Appendix F
Hazards and Hazardous Materials

F1. Site Characterization Study Report
F2. Aquatic Resources Survey Report

F1. Environmental Records Review

Stantec

Memo

To:	Kristen Goland	From:	Steve Little
	Pacific Wind Development, LLC		San Luis Obispo, CA
File:	Fountain Wind Project	Date:	February 20, 2019

Reference: Environmental Records Review

As part of the Phase I Environmental Site Assessment for the referenced project, Stantec Consulting Services has reviewed a database search report prepared by Environmental Data Resources (EDR) consistent with ASTM Standard Practice E1527-13. The findings of the environmental agency database search are summarized as follows:

- As listed in the California Integrated Water Quality System, two permits regulating timber harvesting activities on the Property were issued by the Central Valley Regional Water Quality Control Board (RWQCB) as Waste Discharge Requirements Order No. R5-2017-0061. WDR R5-2017-0061 was issued to Sierra Pacific Industries on February 14, 2018 and to Oxbow Timber 1 LLC on October 24, 2017 (see EDR Report Page 68). These currently active Waste Discharge Requirements regulate the non-point discharge of pollutants to water associated with logging and timber harvesting. A copy of WDR R5-2017-0061 is attached.
- As listed in the California Emergency Response System database, a pre-harvest inspection of Oxbow Timber 1 LLC operations at the Property was conducted by RWQCB staff on June 6, 2017 under the Timber Harvesting program (see EDR Report Page 69). No violations were found.
- Under the California DTSC ENVIROSTOR database, an off-site location identified as Whitmore Gap Filler Annex was listed as a Military Evaluation site with the RWQCB as the lead agency. Located on the peak of Clover Mountain approximately 0.84 miles southeast of the Property, the site is a former Air Defense Command Installation radar site ((see EDR Report Pages 69-71). The radar installation has been decommissioned and the site is currently owned by the U.S. Bureau of Land Management. Based on their evaluation, the RWQCB and DTSC determined in January 2014 that no further action was required for the site.

An annotated radius search map showing the listed sites is attached. The complete EDR report and a copy of WDR R5-2017-0061 are also attached.

Sincerely,

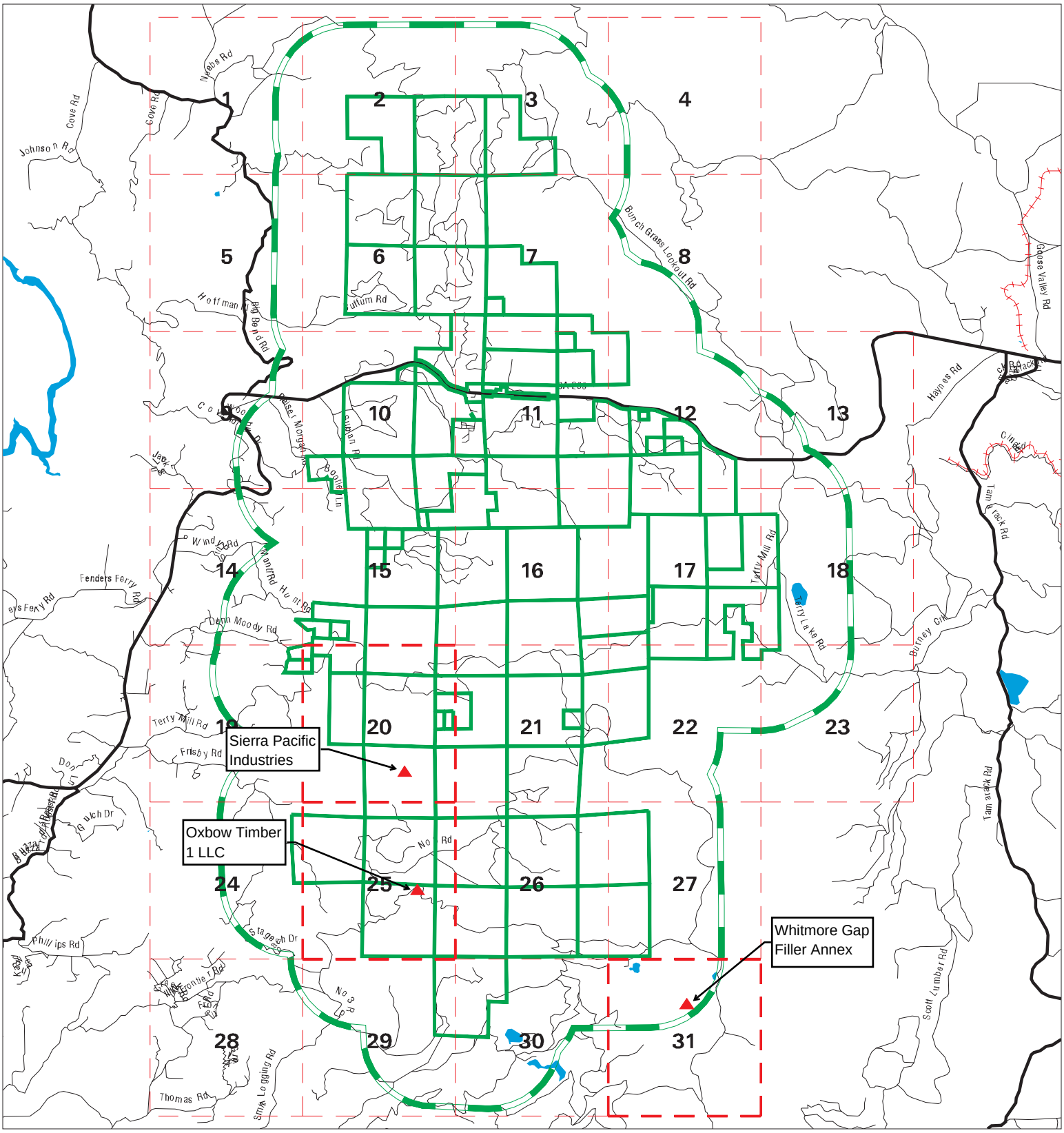
Stantec Consulting Services Inc.

Steve Little, PG, CHG
Principal Geologist
Phone: (805) 250-2857
Steve.little@stantec.com

Reference: **Environmental Records Review**

Attachments: Radius Search Map
EDR Area/Corridor Report
RWQCB Waste Discharge Requirements Order No. R5-2017-0061

Key Map - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1 1/2 3 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19 12:48 PM

Fountain Wind Project
Shasta County
Montgomery Creek, CA 96065

Inquiry Number: 5564109.2s
February 15, 2019

EDR Area / Corridor Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

SUBJECT PROPERTY INFORMATION

ADDRESS

SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

TARGET PROPERTY SEARCH RESULTS

The Target Property was identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

CIWQS: California Integrated Water Quality System

A review of the CIWQS list, as provided by EDR, and dated 12/03/2018 has revealed that there are 2 CIWQS sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
THP 2-16-063-SHA GOO		1 / 20	68
THP 2-16-077-SHA CED		A2 / 25	68

CERS: CERS

A review of the CERS list, as provided by EDR, and dated 10/22/2018 has revealed that there is 1 CERS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
THP 2-16-077-SHA CED		A3 / 25	69

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

EXECUTIVE SUMMARY

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

A review of the ENVIROSTOR list, as provided by EDR, and dated 10/29/2018 has revealed that there is 1 ENVIROSTOR site within approximately1 mile of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
WHITMORE GAP FILLER Facility Id: 71000058 Status: No Further Action	LOCATED IN SHAST COU	SE 1/2 - 1 (0.838 mi.)	B4 / 31	69

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

FUDS: Formerly Used Defense Sites

A review of the FUDS list, as provided by EDR, and dated 01/31/2015 has revealed that there is 1 FUDS site within approximately1 mile of the requested target property.

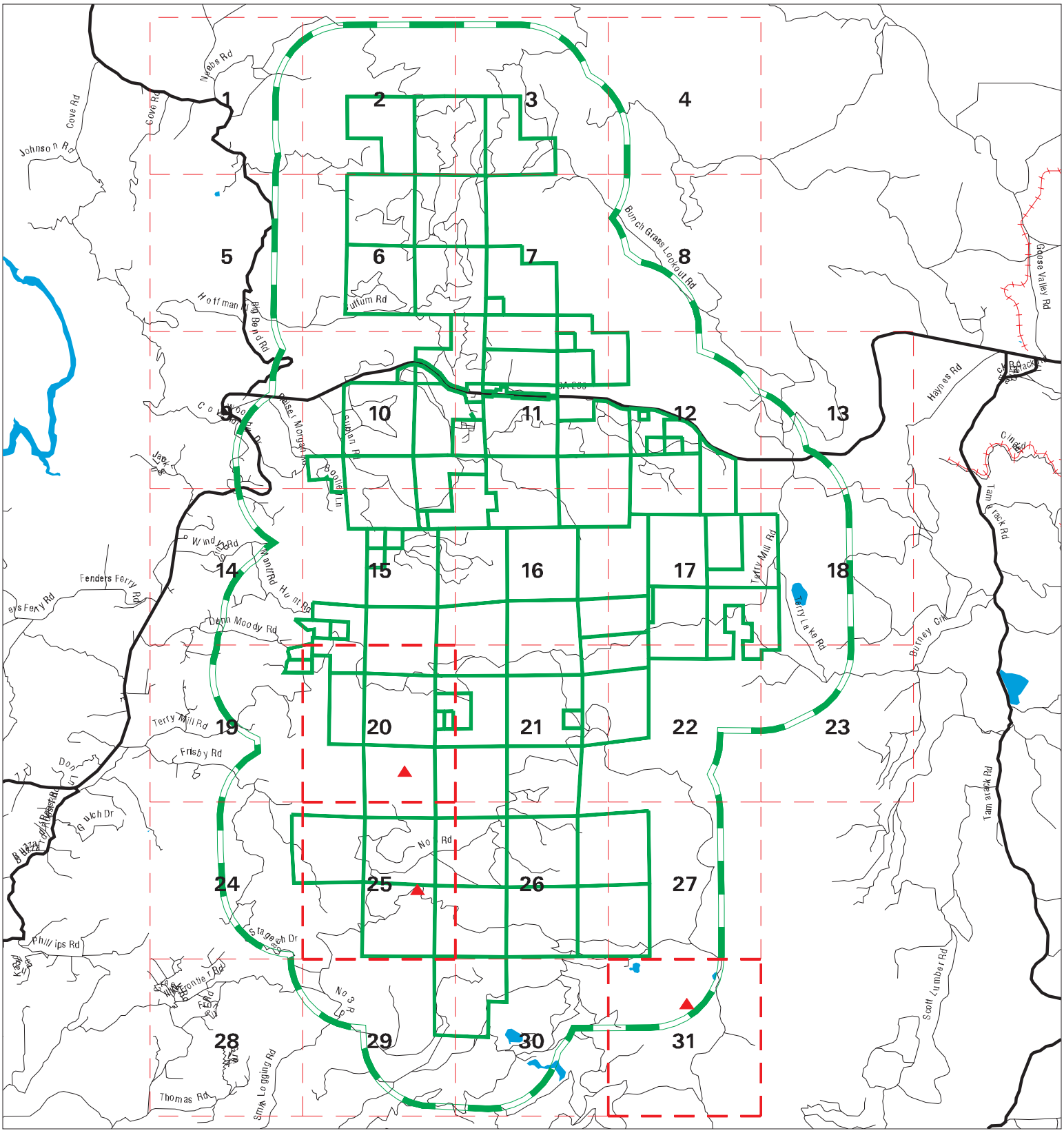
Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
WHITMORE GAP FILLER Federal Facility ID:: CA9799F5242 INST ID:: 57766		SE 1/2 - 1 (0.855 mi.)	B5 / 31	71

MAPPED SITES SUMMARY

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
1 / 20	THP 2-16-063-SHA GOO		CIWQS	TP
A2 / 25	THP 2-16-077-SHA CED		CIWQS	TP
A3 / 25	THP 2-16-077-SHA CED		CERS	TP
B4 / 31	WHITMORE GAP FILLER	LOCATED IN SHAST COU	ENVIROSTOR	4425 0.838 SE
B5 / 31	WHITMORE GAP FILLER		FUDS	4516 0.855 SE

Key Map - 5564109.2s



SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19 12:48 PM

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	1	NR	1
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	1	NR	1
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
ICE	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
UIC GEO	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
MILITARY PRIV SITES	TP		NR	NR	NR	NR	NR	0
PROJECT	TP		NR	NR	NR	NR	NR	0
WDR	TP		NR	NR	NR	NR	NR	0
CIWQS	TP	2	NR	NR	NR	NR	NR	2
CERS	TP	1	NR	NR	NR	NR	NR	1
WIP	0.250		0	0	NR	NR	NR	0
NON-CASE INFO	TP		NR	NR	NR	NR	NR	0
OTHER OIL GAS	TP		NR	NR	NR	NR	NR	0
PROD WATER PONDS	TP		NR	NR	NR	NR	NR	0
SAMPLING POINT	TP		NR	NR	NR	NR	NR	0
WELL STIM PROJ	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		3	0	0	0	2	0	5

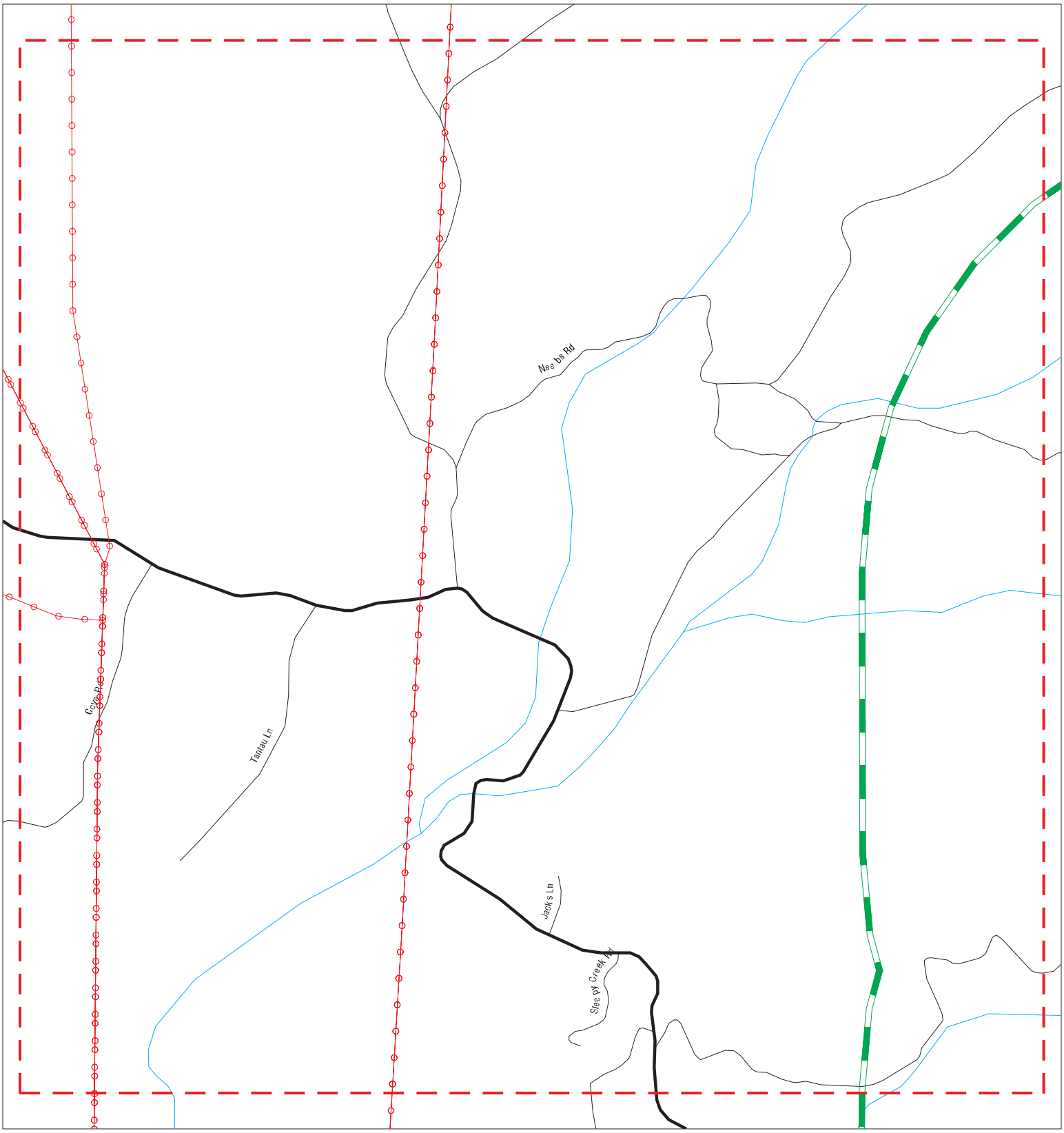
NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Focus Map - 1 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

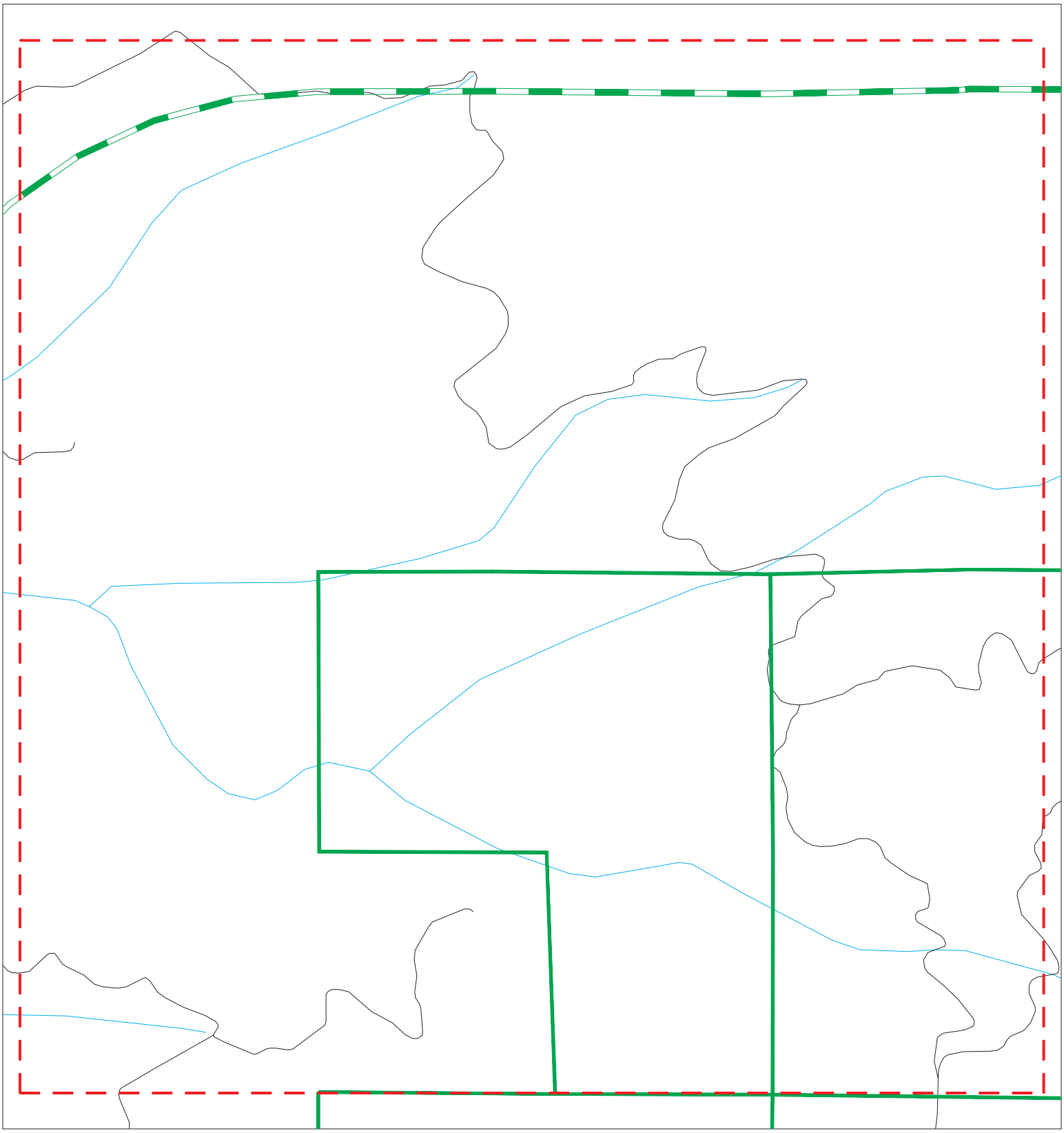
MAPPED SITES SUMMARY - FOCUS MAP 1

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 2 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME:	Fountain Wind Project	CLIENT:	Stantec
ADDRESS:	Shasta County	CONTACT:	Steve Little
CITY/STATE:	Montgomery Creek CA	INQUIRY #:	5564109.2s
ZIP:	96065	DATE:	02/15/19

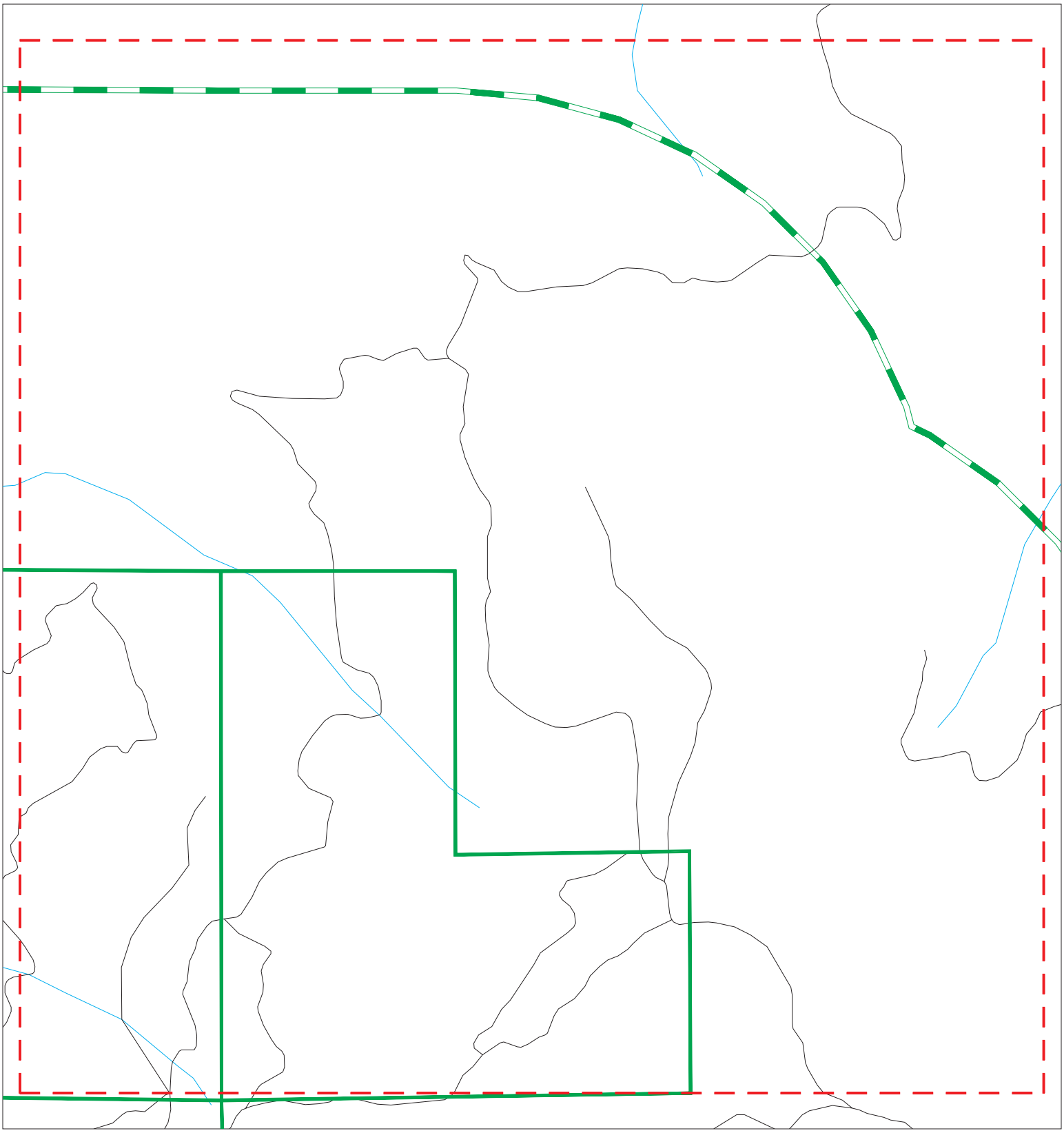
MAPPED SITES SUMMARY - FOCUS MAP 2

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 3 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

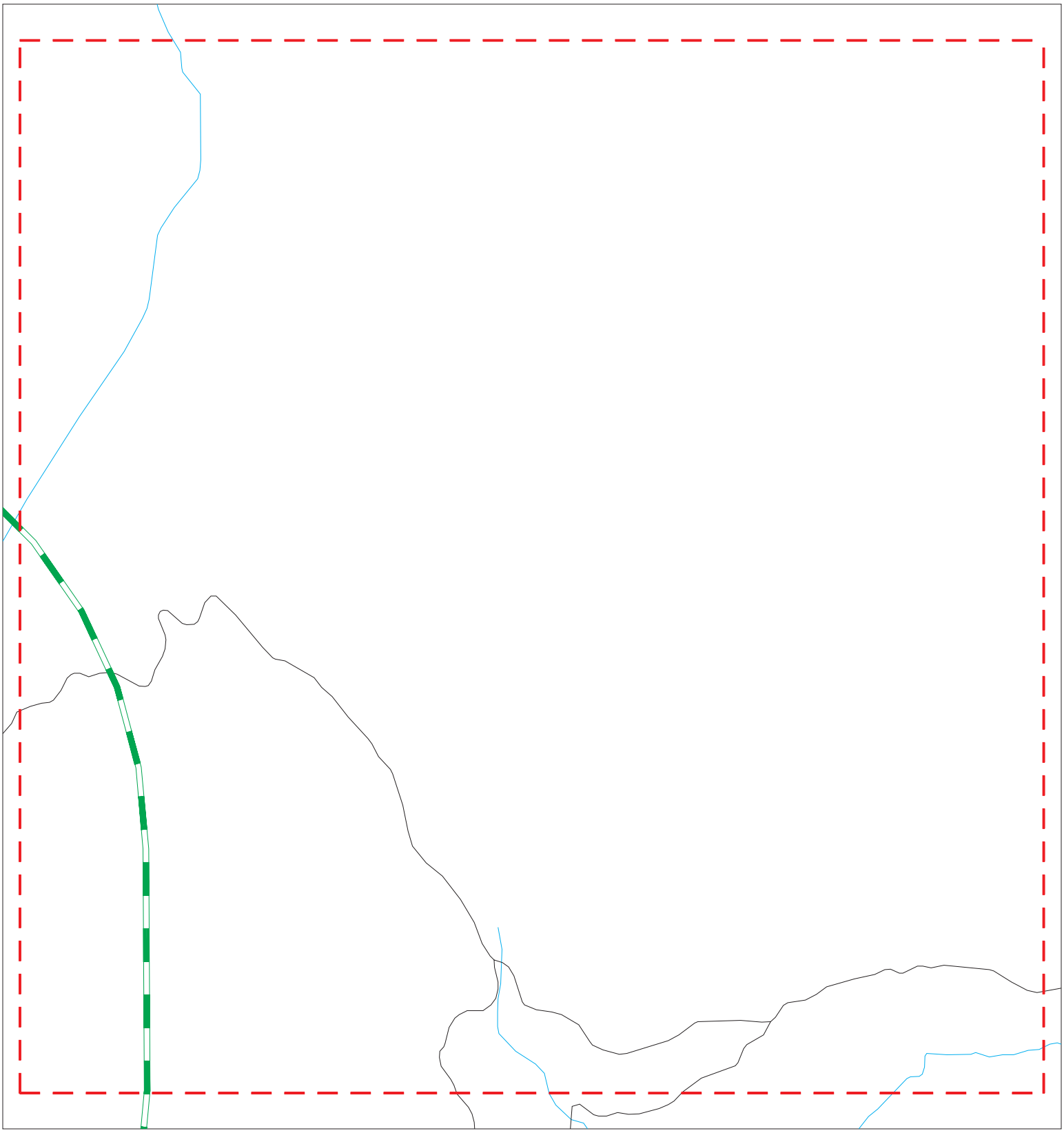
MAPPED SITES SUMMARY - FOCUS MAP 3

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 4 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

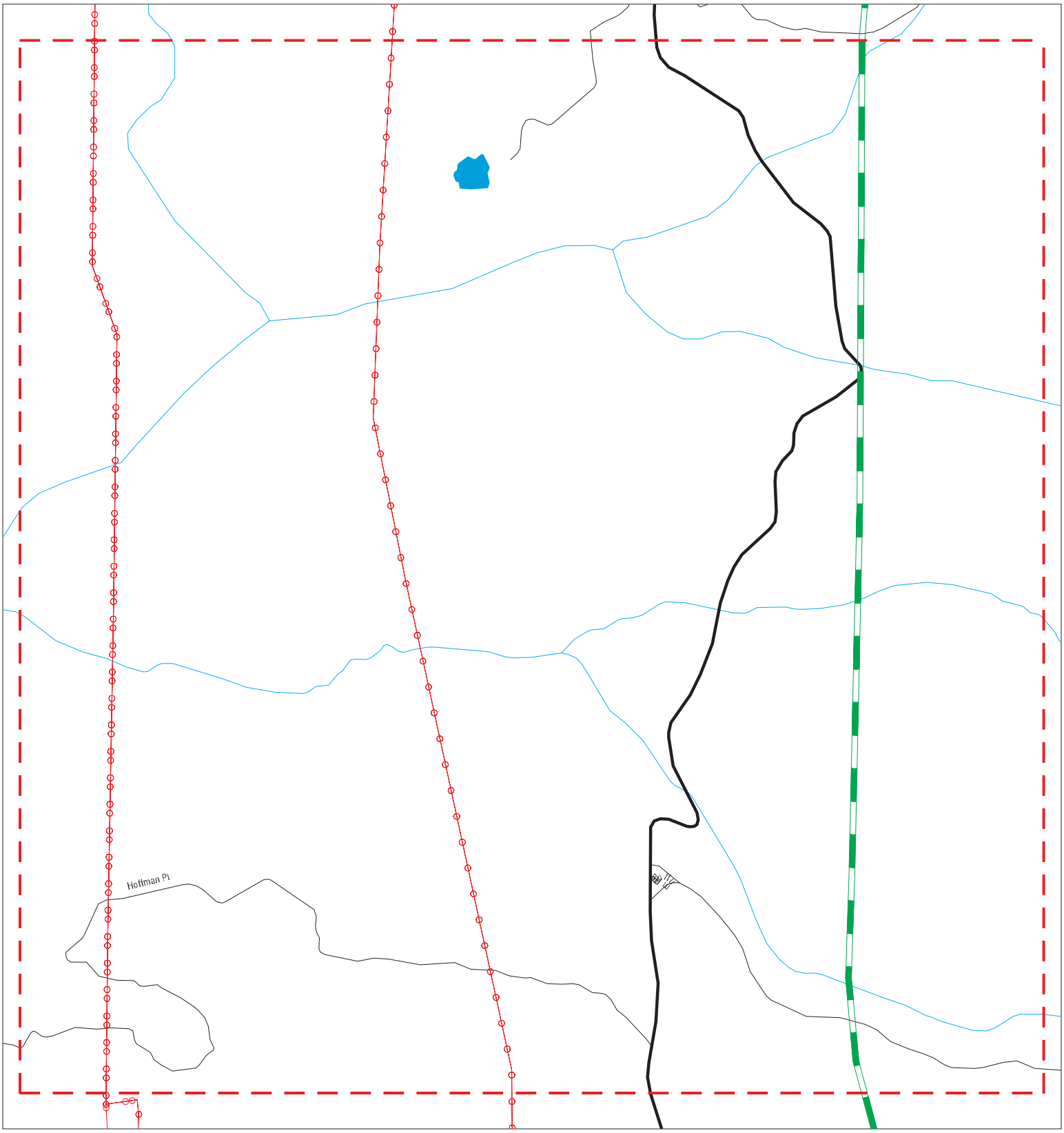
MAPPED SITES SUMMARY - FOCUS MAP 4

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 5 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME:	Fountain Wind Project	CLIENT:	Stantec
ADDRESS:	Shasta County	CONTACT:	Steve Little
CITY/STATE:	Montgomery Creek CA	INQUIRY #:	5564109.2s
ZIP:	96065	DATE:	02/15/19

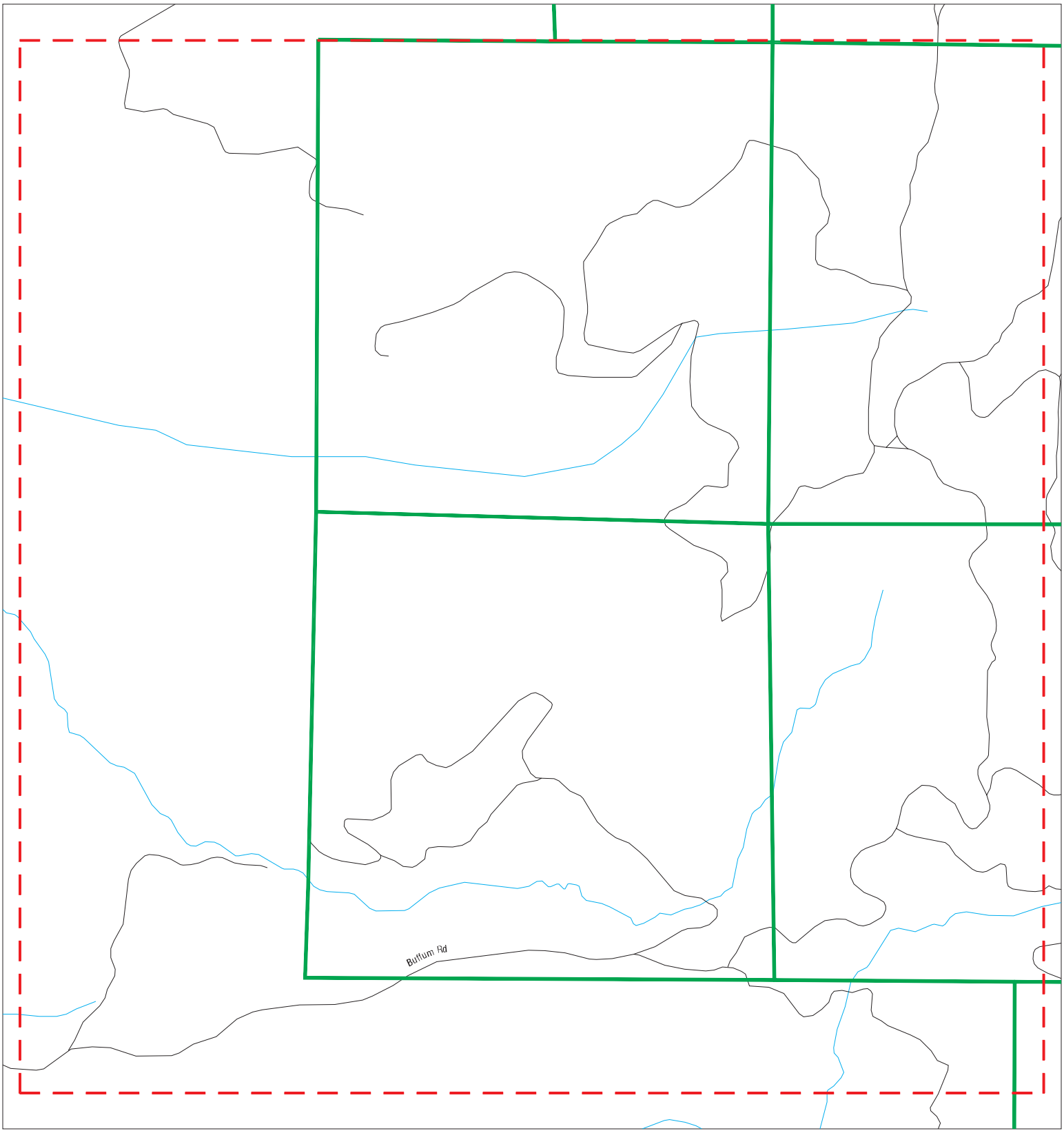
MAPPED SITES SUMMARY - FOCUS MAP 5

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 6 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME:	Fountain Wind Project	CLIENT:	Stantec
ADDRESS:	Shasta County	CONTACT:	Steve Little
CITY/STATE:	Montgomery Creek CA	INQUIRY #:	5564109.2s
ZIP:	96065	DATE:	02/15/19

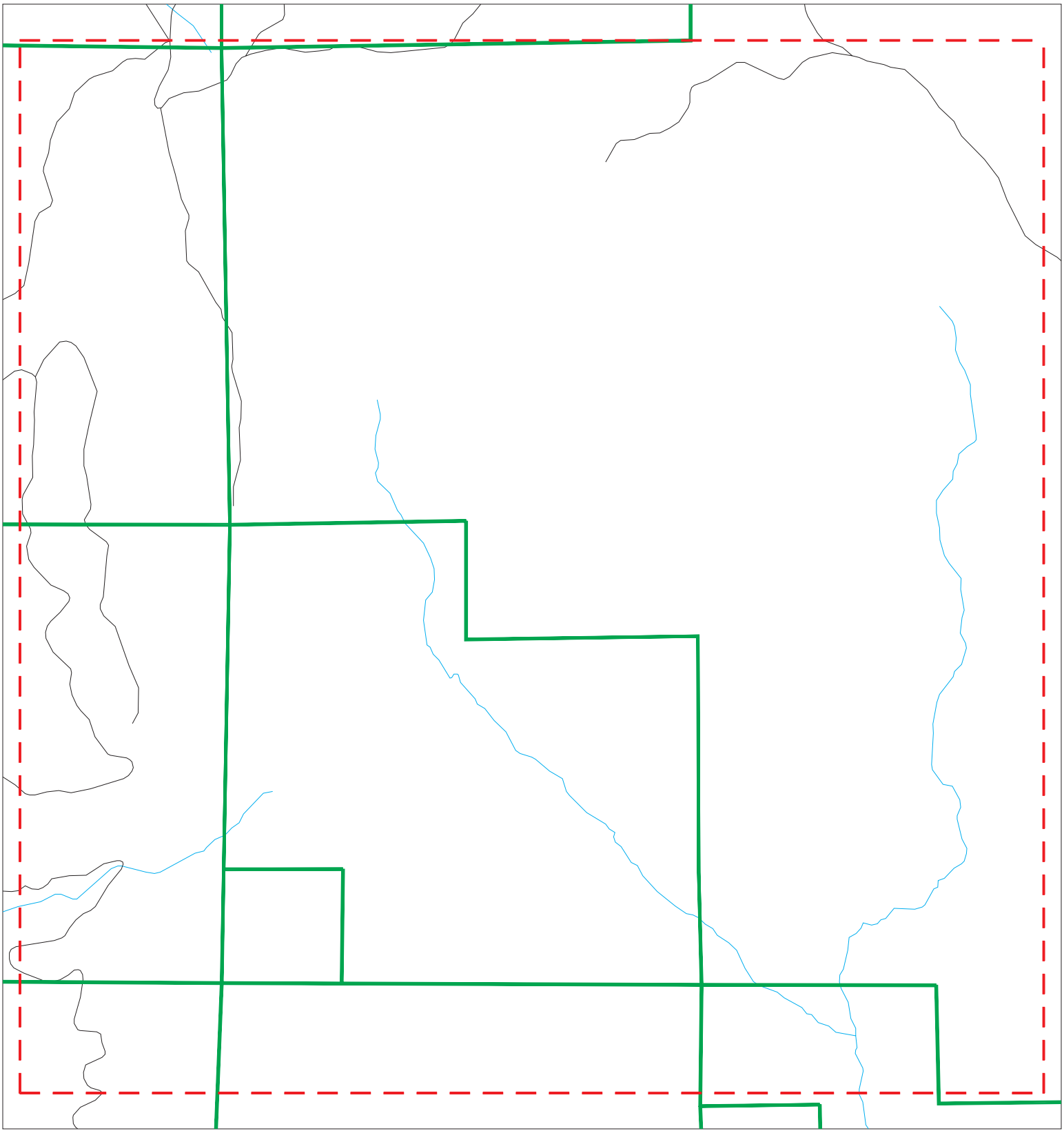
MAPPED SITES SUMMARY - FOCUS MAP 6

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 7 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

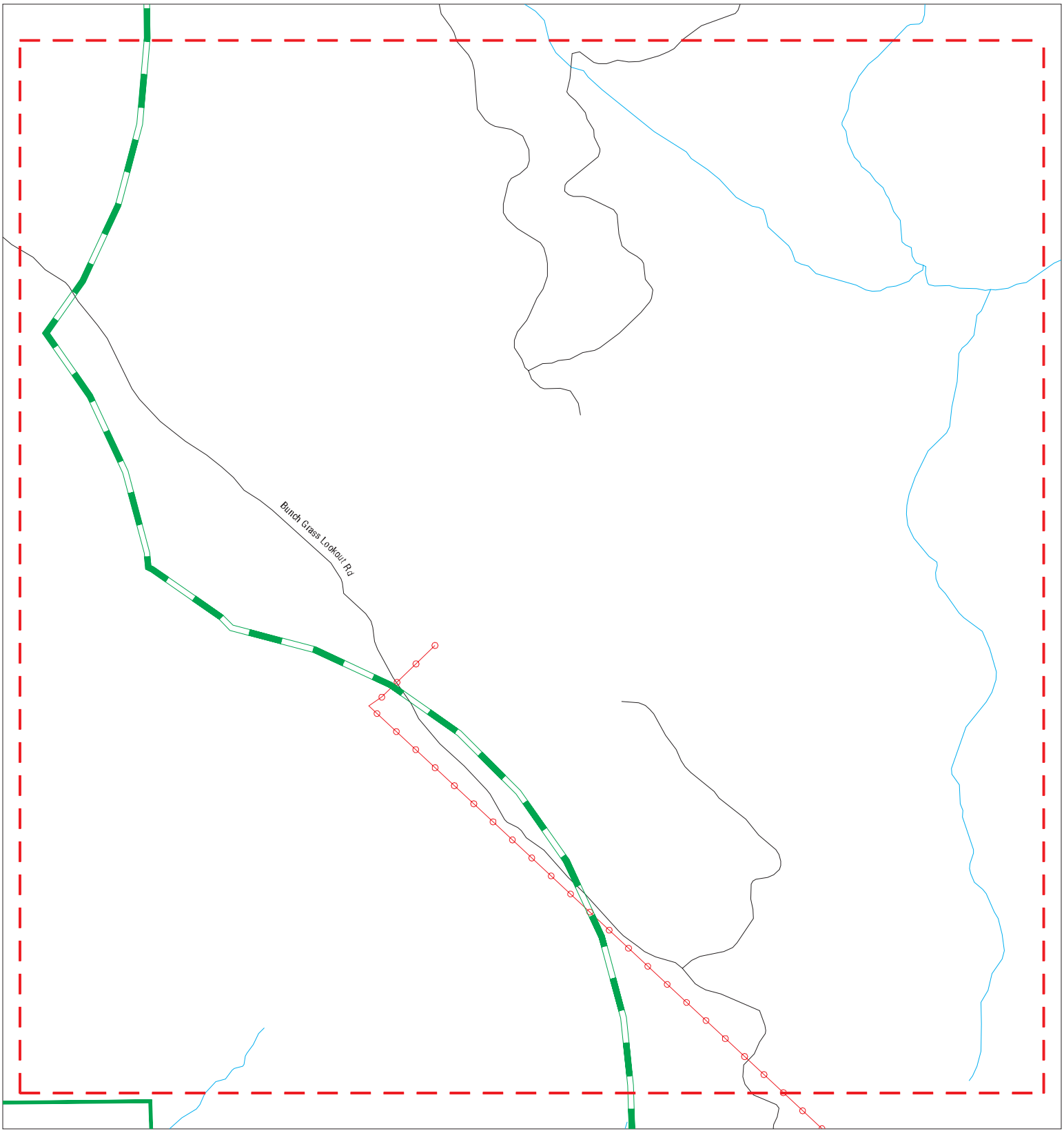
MAPPED SITES SUMMARY - FOCUS MAP 7

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 8 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

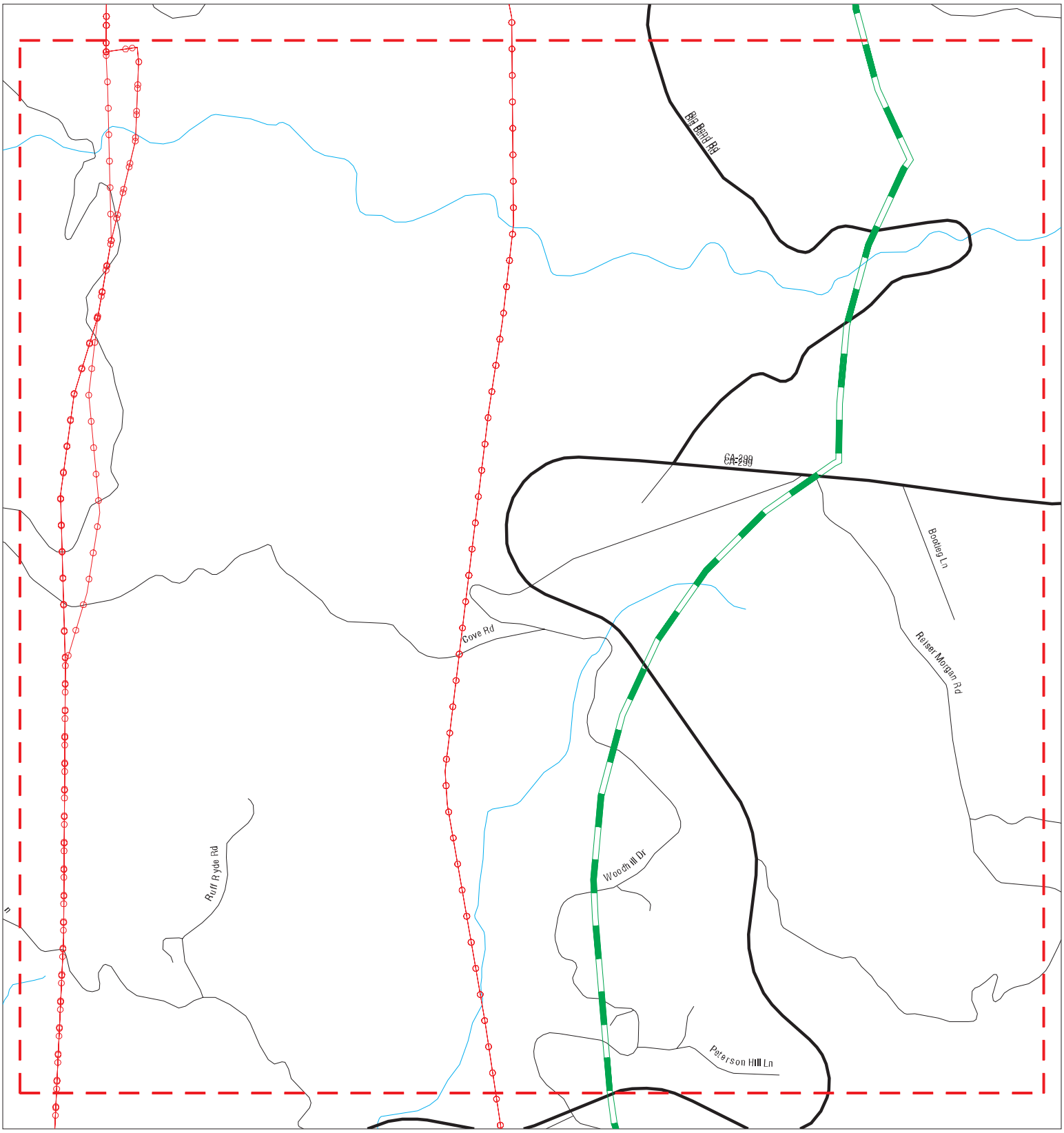
MAPPED SITES SUMMARY - FOCUS MAP 8

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 9 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

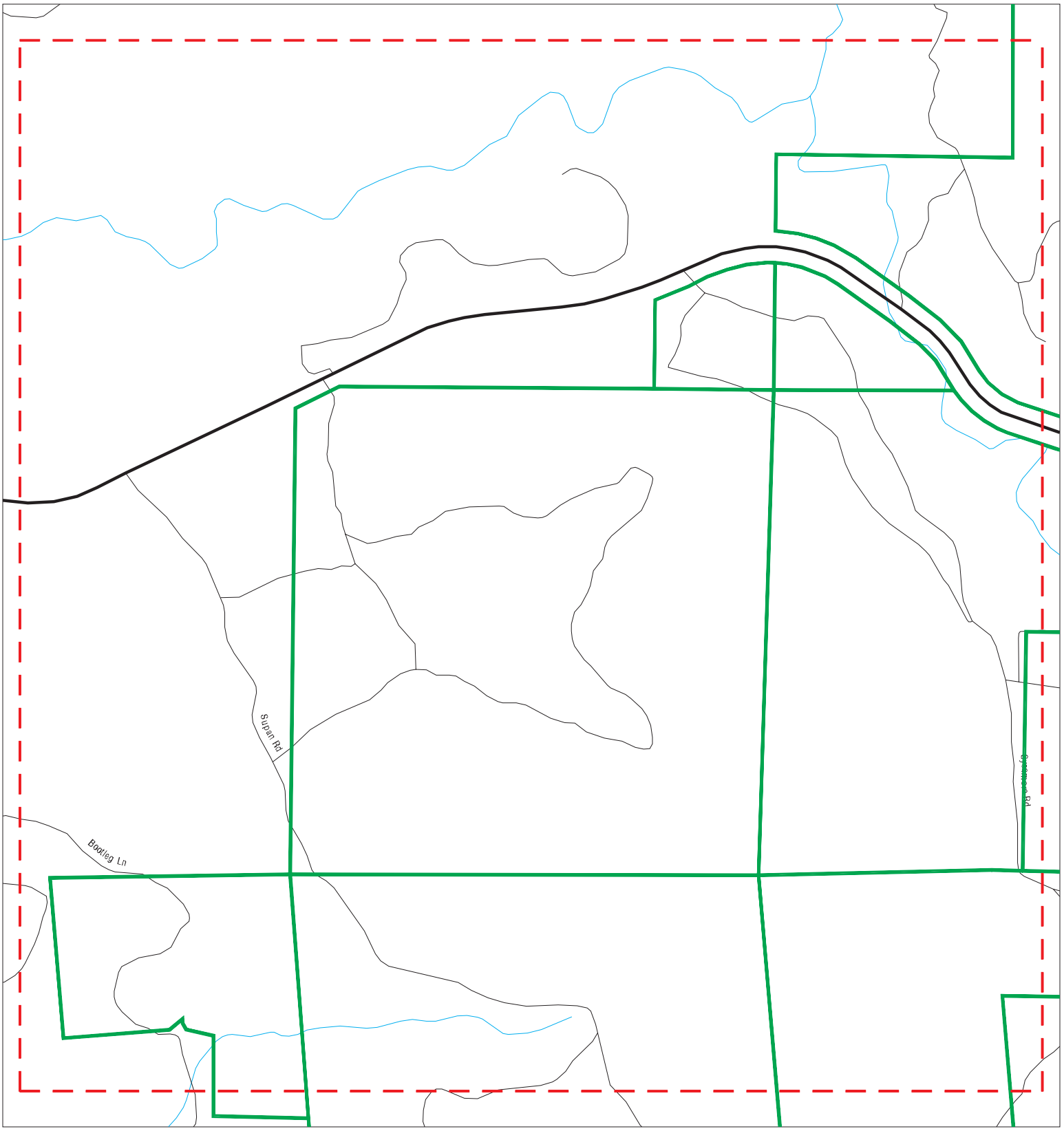
MAPPED SITES SUMMARY - FOCUS MAP 9

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 10 - 5564109.2s



SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

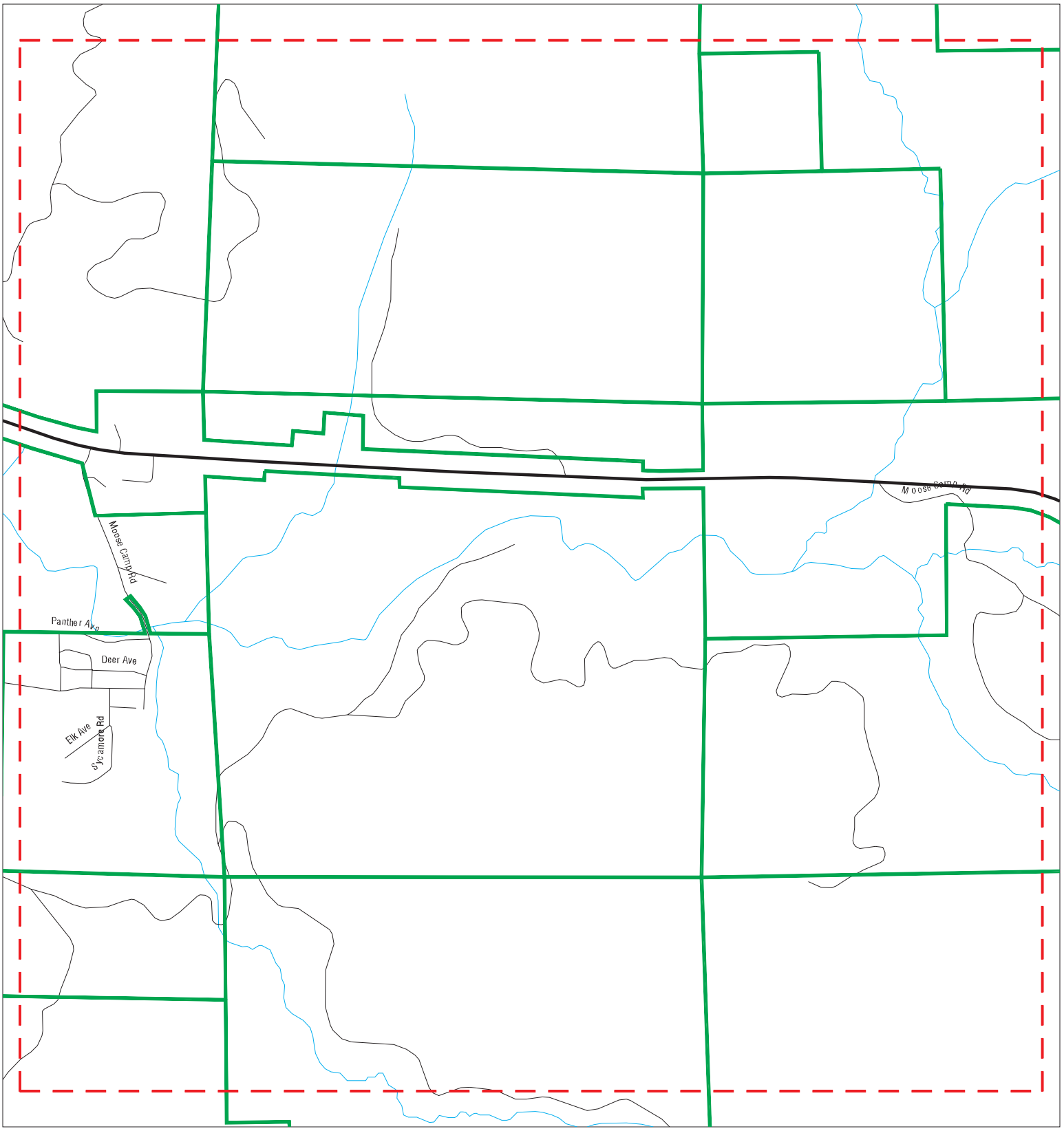
MAPPED SITES SUMMARY - FOCUS MAP 10

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 11 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

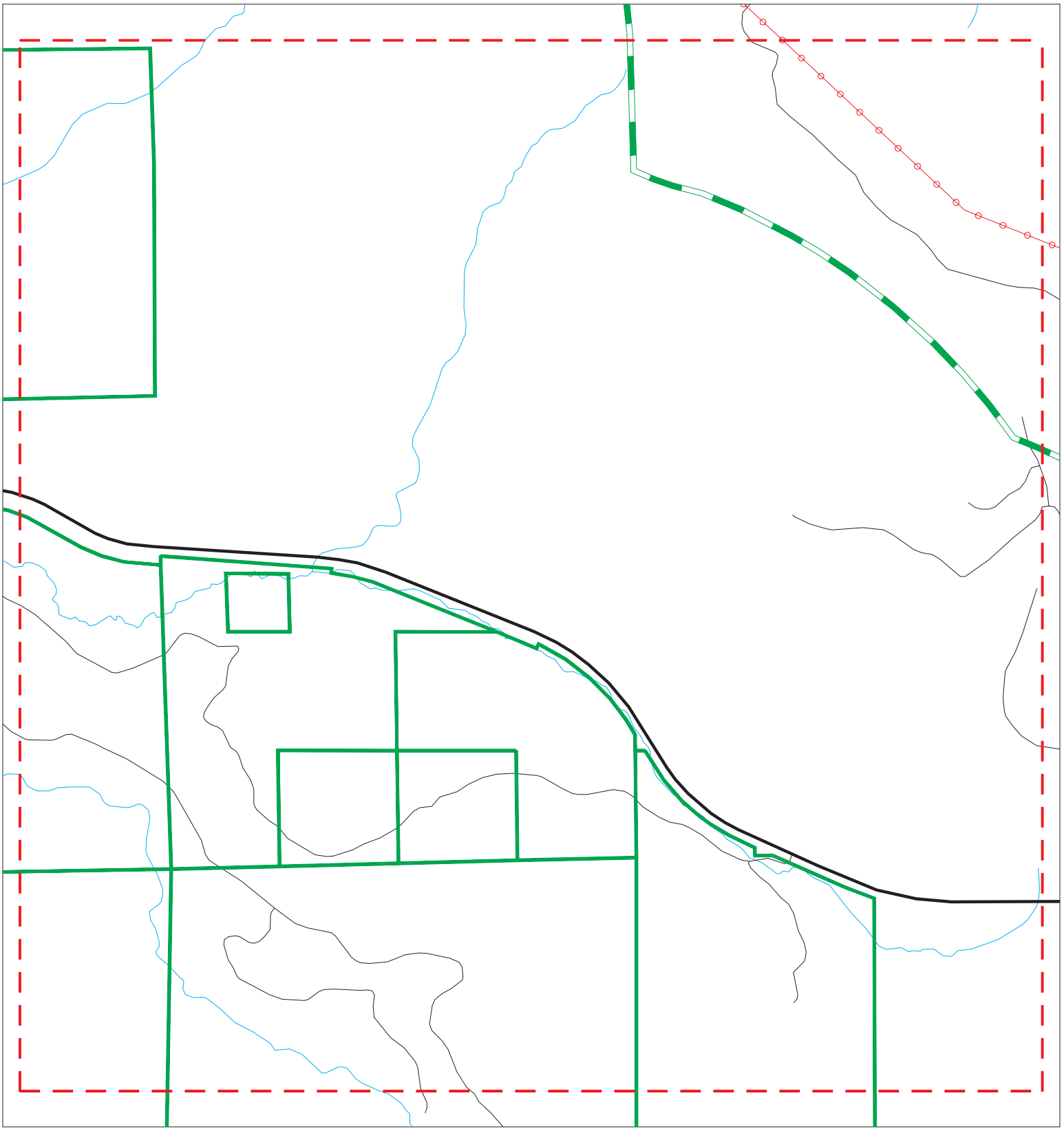
MAPPED SITES SUMMARY - FOCUS MAP 11

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 12 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

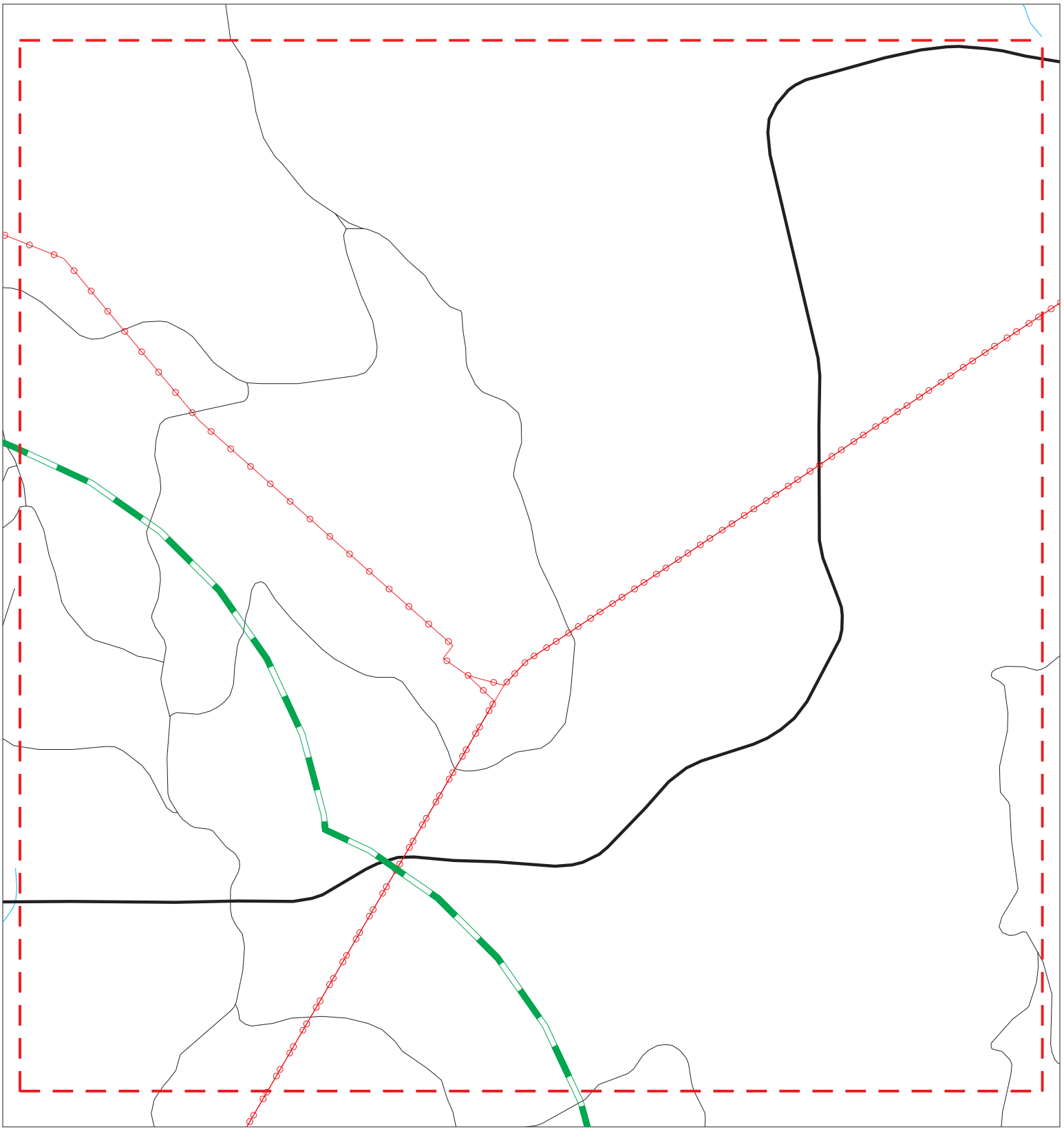
MAPPED SITES SUMMARY - FOCUS MAP 12

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 13 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

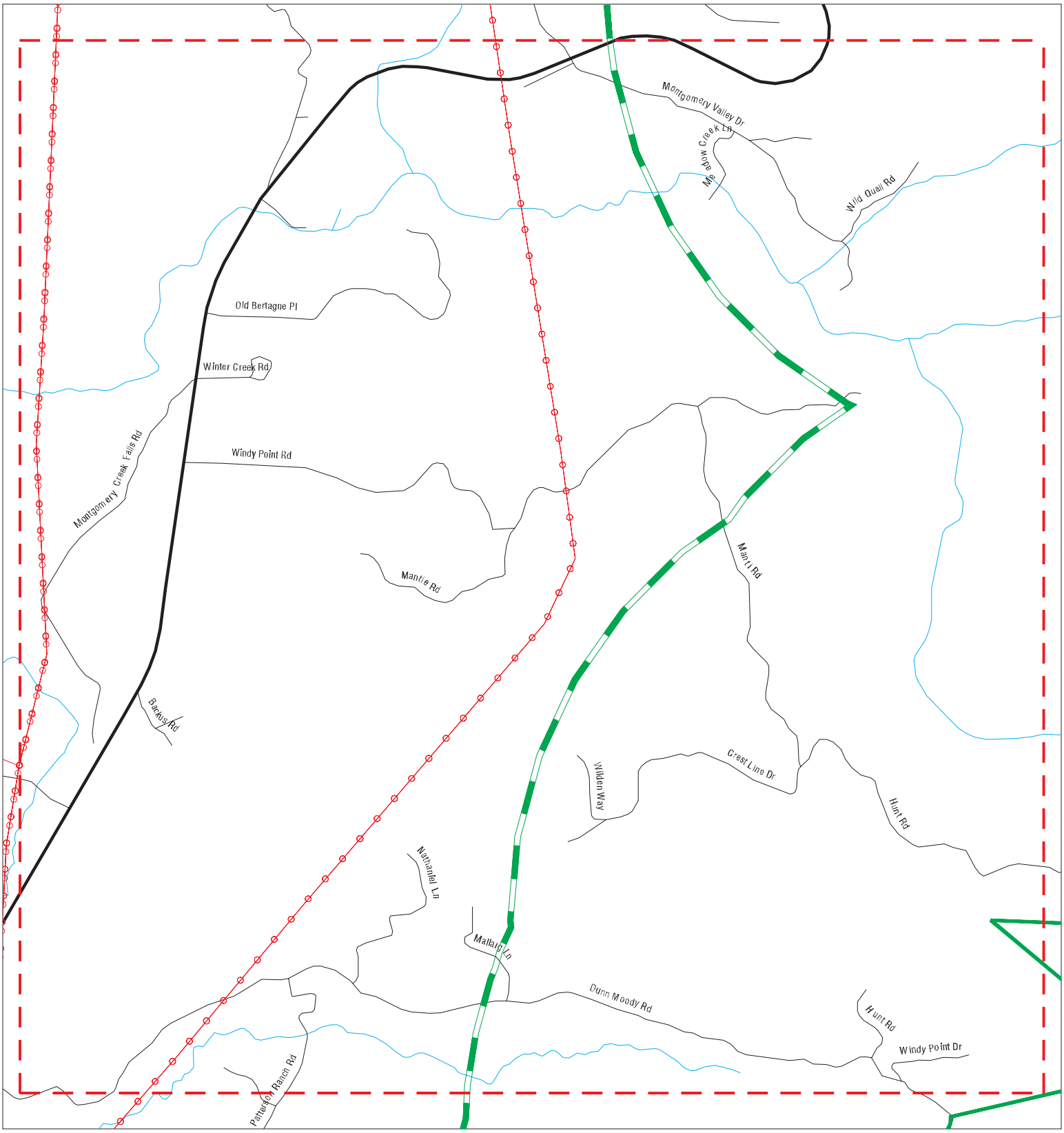
MAPPED SITES SUMMARY - FOCUS MAP 13

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 14 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

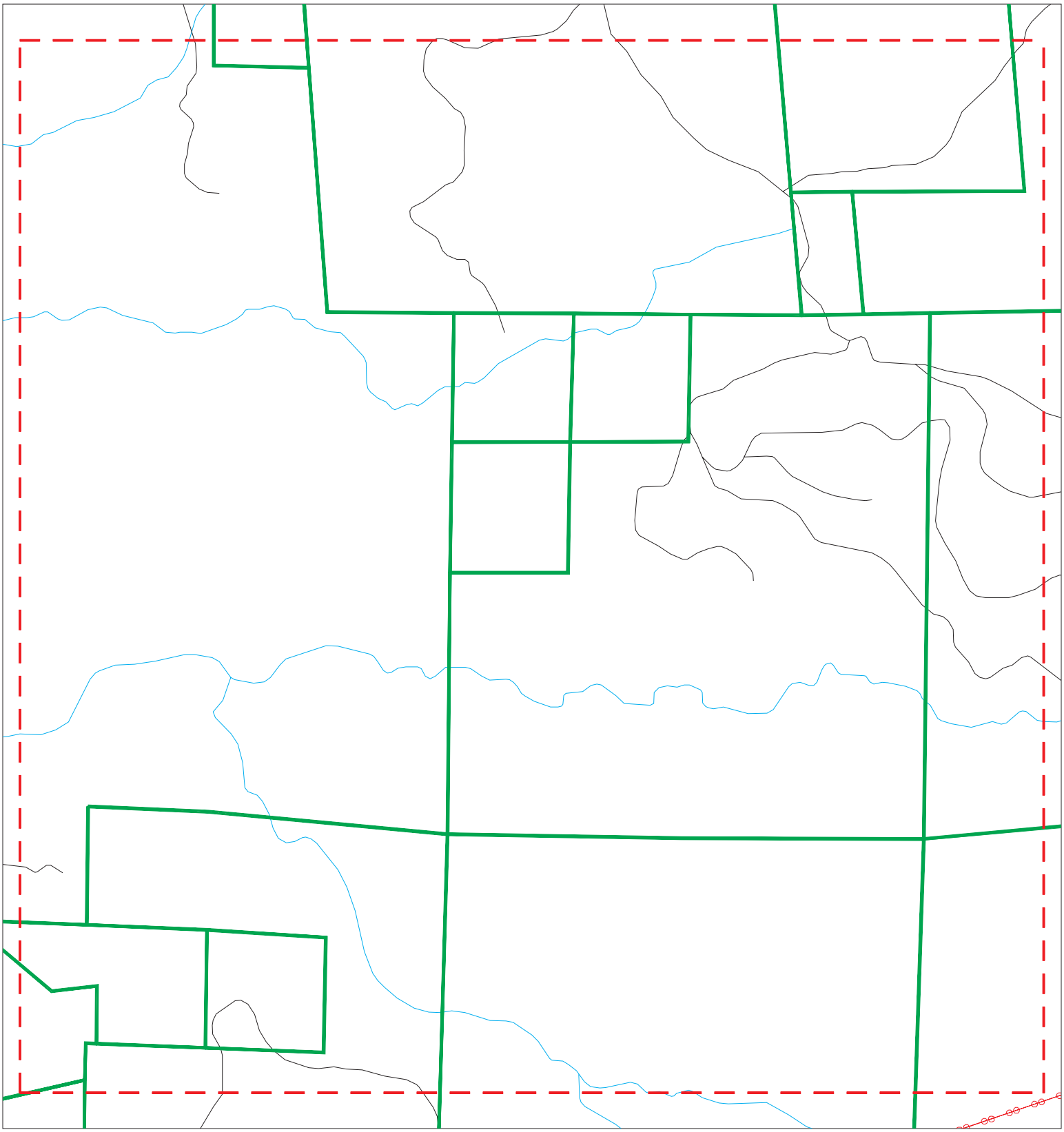
MAPPED SITES SUMMARY - FOCUS MAP 14

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 15 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

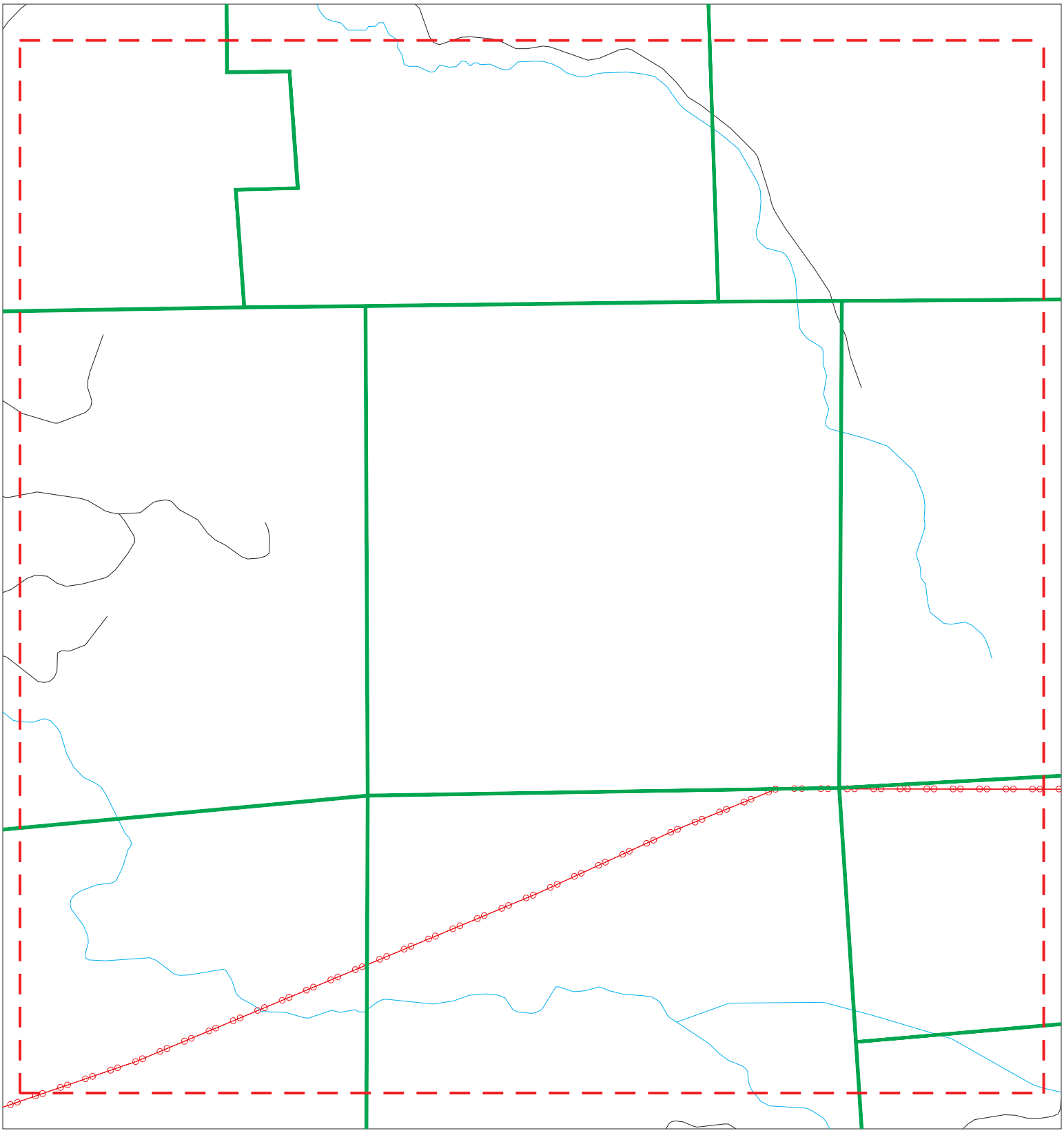
MAPPED SITES SUMMARY - FOCUS MAP 15

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 16 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME:	Fountain Wind Project	CLIENT:	Stantec
ADDRESS:	Shasta County	CONTACT:	Steve Little
CITY/STATE:	Montgomery Creek CA	INQUIRY #:	5564109.2s
ZIP:	96065	DATE:	02/15/19

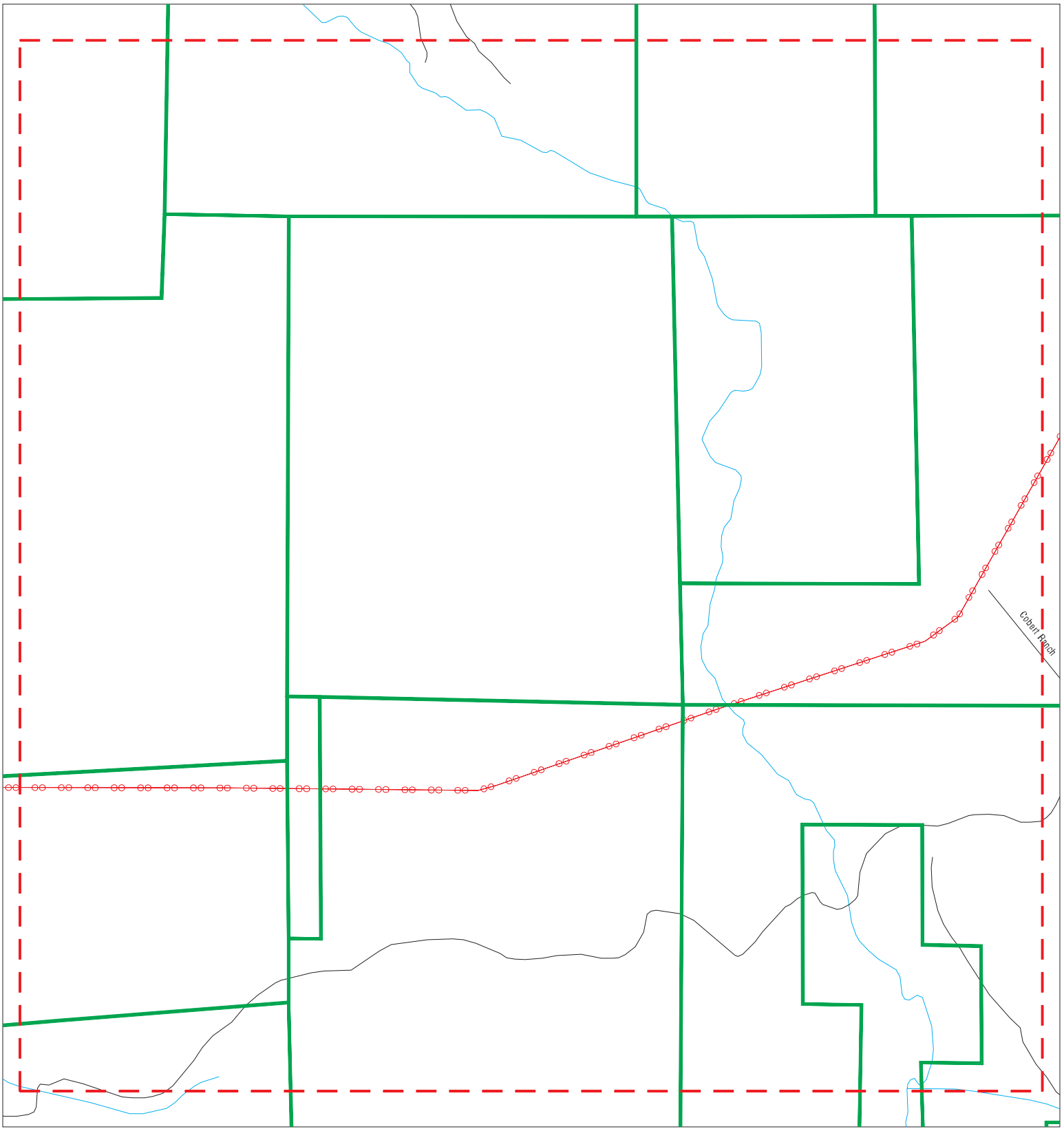
MAPPED SITES SUMMARY - FOCUS MAP 16

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 17 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

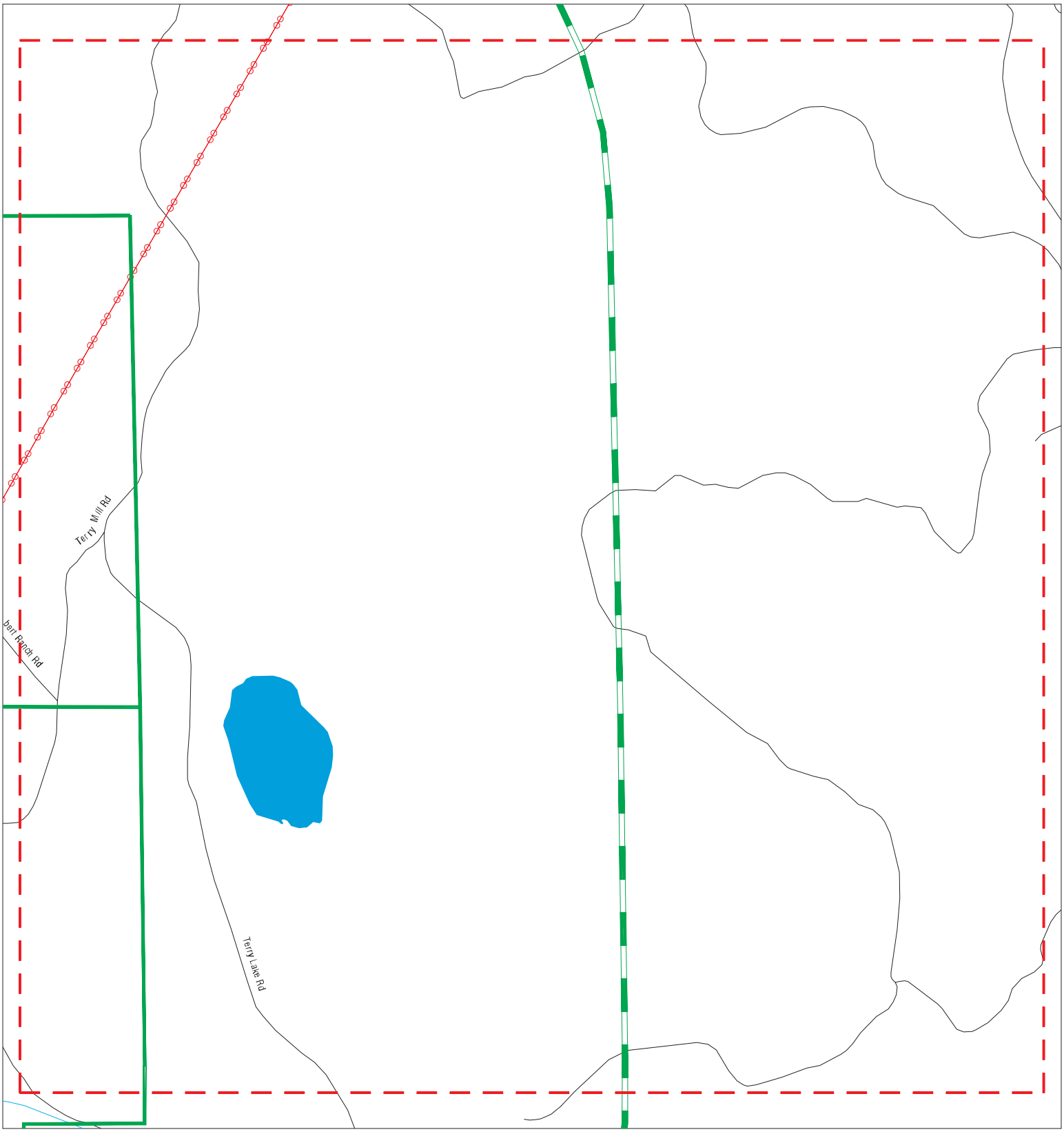
MAPPED SITES SUMMARY - FOCUS MAP 17

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 18 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

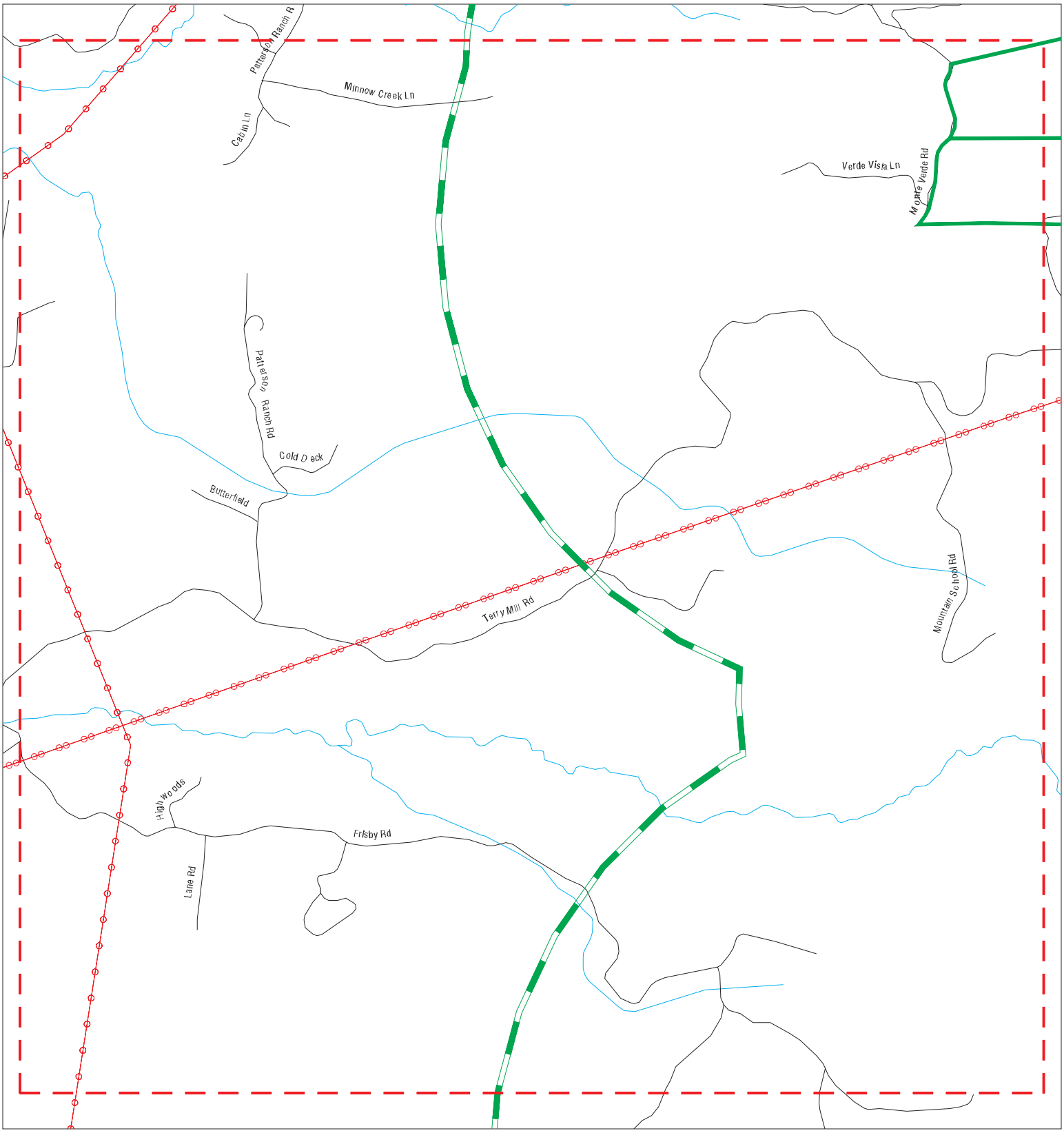
MAPPED SITES SUMMARY - FOCUS MAP 18

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 19 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

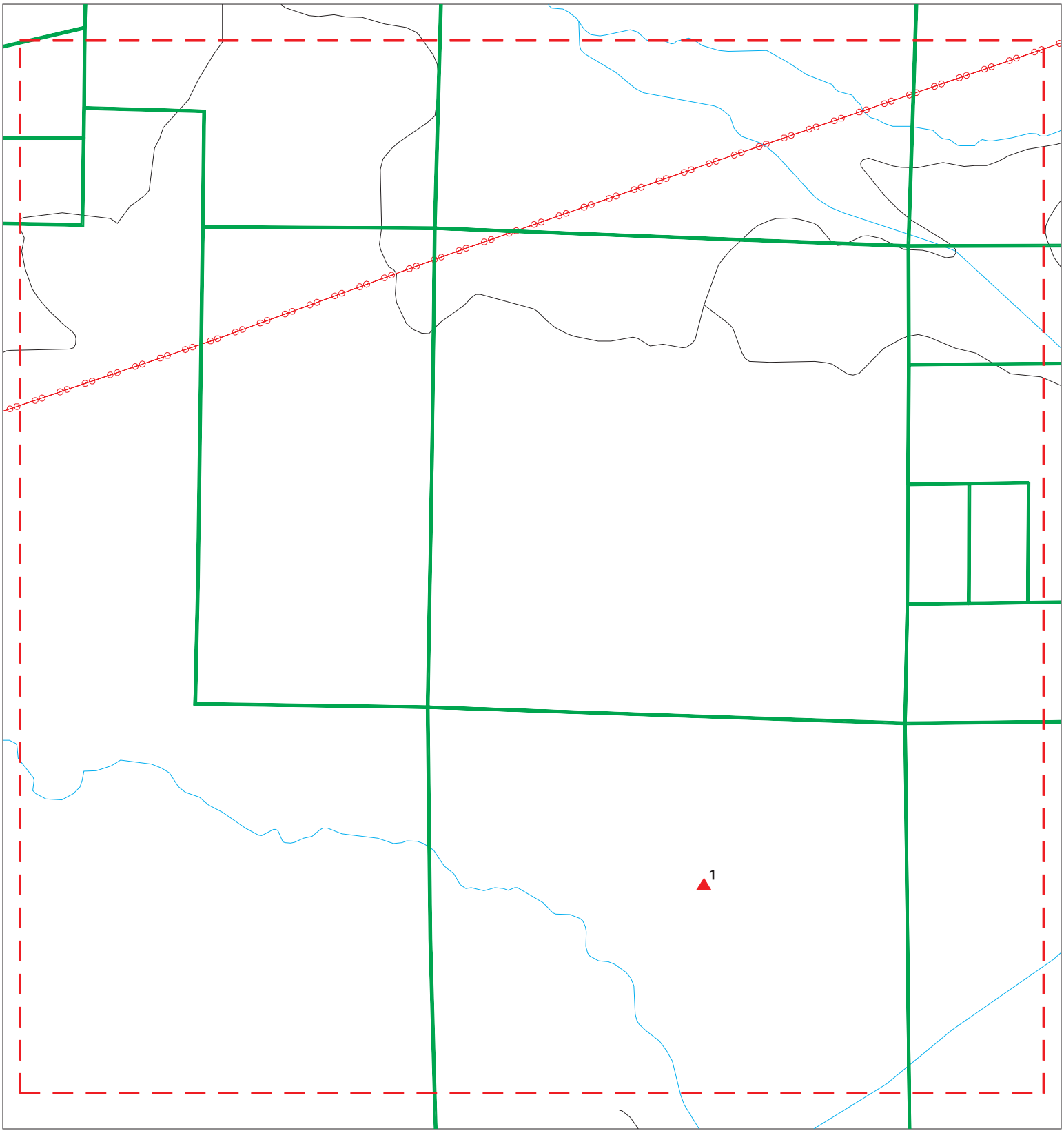
MAPPED SITES SUMMARY - FOCUS MAP 19

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 20 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

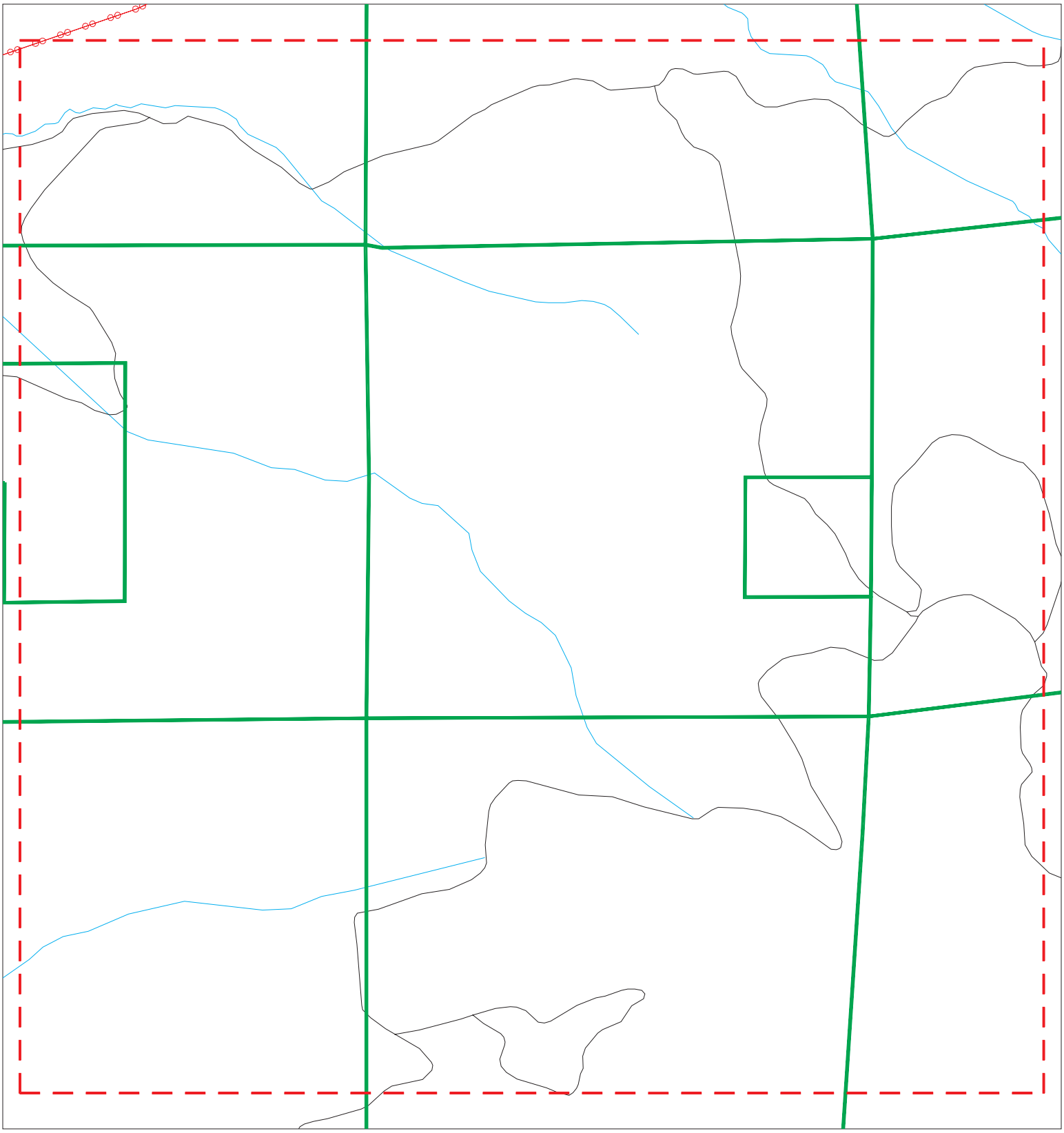
SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

MAPPED SITES SUMMARY - FOCUS MAP 20

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
1 / 20	THP 2-16-063-SHA GOO		CIWQS	TP

Focus Map - 21 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

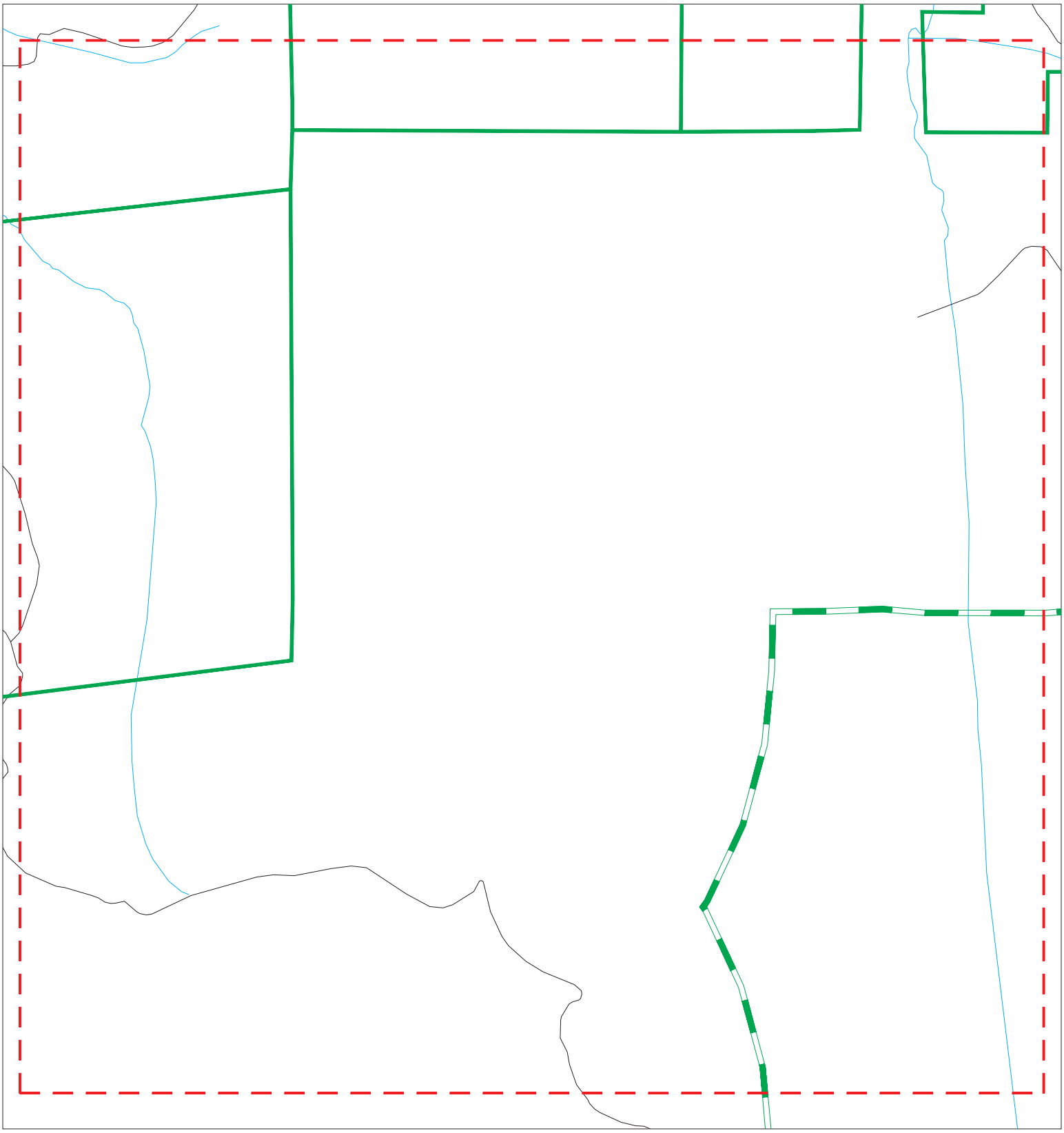
MAPPED SITES SUMMARY - FOCUS MAP 21

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 22 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

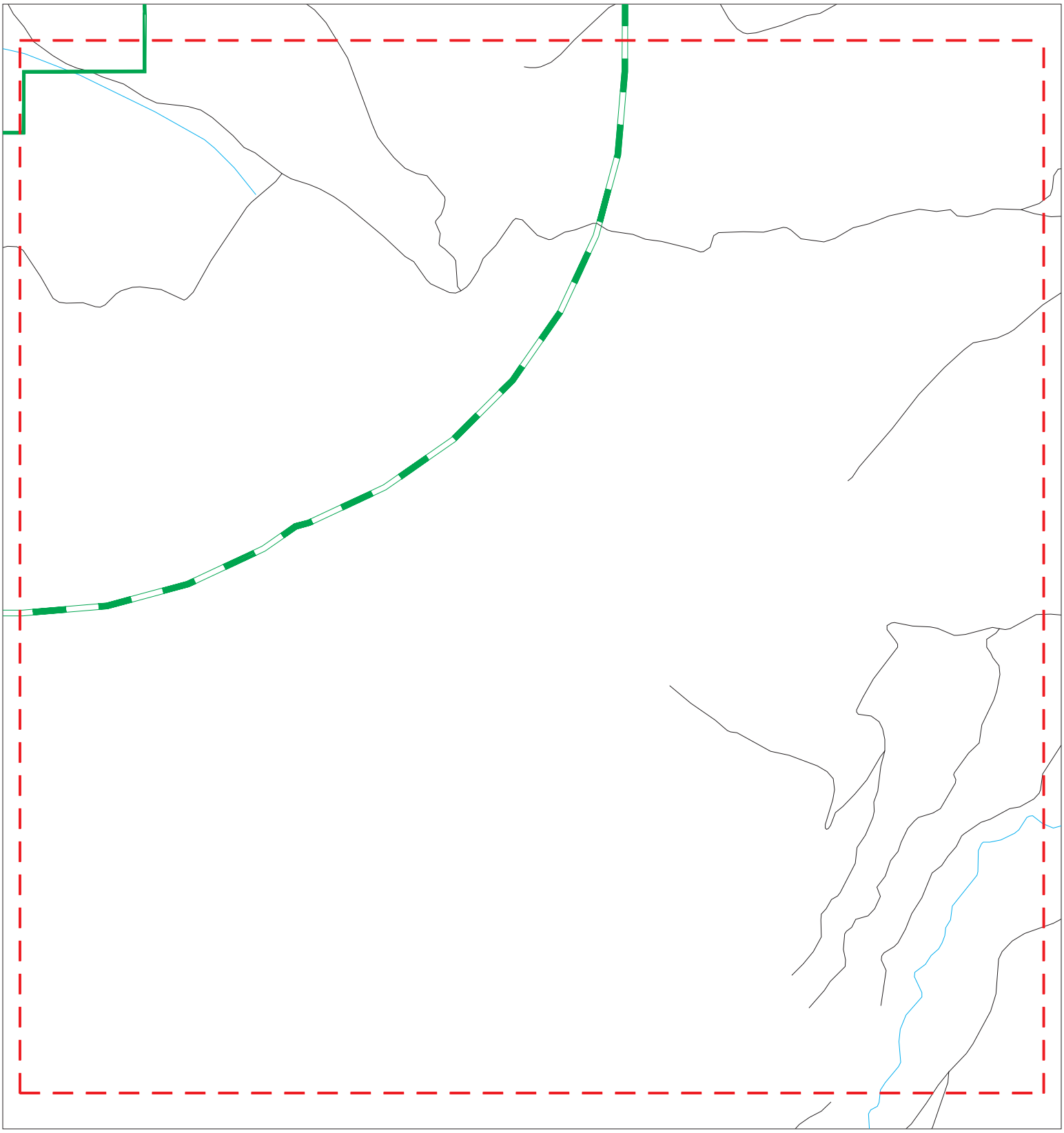
MAPPED SITES SUMMARY - FOCUS MAP 22

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 23 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

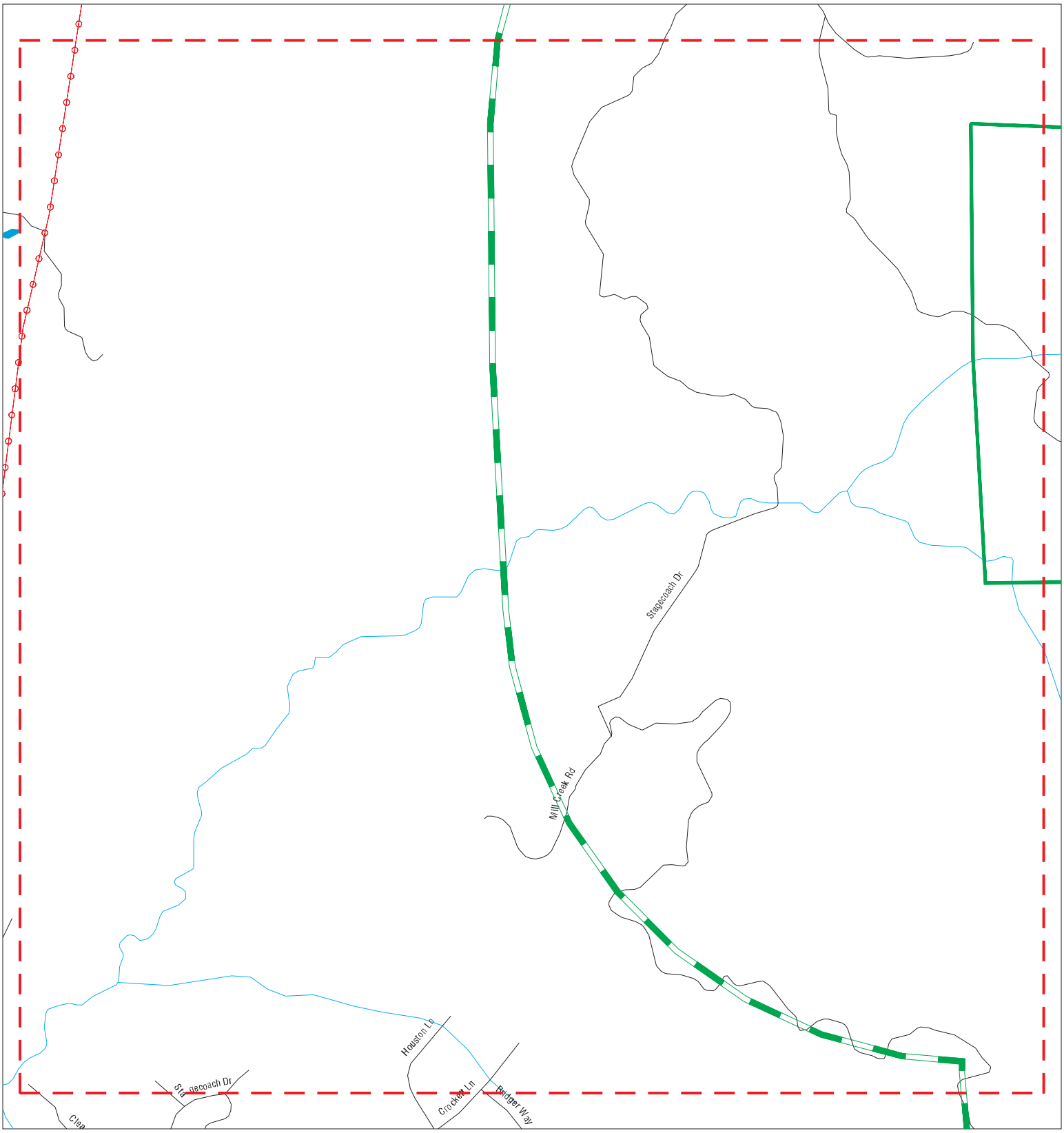
MAPPED SITES SUMMARY - FOCUS MAP 23

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 24 - 5564109.2s



- Sites
- Target Property
- Search Buffer
- Focus Map - No Sites
- Focus Map - Sites
- Power Line
- National Priority List Sites
- Areas of Concern
- Dept. Defense Sites
- Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

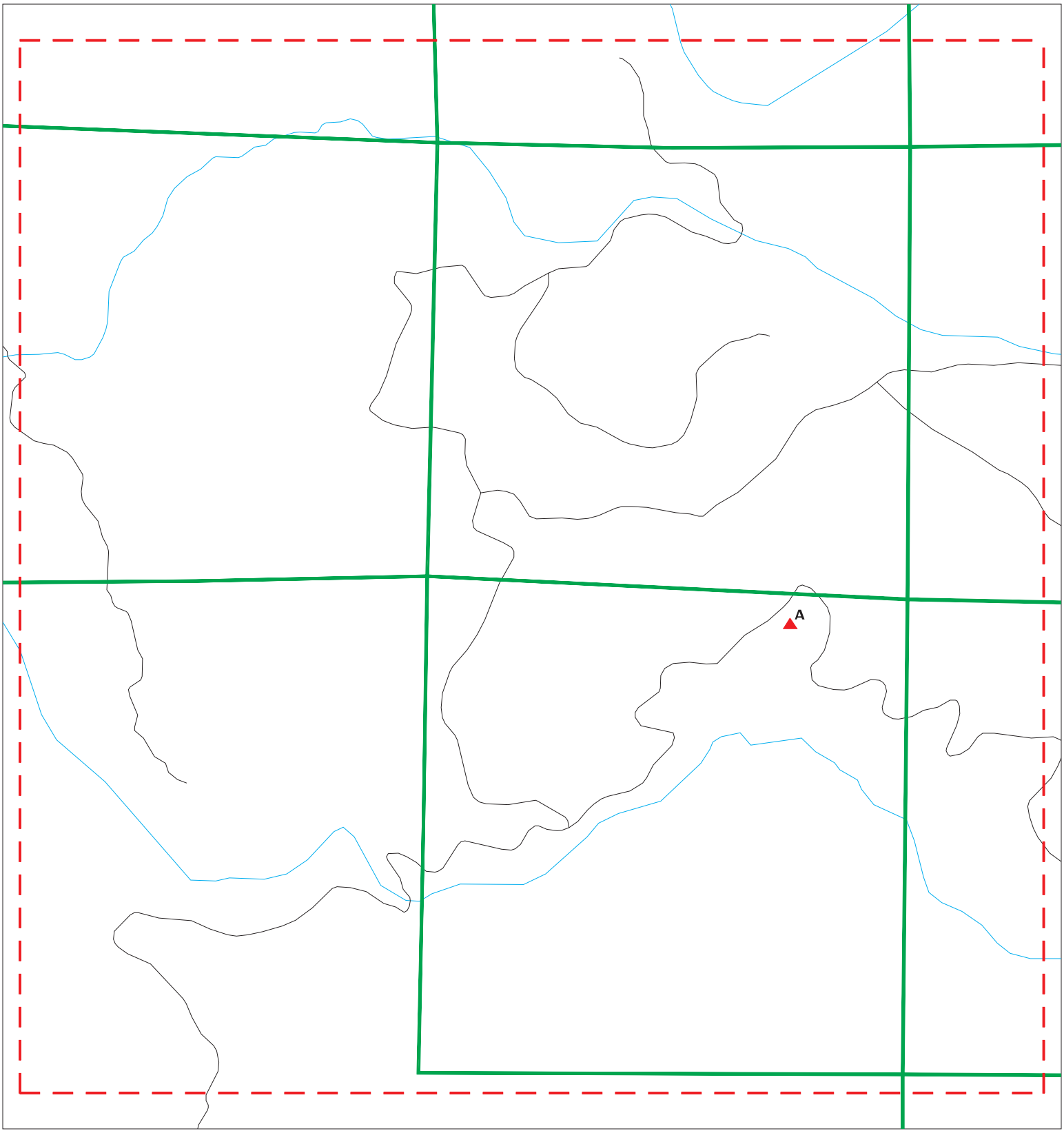
MAPPED SITES SUMMARY - FOCUS MAP 24

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 25 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

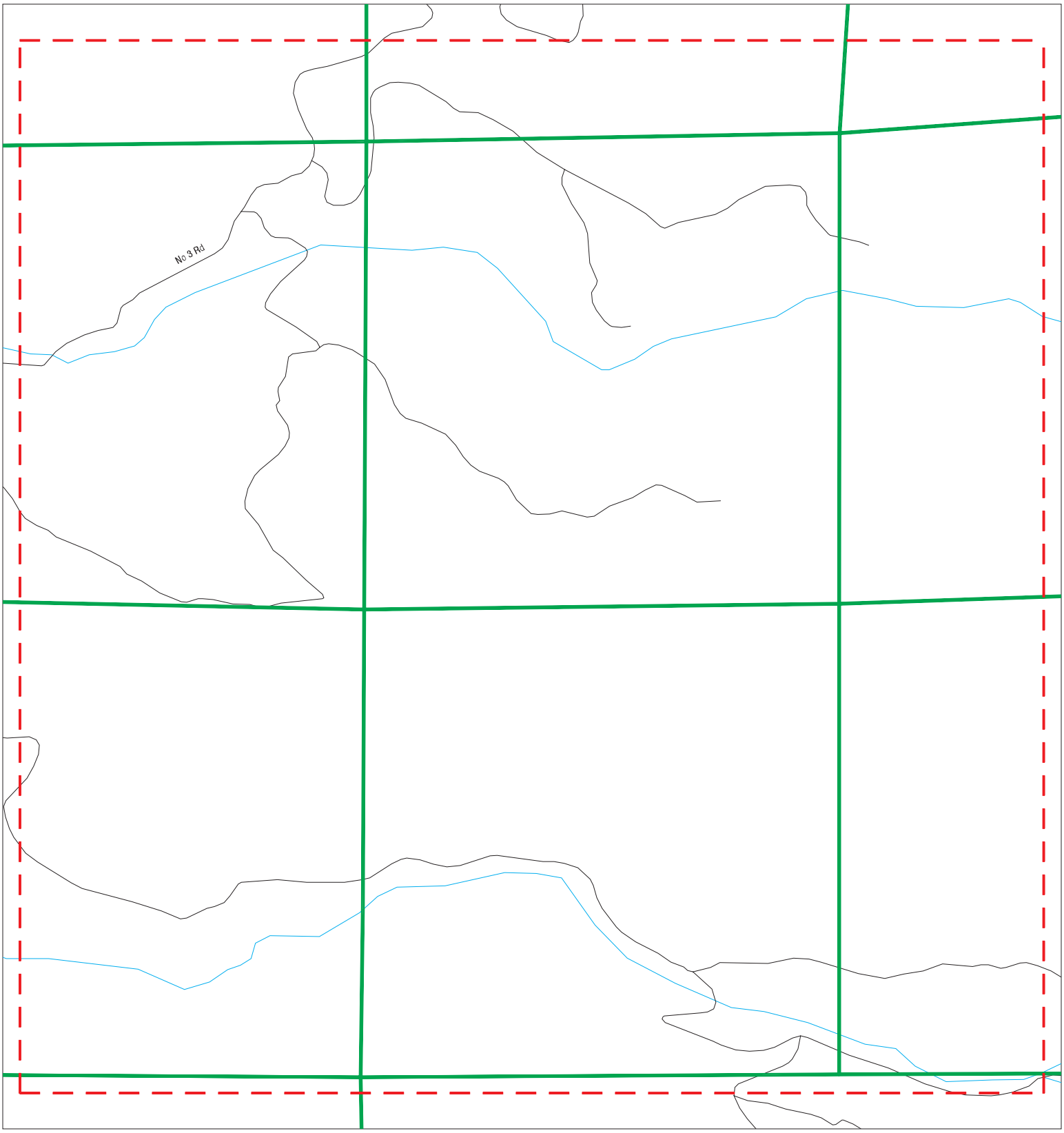
SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

MAPPED SITES SUMMARY - FOCUS MAP 25

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
A2 / 25	THP 2-16-077-SHA CED		CIWQS	TP
A3 / 25	THP 2-16-077-SHA CED		CERS	TP

Focus Map - 26 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME:	Fountain Wind Project	CLIENT:	Stantec
ADDRESS:	Shasta County	CONTACT:	Steve Little
CITY/STATE:	Montgomery Creek CA	INQUIRY #:	5564109.2s
ZIP:	96065	DATE:	02/15/19

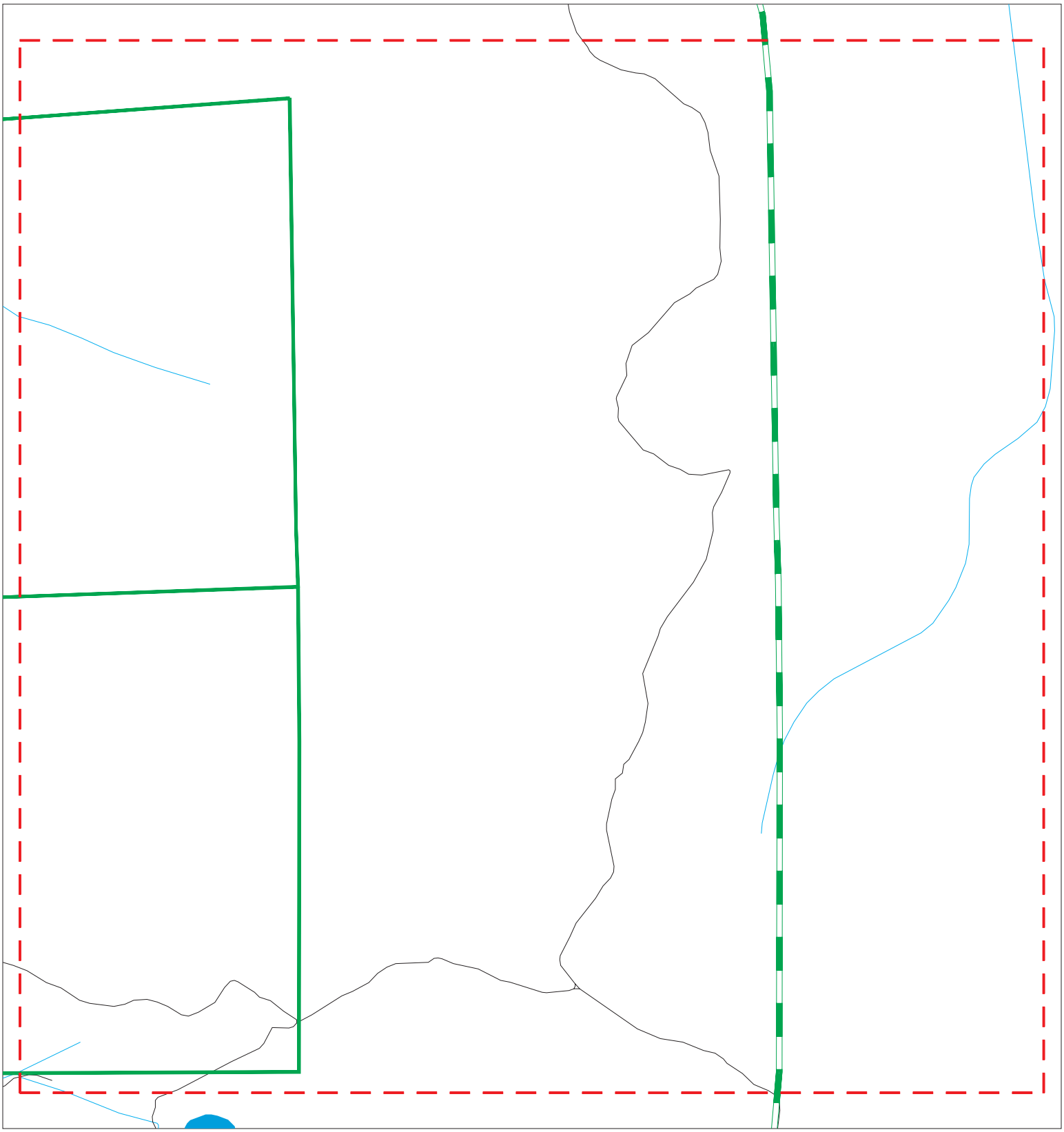
MAPPED SITES SUMMARY - FOCUS MAP 26

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 27 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

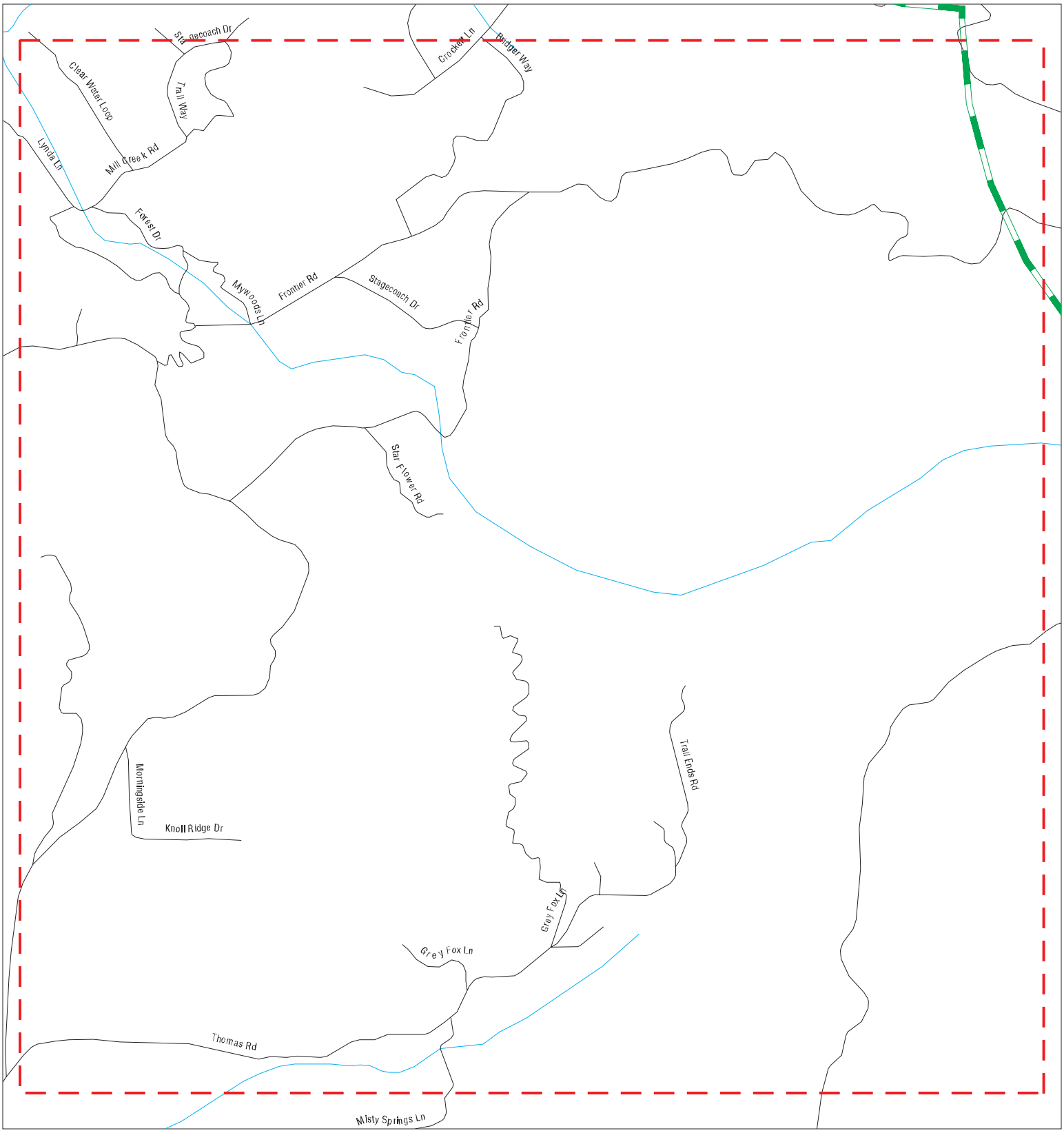
MAPPED SITES SUMMARY - FOCUS MAP 27

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 28 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME:	Fountain Wind Project	CLIENT:	Stantec
ADDRESS:	Shasta County	CONTACT:	Steve Little
CITY/STATE:	Montgomery Creek CA	INQUIRY #:	5564109.2s
ZIP:	96065	DATE:	02/15/19

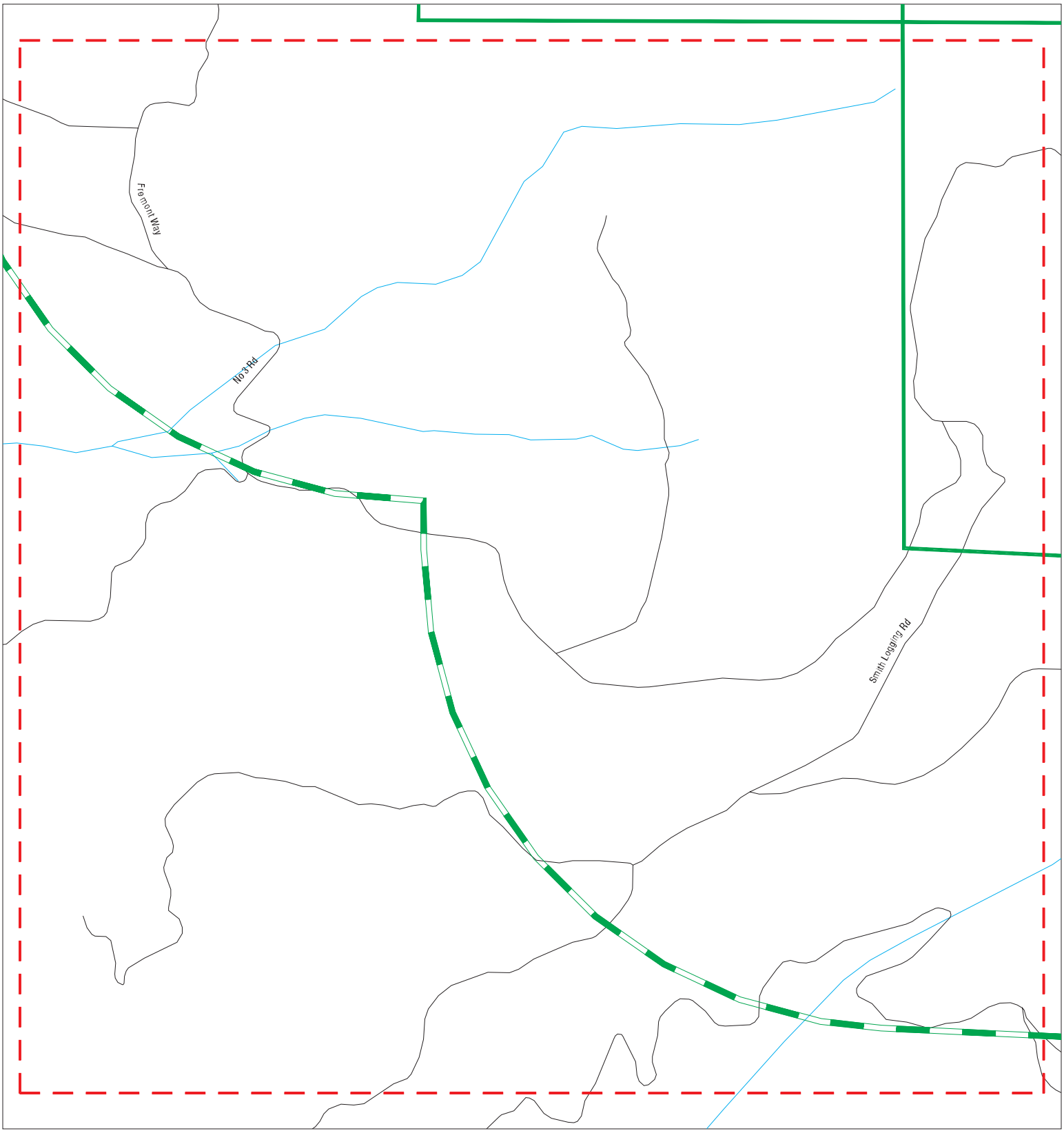
MAPPED SITES SUMMARY - FOCUS MAP 28

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 29 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

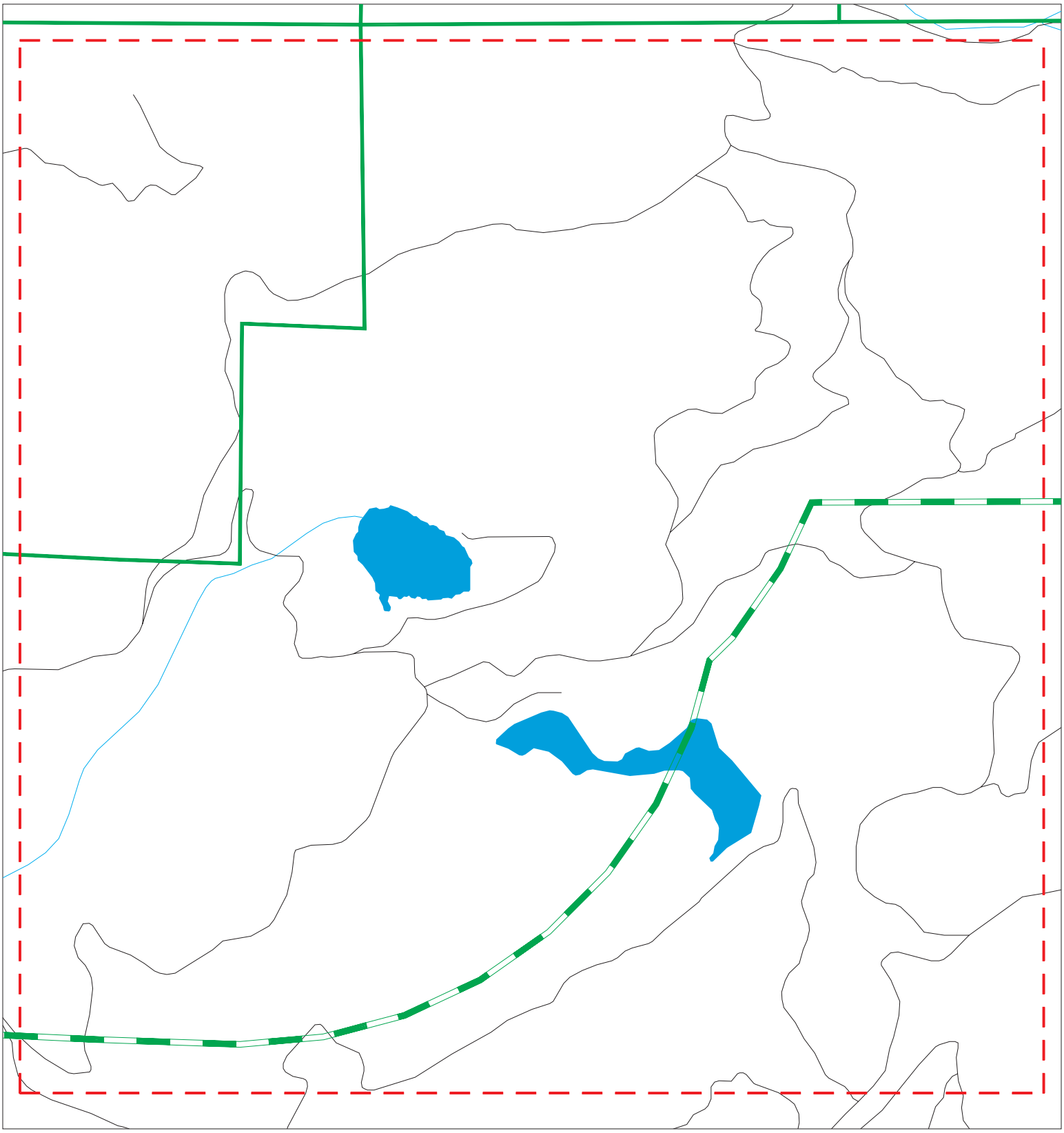
MAPPED SITES SUMMARY - FOCUS MAP 29

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 30 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

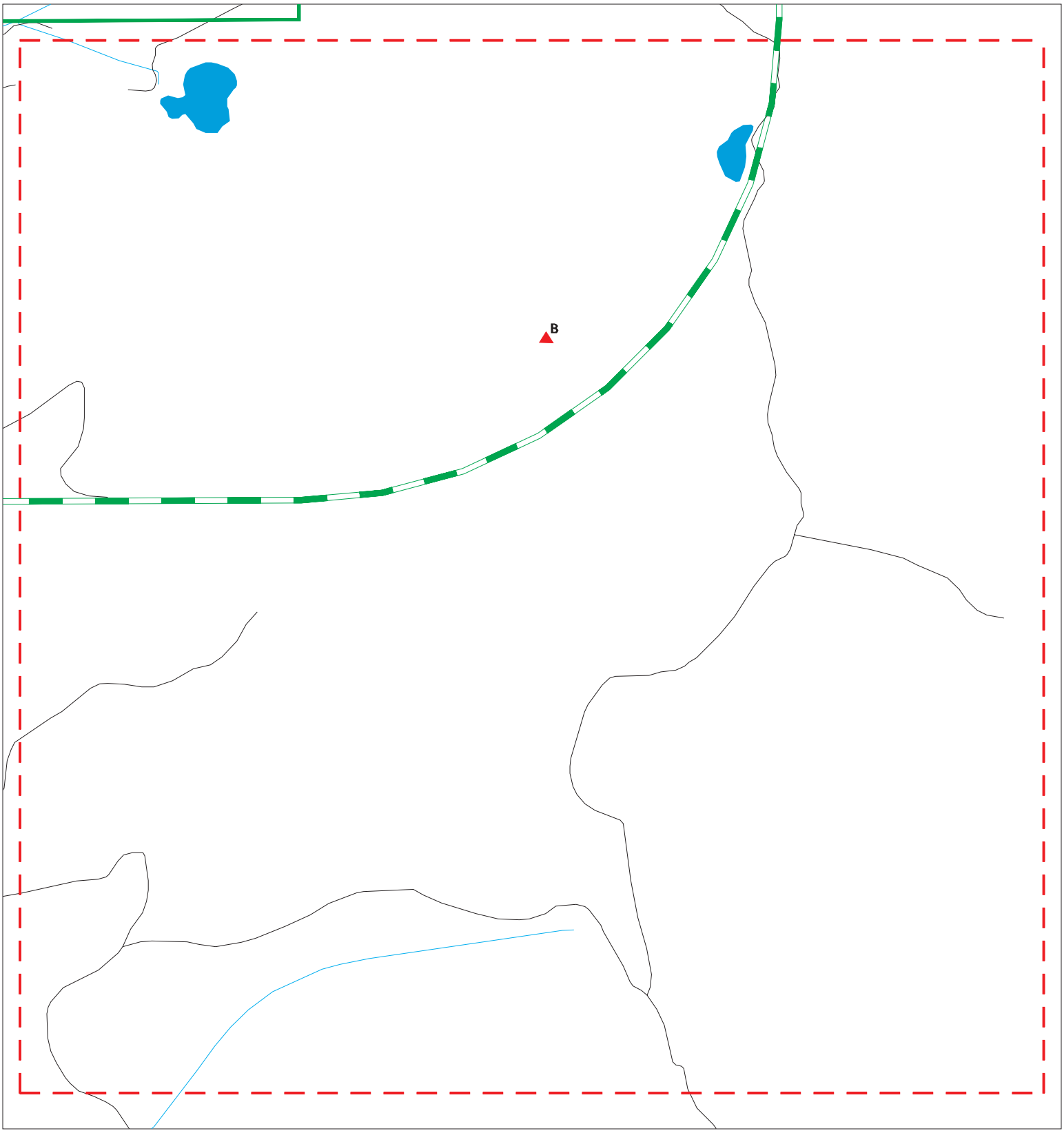
MAPPED SITES SUMMARY - FOCUS MAP 30

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 31 - 5564109.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
Power Line
National Priority List Sites
Areas of Concern
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: Fountain Wind Project	CLIENT: Stantec
ADDRESS: Shasta County	CONTACT: Steve Little
CITY/STATE: Montgomery Creek CA	INQUIRY #: 5564109.2s
ZIP: 96065	DATE: 02/15/19

MAPPED SITES SUMMARY - FOCUS MAP 31

Target Property:
SHASTA COUNTY
MONTGOMERY CREEK, CA 96065

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
B4 / 31	WHITMORE GAP FILLER	LOCATED IN SHAST COU	ENVIROSTOR	4425 0.838 SE
B5 / 31	WHITMORE GAP FILLER		FUDS	4516 0.855 SE

1 **THP 2-16-063-SHA GOOSE** **CIWQS** **S121682117**
Target Property **ROUND MOUNTAIN, CA 96084** **N/A**

Actual: 4375 ft.
Focus Map: 20

CIWQS:

Agency:	Sierra Pacific Industries Burney
Agency Address:	Po Box 2677, Burney, CA 96013
Place/Project Type:	Timber Harvest Area
SIC/NAICS:	Not reported
Region:	5R
Program:	TH
Regulatory Measure Status:	Active
Regulatory Measure Type:	Enrollee - WDR
Order Number:	R5-2017-0061
WDID:	Not reported
NPDES Number:	Not reported
Adoption Date:	Not reported
Effective Date:	02/14/2018
Termination Date:	Not reported
Expiration/Review Date:	06/08/2032
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	40.78937
Longitude:	-121.8655

A2 **THP 2-16-077-SHA CEDAR BOOTS** **CIWQS** **S121682123**
Target Property **OAK RUN, CA 96069** **N/A**

Site 1 of 2 in cluster A

Actual: 3980 ft.
Focus Map: 25

CIWQS:

Agency:	Oxbow Timber I LLC
Agency Address:	98 Mill Street, Weed, CA 96094
Place/Project Type:	Timber Harvest Area
SIC/NAICS:	Not reported
Region:	5R
Program:	TH
Regulatory Measure Status:	Active
Regulatory Measure Type:	Enrollee - WDR
Order Number:	R5-2017-0061
WDID:	Not reported
NPDES Number:	Not reported
Adoption Date:	Not reported
Effective Date:	10/24/2017
Termination Date:	Not reported
Expiration/Review Date:	06/08/2032
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	40.76545
Longitude:	-121.86207

A3 **THP 2-16-077-SHA CEDAR BOOTS** **CERS** **S121783789**
Target **N/A**
Property **OAK RUN, CA 96069**

Site 2 of 2 in cluster A

Actual: **3980 ft.**
Focus Map: **25**

CERS TANKS:

Site ID:	431832
CERS ID:	835561
CERS Description:	Forestry & Silviculture

Evaluation:

Eval General Type:	Initial Site Inspection
Eval Date:	06-06-2017
Violations Found:	No
Eval Type:	Pre-harvest Inspection
Eval Notes:	Not reported
Eval Division:	Water Boards
Eval Program:	TH
Eval Source:	CIWQS

Affiliation:

Affiliation Type Desc:	Owner and Operator
Entity Name:	Oxbow Timber I LLC
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

B4 **WHITMORE GAP FILLER ANNEX** **ENVIROSTOR** **S107737613**
SE **LOCATED IN SHAST COUNTY** **N/A**
1/2-1 **WHITMORE, CA 96096**
0.838 mi.
4425 ft. **Site 1 of 2 in cluster B**

Actual: **6744 ft.**
Focus Map: **31**

ENVIROSTOR:

Facility ID:	71000058
Status:	No Further Action
Status Date:	01/31/2014
Site Code:	100573
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	6.2
NPL:	NO
Regulatory Agencies:	SMBRP, RWQCB 5S - Central Valley
Lead Agency:	RWQCB 5S - Central Valley
Program Manager:	Not reported
Supervisor:	Carrie Tatoian-Cain
Division Branch:	Cleanup Sacramento
Assembly:	01
Senate:	01
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	40.7423

WHITMORE GAP FILLER ANNEX (Continued) **S107737613**

Longitude: -121.7904
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: CLOVER MOUNTAIN GAP FILLER ANNEX (SN-157B)
Alias Type: Alternate Name
Alias Name: WHITMORE GFA SN157B
Alias Type: Alternate Name
Alias Name: CA99799F524200
Alias Type: Federal Facility ID
Alias Name: J09CA0024
Alias Type: INPR
Alias Name: 100573
Alias Type: Project Code (Site Code)
Alias Name: 71000058
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Inventory Project Report (INPR)
Completed Date: 09/26/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: No Department of Defense Action Indicated (NDAI)
Completed Date: 06/22/2011
Comments: DTSC staff do not concur with the recommendations put forward in the NDAI document. The NDAI did not contain sufficient documentation to prove no further defense action was indicated. A site investigation may be warranted at this site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: No Department of Defense Action Indicated (NDAI)
Completed Date: 01/31/2014
Comments: DTSC and the RWQCB reviewed the revised NDAI and determined no DoD action was needed. Please note that this determination is based on information in DTSC s and the Water Boards possession at this time concerning Department of Defense (DoD) activities on the sites listed above. DTSC and the Water Boards reserve the right to address any appropriate environmental or human health related issue, should additional information concerning the environmental condition of this site become available in the future.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

B5 **WHITMORE GAP FILLER ANNEX** **FUDS** **1007211603**
SE **N/A**
1/2-1 **OTHER, CA**
0.855 mi.
4516 ft. **Site 2 of 2 in cluster B**

Actual:
6777 ft.

Focus Map:
31

FUDS:

EPA Region:	09
Congressional District:	01
FUDS Number:	J09CA0024
State:	CA
Facility Name:	WHITMORE GAP FILLER ANNEX
Fiscal Year:	2013
City:	OTHER
Federal Facility ID:	CA9799F5242
Telephone:	916-557-7461
INST ID:	57766
County:	SHASTA
RAB:	Not reported
CORPS_DIST:	Sacramento District (SPK)
NPL Status:	Not Listed
CTC:	588.70000000000005
Current Owner:	Other Federal Government
Future Prog:	Not reported
Description:	The 75.89-acre site is located in Shasta County, 33 miles northeast of Redding, California. It is situated on top of Clover Mountain in the Lassen National Forest. The only evidence of the former radar site is a concrete pad that was once part of the concrete radar control building and concrete and metal building debris. Numerous pipes and conduit protruding from the concrete pad indicate the possible existence of underground storage tanks (USTs). The site is currently owned by the Department of Interior, Bureau of Land Management.
Current Program:	Not reported
History:	On 05 January 1959, the U.S. Government acquired 49.29 easement acres and 18.15 license acres. An additional 8.45 acres were transferred to the Government by public domain. The total acreage acquired was 75.89.The site was used by the Air Defense Command Installation as a gap filler radar site. The improvements were one concrete block building, two 15,000-gallon underground storage tanks and a gravel road.On15 April 1961, 49.29 easement acres, 18.15 license acres, and 6.19 public domain acres were transferred to the Department of Agriculture, U.S. Forest Service. On 01 July 1961, 2.26 public domain acres were transferred to Department of Interior, Bureau of Land Management.
Latitude Degree:	40
Latitude Minute:	45
Latitude Second:	32
Latitude Direction:	N
Longitude Degree:	-121
Longitude Minute:	47
Longitude Second:	24
Longitude Direction:	E

Count: 22 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BURNEY	97417040		SHASTA NATIONAL FOREST		ERNS
BURNEY	S101482461	LOUISIANA-PACIFIC CORP - BURNEY	HIGHWAY 89, 9 MILES NORTHEAST OF BURNEY	96013	ENVIROSTOR
BURNEY	S102436784	SHASTA CO SHERIFF BURNEY	SHASTA ST	96013	LUST, HIST CORTESE
BURNEY	S123100576	CALTRANS-BURNEY	37334 STATE HIGHWAY 299 E	96013	CERS HAZ WASTE, CERS TANKS, C
BURNEY	S123101027	KWIK MART	37047 STATE HIGHWAY 299 E	96013	CERS HAZ WASTE, CERS TANKS, C
BURNEY	S123099745	ED STAUB & SONS PETROLEUM, INC. (BURNEY CARDLOCK)	37289 STATE HIGHWAY 299 E	96013	CERS HAZ WASTE, CERS TANKS, C
BURNEY	S123103489	LES SCHWAB TIRE CENTER #610	37462 STATE HIGHWAY 299 E	96013	CERS HAZ WASTE
BURNEY	S123103443	DOLLAR GENERAL # 15943	37288 STATE HIGHWAY 299 E	96013	CERS HAZ WASTE
BURNEY	S110977745		PIT #3 POWERHOUSE, SOUTHEAST OF BURNEY, SHASTA COUNTY	96013	CHMIRS
BURNEY	1023381477	WESTERN AREA POWER ADMINISTRATIONNA BEAR SPRING MW FACILITY	BUNCH GRASS LOOKOUT ROADNA LAT: 40-54-22NNA LONG:	96013	FINDS
BURNEY	1016430127	FRONTIER CITIZENS TELECOM COMPANY BURNEY SERVICE CNTR	2601 SHASTA ST	96013	FINDS
BURNEY	1023355800	PG&E HATCHET MOUNTAIN REPEATER STATION	BUNCH GRASS LOOKOUT ROADNA 2 MILES NORTH OF HIGHWA	96065	FINDS
BURNEY	S113186563	ZITOMEDIA LLC ANTENNA SITE	BUNCH GRASS LOOKOUT RD		CUPA Listings
BURNEY	S117226717	WESTERN AREA POWER ADMIN - BEAR SPRING MW FACILITY	BUNCH GRASS LOOKOUT RD		CUPA Listings
BURNEY	S110744607	PG&E BURNEY SUBSTATION	SHASTA ST		CUPA Listings
MONTGOMERY CREEK	S113745989	PG&E CLOUD SEEDER SITE M5	BUFFUM RD		CUPA Listings
MONTGOMERY CREEK	S117706533	OAK RUN LUMBER CO	BOOTLEG LANE	96065	NPDES, CIWQS
SHASTA COUNTY	S106391571		1/4 MILE SOUTH OF CAMPBELL CREEK IN THE SACRAMENTO RIVER CANYON NO. OF SHASTA LAKE. SO OF DOG CREEK. DFG ON SCENE		CHMIRS
SHASTA COUNTY	S105637529		HWY 299 E AT SHASTA MILE POST #89.50		CHMIRS
SHASTA COUNTY	1023372102	SHASTA COUNTY CULVERT REPLACEMENT PROJEC 2009	THROUGHOUT SHASTA COUNTY		FINDS
SHASTA COUNTY	S121686595	TURNTABLE BAY MARINA DEVELOPMENT PROJECT	SOUTHERN END OF THE MCCLOUD RIVER ARM OF SHASTA LAKE		CIWQS
SHASTA COUNTY	S123168998	SHASTA COUNTY CULVERT REPLACEMENT PROJEC 2009	THROUGHOUT SHASTA COUNTY		CIWQS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/04/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Quarterly

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/13/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 10/25/2018
Date Made Active in Reports: 12/07/2018
Number of Days to Update: 43

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/07/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 45

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent NPL

CA RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 10/29/2018
Date Data Arrived at EDR: 10/30/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 44

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

CA ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 10/29/2018
Date Data Arrived at EDR: 10/30/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 44

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

CA SWF/LF (SWIS): Solid Waste Information System
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/12/2018
Date Data Arrived at EDR: 11/14/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 29

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/12/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

CA LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

CA LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

CA LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

CA LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/11/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

CA LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

CA LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

CA LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

CA LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

CA LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

CA CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

CA SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

CA SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

CA SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

CA SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

CA SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CA SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

CA SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

CA SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/08/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

State and tribal registered storage tank lists

CA MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/16/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/11/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Semi-Annually

CA AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 04/06/2016
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36

Source: N/A
Telephone: N/A
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

CA VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 10/29/2018
Date Data Arrived at EDR: 10/30/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 44

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

CA BROWNFIELDS: Considered Brownfieds Sites Listing

A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 10/15/2018
Number of Days to Update: 20

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/21/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/17/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/18/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

CA WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: No Update Planned

CA SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 34

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

CA HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 09/28/2018
Date Made Active in Reports: 11/01/2018
Number of Days to Update: 34

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/12/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/13/2019
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 02/01/2019
Next Scheduled EDR Contact: 05/13/2019
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 09/21/2018
Date Data Arrived at EDR: 09/21/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 49

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/26/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

CA HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

CA SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 10/29/2018
Date Data Arrived at EDR: 10/30/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 44

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

CA CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/12/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 55

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

CA TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CA CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 10/22/2018
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 38

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 01/24/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/21/2018
Date Data Arrived at EDR: 09/21/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 49

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/26/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

CA SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 12/04/2018
Date Data Arrived at EDR: 12/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 11/26/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Annually

CA HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/11/2018
Number of Days to Update: 29

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 10/22/2018
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 38

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 01/24/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

Local Land Records

CA LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 11/29/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Semi-Annually

CA DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 12/05/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 37

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/05/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Semi-Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/26/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 73

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

Records of Emergency Release Reports

CA CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 51

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/24/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Semi-Annually

CA LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

CA MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CA SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/19/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/16/2018
Next Scheduled EDR Contact: 02/25/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 08/31/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 45
Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88
Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73
Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198
Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/21/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/16/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 10/26/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 66

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/22/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 08/13/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 36
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/08/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 09/14/2018
Date Data Arrived at EDR: 10/11/2018
Date Made Active in Reports: 12/07/2018
Number of Days to Update: 57
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/22/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 12/05/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/03/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2018
Date Data Arrived at EDR: 10/03/2018
Date Made Active in Reports: 11/09/2018
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/03/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 10/01/2018
Date Data Arrived at EDR: 10/30/2018
Date Made Active in Reports: 01/18/2019
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/29/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 10/12/2018
Date Made Active in Reports: 12/07/2018
Number of Days to Update: 56

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 12/14/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 12/12/2018
Date Data Arrived at EDR: 12/28/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/08/2009
Number of Days to Update: 28

Source: N/A
Telephone: N/A
Last EDR Contact: 11/12/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: Annually

US AIRS MINOR: Aerometric Information Retrieval System Facility Subsystem

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/08/2009
Number of Days to Update: 28

Source: N/A
Telephone: N/A
Last EDR Contact: 11/12/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: Annually

US MINES: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

US MINES 2: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/19/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/15/2018
Date Data Arrived at EDR: 12/05/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 37

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/02/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/30/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 06/19/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 87

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/14/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/22/2018
Date Data Arrived at EDR: 08/22/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 44

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/19/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Quarterly

Other Ascertainable Records

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 10/16/2018
Number of Days to Update: 21

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/21/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

CA CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 08/28/2018
Date Data Arrived at EDR: 08/30/2018
Date Made Active in Reports: 11/01/2018
Number of Days to Update: 63

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 02/11/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Varies

CA CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 7

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

CA DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 11/13/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 42

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

CA DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 10/04/2018
Date Data Arrived at EDR: 10/05/2018
Date Made Active in Reports: 11/01/2018
Number of Days to Update: 27

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 11/26/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

CA DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/30/2018
Date Data Arrived at EDR: 09/27/2018
Date Made Active in Reports: 11/01/2018
Number of Days to Update: 35

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Annually

CA EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/20/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 47

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/21/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Varies

CA ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 11/02/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 41

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

CA Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 10/19/2018
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

CA Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/18/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 53

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/11/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Varies

CA HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 10/10/2018
Date Made Active in Reports: 11/16/2018
Number of Days to Update: 37

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Annually

CA ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/19/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 53

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 11/19/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Quarterly

CA HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/19/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 53

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/19/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Quarterly

CA HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/09/2018
Date Data Arrived at EDR: 10/10/2018
Date Made Active in Reports: 11/16/2018
Number of Days to Update: 37

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 01/08/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Quarterly

CA MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 34
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

CA MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 11/09/2018
Date Data Arrived at EDR: 12/05/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 37
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/05/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

CA NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 11/12/2018
Date Data Arrived at EDR: 11/14/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 29
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/12/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Quarterly

CA PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 12/05/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 37
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/05/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

CA PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 34
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

CA NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/19/2018
Date Data Arrived at EDR: 09/20/2018
Date Made Active in Reports: 10/19/2018
Number of Days to Update: 29
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: No Update Planned

CA UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 01/25/2019
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA UIC GEO: Underground Injection Control Sites (GEOTRACKER)

Underground control injection sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA WASTEWATER PITS: Oil Wastewater Pits Listing

Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/11/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Varies

CA WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Quarterly

CA MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)

Military privatized sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA PROJECT: Project Sites (GEOTRACKER)

Projects sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/18/2019
Number of Days to Update: 37

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

CA CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 38

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 12/04/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

CA CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 10/22/2018
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 38

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 01/24/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

CA WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/19/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Varies

CA NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)

Produced water ponds sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

CA WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 12/10/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Varies

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

CA RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

CA RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 10/05/2018
Date Data Arrived at EDR: 10/10/2018
Date Made Active in Reports: 11/01/2018
Number of Days to Update: 22

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/05/2018
Date Data Arrived at EDR: 10/10/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 23

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List
Cupa Facility List

Date of Government Version: 07/01/2018
Date Data Arrived at EDR: 07/24/2018
Date Made Active in Reports: 08/20/2018
Number of Days to Update: 27

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 01/04/2019
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 10/31/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 12/12/2018
Number of Days to Update: 8

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/21/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 05/23/2018
Date Data Arrived at EDR: 05/24/2018
Date Made Active in Reports: 07/13/2018
Number of Days to Update: 50

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 11/26/2018
Date Data Arrived at EDR: 11/30/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 46

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 08/16/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 8

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 12/13/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 28

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 10/18/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 27

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 12/26/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 12/11/2018
Date Data Arrived at EDR: 12/13/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 33

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/19/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 10/22/2018
Date Data Arrived at EDR: 10/25/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 20

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 11/02/2018
Date Data Arrived at EDR: 11/07/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 37

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/21/2018
Date Data Arrived at EDR: 11/27/2018
Date Made Active in Reports: 12/12/2018
Number of Days to Update: 15

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 11/07/2018
Date Data Arrived at EDR: 11/08/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 6

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/14/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/15/2018
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 22

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

LOS ANGELES COUNTY:

Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 09/20/2018
Date Data Arrived at EDR: 10/12/2018
Date Made Active in Reports: 11/16/2018
Number of Days to Update: 35

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/22/2019
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/15/2018
Date Data Arrived at EDR: 10/16/2018
Date Made Active in Reports: 11/16/2018
Number of Days to Update: 31

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/15/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2018
Date Data Arrived at EDR: 05/01/2018
Date Made Active in Reports: 05/14/2018
Number of Days to Update: 13

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/15/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/01/2018
Date Data Arrived at EDR: 10/16/2018
Date Made Active in Reports: 11/16/2018
Number of Days to Update: 31

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 02/01/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 01/14/2019
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/02/2018
Date Data Arrived at EDR: 10/05/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 28

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/26/2018
Date Data Arrived at EDR: 11/27/2018
Date Made Active in Reports: 12/12/2018
Number of Days to Update: 15

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/14/2018
Next Scheduled EDR Contact: 03/04/2019
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 01/14/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 08/29/2018
Date Data Arrived at EDR: 08/31/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 19

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 12/07/2018
Date Data Arrived at EDR: 12/11/2018
Date Made Active in Reports: 01/24/2019
Number of Days to Update: 44

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 12/06/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 10/29/2018
Date Data Arrived at EDR: 11/01/2018
Date Made Active in Reports: 11/16/2018
Number of Days to Update: 15

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 12/27/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/21/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 11/28/2018
Date Data Arrived at EDR: 11/30/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/26/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/06/2018
Date Data Arrived at EDR: 11/08/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 6

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 10/04/2018
Date Data Arrived at EDR: 11/14/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 29

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 10/04/2018
Date Data Arrived at EDR: 11/14/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 29

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 10/04/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 38

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/05/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 11/29/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 38

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 07/19/2018
Date Data Arrived at EDR: 07/25/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 42

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 10/12/2018
Date Made Active in Reports: 10/16/2018
Number of Days to Update: 4

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/17/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 10/12/2018
Date Made Active in Reports: 11/05/2018
Number of Days to Update: 24

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/17/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 08/03/2018
Date Data Arrived at EDR: 10/02/2018
Date Made Active in Reports: 11/01/2018
Number of Days to Update: 30

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/04/2019
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 08/23/2018
Date Data Arrived at EDR: 10/02/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 31

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/28/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 11/15/2018
Date Data Arrived at EDR: 11/16/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 27

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/28/2018
Date Data Arrived at EDR: 11/30/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 42

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 12/05/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 37

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/05/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 10/22/2018
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 38

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/05/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 38

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 04/01/2019
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/14/2018
Date Data Arrived at EDR: 11/15/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 28

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 34

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 12/13/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/23/2019
Number of Days to Update: 36

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/10/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 11/16/2018
Date Data Arrived at EDR: 11/16/2018
Date Made Active in Reports: 12/13/2018
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 11/21/2018
Next Scheduled EDR Contact: 03/11/2019
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 11/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 38

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 11/29/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 38

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 11/29/2018
Date Data Arrived at EDR: 12/04/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 10

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 12/21/2018
Date Data Arrived at EDR: 12/27/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 19

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/19/2018
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 10/02/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 10/25/2018
Number of Days to Update: 21

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 01/07/2019
Next Scheduled EDR Contact: 04/08/2019
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 12/11/2018
Date Data Arrived at EDR: 12/13/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 33

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 12/13/2018
Next Scheduled EDR Contact: 04/29/2019
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 09/18/2018
Date Data Arrived at EDR: 09/20/2018
Date Made Active in Reports: 10/25/2018
Number of Days to Update: 35

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 11/29/2018
Next Scheduled EDR Contact: 03/18/2019
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List
Cupa facilities

Date of Government Version: 12/13/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 28

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/22/2018
Date Data Arrived at EDR: 10/25/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 20

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 01/17/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List
Cupa program facilities

Date of Government Version: 12/26/2018
Date Data Arrived at EDR: 12/27/2018
Date Made Active in Reports: 01/15/2019
Number of Days to Update: 19

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 01/31/2019
Next Scheduled EDR Contact: 05/20/2019
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/25/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 36

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/22/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/26/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/07/2019
Next Scheduled EDR Contact: 05/27/2019
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/25/2018
Date Data Arrived at EDR: 10/25/2018
Date Made Active in Reports: 11/30/2018
Number of Days to Update: 36

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/22/2019
Next Scheduled EDR Contact: 05/06/2019
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/26/2018
Date Data Arrived at EDR: 12/12/2018
Date Made Active in Reports: 01/16/2019
Number of Days to Update: 35

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/25/2019
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 12/26/2018
Date Data Arrived at EDR: 01/03/2019
Date Made Active in Reports: 01/16/2019
Number of Days to Update: 13

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 12/26/2018
Next Scheduled EDR Contact: 04/15/2019
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 11/05/2018
Date Data Arrived at EDR: 11/07/2018
Date Made Active in Reports: 11/14/2018
Number of Days to Update: 7

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 01/28/2019
Next Scheduled EDR Contact: 05/11/2019
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

STREET AND ADDRESS INFORMATION

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2017-0061

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR DISCHARGES RELATED TO TIMBERLAND MANAGEMENT ACTIVITIES FOR NON-FEDERAL AND FEDERAL LANDS

The California Regional Water Quality Control Board, Central Valley Region (hereafter, Central Valley Water Board) finds that:

SCOPE OF COVERAGE OF THIS GENERAL ORDER

1. This Order serves as general waste discharge requirements (WDRs) for waste discharges related to timberland management activities on both non-federal and federal lands (managed by the U.S. Forest Service) that could affect waters of the state.

2. Under this Order, "timberland management activities" means commercial activities relating to forest management and timberland conversions, including, but not limited to: cutting or removal of timber and other solid wood forest products; construction, reconstruction and maintenance of roads, fuel breaks, firebreaks, watercourse crossings, landings, skid trails, or beds for the falling of trees; fire hazard abatement and fuel reduction activities; pesticide applications; site preparation that involves disturbance of soil or burning of vegetation following timberland management activities; but excluding preparatory treemarking, surveying or roadflagging.[1]

3. Waste specifically regulated under this Order includes: earthen materials, including soil, silt, sand, clay, rock; organic materials, such as slash, sawdust, or bark; and pesticides that enter or threaten to enter into waters of the state from timberland management activities.

4. Under this Order, the term "Discharger" includes the timberland owner or timber owner, anyone working on behalf of the timberland/timber owner in the conduct of timberland management activities for non-federal lands, the U.S. Forest Service, private timber operators operating on federal lands, and anyone working on behalf of the U.S. Forest Service or a timber operator in the conduct of timberland management activities on federal lands. Although all of the aforementioned persons or entities legally are "Dischargers" for the purposes of this Order, only one Notice of Intent (NOI) shall be submitted for each Project enrollment.

5. Attachment A (Definitions), Attachment B (Monitoring and Reporting Program), Attachment C (Post-Fire Management and Reforestation Plan), and Attachment D (Information Sheet) are hereby incorporated into and made a part of this Order by this reference.

REASONS FOR ISSUING GENERAL ORDER

6. There are approximately 16 million acres of federal and non-federal forested lands located within the Central Valley Region. The water quality impacts from timberland management activities on these forested lands falls within the jurisdiction of the Central Valley Water Board.

7. The adoption of individual WDRs for all timberland management activities in the Central Valley

[1]Definitions for "Pesticide", "Plan", and "Project", as well as other definitions, can be found in Attachment A.

Region is not feasible due to the large number of timber harvesting documents received annually for review, the short mandated timeline for the approval of non-federal timberland management activities, and the time needed to adopt individual WDRs. General WDRs on a watershed-by-watershed basis would also take a significant amount of time given the large number of watersheds and sub-watersheds in the Region, and therefore is not feasible. The Central Valley Water Board currently regulates timberland management activities under the Conditional Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvesting Activities (Waiver), Order No. R5-2014-0144, which expires on March 31, 2018. Without the current Waiver or the adoption of this Order, many timberland management activities would not be subject to any regulation under the California Water Code (Water Code) as required by the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (Nonpoint Source Policy) (see Finding 12 below).

8. On October 8, 2013, amendments to Public Resources Code Article 7.7 (commencing with Section 4597) went into effect and established a new type of timber harvesting permit: the Working Forest Management Plan (WFMP). This new permit will allow non-federal, non-industrial landowners of 15,000 acres or less to harvest timber via a non-expiring permit. The amendments also required the California Board of Forestry (BOF) to develop and implement the process for the WFMP by January 2016; process concerns raised by stakeholders have delayed the implementation of the WFMP, which is now anticipated to occur by January 2018.

9. This Order addresses the anticipated implementation of the WFMP by the BOF; the upcoming Waiver expiration; the need for additional information related to post-fire salvage operations; the creation of a low threat category for Plans; the creation of a new category for non-federal watercourse crossing work outside of a Project; the need to revise and clarify the monitoring and reporting program; and the overall need to improve and streamline the existing Waiver. Individual WDRs would not provide identifiable benefits over this Order because this Order contains essentially the same conditions that would be included in individual WDRs, such as the requirements that implement water quality control plans, and this Order is enforceable to the same extent as individual WDRs.

10. As of the effective date of this Order, the Central Valley Water Board will no longer accept new enrollments under the Timber Waiver (Order No. R5-2014-0114). Projects with existing enrollments under the Timber Waiver may continue to operate under the Timber Waiver until its expiration date, March 31, 2018. Projects that will operate past March 31, 2018, must obtain coverage under this Order prior to that date.

REGULATORY CONSIDERATIONS

11. Pursuant to the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code), the Central Valley Water Board has legal authority to regulate waste discharges that could affect the quality of waters of the state.

12. Federal law requires the states to develop and implement plans to address nonpoint source pollution. (33 U.S.C. §1329.) Pursuant to this federal mandate, the State Water Resources Control Board (State Water Board) adopted its Nonpoint Source Policy in 2004. The Nonpoint Source Policy requires the State Water Board and Regional Water Quality Control Boards (Regional Water Boards) to regulate nonpoint source pollution by using either (1) Waste Discharge

Requirements (Water Code section 13260); (2) a Waiver of Waste Discharge Requirements (Water Code section 13269); or (3) a Basin Plan Prohibition (Water Code section 13243).

13. Water Code section 13260, subdivision (a) requires that any person discharging waste or proposing to discharge waste within any region that could affect the quality of waters of the state, other than into a community sewer system, shall file with the appropriate Regional Water Board a Report of Waste Discharge (ROWD) containing such information and data as the Regional Water Board may require.

14. Water Code section 13263 requires the Central Valley Water Board to prescribe WDRs, or waive WDRs, for proposed, existing, or material changes in discharges of waste that could affect water quality. The board may prescribe WDRs even if no ROWD under Water Code section 13260 has been filed. The WDRs must implement applicable water quality control plans and the Water Code. The Central Valley Water Board may prescribe general WDRs for a category of discharges if all the following criteria apply to the discharges in that category:

    a. The discharges are produced by the same or similar operations.
    b. The discharges involve the same or similar types of waste.
    c. The discharges require the same or similar treatment standards.
    d. The discharges are more appropriately regulated under general requirements than individual requirements.

    The rationales for developing general waste discharge requirements for timberland management activities in the Central Valley Region include: (a) discharges are produced by similar operations (timberland management activities); (b) waste discharges under this Order involve similar types of wastes (typically earthen materials such as soil and rock, organic materials such as slash and bark, and pesticides); (c) water quality management practices are similar for timberland management activities; and (d) due to the large number of timberland management activities that take place in the Central Valley region, timberland management activities are more appropriately regulated under general rather than individual WDRs.

15. The Central Valley Water Board's *Water Quality Control Plan for the Sacramento River Basin and the San* Joaquin *River Basin, Fourth Edition, revised April 2016* and the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2015* (hereinafter Basin Plans) designate beneficial uses, establish water quality objectives, contain programs of implementation needed to achieve water quality objectives, and reference plans and policies adopted by the State Water Board.

16. Whether an individual discharge of waste from timberland management activities may affect the quality of the waters of the state depends on a variety of site-specific factors, including, but not limited to:
    a) Distribution and Sensitivity of the Beneficial Uses of Water
        - Presence of domestic water supplies
        - Presence of aquatic species (including listed species)
        - Close proximity of operations to other critical beneficial uses or sensitive receptors
    b) Current Water Quality Conditions
        - Existing Total Maximum Daily Loads or 303(d) listings
        - Documented non-compliance with Basin Plan standards
        - Known or suspected watershed impacts
    c) Physical Setting

- Unstable geologic setting / steep slopes
- Erodible soils
- Existing landslides or active erosion sites
- Roads or watercourse crossings in poor condition
- Harsh climates and/or intense precipitation regimes
- Post-fire landscape

d) Type and Scope of Proposed Activities
- Intensity of silvicultural prescriptions and/or yarding methods
- Intensity of site preparation and/or road construction/reconstruction
- Winter operations and/or "non-standard" or "in-lieu" practices

17. This Order implements the Basin Plans by requiring the implementation of management practices to prevent exceedances of applicable water quality objectives (both numeric and narrative) and requiring the prevention of nuisance. The Order requires implementation of a monitoring and reporting program to determine effects of waste discharges on water quality and the effectiveness of management practices designed to comply with applicable water quality objectives as defined in the Basin Plans.

18. Water Code section 13242 mandates that Regional Water Boards include in their Basin Plans a plan of implementation describing how the board will regulate discharges of waste to waters of the state in a manner that will achieve water quality objectives. Water Code section 13243 provides further that "[a] regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted." Water Code section 13263 also requires a Regional Water Board to prescribe requirements in WDRs that will implement the Basin Plan, including achievement of applicable water quality objectives. The conditions of this Order, including but not limited to Eligibility Criteria, Prohibitions, and requirements pertaining to Significant Existing or Potential Erosion Sites (SEPES), implement these and other applicable statutory mandates.

REGULATORY HISTORY AND COORDINATION WITH OTHER AGENCIES

19. **Non-Federal Lands**

The California Department of Forestry and Fire Protection (CAL FIRE) and the Board of Forestry (BOF)

Timberland management activities on non-federal lands in California are regulated in accordance with the Z'berg-Nejedly Forest Practice Act (FPA) (Public Resources Code § 4511 et seq.) and the California Forest Practice Rules (FPR) (California Code of Regulations, title 14, § 895 et seq.). The BOF is responsible for promulgation of the FPR in accordance with the FPA while CAL FIRE is the state agency responsible for overseeing implementation and enforcement of the FPR for timber harvest activities on non-federal lands. Non-federal landowners proposing to harvest timber for commercial purposes are required to have an approved Plan, prepared by a Registered Professional Forester (RPF), prior to starting timberland management activities. Pursuant to the FPR, the applicable Regional Water Board, California Department of Fish and Wildlife, California Geological Survey, and other responsible and local agencies participate in the review of Plans and provide recommendations to the CAL FIRE Director as part of an interdisciplinary "Review Team." As a member of the Review Team, Regional Water Board staff review proposed Plans and is provided the opportunity to participate in pre-harvest inspections (inspections conducted prior to Plan approval). CAL FIRE's Plan approval process is the functional equivalent to the California

Environmental Quality Act Environmental Impact Report process (Public Resources Code § 21080.5; see also California Code of Regulations, title 14, § 896).

Section 208 of the federal Clean Water Act (33 U.S.C. § 1288) requires states to identify areas with "substantial water quality problems" and to designate a Water Quality Management Agency (WQMA) to develop an area-wide plan for addressing water pollution. In 1988, the State Water Board (a) conditionally certified the "Water Quality Management Plan for Timber Operations on Nonfederal Lands" which included those FPR selected as best management practices and the process by which those rules are administered; (b) designated CAL FIRE and the BOF as joint Water Quality Management Agencies; and (c) executed a Management Agency Agreement (MAA) with CAL FIRE and BOF for the purpose of implementing the certified plan and WQMA designations.

The MAA required U.S. Environmental Protection Agency (U.S. EPA) approval of the State Water Board's certification of the FPR and administering processes for regulation of timberland management activities on non-federal lands in California. That approval had not occurred by the time State Board adopted the 2004 Nonpoint Source Policy. Thus, U.S. EPA approval of the State Board's certification of the FPR would not negate the legal requirement for Regional Boards to address nonpoint source pollution using one or more of the three regulatory options provided under the Nonpoint Source Policy (see Finding 12).

AB 1492

Assembly Bill 1492 was enacted in 2012 with the intent to promote and encourage sustainable forest practices; ensure continued sustainable funding for the state's forest practice program to protect the state's forest resources; and replace the piecemeal funding structure with a single funding source. To that end, AB 1492 established the Timber Regulation and Forest Restoration Fund for the purposes of achieving those goals as well as supporting forest, fisheries and wildlife habitat and water quality restoration. Further, the bill extended the potential life span of timber harvest plans filed through the CAL FIRE Review Team process on state or private lands (after 2012) from a maximum of 5 years to a maximum of 7.

The bill language also requires increases in inspections from the Review Team agencies; promotes transparency via creation of performance measures; requires identification and implementation of efficiencies in the regulation of timber harvesting between state agencies; and identifies an intent to modify the current regulatory programs to incorporate and provide incentives for best practices, and develop standards or strategies, where appropriate, to protect natural resources, including the development of plans that address road management and riparian function on an ownershipwide, watershedwide, or districtwide scale.

Finally, the bill requires an annual report to the legislature, prepared by the Secretary of the Natural Resources Agency in conjunction with the Secretary for Natural Resource Protection.

Lead responsibility for implementing the bill has been assigned to the Natural Resource Agency. Members of the Review Team agencies, including Central Valley Water Board staff, participate in AB 1492 Leadership Team meetings as well as the multiple sub-groups developed to implement the legislature's vision. Further information can be found on the Natural Resources Agency website: http://resources.ca.gov/forestry

The California Department of Fish and Wildlife (CDFW)
Pursuant to Fish and Game Code sections 1600-1616, CDFW regulates any activity on non-federal lands that does one or more of the following: 1) substantially diverts or obstructs the natural flow of any river, stream or lake; 2) substantially changes or uses any material from the bed, channel, or bank of, any river, stream, or lake; or 3) deposits or disposes of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. CDFW may issue a Master Agreement for Timber Operations (MATO) or individual Lake or Streambed Alteration Agreements (LSAAs) to Dischargers that propose watercourse crossing work that meet one or more of these three criteria.

Watercourse crossing work conducted outside of a CAL FIRE-approved Plan or accepted Emergency (EM) Notice, but under the purview of CDFW, was not provided coverage under the Waiver; preventing Dischargers from proactively reconstructing or upgrading existing crossings on their timberlands that were not actively under a Plan. This Order creates a new enrollment category for work on existing watercourse crossings on timber production zoned land outside of a Plan or EM Notice by tiering off CDFW-executed MATOs and LSAAs.

20. **Federal Lands – U.S. Forest Service**
In 1981, pursuant to section 208 of the federal Clean Water Act, the State Water Board (a) certified a plan entitled "Water Quality Management for National Forest System Lands in California" that was developed and submitted by the U.S. Department of Agriculture, U.S. Forest Service; (b) designated the U.S. Forest Service as the WQMA for specified activities on National Forest System lands in California that may result in nonpoint source discharges, including timber management, vegetative manipulation, fuels management, road construction and watershed management; and (c) executed a MAA with the U.S. Forest Service for the purpose of implementing the certified plan and WQMA designation.

The U.S. EPA approved the State Water Board's certification of the U.S. Forest Service water quality management plan, and the management practices therein as "best management practices" (BMPs).

The 1981 MAA between the State Water Board and the U.S. Forest Service contemplates that the Water Boards will waive issuance of waste discharge requirements for U.S. Forest Service timber harvest activities that may result in nonpoint source discharges, provided that the U.S. Forest Service designs and implements its projects to fully comply with state water quality standards. However, the Central Valley Water Board's experience and monitoring have demonstrated that relying solely on the MAA framework to regulate nonpoint source activities on lands managed by the U.S. Forest Service does not result in compliance with water quality standards, and thus does not comport with the State Water Board's Nonpoint Source Policy (see Finding 12).

21. **Chronology of Timber Waiver of Waste Discharge Requirements**
On 30 January 2003, in response to legislative amendments to Water Code section 13269, the Central Valley Water Board adopted Resolution No. R5-2003-0005, which included a conditional "Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities" (Waiver) as Attachment A.

On 28 April 2005, the Central Valley Water Board adopted Resolution No. R5-2005-0052, which (1) renewed the Waiver for a term of 5 years; (2) revised Attachment A; and (3) added Attachment B, "Monitoring and Reporting Conditions" and Attachment C, "Implementation, Forensic and Effectiveness Monitoring and Reporting Program".

On 18 March 2010, the Central Valley Water Board adopted Order R5-2010-0022, which renewed the Waiver and Attachments A, B, and C for 5 years.

On 4 December 2014, the Central Valley Water Board adopted Order No. R5-2014-0144, which renewed the Waiver and Attachments A, B, and C for an additional 3 years; the Waiver expires on March 31, 2018.

MONITORING AND REPORTING PROGRAM

22. Water Code section 13267(b)(1) provides:

> *In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.* (2) *When requested by the person furnishing a report, the portions of a report that might disclose trade secrets or secret processes may not be made available for inspection by the public but shall be made available to governmental agencies for use in making studies. However, these portions of a report shall be available for use by the state or any state agency in judicial review or enforcement proceedings involving the person furnishing the report.*

23. Technical reports are necessary to evaluate Discharger compliance with the terms and conditions of this Order and to ensure that applicable water quality objectives are in fact being met. Consistent with Water Code section 13267, this Order requires the implementation of a monitoring and reporting program (MRP) that is designed to determine the effects of a Discharger's nonpoint source activity on water quality, to verify the effectiveness of management practices designed to comply with applicable water quality objectives, to verify the adequacy and effectiveness of the Order's conditions, and to evaluate Discharger compliance with the terms and conditions of the Order. Additional information regarding the justification for monitoring and technical reports under this Order is included in the Information Sheet.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

24. The Central Valley Water Board, acting as the lead agency for this project under the California Environmental Quality Act (CEQA)(Public Resources Code, section 21000 et seq.), conducted an Initial Study in 2002 in accordance with California Code of Regulations, title 14, section 15063. The Central Valley water Board adopted a negative declaration pursuant to CEQA on 30 January 2003 when it issued a Waiver of Waste Discharge Requirements Order No. R5-2003-0005.

25. This action to create a General Order does not require preparation of a subsequent or supplemental environmental document pursuant to the California Code of Regulations, title 14, sections 15162 or 15163. There is no evidence to indicate that substantial changes are proposed for the project, that substantial changes have occurred with respect to the circumstances of the project, or that there is new information of substantial importance with respect to the project, as described in section 15162, subdivision (a). Therefore, the environmental impacts from issuance of this Order have already been adequately assessed in accordance with CEQA (title 14, section 15061(b)(3)).

ANTIDEGRADATION

26. State Water Board Resolution 68-16 ("Statement of Policy with Respect to Maintenance of High Quality Waters in California") requires the Central Valley Water Board to regulate discharges of waste to waters of the state to achieve the highest water quality consistent with maximum benefit to the people of the state. It further requires that the Discharger meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of the state will be maintained. This Order is consistent with Resolution 68-16 because it requires compliance with applicable water quality control plans, prohibits the creation of pollution or nuisance, and sets forth conditions that require Dischargers to implement additional management practices (beyond those required in the FPR and U.S. Forest Service BMP guidance manuals) to assure protection of beneficial uses of waters of the state and maintain the highest water quality consistent with maximum benefit to the people of the state.

27. This Order is in the public interest and is protective of water quality as described below:
    a) Timberland management activities in California are primarily regulated by other agencies, including CAL FIRE and the U.S. Forest Service. The Central Valley Water Board does not approve timberland management activities, but it does have authority to require compliance with the Water Code.
    b) Without this Order, timberland management activities would continue under authority of those other agencies, but such activities may not be subject to appropriate conditions protective of water quality.
    c) Without this Order, the Central Valley Water Board could regulate a smaller percentage of timberland management activities in the Region individually, but once enrolled in this Order, timberland management activities are subject to enforceable conditions.
    d) This Order contains conditions that require compliance with the Basin Plans, including applicable water quality objectives and prohibitions.
    e) This Order contains conditions requiring compliance with a MRP that will assist in the protection of water quality through assessment and verification of the adequacy and effectiveness of Order conditions and management practices.
    f) Compliance with the conditions of this Order will ensure enrolled Projects are protective of water quality.
    g) This Order does not approve of or authorize a condition of pollution or nuisance.
    h) This Order's conditions are subject to enforcement pursuant to Water Code section 13350.
    i) Given available Central Valley Water Board staff resources, this Order is an effective mechanism to regulate a large number of potential discharges and allows staff to maximize field presence.
    j) This Order allows staff to continue to participate in the review of proposed timberland management Projects, providing staff the opportunity to require implementation of

protective measures beyond those required by CAL FIRE and the U.S. Forest Service for the most critical timber operations.

k) This Order allows for inclusion of staff recommendations developed during review of Projects.

l) This Order allows for watercourse crossing reconstruction on existing crossings on timber production zoned land outside of a Plan or EM Notice that might otherwise go uncorrected for years.

m) The inclusion of a MRP allows for timely application of management practices to protect waters of the state once failures resulting in discharges or potential failures that may result in discharges have been identified.

GENERAL FINDINGS

28. Any person seeking coverage under this Order shall file the applicable eligibility document(s) with the Central Valley Water Board as described herein. Where this Order requires the submittal of a NOI, the Discharger shall complete and submit the NOI form available at: http://www.waterboards.ca.gov/centralvalley/water_issues/forest_activities/index.shtml Dischargers shall file any additional eligibility documents required by the Executive Officer.

29. An annual fee for enrollment under this Order is not required pursuant to Assembly Bill 1492, codified as Public Resources Code section 4629.6(c), which states that no currently authorized or required fees shall be charged by the Regional Water Boards for activities or costs associated with the review of Projects or permits necessary to conduct timberland management activities.

30. This Order does not apply to discharges requiring a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act, including silvicultural point sources as defined in 40 CFR 122.27.

31. This Order does not authorize any act that results in the taking of threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). If a "take" will result from any action authorized under this Order, the Discharger shall obtain appropriate take authorization prior to construction or operation of the Project. The Discharger shall be responsible for meeting all requirements of the applicable Endangered Species Acts.

32. Section 106.3 of the Water Code establishes the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring Dischargers to implement best management practices designed to achieve applicable water quality objectives developed to protect municipal and domestic water supplies.

PUBLIC NOTICE & BOARD MEETING

33. The Central Valley Water Board has notified interested agencies and persons of its intent to issue this Order for discharges of waste from timberland management activities on non-federal and federal lands, and has provided them an opportunity to participate in public workshops and to submit written comments.

34. The Central Valley Water Board conducted a public hearing on 9 June 2017, and all comments,

testimony, and evidence pertaining to this Order were heard and considered.

35. This Order is effective upon adoption by the Central Valley Water Board on 9 June 2017 and remains in effect unless rescinded or revised by the Central Valley Water Board.

IT IS HEREBY ORDERED that all Dischargers meeting the criteria and conditions for coverage under this Order shall comply with the following:

I. Prohibitions

1. The Discharger shall not create a condition of pollution, contamination, or nuisance, as defined by Water Code section 13050.

2. The Discharger shall not contribute to an exceedance of any applicable water quality objectives (whether numeric or narrative) or of any applicable state or federal water quality criteria.

3. The discharge of any waste not specifically regulated by this Order is prohibited unless (a) the Discharger complies with Water Code section 13260(a) and the Central Valley Water Board either issues WDRs pursuant to Water Code section 13263 or an individual waiver pursuant to Water Code section 13269; or (b) the discharge does not create or threaten a condition of pollution or nuisance and the timeframes in Water Code section 13264(a) have lapsed.

4. The Discharger shall not cause any point source discharge of waste to a water of the United States unless such discharge is in compliance with a duly-approved NDPES permit.

II. Provisions

1. Dischargers covered under this Order shall comply with the terms and conditions contained in this Order.

2. The Discharger shall conduct timberland management activities in accordance with (a) the CAL FIRE-approved Plan, CAL FIRE-accepted Exemption (EX) or EM Notice, or CDFW-executed MATO or LSAA, in the case of timberland management activities on non-federal timberlands; or (b) in accordance with the final environmental document/decision document prepared pursuant to the National Environmental Policy Act (NEPA) and valid third party contracts, in the case of timberland management activities on federal lands managed by the U.S. Forest Service.

3. The Discharger shall allow Central Valley Water Board staff reasonable access onto property where activities covered by this Order occur whenever requested by Central Valley Water Board staff for the purpose of performing inspections and conducting monitoring, including; sample collection, measuring, and photographing/taping to determine compliance with Order conditions. Such inspections and monitoring shall be conducted consistent with Water Code section 13267(c), Public Resources Code section 4604(b)(1), and other applicable law.

4. The Discharger shall incorporate management practices and/or water quality protective measures resulting from Central Valley Water Board staff participation in CAL FIRE's Review Team process, the Federal review process, the CDFW review process, and/or

during Project enrollment that arise from changed conditions/new information into the Project document(s) and/or NOI addendum. The Discharger may propose alternative management practices if it can demonstrate to the satisfaction of the Executive Officer that the proposed alternatives will meet water quality requirements. Alternative management practices proposed by a Discharger must comply with the Prohibitions in this Order. Until such alternative management practices receive written approval from the Executive Officer, the Discharger shall adhere to those management practices provided by Regional Water Board staff.

5. The Discharger shall maintain a copy of this Order at its primary place of business. The Discharger's designee/agents shall be provided a copy and be familiar with the contents and requirements of this Order.

6. Dischargers shall comply with the attached Monitoring and Reporting Program, Order No. R5-2017-0061, and future revisions thereto or with an individual monitoring and reporting program as specified by the Central Valley Water Board or the Executive Officer.

7. The Discharger shall comply with all applicable requirements and prohibitions of the applicable Basin Plan, including any amendments adopted by the Central Valley Water Board and approved by the State Water Board, and with all applicable policies adopted by the State Water Board.

8. The Executive Officer may require the Discharger to submit additional technical reports pursuant to Water Code section 13267.

9. Pursuant to Water Code section 13263, this Order shall not create a vested right to discharge waste to waters of the state, and all such discharges of waste shall be considered a privilege. Accordingly, the regulatory coverage provided by this Order: (a) may be modified or terminated at any time, either in its entirety or as to any individual Dischargers; (b) does not permit an illegal activity; (c) does not preclude the need for permits which may be required by federal, local, or other governmental agencies; and (d) does not preclude the Central Valley Water Board from administering enforcement remedies (including civil liability) pursuant to the Water Code.

III. Criteria and Condition Specifications by Category

Table 1 summarizes the enrollment categories and corresponding requirements under this Order. The Central Valley Water Board may determine that a Discharger's otherwise eligible Project does not qualify for enrollment under the requested category, requires enrollment in a different category, or that the Project does not quality for enrollment under the Order at all. If the Central Valley Water Board makes such a determination, it will provide prompt notice to the Discharger that enrollment in a different category is required or that enrollment under the Order is denied.

Eligibility under Category 1, 2A, or 2B assumes Discharger compliance with applicable criteria/conditions under California Code of Regulations, title 14, section 1038 (for Notices of Exemption) or title 14, section 1052 et seq. (for Emergency Notices). During a declared State of Emergency, an Executive Order may authorize CAL FIRE to suspend some or all of these criteria. In the event of such a suspension, the Central Valley Water Board hereby retains for itself the discretion to require the Discharger to meet otherwise applicable criteria under title 14, section

1038 and/or section 1052 et seq. – whether suspended by CAL FIRE or not – for eligibility under Category 1, 2A, or 2B. The Central Valley Water Board will provide prompt notice to affected Dischargers that it intends to exercise this discretion, if applicable.

Table 1. Summary of Timberland Management Activity Categories and Requirements[1]

		Cat.	Plans/Projects Covered	NOI, operation notification, and monitoring requirements	Pages
Lead Agency	CAL FIRE (non-federal)	1	• 1038 EX Notices[2,3] • 1052.1-1052.5 EM Notices[2] (*except fire salvage*) • 1104.1 Conversion Exemptions[2]	• Automatically enrolled • Agency Monitoring	15-16
		2A	• 1052.1 EM Notice[2] for fire salvage on: o Industrial timberlands; or o Non-industrial timberlands when no residence is within EM	• Automatically enrolled contingent on submittal of *NOI* and *Erosion Site Table* within 30 days of EM Notice acceptance by CAL FIRE • *Post-Fire Management and Reforestation Plan* (if applicable) • Annual Agency, Implementation, Forensic, and Effectiveness Monitoring and Summary of Operations • Updates to *Erosion Site Table* and if applicable, *Post-Fire Management and Reforestation Plan*	16-18
		2B	• 1052.1 EM Notice[2] for fire salvage when a non-industrial timberland owner's residence is within EM	• *NOI* prior to operations • Agency and Effectiveness Monitoring	19-20
		3A	• THPs, PTHPs, WFMPs, NTMPs, and other Plans[4]	• *NOI* prior to operations • Annual Agency, Implementation, Forensic, and Effectiveness Monitoring and Summary of Operations	21-23
		3B	• 1051-1051.7 modified THPs[2]; or • THPs, PTHPs, WFMPs, NTMPs, and other Plans that meet all the low threat criteria in Part III.D.2.a.ii.	• *NOI* prior to operations • Agency and Effectiveness Monitoring	21-23
	CDFW	4	• Watercourse crossing work conducted under CDFW MATO or LSAA on timber production zoned land for replacement/reconstruction of *existing* watercourse crossings outside of a Plan or EM Notice	• Submit copy of CDFW notification 30 days prior to work commencing • *NOI* 30 days prior to operations • Implementation, Forensic, and Effectiveness Monitoring	24

		Cat.	Plans/Projects Covered	NOI, operation notification, and monitoring requirements	Pages
	U.S. Forest Service	5A	• Post-fire timberland management activities (fire salvage and hazard tree removal)	• Automatically enrolled contingent on submittal of *NOI* and *Erosion Site Table* within 30 days of startup of operations • *Post-Fire Management and Reforestation Plan* (if applicable) • Annual Implementation, Forensic, and Effectiveness Monitoring and Summary of Operations • Updates to *Erosion Site Table* and if applicable, *Post-Fire Management and Reforestation Plan*	25-27
		5B	• Timber harvesting sales, vegetation management and fuels reduction, forest stand improvement and hazard tree removal, and pesticide applications associated with the aforementioned.	• *NOI* 15 days prior to operations • Annual Notice of Operations 15 days prior to startup • Annual National Core BMP monitoring protocols OR Implementation, Forensic, and Effectiveness Monitoring and Summary of Operations	28-29

[1]**This table only provides an abbreviated summary of the criteria, conditions, and monitoring for categories; refer to category specific criteria/conditions and Attachments B and C for complete information**.
[2]California Code of Regulations, title 14, section (as cited in table)
[3]Excludes the cutting and removal of timber and other solids wood forest products for: Christmas trees, structure protection (150 and 300 feet), and woody debris and slash removal (see Attachment A definition of "timber land management activities").
[4]THP – timber harvesting plan, PTHP – program timber harvesting plan, NTMP – non-industrial timber management plan

A. Certification of Notice of Non-Applicability on Federal and Non-Federal Lands

Enrolment under this Order is not required for Projects that (1) do not contain watercourses or wet meadows and other wet areas within or directly adjacent to the Project area AND (2) do not pose a threat to water quality or the beneficial uses of waters of the state (appurtenant roads to be considered in evaluation). **No later than ten days prior** to the startup of operations, Project proponents must submit a *Certification of Notice of Non-Applicability* signed by a duly authorized agent to the Central Valley Water Board certifying that the Project meets the criteria above.

B. Category 1: Low Threat Exemption and Emergency Notices on Non-Federal Lands

1. Eligibility Criteria: Activities that may proceed under Category 1 are those:

   a) Conducted under a CAL FIRE-accepted Exemption pursuant to California Code of Regulations, title 14, section 1038 (excludes the cutting and removal of timber and other solid wood forest products for Christmas trees, structure protection (150 and 300 feet), and woody debris and slash removal), including but not limited to:

      i. Harvesting dead, dying or diseased trees;
      ii. Substantially damaged timberland unmerchantable as sawlog;
      iii. Forest fire prevention;
      iv. Drought mortality.

   -OR-

   b) Conducted under a CAL FIRE accepted Emergency Notice pursuant to the conditions listed in California Code of Regulations, title 14, sections 1052-1052.5 (**substantially damaged timberlands from fire (fire salvage) excluded – see Categories 2A and 2B**), including, but not limited to:

      i. Harvesting dead or dying (fire salvage excluded);
      ii. Fuel hazard reduction;
      iii. Sudden Oak Death disease.

   -OR-

   c) Conducted under a CAL FIRE-accepted Conversion Exemption pursuant to California Code of Regulations, title 14, section 1104.1, including but not limited to:

      i. Less than 3 acres for the purpose of fuels reduction and/or construction activities;
      ii. Public agency, public and private utility right-of-way.

2. Enrollment: Projects meeting the eligibility criteria listed above for Category 1 are *automatically* enrolled under the Order and must comply with the conditions listed below.

3. Conditions:

   a) The Discharger shall submit a copy of the CAL FIRE-accepted Exemption or Emergency Notice if requested by the Central Valley Water Board.

   b) For Conversion Exemptions that will be for the purpose of residential or commercial development, the Discharger must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit), State Water Board Order No. 2009-0009-DWQ prior to construction activities that disturb one or

more acres or activities that disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres.

c) For Exemption Notices (typically less than 3 acre conversions), for cannabis cultivation, the Discharger may need to obtain coverage under the General Permit for Discharges of Waste Associated with Medicinal Cannabis Cultivation Activities, Order No. R5-2015-0113 or any applicable Order that the State Water Board may adopt in the future to regulate cannabis cultivation.

d) The Discharger shall comply with all conditions specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061, including notifying the Central Valley Water Board whenever: (1) Agency Monitoring detects a violation of the California Forest Practice Rules that relate to water quality protection measures; or (2) management measures fail and result in a discharge, or the potential to discharge, waste to waters of the state.

C. Categories 2A and 2B: Emergency Notices Related to Fire Salvage on Non-Federal Lands

Category 2A (Industrial Fire Salvage and Non-Industrial Fire Salvage With No Residence)

1. Eligibility Criteria: Activities that may proceed under Category 2A are those conducted under a CAL FIRE-accepted Emergency Notice pursuant to the conditions listed in California Code of Regulations, title 14, section 1052.1 for:

   a) Fire Salvage, for **industrial** timberlands.

   -OR-

   b) Fire salvage, for **non-industrial** timberlands when a **residence is not within the Emergency area**.

2. Enrollment: Projects meeting the eligibility criteria listed above for Category 2A are *automatically* enrolled under the Order when the Discharger submits a copy of the Emergency Notice accepted by CAL FIRE to the Central Valley Water Board.

3. Conditions: Dischargers conducting timberland management activities that meet the eligibility criteria for Category 2A listed above must comply with all of the following conditions, as applicable:

   a) The Central Valley Water Board must receive a **complete *NOI for Category 2A* and *Erosion Site Table*** (see Table 1 in Category 2A *NOI*) **within 30 days of Emergency Notice acceptance by CAL FIRE,** signed by the timberland/timber owner, certifying that the activities meet the criteria and conditions for enrollment in Order Category 2A. The Discharger shall provide timely amendments of the *Erosion Site Table* throughout Emergency Notice enrollment to the Central Valley Water Board when conditions or management objectives have changed.

   b) **IF pesticides will be applied following the fire**, THEN the Discharger shall **EITHER**:

      i. **Submit a Post-Fire Management and Reforestation Plan** (PFP; see Attachment C) **to the Central Valley Water Board for approval prior to application of pesticides** within the post-fire management and reforestation plan area. The PFP shall include measures that will provide equal to or better protection than the conditions under Part III.C.3.b.ii below. **The Executive Officer's written approval of the PFP is required**

before implementation of the PFP can satisfy the requirements of this Part III.C.3.b.; approval or denial of the PFP shall be provided within 30 days of PFP submittal.

-OR-

ii. Meet **ALL** of the following conditions:

1. The Discharger shall **comply with the following pesticide no-spray buffers** (unless more stringent buffers are dictated by application labels/guidance, statute, or regulation):

    a. For Class I and II watercourses, the applicable WLPZ widths specified in the California Code of Regulations, title 14, section 936.5;

    b. For Class III and IV watercourses, a minimum of 25 feet where sideslope steepness is less than 30%, and a minimum of 50 feet where sideslope steepness is 30% or greater.

2. Where management activities are planned on a burned area with **slopes greater than 30%, a minimum of 50% average effective groundcover** (see Attachment C for guidance) **is required to be documented prior to pesticide application**. Documentation shall be provided to the Central Valley Water Board in the pesticide notification **30 days prior to application**.

3. The Discharger shall **notify** the Central Valley Water Board **in writing at least 30 days prior to any proposed application of pesticides**. The notification does *not* need to include information on hack and squirt or individual stump applications. The written notification shall include the pesticide product(s) to be applied, the proposed date(s) of application, the method(s) of application, the area(s) of application (CAL FIRE Notice number and Township/Range/Section), a description of measures that will be employed to assure compliance with the applicable Basin Plan, and documentation of 50% or greater effective groundcover (as applicable). Subsequent changes to the proposal must be submitted in writing no less than 48 hours prior to pesticide application.

c) The Discharger shall meet the following conditions unless Central Valley Water Board staff has been consulted and agrees to alternative protection measures as warranted by site-specific conditions (see Part II.4.) and/or as requested by the Discharger when such protection is inconsistent with land management objectives:

i. A minimum Equipment Limitation Zone for any and all Class III and Class IV watercourses of at minimum 25 feet where sideslope steepness is less than 30%, and at a minimum 50 feet where sideslope steepness is 30% or greater.

ii. Culverts or other permanent in-stream structures at watercourse crossings in which water is flowing at the time of installation shall be installed with their necessary protective structures (i.e. armoring, wing walls, diversion prevention measures) concurrently with fill placement. Additionally, installation shall utilize methods to temporarily isolate or divert stream flows from the installation area while maintaining bypass flows or as specified in an executed MATO or LSAA from CDFW.

iii. Any and all riparian vegetation, other than commercial species, that is found along watercourses and lakes or that is found within or bordering wet meadows and other wet areas shall be retained and protected to the extent feasible during timberland management activities.

d) *IF*:

i. Activities are undertaken pursuant to a CAL FIRE Notice on which Central Valley Water Board staff has not consulted; *AND*

ii. In the CAL FIRE Notice or *NOI* the Discharger proposes *EITHER*

1. Timberland management activities on soils with extreme erosion hazard rating (post-fire), known landslides, and/or unstable areas *that have the potential to impact water quality*, *OR*
2. Any watercourse crossing that involves the placement of more than 500 cubic yards or 25 vertical feet of fill material,

THEN additional field review must be conducted or directed by a licensed civil engineer or licensed geologist prior to the startup of operations to determine if activities conducted under the CAL FIRE Notice could cause or exacerbate the potential for soil erosion or mass soil movement. The CAL FIRE Notice or NOI addendum must incorporate all recommendations made by said licensed engineer or geologist for the specific site conditions listed above.

e) The Discharger shall submit copies of any CDFW **notification(s)** for watercourse crossing work within the burn area associated with a MATO or LSAA **within 30 days of filing the notification with CDFW**.

f) For a CAL FIRE Notice where aquatic or wetland habitat for rare, threatened or endangered species is identified and where timberland management activities may impact such habitat, additional field review shall be conducted prior to the startup of operations by a scientist, with a bachelor's or advanced degree in biological sciences and experience in aquatic systems, and/or a qualified professional trained in biological assessments to determine if the Notice could adversely affect such species or their habitat. The CAL FIRE Notice or NOI addendum must incorporate all project modifications and mitigation measures recommended by the scientist/professional to avoid impacts to rare, threatened, or endangered species.

g) If mine tailings and/or associated waste rock will be disturbed or used as construction materials as part of timberland management activities, the Discharger shall contact Central Valley Water Board staff to discuss proper characterization of the materials to ensure prior to such disturbance or use there will be no adverse impacts to water quality and beneficial uses.

h) The Discharger shall comply with all the conditions specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061. Category 2A will be subject to agency, implementation, forensic, and effectiveness monitoring; an annual operations summary; and updates to the *Erosion Site Table* and PFP (as applicable).

i) The Discharger shall seek termination of coverage under the Order in accordance with Part V.A., Termination of Coverage.

Category 2B (Non-Industrial Fire Salvage with Residence)

4. Eligibility Criteria: To be eligible for enrollment under Category 2B, activities must be:

    a) Conducted under a CAL FIRE-accepted Emergency Notice pursuant to the conditions listed in California Code of Regulations, title 14, section 1052.1 for **fire salvage**, when a **non-industrial** timberland owner's **residence is within the Emergency area**.

5. Enrollment: Projects that meet the Category 2B eligibility criteria shall enroll under this Order by submitting the following **prior to operations commencing**: (1) a copy of the CAL FIRE-accepted Notice, and (2) a single *NOI for Categories 2B, 3A, and 3B*, signed by the timberland/timber owner, certifying that the activities meet the criteria and conditions for enrollment in Order Category 2B. **Central Valley Water Board staff will review and respond to the *NOI* within 15 days of receipt; activities may commence in compliance with this Order once the Central Valley Water Board has issued a Notice of Applicability (NOA) to the Discharger indicating that the *NOI* is complete**.

6. Conditions: Dischargers conducting timberland management activities under Category 2B must comply with the following conditions, as applicable:

    a) The Discharger must meet the following conditions unless Central Valley Water Board staff has been consulted and agrees to alternative protection measures as warranted by site-specific conditions (see Part II.4.) and/or as requested by the Discharger when such protection is inconsistent with land management objectives:

        i. A minimum Equipment Limitation Zone for any and all Class III and Class IV watercourses of at minimum 25 feet where sideslope steepness is less than 30%, and at a minimum 50 feet where sideslope steepness is 30% or greater.

        ii. Culverts or other permanent in-stream structures at watercourse crossings in which water is flowing at the time of installation shall be installed with their necessary protective structures (i.e. armoring, wing walls, diversion prevention measures) concurrently with fill placement. Additionally, installation shall utilize methods to temporarily isolate or divert stream flows from the installation area while maintaining bypass flows or as specified in an executed MATO or LSAA from CDFW.

        iii. Any and all riparian vegetation, other than commercial species, that is found along watercourses and lakes or that is found within or bordering wet meadows and other wet areas shall be retained and protected to the extent feasible during timberland management activities.

    b) *IF*:

        i. Activities are undertaken pursuant to a CAL FIRE Notice on which Central Valley Water Board staff has not consulted; *AND*

        ii. The CAL FIRE Notice proposes *EITHER*

            1. Timberland management activities on soils with extreme erosion hazard rating (post-fire), known landslides, and/or unstable areas *that have the potential to impact water quality*, *OR*
            2. Any watercourse crossing that involves the placement of more than 500 cubic yards or 25 vertical feet of fill material,

THEN additional field review must be conducted or directed by a licensed civil engineer or registered geologist prior to the startup of operations to determine if the CAL FIRE Notice could cause or exacerbate the potential for soil erosion or mass soil movement. The CAL FIRE Notice or NOI addendum must incorporate all recommendations made by said licensed engineer or geologist for the specific site conditions listed above.

c) The Discharger shall submit copies of any CDFW **notification(s)** for watercourse crossing work within the burn area associated with a MATO or LSAA **within 30 days of filing the notification with CDFW**.

d) For a CAL FIRE Notice where aquatic or wetland habitat for rare, threatened or endangered species is identified and where timberland management activities may impact such habitat, additional field review shall be conducted prior to the startup of operations by a scientist, with a bachelor's or advanced degree in biological sciences and experience in aquatic systems, and/or a qualified professional trained in biological assessments to determine if the Notice could adversely affect such species or their habitat. The CAL FIRE Notice or NOI addendum must incorporate all project modifications and mitigation measures recommended by the scientist/professional to avoid impacts to rare, threatened, or endangered species.

e) The Discharger shall **notify** the Central Valley Water Board in writing at least **15 days prior to any proposed application of pesticides**; the notification does *not* need to include information on hack and squirt or individual stump applications. The written notification shall include the pesticide product(s) to be applied, the proposed date(s) of application, the method(s) of application, the area(s) of application (Notice number and Township/Range/Section), and a description of measures that will be employed to assure compliance with the applicable Basin Plan. Subsequent changes to the proposal must be submitted in writing no less than 48 hours prior to pesticide application.

f) If mine tailings and/or associated waste rock will be disturbed or used as construction materials as part of timberland management activities, the Discharger shall contact Central Valley Water Board staff to discuss proper characterization of the materials to ensure prior to such disturbance or use there will be no adverse impacts to water quality and beneficial uses.

g) The Discharger shall comply with all the conditions specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061. Category 2B will be subject to agency and effectiveness monitoring.

h) The Discharger shall seek termination of coverage under the Order in accordance with Part V.A., Termination of Coverage.

D. Categories 3A and 3B: Plans that Receive Discretionary Approval from CAL FIRE on Non-Federal Lands

Category 3A (Plans With a Higher Threat to Water Quality)

1. Eligibility Criteria: To be enrolled under Category 3A, activities must meet the following criteria:

    a) The covered activities are timberland management activities on non-federal lands that receive discretionary approval from CAL FIRE, including but not limited to:

        i. Timber harvesting plans;
        ii. Program timber harvesting plans;
        iii. Working forest management plans;
        iv. Non-industrial timber management plans;
        v. Other Plans.

    b) The approved Plan documents or *NOI* addendum include additional management practices and/or water quality protective measures (beyond the requirements of the current Forest Practice Rules) identified during the CAL FIRE Review Team process and/or during Project enrollment (i.e. changed conditions/new information)(see Part II.4.).

Category 3B (Plans With a Lower Threat to Water Quality)

2. Eligibility Criteria: To be enrolled under Category 3B, activities must meet the following criteria:

    a) The covered activities are timberland management activities on non-federal lands that receive discretionary approval from CAL FIRE, including but not limited to:

        i. Modified timber harvesting plans pursuant to California Code of Regulations, title 14, sections 1051-1051.7;

        -OR-

        ii. Timber harvesting plans, program timber harvesting plans, working forest management plans, non-industrial timber management plans, and other Plans that comply with all of the following criteria:

            1) No timberland management activities (i.e. watercourse crossing, road, and/or landing reconstruction/construction/abandonment) within the standard width of a WLPZ or ELZ (as defined in CCR, title 14, section 936.5), wet meadows and other wet areas, ***except*** for: 1) the use and maintenance (not reconstruction) of ***existing*** stable roads and associated watercourse crossings in good working condition that ***will not result in a significant sediment discharge***, and 2) the installation and use of ***dry*** Class III watercourse tractor crossings;
            2) No significant existing or potential erosion sites;
            3) No ground-based equipment on high or extreme Erosion Hazard Rating (EHR) that may result in a significant sediment discharge;
            4) No timberland management activities conducted in-lieu of the standard WLPZ practices contained in the Forest Practice Rules.

    b) The approved Plan documents or *NOI* addendum include additional management practices and/or water quality protective measures (beyond the requirements of the current Forest

Practice Rules) identified during the CAL FIRE Review Team process and/or during Project enrollment (i.e. as a result of changed conditions/new information) (see Part II.4.).

3. Enrollment: Dischargers conducting activities that meet the criteria of Category 3A or 3B shall enroll under this Order as follows:

   a) The Discharger shall submit a copy of the CAL FIRE approved Plan if requested by Central Valley Water Board staff. The Plan must incorporate additional or modified management practices and/or water quality protective measures resulting from the CAL FIRE Review Team process.

   b) The Discharger shall submit a single completed *NOI for Categories 2B, 3A, and 3B* **prior to operations commencing**, signed by the timberland/timber owner, certifying that the activities meet the criteria and conditions contained in either Order Category 3A or 3B. **Central Valley Water Board staff will review and respond to the *NOI* within 15 days of receipt; activities may commence once the Central Valley Water Board has issued a NOA to the Discharger indicating that their NOI is complete**.

4. Conditions: Dischargers conducting timberland management activities under Category 3A or 3B must comply with the following conditions, as applicable:

   a) For CAL FIRE-approved **NTMPs** that do not incorporate the FPR "Road Rules" (Cal. Code Regs., tit. 14, art. 12) which became effective January 2015, the Discharger must submit an inventory of significant existing or potential erosion sites, as detailed in California Code of Regulations, Title 14, section 923.1(e), to the Central Valley Water Board **at least 15 days prior to commencement of timberland management activities**. The erosion inventory shall: (1) be prepared by a RPF; (2) encompass the NTO area and appurtenant roads at a minimum; and (3) include an implementation schedule for treatment of erosion sites.

   b) *IF*:
      i. Activities are undertaken pursuant to a Plan on which Central Valley Water Board staff has not consulted; *AND*

      ii. In the Plan the Discharger proposes *EITHER*
         1. Timberland management activities on soils with extreme erosion hazard rating, known landslides, and/or unstable areas *that have the potential to impact water quality*, *OR*
         2. Any watercourse crossing that involves the placement of more than 500 cubic yards or 25 vertical feet of fill material,

      THEN additional field review must be conducted or directed by a licensed civil engineer or registered geologist prior to the startup of operations to determine if activities conducted under the Plan could cause or exacerbate the potential for soil erosion or mass soil movement. The Plan or NOI addendum must incorporate all recommendations made by said licensed engineer or geologist for the specific site conditions listed above.

   c) Culverts or other permanent in-stream structures at watercourse crossings in which water is flowing at the time of installation shall be installed with their necessary protective structures (e.g. armoring, wing walls, diversion prevention measures) concurrently with fill placement. Additionally, installation shall utilize methods to temporarily isolate or divert stream flows

from the installation area while maintaining bypass flows or as specified in an executed MATO or LSAA from CDFW.

d) For Plans that will be for the purpose of cannabis cultivation, the Discharger may need to obtain coverage under the General Permit for Discharges of Waste Associated with Medicinal Cannabis Cultivation Activities, Order No. R5-2015-0113 or any applicable Order that the State Water Board may adopt in the future to regulate cannabis cultivation.

e) If mine tailings and/or associated waste rock will be disturbed or used as construction materials as part of timberland management activities, the Discharger shall contact Central Valley Water Board staff to discuss proper characterization of the materials to ensure prior to such disturbance or use there will be no adverse impacts to water quality and beneficial uses.

f) The Discharger shall comply with all the conditions specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061.

g) The Discharger shall **notify** the Central Valley Water Board in writing at least **15 days prior to any proposed application of pesticides**; the notification does *not* need to include information on hack and squirt or individual stump applications. The written notification shall include the pesticide product(s) to be applied, the proposed date(s) of application, the method(s) of application, the area(s) of application (Plan number and Township/Range/Section), and a description of measures that will be employed to assure compliance with the applicable Basin Plan. Subsequent changes to the proposal must be submitted in writing no less than 48 hours prior to pesticide application.

h) The Discharger shall seek termination of coverage under the Order in accordance with Part V.A., Termination of Coverage.

For **non-expiring Plans** (such as NTMPs and WFMPs), the Discharger has the following enrollment/termination options: (1) enroll and terminate with each entry (NTO/Notice), or (2) remain continuously enrolled for the duration of the Plan with an additional requirement to certify in the annual report when discharges associated with timberland management activities for each NTO/Notice area have ceased prior to cessation of monitoring for that entry (see Attachment B, Part V.B.).

E. Category 4: Watercourse Crossing Work Conducted under a MATO or LSAA Outside of a Plan / Emergency Notice on Non-Federal Lands

1. Eligibility Criteria: To be enrolled under Category 4, activities must meet the following criteria:

    a) The activities are conducted under a CDFW-executed MATO or LSAA on timber production zoned land pursuant to the conditions listed in Fish and Game Code sections 1600-1616 for replacement/reconstruction of *existing* watercourse crossings outside of a CAL FIRE accepted EM Notice or approved Plan.

    b) A *NOI* is submitted on a project-by-project basis (i.e. no long-term enrollment of a MATO).

    c) The CDFW notification/sub-notification or *NOI* incorporates any water quality protective measures identified during review of the project (see Part II.4.).

2. Enrollment: Dischargers conducting timberland management activities under Category 4 shall enroll under this Order by complying with the following:

    a) Submit a copy of the CDFW notification to Central Valley Water Board staff concurrent with submittal to CDFW; at a minimum**, the notification must be submitted at least 30 days prior to work commencing**. The scope of the notification shall encompass all information required by the applicable MATO or CDFW Form FG2023 for an individual LSAA. The Discharger shall notify the Central Valley Water Board if CDFW declares the notification incomplete or requests additional information.

    b) Submit a *NOI for Category 4* **at least 30 days prior to operations commencing** signed by the timberland/timber owner certifying that the activities meet the criteria and conditions required in Category 4. Activities may commence once the Central Valley Water Board has issued a NOA to the Discharger indicating that their NOI is complete

3. Conditions: Dischargers conducting timberland management activities enrolled under Category 4 shall comply with the following conditions:

    a) Comply with all water quality management practices identified in the CDFW-executed MATO or LSAA and shall provide any amendments/project changes to the Central Valley Water Board for review in a timely manner. The Discharger shall submit a copy of the LSAA and appropriate CEQA documentation to the Central Valley Water Board. A MATO shall only be submitted when requested.

    b) Notify Central Valley Water Board staff of any scheduled site visit with CDFW staff; Central Valley Water Board staff retains the discretion to require a site visit in accordance with Part II.3.

    c) The Discharger shall comply with all the requirements specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061. Category 4 will be subject to Implementation, Forensic, and Effectiveness Monitoring.

    d) The Discharger shall seek termination of coverage under the Order in accordance with Part V.A., Termination of Coverage.

F. Categories 5A and 5B: Timberland Management Activities on Federal Lands Managed by the U.S. Forest Service

Category 5A (Post-Fire Activities)

1. Eligibility Criteria: To be enrolled under Category 5A, activities must meet the following criteria:

   a) Post-fire timberland management activities (e.g. fire salvage and post-fire hazard tree removal for commercial purposes) that have the potential to impact water quality, excluding emergency work conducted during or immediately (within 60 days) after the fire, on federal lands where the U.S. Forest Service has conducted the required or appropriate level of multi-disciplinary review of the timber harvesting proposal and has specified best management practices and additional control measures as needed, in order to assure compliance with the applicable Basin Plan.

   b) The U.S. Forest Service has provided Project description documents to the Central Valley Water Board and allowed time for adequate review and comment. These documents include: 1) the NEPA scoping document; and 2) the NEPA draft environmental analysis, which will include site specific information that identifies Significant Existing or Potential Erosion Sites (SEPES) and priority road improvement locations, as well as, proposed treatments and schedule for those sites to improve or protect water quality. Supplemental project documents may also be provided that contain design specifications, management practices, and/or water quality protection measures. Any additional management practices and/or water quality protective measures identified by Central Valley Water Board staff during the scoping period and/or enrollment under this Order will have been discussed with U.S. Forest Service personnel and incorporated into an addendum to the *NOI* (see Part II.4.), including a timeline and checklist for completion. The project will remain enrolled until all identified management practices and/or water quality protective measures have been completed.

   c) The U.S. Forest Service has conducted a cumulative watershed effects (CWEs) analysis, where required or appropriate, and included specific measures needed to reduce the potential for CWEs in order to assure compliance with the applicable Basin Plan.

2. Enrollment: Projects meeting the Category 5A eligibility criteria are *automatically* enrolled under this Order when the U.S. Forest Service submits copies of final project specific decision/NEPA documents that contain information documenting compliance with the eligibility criteria in Part III.F.1.

   The U.S. Forest Service shall include all specific on-the-ground prescriptions designed to adhere to the BMPs described in *National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide*, and all additional management practices and/or water quality protective measures identified by Central Valley Water Board staff (See Part II.4.) within contracts, permits, agreements, and other instruments used to direct the activities of contractors, permittees, U.S. Forest Service personnel, volunteers, and any other third party.

3. Conditions: Dischargers conducting timberland management activities enrolled under Category 5A must comply with the following conditions, as applicable:

   a) The U.S. Forest Service shall submit **a complete *NOI for Category 5A* and *Erosion Site Table*** (see Table 1 in Category 5A NOI) **within 30 days of startup of operations,** signed by

a duly authorized representative, certifying that the activities meet the criteria and conditions for enrollment in Order Category 5A. The U.S. Forest Service shall provide timely amendments of the *Erosion Site Table* to the Central Valley Water Board throughout Project enrollment when conditions or management objectives have changed.

b) For Projects that were included in a Burned Area Emergency Response (BAER) evaluation, the U.S. Forest Service may submit the BAER report in-lieu of the *Erosion Site Table*, if the report includes all the required information (including implementation schedule) and the Discharger intends to implement the BAER recommendations that have a nexus with water quality protection. If the BAER report is incomplete, and does not contain all of the information required in the *Erosion Site Table*, the U.S. Forest Service may submit an addendum to the BAER report with missing or incomplete information.

c) **IF <u>pesticides</u> will be applied following the fire**, THEN the Discharger shall **EITHER**:

i. **Submit a Post-Fire Management and Reforestation Plan** (PFP; see Attachment C) **to the Central Valley Water Board for approval prior to application of pesticides** within the post-fire management and reforestation plan area. The PFP shall include measures that will provide equal to or better protection than the conditions under Part III.F.3.c.ii below. The Executive Officer's written approval of the PFP is required before implementation of the PFP can satisfy the requirements of this Part III.F.3.c.; **approval or denial of the PFP shall be provided within 30 days of PFP submittal**.

-OR-

ii. Meet **ALL** the following conditions:

1. The Discharger must **comply with the following pesticide no-spray buffers** (unless more stringent buffers are dictated by application labels/guidance, statute, or regulation):

a. Perennial or intermittent watercourses which have: (1) surface domestic water use from and/or within 100 feet downstream of operations area and/or (2) fish always or seasonally present onsite, includes habitat to sustain fish migration and spawning, shall utilize the appropriate **Class I WLPZ width(s)** specified in the California Code of Regulations, title 14, section 936.5.

b. Perennial or intermittent watercourses which have: (1) fish always or seasonally present off-site within 1000 feet downstream (excludes intermittent or ephemeral watercourses with no aquatic life that are tributary to watercourses described under (a) above) and/or (2) aquatic habitat for nonfish aquatic species (aquatic insects and/or other physical habitat indicators such as riparian and aquatic vegetation, watercourse debris, and potential for small pool formation), shall utilize the appropriate **Class II WLPZ width(s)** specified in the California Code of Regulations, title 14, section 936.5.

c. Ephemeral or intermittent watercourses with no aquatic life present, watercourse shows evidence of being capable of sediment transport to watercourses described under (a) and (b) above, shall utilize a minimum of **25 feet** where sideslope steepness is **less than 30%,** and a minimum of **50 feet** where sideslope steepness is **30% or greater**.

2. Where management activities are planned on a burned area with **slopes greater than 30%, a minimum of 50% average effective groundcover** (see Attachment C for guidance) **is required to be documented prior to pesticide application**. Documentation shall be provided to the Central Valley Water Board in the pesticide notification **30 days prior to application**.

3. The Discharger shall adhere to the resource protection measures in the Chemical Use Management Activities as designated in the National Best Management Practices for Water Quality Management on National Forest System Lands (USDA April 2012).

4. The Discharger shall **notify** the Central Valley Water Board **in writing at least 30 days prior to any proposed application of pesticides**; the notification does *not* need to include information on hack and squirt or individual stump applications. The written notification shall include the pesticide product(s) to be applied, the proposed date(s) of application, the method(s) of application, the area(s) of application (Township/Range/Section), a description of measures that will be employed to assure compliance with the applicable Basin Plan, and documentation of 50% or greater effective groundcover (as applicable). Subsequent changes to the proposal must be submitted in writing no less than 48 hours prior to pesticide application.

d) For approved Projects that require enrollment under the Order, the Discharger shall **notify the Central Valley Water Board each year at least 15 days prior to start of operations**.

e) The U.S. Forest Service shall comply with all conditions specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061. Category 5A will be subject to Implementation, Forensic, and Effectiveness Monitoring; an Annual Summary of Operations; and amendments/updates to the *Erosion Site Table* and PFP (as applicable).

f) The U.S. Forest Service shall seek termination of coverage under the Order in accordance with Part V.A., Termination of Coverage.

Category 5B (All timberland management activities except post-fire activities)

4. Eligibility Criteria: To be enrolled under Category 5B, activities must meet the following criteria:

   a) Timberland management activities (see definition of "timberland management activities" as it relates to activities that are commercial in nature) on federal lands where the U.S. Forest Service has conducted a multi-disciplinary review of the timber harvesting proposal and has specified best management practices and additional control measures as needed in order to assure compliance with the applicable Basin Plan. Timberland management activities may include, but are not limited to:

      i. Timber harvesting sales;
      ii. Vegetation management and fuels reduction projects;
      iii. Forest stand improvement and hazard tree removal (excluding hazard tree removal projects that do not pose a threat to water quality (i.e. isolated tree removal in campgrounds, etc.));
      iv. Pesticide applications associated with Part III.F.4.a.i.,ii.,iii. above.

   b) The U.S. Forest Service has provided Project description documents to the Central Valley Water Board and allowed time for adequate review and comment. These documents include: 1) the NEPA scoping document; and 2) the NEPA draft environmental analysis, which will include site specific information that identifies SEPES and priority road improvement locations, as well as, proposed treatments and schedule for those sites to improve or protect water quality. Supplemental project documents may also be provided that contain design specifications, management practices, and/or water quality protection measures. Any additional management practices and/or water quality protective measures identified by Central Valley Water Board staff during the scoping period and/or enrollment under this Order will have been discussed with U.S. Forest Service personnel and incorporated into an addendum to the NOI (see Part II.4.), including a timeline and checklist for completion. The project will remain enrolled until all identified management practices and/or water quality protective measures have been completed.

   c) The U.S. Forest Service has conducted a CWE analysis, where required or appropriate, and included specific measures needed to reduce the potential for CWEs in order to assure compliance with the applicable Basin Plan.

5. Enrollment: To enroll under Category 5B, the U.S. Forest Service shall comply with the following:

   a) Submit to the Central Valley Water Board copies of final decision documents that contain information documenting compliance with the eligibility criteria above. A copy of applicable final NEPA documents shall be submitted upon written request by Central Valley Water Board staff.

   b) Submit a *NOI for Category 5B* **at least 15 days prior to operations commencing**, signed by a duly authorized representative, certifying that the activities meet the criteria and conditions for Order Category 5B. Activities may commence once the Central Valley Water Board has issued a NOA to the Discharger indicating that the NOI is complete.

   c) Submit all specific on-the-ground prescriptions designed to adhere to the U.S. Forest Service BMPs as described in *National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide*, and all additional management practices and/or water quality protective measures

identified by Central Valley Water Board staff (See Part II.4.) within contracts, permits, agreements, and other instruments used to direct the activities of contractors, permittees, U.S. Forest Service personnel, volunteers, and any other third party.

6. Conditions: Dischargers conducting timberland management activities enrolled under Category 5B shall comply with the following conditions, as applicable:

   a) For approved Projects that require enrollment under the Order, the Discharger shall **notify the Central Valley Water Board each year at least 15 days prior to start of operations**.

   b) The Discharger shall **notify the Central Valley Water Board, in writing, at least 15 days prior to any proposed application of pesticides**; the notification does *not* need to include information on hack and squirt or individual stump applications. The written notification shall include the pesticide product(s) to be applied, the proposed date(s) of application, the method(s) of application, project name, area(s) of application (include map), and a description of measures that will be employed to assure compliance with the applicable Basin Plan. Subsequent changes to the proposal must be submitted in writing no less than 48 hours prior to pesticide application.

   c) The U.S. Forest Service shall comply with all conditions specified in Attachment B, Monitoring and Reporting Program, Order No. R5-2017-0061.

      Category 5B will be subject to one National Core BMP monitoring protocol as dictated by Project activities. In addition, one additional National Core BMP monitoring protocol will be required when the Discharger's cumulative watershed effects analysis indicates that the project, combined with other U.S. Forest Service projects conducted in the watershed over the past 10 years, may cause any watershed or sub-watershed to exceed a threshold of concern as determined by various models (i.e., Equivalent Roaded Acres (ERA), Surface Erosion (USLE), Mass Wasting (GEO), etc.). Dischargers have the option to conduct the standard Implementation, Forensic, and Effectiveness monitoring at the Project level in lieu of the National Core BMP monitoring protocols.

   d) The U.S. Forest Service shall seek termination of coverage under the Order in accordance with Part V.A., Termination of Coverage.

IV. Notice of Intent

To apply for coverage under this Order, the Discharger must submit a timely and complete category-specific Notice of Intent for approval by the Executive Officer as follows:

Category	*Non-federal*	*Federal*	*Required Forms*
No threat	X	X	*Notice of Non-Applicability (NONA)*
1	X		None[1]
2A	X		*NOI for Category 2A* and *Erosion Site Table*[2]
2B, 3A, or 3B	X		*NOI for Categories 2B, 3A, and 3B*
4	X		*NOI for Category 4*
5A		X	*NOI for Category 5A* and *Erosion Site Table*[3]
5B		X	*NOI for Category 5B*

[1]Automatically enrolled; submission of a NOI is not required.
[2]Automatically enrolled contingent on submittal of a complete NOI and Erosion Site Table within 30 days of CALFIRE acceptance of EM Notice.
[3]Automatically enrolled contingent on submittal of a complete NOI and Erosion Site Table within 30 days of startup of operations.

Timberland management activities may commence for Categories 2B, 3A, 3B, 4, and 5B once Central Valley Water Board staff has reviewed the NOI for completeness/accuracy and has issued a Notice of Applicability (NOA). Categories 2A and 5A are automatically enrolled but require timely submittal of a complete *NOI* and *Erosion Site Table* as a condition of this Order.

V. Termination of Coverage

A. Initiated by Discharger

The following criteria must be satisfied before termination of Order coverage will be considered by the Executive Officer:

- Timberland management activities are completed;
- All Category specific eligibility criteria/conditions were met;
- All elements of required monitoring and reporting have been completed;
- Soil disturbed by timberland management activities has stabilized;
- Pesticide applications have ceased and are not proposed in the foreseeable future;
- All feasible management measures and mitigations identified in the required Erosion Site Table (Category 2A/5A) and/or Post-Fire Management Plan (as applicable) have been completed and discharges have ceased.

In signing the Notice of Termination (NOT), the Discharger or U.S. Forest Service representative shall certify that: (1) the enrolled Project was conducted in conformance with the approved Plan, accepted CAL FIRE Notice, approved MATO/LSAA, or U.S. Forest Service Project requirements, as well as all applicable eligibility criteria/conditions and other applicable Provisions of this Order; and (2) discharges resulting from timberland management activities (including those associated

with pesticide applications) were in compliance and will continue to comply with all requirements of the applicable Basin Plan.

The NOT shall be reviewed for compliance with the above criteria. A field inspection may be conducted to verify compliance with all applicable requirements under this Order. The Central Valley Water Board shall notify the Discharger **within 90 days** following receipt of a NOT of approval or denial.

Non-federal Projects - The Discharger may terminate coverage under this Order by submitting to the Central Valley Water Board a signed Notice of Termination (NOT) and a CAL FIRE-approved final completion RM-71 form (if available and applicable).

Federal Projects - The Discharger may terminate coverage under this Order by submitting to the Central Valley Water Board a NOT signed by the Forest Supervisor or District Ranger.

B. Initiated by Executive Officer

The Executive Officer may terminate the applicability of this Order for a Project if any of the following determinations are made:

1. The proposed timberland management activities do not comply with the eligibility criteria for this Order.
2. The timberland management activities are not in compliance with the applicable conditions of this Order.
3. The proposed timberland management activities are reasonably likely to cause or contribute to a violation of an applicable Basin Plan or policy. In making this determination, the Executive Officer will consider the recommendations of Central Valley Water Board staff that participated in the review of the proposed timberland management activities, if any.
4. A timberland management activity has varied in whole or in any part from the approved Project, unless these changes result in better protection of water quality.

Upon receipt of notice of termination of applicability of the Order initiated by the Executive Officer, the Discharger shall immediately cease all timberland management activities that may result in discharges to waters of the state, other than activities necessary to control erosion. Before a Discharger may recommence timberland management activities that may result in discharges of waste to waters of the state, the Discharger must follow the applicable procedure either for enrolling under this Order or for obtaining individual waste discharge requirements pursuant to Water Code section 13260. Pursuant to Water Code section 13264, such activities may not recommence unless and until the Discharger receives a NOA under this Order or individual waste discharge requirements are adopted by the Central Valley Water Board.

VI. Petitions

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 June 2017.

Original signed by

PAMELA C. CREEDON, Executive Officer

ATTACHMENT A

DEFINITIONS
FOR
ORDER NO. R5-2017-0061

1. "Timberland management activities" means commercial activities relating to forest management and timberland conversions, including, but not limited to: cutting or removal of timber and other solid wood forest products; construction, reconstruction and maintenance of roads, fuel breaks, firebreaks, watercourse crossings, landings, skid trails, or beds for the falling of trees; fire hazard abatement and fuel reduction activities; pesticide applications; site preparation that involves disturbance of soil or burning of vegetation following timberland management activities; but excluding preparatory treemarking, surveying or roadflagging. This definition excludes the cutting and removal of timber and other solid wood forest products for Christmas trees, structure protection (150 and 300 feet), and woody debris and slash removal associated with CCR, title 14, section 1038 exemptions.

2. "Discharger" means the timberland owner or timber owner and anyone working on behalf of the timberland/timber owner in the conduct of timberland management activities for non-federal lands, and the U.S. Forest Service, private timber operators operating on federal lands, and anyone working on behalf of the U.S. Forest Service or a timber operator in the conduct of timberland management activities on federal lands.

3. "Effective Groundcover" any combination of slash (lopped and in close contact with the ground), mulch (large wood chips, wood shreds, wood strand blends, straw, bark, or surface rock fragments larger than ¾ inch), plants, and plant litter. Large wood chips should be a minimum of 2 inches in length and at least four (4) times longer than they are wide.

4. "Monitoring" refers to all types of monitoring undertaken in connection with determining water quality conditions and factors that may affect water quality conditions, including but not limited to, implementation, effectiveness, forensic, and Order compliance monitoring undertaken in connection with timberland management activities.

5. "Plan" means any Timber Harvesting Plan (THP), Program Timber Harvesting Plan (PTHP), Nonindustrial Timber Management Plan (NTMP), Working Forest Management Plan (WFMP), Modified Timber Harvesting Plan, Notice of Timber Operations, Working Forest Harvest Notice, or other discretionary permit issued by CAL FIRE to harvest timber, including all substantial deviations thereto that propose a change in timberland management activities that may increase the discharge or otherwise pose the potential for increased impacts to water quality. (For example, substantial deviations that propose to add, expand, or extend winter operations shall be considered a "Plan" for purposes of this Order. Minor deviations that do not propose any material change in how or where timberland management activities will be conducted, such as a change in timber operator, a time extension from CAL FIRE, etc., shall not be considered a "Plan" for purposes of this Order.)

6. "Pesticide" means (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these material that threaten beneficial uses. This definition excludes aquatic pesticide discharges covered under Order No. 2013-0002-DWQ.

7. "Project" means any CAL FIRE Plan (as defined in #5 above), CAL FIRE Emergency/Exemption Notice, or existing watercourse crossing reconstruction not covered under a Plan or Emergency Notice but conducted pursuant to a CDFW-executed MATO or LSAA on timber production zoned

non-federal lands, and any timberland management activities (i.e. timber sales, fire salvage, fuel hazard reduction, forest stand improvement and hazard tree removal) on federal lands.

8. "Significant Existing or Potential Erosion Site (SEPES)" means a location where soil erosion is currently, or there are visible physical conditions to indicate soil erosion may be in the future, discharged to watercourses or lakes in quantities that violate a water quality objective (narrative or numeric), prohibition, Total Maximum Daily Load implementation plan, policy, or other requirement contained in a water quality control plan adopted by the Regional Board and approved by the State Water Board, or a location where soil erosion may result in significant individual or cumulative adverse impacts to the beneficial uses of water.

9. "Watercourse protection zone" means any Watercourse and Lake Protection Zone, Equipment Limitation Zone, and Equipment Exclusion Zone for the protection of waters of the state as defined in California Code of Regulations, title 14, section 895.1 of the California Forest Practice Rules; it also means any Riparian Reserve or Riparian Conservation Area for federal Projects.

10. All other terms shall have the same definitions as defined in California Code of Regulations, title 14, section 895.1 of the California Forest Practice Rules and the Porter-Cologne Water Quality Control Act, unless specified otherwise. A few definitions from the 2017 FPR that are used throughout the Order are cited below for ease of reference:

    "Equipment Exclusion Zone" (EEZ) means the area, as explained in the THP, where heavy equipment associated with timber operations is totally excluded for the protection of water quality, the beneficial uses of water, and/or other forest resources.

    "Equipment Limitation Zone" (ELZ) means the area, as explained in the THP, where heavy equipment associated with timber operations is limited for the protection of water quality, the beneficial uses of water, and/or other forest resources.

    "Erosion Hazard Rating" (EHR) means the rating derived from the procedure specified in 14 CCR § 912.5 [932.5, 952.5] designed to evaluate the susceptibility of the soil within a given location to erosion.

    "Hydrologic Disconnection" means the removal of direct routes of drainage or overland flow of road runoff to a watercourse or lake.

    "Saturated Soil Conditions" means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during timber operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.

    "Significant Sediment Discharge" means soil erosion that is currently, or, as determined based upon visible physical conditions, may be in the future, discharged to watercourses or lakes in quantities that violate Water Quality Requirements or result in significant individual or cumulative adverse impacts to the beneficial uses of water. One indicator of a Significant Sediment Discharge is a visible increase in turbidity to receiving Class I, II, III, or IV waters.

    "Water Quality Requirements" means a water quality objective (narrative or numeric), prohibition, TMDL implementation plan, policy, or other requirement contained in a water quality control plan adopted by the Regional Board and approved by the State Water Board.

"Watercourse and Lake Protection Zone" (WLPZ) means a strip of land, along both sides of a watercourse or around the circumference of a lake or spring, where additional practices may be required for protection of the quality and beneficial uses of water, fish and riparian wildlife habitat, other forest resources and for controlling erosion.

ATTACHMENT B
MONITORING AND REPORTING PROGRAM
FOR
ORDER NO. R5-2017-0061

This Monitoring and Reporting Program (MRP) is issued pursuant to Water Code section 13267 and includes requirements for Projects enrolled under the Waste Discharge Requirements General Order for Discharges Related to Timberland Management Activities on Non-federal and Federal Lands, Order No. R5-2017-0061 (hereinafter referred to as the "Order"). The MRP is required to assure compliance with Order criteria and conditions, to verify the adequacy and effectiveness of the Order, to assist Dischargers with implementation and maintenance of water quality protection measures, and to identify and correct waste discharges that violate or threaten to violate water quality control plan (Basin Plan) requirements.

Dischargers with Projects enrolled under this Order are subject to monitoring requirements; however, the comprehensiveness of the monitoring required depends upon the scope of the timberland management activities and the category of enrollment. The inspection plan, monitoring requirements by category, monitoring types (agency, implementation, forensic, and effectiveness), incident reporting, reporting requirements, and potential additional monitoring requirements are described within this MRP.

I. INSPECTION PLAN

Dischargers shall prepare and implement an Inspection Plan for Projects that exceed 100 acres for all Categories (***except*** Category 1 and Category 5B (unless the U.S. Forest Service conducts implementation, forensic, and effectiveness monitoring in the Project area in lieu of National Core BMP Protocol monitoring)). The Inspection Plan shall be designed to ensure that management measures are installed and functioning prior to a precipitation event that generates overland flow, that the measures were effective in controlling significant sediment discharges (see definition in Attachment A) throughout the winter period, and that no new significant sediment discharge sources developed. The Inspection Plan shall include a site map that includes monitoring points and inspection locations to be visited before, during, and after the winter period once operations have begun. Monitoring points are further described as follows:

- *Visual Monitoring Points* - Visual monitoring points shall be delineated on the monitoring points site map and shall address all bulleted inspection items applicable to the enrolled category detailed in the implementation, forensic, and effectiveness monitoring sections that follow (e.g. watercourse crossings, roads, landings, skid trails, water diversions, unstable areas, accessible watercourse confluences).
- *Photo-point Monitoring* – Photo-point monitoring locations shall be delineated on the site map and shall be identified (monumented) in the field by use of rebar, flagging or other method that will last throughout the period of enrollment for the Project. Photo-point locations shall be determined during Project inspections when Central Valley Water Board staff is present and/or as determined by the Discharger to illustrate compliance. If significant sediment discharges are detected during enrollment or monitoring, these locations shall be added to the Inspection Plan and be photo-point monitored for the remainder of the Project's enrollment.

Inspection Plans shall be maintained and updated as needed by the Discharger and/or agents thereof and shall be submitted to the Central Valley Water Board upon request.

II. MONITORING REQUIREMENTS BY CATEGORY

Projects enrolled under this Order are subject to monitoring requirements based on category of enrollment and threat to water quality. Monitoring requirements for each category are detailed below.

NON-FEDERAL PROJECTS (Categories 1 - 4)

Table 1. Monitoring and Reporting Requirements for Non-Federal Projects

Order Category	1	2B/3B	2A	3A	4
Inspection Plan		Prepare for Projects >100 acres - submit copy when requested			
Agency Monitoring	Yes, submit when a violation of the FPR is identified that relates to water quality protection measures				
Implementation Monitoring			Conduct by November 15[1]		
Forensic Monitoring			Conduct Twice Between November 16 and April 1[1, 2]	Conduct Once Between November 16 and April 1[1]	
Effectiveness Monitoring		Conduct Once Between April 2 and June 15[1]			
Summary of Operations / Annual Report			Submit by July 15		
Erosion Site Table and PFP[3] Update(s)			As Needed[4]		

[1]Photo-point monitoring required as determined by Central Valley Water Board staff on Project inspections and/or as self-determined by the Discharger to illustrate compliance AND for significant sediment discharges (Incident Report required, see Part IV.). Monitoring to be included in annual report due July 15 annually.

[2]*Once between Nov. 16 and Jan. 15 AND once between Jan. 16 and April 1 (see Part III.C.).*

[3]Post-Fire Management and Reforestation Plan (PFP), if applicable (see Attachment C).

[4]Timely amendments to be made throughout Project enrollment when conditions or management objectives have changed.

The monitoring requirements above that are in addition to those required by the FPRs, do not supersede or nullify the monitoring requirements required by the FPR

FEDERAL PROJECTS (Categories 5A and 5B)

Table 2. Monitoring and Reporting Requirements for Federal Projects

<table>
<tr><th>Order Category</th><th>5A (Post-Fire)</th><th>5B</th></tr>
<tr><td>Inspection Plan</td><td colspan="2">Prepare for Projects >100 acres - submit copy when requested[1]</td></tr>
<tr><td>Implementation Monitoring</td><td>Conduct by November 15[2]</td><td rowspan="3">Complete one of the following National Core BMP monitoring protocols in the Project area based on the highest threat to water quality from Project activities[2,4,5]
Road B. Completed Road or Waterbody Crossing Construction or Reconstruction;
Road C. Road Operation and Maintenance;
Veg. A. Ground-based Skidding and Harvesting;
Veg. B. Cable or Aerial Yarding;
Veg. C. Mechanical Site Treatments; or
WatUses C. Completed Reconstruction/Repair or Operation and Maintenance of Water Sources (Drafting)</td></tr>
<tr><td>Forensic Monitoring</td><td>Conduct Twice Between November 16 and April 1[2,3]</td></tr>
<tr><td>Effectiveness Monitoring</td><td>Conduct Once Between April 2 and June 15[2]</td></tr>
<tr><td>Summary of Operations / Annual Report</td><td colspan="2">Submit by August 15</td></tr>
<tr><td>Erosion Site Table and PFP[6] Update(s)</td><td>As Needed[7]</td><td></td></tr>
</table>

[1]For Category 5B, prepare only if electing to do traditional implementation, forensic, and effectiveness monitoring in the Project area in lieu of National Core BMP protocols (see footnote 5 below).

[2]Photo-point monitoring required as determined by Central Valley Water Board staff on Project inspections and/or as self-determined by the Discharger to illustrate compliance AND for significant sediment discharges (Incident Report required, see Part IV.). Monitoring to be included in Annual Report that is submitted August 15 annually.

[3]Once between Nov. 16 and Jan. 15 AND once between Jan. 16 and April 1 (see Part III.C.)

[4]One *additional* National Core BMP monitoring protocol is required when USFS cumulative watershed effects analysis indicates that the Project, combined with other USFS activities conducted in the watershed over the past 10 years, may cause any watershed or sub-watershed to exceed a threshold of concern as determined by various models (i.e. Equivalent Roaded Acres, Surface Erosion, Mass Wasting). The *National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide* is located at: http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf

[5]The Discharger may opt to conduct implementation, forensic, and effectiveness monitoring as detailed for Category 3A in lieu of conducting the National Core BMP monitoring protocols; the monitoring must occur in the Project area.

[6]Post-Fire Management and Reforestation Plan (PFP), if applicable (see Attachment C).

[7]Timely amendments to be made throughout Project enrollment when conditions or management objectives have changed.

III. MONITORING TYPES

A. AGENCY MONITORING

Non-federal Projects - Agency monitoring is monitoring (direct field observations) conducted by CAL FIRE to evaluate compliance with the Forest Practice Rules (FPR). The Discharger does not conduct agency monitoring, but should retain copies of all inspection reports from agency monitoring throughout the life of the Project as the reports may be requested by the Central Valley Water Board. The Discharger shall submit a copy of agency monitoring to the Central Valley Water Board when a violation of the FPR is identified that relates to water quality protection measures and the Discharger shall provide notification of such violation within 48 hours of discovery (see Part IV.).

B. IMPLEMENTATION MONITORING

Description	Implementation monitoring consists of detailed visual monitoring within the Project area of hillslope features (i.e. roads, landings, skid trails, watercourse crossings, watercourse protection zones, unstable areas) prior to a precipitation event that generates overland flow; with emphasis placed on determining if management measures (such as erosion control measures, drainage structures, watercourse protection zones) were implemented in accordance with the Project language, FPR, BMP guidance, Central Valley Water Board recommendations, and Order criteria and conditions. For Category 5B, selected National Core BMP monitoring protocols (see Part II, Table 2) will satisfy the Implementation, Forensic, and Effectiveness portions of the monitoring requirements of the Order if the monitoring was conducted *within* the Project area.		
Inspection Timeframe	Prior to a precipitation event that generates overland flow, but no later than November 15		
Inspection Schedule	**Status of Timberland Management Activities**		
	Not Active[1]	Active - No Winter Ops	Active - Winter Ops
Monitoring Required?	No	Yes	Yes
Monitoring Details	N/A	A pre-winter implementation inspection shall be completed **prior to a storm that generates overland flow, but no later than November 15 of each year** to assure that management measures are in place and secure prior to the winter period.	*1st Inspection* - A pre-winter implementation inspection shall be completed **prior to a storm that generates overland flow, but no later than November 15 of each year** to assure that management measures, for areas not subject to winter operations, are in place and secure prior to the winter period. *2nd Inspection* - An Implementation inspection shall be completed **immediately following cessation of winter period operations**, in areas where winter operations occurred, to assure management measures are in place and secure.

[1]Timberland management activities have not commenced on any portion of the Project.

Implementation Inspection – The inspection(s) shall be conducted by the Discharger and is intended to assure that management measures are properly installed; at a minimum, the inspection(s) should focus on the following Project areas:

- Culverts are clear of debris;
- Critical dips are installed and/or diversion potential is addressed at watercourse crossings;
- Fill slopes are adequately armored/stabilized;
- Road runoff is disconnected from watercourse crossings;
- Sufficient drainage facilities installed on roads and skid trails;
- Appropriate watercourse protection zones implemented;
    - Disturbed areas in the watercourse protection zones stabilized;
- Significant existing or potential erosion sites (SEPES) identified in the Project and/or as indicated in an *Erosion Site Table* for Category 2A or 5A;
- Non-standard (in-lieu) practice areas;
    - Landings/skid trails/roads in watercourse protection zones drained/disconnected and/or stabilized;
- Road rocking near watercourses and crossings done to specifications in enrolled Project;
- Temporary and tractor watercourse crossings disconnected and fills excavated to natural grade and orientation;
- Drafting pads and approaches drained and stabilized;
    - Artificial impoundment barriers removed/diversions turned off (if no winter operations);
- Timberland management activities that have the potential to affect unstable areas upslope of watercourses;
- Photo-point monitoring locations (as determined by Central Valley Water Board staff during Project inspections and/or as self-determined by the Discharger to illustrate compliance).

Note: Additional implementation inspections do not need to be conducted for *completed* Project areas where a *full round* of monitoring inspections (implementation, forensic, and effectiveness) have been completed without the occurrence of reportable incidents OR the implementation of new management measures. Project areas that are *newly* active must have an implementation inspection conducted.

C. FORENSIC MONITORING

<table>
<tr><td>Description</td><td colspan="3">Forensic monitoring consists of visual field detection techniques during the winter period within the Project area to determine the condition of installed management measures and to identify threatened or actual significant sediment discharges caused by: failed management measures, failure to implement appropriate management measures, legacy timber activities, non-timber harvesting related land disturbances, and natural sediment sources. The goal of winter forensic monitoring is to locate potential or actual sources of sediment in a timely manner so that rapid corrective action may be taken where feasible and appropriate. If forensic monitoring detects a significant sediment discharge, the Discharger is required to submit photo-point monitoring and an Incident Report (see Part IV.) to the Central Valley Water Board.

For Category 5B, selected National Core BMP monitoring protocols (see Part II, Table 2) will satisfy the Implementation, Forensic, and Effectiveness portion of the monitoring requirements of the Order when the monitoring was conducted within the Project area.</td></tr>
<tr><td>Inspection Timeframe</td><td colspan="3">Category 2A and 5A- Once between November 16 and January 15, <u>AND</u>
Once between January 16 and April 1

Category 3A and 4 - Once between November 16 and April 1</td></tr>
<tr><td rowspan="2">Inspection Schedule</td><td colspan="3">Status of Timberland Management Activities</td></tr>
<tr><td>Not Active[1]</td><td>Active - No Winter Ops</td><td>Active - Winter Ops</td></tr>
<tr><td>Monitoring Required?</td><td>No</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Inspection Details and Guidance</td><td colspan="3">The forensic monitoring inspection(s) shall occur after saturated soil conditions have been reached and within 48 hours* after a storm that produces overland flow.

The following bulleted examples may be used as guidance to determine when appropriate conditions (saturated soils and overland flow) may exist for conducting forensic inspections, but are not a requirement for inspection(s) as climatic conditions vary widely over the Central Valley Region.

• Within 48 hours* following a 24-hour storm event of at least 2 inches (of rainfall) and after 5 inches (of total precipitation) has accumulated after November 15.

• Within 48 hours* following a 24-hour storm event of at least 2 inches (of rainfall) and after 15 inches (of total precipitation) has accumulated after November 15.

*Inspections that cannot be conducted during or within 48 hours of such a storm event (due to worker safety, access issues or other uncontrollable factors) shall be conducted as soon as possible thereafter.</td></tr>
<tr><td>Photo-Point Monitoring</td><td colspan="3">Forensic photo-point monitoring is required as follows:
• As determined by Central Valley Water Board staff during Project inspections and/or as self-determined by the Discharger to illustrate compliance; and
• When a significant sediment discharge (threatened or actual) is identified resulting from failed management measures, failure to implement management measures, legacy timber activities, non-timber harvesting related land disturbances, and natural sediment sources.</td></tr>
</table>

[1]Timberland management activities have not commenced on any portion of the Project.

Forensic Inspections - Inspections shall be conducted by the Discharger to identify threatened or actual significant sediment discharges such as failed management measures or natural sources (e.g. landslide). The inspection should focus on identifying evidence of erosion (e.g. rilling or gullying of road surfaces and road fills; watercourse crossings with evidence of downcutting, plugging, or overtopping; and increased levels of sediment/turbidity in watercourses). The inspections should focus on the following Project areas, including but not limited to:

- Constructed and reconstructed watercourse crossings;
- Existing undersized watercourse crossings;
- Watercourse protection zones where ground based equipment operations have occurred (e.g. tractor crossings, landing construction/reconstruction, watercourse crossing/road abandonment);
- Project areas of non-standard (in-lieu) practices that have the potential to impact water quality;
- Road segments that were unable to be hydrologically disconnected;
- SEPES identified in the Project and/or as indicated in an *Erosion Site Table* for Category 2A or 5A;
- Road construction or reconstruction within 500 feet of a watercourse;
- Areas rated as high or extreme erosion hazard that have the potential to impact water quality where ground-based equipment operated;
- Areas where ground-based equipment operated on slopes greater than 65% or slopes over 50% rated as high or extreme erosion hazard that have the potential to impact water quality;
- Timberland management activities that have the potential to affect unstable areas near watercourses;
- Photo-point monitoring locations.

D. EFFECTIVENESS MONITORING

<table>
<tr><td>Description</td><td colspan="3">Effectiveness monitoring is a visual evaluation following the winter period of management measures (e.g. erosion control structures) and infrastructure (e.g. roads and watercourse crossings) within the Project area. Effectiveness monitoring is intended to determine the effectiveness of implemented management measures in preventing significant sediment discharges to watercourses and in protecting water quality, and to identify any new sediment sources. If effectiveness monitoring detects a significant sediment discharge resulting from failed management measures or failure to implement management measures, the Discharger is required to submit photo-point monitoring and an Incident Report (see Part IV.) to the Central Valley Water Board.

For Category 5B, selected National Core BMP monitoring protocols (see Part II., Table 2) will satisfy the Implementation, Forensic, and Effectiveness portions of the monitoring requirements of the Order when the monitoring was conducted within the Project area.</td></tr>
<tr><td>Inspection Timeframe</td><td colspan="3">Between April 2 and June 15.</td></tr>
<tr><td rowspan="2">Inspection Schedule</td><td colspan="3">Status of Timberland Management Activities</td></tr>
<tr><td>Not Active[1]</td><td>Active – No Winter Ops</td><td>Active - Winter Ops</td></tr>
<tr><td>Monitoring Required?</td><td>No</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Inspection/ Monitoring Details</td><td colspan="3">The inspection shall be conducted by the Discharger to identify threatened or actual significant sediment discharges from failed management measures and/or failure to implement appropriate management measures. The inspection should evaluate the same Project areas bulleted under the Forensic Inspections Section on the previous page.</td></tr>
<tr><td>Photo-Point Monitoring</td><td colspan="3">Effectiveness photo-point monitoring is required as follows:
As determined by Central Valley Water Board staff during Project inspections and/or as self-determined by the Discharger to illustrate compliance; and
When a significant sediment discharge (threatened or actual) is detected from failed management measures or failure to implement management measures.</td></tr>
</table>

[1]Timberland management activities have not commenced on any portion of the Project.

Effectiveness Inspection – Evaluate the same Project areas bulleted under the *Forensic Inspections* Section on page 7 (see Part III.C.).

IV. INCIDENT REPORT

The Discharger shall notify Central Valley Water Board staff as soon as possible, but **no later than 48 hours after detection** of any of the following, including, but not limited to:

- Violation(s), threatened or actual, of any applicable water quality objective (i.e. for turbidity, sediment, temperature, dissolved oxygen, pesticides, etc.) caused by:
    - Failed management measures (e.g. watercourse crossing fill failure; watercourse diversion; major road, landing, or skid trail failure within or adjacent to a watercourse protection zone);
    - Failure to implement appropriate management measures;
    - Natural sediment sources (landslide/unstable areas);
    - Legacy timber activities (as assessed during Forensic Monitoring);
    - Non-timber harvesting related land disturbances (as assessed during Forensic Monitoring);
- Violation(s) of eligibility criteria or conditions specified in the Order.

Typically, Incident Reporting is a result of forensic or effectiveness monitoring, but can occur at any time during enrollment. After timely notification of an incident, the Discharger should discuss any implemented and planned corrective measures with Central Valley Water Board staff. Central Valley Water Board staff may require additional monitoring (inspections, photo-point, water column sampling, physical stream conditions, etc.) until corrective actions are completed and/or significant sediment discharges/threatened discharges have ceased.

Incident Report - A written report regarding aforementioned incidents(s) shall be submitted to the Central Valley Water Board by the Discharger **within 14 days** following detection and shall include all required information specified in this MRP, including the following:

- The date incident(s) was/were discovered;
- The name and title of person(s) discovering incident(s);
- The name and title of person(s) responsible for follow-up on the incident(s);
- A map indicating location of incident(s);
- Description of recent weather conditions prior to discovering the incident(s);
- Description of the nature and extent of incident(s) (including estimate(s) of sediment/fill volume discharged, if applicable);
- Color photos of site characterizing incident(s) (including impacted watercourse(s));
- Description of corrective management measures implemented to date;
- An implementation schedule for additional corrective actions;
- The signature and title of person preparing the report.

The Executive Officer may modify or rescind this MRP at any time or may issue site-specific and individually developed monitoring and reporting requirements to any Discharger for Projects that could affect the beneficial uses of waters of the state.

V. REPORTING REQUIREMENTS

A. Agency Reporting (Non-Federal Projects)
Dischargers are required to submit a copy of agency monitoring to the Central Valley Water Board when a violation of the FPR is identified that relates to water quality protection measures; the Discharger shall notify the Central Valley Water Board within 48 hours of discovery of such a violation.

B. Annual Reporting (Non-Federal and Federal Projects)
The Discharger shall submit an Annual Monitoring Report to the Executive Officer **by July 15** for Non-Federal Projects and **by August 15** for Federal Projects, for inspections conducted before, during, and after the previous winter period for every year a Project is enrolled in the Order after timberland management activities have commenced; activities that commence after the winter period (April1) shall have monitoring inspections included in the next calendar year annual report.

The Annual Monitoring Report shall include the following (as applicable) as described under Table 1 and Table 2 of this MRP:

Summary of Operations
- The name/number of the Project;
- A table, map, narrative, or combination thereof that includes the following:
    - Watercourse crossings and road segments that have been constructed, reconstructed, and abandoned/deactivated during the past year;
    - SEPES that have been addressed during the past year as identified in the Project and/or *Erosion Site Table*;
    - Units/areas harvested during the past year.

Implementation, Forensic, and Effectiveness Monitoring Inspection Reporting
- Name/number of the Project;
- Name/title of person submitting the report;
- Date of inspection;
- Inspector's name/title;
- Storm event date, precipitation amount, and rainfall station used (forensic only);
- Rainfall accumulation since November 15 (forensic only);
- Color photographs from photo-point monitoring with date/time/location clearly delineated (if applicable);
- Incident Report(s) Update – Include any pertinent updates and/or additional monitoring required by the Central Valley Water Board (if applicable).

- U.S. Forest Service Category 5B (Federal) - Submittal of selected National Core BMP monitoring protocols (see Part II., Table 2) will satisfy the Implementation, Forensic, and Effectiveness portions of the monitoring requirements of the Order when the monitoring was conducted *within* the Project area.

Non-Expiring Plans (NTMPs and WFMPs) (Non-Federal Projects)
- Dischargers that elect to remain continuously enrolled (i.e. not terminate coverage after each entry) under the Order for the duration of the Plan must (1) complete at minimum one full round of monitoring (implementation, forensic, and effectiveness) for each NTO/Harvest Notice area, and (2) be able to certify in a statement (see Part V.C. below) in the annual report that discharges

associated with timberland management activities have ceased for each NTO/Notice area prior to cessation of monitoring for that area.

C. Submission of Reports/Data

The Central Valley Water Board is transitioning to a paperless office; therefore, reports should be submitted in searchable Portable Document Format (PDF), Word, and/or Excel when feasible. Documents that are less than 50 MB should be emailed to the appropriate office:

Rancho Cordova Office: centralvalleysacramento@waterboards.ca.gov;
Redding Office: centralvalleyredding@waterboards.ca.gov;
Fresno Office: centralvalleyfresno@waterboards.ca.gov;

In the subject line of the email, include the program (Forest Activities Program), subject (e.g. annual report, incident report), county, and the name of the staff person that will receive the document (if known). Documents that are 50 MB or larger should be transferred to a disc or flash drive and mailed to the appropriate office. Staff may request that some documents be submitted in hard copy, particularly drawings or maps that require a large size to be readable, or in other electronic formats where evaluation of the data is required.

Monitoring forms (cover letter with certification statement, implementation, forensic, and effectiveness) are provided on the Central Valley Water Board Forest Activities Program website (http://www.waterboards.ca.gov/centralvalley/water_issues/timber_harvest/index.shtml) for Discharger use. If the Discharger elects to create their own monitoring form, it must include all the applicable information detailed under Part V. B. and Tables 1 and 2 or this MRP and include the following certification statement and the signature of the Discharger:

> *I am aware that monitoring and technical reports submitted pursuant to Water Code section 13267 are submitted under penalty of perjury, and I certify that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete.*

In addition, for *non-expiring* Plans that will remain *continuously* enrolled and for which the Discharger intends to cease monitoring in a NTO/Notice Area, the Discharger must include the following statement in the annual report:

> *I certify that all discharges associated with timberland management activities for this NTO/Notice area are and will continue to be in conformance with all applicable Basin Plan requirements and hereby notify the board that no further monitoring is planned for the subject NTO/Notice area.*

The Discharger shall submit all required monitoring reports to the respective Central Valley Water Board office in accordance with the reporting requirements specified in this Order.

The Discharger shall also report monitoring data and results, in a timely manner, for all water quality related monitoring conducted <u>independent</u> of the requirements of this Order.

VI. POTENTIAL ADDITIONAL MONITORING REQUIREMENTS

Pursuant to California Water Code section 13267, the Executive Officer has the authority to issue site-specific and individually developed monitoring and reporting requirements to any Discharger whose activities could affect the beneficial uses of waters of the state.

Additional monitoring requirements may include, but are not limited to:

- Water column sampling (typically for sediment);
- Physical stream condition assessment for:
  - Gravel Embeddedness – Degree gravel is embedded with sand or finer sediments;
  - Pool Sedimentation – Degree of sediment depositions in pools;
  - Stream Channel Aggradation – Degree that stream channel has been raised by sedimentation;
  - Streambank Cutting, Mass Wasting and Stream Downcutting;
  - Stream-Side Vegetation;
- Streamflow data (current, historical, peak flows);
- Bioassessment.

ATTACHMENT C

POST-FIRE MANAGEMENT AND REFORESTATION PLAN GUIDANCE AND TECHNICAL STANDARDS FOR CATEGORIES 2A AND 5A

ORDER NO. R5-2017-0061

Waste Discharge Requirements General Order R5-2017-0061 (hereinafter referred to as Order) requires Dischargers who intend to apply pesticides associated with timberland management and reforestation activities related to fire salvage to develop comply with management measures as described in Part III.C.3.b.ii (Category 2A) and Part III. F.3.c.ii (Category 5A) of the Order OR to prepare a Post-Fire Management and Reforestation Plan (PFP) to help mitigate erosion, sediment delivery, and discharges of waste that could affect waters of the state.

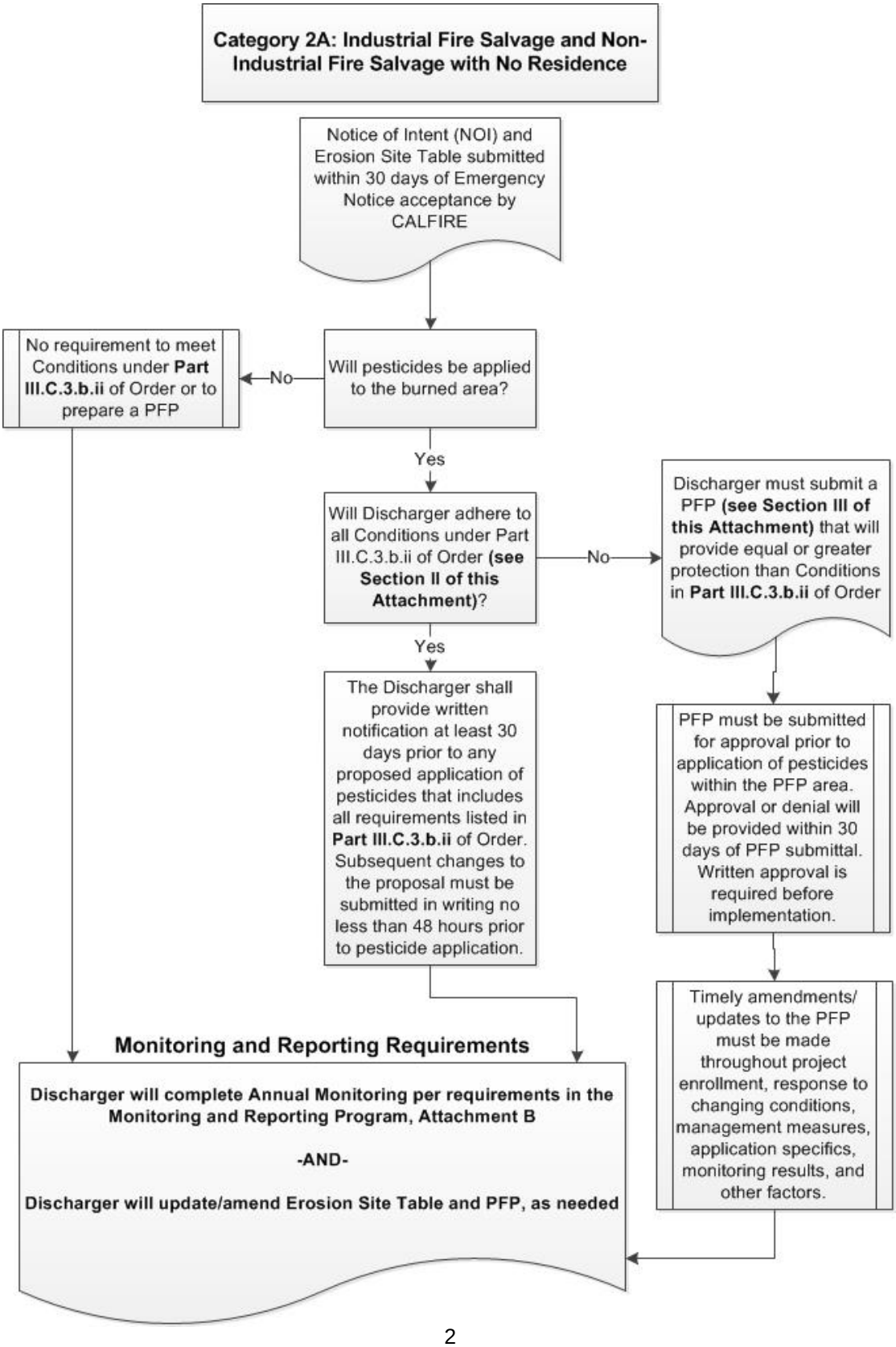
The purpose of Attachment C is to serve as a guidance document to help Dischargers understand the requirements of Categories 2A and 5A and to give a detailed explanation of the technical standard requirements. Attachment C is organized into three Sections as follows: 1) Flow Charts for Category 2A and 5A that guide the Discharger through a series of questions about pesticide application and the subsequent required steps for document submittal and reporting; 2) Pesticide Buffer and Effective Ground Cover Requirements, which provides detailed information on pesticide buffers and photographic examples of 50% ground cover; and 3) Contents of a PFP.

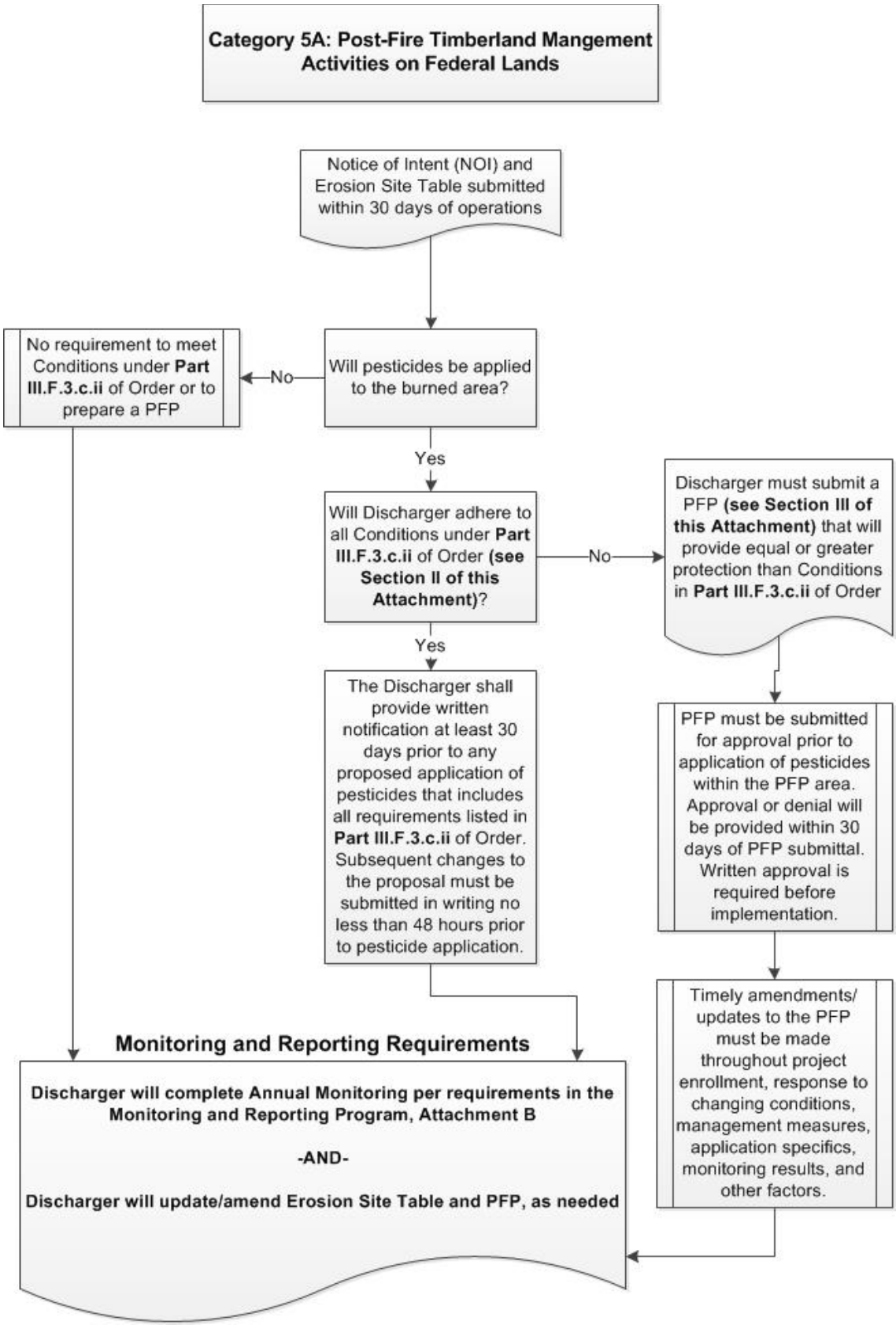
A PFP is required for all pesticide applications for: 1) for Emergency Notices enrolled in Category 2A where the Discharger elects to not meet the specific watercourse buffers or ground cover requirements as stated in Part III.C.3.b.ii of the Order; and 2) for Projects enrolled in Category 5A where the Discharger elects to not meet the specific watercourse buffers or ground cover requirements as stated in Part III.F.3.c.ii of the Order. The purpose of the PFP is to allow the Discharger flexibility in applying specific management practices across the fire salvage area that consider all aspects of the timing of the fire salvage, site-preparation, and other management objectives associated with reforestation; provide for site specificity in terms of topography, soils, climate, hydrology, and burn severity; and consider all sources of potential negative water quality impacts from those activities (i.e. sediment and pesticides).

A PFP must contain, at a minimum, all of the elements listed under “Contents of a PFP” (Section III of this Attachment); the portions of the PFP that are related directly to pesticide applications must be prepared by, or under the reasonable charge of, a Registered Professional Forester, Pest Control Advisor, and/or other qualified professional. **The Discharger shall submit the PFP to the Central Valley Regional Water Quality Control Board for approval prior to application of pesticides within the post-fire management and reforestation plan area; approval or denial of the PFP shall be provided to the Discharger within 30 days of PFP submittal**. Additionally, **the PFP must be updated/amended** in response to changing conditions, management measures, and application specifics; addition of fire salvage areas (i.e. Emergency Notices or Projects) or application areas; monitoring results; and other factors throughout Project enrollment.

For Category 5A pesticide applications on fire salvaged federal lands, if a Project has been prepared under the National Environmental Policy Act (NEPA) for reforestation activities, the NEPA document(s) may be submitted in-lieu of the PFP if it includes all required information detailed under “Contents of a PFP. If the NEPA document(s) does not cover all elements of the “Contents of a PFP”, then the U.S. Forest Service may submit supplemental information along with the NEPA document(s).

I. Flow Charts for Category 2A and 5A




Category 5A: Post-Fire Timberland Mangement Activities on Federal Lands
Notice of Intent (NOI) and Erosion Site Table submitted within 30 days of operations
Will pesticides be applied to the burned area?
No
No requirement to meet Conditions under Part III.F.3.c.ii of Order or to prepare a PFP
Yes
Will Discharger adhere to all Conditions under Part III.F.3.c.ii of Order (see Section II of this Attachment)?
No
Discharger must submit a PFP (see Section III of this Attachment) that will provide equal or greater protection than Conditions in Part III.F.3.c.ii of Order
Yes
The Discharger shall provide written notification at least 30 days prior to any proposed application of pesticides that includes all requirements listed in Part III.F.3.c.ii of Order. Subsequent changes to the proposal must be submitted in writing no less than 48 hours prior to pesticide application.
PFP must be submitted for approval prior to application of pesticides within the PFP area. Approval or denial will be provided within 30 days of PFP submittal. Written approval is required before implementation.
Timely amendments/ updates to the PFP must be made throughout project enrollment, response to changing conditions, management measures, application specifics, monitoring results, and other factors.
Monitoring and Reporting Requirements
Discharger will complete Annual Monitoring per requirements in the Monitoring and Reporting Program, Attachment B
-AND-
Discharger will update/amend Erosion Site Table and PFP, as needed

II. Pesticide Buffer and Effective Ground Cover Requirements

For Category 2A Fire Salvage Projects, all industrial and non-industrial with no residence (see Part III.C.1. criteria in the Order), where pesticides will be applied, the Discharger shall submit a PFP or meet the conditions in Part III.C.3.b.ii of the Order, which are *abbreviated* below:

- The Discharger must **comply with the following pesticide no-spray buffers** (unless more stringent buffers are dictated by application labels/guidance, statute, or regulation):
    - For Class I and II watercourses, the applicable WLPZ widths specified in the California Code of Regulations, title 14, section 936.5; http://calfire.ca.gov/resource_mgt/resource_mgt_forestpractice
    - For Class III and IV watercourses, a minimum of 25 feet where sideslope steepness is less than 30%, and a minimum of 50 feet where sideslope steepness is 30% or greater.
- Where management activities are planned on a burned area with **slopes greater than 30%, a minimum of 50% average effective groundcover is required to be documented prior to pesticide application**. Documentation shall be provided to the Central Valley Water Board in the pesticide notification **30 days prior to application**.
- The Discharger shall **notify** the Central Valley Water Board **in writing at least 30 days prior to any proposed application of pesticides**.

For Category 5A Post-Fire Projects (see Part III.F.1. criteria in the Order), where pesticides will be applied, the Discharger shall submit a PFP or meet the conditions in Part III.F.3.c.ii of the Order, which are *abbreviated* below:

- The Discharger must **comply with the following pesticide no-spray buffers** (unless more stringent buffers are dictated by application labels/guidance, statute, or regulation):
    a) Perennial or intermittent watercourses which have: (1) surface domestic water use from and/or within 100 feet downstream of operations area and/or (2) fish always or seasonally present onsite, includes habitat to sustain fish migration and spawning, shall utilize the appropriate **Class I WLPZ width(s)** specified in the California Code of Regulations, title 14, section 936.5. http://calfire.ca.gov/resource_mgt/resource_mgt_forestpractice

    b) Perennial or intermittent watercourses which have: (1) fish always or seasonally present off-site within 1000 feet downstream (excludes intermittent or ephemeral watercourses with no aquatic life that are tributary to watercourses described under (a) above) and/or (2) aquatic habitat for nonfish aquatic species (aquatic insects and/or other physical habitat indicators such as riparian and aquatic vegetation, watercourse debris, and potential for small pool formation), shall utilize the appropriate **Class II WLPZ width(s)** specified in the California Code of Regulations, title 14, section 936.5. http://calfire.ca.gov/resource_mgt/resource_mgt_forestpractice

    c) Ephemeral or intermittent watercourses with no aquatic life present, watercourse shows evidence of being capable of sediment transport to watercourses described under (a) and

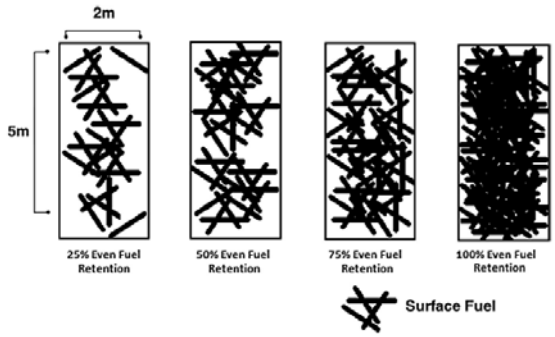
(b) above, shall utilize a minimum of **25 feet** where sideslope steepness is **less than 30%,** and a minimum of **50 feet** where sideslope steepness is **30% or greater**.

- Where management activities are planned on a burned area with **slopes greater than 30%, a minimum of 50% average effective groundcover is required to be documented prior to pesticide application**. Documentation shall be provided to the Central Valley Water Board in the pesticide notification **30 days prior to application**.

- The Discharger shall **notify** the Central Valley Water Board **in writing at least 30 days prior to any proposed application of pesticides**.

- The Discharger shall adhere to the resource protection measures in the Chemical Use Management Activities as designated in the National Best Management Practices for Water Quality Management on National Forest System Lands (USDA April 2012).

"Effective Ground Cover", as defined in Attachment A, means any combination of slash (lopped and in close contact with the ground), mulch (large wood chips, wood shreds, wood strand blends, straw, bark, surface rock fragments larger than ¾ inch), plants, and plant litter. Large wood chips are a minimum of 2 inches in length and at least four (4) times longer than they are wide.



Fifty-percent ground cover documentation shall use standard methods including aerial photography analysis, point intercept, plot, or transect methods, or any combination thereof.

The Discharger shall provide documentation of ground cover sampling methodology, locations of any ground-based sampling points, and any ground-based verification points or plots for aerial photo estimates. The figure to the left, borrowed from Harrison et. al 2016, is a schematic that illustrates even distribution of 25, 50, 75, and 100% ground cover. Additionally, the photo in the bottom left corner, borrowed from the Natural Resource Conservation Service at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/technical/ecoscience/agronomy/, provides a useful image of 50% ground cover.

For post-fire salvage activities, ground cover shall be estimated down to 20 acres if such a scale will change the estimated effective ground cover percentage of individual areas, and down to 10 acres for areas that either have been determined to have high or extreme EHR, or have experienced high to severe burn severity as a result of wildfire. Burn severity determination will be made based on available soil burn severity maps or through field determinations made by the RPF or qualified professional.

III. Contents of a Post-Fire Management and Reforestation Plan

The PFP shall include the following to demonstrate that the Discharger can mitigate, to the maximum extent feasible, any controllable and management related sources of sediment and pesticides that may impact waters of the state, and that proposed management measures and operations will provide equal to or better protection than the conditions under Part III.C.3.b.ii. or Part III.F.3.c.ii of the Order, Category 2A and Category 5A, respectively.

A. A list of Emergency Notices/Projects enrolled under the Order that will adhere to the PFP.

B. A list of any "other areas" in the burn area that will adhere to the PFP (if they are not included in an Emergency Notice or Project area), such as old plantations that burned over and will receive pesticide applications but did not have timber salvaged. For these "other areas", include a map that shows the location(s) by Township, Section, Range and the associated acreage.

C. Evaluation of Receiving Waters and Beneficial Uses

   a. Within and downstream of the Emergency Notice/Project area(s) and "other areas":

      i. List the beneficial uses for surface water bodies and downstream receiving waters as identified in the appropriate Basin Plan;
      ii. List any 303(d) listing(s);
      iii. Identify and describe other critical habitat and aquatic resources (e.g. salmonids, domestic water supply intakes, aquatic species (including listed species));

   b. Describe how the PFP will adequately protect/address the resources identified above.

D. Pesticide Application

   a. Describe the following:

      i. Pesticide Product(s) to be applied;
      ii. Application method(s);
      iii. Schedule for application (dates);
      iv. Location(s) of application (Emergency Notice number and/or Township/Section/Range);

      **Changes to any of the above (D.a.i-iv.) must be submitted in writing no less than 48 hours prior to pesticide application.

   b. An evaluation of how pesticide applications could impact: identified significant and existing potential erosion sites and/or unstable areas/swales/erosional features that could contribute sediment to downstream crossings and watercourses.

   c. Explain why site conditions are favorable for the proposed land management activities (e.g. EHR, burn severity, slopes, annual rainfall).

   d. Describe pesticide mitigation measures recommended by the PCA, RPF, or other qualified professional that will be employed.

E. Land Management Practices

a. Describe any management practices/ mitigation measures that will be utilized to mitigate soil erosion (e.g. slash packing, mulching, contour ripping, waterbar spacing, percent groundcover, falling logs on contour, watercourse buffers, vegetative buffer strips, leave trees, etc.). The description/maps shall indicate the location(s) where specified management practices will be applied.

F. Monitoring

a. If additional monitoring is proposed or required to evaluate management measures related to the PFP, include the following;

i. Type of monitoring proposed (i.e., visual, photo point, water column sampling, etc.);
ii. Location of monitoring;
iii. Frequency and schedule;
iv. Evaluation of monitoring results;
v. Report submittal.

ATTACHMENT D
INFORMATION SHEET IN SUPPORT OF

GENERAL ORDER OF WASTE DISCHARGE REQUIREMENTS FOR TIMBERLAND MANAGEMENT ACTIVITIES ON NON-FEDERAL AND FEDERAL LANDS IN THE CENTRAL VALLEY REGION FOR ORDER NO. R5-2017-0061

This Information Sheet sets forth the background, rationale and references used in the development of certain requirements for Waste Discharge Requirements related to Timberland Management Activities on Non-Federal and Federal Lands, Order No. R5-2017-0061 (hereinafter "Order") within the Central Valley Region. Specifically, the information included herein elaborates on findings in the General Order related to water quality impacts and timberland management activities in the post-fire environment, an evaluation of Significant Existing or Potential Erosion Sites (SEPES), and monitoring and reporting costs associated with Order compliance. The content of this Information Sheet includes: the best available scientific research and information in the area of fire ecology, erosion, forest hydrology and water quality impacts from pesticide[1] use in the post-fire environment; field observations by Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff; clarification on the evaluation of SEPES; and a summary of the existing rules and policies that are currently in place in California that regulate post-fire salvage logging and subsequent post-fire management activities.

WATER QUALITY IMPACTS AND TIMBER HARVEST OPERATIONS IN THE POST-FIRE ENVIRONMENT

In the western United States historic forest management and fire suppression, in conjunction with a changing climate, have led to uncharacteristically large, severe wildfires (Flannigan et al. 2000, Littell et al. 2009, Westerling et al. 2006, Westerling and Bryant 2008). As a result of this general decline in active fuels management on both federal and non-federal lands, exacerbated by nearly a century of intense fire suppression, increased frequency and intensity of stand-replacing fire is occurring throughout the western United States. The remaining forests of central and northern California that have not recently burned at high severity have high fuel loads and are experiencing extended periods of above average seasonal temperatures. These factors are leading to both extended fire seasons as a result of drier fuel conditions, and increased incident of extreme fire behavior with stand-replacing wildfires. Climatology models and information gathered by leading fire ecologists predict that the future wildfire regime in California will result in increased spatial size, distribution, and occurrence of severe wildfires (Fried et al. 2004, Miller et al. 2009, Westerling and Bryant 2008, Westerling et al. 2011).

Fire is a natural disturbance that directly influences California ecosystems and ecological processes, plant species, animals, and entire watershed ecosystems in California that have evolved to be both tolerant and dependent on fire as a landscape scale physical disturbance. However, as fire regimes in California shift, so has the intensity of the physical disturbance caused by wildfire. Increases in wildfire frequency, magnitude, and severity due to climate change within the western United States may lead to detrimental sediment-related water quality issues within

[1] For the purposes of this Information Sheet and Order (Attachment A) "pesticide" means (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these material that threaten beneficial uses. This definition excludes aquatic pesticide discharges covered under Order No. 2013-0002-DWQ.

burned mountainous watersheds (Gould et al. 2016). There must be recognition that post-fire land use activities have the potential to exacerbate fire effects, and land owners, land managers, and resource agencies have a responsibility to understand what those potential impacts are and where there is opportunity to minimize those impacts through both adaptive management and strategic regulatory measures.

Water Quality Impacts Following Fire

Following severe wildfire in forested landscapes, increased soil water repellency and other changes to soil properties can reduce infiltration rates and increase the rate and frequency of runoff (Martin and Moody 2001, Robichaud 2000, Robichaud et al. 2016). Additionally, the loss of ground cover following severe wildfires is a dominant factor for increased soil erosion rates (Benavides-Solorio and MacDonald 2001, Delwiche 2009, Larsen et al. 2009, Robichaud et al. 2016). Increased soil erosion rates and sediment delivery to downstream channel networks can pose a significant threat to aquatic resources and beneficial uses, particularly after extensive high severity wildfires (Helvey 1980, Moody et al. 2013, Bladon et al. 2014, Chappel 2014).

Soil erosion at its most basic form involves the detachment, breakdown, transport, and deposition of sediment, which in the context of post-wildfire effects, is dependent on multiple factors, including: fire severity, watershed area, topography, geology, vegetation, and precipitation intensity. The greatest erosion events typically occur before vegetation regrowth and recovery and often coincide with episodic, short-duration, high intensity rain storms immediately after severe wildfire (Moody and Martin 2001). Accelerated erosion, potential hydrophobic soils, reduced water infiltration rates, overland runoff, and mass soil hillslope failures can also produce catastrophic debris flows in some environments (Doerr et al. 2009) which pose a direct threat to water quality, beneficial uses, and human health and safety (Cannon et al. 2010). Accelerated soil loss also affects site class and future tree growth.

On uncompacted, unburned hillslopes and areas with intact overstory canopy and ground cover, overland flow usually occurs only during very intense and short duration storm events. In high severity post-fire environments, where soil properties have been altered and effective ground cover is not present, significantly higher rates of runoff can be expected (e.g., Wagenbrenner et al. 2017). Compared to lower severity fires, high severity fires consume a higher proportion of the vegetation, forest litter, and other organic matter that provide effective ground cover. Reduced ground cover exposes more of the soil to precipitation and often increases erosion by several orders of magnitude. In studies conducted in the Sierra Nevada, rates of post-fire surface erosion have been reported to be 2-239 times greater than pre-burn rates (Ahlgren and Ahlgren 1960). The amount of erosion and sedimentation depends on severity of the fire and post fire storm events (number and intensity), especially the first two winters. The progressive decline in post-fire sediment yields over time is largely controlled by the regeneration of surface cover, primarily vegetation (MacDonald and Larsen 2009, Benavides-Solorio et al. 2001, Larsen et al. 2009). With the return of vegetative growth and stabilization of easily mobilized soil material, hillslope erosion rates generally attenuate with time after the wildfire and return to background rates within 2-3 years (Heede et al. 1988, Wohlgemuth et al. 1998) under natural conditions.

Only limited post-fire sediment monitoring has been undertaken in the Sierra Nevada and Cascade Ranges. Usually erosion and sediment data are not collected following a wildfire. Data collected to date show widely varying impacts, with very high hillslope erosion rates usually requiring one or more major hydrologic event the first two winters. In general, post-wildfire erosion is highly variable

and difficult to predict. The risk of elevated sediment yields generally is greatest the first few years after the fire until vegetation is reestablished (Wagenbrenner 2017).

As an extreme example of post fire erosion, the 2012 Bagley Fire (46,011 acres) in Shasta County produced an estimated total hillslope erosion of 5.23 million tons (114 tons per acre) during the first year post-fire. Two intense storms occurred a few months after the fire, with estimated return intervals of 25-50 years. Soil loss was estimated at 0.2 to 2.2 inches on virtually all hillslopes (USFS 2014). Measured sediment delivered to Squaw Creek during the first year post-fire resulted in sustained turbidity and significantly higher water temperatures, exceeding 70 degrees Fahrenheit; a temperature that can be lethal to cold water fish. Sediment produced during the first year post-fire and during subsequent years continue to be transported downstream to Lake Shasta, leading to reduced storage capacity and increased nutrient loads.

Other post-fire monitoring efforts in interior California have documented lower sediment yields at the plot or small catchment scales. These include the 2012 Ponderosa Fire - 15.5 t/ac (James 2014); 1999 Pendola Fire - 5 t/ac (MacDonald et al. 2004); 2007 Angora Fire - 0.01 t/ac (Wade and Kocker 2012), 1987 Stanislaus Complex - 20-50 t/ac (J. Frazier and A. Janicki, Stanislaus National Forest, pers. communication, cited in the California Fire Plan, BOF 1995); 1987 Hayfork District - Shasta Trinity National Forest Complex Fires - 10-40 cubic yds/ac (Miles et al. 1989); and the 2001 Star Fire - 1.2 t/ac, second winter (Chase 2004).

Following wildfire, sediment discharge can lead to changes in turbidity, temperature and stream chemistry. These changes may degrade water quality (i.e., taste, odor, color) and impair drinking-water treatment processes, along with negatively impacting aquatic life. Increases in sediment and turbidity can affect aquatic ecosystems by clogging streambed interstitial voids with fine sediments, reducing stream depth, increasing channel instability, altering stream temperatures, impairing fish feeding, and destabilizing stream channels (Goode et al. 2012). The growth and survival of aquatic plants, invertebrates, and fish are negatively affected by increases in sediment and turbidity (Wagner et al. 2014).

Wildfires such as the 2012 Bagley Fire can liberate accumulated metals, such as arsenic, aluminum, cadmium, iron, lead, and mercury. These metals have a strong affinity for ash and fine sediment, which are subsequently discharged to stream systems via elevated runoff and erosion (Bladon et al. 2014). Mercury's potential to bioaccumulate and biomagnify can result in health problems for consumers of fish. There are several streams, lakes, and reservoirs—including Lake Shasta—in the Central Valley Water Board region that are currently listed as 303(d) impaired by various metals, including mercury. Many of these waterbodies are located in watersheds subject to increased risk of large, severe wildfires.

Nutrients such as nitrogen and phosphorous are often mobilized by fire, which results in increased loading to streams (Bixby et al. 2015). In addition, significant increases in specific conductance and turbidity, along with corresponding decreases in dissolved oxygen are documented (Sherson et al. 2015). Nutrients can contribute to and exacerbate Cyanobacteria (blue-green algae) blooms, such as those experienced during the summer of 2015 throughout much of the Central Valley Water Board region, including Lake Shasta.

Timber Harvesting Policies and Regulations in California

Non-Federal Lands

Timber harvesting on non-federal lands in California is regulated by the Board of Forestry and Fire Protection (BOF) in accordance with the Forest Practice Act (FPA) through implementation of the California Forest Practice Rules (FPRs); a set of regulations that lay out administrative procedures and prescriptive best management practices to protect natural resources. Pursuant to the FPA and through the FPRs, the California Department for Forestry and Fire Protection (CAL FIRE), acting as the lead agency, the applicable Regional Water Board, California Department of Fish and Wildlife (CDFW), and California Geological Survey are responsible agencies for the review of timber harvesting plans (THPs) (Cal. Code of Regs., tit. 14, § 896). As a member of this interdisciplinary Review Team for green tree THPs, the Central Valley Water Board staff reviews proposed THPs, and has the opportunity to participate in pre-harvest inspections, and may provide input and recommendations on water quality-specific components to ensure water quality protection prior to CAL FIRE approval.

This multi-disciplinary review process for green tree THPs is considered to be functionally equivalent to the Environmental Impact Report (EIR) process under California Environmental Quality Act (CEQA) (*see* Cal. Code of Regs., tit. 14, § 896). The average THP consists of more than 120 pages of information related to the site, current conditions, proposed operations, cumulative impacts assessment, operational considerations, and proposed mitigations to address potential impacts to a variety of natural resources supported by forestlands.

Following wildfire, many large industrial forest landowners engage in salvage logging, whereby burned, damaged, and commercially valuable timber is removed through conventional timber harvesting techniques. Generally, the value of the commercial timber burned in a fire degrades within 1-2 years post-fire, resulting in harvesting operations that focus on removing burned timber quickly to recover as much economic value as possible. The FPA and FPRs allow for the rapid removal of trees from areas damaged by fires where such removal meets the definition of an emergency:

> *…those conditions that will cause appreciable financial loss to the timber owner that may be minimized by immediate harvesting of timber"* (Pub. Res. Code § 4592; *see also* Cal. Code of Regs., tit.14, § 895.1).

The Emergency Notice process requires minimal documentation (generally approximately 3 pages including a map) and does not provide opportunity for the interdisciplinary Review Team to address potential impacts to resources from post-fire salvage operations. As a non-discretionary action taken by CAL FIRE, timber operations associated with Emergency Notices can commence five working days after submittal without first preparing a THP, and are not subject to the interdisciplinary Review Team process or public review/comment. In fact, due to the accelerated timeline for Emergency Notices, it is generally only after a timber/timberland owner has submitted the Emergency Notice to CAL FIRE and then submitted an application for coverage under the Central Valley Water Board's current Waiver of Waste Discharge Requirements (Order No. R5-2014-0144) that staff becomes aware post-fire salvage operations have commenced and receive limited information about the location and timing of those operations.

Non-federal timber/timberland owners are required to retain a Registered Professional Forester (RPF) to prepare and submit an Emergency Notice. Timber operations conducted pursuant to a CAL FIRE-accepted Emergency Notice must comply with the rules and regulations of the BOF and

specifically with all operational provisions of the FPRs applicable to plans. The timber/timberland owner has one year to complete timber harvesting under the Emergency Notice from the date of CAL FIRE receipt, unless a discretionary THP is subsequently approved allowing for continued operations in the area.

There are also other differences between an Emergency Notice for post-fire salvage and a typical "green tree" THP. While there are no upper (or lower) limits for the total acreage allowed under a THP, individual even aged harvest unit size in a "green tree" THP is limited to 20 acres for tractor logging and 30 acres for cable/aerial logging with additional controls on the filing of contiguous harvesting plans. Post-fire salvage operations have no upper or lower limits for the total acreage harvested, as long as all operations can be concluded within the one-year time period. Therefore, harvest units under an Emergency Notice can be as large as the timber/timberland owner can operationally accommodate, effectively resulting in the potential for clear-cutting of multiple contiguous square miles (thousands of acres). In burned landscapes, large salvage logged units that exceed hundreds of acres in size can exacerbate runoff and erosion rates through removal of standing dead timber and timber that is damaged by the fire. Increased erosion and runoff can occur due to road and skid trail construction and use, and possible reduction in overstory canopy and removal of biomass that if left unharvested would provide ground cover (i.e., needle cast, tree limbs, and eventually snags and whole trees) to dissipate rainfall energy and concentrated flow along the hillslopes. Often, however, salvage logging increases short-term ground cover due to the logging slash and tree tops left on site (Poff 1989).

Another fundamental difference between an Emergency Notice for post-fire salvage and a typical "green tree" THP applies to the Watercourse and Lake Protection Zone (WLPZ)—also known as riparian buffer zones. WLPZ requirements apply to both standard green tree THPs as well as Emergency Notice operations; however, trees within the WLPZ that have fallen, or are damaged, dead, or dying can be removed under an Emergency Notice, regardless of the standard tree retention or restocking requirements of the FPRs for green tree THPs. This can result in the complete removal of all large timber from within these streamside zones during salvage logging operations, unless the watershed requires additional protection measures for anadromous salmonids.

In 2009, after the 2008 June lightning fire siege that occurred across the state, a proposal to extend Emergency Notices from 120 to 365 days was proposed by the timber industry to the BOF. The proposal included modification of California Code of Regulations, title14, section 1052(e) language that:

> *…intended to lengthen the effective period of an Emergency Notice such that preparation and approval of a succeeding THP may be assured prior to expiration of an Emergency Notice.*

At the time, Central Valley Regional Water Board staff argued that if the BOF's intent was to ensure harvesting operations in the post-fire environment would be started under an Emergency Notice and then analyzed with the THP Review Team process, then the rule language would need to clearly require a THP be submitted prior to the expiration of the applicable Emergency Notice.

In response to questions about possible significant adverse environmental effects, the BOF found that:

> *…[this] proposed regulation would not result in significant adverse environmental effects. The existing Forest Practice Rules for Emergency Notices and Timber Harvesting Plans already provide for comprehensive assessment and mitigation of potential adverse effects. This proposed regulation does not alter these existing provisions.*

Additional response was provided by Central Valley Water Board staff:

> *While Regional Water Board staff agrees that the FPRs provide for assessment and mitigation of potential adverse effects through the THP process, the information required in a THP is significantly more complex than that required by the Emergency Notice. It is inaccurate to state that the FPRs provide for a comprehensive assessment and mitigation of potential adverse effects through the Emergency Notice process. While there is a list of operational limitations that must be complied with for Emergency Notices in the FPRs, there are numerous concerns that are not addressed. And in fact, an argument could be made that allowing operations on lands that have been burned (and thus been made more sensitive than those normally reviewed under the THP process) through a non-discretionary process is not an environmentally responsible or defensible position.*
>
> *If a burned area has unmaintained legacy roads and [watercourse] crossings that are undersized, the Emergency Notice allows for those roads to be used and does not require assessment and mitigation of any erosion problems from those roads and crossings.* [Central Valley] *Water Board staff acknowledges that there may not be a simple answer for the problem this rule is trying to address, but a simple extension of the time limits is only addressing a small portion of the problem.*
>
> *The FPRs provide minimum operational standards, and those requirements are frequently supplemented with additional mitigations to address potential impacts to the resources through the interdisciplinary review team process* [for THPs]. *Due to the nature of the Emergency Notice process those same minimum operational standards* [additional mitigations] *provided in the FPRs are not applied. If Emergency Notices are allowed to proceed for 365 days, the likelihood of a succeeding THP ever being submitted and those additional environmental mitigation measures being developed declines dramatically.*
>
> *There must be acknowledgement that fire is a natural process by which waters of the state (as well as other resources) are impacted, but it is critical to accept that it is our responsibility to ensure that the impacts from the fire are not further aggravated by anthropogenic activities.*

Since the lightning fire siege that occurred throughout the state in 2008, Central Valley Water Board Forest Activities Program staff has focused more effort on these post-fire salvage operations and have not observed THPs being prepared to continue salvage operations subsequent to the first year of harvesting conducted under Emergency Notices (on non-federal lands). Instead, staff has observed multiple Emergency Notices being submitted for 1-3 years after the fire.

Over the last several years CAL FIRE has processed, on average, approximately 175 Emergency Notices covering roughly 45,000 acres annually. This number is heavily dependent on annual fire season activity, but it provides a general idea of the recent scope of the issue.

During this time, Central Valley Water Board staff has observed extensive soil erosion and sediment discharge to receiving waters extending for several years following many large wildfire

events. These large fires include: the Bagley, Bully, Ponderosa, King, Chips, Moonlight, Valley, and Rim Fires. Post-fire salvage operations following these fires has resulted in direct impacts to water quality through accelerated erosion and sediment delivery from skid trails, roads, landings, and episodic events such as landslides and debris flows. Many of these sources of sediment discharge are largely attributed to and associated with post-fire salvage operations. Direct in-stream measurements of turbidity that exceeded Basin Plan objectives have been documented downstream of several fires (e.g., Ponderosa, Bagley, and Bully Fires). There are data to suggest that changes in turbidity in streams draining the 2012 Ponderosa Fire were caused by the fire, salvage harvesting, and associated road use (Lewis 2014). In addition, dozens of herbicide (pesticide) detections have been recorded in the post-fire environment that will be discussed in later sections of this document.

There is recognition among Central Valley Water Board staff that identifying cause and effect between post-fire salvage operations and water quality impacts is challenging. Non-point source water quality pollution can be complex and evaluating sediment discharge from post-fire salvage operations against natural or background delivery rates to watercourses is no different. However, the Central Valley Water Board has a responsibility and mandate under the Clean Water Act, California Water Code, Basin Plan, and Non-Point Source policy to identify potential non-point source discharges to waters of the state and address those discharges through prohibitions; or Waste Discharge Requirements (WDRs); conditional waivers of WDRs; or until a determination has been made that the threat of discharge and impact to water quality no longer exists.

Federal Lands

As the largest public land management agency in the Central Valley Region's forested zones, the U.S. Forest Service (USFS) experiences large catastrophic wildland fires, predominantly along the west slope of the Sierra Nevada and southern Cascade Ranges on National Forest System lands (NFS).

Immediately following a fire on federal lands, there is a rapid assessment by a Burned Area Emergency Resource (BAER) team staffed by specially trained professionals for fires greater than 300 acres, generally including hydrologists, soil scientists, engineers, biologists, vegetation specialists, archeologists, GIS specialists, and others, who rapidly evaluate the burned area and prescribe emergency stabilization treatments for Forest Service lands. The BAER program is designed to address these emergency situations through its key goals of protecting values at risk (VARs), including life, property, and critical natural and cultural resources. Water quality and aquatic habitat are not specifically included in the list of VARs evaluated through the BAER process. In most cases, only a small portion of the burned area is treated based on the outcome of the BAER process, due to the high cost of effective treatments (e.g., mulching; hydro-mulching). Some of the information that is gathered during these assessments, however, can be utilized for development of future project proposals and in support of environmental documents for those projects.

The percent of federal lands salvage logged is much lower than that which occurs on private industrial timberland in California. Post-fire salvage logging on federal lands seldom occurs in the first year of the fire due to the time involved in preparing environmental documents in conformance with the National Environmental Policy Act (NEPA). Depending on the scope of proposed actions and the level of impact on the environment, the USFS may choose to prepare a Categorical Exclusion (CE), Environmental Assessment (EA), or Environmental Impact Statement (EIS). In general, the USFS will only utilize a CE for very small proposed post-fire salvage operations or roadside hazard tree removal through areas that have experienced wildfire. The preparation of this

document and final decision can be relatively fast and a final decision can be made within a few months. The scope of an EA is generally broader and incorporates multiple resource objectives (e.g., reduce public safety hazard along NFS roads, recover economic value of fire-killed trees, reduce fuel loading, implement reforestation, and manage road infrastructure). These documents take longer to develop utilizing a multi-disciplinary team of specialists, and there is a much more involved public scoping process which can often lead to delays and litigation. The most robust NEPA document is the EIS. These documents can be very broad in scope and include evaluation of a multitude of resource objectives and goals. Preparation of these documents can be lengthy and if post-fire salvage operations are a component of the proposed actions, it is often unlikely that the decision approving the NEPA document will be prepared before the fire-killed commercial species of trees have lost all economic value.

There is a growing trend within the federal agency to prepare larger environmental documents (i.e., EA and EIS) in an effort to conduct multi-phased and longer term watershed-scale projects with multiple resource goals and objectives. There are many reasons why the USFS pursues this type of approach to their land management; however, a consequence of this approach is that post-fire salvage projects can take much longer to receive approval, and as a result, the trees quickly lose economic value before they can be harvested. This can lead to the timber sale/salvage component of these projects being removed from the project or Timber Sales are not purchased by private contractors and the trees are left unharvested. Either way, standing dead and dying trees are often left behind on the landscape. Reforestation efforts are greatly compromised, leading to reduced long term carbon storage in California forestlands (CARB 2017). Despite broad agreement on reforesting lands burned, lack of funding and staff have made reforestation very difficult.

The Central Valley Water Board's review process for post-fire salvage projects on federal lands is significantly different compared to non-federal projects. Following a wildfire on NFS lands, Central Valley Water Board staff review the Schedule of Proposed Actions (SOPA) list for each National Forest to see what projects and associated environmental documents will be proposed. Staff review and respond to the proposed action during the regular public scoping period. Once a USFS decision has been made on the NEPA document, the USFS submits a NOI for the proposed project, and Central Valley Water Board staff review the submitted project documents, enrolling the project under the appropriate permit category. Staff often conducts inspections of the post-fire salvage operations and provides recommendations for additional erosion mitigations where necessary to protect water quality. However, unlike the THP process for non-federal lands, it is sometimes difficult to incorporate substantial recommendations (e.g., new or reconstructed watercourse crossings or significant modification to road shape and drainage) without modifying the original environmental documents (i.e., CE, EA, or EIS). These documents are often written in very general, non-prescriptive terms that make evaluations for potential water quality impacts prior to commencement of project activities challenging. The lack of site specificity in the project documents provided by the USFS has been an on-going issue for Central Valley Water Board staff, not only for post-fire salvage projects, but for all non-point source projects enrolled under Water Board permits.

Post-Fire Timber Harvest

Numerous studies have been conducted on post-fire erosion response to logging (Ice and Beschta 1999). Some studies indicate that there are potential benefits to logging after wildfire—increasing ground cover through logging slash, removing sources of high intensity water droplets from standing dead trees, reduction of fuel loading and risk of high intensity fires, and by breaking up

hydrophobic soil layers (Poff 1989, James 2014). The application of these ground-based treatments, however, are often limited to slopes that are less than 35 percent where erosion rates are generally lower due to lower erosive energy and runoff velocity. Conversely, there is documentation from other studies reporting that salvage logging increases the risk of sedimentation and that specific best management practices are needed to mitigate the hydrologic impacts of post-fire logging (Beschta et al. 1995, Peterson et al. 2009, Wagenbrenner et al. 2015, Wagenbrenner et al. 2016b, Lewis 2014).

At the small catchment scale, impacts of salvage logging on sediment yields are variable. One recent study has shown a net decrease in sediment yields after salvage logging and subsequent herbicide (pesticide) applications (James 2014), two studies have shown no detectable change in sediment yields because of salvage logging (Wagenbrenner et al. 2015)—Hayman and Kraft Springs Fires; Olsen, 2016), and one study has documented an increase in sediment yields because of salvage logging (Wagenbrenner et al. 2015—Red Eagle Fire) (Wagenbrenner 2017).

Non-Federal Lands

Large non-federal industrial landowners generally remove all the trees within an Emergency Notice harvest unit, including those only partially burned or scorched. This can result in post-fire harvest units which have no size limitations and are almost completely devoid of trees. Based on the fact that burned areas produce additional stormwater runoff and sediment, both the existing road network and any new logging road construction should be designed, utilized for heavy equipment and log hauling, and maintained to minimize delivery of sediment to streams. Post-fire logging generally requires the installation and use of numerous skid trails, used when heavy equipment transports the cut logs within the logging unit to a landing, where the tree is then processed and loaded onto log trucks for transport to the mill. As with new logging road construction, post-fire skid trails present a heightened potential for erosion and sediment transport. With the urgency to remove burned trees and maximize the economic value of the rapidly degrading wood product, there are usually compressed timelines within which to evaluate, design, and implement logging operations, including road construction, before the first winter period following the fire. Central Valley Water Board staff has observed that standard coefficients and input values (e.g., runoff coefficients, time of concentration calculations, headwater/depth ratios for culverts, etc.) used in technical guidance documents for design of stream crossing structures (as noted in Cafferata et al. 2004) may be inadequate in the post-fire environment.

Federal Lands

Unlike non-federal landowners, USFS salvage operations remove only a fraction of the burned trees and generally leave most partially burned and scorched trees for wildlife values and possible recovery. This limited and selective harvesting, by its very nature, may provide immediate ground cover in the form of needle cast, as well as dead trees, green trees (foliage), and some logging slash.

Riparian buffers mandated by various USFS BMPs, regulations and policies, are wider than those required of non-federal landowners in the FPRs, providing extra protection for aquatic resources and water quality.

Post-Fire Pesticide Use

Non-Federal Lands

While post-fire salvage operations conducted under an Emergency Notice are not required to restock (i.e., replant conifers), most non-federal industrial timberland owners in California choose to

reforest their lands. Replanting conifers is frequently accompanied by pesticide applications to ensure seedling survival and establish conifer plantations as quickly as possible (DiTornaso et al. 1997, Webster and Fredrickson 2005, Zhang et al. 2008). In some cases, pre-emergent pesticides are applied in the late fall or early spring immediately after the fire to prevent competing vegetation from germinating. In other cases, post-emergent pesticides are used to kill newly sprouting vegetation before and/or after planting new conifers. There are two common methods in which pesticides are applied within the forested landscape to facilitate regeneration of conifer seedlings: spot applications, where an applicator uses a hand-sprayer to apply pesticides in a small circle around an individual conifer seedling; and aerial applications, where pesticides are sprayed from an aircraft over larger areas. In many cases, especially with the size and extent of recent spatially extensive wildfires, applications of pesticides by non-federal landowners are accomplished via aerial spraying (e.g., helicopters).

Pre-emergents [pesticides] are very effective at preventing new ground cover establishment for several years in the post-fire landscape, which reduces competition for nutrients, light, and water, increasing the success rate of conifer seedling survival (Webster and Fredrickson 2005). From a reforestation perspective, the use of pre-emergents [pesticides] achieves the objective of reducing competition between recently established commercial tree species seedlings and non-desirable species such as hardwoods, brush, and grasses. This practice, however, can come at a cost by delaying natural recovery of the burned landscape and the establishment of effective ground cover to reduce surface erosion (DiTornaso et al. 1997).

Very little information is available regarding the impacts of post-fire management on runoff and erosion (Wagenbrenner 2017). Most post fire research has focused attention on the physical effects of ground-based salvage logging on runoff and erosion, while little attention has focused on post-logging vegetation management. It is currently unknown whether post-fire vegetation management using pesticide treatments has a larger effect on post-fire hydrogeomorphic processes than salvage logging due to alterations in post-fire recovery processes (i.e., revegetation and associated ground cover increases). Clearly there are trade-offs associated with limited pesticide application (e.g., poorer seedling survival, slower establishment of tree cover).

Numerous studies have shown that the percent of ground cover is the primary and dominant control of erosion and sediment yield in the post-fire environment (Benavides-Solorio and Macdonald 2001, Benavides-Solorio et al. 2005, Goldman et al. 1986, Larsen et al. 2009, Lavee et al. 1995, Robichaud et al. 2010, Wagenbrenner et al. 2015, Slesak et al. 2015, Delwiche 2009).

Federal Lands

The USFS typically utilizes pesticides on a very limited basis in post-fire environments. In most cases where pesticides are used on NFS lands, spot spraying is used to control invasive weeds and to help re-establish conifers. Unlike non-federal industrial landowners, these limited applications generally occur a year or more after the fire when vegetative recovery and ground cover has been significantly re-established, thereby, providing the cover necessary to reduce erosion and limit offsite movement of sediment.

For the pesticides commonly used by the USFS in its management activities, Human Health and Ecological Risk Assessments (HERAs) are prepared. In these documents, the process of risk assessment is used to quantitatively evaluate the probability that pesticide use might pose harm to humans or other species in the environment. When evaluating risks from the use of pesticides proposed in a NEPA planning document, the USFS has determined that reliance on the U.S. Environmental Protection Agency's (U.S. EPA) pesticide registration process as the sole

demonstration of safety is insufficient. The USFS and Bureau of Land Management (BLM) were involved in court cases in the early 1980's that specifically addressed this question (principally Save Our Ecosystems v. Clark, 747 F.2d 1240, 1248 (9th Circuit, 1984) and Southern Oregon Citizens v. Clark, 720 F. 2d 1475, 1480 (9th Cir. 1983)). These court decisions and others affirmed that although the USFS can use U.S. EPA toxicology data, it is still required to do an independent assessment of the safety of pesticides rather than relying on the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) registration alone. The Courts have also found that FIFRA does not require the same examination of impacts that the USFS is required to undertake under NEPA. Further, USFS assessments consider data collected from both published scientific literature and data submitted to U.S. EPA to support FIFRA product registration, whereas U.S. EPA utilizes the latter data only. The U.S. EPA also considers many forestry pesticides uses to be minor. Thus, the project-specific application rates, spectrum of target and non-target organisms, and specialized exposure scenarios evaluated by the USFS are frequently not evaluated by U.S. EPA in its generalized registration assessments.

Post-Fire Pesticide Application and Regulations

Post-fire applications of pesticides follow the same pesticide labeling rules as used in 'green tree' forestry pesticide applications (as shown on the individual pesticide label), regardless of the severity of the fire and the amount of vegetation cover removed by the fire or the risk of erosion.

All pesticide label requirements, including those related to aquatic buffers are initially approved by the U.S. EPA based on evaluation of pesticide registrant submitted data used to support proposed label uses. In order for pesticide products to be used in California, the Department of Pesticide Regulation (DPR) reviews all U.S. EPA pesticide label components. State specific modifications to address necessary additional restrictions may be incorporated in coordination with registrant and EPA. Each pesticide label has general use instructions with specific state requirements. A Pest Control Advisor (PCA) is a trained, licensed individual that provides site specific pesticide recommendations. Most commonly used forestry pesticides have no aquatic buffers listed on the label, as indicated in Table 1 below.

Table 1 – Pesticide aquatic buffer widths as provided in current labels*

Active Ingredient	Formulation Name	Aquatic Buffer (feet)	Label Toxicity Warnings	Additional Labeling
Aminopyralid	Milestone	0		
Clopyralid	Transline	0		
Glyphosate	Accord XRT II	0		
Hexazinone	Velpar L	0		
Imazapyr	Polaris	0		
	Arsenal	0		
	Chopper	0		
	Stalker	0		
	Rotary 2 SL	0		
Oxfluorfen	Pindar GT	25 ***Vegetated* buffer strip	*This product is toxic to aquatic invertebrates and wildlife*	*Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas*
	Cleantraxx	25 ***Vegetated* buffer strip	*This product is toxic to aquatic invertebrates and wildlife*	*Runoff from treated areas may be hazardous to aquatic organisms in*

Active Ingredient	Formulation Name	Aquatic Buffer (feet)	Label Toxicity Warnings	Additional Labeling
				neighboring areas.
Sulfometuron methyl	Oust XP	0		
Triclopyr	Garlon 4	0	*This pesticide is toxic to fish.*	*The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.*
	Element 4	0	*This pesticide is toxic to fish.*	*The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.*
	Forestry Garlon XRT	0	*This pesticide is toxic to fish.*	*The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.*
***** 2,4-D**	Weedone LV6 EC	0	*This pesticide is toxic to fish.*	*The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.*
	Weedone LV4	0	*This pesticide is toxic to fish.*	*The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.*

** This table provides a summary of current label requirements and is subject to change. The most up to date requirements for individual pesticides are listed on the label and should take precedent.*

*** Vegetated buffer: Note that in many wildfires with high burn severity there is no vegetation remaining to provide an aquatic buffer.*

**** 2,4-D is a Restricted Material: Restricted Materials are designated by DPR, based on hazards to public health, applicators, farm workers, domestic animals, honeybees, the environment, wildlife, or crops other than those being treated.*

Pesticide Application Monitoring (DPR/County Ag)

For non-restricted materials, licensed pesticide applicators are required to report pesticide use to the respective county agricultural commissioner (CAC) within seven days of the completion of the application. Restricted material pesticides (e.g., 2,4-D and strychnine) have to report to the CAC 24 hours in advance of application. Restricted Materials are designated by DPR, based on hazards to public health, applicators, farm workers, domestic animals, honeybees, the environment, wildlife, or crops other than those being treated. There is no evidence that any monitoring of forestry pesticide applications is conducted by CAC staff (Central Valley Water Board staff personal communication with CAC staff and RPFs, May 2016).

Post-Fire Pesticide Detections

Following the 2012 Ponderosa Fire in the Battle Creek watershed located in Shasta and Tehama counties, salvage operations were conducted throughout the watershed on non-federal lands. During 2013 and early 2014, approximately 12,000 pounds of Hexazinone (Active Ingredient – A.I.) 1395 pounds of Imazapyr, 115 pounds of Triclopyr, and 30 pounds of 2,4-D were applied in the Battle Creek watershed, most of it associated with post-fire conifer plantation establishment. . Through a contract agreement with the Central Valley Water Board, a water sampling and analysis pilot study was conducted by the California Department of Fish and Wildlife (CDFW) between November 2013 and March 2014. Hexazinone, 2, 4-D, Triclopyr, and Imazapyr were detected. Hexazinone was detected in all 26 samples. The primary purpose of the pilot study was to test the utility of the Continuous Low Level Aquatic Monitoring (CLAM) collection devices for detecting pesticides downstream of forestry operations. This study did not quantify concentrations of specific chemicals; however, pesticide chemicals were present and detectable. While detections were indicated, significant issues with regard to the equipment reliability of the CLAM sampling devices, testing protocols, and verification standards indicate that further study is needed. Until further study can be conducted, the General Order establishes specific requirements in Parts III.C.3.b.ii. and III.F.3.c.ii. to provide reasonable protection measures to address potential threat to water quality from pesticides in forestry application.

Post-Fire Mitigations for Protecting Water Quality

The previous sections have summarized the naturally occurring and anthropogenic sources of accelerated erosion and sediment delivery that can occur following a major wildfire, including: the mechanics of increased runoff rates, hydrophobicity, surface soil erosion, and the inability of burned landscapes to buffer increased erosion. In unmanaged landscapes where no salvage logging operations will occur, these processes will occur naturally and play a vital role in ecosystem dynamics and landscape scale erosional processes. In managed landscapes where salvage logging will occur, BMPs and mitigations are needed to reduce management-related sediment sources to watercourses within the burned area. The most widely used and most cost-effective management measures and BMPs used to mitigate erosion and sediment delivery are erosion barrier treatments, mulch treatments, chemical soil surface treatments, and natural reestablishment of vegetative cover.

Erosion barrier treatments are designed to slow runoff, and trap and store eroded sediment. Common post-fire hillslope erosion barriers include contour-felled logs, straw wattles, contour trenches or ‘contour ripping’ (hand or machine dug), and straw bales (Napper 2006). Erosion barriers, and contour-felled logs in particular, may reduce runoff and sediment yields for low intensity rain events, but they are unlikely to have a significant effect for high intensity rain events and can concentrate flow, creating erosion if implemented incorrectly (Robichaud et al. 2010). Contour ripping has been used by some landowners and land managers as cost-effective erosion mitigation in post-fire environments (James 2014). Contour ripping can be implemented generally on slopes 35% or less, where erosion is lower than on steeper slopes, and is not restricted by natural barriers, such as rocky terrain. The contours created by this practice must be deep enough to penetrate the hydrophobic layer created by high intensity fire and be constructed “on-contour”, perpendicular to slope, to reduce flow pathways and concentration of runoff that could result in rilling and gullying. A study conducted by a large industrial landowner in the Ponderosa Fire footprint indicates that contour ripping reduces post-fire surface erosion (James 2014).

Mulch treatments can be an effective post-fire mitigation for reducing surface erosion and involves the spread of material over the exposed soil surface to protect it from rain drop impact, overland flow, and erosion. Mulching is a quick way to immediately increase ground cover in areas that are at high risk of erosion and can be an effective post-fire mitigation. Mulches include wet mulches, such as hydromulches, which are mixed with water and sprayed over the soil surface. Dry mulches include straw, wood chips, wood shreds, and wood strands. Large wood chippers and masticators have proven to be very effective at generating wood chips and wood sheds using on-site fuels and logging slash. A limiting factor with dry mulches is that they are generally applied only on slopes from 20 to 60 percent, or where chippers can broadcast chipped materials on to the hillslope. "Straw bombing" or heli-mulching is another technique that has been utilized most frequently on federal post-fire landscapes by dropping cut hay bales from helicopters. This method can be effective, however, the operational cost of helicopters to "bomb" the hillside is often cost prohibitive (usually over $1500 per acre), and can result in less than two percent of the landscape being successfully treated.

Tackifiers—also known as soil binding agents—are another form of erosion treatment that is applied directly to the soil surface, forming a thin web of polymer designed to hold soil particles together. The soil binder polyacrylamide (PAM), a soil particle flocculant, is designed to connect small particles, thus increasing their size and mass. PAM is the only soil binder that has been used as a post-fire hillslope stabilization treatment. Post-fire treatment effectiveness studies that include PAM have generally been inconclusive or have shown no treatment effect.

For landscape-scale fires, many of the mitigations mentioned above are costly, with varying degrees of effectiveness (Robichaud et al. 2010, Wagenbrenner et al. 2006). The natural re-establishment of ground cover has shown to be the most feasible and cost-effective method to reduce erosion and sediment production (MacDonald and Larsen 2009, Benavides-Solorio et al. 2001). For many non-federal industrial timberland owners, however, allowing burned forestlands to regenerate naturally is not a viable economic option for maximizing commercial tree species production. For these landowners, herbicide (pesticide) use has been proven to be an effective measure for delaying the re-establishment of natural vegetative cover and increasing the rate of survival for replanted conifer seedlings. As discussed in previous sections of this document, the application of pesticides in the post-fire environment can have both a direct and indirect effect on rates of soil erosion, and the potential discharge of residual chemicals directly into surface waters.

Ground cover and riparian buffers can reduce pesticide discharge into streams by providing dissipation, filtration, chemical sequestration, and chemical degradation/biodegradation (Wenger 1999, Larson et al. 1997). Ground cover has been shown through numerous studies to be effective at reducing erosion and sediment transport. Research consistently indicates that 50% ground cover functions as the threshold where erosion and sediment production is significantly reduced (Benavides-Solorio et al. 2005, Foltz and Wagenbrenner 2010, Golman et al. 1986, Harrison et al. 2016, MacDonald and Robichaud 2008, Prats et al. 2012, Robichaud et al. 2012, Wagenbrenner et al. 2006, Yanosek et al. 2006).

Riparian buffers are shown to protect water quality, habitat, and biota in *non-burned* landscapes (Sweeney and Newbold 2014, Wenger 1999, U. S. Army Corps of Engineers 1991). Unburned or stream buffers burned with low severity are critical to protect water quality and other beneficial uses in post-fire environments because of the increased sediment production due to runoff after wildfires. Appropriate sized stream buffers (generally ≥30 meters or 100 feet) have been shown to mitigate stream impacts from *green tree* logging activities, while small buffers (≤10 meters) do not significantly protect a stream from logging impacts (Davies and Nelson 1994). Areas with high

resource value—such as wetlands and fish bearings streams—benefit from buffers that are a minimum of 15 meters, or approximately 50 feet (Castelle et al. 1994).
Studies on herbicide fate and transport show that average buffer widths of 38 m and 50 m, in restored and managed riparian forests respectively, reduced herbicide concentrations to at or below detection limits (Lowrance et al. 1997, Vellidis et al. 2002). A review of pesticide buffers found that cases of high pesticide concentrations only occurred when no buffer was used and that generally, bufferstrips of 15 m or larger are effective in minimizing pesticide contamination in streams (Neary et al. 1993).

This General Order requires the implementation of buffers based upon the information provided above. While slightly larger than research indicates necessary, required buffers are the same as those required in the FPRs to address large variations in soil, topography, resource sensitivity, etc. This General Order also allows the discharger to propose an optional plan (Attachment C) should they wish to test out emerging or alternate methods, technology, or pesticide use within the buffer(s) or on the slopes above.

Development of effective post-fire mitigations and BMPs to reduce impacts from erosion and sediment delivery to streams is an area of research and development that is being explored by many leading fire scientists, soil scientists, watershed scientists, foresters, and many state and federal resource agencies throughout the western U.S., including California. In an effort to provide more site-specific research into the effects of post-fire salvage logging in California, and to support an adaptive management framework where new science and research is used to support or promulgate existing and new rules and regulations, the Central Valley Water Board is funding a study through the AB 1492 Timber Regulation and Forest Restoration Fund (TRFRF) on Boggs Mountain Demonstration Forest (BMDSF), managed by CAL FIRE. BMDSF burned in 2015 during the Valley Fire and has provided a valuable opportunity to explore the effects of post-fire management on water quality by assessing the responses of runoff and sediment to logging and reforestation activities, and to demonstrate effective logging BMPs to landowners and land managers that are well suited for post-fire landscapes to mitigate potential water quality impacts. The project has three primary purposes: (1) to quantify the effects of post-fire salvage logging and common post-salvage site preparation techniques including mechanical and herbicide (pesticide)-assisted reforestation on soil properties controlling runoff, hillslope erosion rates, and vegetative recovery; (2) to understand processes occurring at small-catchment scales so that small-plot results can be extrapolated to sizes of specific interest to land managers and watershed stakeholders; and (3) to develop and demonstrate alternative BMPs used to reduce runoff and erosion from post-fire salvage logging. This study is currently underway and is expected to be completed by 2019. Initial study results are presented in Wagenbrenner et al. (2016a) and Olsen (2016).

Evaluation of Significant Existing or Potential Erosion Sites (SEPES)

The BOF, through a lengthy stakeholder process, developed and adopted a section in the FPRs referred to as the Road Rules, 2013, Rule Package. This rule package was intended to clarify, streamline and organize all of the FPRs where roads were included. The development process resulted in some additions as well, including the new definition of “Significant Existing or Potential Erosion Site (SEPES)” (Cal. Code of Regs., title 14, § 895.1) based upon a need to address such sites for water quality protection. The FPRs now include the following definition:

> “*Significant Existing or Potential Erosion Site means a location where soil is currently, or there are visible physical conditions to indicate soil erosion may be in the future, discharged*

> *to watercourses or lakes in quantities that violate Water Quality Requirements or result in significant individual or cumulative adverse impacts to the beneficial uses of water."*

The Road Rules, 2013, Rule Package became effective on January 1, 2015. Central Valley Water Board staff has been reviewing and commenting on the application of this definition for the past two years through the THP process and noting inconsistent interpretations. In Attachment A of the Order, an expanded definition has been provided that embeds the definition of Water Quality Requirements (also provided California Code of Regulations, title 14, section 895.1):

> *"Significant Existing or Potential Erosion Sites (SEPES)" means a location where soil erosion is currently, or there are visible physical conditions to indicate soil erosion may be in the future, discharged to watercourses or lakes in quantities that violate a water quality objective (narrative or numeric), prohibition, Total Maximum Daily Load (TMDL) implementation plan, policy, or other requirement contained in a water quality control plan adopted by the Central Valley Water Board and approved by the State Water Central Valley Water Board, or a location where soil erosion may result in significant individual or cumulative adverse impacts to the beneficial uses of water"* (emphasis added).

The intent in combining the two definitions in Attachment A of the Order is to emphasize that level of significance relative to existing and potential erosion sites is ultimately determined by, and is the responsibility of the Central Valley Water Board, who have a legal mandate and the authority to determine the significance of any discharge to waters of the state, and to ensure permitted discharges are in conformance with the appropriate Basin Plan, permit, policy, or other requirement (see Finding 18 of the Order).

Indicators of SEPES on the Existing Road Network

As noted in California Code of Regulations, title 14, Technical Rule Addendum No. 5: Guidance on Hydrologic Disconnection, Road Drainage, Minimization of Diversion Potential, and High Risk Crossings (1st Edition), section B, indicators of SEPES with the existing road drainage systems include:

- *Evidence of direct sediment entry into a watercourse or a flood prone area from road surfaces or drainage structures and facilities (e.g., ponded sediment, sediment deposits, delivery of turbid runoff from drainage structures during rainfall events).*
- *Ditch scour or downcutting resulting from excessively long undrained ditches with infrequent ditch drain (relief) culverts or other outlet structures or facilities. This condition can also result from design inadequacies (e.g., spacing not altered for steep ditch gradient), inadequate erosion prevention practices (e.g., lack of armoring), or ditches located in areas of erodible soils.*
- *Gullies or other evidence of erosion on road surfaces or below the outlets of road drainage facilities or structures, including ditch drain (relief) culverts, with transport or a high likelihood of transport to a watercourse.*

Additionally, if a road and/or ditch runoff is hydrologically connected to a watercourse, the following factors elevate the risk of sediment delivery to a watercourse:

- *Existing or high potential for cutbank sloughing or erosion into inside ditches.*
- *Native-surfaced road exhibiting erosion.*
- *Native-surfaced road composed of erodible soil types (e.g., granitic soils).*

- *Rilled, gullied, or rutted road approaches to crossings.*
- *Existing ditch drain (relief) culverts or other road drainage structures with significant plugging from sediment and/or small woody debris.*
- *Existing ditch drain (relief) culverts or other road drainage structures with decreased capacity due to damage or impairment (e.g., crushed or bent inlets, flattened dips due to road grading).*
- *Decreased structural integrity of ditch drain (relief) culverts, waterbreaks, or other road drainage structures (e.g., excessive culvert corrosion, breached waterbreaks, or rutted road segments).*

Under the FPRs, a standard 'green tree' THP must include an analysis of all SEPES and a schedule for addressing such sites within the project area as a part of the CEQA EIR equivalent process. However, post-fire salvage operations conducted under an Emergency Notice are exempt from the requirement to disclose and address SEPES. Previous sections of this Information Sheet have described the concerns that Central Valley Water Board staff have with salvage logging operations conducted under an Emergency Notice, and to address these concerns, the Order contains requirements for SEPES disclosure as a condition for enrollment of post-fire salvage operations.

SEPES in the Post-Fire Environment

For post-fire salvage areas (Category 2A and 5A), and areas not salvage logged but proposed for reforestation with pesticide applications, the Discharger shall evaluate SEPES considering the factors listed below that elevate the risk of sediment delivery to watercourses. The intent of this expanded SEPES evaluation is to identify existing or the potential for upslope erosional features (e.g., landslides, debris flows, significant gully networks, channel initiation and other mass wasting features) within the burned/logged area that have the potential to significantly influence the downslope road network. Documentation of hillslope level SEPES is only required where there is, or there is the potential for, an interaction of that feature with the below road network that will result in significant erosion and sediment delivery to a watercourse.

- Increased runoff and associated sediment/debris in high/moderate burn severity areas originating at mid to upper, convergent slope within the fire salvage area; or in areas outside the salvage area that contribute increased runoff to watercourse crossings and drainage structures within the fire salvage area or to appurtenant roads.
- Rilling and gullying along existing or proposed skid trails and water bars within the fire salvage area that have potential for sediment delivery to a watercourse;
- Existing watercourse crossings, particularly those with a structure (i.e. culvert, bridge), that are now undersized and at an elevated risk of failure due to any of the bulleted items listed above.

How Information is Used in the General Order

This Information Sheet sets forth the background and rationale used in the development of certain requirements in Order No. R5-2017-0061. Many of these requirements are new and represent significant changes between Order No. R5-2014-0144 (Timber "Waiver") and Order R5-2017-0061, specifically creation of Category 2A and Category 5A for post-fire salvage operations on non-federal and federal lands, respectively. The following requirements and the rationale for these requirements will be summarized in this section: 50% Effective Ground Cover and Minimum

Watercourse Pesticide Buffers (Parts III.C.3.b.ii. and III.F.3.c.ii. of the General Order); Table 1. Erosion Site Table for Significant Existing or Potential Erosion Sites (SEPES) and New Watercourse Crossings (Category 2A and 5A NOI); and the Post-Fire Management and Reforestation Plan (Attachment C).

50% Effective Ground Cover

Based on thorough research and review of dozens of peer reviewed studies, technical guidance documents, and handbooks on post-fire effects, and the mechanisms that are driving both increased rates of erosion and sediment delivery on managed and un-managed post-fire landscapes, the rationale for selecting 50% effective ground cover as a requirement for Category 2A and 5A in the Order (see Parts III.C.3.b.ii. and III.F.3.c.ii.) is based four primary factors:

- The dominant factor for controlling soil erosion rates post-fire is ground cover;
- Fifty-percent effective ground cover is the value most often referred to the reviewed literature (e.g., U.S. Forest Service 2012, Benavides-Solorio et al. 2001, 2005, Berg and Azuma 2010, Doerr et al. 2009, Goldman et al. 1986, Harrison et al. 2016, Hyde et al. 2007, 2014, and 2015, Johansen et al. 2001, Stubblefield et al. 2016);
- Fifty-percent effective ground cover is a value that is most easily assessed and verified from visual estimations; and
- Ground cover is shown to be the most feasible and cost-effective method to reduce erosion and sediment production.

Watercourse Pesticide Buffers

The rationale behind the requirement for standard watercourse riparian buffers (see Parts III.C.3.b.ii. and III.F.3.c.ii. of the Order) in Category 2A and 5A in the Order is based on four primary factors:

- Extensive literature review indicates that ground cover and aquatic buffers can reduce pesticide discharge into streams by providing dissipation, filtration, chemical sequestration, chemical degradation/biodegradation (Brosofske et al. 1997, Reeves et al. 2006, Davies and Nelson 1994, Sweeney and Newbold 2014, Richardson et al. 2012, Wenger 1999, ACOE 1991, MacDonald 2011, Lindenmayer and Noss 2006, Minshall 2003);
- Studies on herbicide fate and transport show that average buffer widths of 38 m and 50 m, in restored and managed riparian forests respectiviely, reduced herbicide concentrations to at or below detection limits (Lowrance et al. 1997, Vellidis et al. 2002).
- A review of pesticide buffers found that cases of high pesticide concentrations only occurred when no buffer was used and that generally, bufferstrips of 15 m or larger are effective in minimizing pesticide contamination in streams (Neary et al. 1993).
- Buffers widths for pesticide applied in the post-fire landscape are limited or non-existent (see Table 1);
- Post-fire pesticide sampling by CDFW in 2014 indicates that label instructions and applications were ineffective at preventing discharge of specific chemicals (Hexazinone, 2, 4-D, Triclopyr, and Imazapyr) to surface waters; and
- The buffer requirements that are in the Order (see Parts III.C.3.b.ii. and III.F.3.c.ii.) are existing buffer widths for WLPZs as specified in California Code of Regulations, title 14, section 936.5 for ‘green tree’ timber harvesting activities, have been proven to be effective at reducing transport of waste to surface waters, and are widths that are familiar to RPFs. For federal projects, these same buffer widths are specified around perennial, intermittent, and ephemeral streams.

Erosion Site Table for Significant Existing or Potential Erosion Sites (SEPES) and New Watercourse Crossings

The rationale behind the requirement to disclose road and crossing-related SEPES within project areas enrolling in Category 2A and 5A NOI is based on five primary factors:

- Decades of research in post-fire hydrologic response and erosional processes indicate that roads and associated watercourse crossings are particularly susceptible to accelerated rates of erosion due to increased runoff rates and transport of associated sediment and debris;
- SEPES and new/reconstructed watercourse crossings in the post-fire environmental necessitate additional evaluation and review, as normal input values for calculating stream flow to determine the appropriate size and capacity of stream crossing structures (e.g., culverts) may need modification (Cafferata et al. 2017);
- Emergency Notices pursuant to California Code of Regulations, title 14, §§ 1052.1 et seq., for fire salvage do not provide adequate information to properly assess whether a project has SEPES and whether those sites will be mitigated to a level that is less than significant (for enrollment in Category 2A);
- Following wildfires on federal lands, values at risk assessed through BAER teams do not directly consider or prioritize water quality and aquatic habitat for immediate resource protection; and
- Requirement of an Erosion Site Table for Category 2A and 5A allows for better treatment prioritization and implementation tracking.

Post-fire Management and Reforestation Plan (PFP)

The rationale behind the Order requirement for Category 2A and 5A to provide a PFP (Attachment C) in-lieu of complying with the watercourse buffers and ground cover standards, is based on four primary factors:

- A PFP provides the Discharger flexibility in applying specific management practices across the fire salvage area that consider all aspects of the timing of the fire salvage, site-preparation, and other activities associated with reforestation; provides for site specificity in terms of topography, soils, climate, hydrology, and soil burn severity; and consider all sources of potential negative water quality impacts from those activities (i.e., sediment and pesticide applications);
- Allows the Discharger the option to address multiple Emergency Notice areas (non-federal), and fire salvage areas (federal projects), under one comprehensive post-fire plan;
- Provides the Discharger the option and flexibility in applying post-fire management practices and mitigations other than those identified in Parts III.C.3.b.ii. and III.F.3.c.ii. of the Order, including experimental practices; and
- Ensures an appropriate monitoring plan will be developed for a PFP.

COST OF MONITORING FOR NON-FEDERAL PROJECTS

Water Code section 13267(b)(1) states that "the burden, including costs, of these [required monitoring and] reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." Based upon information provided by timber industry representatives, staff estimates an annual cost of required visual monitoring and reporting, depending on project type and enrollment category, to range from $100 to $2,800 per enrolled project once operations have been initiated. Table 2 provides an estimate for a 'green-tree' THP on non-federal lands with a maximum operational lifespan of 7 years enrolled under Category 3A and for a post-fire salvage Emergency Notice project with a maximum operational lifespan of 1 year enrolled in Category 2A. Projects can remain enrolled in the General Order beyond the maximum operational lifespan if risks to water quality are identified and additional management measures, monitoring and reporting are necessary to protect the beneficial uses.

Table 2. Example Monitoring Cost Estimate for 7 Year THP and 1 Year Post-Fire Salvage Emergency Notice (EM).

MRP Activity	THP (3A) Cost Range	EM (2A) Cost Range
Inspection Plan Development (1 time cost per project)	$200-$500	$200-$500
Erosion Site Inventory Table	NA	$500-$700
Implementation Monitoring**	$500-$700	$500-$700
Forensic Monitoring**	$500-$700	$500-$700
Effectiveness Monitoring	$500-$700	$500-$700
Reporting (annual and NOV)	$100-$200	$100-$200
1st Year Cost Estimate*	$1,800-$2,800	$2,300-$3,500
Total Cost Estimate for 7 years of enrollment	$11,200-$16,100	NA
Total Cost Estimate for 2 years of enrollment	NA	$4,200-$6,000

** Mileage not included, extreme variability in distance to monitored sites exists.*
*** Implementation and forensic monitoring required by the FPRs for THPs.*

The visual monitoring required for 'green tree' projects (THPs) on non-federal lands has, since 2005 under the Timber Waiver, included two rounds of forensic monitoring during the winter period once operations have commenced. Eleven years of enrolled project monitoring has resulted in staff proposing to reduce this type of monitoring from twice per winter to once per winter under the General Order, comprising a modest annual cost savings to the timber/timberland owner of these projects.

It must also be noted that implementation monitoring is a requirement of the FPRs, as is forensic monitoring. The FPRs specify that the Regional Water Board's monitoring and reporting requirements may be used in the evaluation of the road rule requirements. California Code of Regulations, title 14, section 943.7(k)(2) under Maintenance and Monitoring of Logging Roads and Landings specifies: "*Inspections conducted pursuant to California Regional Water Quality Control Board requirements may be used to satisfy the inspection requirement of this section."* While the FPRs require visual implementation inspections prior to the winter period, and inspections during the winter period (essentially "forensic" monitoring), no formal reporting is required. So, even should the Central Valley Water Board determine that no additional monitoring or reporting will be required of projects enrolled in the Order, implementation and forensic inspections are still required by the FPRs (even for projects eligible to file an Notice of Non-Applicability under the General Order), though no reporting occurs. Thus, requiring development of an inspection plan,

effectiveness monitoring, Notice of Violation (NOV) reporting and annual reporting are additional costs to non-federal Dischargers not required by the Forest Practice Rules.

The Central Valley Water Board concludes that the cost of monitoring and reporting required by the General Order represent a reasonable cost of conducting permitted operations that pose a threat to water quality. Benefits inherent in the proposed monitoring and reporting are many and include: increased awareness on the part of the landowner/land manager of sensitive water quality resources; potential impacts and effectiveness of management measures; increased potential for identifying threats before they impact water quality and the beneficial uses; increased data available to aid in future risk analyses; lessons learned regarding specific threats and effective mitigations that can be presented to the BOF for consideration in developing rule revisions or used in the furtherance of best management practice development.

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F2. Shadow Flicker Analysis

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memorandum

To:	Henry Woltag ConnectGen LLC	EDR Project No:	19255
From:	Jacob Runner		
Date:	May 6, 2020		
Reference:	Fountain Wind Farm Shadow Flicker Analysis		

Comments:

Introduction

This memorandum report presents the findings of a shadow flicker analysis for the proposed Fountain Wind Farm (the Project) proposed by ConnectGen LLC (Client) in Shasta County, California (Figure 1). The layout evaluated in this analysis includes 72 Vestas V162 wind turbines on a 125-meter tower. The shadow flicker impact was evaluated at 69 receptors within 10 rotor diameters (1,620 meters) of the proposed wind turbines.

Shadow flicker refers to the shadows that a wind turbine casts over structures and observers at times of the day when the sun is directly behind the turbine rotor from an observer's position. During intervals of sunshine, operating wind turbine generators will cast a shadow on surrounding areas as the rotor blades pass in front of the sun, causing a flickering effect while the rotor is in motion. Shadow flicker is most pronounced in northern latitudes during winter months because of the lower angle of the sun in the winter sky. However, it is possible to encounter shadow flicker anywhere for brief periods after sunrise and before sunset (U.S. Department of the Interior, 2005). Shadow flicker does not occur when fog or clouds obscure the sun, or when turbines are not operating.

The distance between a wind turbine and a potential shadow-flicker receptor affects the intensity of the shadows cast by the blades, and therefore the intensity of flickering. Shadows cast close to a turbine will be more intense, distinct, and focused. This is because a greater proportion of the sun's disc is intermittently blocked by the turbine (BERR, 2009). Obstacles such as terrain, vegetation, and/or buildings occurring between residences and wind turbines can significantly reduce or eliminate shadow flicker effects. At distances beyond roughly 10 rotor diameters (approximately 1,620 meters based on the largest turbine model proposed for the Project [V162]) shadow flicker effects are generally considered negligible (BERR, 2009; DECC, 2011; DOER, 2011). For this reason, the shadow flicker analysis was run with a study area of 10 rotor diameters (1,620 meters).

The location and duration of shadow flicker can be predicted quite accurately using computer modeling programs and input data regarding turbine locations, turbine dimensions, receptor locations, local topography, and sunshine frequency. A conservative assumption that the turbines are in continuous operation is also applied. Shadow flicker effects predicted by the modeling exercise are expressed in terms of frequency (hours per year) at each receptor location.

Methods

This shadow flicker analysis evaluated the potential impact of 72 Vestas V162 turbines, each with a rotor diameter of 162 meters and a hub height of 125 meters (Figure 2).

WindPRO 3.3 software and the associated Shadow module was used to conduct the shadow flicker analysis. This software is a widely accepted modeling software package developed specifically for the design and evaluation of wind power projects. Input variables and assumptions used for shadow flicker modeling calculations for the proposed Project include:

- The latitude and longitude coordinates of 72 proposed wind turbine sites (provided by the Applicant).
- The latitude and longitude coordinates for 69 potential receptors located within the 10-rotor diameter Study Area (provided by the Applicant).
- USGS 1:24,000 topographic mapping and USGS digital elevation model (DEM) data.
- The rotor diameter (162 meters) and hub height (125 meters) for the V162 turbine.
- Annual wind rose data (provided by the Applicant) to determine the approximate directional frequency of rotor orientation throughout the year (Table A1 of Attachment A).
- To account for the occurrence of cloudy conditions, the average monthly percent of available sunshine for the nearest National Oceanic and Atmospheric Administration (NOAA) weather station in Sacramento, California was used (Table A2 of Attachment A). Data were obtained from NOAA's "Comparative Climatic Data for the United States through 2015" (http://www.ncdc.noaa.gov).
- No allowance was made for wind being below or above generation speeds. Blades are assumed to be moving during all daylight hours when the sun's elevation is more than 3 degrees above the horizon. Shadow flicker is generally considered imperceptible when the sun is less than 3 degrees above the horizon due to the scattering effect of the atmosphere on low angle sunlight (DECC, 2011).
- In the preliminary analysis, the possible screening effect of trees and buildings adjacent to the receptors was not taken into consideration. In addition, the number and/or orientation of windows in residential receptors were not considered in the analysis.

Based on these variables and assumptions, *WindPRO* was used to calculate the theoretical number of hours per year that shadow flicker would occur at any given location in the vicinity of the Project. These predicted values represent a worst-case scenario. To more accurately calculate the amount of shadow flicker modeled to occur at non-participating receptors predicted to receive over 30-hours in the preliminary analysis, a desktop analysis was conducted to identify obstacles that could fully or partially block shadows at receptor sites. These data were then incorporated into the WindPro model and the analysis of predicted shadow flicker impacts at this receptor was evaluated. The following steps were undertaken as part of this desktop analysis:

1. Orthographic images were imported into the WindPro model (all images are geo-referenced).
2. Using digitizing tools in WindPro, geometric objects were drawn to represent different types of obstacles. Each object was assigned a width, length, and height to reflect the dimensions of the obstacle, as documented through client correspondence and orthographic images.
3. Porosity is then assigned to each obstacle. Low porosity factors (0, 0.2, etc.) were assigned to dense obstacles (such as buildings or stands of conifers) while higher porosity factors (0.5, 0.6, etc.) were assigned to obstacles with less density (such as widely spaced deciduous trees), see Table 1.

Table 1. Summary of Identified Obstacles at Non-Participating Receptors Predicted to Exceed 30 Hours[1]

Receptor ID	Obstacle Types	Obstacle Location Relative to Receptor	Approximate Obstacle Dimensions (meters)	Assigned Porosity Factor
46	Stand of Mixed Trees	NW	12 x 19 x 7	0.3
51	Large Stand of Mixed Trees	W	12 x 44 x 50	0.3
12	Large Stand of Mixed Trees	W	12 x 67 x 45	0.3
15	Large Stand of Mixed Trees	W	12 x 43 x 71	0.3
11	Large Stand of Mixed Trees	NNW	12 x 67 x 45	0.3
	Large Stand of Mixed Trees	WSW	12 x 35 x 22	0.3
47	Large Stand of Mixed Trees	W	12 x 36 x 51	0.3
48	Large Stand of Mixed Trees	WNW	12 x 21 x 21	0.3
52	Large Stand of Mixed Trees	W	12 x 67 x 45	0.3
3	Large Stand of Mixed Trees	W	12 x 30 x 41	0.3
	Large Stand of Mixed Trees	WSW	12 x 20 x 74	0.3
50	Large Stand of Mixed Trees	W	12 x 30 x 41	0.3
	Large Stand of Mixed Trees	WSW	12 x 20 x 74	0.3
5	Large Stand of Mixed Trees	NNE	12 x 35 x 22	0.3
	Large Stand of Mixed Trees	W	12 x 20 x 14	0.3
	Stand of Evergreen Trees	WNW	12 x 36 x 71	0.2
1	Large Stand of Mixed Trees	NW	12 x 60 x 146	0.3
	Large Stand of Mixed Trees	NNE	12 x 128 x 247	0.3
49	Large Stand of Mixed Trees	NW	12 x 19 x 7	0.3
7	Stand of Evergreen Trees	W	12 x 36 x 71	0.2
	Large Stand of Mixed Trees	SE	12 x 20 x 14	0.3
6	Large Stand of Mixed Trees	NW	12 x 36 x 71	0.2
	Large Stand of Mixed Trees	W	12 x 41 x 18	0.3
2	Deciduous Tree	W	12 x 8 x 7	0.4
	Open Hedge	N	8 x 30 x 5	0.7
57	Large Stand of Mixed Trees	NW	12 x 24 x 11	0.3

No consistent national, state, county, or local standards exist for allowable frequency or duration of shadow flicker from wind turbines at the proposed Project site. The National Association of Regulatory Utility Commissioners (NARUC)

[1] The non-participating receptors identified in this table were identified based on the results of the conservative worst-case analysis modeling. See the Results section of this document for an identification of receptors predicted to receive over 30 hours of shadow flicker per year after the effects of screening were taken into consideration.

recommends a threshold of 30 hours of shadow flicker per year at occupied buildings (NARUC, 2012). Accordingly, a threshold of 30 hours of shadow flicker per year was applied to this Project.

Although shadow flicker has been alleged to cause or contribute to health effects, including seizures, modern wind turbines typically operate at a frequency lower than the typical threshold for photosensitive epilepsy sensitivity, and there is no evidence that wind turbines can trigger seizures (British Epilepsy Association, 2007; Ellenbogen et al., 2012; NHMRC, 2010; DECC, 2011). Based on a detailed review of scientific literature and other reports, an expert panel found that, "there is limited scientific evidence of an association from prolonged shadow flicker and potential transitory cognitive and physical health effects" (Ellenbogen et al., 2012).

The model calculations include the cumulative sum of shadow hours for all turbines. This omni-directional approach reports total shadow flicker results at a receptor regardless of the presence or orientation of windows at the receptor (i.e., it assumes shadows from all directions can be perceived at a receptor, which may or may not be true). A receptor in the model is defined as a one square meter area, one meter above ground level; the actual dimensions of the receptor or window locations are not taken into consideration.

Results

Output from the model includes the following information:

- Calculated shadow flicker time (specific days, maximum hours per day, and total hours per year when shadow flicker is expected) at each of the receptors located in the Study Area.
- Tabulated and plotted time of day that receptors are predicted to receive shadow flicker (Attachment B).
- Shadow isolines, which are used to create maps showing turbine locations, receptors, and projected shadow flicker duration (hours per year; Figure 3).

A summary of the projected shadow flicker at each of the 69 receptors in the Study Area is presented below:

- 13 (19%) of the receptors may be affected 0-1 hour/year,
- 19 (28%) of the receptors may be affected 1-10 hours/year,
- 19 (28%) of the receptors may be affected 10-20 hours/year,
- 16 (23%) of the receptors may be affected 20-30 hours/year,
- 2 (3%) of the receptors may be affected for more than 30 hours/year.

As these results indicate, 97% of the receptors are predicted to receive less than 30 hours of shadow flicker per year, with 47% of the receptors predicted to receive less than 10 hours of shadow flicker per year. At most receptor locations, shadow flicker will occur primarily in the early morning or late afternoon and will generally last less than 1 hour per day. The maximum daily duration of shadow flicker is 1 hour and 14 minutes (at receptor 2, see Attachment B).

Table 2 provides the results of the predicted shadow flicker at the two receptors calculated to experience more than 30 hours of shadow flicker per year. Figure 4 shows the results of the predicted shadow flicker with obstacles in place at non-participating receptors originally predicted over 30-hours of shadow flicker per year. The times of day and duration of shadow flicker experienced by each receptor will vary throughout the calendar year based on the position of the sun in the sky and the direction of prevailing winds. See Attachment B for detailed calendars that illustrate the specific times of year and day that shadow flicker may occur at all receptors.

Table 2. Summary of Shadow Flicker Results at Receptors Predicted to Exceed 30 Hours

Receptor ID	Project Status	Predicted Annual Shadow Flicker (hh:mm)	Predicted Max Daily Shadow Flicker (hh:mm)	Predicted Shadow Flicker (days/year)
2	Non-Participating	50:20	1:14	119
58	Participating	51:41	0:57	230

Details regarding shadow flicker effects predicted at the two receptors predicted to receive over 30 hours of shadow flicker are presented in Table 3 below and in Attachment B.

Table 3. Daily Effect to Receptors Predicted to Exceed 30 Hours of Shadow Flicker

Receptor ID	Project Status	Predicted Annual Shadow Flicker (hh:mm)	Turbines Contributing to Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker[1]
2	Non-Participating	50:20	D04, D05	6:45 PM – 8:15 PM
58	Participating	51:41	N02, M08, M10	6:45 AM – 7:30 AM 8:00 AM – 8:45 AM 4:15 PM – 5:45 PM 7:15 PM – 8:30 PM

[1] The times of day represent the range of times during which each receptor could potentially experience shadow flicker throughout the year; however, no receptors will experience shadow flicker every day during all of these hours. See Attachment B for detailed calendars that illustrate the specific time of year and day that each receptor may experience shadow flicker.

Conclusion

In summary, as a result of modeling the proposed Vestas V162 turbine model, *WindPRO* predicted that two receptors will receive more than 30 hours of shadow flicker per year. The primary concern with shadow flicker is the annoyance that it can cause for adjacent homeowners. A common finding is that annoyance is lower among residents who benefited economically from the wind turbines (i.e., project participants; Michaud et al., 2016). One of the receptors predicted to receive over 30 hours of shadow flicker per year is a Project participant.

Depending on the final turbine layout and model selected, there may be no non-participating receptors that are predicted to receive more than 30 hours/year of shadow flicker, the proposed threshold for which mitigation will be performed as discussed below. Therefore, following final turbine model selection the Applicant will prepare an updated receptor-specific shadow flicker analysis for non-participating residences. This analysis will take into account any screening by existing yard trees, buildings, or proximity to stands of trees and the number and/or orientation of windows in residential receptors. Additionally, this analysis will also use project specific met data to account for wind being below or above generation speeds.

Many of the modeled shadow flicker hours are expected to be of low intensity, as they will occur during the early morning or late afternoon hours when the sun is low in the sky. When the sun sinks low on the horizon, more of its light is scattered by the atmosphere, which has the effect of dampening its brightness and therefore reducing its ability to cast dark shadows. Following the final shadow flicker analysis for non-participating residences, if shadow flicker is modeled to exceed 30 hours per year at a non-participating residence, the following mitigation options are available: work with the landowner to become a Project participant or planting of trees or installation of window blinds to block the shadow flicker. These mitigation options can be easily implemented even after the Facility has been constructed.

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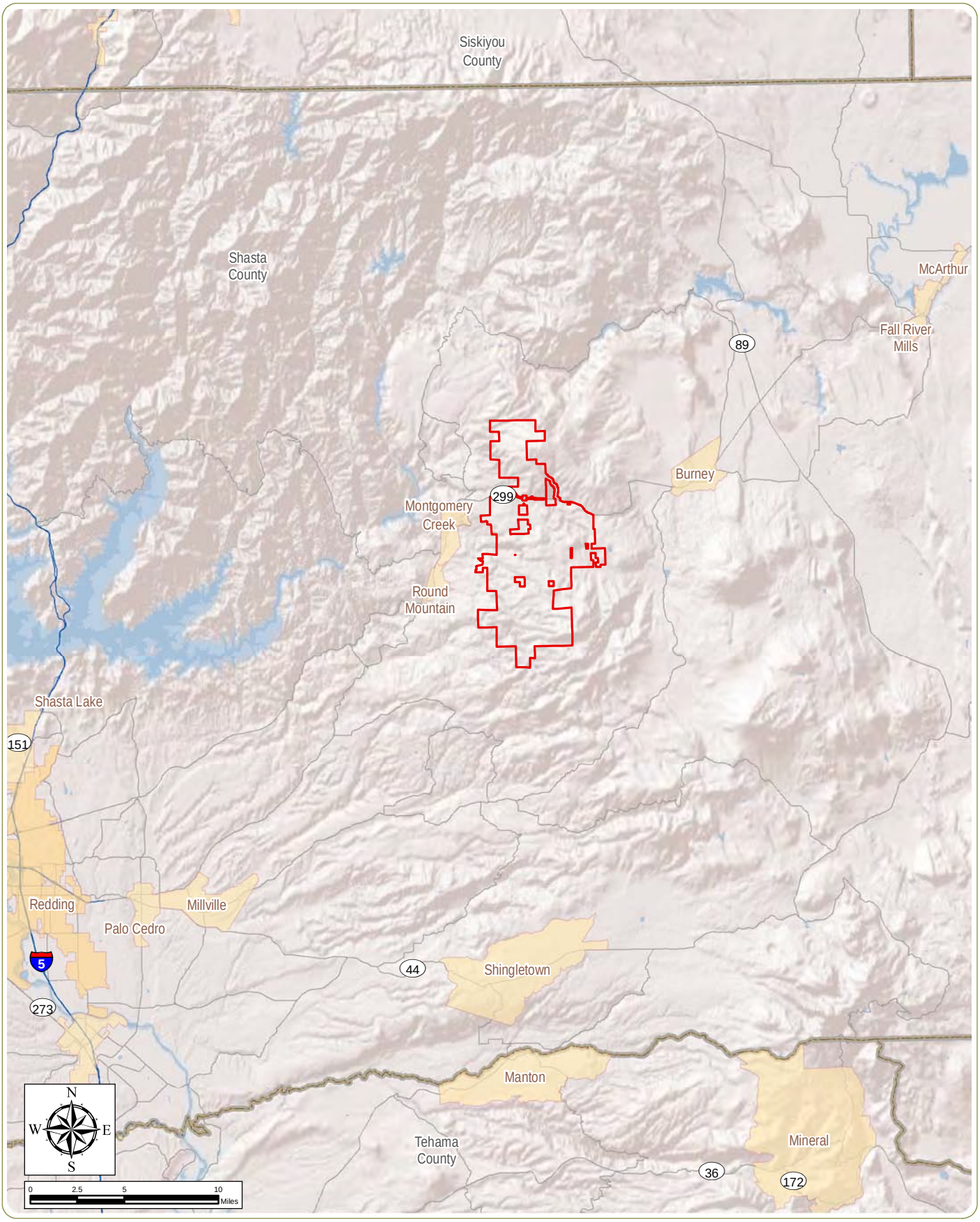
Figures



Fountain Wind Farm

Shasta County, California

Figure 1. Regional Project Location

Project Area

Notes: 1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service and ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on April 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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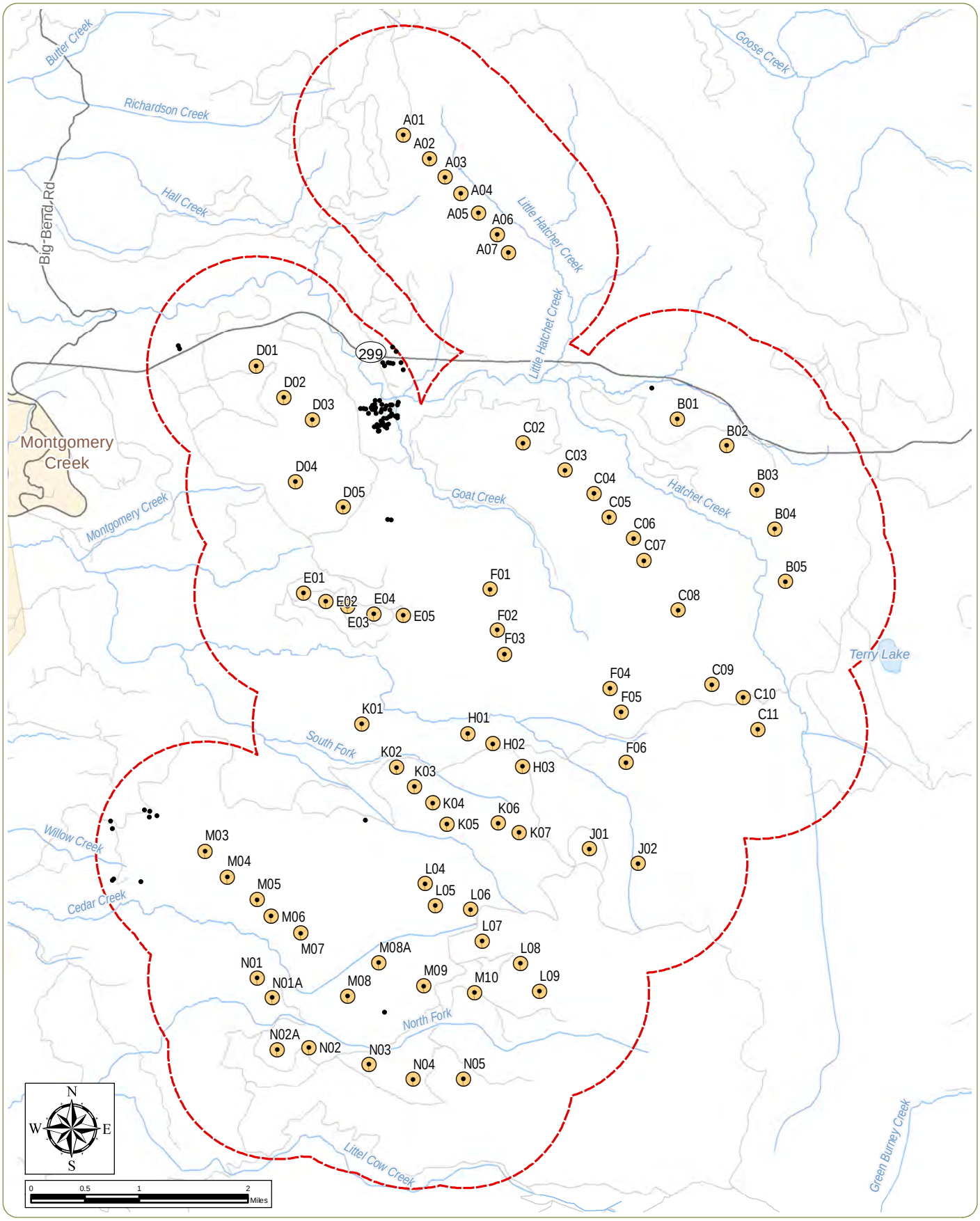

Fountain Wind Farm

Shasta County, California

Figure 2. Proposed Turbine Layout

- Receptor
- Wind Turbine
- 1620-meter Study Area

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on April 28, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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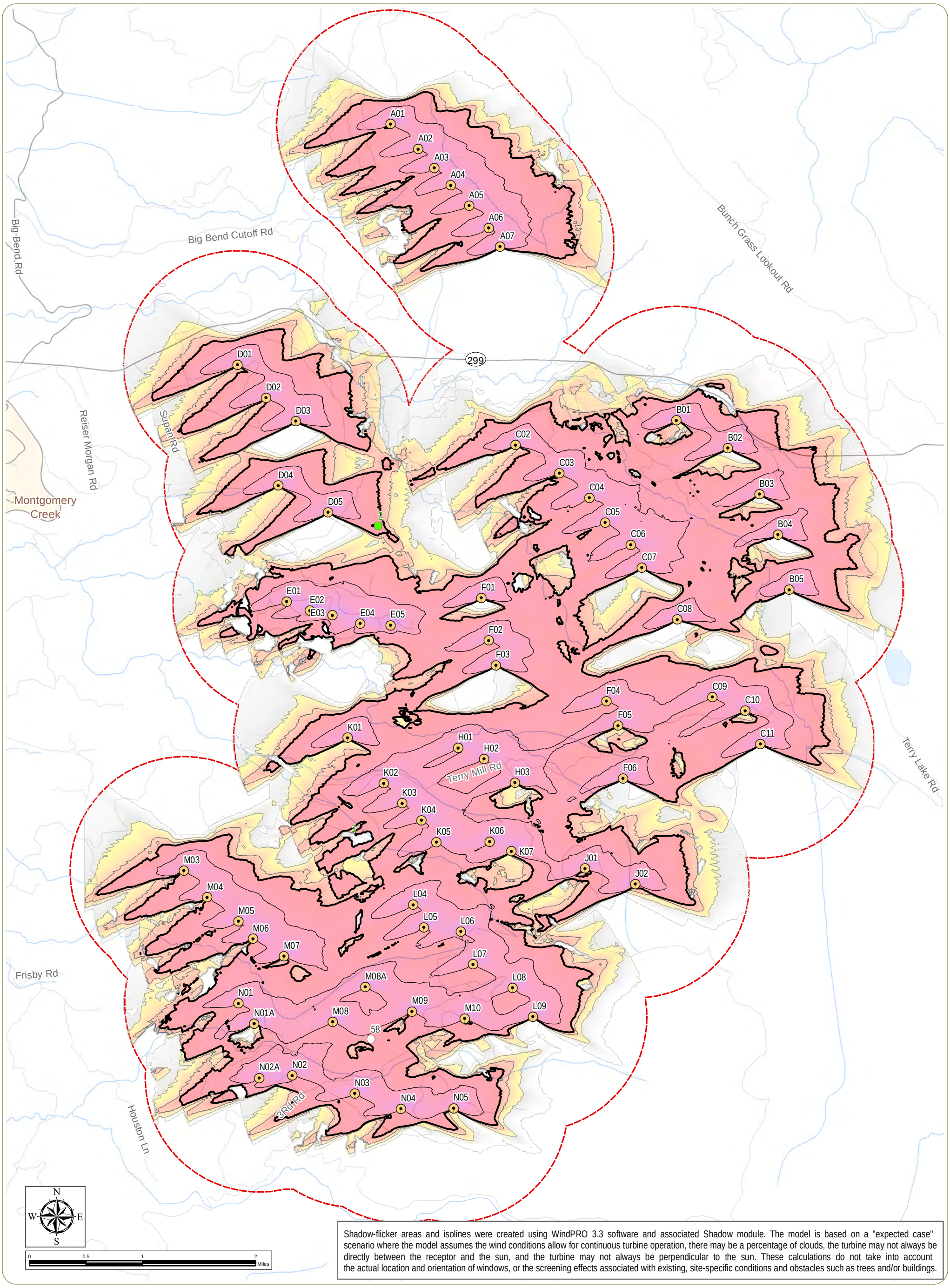

Shadow-flicker areas and isolines were created using WindPRO 3.3 software and associated Shadow module. The model is based on a "expected case" scenario where the model assumes the wind conditions allow for continuous turbine operation, there may be a percentage of clouds, the turbine may not always be directly between the receptor and the sun, and the turbine may not always be perpendicular to the sun. These calculations do not take into account the actual location and orientation of windows, or the screening effects associated with existing, site-specific conditions and obstacles such as trees and/or buildings.

Fountain Wind Farm

Shasta County, California

Figure 3. Projected Shadow Flicker

- Non-Participating Receptor > 30 hours/year
- Participating Receptor > 30 hours/year
- Receptor < 30 hours/year
- Wind Turbine
- 1620-meter Study Area

Shadow Isolines

- 0 hours/year
- 10 hours/year
- 20 hours/year
- 30 hours/year
- 100 hours/year

Shadow Flicker (hours/year)

- < 1
- 1 - 10
- 10 - 20
- 20 - 30
- 30 - 100
- > 100

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on May 6, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Shadow-flicker areas and isolines were created using WindPRO 3.3 software and associated Shadow module. The model is based on a "expected case" scenario where the model assumes the wind conditions allow for continuous turbine operation, there may be a percentage of clouds, the turbine may not always be directly between the receptor and the sun, and the turbine may not always be perpendicular to the sun.

Fountain Wind Farm

Shasta County, California

Figure 4. Projected Shadow Flicker with Obstacles
Sheet 1 of 2

Non-Participating Receptor Analyzed
Wind Turbine
1620-meter Study Area

Shadow Isolines
0 hours/year
10 hours/year
20 hours/year
30 hours/year
100 hours/year

Shadow Flicker (hours/year)
< 1
1 - 10
10 - 20
20 - 30
30 - 100
> 100

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on April 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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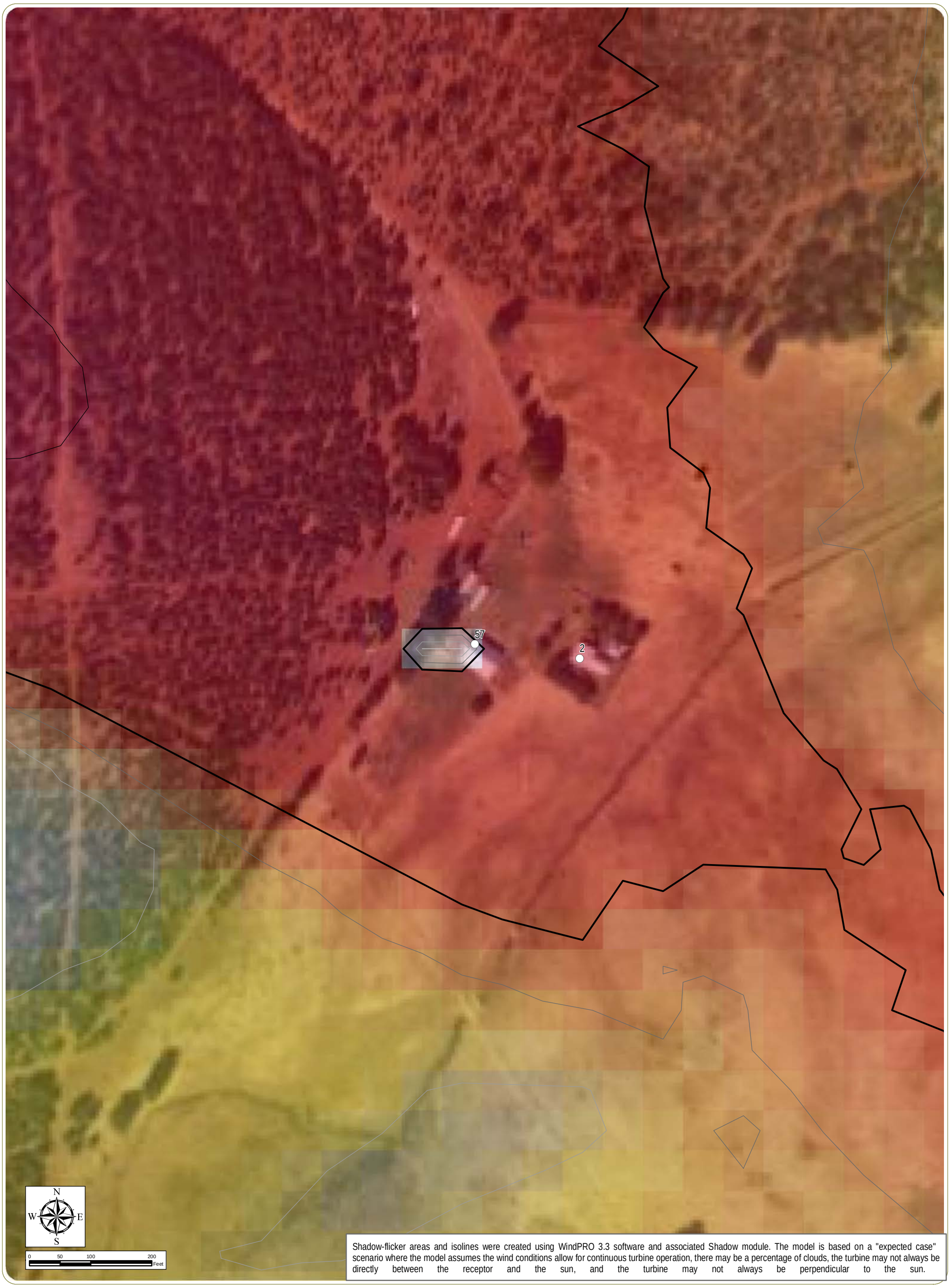

Fountain Wind Farm

Shasta County, California

Figure 4. Projected Shadow Flicker with Obstacles
Sheet 2 of 2

Non-Participating Receptor Analyzed
Wind Turbine
1620-meter Study Area

Shadow Isolines
0 hours/year
10 hours/year
20 hours/year
30 hours/year
100 hours/year

Shadow Flicker (hours/year)
< 1
1 - 10
10 - 20
20 - 30
30 - 100
> 100

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on April 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Attachment A
Wind Rose and Sunshine Data

Table A1. Wind Rose Data

SECTOR	N	NNE	NE	ENE	E	ESE	SE	SSE
Frequency	0.26	0.74	3.65	22.10	20.89	1.36	0.06	0.27
Hours of Operation	23	65	319	1,935	1,830	119	5	24

SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW
Frequency	3.88	16.34	20.16	8.68	1.13	0.22	0.12	0.15
Hours of Operation	340	1,432	1,766	761	99	19	10	13

Source: Wind rose data provided by ConnectGen LLC.

Table A2. Sunshine Probability Data[1]

Month	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Sunshine Probability[2]	0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

[1]Source: NOAA Comparative Climatic Data for the United States through 2015 – Sacramento, California Weather Station.
[2]Defined by NOAA as the total time that sunshine reaches the surface of the earth, expressed as the percentage of the maximum amount possible from sunrise to sunset with clear sky conditions.

Attachment B

WindPRO Results and Calendar

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Main Result

Assumptions for shadow calculations

Maximum distance for influence	1,620	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	1	minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761

W	WNW	NW	NNW	Sum
99	19	10	13	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: 5m_contour.wpo (2)
Obstacles used in calculation
Eye height for map: 1.5 m
Grid resolution: 1.0 m

All coordinates are in
UTM (north)-NAD83 (US+CA) Zone: 10

WTGs

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
A01	597,318	4,527,808	1,492.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
A02	597,712	4,527,454	1,504.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
A03	597,941	4,527,184	1,490.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
A04	598,171	4,526,937	1,500.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
A05	598,437	4,526,648	1,484.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
A06	598,714	4,526,329	1,457.7	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
A07	598,875	4,526,063	1,438.8	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
B01	601,381	4,523,596	1,279.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
B02	602,116	4,523,200	1,331.9	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
B03	602,564	4,522,544	1,353.9	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
B04	602,827	4,521,967	1,380.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
B05	602,987	4,521,187	1,420.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C02	599,095	4,523,244	1,363.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C03	599,718	4,522,840	1,375.5	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C04	600,146	4,522,492	1,399.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C05	600,369	4,522,141	1,388.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C06	600,735	4,521,827	1,440.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C07	600,890	4,521,500	1,448.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C08	601,395	4,520,764	1,527.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C09	601,895	4,519,661	1,405.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C10	602,363	4,519,468	1,403.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
C11	602,575	4,518,991	1,389.5	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
D01	595,140	4,524,387	1,139.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
D02	595,549	4,523,917	1,186.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
D03	595,971	4,523,583	1,191.8	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
D04	595,721	4,522,668	1,191.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
D05	596,430	4,522,287	1,204.4	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
E01	595,841	4,521,015	1,265.5	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
E02	596,170	4,520,891	1,248.2	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
E03	596,491	4,520,821	1,285.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
E04	596,885	4,520,706	1,258.5	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
E05	597,317	4,520,684	1,244.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
F01	598,610	4,521,072	1,433.8	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
F02	598,715	4,520,467	1,415.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
F03	598,817	4,520,112	1,404.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0

To be continued on next page...

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Main Result

...continued from previous page

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
F04	600,387	4,519,601	1,437.8	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
F05	600,551	4,519,255	1,413.7	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
F06	600,625	4,518,503	1,415.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
H01	598,278	4,518,936	1,379.9	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
H02	598,647	4,518,781	1,411.9	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
H03	599,088	4,518,444	1,441.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
J01	600,083	4,517,222	1,548.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
J02	600,797	4,517,003	1,573.2	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K01	596,707	4,519,080	1,307.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K02	597,221	4,518,435	1,358.8	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K03	597,481	4,518,149	1,380.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K04	597,756	4,517,907	1,383.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K05	597,970	4,517,594	1,374.2	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K06	598,727	4,517,605	1,468.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
K07	599,039	4,517,466	1,508.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
L04	597,642	4,516,708	1,461.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
L05	597,794	4,516,383	1,448.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
L06	598,318	4,516,326	1,446.5	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
L07	598,491	4,515,859	1,498.7	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
L08	599,056	4,515,524	1,579.7	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
L09	599,342	4,515,113	1,621.2	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M03	594,381	4,517,194	1,211.5	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M04	594,709	4,516,810	1,268.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M05	595,156	4,516,473	1,310.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M06	595,360	4,516,223	1,316.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M07	595,801	4,515,977	1,343.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M08	596,496	4,515,042	1,365.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M08A	596,959	4,515,539	1,388.3	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M09	597,622	4,515,191	1,421.9	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
M10	598,374	4,515,088	1,510.2	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N01	595,155	4,515,306	1,343.6	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N01A	595,379	4,515,016	1,291.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N02	595,918	4,514,280	1,372.9	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N02A	595,449	4,514,243	1,403.7	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N03	596,809	4,514,026	1,393.1	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N04	597,468	4,513,805	1,445.4	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0
N05	598,214	4,513,815	1,526.0	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m...	Yes	VESTAS	V162-5,600	5,600	162.0	125.0	0.0

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1	596,761	4,517,643	1,313.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2	597,139	4,522,095	1,193.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3	596,965	4,523,417	1,160.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
4	597,077	4,523,458	1,160.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
5	596,936	4,523,472	1,156.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
6	596,892	4,523,480	1,154.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
7	596,927	4,523,510	1,153.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
8	597,040	4,523,485	1,158.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
9	597,075	4,523,502	1,157.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
10	597,102	4,523,517	1,154.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
11	596,977	4,523,500	1,155.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
12	596,994	4,523,518	1,154.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
13	597,018	4,523,541	1,152.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
14	597,077	4,523,604	1,143.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
15	596,914	4,523,677	1,141.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
16	596,992	4,523,699	1,137.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
17	597,199	4,523,634	1,137.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
18	597,049	4,523,741	1,133.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
19	596,900	4,523,731	1,140.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
20	596,860	4,523,737	1,143.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0

To be continued on next page...

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Main Result

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
21	596,907	4,523,763	1,139.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
22	596,842	4,523,763	1,143.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
23	596,865	4,523,793	1,141.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
24	596,900	4,523,815	1,139.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
25	597,003	4,523,811	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
26	597,072	4,523,791	1,132.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
28	597,152	4,523,804	1,130.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
29	597,130	4,523,806	1,129.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
30	596,902	4,523,866	1,139.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
31	596,973	4,523,866	1,136.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
32	597,246	4,523,843	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
33	597,237	4,523,800	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
34	597,016	4,524,431	1,138.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
35	597,096	4,524,432	1,139.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
36	597,128	4,524,422	1,140.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
37	597,169	4,524,418	1,140.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
38	597,284	4,524,428	1,142.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
39	597,044	4,524,382	1,137.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
40	597,320	4,524,323	1,135.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
41	597,161	4,524,663	1,147.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
42	597,211	4,524,594	1,146.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
43	601,007	4,524,052	1,253.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
44	594,004	4,524,632	1,054.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
45	593,985	4,524,684	1,054.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
46	596,765	4,523,743	1,146.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
47	596,801	4,523,680	1,147.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
48	596,728	4,523,747	1,148.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
49	596,687	4,523,749	1,149.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
50	596,950	4,523,415	1,160.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
51	597,031	4,523,606	1,146.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
52	596,991	4,523,563	1,150.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
53	597,117	4,523,632	1,135.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
54	597,136	4,523,639	1,134.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
57	597,086	4,522,102	1,193.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
58	597,040	4,514,798	1,418.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
59	593,426	4,516,733	1,005.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
60	593,029	4,516,772	950.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
61	593,007	4,516,752	950.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
62	593,479	4,517,798	991.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
63	593,554	4,517,692	994.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
64	593,668	4,517,712	1,007.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
65	593,563	4,517,780	997.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
66	592,979	4,517,635	948.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
67	593,003	4,517,524	948.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
68	597,234	4,523,612	1,145.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
69	597,150	4,523,668	1,132.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
70	597,235	4,523,642	1,147.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
71	597,122	4,523,729	1,130.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
72	597,005	4,523,739	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
1	21:55	52	0:30	3:52
2	103:12	119	1:14	50:20
3	46:49	99	0:42	23:19
4	48:02	130	0:34	25:22
5	21:26	64	0:27	9:49
6	0:00	0	0:00	0:00
7	0:00	0	0:00	0:00

To be continued on next page...

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SHADOW - Main Result

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
8	52:01	139	0:35	27:35
9	48:21	135	0:34	25:47
10	30:59	82	0:33	16:29
11	0:00	0	0:00	0:00
12	0:00	0	0:00	0:00
13	0:00	0	0:00	0:00
14	19:15	44	0:34	11:12
15	0:00	0	0:00	0:00
16	34:09	84	0:36	19:34
17	15:23	38	0:30	8:59
18	30:20	77	0:34	17:39
19	39:46	90	0:39	23:11
20	47:13	116	0:41	27:10
21	44:10	114	0:38	25:25
22	43:31	93	0:41	25:45
23	41:05	91	0:40	24:37
24	37:59	87	0:38	22:54
25	31:54	79	0:35	19:04
26	28:35	75	0:33	16:54
28	25:17	71	0:31	14:58
29	25:52	71	0:31	15:20
30	37:16	85	0:38	22:38
31	33:02	81	0:36	20:01
32	13:28	36	0:29	8:15
33	13:44	36	0:29	8:23
34	41:11	102	0:30	19:43
35	30:33	76	0:29	13:22
36	28:56	80	0:28	12:46
37	23:26	71	0:27	10:33
38	16:46	52	0:25	7:54
39	42:50	114	0:30	20:41
40	13:26	41	0:26	7:01
41	6:53	30	0:17	2:52
42	19:44	54	0:26	8:20
43	0:00	0	0:00	0:00
44	16:32	40	0:32	7:15
45	15:58	40	0:31	6:42
46	0:00	0	0:00	0:00
47	7:45	30	0:19	3:14
48	0:00	0	0:00	0:00
49	0:00	0	0:00	0:00
50	49:02	101	0:43	24:20
51	0:00	0	0:00	0:00
52	0:00	0	0:00	0:00
53	28:44	77	0:33	15:55
54	27:45	76	0:32	15:25
57	0:00	0	0:00	0:00
58	119:16	230	0:57	51:41
59	15:19	42	0:28	9:33
60	28:47	72	0:27	21:51
61	27:28	70	0:27	20:56
62	32:24	82	0:33	8:07
63	36:20	86	0:37	10:06
64	44:28	96	0:40	11:13
65	36:48	87	0:36	9:05
66	9:49	32	0:25	4:01
67	10:29	33	0:25	4:39
68	14:39	38	0:30	8:28
69	26:50	74	0:31	15:05
70	14:25	37	0:30	8:24
71	27:14	75	0:32	15:44
72	32:35	81	0:35	18:58

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SHADOW - Main Result

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
A01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (68)	0:00	0:00
A02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (69)	0:00	0:00
A03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (70)	0:00	0:00
A04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (71)	0:00	0:00
A05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (72)	0:00	0:00
A06	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (73)	0:00	0:00
A07	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (74)	0:00	0:00
B01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (109)	0:00	0:00
B02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (111)	0:00	0:00
B03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (112)	0:00	0:00
B04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (116)	0:00	0:00
B05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (118)	0:00	0:00
C02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (79)	0:00	0:00
C03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (80)	0:00	0:00
C04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (110)	0:00	0:00
C05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (113)	0:00	0:00
C06	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (114)	0:00	0:00
C07	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (115)	0:00	0:00
C08	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (117)	0:00	0:00
C09	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (121)	0:00	0:00
C10	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (122)	0:00	0:00
C11	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (123)	0:00	0:00
D01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (75)	22:04	9:28
D02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (76)	78:20	40:42
D03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (77)	182:46	97:01
D04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (78)	56:14	25:43
D05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (82)	84:51	41:58
E01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (81)	0:00	0:00
E02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (83)	0:00	0:00
E03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (84)	0:00	0:00
E04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (85)	0:00	0:00
E05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (139)	0:00	0:00
F01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (86)	0:00	0:00
F02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (87)	0:00	0:00
F03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (88)	0:00	0:00
F04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (119)	0:00	0:00
F05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (120)	0:00	0:00
F06	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (124)	0:00	0:00
H01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (90)	0:00	0:00
H02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (95)	0:00	0:00
H03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (96)	0:00	0:00
J01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (125)	0:00	0:00
J02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (126)	0:00	0:00
K01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (89)	0:00	0:00
K02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (91)	0:00	0:00
K03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (92)	0:00	0:00
K04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (93)	0:00	0:00
K05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (94)	0:00	0:00
K06	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (97)	0:00	0:00
K07	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (104)	0:00	0:00
L04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (102)	21:55	3:52
L05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (103)	0:00	0:00
L06	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (106)	0:00	0:00
L07	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (107)	0:00	0:00
L08	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (108)	0:00	0:00
L09	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (131)	0:00	0:00
M03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (138)	95:10	44:12
M04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (137)	43:53	15:50
M05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (98)	0:00	0:00
M06	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (99)	0:00	0:00
M07	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (100)	0:00	0:00
M08	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (128)	68:41	30:14
M08A	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (136)	0:00	0:00
M09	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (105)	0:00	0:00
M10	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (130)	16:06	11:13

To be continued on next page...

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SHADOW - Main Result

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
N01	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (101)	0:00	0:00
N01A	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (134)	0:00	0:00
N02	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (127)	11:20	6:19
N02A	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (135)	0:00	0:00
N03	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (129)	0:00	0:00
N04	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (132)	0:00	0:00
N05	VESTAS V162 5600 162.0 !O! hub: 125.0 m (TOT: 206.0 m) (133)	23:09	4:15

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

Project:
Fountain Wind_SFA

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Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 1 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (76)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:32		08:50 (L04)	07:19	06:43	06:53	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		08:39 (L04)
	16:50	28	09:18 (L04)	17:24	17:57	19:31	20:03	20:32	20:43	20:25	19:43	18:53	18:06			16:41	21	09:00 (L04)
2	07:32		08:50 (L04)	07:18	06:41	06:51	06:06	05:39	05:40	06:05	06:35	07:05	06:39			07:13		08:38 (L04)
	16:51	29	09:19 (L04)	17:25	17:59	19:32	20:04	20:33	20:43	20:24	19:41	18:51	17:05			16:41	23	09:01 (L04)
3	07:33		08:51 (L04)	07:17	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40			07:14		08:38 (L04)
	16:51	28	09:19 (L04)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	24	09:02 (L04)
4	07:33		08:51 (L04)	07:16	06:38	06:48	06:03	05:38	05:41	06:07	06:37	07:07	06:41			07:15		08:38 (L04)
	16:52	28	09:19 (L04)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:41	25	09:03 (L04)
5	07:33		08:52 (L04)	07:15	06:37	06:46	06:02	05:37	05:42	06:08	06:38	07:08	06:42			07:16		08:38 (L04)
	16:53	27	09:19 (L04)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	26	09:04 (L04)
6	07:33		08:52 (L04)	07:14	06:35	06:44	06:01	05:37	05:43	06:09	06:39	07:09	06:44			07:17		08:38 (L04)
	16:54	27	09:19 (L04)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40	27	09:05 (L04)
7	07:32		08:53 (L04)	07:13	06:34	06:43	06:00	05:37	05:43	06:10	06:40	07:10	06:45			07:18		08:38 (L04)
	16:55	26	09:19 (L04)	17:31	18:04	19:37	20:09	20:36	20:42	20:19	19:33	18:43	16:59			16:40	27	09:05 (L04)
8	07:32		08:54 (L04)	07:11	07:32	06:41	05:59	05:37	05:44	06:10	06:41	07:11	06:46			07:19		08:39 (L04)
	16:56	25	09:19 (L04)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58			16:40	27	09:06 (L04)
9	07:32		08:55 (L04)	07:10	07:30	06:40	05:58	05:36	05:44	06:11	06:42	07:12	06:47			07:20		08:39 (L04)
	16:57	24	09:19 (L04)	17:33	19:06	19:40	20:11	20:37	20:42	20:16	19:30	18:40	16:57			16:40	28	09:07 (L04)
10	07:32		08:56 (L04)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48			07:21		08:39 (L04)
	16:58	23	09:19 (L04)	17:35	19:08	19:41	20:12	20:38	20:41	20:15	19:28	18:38	16:56			16:40	29	09:08 (L04)
11	07:32		08:57 (L04)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50			07:22		08:40 (L04)
	16:59	21	09:18 (L04)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55			16:40	28	09:08 (L04)
12	07:31		08:58 (L04)	07:07	07:26	06:35	05:54	05:36	05:47	06:14	06:45	07:15	06:51			07:22		08:40 (L04)
	17:00	20	09:18 (L04)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54			16:40	29	09:09 (L04)
13	07:31		09:00 (L04)	07:05	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52			07:23		08:40 (L04)
	17:01	18	09:18 (L04)	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53			16:40	29	09:09 (L04)
14	07:31		09:00 (L04)	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53			07:24		08:40 (L04)
	17:02	16	09:16 (L04)	17:40	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52			16:41	30	09:10 (L04)
15	07:30		09:03 (L04)	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54			07:25		08:41 (L04)
	17:03	13	09:16 (L04)	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51			16:41	30	09:11 (L04)
16	07:30		09:05 (L04)	07:02	07:19	06:29	05:50	05:36	05:50	06:18	06:49	07:20	06:55			07:25		08:42 (L04)
	17:04	9	09:14 (L04)	17:42	19:14	19:47	20:18	20:41	20:38	20:07	19:18	18:29	16:50			16:41	29	09:11 (L04)
17	07:30			07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57			07:26		08:41 (L04)
	17:06			17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49			16:41	30	09:11 (L04)
18	07:29			06:59	07:16	06:26	05:48	05:36	05:51	06:20	06:51	07:22	06:58			07:27		08:42 (L04)
	17:07			17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:49			16:42	30	09:12 (L04)
19	07:29			06:58	07:14	06:24	05:48	05:36	05:52	06:21	06:52	07:23	06:59			07:27		08:42 (L04)
	17:08			17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48			16:42	30	09:12 (L04)
20	07:28			06:56	07:12	06:23	05:47	05:36	05:53	06:22	06:53	07:24	07:00			07:28		08:43 (L04)
	17:09			17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:23	16:47			16:42	30	09:13 (L04)
21	07:27			06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01			07:28		08:44 (L04)
	17:10			17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46			16:43	30	09:14 (L04)
22	07:27			06:53	07:09	06:20	05:45	05:37	05:55	06:24	06:55	07:26	07:02			07:29		08:44 (L04)
	17:11			17:49	19:21	19:53	20:24	20:43	20:34	19:58	19:08	18:20	16:46			16:43	30	09:14 (L04)
23	07:26			06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04			07:29		08:44 (L04)
	17:13			17:50	19:22	19:54	20:24	20:43	20:34	19:57	19:06	18:18	16:45			16:44	30	09:14 (L04)
24	07:25			06:50	07:06	06:17	05:44	05:37	05:56	06:26	06:57	07:29	07:05			07:30		08:45 (L04)
	17:14			17:52	19:23	19:55	20:25	20:43	20:33	19:55	19:04	18:17	16:45			16:44	30	09:15 (L04)
25	07:25			06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06			07:30		08:45 (L04)
	17:15			17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44			16:45	30	09:15 (L04)
26	07:24			06:47	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		08:44 (L04)	07:31		08:46 (L04)
	17:16			17:54	19:25	19:57	20:27	20:43	20:31	19:52	19:01	18:14	16:43	8	08:52 (L04)	16:45	30	09:16 (L04)
27	07:23			06:46	07:01	06:13	05:42	05:38	05:59	06:29	07:00	07:32	07:08		08:42 (L04)	07:31		08:47 (L04)
	17:17			17:55	19:26	19:58	20:28	20:43	20:30	19:51	18:59	18:13	16:43	13	08:55 (L04)	16:46	29	09:16 (L04)
28	07:22			06:44	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		08:41 (L04)	07:31		08:47 (L04)
	17:19			17:56	19:27	19:59	20:29	20:44	20:29	19:49	18:58	18:11	16:43	15	08:56 (L04)	16:47	30	09:17 (L04)
29	07:22				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		08:40 (L04)	07:32		08:47 (L04)
	17:20				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	18	08:58 (L04)	16:47	30	09:17 (L04)
30	07:21				06:56	06:09	05:40	05:39	06:02	06:32	07:03	07:35	07:11		08:39 (L04)	07:32		08:48 (L04)
	17:21				19:29	20:02	20:30	20:43	20:27	19:46	18:54	18:09	16:42	20	08:59 (L04)	16:48	29	09:17 (L04)
31	07:20				06:54		05:39		06:03	06:33		07:37				07:32		08:49 (L04)
	17:22				19:30		20:31		20:26	19:44		18:07				16:49	29	09:18 (L04)
Potential sun hours	298			297	369	398	448	451	458	428	375	346	299			288		
Total, worst case		362												74			879	
Sun reduction		0.45												0.61			0.47	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.37												0.37			0.37	
Total reduction		0.17												0.23			0.18	
Total, real		61												17			155	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 2 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (77)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	18:52 (D05)	05:39	18:52 (D05)	05:40	19:02 (D05)	06:04	18:57 (D05)	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03 43	19:35 (D05)	20:32 64	20:01 (D04)	20:44 37	19:39 (D05)	20:25 62	20:01 (D04)	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	18:52 (D05)	05:38	18:53 (D05)	05:40	19:02 (D05)	06:05	18:57 (D05)	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04 44	19:36 (D05)	20:33 62	20:01 (D04)	20:43 42	20:00 (D04)	20:24 60	20:00 (D04)	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	18:50 (D05)	05:38	18:54 (D05)	05:41	19:02 (D05)	06:06	18:57 (D05)	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05 46	19:36 (D05)	20:34 60	20:01 (D04)	20:43 46	20:02 (D04)	20:23 58	19:59 (D04)	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	18:50 (D05)	05:38	18:54 (D05)	05:41	19:02 (D05)	06:06	18:57 (D05)	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06 47	19:37 (D05)	20:34 58	20:00 (D04)	20:43 49	20:04 (D04)	20:22 54	19:58 (D04)	19:38	18:48	17:02	16:41
5	07:33	07:15	06:37	06:46	06:02	18:49 (D05)	05:37	18:55 (D05)	05:42	19:02 (D05)	06:07	18:58 (D05)	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07 48	19:37 (D05)	20:35 56	20:00 (D04)	20:43 50	20:04 (D04)	20:21 50	19:48 (D05)	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	18:49 (D05)	05:37	18:56 (D05)	05:42	19:02 (D05)	06:08	18:58 (D05)	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08 49	19:38 (D05)	20:36 54	20:00 (D04)	20:43 54	20:06 (D04)	20:20 50	19:48 (D05)	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	18:48 (D05)	05:37	18:55 (D05)	05:43	19:01 (D05)	06:09	18:58 (D05)	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09 50	19:38 (D05)	20:36 52	19:58 (D04)	20:42 56	20:06 (D04)	20:19 49	19:47 (D05)	19:33	18:43	16:59	16:40
8	07:32	07:11	07:32	06:41	05:59	18:48 (D05)	05:36	18:56 (D05)	05:44	19:01 (D05)	06:10	18:59 (D05)	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10 51	19:39 (D05)	20:37 50	19:58 (D04)	20:42 58	20:07 (D04)	20:17 48	19:47 (D05)	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	18:48 (D05)	05:36	18:57 (D05)	05:44	19:01 (D05)	06:11	18:59 (D05)	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11 55	19:49 (D04)	20:38 46	19:57 (D04)	20:42 60	20:08 (D04)	20:16 47	19:46 (D05)	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	18:47 (D05)	05:36	18:57 (D05)	05:45	19:01 (D05)	06:12	19:00 (D05)	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12 58	19:49 (D04)	20:38 45	19:57 (D04)	20:41 61	20:08 (D04)	20:15 45	19:45 (D05)	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	18:46 (D05)	05:36	18:58 (D05)	05:46	19:01 (D05)	06:13	19:01 (D05)	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13 61	19:50 (D04)	20:39 40	19:55 (D04)	20:41 63	20:09 (D04)	20:14 43	19:44 (D05)	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	18:46 (D05)	05:36	18:59 (D05)	05:46	19:01 (D05)	06:14	19:01 (D05)	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14 64	19:51 (D04)	20:39 36	19:35 (D05)	20:41 64	20:10 (D04)	20:12 42	19:43 (D05)	19:25	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	05:53	18:46 (D05)	05:36	18:59 (D05)	05:47	19:00 (D05)	06:15	19:01 (D05)	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15 65	19:51 (D04)	20:40 36	19:35 (D05)	20:40 66	20:10 (D04)	20:11 40	19:41 (D05)	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	18:47 (D05)	05:36	19:00 (D05)	05:48	19:00 (D05)	06:16	19:02 (D05)	06:47	07:17	06:53	07:24
	17:02	17:40	19:12	19:45	20:16 66	19:53 (D04)	20:40 35	19:35 (D05)	20:40 68	20:11 (D04)	20:10 38	19:40 (D05)	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	18:47 (D05)	05:36	19:00 (D05)	05:49	19:00 (D05)	06:17	19:04 (D05)	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17 67	19:54 (D04)	20:41 35	19:35 (D05)	20:39 70	20:12 (D04)	20:08 34	19:38 (D05)	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	18:47 (D05)	05:36	19:00 (D05)	05:49	19:00 (D05)	06:18	19:05 (D05)	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18 68	19:55 (D04)	20:41 35	19:35 (D05)	20:39 70	20:12 (D04)	20:07 32	19:37 (D05)	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	18:47 (D05)	05:36	19:01 (D05)	05:50	18:59 (D05)	06:19	19:07 (D05)	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19 69	19:56 (D04)	20:41 34	19:35 (D05)	20:38 72	20:12 (D04)	20:06 28	19:35 (D05)	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	18:47 (D05)	05:36	19:01 (D05)	05:51	18:59 (D05)	06:20	19:09 (D05)	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20 70	19:57 (D04)	20:42 34	19:35 (D05)	20:37 72	20:12 (D04)	20:04 23	19:32 (D05)	19:15	18:25	16:49	16:41
19	07:29	06:58	07:14	06:24	05:47	18:47 (D05)	05:36	19:01 (D05)	05:52	18:59 (D05)	06:21	19:12 (D05)	06:52	07:23	06:59	07:27
	17:08	17:46	19:17	19:50	20:21 70	19:57 (D04)	20:42 34	19:35 (D05)	20:37 73	20:12 (D04)	20:03 17	19:29 (D05)	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	18:47 (D05)	05:36	19:01 (D05)	05:53	18:59 (D05)	06:22		06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22 71	19:58 (D04)	20:42 34	19:35 (D05)	20:36 72	20:11 (D04)	20:01		19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	18:48 (D05)	05:36	19:01 (D05)	05:54	18:59 (D05)	06:23		06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23 71	19:59 (D04)	20:43 34	19:35 (D05)	20:35 72	20:11 (D04)	20:00		19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:20	05:45	18:48 (D05)	05:36	19:02 (D05)	05:54	18:58 (D05)	06:24		06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24 72	20:00 (D04)	20:43 34	19:36 (D05)	20:35 71	20:09 (D04)	19:58		19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18 19:11 (D05)	05:44	18:48 (D05)	05:37	19:02 (D05)	05:55	18:58 (D05)	06:25		06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54 7 19:18 (D05)	20:25 73	20:01 (D04)	20:43 34	19:36 (D05)	20:34 71	20:09 (D04)	19:57		19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17 19:06 (D05)	05:43	18:49 (D05)	05:37	19:02 (D05)	05:56	18:58 (D05)	06:26		06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55 18 19:24 (D05)	20:25 73	20:02 (D04)	20:43 34	19:36 (D05)	20:33 70	20:08 (D04)	19:55		19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15 19:03 (D05)	05:43	18:49 (D05)	05:37	19:03 (D05)	05:57	18:58 (D05)	06:27		06:58	07:30	07:06	07:30
	17:15	17:53	19:24	19:56 24 19:27 (D05)	20:26 74	20:03 (D04)	20:43 34	19:37 (D05)	20:32 69	20:07 (D04)	19:54		19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14 19:00 (D05)	05:42	18:49 (D05)	05:38	19:02 (D05)	05:58	18:58 (D05)	06:28		06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57 28 19:28 (D05)	20:27 74	20:03 (D04)	20:44 35	19:37 (D05)	20:31 69	20:07 (D04)	19:52		19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12 18:58 (D05)	05:41	18:50 (D05)	05:38	19:02 (D05)	05:59	18:58 (D05)	06:29		07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:58 32 19:30 (D05)	20:28 72	20:03 (D04)	20:44 35	19:37 (D05)	20:30 68	20:06 (D04)	19:51		18:59	18:13	16:43	16:46
28	07:22	06:44	06:59	06:11 18:57 (D05)	05:41	18:50 (D05)	05:38	19:03 (D05)	06:00	18:58 (D05)	06:30		07:01	07:33	07:09	07:31
	17:18	17:56	19:27	20:00 35 19:32 (D05)	20:29 70	20:02 (D04)	20:44 35	19:38 (D05)	20:29 67	20:05 (D04)	19:49		18:58	18:11	16:42	16:46
29	07:22		06:57	06:10 18:54 (D05)	05:40	18:51 (D05)	05:39	19:02 (D05)	06:01	18:58 (D05)	06:31		07:02	07:34	07:10	07:32
	17:20		19:28	20:01 39 19:33 (D05)	20:30 70	20:03 (D04)	20:44 36	19:38 (D05)	20:28 66	20:04 (D04)	19:48		18:56	18:10	16:42	16:47
30	07:21		06:56	06:08 18:53 (D05)	05:40	18:51 (D05)	05:39	19:03 (D05)	06:02	18:57 (D05)	06:32		07:03	07:35	07:11	07:32
	17:21		19:29	20:02 41 19:34 (D05)	20:31 68	20:02 (D04)	20:44 36	19:39 (D05)	20:27 66	20:03 (D04)	19:46		18:54	18:09	16:42	16:48
31	07:20		06:54		05:39	18:52 (D05)			06:03	18:57 (D05)	06:33			07:37		07:32
	17:22		19:30		20:31 66	20:02 (D04)			20:26 64	20:02 (D04)	19:44			18:07		16:49
Potential sun hours	298	297	369	398	448		451		458		428		375	346	298	288
Total, worst case				224	1945		1247		1956		820					
Sun reduction				0.82	0.92		0.94		0.97		0.96					
Oper. time red.				1.00	1.00		1.00		1.00		1.00					
Wind dir. red.				0.53	0.52		0.52		0.51		0.52					
Total reduction				0.43	0.48		0.49		0.50		0.50					
Total, real				97	924		611		975		413					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 3 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (78)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	18:47 (D03)	05:39	05:40	06:04	19:37 (D02)	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03 35	19:22 (D03)	20:32	20:44	20:25 24	20:01 (D02)	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	18:48 (D03)	05:38	05:40	06:05	19:08 (D03)	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04 33	19:21 (D03)	20:33	20:44	20:24 33	20:00 (D02)	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	18:47 (D03)	05:38	05:41	06:05	19:06 (D03)	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05 33	19:20 (D03)	20:34	20:43	20:23 37	19:59 (D02)	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	18:48 (D03)	05:38	05:41	06:06	19:04 (D03)	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06 38	19:43 (D02)	20:34	20:43	20:22 39	19:58 (D02)	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	18:49 (D03)	05:37	05:42	06:07	19:02 (D03)	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07 40	19:44 (D02)	20:35	20:43	20:21 40	19:57 (D02)	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	18:50 (D03)	05:37	05:42	06:08	19:01 (D03)	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08 42	19:46 (D02)	20:36	20:43	20:20 40	19:56 (D02)	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	18:51 (D03)	05:37	05:43	06:09	19:00 (D03)	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09 41	19:47 (D02)	20:36	20:43	20:19 41	19:55 (D02)	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	18:53 (D03)	05:36	05:44	06:10	18:59 (D03)	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10 40	19:48 (D02)	20:37	20:42	20:17 39	19:54 (D02)	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	18:55 (D03)	05:36	05:44	06:11	18:58 (D03)	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11 38	19:49 (D02)	20:38	20:42	20:16 36	19:52 (D02)	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	18:56 (D03)	05:36	05:45	06:12	18:57 (D03)	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12 36	19:49 (D02)	20:38	20:42	20:15 33	19:30 (D03)	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	18:59 (D03)	05:36	05:46	06:13	18:56 (D03)	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13 31	19:50 (D02)	20:39	20:41	20:14 34	19:30 (D03)	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	19:26 (D02)	05:36	05:46 19:47 (D02)	06:14	18:55 (D03)	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14 25	19:51 (D02)	20:39	20:41 4 19:51 (D02)	20:12 36	19:31 (D03)	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33 19:02 (D03)	05:53	19:26 (D02)	05:36	05:47 19:44 (D02)	06:15	18:54 (D03)	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44 11 19:13 (D03)	20:15 26	19:52 (D02)	20:40	20:40 9 19:53 (D02)	20:11 36	19:30 (D03)	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32 18:59 (D03)	05:52	19:27 (D02)	05:36	05:48 19:43 (D02)	06:16	18:53 (D03)	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45 18 19:17 (D03)	20:16 26	19:53 (D02)	20:40	20:40 12 19:55 (D02)	20:10 37	19:30 (D03)	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30 18:56 (D03)	05:51	19:27 (D02)	05:36	05:49 19:43 (D02)	06:17	18:53 (D03)	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46 22 19:18 (D03)	20:17 26	19:53 (D02)	20:41	20:39 14 19:57 (D02)	20:08 37	19:30 (D03)	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28 18:54 (D03)	05:50	19:27 (D02)	05:36	05:49 19:42 (D02)	06:18	18:53 (D03)	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47 26 19:20 (D03)	20:18 26	19:53 (D02)	20:41	20:39 16 19:58 (D02)	20:07 37	19:30 (D03)	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27 18:52 (D03)	05:49	19:27 (D02)	05:36	05:50 19:40 (D02)	06:19	18:53 (D03)	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48 29 19:21 (D03)	20:19 26	19:53 (D02)	20:41	20:38 18 19:58 (D02)	20:06 37	19:30 (D03)	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25 18:51 (D03)	05:48	19:27 (D02)	05:36	05:51 19:40 (D02)	06:20	18:52 (D03)	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49 31 19:22 (D03)	20:20 25	19:52 (D02)	20:42	20:37 19 19:59 (D02)	20:04 38	19:30 (D03)	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24 18:50 (D03)	05:47	19:27 (D02)	05:36	05:52 19:40 (D02)	06:21	18:52 (D03)	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50 32 19:22 (D03)	20:21 25	19:52 (D02)	20:42	20:37 20 20:00 (D02)	20:03 37	19:29 (D03)	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22 18:49 (D03)	05:47	19:27 (D02)	05:36	05:53 19:39 (D02)	06:22	18:52 (D03)	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51 34 19:23 (D03)	20:22 25	19:52 (D02)	20:42	20:36 22 20:01 (D02)	20:01 37	19:29 (D03)	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21 18:48 (D03)	05:46	19:28 (D02)	05:36	05:54 19:39 (D02)	06:23	18:52 (D03)	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52 35 19:23 (D03)	20:23 24	19:52 (D02)	20:43	20:35 23 20:02 (D02)	20:00 37	19:29 (D03)	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19 18:48 (D03)	05:45	19:28 (D02)	05:36	05:54 19:38 (D02)	06:24	18:53 (D03)	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53 36 19:24 (D03)	20:24 23	19:51 (D02)	20:43	20:35 23 20:01 (D02)	19:58 35	19:28 (D03)	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18 18:47 (D03)	05:44	19:29 (D02)	05:37	05:55 19:38 (D02)	06:25	18:53 (D03)	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54 36 19:23 (D03)	20:25 22	19:51 (D02)	20:43	20:34 24 20:02 (D02)	19:57 34	19:27 (D03)	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17 18:47 (D03)	05:43	19:30 (D02)	05:37	05:56 19:37 (D02)	06:26	18:54 (D03)	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55 37 19:24 (D03)	20:26 21	19:51 (D02)	20:43	20:33 25 20:02 (D02)	19:55 32	19:26 (D03)	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15 18:47 (D03)	05:43	19:30 (D02)	05:37	05:57 19:37 (D02)	06:27	18:54 (D03)	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56 37 19:24 (D03)	20:26 20	19:50 (D02)	20:43	20:32 26 20:03 (D02)	19:54 31	19:25 (D03)	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14 18:46 (D03)	05:42	19:31 (D02)	05:38	05:58 19:37 (D02)	06:28	18:55 (D03)	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57 37 19:23 (D03)	20:27 18	19:49 (D02)	20:44	20:31 26 20:03 (D02)	19:52 29	19:24 (D03)	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12 18:46 (D03)	05:41	19:32 (D02)	05:38	05:59 19:37 (D02)	06:29	18:56 (D03)	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59 37 19:23 (D03)	20:28 17	19:49 (D02)	20:44	20:30 26 20:03 (D02)	19:51 26	19:22 (D03)	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11 18:46 (D03)	05:41	19:33 (D02)	05:38	06:00 19:37 (D02)	06:30	18:58 (D03)	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00 37 19:23 (D03)	20:29 15	19:48 (D02)	20:44	20:29 27 20:04 (D02)	19:49 22	19:20 (D03)	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10 18:46 (D03)	05:40	19:34 (D02)	05:39	06:01 19:36 (D02)	06:31	19:00 (D03)	07:02	07:34	07:10	07:32
	17:20		19:28	20:01 36 19:22 (D03)	20:30 13	19:47 (D02)	20:44	20:28 27 20:03 (D02)	19:48 17	19:17 (D03)	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08 18:46 (D03)	05:40	19:35 (D02)	05:39	06:02 19:37 (D02)	06:32	19:03 (D03)	07:03	07:35	07:11	07:32
	17:21		19:29	20:02 36 19:22 (D03)	20:31 11	19:46 (D02)	20:44	20:27 26 20:03 (D02)	19:46 11	19:14 (D03)	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39	19:38 (D02)		06:03 19:37 (D02)	06:33			07:37		07:32
	17:22		19:30		20:31 7	19:45 (D02)		20:26 25 20:02 (D02)	19:45			18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case				567	828		412	1002				
Sun reduction				0.82	0.92		0.97	0.96				
Oper. time red.				1.00	1.00		1.00	1.00				
Wind dir. red.				0.57	0.52		0.50	0.56				
Total reduction				0.47	0.48		0.48	0.54				
Total, real				264	398		200	537				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 4 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April			May			June
1	07:32			07:19		16:30 (D04)	06:43	06:52			06:07		19:24 (D02)	05:39
	16:50			17:23	24	16:54 (D04)	17:57	19:31			20:03	17	19:41 (D02)	20:32
2	07:33			07:18		16:31 (D04)	06:41	06:51			06:06		19:23 (D02)	05:38
	16:50			17:25	23	16:54 (D04)	17:58	19:32			20:04	19	19:42 (D02)	20:33
3	07:33			07:17		16:31 (D04)	06:40	06:49			06:05		19:22 (D02)	05:38
	16:51			17:26	23	16:54 (D04)	18:00	19:33			20:05	20	19:42 (D02)	20:34
4	07:33			07:16		16:32 (D04)	06:38	06:48			06:03		19:22 (D02)	05:38
	16:52			17:27	21	16:53 (D04)	18:01	19:34			20:06	21	19:43 (D02)	20:34
5	07:33			07:15		16:33 (D04)	06:37	06:46			06:02		19:21 (D02)	05:37
	16:53			17:28	19	16:52 (D04)	18:02	19:35			20:07	23	19:44 (D02)	20:35
6	07:33			07:14		16:35 (D04)	06:35	06:44			06:01		19:21 (D02)	05:37
	16:54			17:30	16	16:51 (D04)	18:03	19:36			20:08	25	19:46 (D02)	20:36
7	07:33			07:13		16:37 (D04)	06:34	06:43		18:58 (D03)	06:00		19:21 (D02)	05:37
	16:55			17:31	13	16:50 (D04)	18:04	19:37	13	19:11 (D03)	20:09	25	19:46 (D02)	20:36
8	07:32			07:12		16:40 (D04)	07:32	06:41		18:54 (D03)	05:59		19:22 (D02)	05:36
	16:56			17:32	7	16:47 (D04)	19:05	19:38	19	19:13 (D03)	20:10	24	19:46 (D02)	20:37
9	07:32			07:10			07:30	06:39		18:52 (D03)	05:57		19:22 (D02)	05:36
	16:57			17:33			19:06	19:40	22	19:14 (D03)	20:11	24	19:46 (D02)	20:38
10	07:32			07:09			07:29	06:38		18:50 (D03)	05:56		19:21 (D02)	05:36
	16:58			17:35			19:07	19:41	26	19:16 (D03)	20:12	23	19:44 (D02)	20:38
11	07:32			07:08			07:27	06:36		18:49 (D03)	05:55		19:22 (D02)	05:36
	16:59			17:36			19:09	19:42	28	19:17 (D03)	20:13	22	19:44 (D02)	20:39
12	07:32			07:07			07:26	06:35		18:48 (D03)	05:54		19:22 (D02)	05:36
	17:00			17:37			19:10	19:43	30	19:18 (D03)	20:14	21	19:43 (D02)	20:39
13	07:31			07:05			07:24	06:33		18:47 (D03)	05:53		19:23 (D02)	05:36
	17:01			17:38			19:11	19:44	31	19:18 (D03)	20:15	20	19:43 (D02)	20:40
14	07:31			07:04			07:22	06:32		18:46 (D03)	05:52		19:24 (D02)	05:36
	17:02			17:39			19:12	19:45	33	19:19 (D03)	20:16	18	19:42 (D02)	20:40
15	07:31			07:03			07:21	06:30		18:45 (D03)	05:51		19:25 (D02)	05:36
	17:03			17:41			19:13	19:46	33	19:18 (D03)	20:17	17	19:42 (D02)	20:41
16	07:30			07:02			07:19	06:28		18:45 (D03)	05:50		19:27 (D02)	05:36
	17:04			17:42			19:14	19:47	34	19:19 (D03)	20:18	13	19:40 (D02)	20:41
17	07:30		16:36 (D04)	07:00			07:17	06:27		18:44 (D03)	05:49		19:28 (D02)	05:36
	17:05	5	16:41 (D04)	17:43			19:15	19:48	34	19:18 (D03)	20:19	10	19:38 (D02)	20:41
18	07:29		16:33 (D04)	06:59			07:16	06:25		18:45 (D03)	05:48		19:31 (D02)	05:36
	17:07	9	16:42 (D04)	17:44			19:16	19:49	33	19:18 (D03)	20:20	4	19:35 (D02)	20:42
19	07:29		16:33 (D04)	06:58			07:14	06:24		18:44 (D03)	05:47			05:36
	17:08	11	16:44 (D04)	17:46			19:17	19:50	33	19:17 (D03)	20:21			20:42
20	07:28		16:31 (D04)	06:56			07:12	06:22		18:45 (D03)	05:47			05:36
	17:09	14	16:45 (D04)	17:47			19:18	19:51	32	19:17 (D03)	20:22			20:42
21	07:28		16:31 (D04)	06:55			07:11	06:21		18:44 (D03)	05:46			05:36
	17:10	15	16:46 (D04)	17:48			19:19	19:52	32	19:16 (D03)	20:23			20:43
22	07:27		16:30 (D04)	06:53			07:09	06:19		18:45 (D03)	05:45			05:36
	17:11	17	16:47 (D04)	17:49			19:21	19:53	31	19:16 (D03)	20:24			20:43
23	07:26		16:30 (D04)	06:52			07:07	06:18		18:45 (D03)	05:44			05:37
	17:12	18	16:48 (D04)	17:50			19:22	19:54	30	19:15 (D03)	20:25			20:43
24	07:26		16:29 (D04)	06:50			07:06	06:17		18:46 (D03)	05:43			05:37
	17:14	20	16:49 (D04)	17:51			19:23	19:55	28	19:14 (D03)	20:26			20:43
25	07:25		16:30 (D04)	06:49			07:04	06:15		18:47 (D03)	05:43			05:37
	17:15	22	16:52 (D04)	17:53			19:24	19:56	26	19:13 (D03)	20:26			20:43
26	07:24		16:29 (D04)	06:48			07:02	06:14		18:47 (D03)	05:42			05:38
	17:16	24	16:53 (D04)	17:54			19:25	19:57	24	19:11 (D03)	20:27			20:44
27	07:23		16:29 (D04)	06:46			07:01	06:12		18:49 (D03)	05:41			05:38
	17:17	25	16:54 (D04)	17:55			19:26	19:58	26	19:37 (D02)	20:28			20:44
28	07:22		16:29 (D04)	06:45			06:59	06:11		18:51 (D03)	05:41			05:38
	17:18	25	16:54 (D04)	17:56			19:27	20:00	26	19:38 (D02)	20:29			20:44
29	07:22		16:29 (D04)				06:57	06:10		18:53 (D03)	05:40			05:39
	17:20	25	16:54 (D04)				19:28	20:01	24	19:38 (D02)	20:30			20:44
30	07:21		16:29 (D04)				06:56	06:08		19:25 (D02)	05:40			05:39
	17:21	25	16:54 (D04)				19:29	20:02	14	19:39 (D02)	20:31			20:44
31	07:20		16:30 (D04)				06:54				05:39			
	17:22	24	16:54 (D04)				19:30				20:31			
Potential sun hours	298			297			369	398			448			452
Total, worst case		279			146				662			346		
Sun reduction		0.45			0.62				0.82			0.92		
Oper. time red.		1.00			1.00				1.00			1.00		
Wind dir. red.		0.87			0.87				0.60			0.52		
Total reduction		0.41			0.56				0.51			0.50		
Total, real		114			82				338			172		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 4 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July			August			September			October	November			December
1	05:40			06:04		19:33 (D02)	06:34		18:48 (D03)	07:04	06:38			07:12
	20:44			20:25	21	19:54 (D02)	19:43	28	19:16 (D03)	18:53	18:06			16:41
2	05:40			06:05		19:32 (D02)	06:35		18:48 (D03)	07:05	06:39			07:13
	20:44			20:24	23	19:55 (D02)	19:41	26	19:14 (D03)	18:51	17:05			16:41
3	05:41			06:05		19:32 (D02)	06:36		18:50 (D03)	07:06	06:40		16:08 (D04)	07:14
	20:43			20:23	23	19:55 (D02)	19:40	22	19:12 (D03)	18:49	17:04	9	16:17 (D04)	16:41
4	05:41			06:06		19:31 (D02)	06:37		18:51 (D03)	07:07	06:41		16:06 (D04)	07:15
	20:43			20:22	24	19:55 (D02)	19:38	19	19:10 (D03)	18:48	17:02	14	16:20 (D04)	16:40
5	05:42			06:07		19:31 (D02)	06:38		18:54 (D03)	07:08	06:43		16:05 (D04)	07:16
	20:43			20:21	24	19:55 (D02)	19:36	13	19:07 (D03)	18:46	17:01	16	16:21 (D04)	16:40
6	05:42			06:08		19:31 (D02)	06:39			07:09	06:44		16:03 (D04)	07:17
	20:43			20:20	24	19:55 (D02)	19:35			18:44	17:00	19	16:22 (D04)	16:40
7	05:43			06:09		19:31 (D02)	06:40			07:10	06:45		16:02 (D04)	07:18
	20:43			20:19	24	19:55 (D02)	19:33			18:43	16:59	21	16:23 (D04)	16:40
8	05:44			06:10		19:31 (D02)	06:41			07:11	06:46		16:02 (D04)	07:19
	20:42			20:17	23	19:54 (D02)	19:31			18:41	16:58	22	16:24 (D04)	16:40
9	05:44			06:11		19:31 (D02)	06:42			07:12	06:47		16:01 (D04)	07:20
	20:42			20:16	22	19:53 (D02)	19:30			18:39	16:57	24	16:25 (D04)	16:40
10	05:45			06:12		19:32 (D02)	06:43			07:13	06:48		16:01 (D04)	07:21
	20:42			20:15	19	19:51 (D02)	19:28			18:38	16:56	24	16:25 (D04)	16:40
11	05:46			06:13		19:32 (D02)	06:44			07:14	06:50		16:01 (D04)	07:22
	20:41			20:14	18	19:50 (D02)	19:26			18:36	16:55	25	16:26 (D04)	16:40
12	05:46			06:14		19:33 (D02)	06:45			07:15	06:51		16:01 (D04)	07:23
	20:41			20:12	16	19:49 (D02)	19:25			18:35	16:54	25	16:26 (D04)	16:40
13	05:47			06:15		19:03 (D03)	06:46			07:16	06:52		16:01 (D04)	07:23
	20:40			20:11	21	19:47 (D02)	19:23			18:33	16:53	25	16:26 (D04)	16:40
14	05:48			06:16		19:00 (D03)	06:47			07:17	06:53		16:01 (D04)	07:24
	20:40			20:10	26	19:46 (D02)	19:21			18:32	16:52	25	16:26 (D04)	16:40
15	05:49			06:17		18:57 (D03)	06:48			07:19	06:54		16:02 (D04)	07:25
	20:39			20:08	27	19:44 (D02)	19:20			18:30	16:51	24	16:26 (D04)	16:41
16	05:49			06:18		18:55 (D03)	06:49			07:20	06:56		16:02 (D04)	07:26
	20:39			20:07	22	19:17 (D03)	19:18			18:28	16:50	24	16:26 (D04)	16:41
17	05:50			06:19		18:54 (D03)	06:50			07:21	06:57		16:03 (D04)	07:26
	20:38			20:06	24	19:18 (D03)	19:16			18:27	16:49	22	16:25 (D04)	16:41
18	05:51			06:20		18:53 (D03)	06:51			07:22	06:58		16:03 (D04)	07:27
	20:37			20:04	26	19:19 (D03)	19:15			18:25	16:48	20	16:23 (D04)	16:41
19	05:52			06:21		18:51 (D03)	06:52			07:23	06:59		16:05 (D04)	07:28
	20:37			20:03	29	19:20 (D03)	19:13			18:24	16:48	18	16:23 (D04)	16:42
20	05:53			06:22		18:50 (D03)	06:53			07:24	07:00		16:05 (D04)	07:28
	20:36			20:01	31	19:21 (D03)	19:11			18:22	16:47	17	16:22 (D04)	16:42
21	05:54			06:23		18:50 (D03)	06:54			07:25	07:01		16:06 (D04)	07:29
	20:35			20:00	31	19:21 (D03)	19:10			18:21	16:46	15	16:21 (D04)	16:43
22	05:54			06:24		18:49 (D03)	06:55			07:26	07:03		16:07 (D04)	07:29
	20:35			19:58	32	19:21 (D03)	19:08			18:20	16:46	14	16:21 (D04)	16:43
23	05:55			06:25		18:48 (D03)	06:56			07:27	07:04		16:09 (D04)	07:30
	20:34			19:57	33	19:21 (D03)	19:06			18:18	16:45	11	16:20 (D04)	16:43
24	05:56			06:26		18:48 (D03)	06:57			07:29	07:05		16:11 (D04)	07:30
	20:33			19:55	33	19:21 (D03)	19:04			18:17	16:44	9	16:20 (D04)	16:44
25	05:57			06:27		18:48 (D03)	06:58			07:30	07:06		16:14 (D04)	07:30
	20:32			19:54	33	19:21 (D03)	19:03			18:15	16:44	5	16:19 (D04)	16:45
26	05:58		19:40 (D02)	06:28		18:47 (D03)	06:59			07:31	07:07			07:31
	20:31	8	19:48 (D02)	19:52	34	19:21 (D03)	19:01			18:14	16:43			16:45
27	05:59		19:38 (D02)	06:29		18:47 (D03)	07:00			07:32	07:08			07:31
	20:30	12	19:50 (D02)	19:51	34	19:21 (D03)	18:59			18:13	16:43			16:46
28	06:00		19:37 (D02)	06:30		18:47 (D03)	07:01			07:33	07:09			07:32
	20:29	14	19:51 (D02)	19:49	33	19:20 (D03)	18:58			18:11	16:42			16:46
29	06:01		19:35 (D02)	06:31		18:47 (D03)	07:02			07:34	07:10			07:32
	20:28	17	19:52 (D02)	19:48	32	19:19 (D03)	18:56			18:10	16:42			16:47
30	06:02		19:34 (D02)	06:32		18:48 (D03)	07:03			07:35	07:11			07:32
	20:27	19	19:53 (D02)	19:46	31	19:19 (D03)	18:54			18:09	16:42			16:48
31	06:03		19:33 (D02)	06:33		18:48 (D03)				07:37				07:32
	20:26	20	19:53 (D02)	19:44	30	19:18 (D03)				18:07				16:49
Potential sun hours	458			428			375			346	298			288
Total, worst case		90			823			108				428		
Sun reduction		0.97			0.96			0.93				0.61		
Oper. time red.		1.00			1.00			1.00				1.00		
Wind dir. red.		0.52			0.57			0.60				0.87		
Total reduction		0.52			0.57			0.58				0.55		
Total, real		47			471			63				237		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 5 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (80)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:32			07:19		16:22 (D04)	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		15:57 (D04)
	16:50			17:23	16	16:38 (D04)	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	20	16:17 (D04)
2	07:33			07:18		16:25 (D04)	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39			07:13		15:58 (D04)
	16:50			17:25	12	16:37 (D04)	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	18	16:16 (D04)
3	07:33		16:20 (D04)	07:17		16:28 (D04)	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40			07:14		15:59 (D04)
	16:51	2	16:22 (D04)	17:26	5	16:33 (D04)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	17	16:16 (D04)
4	07:33		16:18 (D04)	07:16			06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		16:00 (D04)
	16:52	7	16:25 (D04)	17:27			18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40	16	16:16 (D04)
5	07:33		16:17 (D04)	07:15			06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		16:01 (D04)
	16:53	10	16:27 (D04)	17:28			18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	14	16:15 (D04)
6	07:33		16:17 (D04)	07:14			06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17		16:03 (D04)
	16:54	12	16:29 (D04)	17:30			18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40	12	16:15 (D04)
7	07:33		16:16 (D04)	07:13			06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45			07:18		16:04 (D04)
	16:55	14	16:30 (D04)	17:31			18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59			16:40	10	16:14 (D04)
8	07:32		16:15 (D04)	07:12			07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46		15:59 (D04)	07:19		16:05 (D04)
	16:56	16	16:31 (D04)	17:32			19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	6	16:05 (D04)	16:40	7	16:12 (D04)
9	07:32		16:15 (D04)	07:10			07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47		15:55 (D04)	07:20		16:08 (D04)
	16:57	17	16:32 (D04)	17:33			19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	13	16:08 (D04)	16:40	3	16:11 (D04)
10	07:32		16:15 (D04)	07:09			07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48		15:53 (D04)	07:21		
	16:58	18	16:33 (D04)	17:35			19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16	16:09 (D04)	16:40		
11	07:32		16:15 (D04)	07:08			07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50		15:53 (D04)	07:22		
	16:59	20	16:35 (D04)	17:36			19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	19	16:12 (D04)	16:40		
12	07:32		16:14 (D04)	07:07			07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		15:52 (D04)	07:23		
	17:00	21	16:35 (D04)	17:37			19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	21	16:13 (D04)	16:40		
13	07:31		16:14 (D04)	07:06			07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		15:51 (D04)	07:23		
	17:01	22	16:36 (D04)	17:38			19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	22	16:13 (D04)	16:40		
14	07:31		16:14 (D04)	07:04			07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		15:50 (D04)	07:24		
	17:02	23	16:37 (D04)	17:39			19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	24	16:14 (D04)	16:40		
15	07:31		16:14 (D04)	07:03			07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		15:50 (D04)	07:25		
	17:03	24	16:38 (D04)	17:41			19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	25	16:15 (D04)	16:41		
16	07:30		16:13 (D04)	07:02			07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		15:50 (D04)	07:26		
	17:04	25	16:38 (D04)	17:42			19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	25	16:15 (D04)	16:41		
17	07:30		16:14 (D04)	07:00			07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		15:49 (D04)	07:26		
	17:05	26	16:40 (D04)	17:43			19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	27	16:16 (D04)	16:41		
18	07:29		16:14 (D04)	06:59			07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		15:49 (D04)	07:27		
	17:07	26	16:40 (D04)	17:44			19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	27	16:16 (D04)	16:41		
19	07:29		16:14 (D04)	06:58			07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59		15:50 (D04)	07:28		
	17:08	27	16:41 (D04)	17:46			19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	27	16:17 (D04)	16:42		
20	07:28		16:14 (D04)	06:56			07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00		15:50 (D04)	07:28		
	17:09	27	16:41 (D04)	17:47			19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	27	16:17 (D04)	16:42		
21	07:28		16:15 (D04)	06:55			07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01		15:50 (D04)	07:29		
	17:10	27	16:42 (D04)	17:48			19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	27	16:17 (D04)	16:43		
22	07:27		16:15 (D04)	06:53			07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03		15:50 (D04)	07:29		
	17:11	27	16:42 (D04)	17:49			19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	27	16:17 (D04)	16:43		
23	07:26		16:15 (D04)	06:52			07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04		15:50 (D04)	07:30		
	17:12	27	16:42 (D04)	17:50			19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	27	16:17 (D04)	16:43		
24	07:26		16:15 (D04)	06:50			07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05		15:52 (D04)	07:30		
	17:14	27	16:42 (D04)	17:51			19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	26	16:18 (D04)	16:44		
25	07:25		16:16 (D04)	06:49			07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		15:52 (D04)	07:31		
	17:15	27	16:43 (D04)	17:53			19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	26	16:18 (D04)	16:45		
26	07:24		16:17 (D04)	06:48			07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		15:52 (D04)	07:31		
	17:16	25	16:42 (D04)	17:54			19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	25	16:17 (D04)	16:45		
27	07:23		16:17 (D04)	06:46			07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		15:53 (D04)	07:31		
	17:17	25	16:42 (D04)	17:55			19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	24	16:17 (D04)	16:46		
28	07:22		16:18 (D04)	06:45			06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		15:54 (D04)	07:32		
	17:18	24	16:42 (D04)	17:56			19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	23	16:17 (D04)	16:46		
29	07:22		16:19 (D04)				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		15:54 (D04)	07:32		
	17:20	22	16:41 (D04)				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	23	16:17 (D04)	16:47		
30	07:21		16:20 (D04)				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		15:55 (D04)	07:32		
	17:21	21	16:41 (D04)				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	21	16:16 (D04)	16:48		
31	07:20		16:21 (D04)				06:54		05:39		06:03	06:33		07:37				07:32		
	17:22	19	16:40 (D04)				19:30		20:31		20:26	19:45		18:07				16:49		
Potential sun hours	298			297			369	398	448	452	458	428	375	346	298			288		
Total, worst case		608			33											528			117	
Sun reduction		0.45			0.62											0.61			0.47	
Oper. time red.		1.00			1.00											1.00			1.00	
Wind dir. red.		0.88			0.88											0.88			0.88	
Total reduction		0.40			0.54											0.54			0.41	
Total, real		240			18											283			48	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 6 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (81)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 7 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (82)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 8 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April			May			June	
1	07:32			07:19		16:27 (D04)	06:43	06:52			06:07		19:21 (D02)	05:39	
	16:50			17:23	20	16:47 (D04)	17:57	19:31			20:03	20	19:41 (D02)	20:32	
2	07:33			07:18		16:28 (D04)	06:41	06:51			06:06		19:20 (D02)	05:38	
	16:50			17:25	19	16:47 (D04)	17:58	19:32			20:04	22	19:42 (D02)	20:33	
3	07:33			07:17		16:29 (D04)	06:40	06:49			06:05		19:19 (D02)	05:38	
	16:51			17:26	16	16:45 (D04)	18:00	19:33			20:05	23	19:42 (D02)	20:34	
4	07:33			07:16		16:31 (D04)	06:38	06:48		18:59 (D03)	06:03		19:19 (D02)	05:38	
	16:52			17:27	13	16:44 (D04)	18:01	19:34	5	19:04 (D03)	20:06	24	19:43 (D02)	20:34	
5	07:33			07:15		16:34 (D04)	06:37	06:46		18:53 (D03)	06:02		19:19 (D02)	05:37	
	16:53			17:28	7	16:41 (D04)	18:02	19:35	15	19:08 (D03)	20:07	25	19:44 (D02)	20:35	
6	07:33			07:14			06:35	06:44		18:50 (D03)	06:01		19:19 (D02)	05:37	
	16:54			17:30			18:03	19:36	20	19:10 (D03)	20:08	25	19:44 (D02)	20:36	
7	07:33			07:13			06:34	06:43		18:48 (D03)	06:00		19:19 (D02)	05:37	
	16:55			17:31			18:04	19:37	24	19:12 (D03)	20:09	25	19:44 (D02)	20:36	
8	07:32			07:12			07:32	06:41		18:46 (D03)	05:59		19:19 (D02)	05:36	
	16:56			17:32			19:05	19:38	27	19:13 (D03)	20:10	25	19:44 (D02)	20:37	
9	07:32			07:10			07:30	06:39		18:44 (D03)	05:57		19:20 (D02)	05:36	
	16:57			17:33			19:06	19:40	29	19:13 (D03)	20:11	23	19:43 (D02)	20:38	
10	07:32			07:09			07:29	06:38		18:44 (D03)	05:56		19:19 (D02)	05:36	
	16:58			17:35			19:07	19:41	30	19:14 (D03)	20:12	23	19:42 (D02)	20:38	
11	07:32			07:08			07:27	06:36		18:42 (D03)	05:55		19:20 (D02)	05:36	
	16:59			17:36			19:09	19:42	32	19:14 (D03)	20:13	21	19:41 (D02)	20:39	
12	07:32		16:27 (D04)	07:07			07:26	06:35		18:42 (D03)	05:54		19:20 (D02)	05:36	
	17:00	8	16:35 (D04)	17:37			19:10	19:43	33	19:15 (D03)	20:14	21	19:41 (D02)	20:39	
13	07:31		16:26 (D04)	07:05			07:24	06:33		18:41 (D03)	05:53		19:21 (D02)	05:36	
	17:01	10	16:36 (D04)	17:38			19:11	19:44	34	19:15 (D03)	20:15	19	19:40 (D02)	20:40	
14	07:31		16:25 (D04)	07:04			07:22	06:32		18:41 (D03)	05:52		19:22 (D02)	05:36	
	17:02	12	16:37 (D04)	17:39			19:12	19:45	34	19:15 (D03)	20:16	17	19:39 (D02)	20:40	
15	07:31		16:25 (D04)	07:03			07:21	06:30		18:40 (D03)	05:51		19:24 (D02)	05:36	
	17:03	14	16:39 (D04)	17:41			19:13	19:46	35	19:15 (D03)	20:17	14	19:38 (D02)	20:41	
16	07:30		16:24 (D04)	07:02			07:19	06:28		18:40 (D03)	05:50		19:26 (D02)	05:36	
	17:04	15	16:39 (D04)	17:42			19:14	19:47	35	19:15 (D03)	20:18	11	19:37 (D02)	20:41	
17	07:30		16:24 (D04)	07:00			07:17	06:27		18:40 (D03)	05:49		19:29 (D02)	05:36	
	17:05	17	16:41 (D04)	17:43			19:15	19:48	34	19:14 (D03)	20:19	5	19:34 (D02)	20:41	
18	07:29		16:23 (D04)	06:59			07:16	06:25		18:40 (D03)	05:48			05:36	
	17:07	19	16:42 (D04)	17:44			19:16	19:49	34	19:14 (D03)	20:20			20:42	
19	07:29		16:23 (D04)	06:58			07:14	06:24		18:40 (D03)	05:47			05:36	
	17:08	21	16:44 (D04)	17:46			19:17	19:50	33	19:13 (D03)	20:21			20:42	
20	07:28		16:23 (D04)	06:56			07:12	06:22		18:41 (D03)	05:47			05:36	
	17:09	22	16:45 (D04)	17:47			19:18	19:51	32	19:13 (D03)	20:22			20:42	
21	07:28		16:23 (D04)	06:55			07:11	06:21		18:40 (D03)	05:46			05:36	
	17:10	23	16:46 (D04)	17:48			19:19	19:52	32	19:12 (D03)	20:23			20:43	
22	07:27		16:23 (D04)	06:53			07:09	06:19		18:41 (D03)	05:45			05:36	
	17:11	24	16:47 (D04)	17:49			19:21	19:53	30	19:11 (D03)	20:24			20:43	
23	07:26		16:23 (D04)	06:52			07:07	06:18		18:42 (D03)	05:44			05:37	
	17:12	24	16:47 (D04)	17:50			19:22	19:54	27	19:09 (D03)	20:25			20:43	
24	07:26		16:22 (D04)	06:50			07:06	06:17		18:43 (D03)	05:43			05:37	
	17:14	26	16:48 (D04)	17:51			19:23	19:55	25	19:08 (D03)	20:26			20:43	
25	07:25		16:23 (D04)	06:49			07:04	06:15		18:45 (D03)	05:43			05:37	
	17:15	26	16:49 (D04)	17:53			19:24	19:56	22	19:07 (D03)	20:26			20:43	
26	07:24		16:24 (D04)	06:48			07:02	06:14		18:45 (D03)	05:42			05:38	
	17:16	25	16:49 (D04)	17:54			19:25	19:57	26	19:35 (D02)	20:27			20:44	
27	07:23		16:24 (D04)	06:46			07:01	06:12		18:48 (D03)	05:41			05:38	
	17:17	25	16:49 (D04)	17:55			19:26	19:58	26	19:37 (D02)	20:28			20:44	
28	07:22		16:24 (D04)	06:45			06:59	06:11		18:52 (D03)	05:41			05:38	
	17:18	25	16:49 (D04)	17:56			19:27	20:00	21	19:38 (D02)	20:29			20:44	
29	07:22		16:24 (D04)				06:57	06:10		19:22 (D02)	05:40			05:39	
	17:20	25	16:49 (D04)				19:28	20:01	16	19:38 (D02)	20:30			20:44	
30	07:21		16:25 (D04)				06:56	06:08		19:21 (D02)	05:40			05:39	
	17:21	23	16:48 (D04)				19:29	20:02	18	19:39 (D02)	20:31			20:44	
31	07:20		16:26 (D04)				06:54				05:39				
	17:22	22	16:48 (D04)				19:30				20:31				
Potential sun hours	298			297			369	398			448			452	
Total, worst case		406			75				729			343			
Sun reduction		0.45			0.62				0.82			0.92			
Oper. time red.		1.00			1.00				1.00			1.00			
Wind dir. red.		0.87			0.87				0.60			0.52			
Total reduction		0.41			0.57				0.52			0.50			
Total, real		167			43				378			172			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker
(WTG causing flicker first time) (WTG causing flicker last time)			

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SHADOW - Calendar

Shadow receptor: 8 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July			August			September			October	November			December		
1	05:40			06:04		19:31 (D02)	06:34		18:41 (D03)	07:04	06:38			07:12		16:13 (D04)
	20:44			20:25	21	19:52 (D02)	19:43	32	19:13 (D03)	18:53	18:06			16:41	2	16:15 (D04)
2	05:40			06:05		19:30 (D02)	06:35		18:42 (D03)	07:05	06:39			07:13		
	20:44			20:24	22	19:52 (D02)	19:41	30	19:12 (D03)	18:51	17:05			16:41		
3	05:41			06:05		19:30 (D02)	06:36		18:42 (D03)	07:06	06:40			07:14		
	20:43			20:23	23	19:53 (D02)	19:40	29	19:11 (D03)	18:49	17:04			16:41		
4	05:41			06:06		19:29 (D02)	06:37		18:43 (D03)	07:07	06:41			07:15		
	20:43			20:22	24	19:53 (D02)	19:38	27	19:10 (D03)	18:48	17:02			16:40		
5	05:42			06:07		19:29 (D02)	06:38		18:44 (D03)	07:08	06:43			07:16		
	20:43			20:21	24	19:53 (D02)	19:36	24	19:08 (D03)	18:46	17:01			16:40		
6	05:42			06:08		19:29 (D02)	06:39		18:46 (D03)	07:09	06:44		16:04 (D04)	07:17		
	20:43			20:20	25	19:54 (D02)	19:35	20	19:06 (D03)	18:44	17:00	8	16:12 (D04)	16:40		
7	05:43			06:09		19:29 (D02)	06:40		18:48 (D03)	07:10	06:45		16:01 (D04)	07:18		
	20:43			20:19	25	19:54 (D02)	19:33	15	19:03 (D03)	18:43	16:59	13	16:14 (D04)	16:40		
8	05:44			06:10		19:29 (D02)	06:41		18:52 (D03)	07:11	06:46		16:00 (D04)	07:19		
	20:42			20:17	24	19:53 (D02)	19:31	6	18:58 (D03)	18:41	16:58	16	16:16 (D04)	16:40		
9	05:44			06:11		19:29 (D02)	06:42			07:12	06:47		15:59 (D04)	07:20		
	20:42			20:16	24	19:53 (D02)	19:30			18:39	16:57	19	16:18 (D04)	16:40		
10	05:45			06:12		19:29 (D02)	06:43			07:13	06:48		15:57 (D04)	07:21		
	20:42			20:15	22	19:51 (D02)	19:28			18:38	16:56	21	16:18 (D04)	16:40		
11	05:46			06:13		19:29 (D02)	06:44			07:14	06:50		15:58 (D04)	07:22		
	20:41			20:14	21	19:50 (D02)	19:26			18:36	16:55	22	16:20 (D04)	16:40		
12	05:46			06:14		19:30 (D02)	06:45			07:15	06:51		15:57 (D04)	07:23		
	20:41			20:12	19	19:49 (D02)	19:25			18:35	16:54	23	16:20 (D04)	16:40		
13	05:47			06:15		19:29 (D02)	06:46			07:16	06:52		15:56 (D04)	07:23		
	20:40			20:11	18	19:47 (D02)	19:23			18:33	16:53	25	16:21 (D04)	16:40		
14	05:48			06:16		19:30 (D02)	06:47			07:17	06:53		15:56 (D04)	07:24		
	20:40			20:10	16	19:46 (D02)	19:21			18:32	16:52	25	16:21 (D04)	16:40		
15	05:49			06:17		18:57 (D03)	06:48			07:19	06:54		15:57 (D04)	07:25		
	20:39			20:08	23	19:44 (D02)	19:20			18:30	16:51	25	16:22 (D04)	16:41		
16	05:49			06:18		18:54 (D03)	06:49			07:20	06:56		15:56 (D04)	07:26		
	20:39			20:07	26	19:43 (D02)	19:18			18:28	16:50	26	16:22 (D04)	16:41		
17	05:50			06:19		18:52 (D03)	06:50			07:21	06:57		15:56 (D04)	07:26		
	20:38			20:06	24	19:41 (D02)	19:16			18:27	16:49	26	16:22 (D04)	16:41		
18	05:51			06:20		18:50 (D03)	06:51			07:22	06:58		15:56 (D04)	07:27		
	20:37			20:04	23	19:13 (D03)	19:15			18:25	16:48	26	16:22 (D04)	16:41		
19	05:52			06:21		18:49 (D03)	06:52			07:23	06:59		15:58 (D04)	07:28		
	20:37			20:03	25	19:14 (D03)	19:13			18:24	16:48	24	16:22 (D04)	16:42		
20	05:53			06:22		18:47 (D03)	06:53			07:24	07:00		15:58 (D04)	07:28		
	20:36			20:01	28	19:15 (D03)	19:11			18:22	16:47	24	16:22 (D04)	16:42		
21	05:54			06:23		18:46 (D03)	06:54			07:25	07:01		15:58 (D04)	07:29		
	20:35			20:00	30	19:16 (D03)	19:10			18:21	16:46	23	16:21 (D04)	16:43		
22	05:54			06:24		18:45 (D03)	06:55			07:26	07:03		15:59 (D04)	07:29		
	20:35			19:58	32	19:17 (D03)	19:08			18:20	16:46	22	16:21 (D04)	16:43		
23	05:55			06:25		18:44 (D03)	06:56			07:27	07:04		15:59 (D04)	07:30		
	20:34			19:57	33	19:17 (D03)	19:06			18:18	16:45	21	16:20 (D04)	16:43		
24	05:56			06:26		18:44 (D03)	06:57			07:29	07:05		16:01 (D04)	07:30		
	20:33			19:55	33	19:17 (D03)	19:04			18:17	16:44	19	16:20 (D04)	16:44		
25	05:57			06:27		18:43 (D03)	06:58			07:30	07:06		16:02 (D04)	07:31		
	20:32			19:54	34	19:17 (D03)	19:03			18:15	16:44	17	16:19 (D04)	16:45		
26	05:58			06:28		18:43 (D03)	06:59			07:31	07:07		16:03 (D04)	07:31		
	20:31			19:52	34	19:17 (D03)	19:01			18:14	16:43	15	16:18 (D04)	16:45		
27	05:59		19:38 (D02)	06:29		18:42 (D03)	07:00			07:32	07:08		16:04 (D04)	07:31		
	20:30	8	19:46 (D02)	19:51	35	19:17 (D03)	18:59			18:13	16:43	14	16:18 (D04)	16:46		
28	06:00		19:36 (D02)	06:30		18:42 (D03)	07:01			07:33	07:09		16:05 (D04)	07:32		
	20:29	12	19:48 (D02)	19:49	35	19:17 (D03)	18:58			18:11	16:42	12	16:17 (D04)	16:46		
29	06:01		19:33 (D02)	06:31		18:42 (D03)	07:02			07:34	07:10		16:06 (D04)	07:32		
	20:28	16	19:49 (D02)	19:48	34	19:16 (D03)	18:56			18:10	16:42	11	16:17 (D04)	16:47		
30	06:02		19:32 (D02)	06:32		18:42 (D03)	07:03			07:35	07:11		16:08 (D04)	07:32		
	20:27	18	19:50 (D02)	19:46	34	19:16 (D03)	18:54			18:09	16:42	8	16:16 (D04)	16:48		
31	06:03		19:31 (D02)	06:33		18:42 (D03)				07:37				07:32		
	20:26	20	19:51 (D02)	19:44	33	19:15 (D03)				18:07				16:49		
Potential sun hours	458			428			375			346	298			288		
Total, worst case		74			824			183				485			2	
Sun reduction		0.97			0.96			0.93				0.61			0.47	
Oper. time red.		1.00			1.00			1.00				1.00			1.00	
Wind dir. red.		0.52			0.58			0.61				0.87			0.87	
Total reduction		0.53			0.58			0.60				0.56			0.43	
Total, real		39			476			109				271			1	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 9 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April			May			June	
1	07:32			07:19		16:28 (D04)	06:43	06:52			06:07		19:18 (D02)	05:39	
	16:50			17:23	20	16:48 (D04)	17:57	19:31			20:03	23	19:41 (D02)	20:32	
2	07:33			07:18		16:29 (D04)	06:41	06:51		18:56 (D03)	06:06		19:17 (D02)	05:38	
	16:50			17:25	18	16:47 (D04)	17:58	19:32	6	19:02 (D03)	20:04	25	19:42 (D02)	20:33	
3	07:33			07:17		16:30 (D04)	06:40	06:49		18:51 (D03)	06:05		19:17 (D02)	05:38	
	16:51			17:26	16	16:46 (D04)	18:00	19:33	15	19:06 (D03)	20:05	24	19:41 (D02)	20:34	
4	07:33			07:16		16:32 (D04)	06:38	06:48		18:49 (D03)	06:03		19:17 (D02)	05:38	
	16:52			17:27	12	16:44 (D04)	18:01	19:34	20	19:09 (D03)	20:06	24	19:41 (D02)	20:34	
5	07:33			07:15		16:36 (D04)	06:37	06:46		18:46 (D03)	06:02		19:17 (D02)	05:37	
	16:53			17:28	5	16:41 (D04)	18:02	19:35	24	19:10 (D03)	20:07	24	19:41 (D02)	20:35	
6	07:33			07:14			06:35	06:44		18:44 (D03)	06:01		19:17 (D02)	05:37	
	16:54			17:30			18:03	19:36	27	19:11 (D03)	20:08	24	19:41 (D02)	20:36	
7	07:33			07:13			06:34	06:43		18:44 (D03)	06:00		19:18 (D02)	05:37	
	16:55			17:31			18:04	19:37	28	19:12 (D03)	20:09	22	19:40 (D02)	20:36	
8	07:32			07:12			07:32	06:41		18:42 (D03)	05:59		19:18 (D02)	05:36	
	16:56			17:32			19:05	19:38	30	19:12 (D03)	20:10	22	19:40 (D02)	20:37	
9	07:32			07:10			07:30	06:39		18:41 (D03)	05:57		19:19 (D02)	05:36	
	16:57			17:33			19:06	19:40	31	19:12 (D03)	20:11	20	19:39 (D02)	20:38	
10	07:32			07:09			07:29	06:38		18:41 (D03)	05:56		19:19 (D02)	05:36	
	16:58			17:35			19:07	19:41	32	19:13 (D03)	20:12	18	19:37 (D02)	20:38	
11	07:32			07:08			07:27	06:36		18:39 (D03)	05:55		19:20 (D02)	05:36	
	16:59			17:36			19:09	19:42	34	19:13 (D03)	20:13	16	19:36 (D02)	20:39	
12	07:32		16:30 (D04)	07:07			07:26	06:35		18:40 (D03)	05:54		19:22 (D02)	05:36	
	17:00	4	16:34 (D04)	17:37			19:10	19:43	33	19:13 (D03)	20:14	13	19:35 (D02)	20:39	
13	07:31		16:28 (D04)	07:05			07:24	06:33		18:39 (D03)	05:53		19:24 (D02)	05:36	
	17:01	8	16:36 (D04)	17:38			19:11	19:44	34	19:13 (D03)	20:15	9	19:33 (D02)	20:40	
14	07:31		16:26 (D04)	07:04			07:22	06:32		18:39 (D03)	05:52			05:36	
	17:02	11	16:37 (D04)	17:39			19:12	19:45	34	19:13 (D03)	20:16			20:40	
15	07:31		16:26 (D04)	07:03			07:21	06:30		18:39 (D03)	05:51			05:36	
	17:03	13	16:39 (D04)	17:41			19:13	19:46	33	19:12 (D03)	20:17			20:41	
16	07:30		16:25 (D04)	07:02			07:19	06:28		18:39 (D03)	05:50			05:36	
	17:04	14	16:39 (D04)	17:42			19:14	19:47	33	19:12 (D03)	20:18			20:41	
17	07:30		16:25 (D04)	07:00			07:17	06:27		18:39 (D03)	05:49			05:36	
	17:05	16	16:41 (D04)	17:43			19:15	19:48	32	19:11 (D03)	20:19			20:41	
18	07:29		16:24 (D04)	06:59			07:16	06:25		18:40 (D03)	05:48			05:36	
	17:07	18	16:42 (D04)	17:44			19:16	19:49	30	19:10 (D03)	20:20			20:42	
19	07:29		16:24 (D04)	06:58			07:14	06:24		18:40 (D03)	05:47			05:36	
	17:08	20	16:44 (D04)	17:46			19:17	19:50	29	19:09 (D03)	20:21			20:42	
20	07:28		16:24 (D04)	06:56			07:12	06:22		18:41 (D03)	05:47			05:36	
	17:09	21	16:45 (D04)	17:47			19:18	19:51	27	19:08 (D03)	20:22			20:42	
21	07:28		16:24 (D04)	06:55			07:11	06:21		18:41 (D03)	05:46			05:36	
	17:10	22	16:46 (D04)	17:48			19:19	19:52	25	19:06 (D03)	20:23			20:43	
22	07:27		16:24 (D04)	06:53			07:09	06:19		18:43 (D03)	05:45			05:36	
	17:11	23	16:47 (D04)	17:49			19:21	19:53	22	19:05 (D03)	20:24			20:43	
23	07:26		16:24 (D04)	06:52			07:07	06:18		18:44 (D03)	05:44			05:37	
	17:12	24	16:48 (D04)	17:50			19:22	19:54	18	19:02 (D03)	20:25			20:43	
24	07:26		16:23 (D04)	06:50			07:06	06:17		18:47 (D03)	05:43			05:37	
	17:14	25	16:48 (D04)	17:51			19:23	19:55	20	19:34 (D02)	20:26			20:43	
25	07:25		16:24 (D04)	06:49			07:04	06:15		18:52 (D03)	05:43			05:37	
	17:15	25	16:49 (D04)	17:53			19:24	19:56	14	19:35 (D02)	20:26			20:43	
26	07:24		16:24 (D04)	06:48			07:02	06:14		19:21 (D02)	05:42			05:38	
	17:16	25	16:49 (D04)	17:54			19:25	19:57	14	19:35 (D02)	20:27			20:44	
27	07:23		16:25 (D04)	06:46			07:01	06:12		19:20 (D02)	05:41			05:38	
	17:17	24	16:49 (D04)	17:55			19:26	19:58	17	19:37 (D02)	20:28			20:44	
28	07:22		16:25 (D04)	06:45			06:59	06:11		19:20 (D02)	05:41			05:38	
	17:18	24	16:49 (D04)	17:56			19:27	20:00	18	19:38 (D02)	20:29			20:44	
29	07:22		16:25 (D04)				06:57	06:10		19:18 (D02)	05:40			05:39	
	17:20	24	16:49 (D04)				19:28	20:01	20	19:38 (D02)	20:30			20:44	
30	07:21		16:26 (D04)				06:56	06:08		19:18 (D02)	05:40			05:39	
	17:21	23	16:49 (D04)				19:29	20:02	21	19:39 (D02)	20:31			20:44	
31	07:20		16:27 (D04)				06:54				05:39				
	17:22	21	16:48 (D04)				19:30				20:31				
Potential sun hours	298			297			369	398			448			452	
Total, worst case		385			71				721			264			
Sun reduction		0.45			0.62				0.82			0.92			
Oper. time red.		1.00			1.00				1.00			1.00			
Wind dir. red.		0.87			0.87				0.61			0.53			
Total reduction		0.41			0.57				0.52			0.51			
Total, real		158			40				376			133			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 9 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July		August		September		October	November		December
1	05:40		06:04		19:32 (D02)	06:34	18:38 (D03)	07:04	06:38	07:12
	20:44		20:25	14	19:46 (D02)	19:43 34	19:12 (D03)	18:53	18:06	16:41
2	05:40		06:05		19:30 (D02)	06:35	18:38 (D03)	07:05	06:39	07:13
	20:44		20:24	17	19:47 (D02)	19:41 33	19:11 (D03)	18:51	17:05	16:41
3	05:41		06:05		19:29 (D02)	06:36	18:39 (D03)	07:06	06:40	07:14
	20:43		20:23	19	19:48 (D02)	19:40 31	19:10 (D03)	18:49	17:04	16:41
4	05:41		06:06		19:29 (D02)	06:37	18:39 (D03)	07:07	06:41	07:15
	20:43		20:22	20	19:49 (D02)	19:38 30	19:09 (D03)	18:48	17:02	16:40
5	05:42		06:07		19:28 (D02)	06:38	18:40 (D03)	07:08	06:43	07:16
	20:43		20:21	22	19:50 (D02)	19:36 28	19:08 (D03)	18:46	17:01	16:40
6	05:42		06:08		19:27 (D02)	06:39	18:40 (D03)	07:09	06:44	16:05 (D04) 07:17
	20:43		20:20	23	19:50 (D02)	19:35 27	19:07 (D03)	18:44	17:00 7	16:12 (D04) 16:40
7	05:43		06:09		19:27 (D02)	06:40	18:41 (D03)	07:10	06:45	16:02 (D04) 07:18
	20:43		20:19	23	19:50 (D02)	19:33 24	19:05 (D03)	18:43	16:59 12	16:14 (D04) 16:40
8	05:44		06:10		19:27 (D02)	06:41	18:43 (D03)	07:11	06:46	16:01 (D04) 07:19
	20:42		20:17	24	19:51 (D02)	19:31 20	19:03 (D03)	18:41	16:58 16	16:17 (D04) 16:40
9	05:44		06:11		19:26 (D02)	06:42	18:45 (D03)	07:12	06:47	16:00 (D04) 07:20
	20:42		20:16	25	19:51 (D02)	19:30 15	19:00 (D03)	18:39	16:57 18	16:18 (D04) 16:40
10	05:45		06:12		19:26 (D02)	06:43	18:49 (D03)	07:13	06:48	15:58 (D04) 07:21
	20:42		20:15	25	19:51 (D02)	19:28 7	18:56 (D03)	18:38	16:56 21	16:19 (D04) 16:40
11	05:46		06:13		19:26 (D02)	06:44		07:14	06:50	15:59 (D04) 07:22
	20:41		20:14	24	19:50 (D02)	19:26		18:36	16:55 21	16:20 (D04) 16:40
12	05:46		06:14		19:26 (D02)	06:45		07:15	06:51	15:58 (D04) 07:23
	20:41		20:12	23	19:49 (D02)	19:25		18:35	16:54 23	16:21 (D04) 16:40
13	05:47		06:15		19:26 (D02)	06:46		07:16	06:52	15:57 (D04) 07:23
	20:40		20:11	21	19:47 (D02)	19:23		18:33	16:53 24	16:21 (D04) 16:40
14	05:48		06:16		19:26 (D02)	06:47		07:17	06:53	15:57 (D04) 07:24
	20:40		20:10	20	19:46 (D02)	19:21		18:32	16:52 24	16:21 (D04) 16:40
15	05:49		06:17		19:27 (D02)	06:48		07:19	06:54	15:58 (D04) 07:25
	20:39		20:08	17	19:44 (D02)	19:20		18:30	16:51 24	16:22 (D04) 16:41
16	05:49		06:18		19:27 (D02)	06:49		07:20	06:56	15:57 (D04) 07:26
	20:39		20:07	16	19:43 (D02)	19:18		18:28	16:50 25	16:22 (D04) 16:41
17	05:50		06:19		19:29 (D02)	06:50		07:21	06:57	15:57 (D04) 07:26
	20:38		20:06	13	19:42 (D02)	19:16		18:27	16:49 25	16:22 (D04) 16:41
18	05:51		06:20		18:56 (D03)	06:51		07:22	06:58	15:57 (D04) 07:27
	20:37		20:04	17	19:40 (D02)	19:15		18:25	16:48 25	16:22 (D04) 16:41
19	05:52		06:21		18:52 (D03)	06:52		07:23	06:59	15:59 (D04) 07:28
	20:37		20:03	20	19:39 (D02)	19:13		18:24	16:48 24	16:23 (D04) 16:42
20	05:53		06:22		18:50 (D03)	06:53		07:24	07:00	15:59 (D04) 07:28
	20:36		20:01	19	19:09 (D03)	19:11		18:22	16:47 23	16:22 (D04) 16:42
21	05:54		06:23		18:48 (D03)	06:54		07:25	07:01	15:59 (D04) 07:29
	20:35		20:00	22	19:10 (D03)	19:10		18:21	16:46 22	16:21 (D04) 16:43
22	05:54		06:24		18:46 (D03)	06:55		07:26	07:03	16:00 (D04) 07:29
	20:35		19:58	25	19:11 (D03)	19:08		18:20	16:46 21	16:21 (D04) 16:43
23	05:55		06:25		18:45 (D03)	06:56		07:27	07:04	16:00 (D04) 07:30
	20:34		19:57	27	19:12 (D03)	19:06		18:18	16:45 20	16:20 (D04) 16:43
24	05:56		06:26		18:44 (D03)	06:57		07:29	07:05	16:02 (D04) 07:30
	20:33		19:55	29	19:13 (D03)	19:04		18:17	16:44 18	16:20 (D04) 16:44
25	05:57		06:27		18:43 (D03)	06:58		07:30	07:06	16:03 (D04) 07:31
	20:32		19:54	30	19:13 (D03)	19:03		18:15	16:44 16	16:19 (D04) 16:45
26	05:58		06:28		18:42 (D03)	06:59		07:31	07:07	16:04 (D04) 07:31
	20:31		19:52	32	19:14 (D03)	19:01		18:14	16:43 14	16:18 (D04) 16:45
27	05:59		06:29		18:41 (D03)	07:00		07:32	07:08	16:05 (D04) 07:31
	20:30		19:51	33	19:14 (D03)	18:59		18:13	16:43 13	16:18 (D04) 16:46
28	06:00		06:30		18:41 (D03)	07:01		07:33	07:09	16:06 (D04) 07:32
	20:29		19:49	33	19:14 (D03)	18:58		18:11	16:42 11	16:17 (D04) 16:46
29	06:01		06:31		18:40 (D03)	07:02		07:34	07:10	16:08 (D04) 07:32
	20:28		19:48	34	19:14 (D03)	18:56		18:10	16:42 9	16:17 (D04) 16:47
30	06:02	19:36 (D02)	06:32		18:40 (D03)	07:03		07:35	07:11	16:10 (D04) 07:32
	20:27 5	19:41 (D02)	19:46	33	19:13 (D03)	18:54		18:09	16:42 6	16:16 (D04) 16:48
31	06:03	19:33 (D02)	06:33		18:40 (D03)			07:37		07:32
	20:26 11	19:44 (D02)	19:44	33	19:13 (D03)			18:07		16:49
Potential sun hours	458		428		375			346	298	288
Total, worst case	16		733		249				462	
Sun reduction	0.97		0.96		0.93				0.61	
Oper. time red.	1.00		1.00		1.00				1.00	
Wind dir. red.	0.53		0.58		0.62				0.87	
Total reduction	0.53		0.58		0.61				0.56	
Total, real	9		423		151				257	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 10 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (85)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April		May		June	July	August		September		October	November	December
1	07:32	07:19	06:43	06:52		18:52 (D03)	06:07	19:15 (D02)	05:39	05:40	06:04		06:34	18:37 (D03)	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	12	19:04 (D03)	20:03	24 19:39 (D02)	20:32	20:44	20:25		19:43	33 19:10 (D03)	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51		18:48 (D03)	06:06	19:16 (D02)	05:38	05:40	06:05	19:32 (D02)	06:35	18:36 (D03)	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	18	19:06 (D03)	20:04	24 19:40 (D02)	20:33	20:44	20:24	9 19:41 (D02)	19:41	33 19:09 (D03)	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49		18:46 (D03)	06:05	19:15 (D02)	05:38	05:41	06:05	19:30 (D02)	06:36	18:36 (D03)	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	22	19:08 (D03)	20:05	23 19:38 (D02)	20:34	20:43	20:23	13 19:43 (D02)	19:40	33 19:09 (D03)	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48		18:45 (D03)	06:03	19:15 (D02)	05:38	05:41	06:06	19:29 (D02)	06:37	18:36 (D03)	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	24	19:09 (D03)	20:06	23 19:38 (D02)	20:34	20:43	20:22	16 19:45 (D02)	19:38	32 19:08 (D03)	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46		18:43 (D03)	06:02	19:16 (D02)	05:37	05:42	06:07	19:28 (D02)	06:38	18:37 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	27	19:10 (D03)	20:07	22 19:38 (D02)	20:35	20:43	20:21	18 19:46 (D02)	19:36	30 19:07 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44		18:41 (D03)	06:01	19:17 (D02)	05:37	05:42	06:08	19:27 (D02)	06:39	18:37 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	29	19:10 (D03)	20:08	20 19:37 (D02)	20:36	20:43	20:20	20 19:47 (D02)	19:35	29 19:06 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43		18:41 (D03)	06:00	19:17 (D02)	05:37	05:43	06:09	19:26 (D02)	06:40	18:38 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	30	19:11 (D03)	20:09	20 19:37 (D02)	20:36	20:43	20:19	21 19:47 (D02)	19:33	27 19:05 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41		18:39 (D03)	05:59	19:18 (D02)	05:36	05:44	06:10	19:25 (D02)	06:41	18:39 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	32	19:11 (D03)	20:10	18 19:36 (D02)	20:37	20:42	20:17	23 19:48 (D02)	19:31	25 19:04 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39		18:38 (D03)	05:57	19:20 (D02)	05:36	05:44	06:11	19:25 (D02)	06:42	18:40 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	33	19:11 (D03)	20:11	14 19:34 (D02)	20:38	20:42	20:16	23 19:48 (D02)	19:30	22 19:02 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38		18:39 (D03)	05:56	19:20 (D02)	05:36	05:45	06:12	19:25 (D02)	06:43	18:41 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	32	19:11 (D03)	20:12	12 19:32 (D02)	20:38	20:42	20:15	23 19:48 (D02)	19:28	19 19:00 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36		18:38 (D03)	05:55	19:23 (D02)	05:36	05:46	06:13	19:24 (D02)	06:44	18:44 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	33	19:11 (D03)	20:13	6 19:29 (D02)	20:39	20:41	20:14	24 19:48 (D02)	19:26	12 18:56 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35		18:38 (D03)	05:54		05:36	05:46	06:14	19:24 (D02)	06:45		07:15	06:51	07:23
	17:00	17:37	19:10	19:43	33	19:11 (D03)	20:14		20:39	20:41	20:12	24 19:48 (D02)	19:25		18:35	16:54	16:40
13	07:31	07:05	07:24	06:33		18:38 (D03)	05:53		05:36	05:47	06:15	19:23 (D02)	06:46		07:16	06:52	07:23
	17:01	17:38	19:11	19:44	32	19:10 (D03)	20:15		20:40	20:40	20:11	24 19:47 (D02)	19:23		18:33	16:53	16:40
14	07:31	07:04	07:22	06:32		18:38 (D03)	05:52		05:36	05:48	06:16	19:23 (D02)	06:47		07:17	06:53	07:24
	17:02	17:39	19:12	19:45	32	19:10 (D03)	20:16		20:40	20:40	20:10	23 19:46 (D02)	19:21		18:32	16:52	16:40
15	07:31	07:03	07:21	06:30		18:38 (D03)	05:51		05:36	05:49	06:17	19:24 (D02)	06:48		07:19	06:54	07:25
	17:03	17:41	19:13	19:46	31	19:09 (D03)	20:17		20:41	20:39	20:08	20 19:44 (D02)	19:20		18:30	16:51	16:41
16	07:30	07:02	07:19	06:28		18:39 (D03)	05:50		05:36	05:49	06:18	19:24 (D02)	06:49		07:20	06:56	07:26
	17:04	17:42	19:14	19:47	29	19:08 (D03)	20:18		20:41	20:39	20:07	19 19:43 (D02)	19:18		18:28	16:50	16:41
17	07:30	07:00	07:17	06:27		18:39 (D03)	05:49		05:36	05:50	06:19	19:25 (D02)	06:50		07:21	06:57	07:26
	17:05	17:43	19:15	19:48	28	19:07 (D03)	20:19		20:41	20:38	20:06	17 19:42 (D02)	19:16		18:27	16:49	16:41
18	07:29	06:59	07:16	06:25		18:40 (D03)	05:48		05:36	05:51	06:20	19:25 (D02)	06:51		07:22	06:58	07:27
	17:07	17:44	19:16	19:49	26	19:06 (D03)	20:20		20:42	20:37	20:04	15 19:40 (D02)	19:15		18:25	16:48	16:41
19	07:29	06:58	07:14	06:24		18:41 (D03)	05:47		05:36	05:52	06:21	19:27 (D02)	06:52		07:23	06:59	07:28
	17:08	17:46	19:17	19:50	23	19:04 (D03)	20:21		20:42	20:37	20:03	12 19:39 (D02)	19:13		18:24	16:48	16:42
20	07:28	06:56	07:12	06:22		18:42 (D03)	05:47		05:36	05:53	06:22	19:29 (D02)	06:53		07:24	07:00	07:28
	17:09	17:47	19:18	19:51	21	19:03 (D03)	20:22		20:42	20:36	20:01	9 19:38 (D02)	19:11		18:22	16:47	16:42
21	07:28	06:55	07:11	06:21		18:44 (D03)	05:46		05:36	05:54	06:23	18:51 (D03)	06:54		07:25	07:01	07:29
	17:10	17:48	19:19	19:52	16	19:00 (D03)	20:23		20:43	20:35	20:00	12 19:03 (D03)	19:10		18:21	16:46	16:43
22	07:27	06:53	07:09	06:19		18:47 (D03)	05:45		05:36	05:54	06:24	18:48 (D03)	06:55		07:26	07:03	07:29
	17:11	17:49	19:21	19:53	13	19:30 (D02)	20:24		20:43	20:35	19:58	17 19:05 (D03)	19:08		18:20	16:46	16:43
23	07:26	06:52	07:07	06:18		19:22 (D02)	05:44		05:37	05:55	06:25	18:46 (D03)	06:56		07:27	07:04	07:30
	17:12	17:50	19:22	19:54	10	19:32 (D02)	20:25		20:43	20:34	19:57	21 19:07 (D03)	19:06		18:18	16:45	16:43
24	07:26	06:50	07:06	06:17		19:21 (D02)	05:43		05:37	05:56	06:26	18:44 (D03)	06:57		07:29	07:05	07:30
	17:14	17:51	19:23	19:55	13	19:34 (D02)	20:26		20:43	20:33	19:55	24 19:08 (D03)	19:04		18:17	16:44	16:44
25	07:25	06:49	07:04	06:15		19:19 (D02)	05:43		05:37	05:57	06:27	18:43 (D03)	06:58		07:30	07:06	07:30
	17:15	17:53	19:24	19:56	16	19:35 (D02)	20:26		20:43	20:32	19:54	26 19:09 (D03)	19:03		18:15	16:44	16:45
26	07:24	06:48	07:02	06:14		19:18 (D02)	05:42		05:38	05:58	06:28	18:42 (D03)	06:59		07:31	07:07	07:31
	17:16	17:54	19:25	19:57	17	19:35 (D02)	20:27		20:44	20:31	19:52	28 19:10 (D03)	19:01		18:14	16:43	16:45
27	07:23	06:46	07:01	06:12		19:17 (D02)	05:41		05:38	05:59	06:29	18:41 (D03)	07:00		07:32	07:08	07:31
	17:17	17:55	19:26	19:58	20	19:37 (D02)	20:28		20:44	20:30	19:51	29 19:10 (D03)	18:59		18:13	16:43	16:46
28	07:22	06:45	06:59	06:11		19:17 (D02)	05:41		05:38	06:00	06:30	18:40 (D03)	07:01		07:33	07:09	07:32
	17:18	17:56	19:27	20:00	21	19:38 (D02)	20:29		20:44	20:29	19:49	31 19:11 (D03)	18:58		18:11	16:42	16:46
29	07:22		06:57	06:10		19:15 (D02)	05:40		05:39	06:01	06:31	18:39 (D03)	07:02		07:34	07:10	07:32
	17:20		19:28	20:01	23	19:38 (D02)	20:30		20:44	20:28	19:48	32 19:11 (D03)	18:56		18:10	16:42	16:47
30	07:21		06:56	06:08		19:15 (D02)	05:40		05:39	06:02	06:32	18:39 (D03)	07:03		07:35	07:11	07:32
	17:21		19:29	20:02	24	19:39 (D02)	20:31		20:44	20:27	19:46	32 19:11 (D03)	18:54		18:09	16:42	16:48
31	07:20		06:54				05:39			06:03	06:33	18:38 (D03)			07:37		07:32
	17:22		19:30				20:31			20:26	19:44	33 19:11 (D03)			18:07		16:49
Potential sun hours	298	297	369	398			448	452	458	428		375		346	298	288	
Total, worst case					720		206				638		295				
Sun reduction					0.82		0.92				0.96		0.93				
Oper. time red.					1.00		1.00				1.00		1.00				
Wind dir. red.					0.61		0.53				0.58		0.63				
Total reduction					0.50		0.49				0.55		0.59				
Total, real					362		101				353		174				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 11 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (86)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 12 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (87)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
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	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
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	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
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	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
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	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
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	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
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	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
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	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
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	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
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	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 13 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (88)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
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	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
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	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
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	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
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	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
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	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
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	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
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	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
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	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
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	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
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27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
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29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 14 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (89)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:28 (D03)	06:07	05:39	05:40	06:04	06:34	18:27 (D03)	07:04	06:38	07:12
	16:50	17:23	17:57	19:31 32	19:00 (D03)	20:03	20:32	20:44	20:25	19:43 25	18:52 (D03)	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	18:27 (D03)	06:06	05:38	05:40	06:05	06:35	18:26 (D03)	07:05	06:39	07:13
	16:50	17:25	17:58	19:32 33	19:00 (D03)	20:04	20:33	20:44	20:24	19:41 27	18:53 (D03)	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	18:26 (D03)	06:05	05:38	05:41	06:05	06:36	18:24 (D03)	07:06	06:40	07:14
	16:51	17:26	18:00	19:33 33	18:59 (D03)	20:05	20:34	20:43	20:23	19:40 29	18:53 (D03)	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	18:26 (D03)	06:03	05:38	05:41	06:06	06:37	18:23 (D03)	07:07	06:41	07:15
	16:52	17:27	18:01	19:34 34	19:00 (D03)	20:06	20:34	20:43	20:22	19:38 31	18:54 (D03)	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	18:26 (D03)	06:02	05:37	05:42	06:07	06:38	18:22 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02	19:35 33	18:59 (D03)	20:07	20:35	20:43	20:21	19:36 32	18:54 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	18:26 (D03)	06:01	05:37	05:42	06:08	06:39	18:22 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03	19:36 32	18:58 (D03)	20:08	20:36	20:43	20:20	19:35 32	18:54 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	18:26 (D03)	06:00	05:37	05:43	06:09	06:40	18:21 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04	19:37 32	18:58 (D03)	20:09	20:36	20:43	20:19	19:33 33	18:54 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	18:26 (D03)	05:59	05:36	05:44	06:10	06:41	18:21 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05	19:38 31	18:57 (D03)	20:10	20:37	20:42	20:17	19:31 33	18:54 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	18:26 (D03)	05:57	05:36	05:44	06:11	06:42	18:20 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06	19:40 29	18:55 (D03)	20:11	20:38	20:42	20:16	19:30 34	18:54 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	18:28 (D03)	05:56	05:36	05:45	06:12	06:43	18:20 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07	19:41 27	18:55 (D03)	20:12	20:38	20:42	20:15	19:28 33	18:53 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	18:28 (D03)	05:55	05:36	05:46	06:13	06:44	18:20 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09	19:42 25	18:53 (D03)	20:13	20:39	20:41	20:14	19:26 32	18:52 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	18:30 (D03)	05:54	05:36	05:46	06:14	06:45	18:20 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10	19:43 21	18:51 (D03)	20:14	20:39	20:41	20:12	19:25 32	18:52 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	18:31 (D03)	05:53	05:36	05:47	06:15	06:46	18:20 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11	19:44 18	18:49 (D03)	20:15	20:40	20:40	20:11	19:23 31	18:51 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	18:34 (D03)	05:52	05:36	05:48	06:16	06:47	18:21 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12	19:45 12	18:46 (D03)	20:16	20:40	20:40	20:10	19:21 29	18:50 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30		05:51	05:36	05:49	06:17	06:48	18:21 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13	19:46		20:17	20:41	20:39	20:08	19:20 27	18:48 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28		05:50	05:36	05:49	06:18	06:49	18:22 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14	19:47		20:18	20:41	20:39	20:07	19:18 25	18:47 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27		05:49	05:36	05:50	06:19	06:50	18:24 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15	19:48		20:19	20:41	20:38	20:06	19:16 21	18:45 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25		05:48	05:36	05:51	06:20	06:51	18:26 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16	19:49		20:20	20:42	20:37	20:04	19:15 16	18:42 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24		05:47	05:36	05:52	06:21	06:52	18:28 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17	19:50		20:21	20:42	20:37	20:03	19:13 9	18:37 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22		05:47	05:36	05:53	06:22	06:53		07:24	07:00	07:28
	17:09	17:47	19:18	19:51		20:22	20:42	20:36	20:01	19:11		18:22	16:47	16:42
21	07:28	06:55	07:11	06:21		05:46	05:36	05:54	06:23	06:54		07:25	07:01	07:29
	17:10	17:48	19:19	19:52		20:23	20:43	20:35	20:00	19:10		18:21	16:46	16:43
22	07:27	06:53	07:09	06:19		05:45	05:36	05:54	06:24	06:55		07:26	07:03	07:29
	17:11	17:49	19:21	19:53		20:24	20:43	20:35	19:58	19:08		18:20	16:46	16:43
23	07:26	06:52	07:07	06:18		05:44	05:37	05:55	06:25	06:56		07:27	07:04	07:30
	17:12	17:50	19:22	19:54		20:25	20:43	20:34	19:57	19:06		18:18	16:45	16:43
24	07:26	06:50	07:06	18:43 (D03)	06:17	05:43	05:37	05:56	06:26	06:57		07:29	07:05	07:30
	17:14	17:51	19:23 6	18:49 (D03)	19:55	20:26	20:43	20:33	19:55	19:04		18:17	16:44	16:44
25	07:25	06:49	07:04	18:38 (D03)	06:15	05:43	05:37	05:57	06:27	06:58		07:30	07:06	07:31
	17:15	17:53	19:24 15	18:53 (D03)	19:56	20:26	20:43	20:32	19:54	19:03		18:15	16:44	16:45
26	07:24	06:48	07:02	18:35 (D03)	06:14	05:42	05:38	05:58	06:28	06:59		07:31	07:07	07:31
	17:16	17:54	19:25 20	18:55 (D03)	19:57	20:27	20:44	20:31	19:52	19:01		18:14	16:43	16:45
27	07:23	06:46	07:01	18:33 (D03)	06:12	05:41	05:38	05:59	06:29	07:00		07:32	07:08	07:31
	17:17	17:55	19:26 24	18:57 (D03)	19:58	20:28	20:44	20:30	19:51	18:59		18:13	16:43	16:46
28	07:22	06:45	06:59	18:31 (D03)	06:11	05:41	05:38	06:00	06:30	07:01		07:33	07:09	07:32
	17:18	17:56	19:27 27	18:58 (D03)	20:00	20:29	20:44	20:29	19:49	18:58		18:11	16:42	16:46
29	07:22		06:57	18:30 (D03)	06:10	05:40	05:39	06:01	06:31 18:35 (D03)	07:02		07:34	07:10	07:32
	17:20		19:28 28	18:58 (D03)	20:01	20:30	20:44	20:28	19:48 12 18:47 (D03)	18:56		18:10	16:42	16:47
30	07:21		06:56	18:29 (D03)	06:08	05:40	05:39	06:02	06:32 18:32 (D03)	07:03		07:35	07:11	07:32
	17:21		19:29 30	18:59 (D03)	20:02	20:31	20:44	20:27	19:46 18 18:50 (D03)	18:54		18:09	16:42	16:48
31	07:20		06:54	18:28 (D03)		05:39		06:03	06:33 18:30 (D03)			07:37		07:32
	17:22		19:30 31	18:59 (D03)		20:31		20:26	19:44 21 18:51 (D03)			18:07		16:49
Potential sun hours	298	297	369	398		448	452	458	428	375		346	298	288
Total, worst case			181	392					51	531				
Sun reduction			0.73	0.82					0.96	0.93				
Oper. time red.			1.00	1.00					1.00	1.00				
Wind dir. red.			0.67	0.67					0.67	0.67				
Total reduction			0.49	0.55					0.65	0.63				
Total, real			89	217					33	333				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 15 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (90)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 16 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (91)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:13 (D03)	06:07	05:39	05:40	06:04	06:34	19:09 (D02)	07:04	06:38	07:12
	16:50	17:23	17:57	19:31 29	18:42 (D03)	20:03	20:32	20:44	20:25	19:43 4	19:13 (D02)	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	18:13 (D03)	06:06	05:38	05:40	06:05	06:35		07:05	06:39	07:13
	16:50	17:25	17:58	19:32 28	18:41 (D03)	20:04	20:33	20:44	20:24	19:41		18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	18:14 (D03)	06:05	05:38	05:41	06:05	06:36		07:06	06:40	07:14
	16:51	17:26	18:00	19:33 25	18:39 (D03)	20:05	20:34	20:43	20:23	19:40		18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	18:16 (D03)	06:03	05:38	05:41	06:06	06:37		07:07	06:41	07:15
	16:52	17:27	18:01	19:34 21	18:37 (D03)	20:06	20:34	20:43	20:22	19:38		18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	18:18 (D03)	06:02	05:37	05:42	06:07	06:38		07:08	06:43	07:16
	16:53	17:28	18:02	19:35 16	18:34 (D03)	20:07	20:35	20:43	20:21	19:36		18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	18:21 (D03)	06:01	05:37	05:42	06:08	06:39	18:17 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03	19:36 9	18:30 (D03)	20:08	20:36	20:43	20:20	19:35 8	18:25 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43		06:00	05:37	05:43	06:09	06:40	18:13 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04	19:37		20:09	20:36	20:43	20:19	19:33 16	18:29 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41		05:59	05:36	05:44	06:10	06:41	18:10 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05	19:38		20:10	20:37	20:42	20:17	19:31 21	18:31 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39		05:57	05:36	05:44	06:11	06:42	18:08 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06	19:40		20:11	20:38	20:42	20:16	19:30 25	18:33 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38		05:56	05:36	05:45	06:12	06:43	18:06 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07	19:41		20:12	20:38	20:42	20:15	19:28 28	18:34 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	19:10 (D02)	05:55	05:36	05:46	06:13	06:44	18:05 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09	19:42 4	19:14 (D02)	20:13	20:39	20:41	20:14	19:26 29	18:34 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	19:06 (D02)	05:54	05:36	05:46	06:14	06:45	18:04 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10	19:43 12	19:18 (D02)	20:14	20:39	20:41	20:12	19:25 31	18:35 (D03)	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	19:03 (D02)	05:53	05:36	05:47	06:15	06:46	18:03 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11	19:44 17	19:20 (D02)	20:15	20:40	20:40	20:11	19:23 32	18:35 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	19:02 (D02)	05:52	05:36	05:48	06:16 19:11 (D02)	06:47	18:02 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12	19:45 20	19:22 (D02)	20:16	20:40	20:40	20:10 10 19:21 (D02)	19:21 34	18:36 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21	18:27 (D03) 06:30	19:00 (D02)	05:51	05:36	05:49	06:17 19:08 (D02)	06:48	18:01 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13 10	18:37 (D03) 19:46 22	19:22 (D02)	20:17	20:41	20:39	20:08 15 19:23 (D02)	19:20 35	18:36 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19	18:22 (D03) 06:28	18:59 (D02)	05:50	05:36	05:49	06:18 19:07 (D02)	06:49	18:00 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14 18	18:40 (D03) 19:47 24	19:23 (D02)	20:18	20:41	20:39	20:07 17 19:24 (D02)	19:18 36	18:36 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17	18:21 (D03) 06:27	18:58 (D02)	05:49	05:36	05:50	06:19 19:05 (D02)	06:50	18:00 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15 22	18:43 (D03) 19:48 25	19:23 (D02)	20:19	20:41	20:38	20:06 20 19:25 (D02)	19:16 35	18:35 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16	18:18 (D03) 06:25	18:58 (D02)	05:48	05:36	05:51	06:20 19:04 (D02)	06:51	17:59 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16 26	18:44 (D03) 19:49 25	19:23 (D02)	20:20	20:42	20:37	20:04 22 19:26 (D02)	19:15 36	18:35 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14	18:16 (D03) 06:24	18:57 (D02)	05:47	05:36	05:52	06:21 19:03 (D02)	06:52	17:58 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17 29	18:45 (D03) 19:50 26	19:23 (D02)	20:21	20:42	20:37	20:03 24 19:27 (D02)	19:13 35	18:33 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12	18:16 (D03) 06:22	18:57 (D02)	05:47	05:36	05:53	06:22 19:02 (D02)	06:53	17:58 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18 30	18:46 (D03) 19:51 26	19:23 (D02)	20:22	20:42	20:36	20:01 25 19:27 (D02)	19:11 35	18:33 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11	18:14 (D03) 06:21	18:57 (D02)	05:46	05:36	05:54	06:23 19:02 (D02)	06:54	17:58 (D03)	07:25	07:01	07:29
	17:10	17:48	19:19 32	18:46 (D03) 19:52 25	19:22 (D02)	20:23	20:43	20:35	20:00 25 19:27 (D02)	19:10 34	18:32 (D03)	18:21	16:46	16:43
22	07:27	06:53	07:09	18:13 (D03) 06:19	18:57 (D02)	05:45	05:36	05:54	06:24 19:01 (D02)	06:55	17:58 (D03)	07:26	07:03	07:29
	17:11	17:49	19:21 34	18:47 (D03) 19:53 25	19:22 (D02)	20:24	20:43	20:35	19:58 26 19:27 (D02)	19:08 33	18:31 (D03)	18:20	16:46	16:43
23	07:26	06:52	07:07	18:13 (D03) 06:18	18:57 (D02)	05:44	05:37	05:55	06:25 19:01 (D02)	06:56	17:59 (D03)	07:27	07:04	07:30
	17:12	17:50	19:22 34	18:47 (D03) 19:54 24	19:21 (D02)	20:25	20:43	20:34	19:57 26 19:27 (D02)	19:06 31	18:30 (D03)	18:18	16:45	16:43
24	07:26	06:50	07:06	18:12 (D03) 06:17	18:57 (D02)	05:43	05:37	05:56	06:26 19:01 (D02)	06:57	17:59 (D03)	07:29	07:05	07:30
	17:14	17:51	19:23 35	18:47 (D03) 19:55 24	19:21 (D02)	20:26	20:43	20:33	19:55 26 19:27 (D02)	19:04 30	18:29 (D03)	18:17	16:44	16:44
25	07:25	06:49	07:04	18:11 (D03) 06:15	18:58 (D02)	05:43	05:37	05:57	06:27 19:01 (D02)	06:58	18:00 (D03)	07:30	07:06	07:31
	17:15	17:53	19:24 36	18:47 (D03) 19:56 22	19:20 (D02)	20:26	20:43	20:32	19:54 25 19:26 (D02)	19:03 27	18:27 (D03)	18:15	16:44	16:45
26	07:24	06:48	07:02	18:10 (D03) 06:14	18:59 (D02)	05:42	05:38	05:58	06:28 19:01 (D02)	06:59	18:01 (D03)	07:31	07:07	07:31
	17:16	17:54	19:25 36	18:46 (D03) 19:57 19	19:18 (D02)	20:27	20:44	20:31	19:52 25 19:26 (D02)	19:01 24	18:25 (D03)	18:14	16:43	16:45
27	07:23	06:46	07:01	18:11 (D03) 06:12	19:00 (D02)	05:41	05:38	05:59	06:29 19:01 (D02)	07:00	18:03 (D03)	07:32	07:08	07:31
	17:17	17:55	19:26 35	18:46 (D03) 19:59 17	19:17 (D02)	20:28	20:44	20:30	19:51 24 19:25 (D02)	18:59 20	18:23 (D03)	18:13	16:43	16:46
28	07:22	06:45	06:59	18:11 (D03) 06:11	19:02 (D02)	05:41	05:38	06:00	06:30 19:02 (D02)	07:01	18:06 (D03)	07:33	07:09	07:32
	17:18	17:56	19:27 34	18:45 (D03) 20:00 14	19:16 (D02)	20:29	20:44	20:29	19:49 22 19:24 (D02)	18:58 13	18:19 (D03)	18:11	16:42	16:46
29	07:22		06:57	18:10 (D03) 06:10	19:04 (D02)	05:40	05:39	06:01	06:31 19:03 (D02)	07:02		07:34	07:10	07:32
	17:20		19:28 34	18:44 (D03) 20:01 8	19:12 (D02)	20:30	20:44	20:28	19:48 19 19:22 (D02)	18:56		18:10	16:42	16:47
30	07:21		06:56	18:11 (D03) 06:08		05:40	05:39	06:02	06:32 19:04 (D02)	07:03		07:35	07:11	07:32
	17:21		19:29 33	18:44 (D03) 20:02		20:31	20:44	20:27	19:46 17 19:21 (D02)	18:54		18:09	16:42	16:48
31	07:20		06:54	18:11 (D03)		05:39		06:03	06:33 19:06 (D02)			07:37		07:32
	17:22		19:30 32	18:43 (D03)		20:31		20:26	19:45 12 19:18 (D02)			18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			510	507				380	652			
Sun reduction			0.73	0.82				0.96	0.93			
Oper. time red.			1.00	1.00				1.00	1.00			
Wind dir. red.			0.72	0.61				0.58	0.72			
Total reduction			0.53	0.50				0.56	0.67			
Total, real			269	256				211	438			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 17 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (92)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March			April			May	June	July	August	September			October	November	December
1	07:32	07:19	06:43			06:52		18:27 (D03)	06:07	05:39	05:40	06:04	06:34			07:04	06:38	07:12
	16:50	17:23	17:57			19:31	30	18:57 (D03)	20:03	20:32	20:44	20:25	19:43			18:53	18:06	16:41
2	07:33	07:18	06:41			06:51		18:27 (D03)	06:06	05:38	05:40	06:05	06:35			07:05	06:39	07:13
	16:50	17:25	17:58			19:32	30	18:57 (D03)	20:04	20:33	20:44	20:24	19:41			18:51	17:05	16:41
3	07:33	07:17	06:40			06:49		18:27 (D03)	06:05	05:38	05:41	06:05	06:36		18:31 (D03)	07:06	06:40	07:14
	16:51	17:26	18:00			19:33	29	18:56 (D03)	20:05	20:34	20:43	20:23	19:40	12	18:43 (D03)	18:49	17:04	16:41
4	07:33	07:16	06:38			06:48		18:28 (D03)	06:03	05:38	05:41	06:06	06:37		18:29 (D03)	07:07	06:41	07:15
	16:52	17:27	18:01			19:34	27	18:55 (D03)	20:06	20:34	20:43	20:22	19:38	17	18:46 (D03)	18:48	17:02	16:40
5	07:33	07:15	06:37			06:46		18:28 (D03)	06:02	05:37	05:42	06:07	06:38		18:26 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02			19:35	26	18:54 (D03)	20:07	20:35	20:43	20:21	19:36	21	18:47 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35			06:44		18:29 (D03)	06:01	05:37	05:42	06:08	06:39		18:25 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03			19:36	23	18:52 (D03)	20:08	20:36	20:43	20:20	19:35	23	18:48 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34			06:43		18:30 (D03)	06:00	05:37	05:43	06:09	06:40		18:23 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04			19:37	21	18:51 (D03)	20:09	20:36	20:43	20:19	19:33	26	18:49 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32			06:41		18:32 (D03)	05:59	05:36	05:44	06:10	06:41		18:22 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05			19:38	17	18:49 (D03)	20:10	20:37	20:42	20:17	19:31	27	18:49 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30			06:39		18:33 (D03)	05:57	05:36	05:44	06:11	06:42		18:21 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06			19:40	12	18:45 (D03)	20:11	20:38	20:42	20:16	19:30	29	18:50 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29			06:38			05:56	05:36	05:45	06:12	06:43		18:21 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07			19:41			20:12	20:38	20:42	20:15	19:28	29	18:50 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27			06:36			05:55	05:36	05:46	06:13	06:44		18:20 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09			19:42			20:13	20:39	20:41	20:14	19:26	30	18:50 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26			06:35			05:54	05:36	05:46	06:14	06:45		18:20 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10			19:43			20:14	20:39	20:41	20:12	19:25	30	18:50 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24			06:33			05:53	05:36	05:47	06:15	06:46		18:19 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11			19:44			20:15	20:40	20:40	20:11	19:23	30	18:49 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22			06:32			05:52	05:36	05:48	06:16	06:47		18:19 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12			19:45			20:16	20:40	20:40	20:10	19:21	30	18:49 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21			06:30			05:51	05:36	05:49	06:17	06:48		18:19 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13			19:46			20:17	20:41	20:39	20:08	19:20	29	18:48 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19			06:28			05:50	05:36	05:49	06:18	06:49		18:19 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14			19:47			20:18	20:41	20:39	20:07	19:18	28	18:47 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17			06:27			05:49	05:36	05:50	06:19	06:50		18:20 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15			19:48			20:19	20:41	20:38	20:06	19:16	26	18:46 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16			06:25			05:48	05:36	05:51	06:20	06:51		18:20 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16			19:49			20:20	20:42	20:37	20:04	19:15	25	18:45 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14			06:24			05:47	05:36	05:52	06:21	06:52		18:20 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17			19:50			20:21	20:42	20:37	20:03	19:13	22	18:42 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12			06:22			05:47	05:36	05:53	06:22	06:53		18:22 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18			19:51			20:22	20:42	20:36	20:01	19:11	18	18:40 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11			06:21			05:46	05:36	05:53	06:23	06:54		18:24 (D03)	07:25	07:01	07:29
	17:10	17:48	19:19			19:52			20:23	20:43	20:35	20:00	19:10	13	18:37 (D03)	18:21	16:46	16:42
22	07:27	06:53	07:09		18:40 (D03)	06:19			05:45	05:36	05:54	06:24	06:55			07:26	07:03	07:29
	17:11	17:49	19:21	10	18:50 (D03)	19:53			20:24	20:43	20:35	19:58	19:08			18:19	16:46	16:43
23	07:26	06:52	07:07		18:37 (D03)	06:18			05:44	05:37	05:55	06:25	06:56			07:27	07:04	07:30
	17:12	17:50	19:22	17	18:54 (D03)	19:54			20:25	20:43	20:34	19:57	19:06			18:18	16:45	16:43
24	07:26	06:50	07:06		18:34 (D03)	06:17			05:43	05:37	05:56	06:26	06:57			07:29	07:05	07:30
	17:14	17:51	19:23	21	18:55 (D03)	19:55			20:26	20:43	20:33	19:55	19:04			18:17	16:44	16:44
25	07:25	06:49	07:04		18:32 (D03)	06:15			05:43	05:37	05:57	06:27	06:58			07:30	07:06	07:30
	17:15	17:53	19:24	24	18:56 (D03)	19:56			20:26	20:43	20:32	19:54	19:03			18:15	16:44	16:45
26	07:24	06:48	07:02		18:31 (D03)	06:14			05:42	05:38	05:58	06:28	06:59			07:31	07:07	07:31
	17:16	17:54	19:25	25	18:56 (D03)	19:57			20:27	20:44	20:31	19:52	19:01			18:14	16:43	16:45
27	07:23	06:46	07:01		18:30 (D03)	06:12			05:41	05:38	05:59	06:29	07:00			07:32	07:08	07:31
	17:17	17:55	19:26	28	18:58 (D03)	19:58			20:28	20:44	20:30	19:51	18:59			18:12	16:43	16:46
28	07:22	06:45	06:59		18:29 (D03)	06:11			05:41	05:38	06:00	06:30	07:01			07:33	07:09	07:32
	17:18	17:56	19:27	29	18:58 (D03)	20:00			20:29	20:44	20:29	19:49	18:58			18:11	16:42	16:46
29	07:22		06:57		18:28 (D03)	06:10			05:40	05:39	06:01	06:31	07:02			07:34	07:10	07:32
	17:20		19:28	29	18:57 (D03)	20:01			20:30	20:44	20:28	19:48	18:56			18:10	16:42	16:47
30	07:21		06:56		18:28 (D03)	06:08			05:40	05:39	06:02	06:32	07:03			07:35	07:11	07:32
	17:21		19:29	30	18:58 (D03)	20:02			20:31	20:44	20:27	19:46	18:54			18:09	16:42	16:48
31	07:20		06:54		18:27 (D03)				05:39		06:03	06:33				07:37		07:32
	17:22		19:30	30	18:57 (D03)				20:31		20:26	19:44				18:07		16:49
Potential sun hours	298	297	369			398			448	452	458	428	375			346	298	288
Total, worst case				243			215							465				
Sun reduction				0.73			0.82							0.93				
Oper. time red.				1.00			1.00							1.00				
Wind dir. red.				0.69			0.69							0.69				
Total reduction				0.50			0.56							0.64				
Total, real				122			121							297				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 18 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (93)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March		April			May	June	July	August			September			October			November	December
1	07:32	07:19	06:43		06:52		18:18 (D03)	06:07	05:39	05:40	06:04			06:34		18:56 (D02)	07:04		18:00 (D03)	06:38	07:12
	16:50	17:23	17:57		19:31	11	18:29 (D03)	20:03	20:32	20:44	20:25			19:43	20	19:16 (D02)	18:53	16	18:16 (D03)	18:06	16:41
2	07:33	07:18	06:41		06:51			06:06	05:38	05:40	06:05			06:35		18:57 (D02)	07:05		18:03 (D03)	06:39	07:13
	16:50	17:25	17:58		19:32			20:04	20:33	20:44	20:24			19:41	18	19:15 (D02)	18:51	8	18:11 (D03)	17:05	16:41
3	07:33	07:17	06:40		06:49			06:05	05:38	05:41	06:05			06:36		18:58 (D02)	07:06			06:40	07:14
	16:51	17:26	18:00		19:33			20:05	20:34	20:43	20:23			19:40	15	19:13 (D02)	18:49			17:04	16:41
4	07:33	07:16	06:38		06:48			06:03	05:38	05:41	06:06			06:37		19:00 (D02)	07:07			06:41	07:15
	16:52	17:27	18:01		19:34			20:06	20:34	20:43	20:22			19:38	11	19:11 (D02)	18:48			17:02	16:40
5	07:33	07:15	06:37		06:46			06:02	05:37	05:42	06:07			06:38			07:08			06:43	07:16
	16:53	17:28	18:02		19:35			20:07	20:35	20:43	20:21			19:36			18:46			17:01	16:40
6	07:33	07:14	06:35		06:44			06:01	05:37	05:42	06:08			06:39			07:09			06:44	07:17
	16:54	17:30	18:03		19:36			20:08	20:36	20:43	20:20			19:35			18:44			17:00	16:40
7	07:33	07:13	06:34		06:43			06:00	05:37	05:43	06:09			06:40			07:10			06:45	07:18
	16:55	17:31	18:04		19:37			20:09	20:36	20:43	20:19			19:33			18:43			16:59	16:40
8	07:32	07:12	07:32		06:41		19:03 (D02)	05:59	05:36	05:44	06:10			06:41			07:11			06:46	07:19
	16:56	17:32	19:05		19:38	10	19:13 (D02)	20:10	20:37	20:42	20:17			19:31			18:41			16:58	16:40
9	07:32	07:10	07:30		06:39		19:00 (D02)	05:57	05:36	05:44	06:11			06:42			07:12			06:47	07:20
	16:57	17:33	19:06		19:40	15	19:15 (D02)	20:11	20:38	20:42	20:16			19:30			18:39			16:57	16:40
10	07:32	07:09	07:29		06:38		18:59 (D02)	05:56	05:36	05:45	06:12			06:43			07:13			06:48	07:21
	16:58	17:35	19:07		19:41	18	19:17 (D02)	20:12	20:38	20:42	20:15			19:28			18:38			16:56	16:40
11	07:32	07:08	07:27		06:36		18:57 (D02)	05:55	05:36	05:46	06:13			06:44		18:11 (D03)	07:14			06:50	07:22
	16:59	17:36	19:09		19:42	21	19:18 (D02)	20:13	20:39	20:41	20:14			19:26	10	18:21 (D03)	18:36			16:55	16:40
12	07:32	07:07	07:26	18:22 (D03)	06:35		18:56 (D02)	05:54	05:36	05:46	06:14			06:45		18:07 (D03)	07:15			06:51	07:23
	17:00	17:37	19:10	14 18:36 (D03)	19:43	23	19:19 (D02)	20:14	20:39	20:41	20:12			19:25	17	18:24 (D03)	18:35			16:54	16:40
13	07:31	07:06	07:24	18:19 (D03)	06:33		18:55 (D02)	05:53	05:36	05:47	06:15			06:46		18:05 (D03)	07:16			06:52	07:23
	17:01	17:38	19:11	19 18:38 (D03)	19:44	24	19:19 (D02)	20:15	20:40	20:40	20:11			19:23	21	18:26 (D03)	18:33			16:53	16:40
14	07:31	07:04	07:22	18:17 (D03)	06:32		18:55 (D02)	05:52	05:36	05:48	06:16			06:47		18:03 (D03)	07:17			06:53	07:24
	17:02	17:39	19:12	23 18:40 (D03)	19:45	24	19:19 (D02)	20:16	20:40	20:40	20:10			19:21	24	18:27 (D03)	18:32			16:52	16:40
15	07:31	07:03	07:21	18:15 (D03)	06:30		18:54 (D02)	05:51	05:36	05:49	06:17			06:48		18:01 (D03)	07:19			06:54	07:25
	17:03	17:41	19:13	26 18:41 (D03)	19:46	25	19:19 (D02)	20:17	20:41	20:39	20:08			19:20	27	18:28 (D03)	18:30			16:51	16:41
16	07:30	07:02	07:19	18:13 (D03)	06:28		18:54 (D02)	05:50	05:36	05:49	06:18			06:49		18:00 (D03)	07:20			06:56	07:26
	17:04	17:42	19:14	29 18:42 (D03)	19:47	25	19:19 (D02)	20:18	20:41	20:39	20:07			19:18	29	18:29 (D03)	18:28			16:50	16:41
17	07:30	07:00	07:17	18:13 (D03)	06:27		18:53 (D02)	05:49	05:36	05:50	06:19			06:50		17:59 (D03)	07:21			06:57	07:26
	17:05	17:43	19:15	30 18:43 (D03)	19:48	25	19:18 (D02)	20:19	20:41	20:38	20:06			19:16	30	18:29 (D03)	18:27			16:49	16:41
18	07:29	06:59	07:16	18:12 (D03)	06:25		18:54 (D02)	05:48	05:36	05:51	06:20			06:51		17:58 (D03)	07:22			06:58	07:27
	17:07	17:44	19:16	31 18:43 (D03)	19:49	24	19:18 (D02)	20:20	20:42	20:37	20:04			19:15	31	18:29 (D03)	18:25			16:48	16:41
19	07:29	06:58	07:14	18:10 (D03)	06:24		18:54 (D02)	05:47	05:36	05:52	06:21		19:05 (D02)	06:52		17:56 (D03)	07:23			06:59	07:28
	17:08	17:46	19:17	33 18:43 (D03)	19:50	23	19:17 (D02)	20:21	20:42	20:37	20:03	10	19:15 (D02)	19:13	32	18:28 (D03)	18:24			16:48	16:42
20	07:28	06:56	07:12	18:11 (D03)	06:22		18:55 (D02)	05:47	05:36	05:53	06:22		19:03 (D02)	06:53		17:55 (D03)	07:24			07:00	07:28
	17:09	17:47	19:18	33 18:44 (D03)	19:51	21	19:16 (D02)	20:22	20:42	20:36	20:01	14	19:17 (D02)	19:11	33	18:28 (D03)	18:22			16:47	16:42
21	07:28	06:55	07:11	18:10 (D03)	06:21		18:55 (D02)	05:46	05:36	05:54	06:23		19:01 (D02)	06:54		17:54 (D03)	07:25			07:01	07:29
	17:10	17:48	19:19	33 18:43 (D03)	19:52	20	19:15 (D02)	20:23	20:43	20:35	20:00	18	19:19 (D02)	19:10	34	18:28 (D03)	18:21			16:46	16:43
22	07:27	06:53	07:09	18:09 (D03)	06:19		18:56 (D02)	05:45	05:36	05:54	06:24		19:00 (D02)	06:55		17:54 (D03)	07:26			07:03	07:29
	17:11	17:49	19:21	34 18:43 (D03)	19:53	18	19:14 (D02)	20:24	20:43	20:35	19:58	20	19:20 (D02)	19:08	34	18:28 (D03)	18:20			16:46	16:43
23	07:26	06:52	07:07	18:10 (D03)	06:18		18:57 (D02)	05:44	05:37	05:55	06:25		18:58 (D02)	06:56		17:54 (D03)	07:27			07:04	07:30
	17:12	17:50	19:22	33 18:43 (D03)	19:54	14	19:11 (D02)	20:25	20:43	20:34	19:57	22	19:20 (D02)	19:06	33	18:27 (D03)	18:18			16:45	16:43
24	07:26	06:50	07:06	18:09 (D03)	06:17		19:00 (D02)	05:43	05:37	05:56	06:26		18:58 (D02)	06:57		17:54 (D03)	07:29			07:05	07:30
	17:14	17:51	19:23	33 18:42 (D03)	19:55	9	19:09 (D02)	20:26	20:43	20:33	19:55	23	19:21 (D02)	19:04	33	18:27 (D03)	18:17			16:44	16:44
25	07:25	06:49	07:04	18:09 (D03)	06:15			05:43	05:37	05:57	06:27		18:57 (D02)	06:58		17:54 (D03)	07:30			07:06	07:31
	17:15	17:53	19:24	32 18:41 (D03)	19:56			20:26	20:43	20:32	19:54	24	19:21 (D02)	19:03	32	18:26 (D03)	18:15			16:44	16:45
26	07:24	06:48	07:02	18:09 (D03)	06:14			05:42	05:38	05:58	06:28		18:56 (D02)	06:59		17:54 (D03)	07:31			07:07	07:31
	17:16	17:54	19:25	31 18:40 (D03)	19:57			20:27	20:44	20:31	19:52	25	19:21 (D02)	19:01	31	18:25 (D03)	18:14			16:43	16:45
27	07:23	06:46	07:01	18:10 (D03)	06:12			05:41	05:38	05:59	06:29		18:56 (D02)	07:00		17:55 (D03)	07:32			07:08	07:31
	17:17	17:55	19:26	30 18:40 (D03)	19:59			20:28	20:44	20:30	19:51	25	19:21 (D02)	18:59	29	18:24 (D03)	18:13			16:43	16:46
28	07:22	06:45	06:59	18:11 (D03)	06:11			05:41	05:38	06:00	06:30		18:56 (D02)	07:01		17:55 (D03)	07:33			07:09	07:32
	17:18	17:56	19:27	27 18:38 (D03)	20:00			20:29	20:44	20:29	19:49	25	19:21 (D02)	18:58	27	18:22 (D03)	18:11			16:42	16:46
29	07:22		06:57	18:11 (D03)	06:10			05:40	05:39	06:01	06:31		18:56 (D02)	07:02		17:56 (D03)	07:34			07:10	07:32
	17:20		19:28	25 18:36 (D03)	20:01			20:30	20:44	20:28	19:48	24	19:20 (D02)	18:56	24	18:20 (D03)	18:10			16:42	16:47
30	07:21		06:56	18:13 (D03)	06:08			05:40	05:39	06:02	06:32		18:56 (D02)	07:03		17:58 (D03)	07:35			07:11	07:32
	17:21		19:29	22 18:35 (D03)	20:02			20:31	20:44	20:27	19:46	23	19:19 (D02)	18:54	20	18:18 (D03)	18:09			16:42	16:48
31	07:20		06:54	18:15 (D03)				05:39		06:03	06:33		18:56 (D02)				07:37				07:32
	17:22		19:30	17 18:32 (D03)				20:31		20:26	19:45	23	19:19 (D02)				18:07				16:49
Potential sun hours	298	297	369		398			448	452	458	428			375			346			298	288
Total, worst case				555		350						276			615			24			
Sun reduction				0.73		0.82						0.96			0.93			0.84			
Oper. time red.				1.00		1.00						1.00			1.00			1.00			
Wind dir. red.				0.73		0.60						0.60			0.72			0.73			
Total reduction				0.54		0.50						0.58			0.67			0.62			
Total, real				299		173						159			413			15			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 19 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (94)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:07 (D03)	06:07	05:39	05:40	06:04	06:34	19:00 (D02)	07:04	17:51 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31 23	18:30 (D03)	20:03	20:32	20:44	20:25	19:43 16	19:16 (D02)	18:53 24	18:15 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	18:09 (D03)	06:06	05:38	05:40	06:05	06:35	19:02 (D02)	07:05	17:52 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32 18	18:27 (D03)	20:04	20:33	20:44	20:24	19:41 11	19:13 (D02)	18:51 20	18:12 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49	18:12 (D03)	06:05	05:38	05:41	06:05	06:36		07:06	17:55 (D03)	06:40	07:14
	16:51	17:26	18:00	19:33 11	18:23 (D03)	20:05	20:34	20:43	20:23	19:40		18:49 13	18:08 (D03)	17:04	16:41
4	07:33	07:16	06:38	06:48		06:03	05:38	05:41	06:06	06:37		07:07		06:41	07:15
	16:52	17:27	18:01	19:34		20:06	20:34	20:43	20:22	19:38		18:48		17:02	16:40
5	07:33	07:15	06:37	06:46		06:02	05:37	05:42	06:07	06:38		07:08		06:43	07:16
	16:53	17:28	18:02	19:35		20:07	20:35	20:43	20:21	19:36		18:46		17:01	16:40
6	07:33	07:14	06:35	06:44		06:01	05:37	05:42	06:08	06:39		07:09		06:44	07:17
	16:54	17:30	18:03	19:36		20:08	20:36	20:43	20:20	19:35		18:44		17:00	16:40
7	07:33	07:13	06:34	06:43		06:00	05:37	05:43	06:09	06:40		07:10		06:45	07:18
	16:55	17:31	18:04	19:37		20:09	20:36	20:43	20:19	19:33		18:43		16:59	16:40
8	07:32	07:12	07:32	06:41		05:59	05:36	05:44	06:10	06:41		07:11		06:46	07:19
	16:56	17:32	19:05	19:39		20:10	20:37	20:42	20:17	19:31		18:41		16:58	16:40
9	07:32	07:10	07:30	06:39		05:57	05:36	05:44	06:11	06:42	18:07 (D03)	07:12		06:47	07:20
	16:57	17:33	19:06	19:40		20:11	20:38	20:42	20:16	19:30 10	18:17 (D03)	18:39		16:57	16:40
10	07:32	07:09	07:29 18:20 (D03)	06:38	19:04 (D02)	05:56	05:36	05:45	06:12	06:43	18:03 (D03)	07:13		06:48	07:21
	16:58	17:35	19:07 8 18:28 (D03)	19:41 11	19:15 (D02)	20:12	20:38	20:42	20:15	19:28 17	18:20 (D03)	18:38		16:56	16:40
11	07:32	07:08	07:27 18:16 (D03)	06:36	19:01 (D02)	05:55	05:36	05:46	06:13	06:44	18:00 (D03)	07:14		06:50	07:22
	16:59	17:36	19:09 17 18:33 (D03)	19:42 16	19:17 (D02)	20:13	20:39	20:41	20:14	19:26 22	18:22 (D03)	18:36		16:55	16:40
12	07:32	07:07	07:26 18:13 (D03)	06:35	18:59 (D02)	05:54	05:36	05:46	06:14	06:45	17:58 (D03)	07:15		06:51	07:23
	17:00	17:37	19:10 22 18:35 (D03)	19:43 20	19:19 (D02)	20:14	20:39	20:41	20:12	19:25 26	18:24 (D03)	18:35		16:54	16:40
13	07:31	07:06	07:24 18:10 (D03)	06:33	18:57 (D02)	05:53	05:36	05:47	06:15	06:46	17:56 (D03)	07:16		06:52	07:23
	17:01	17:38	19:11 27 18:37 (D03)	19:44 22	19:19 (D02)	20:15	20:40	20:40	20:11	19:23 29	18:25 (D03)	18:33		16:53	16:40
14	07:31	07:04	07:22 18:09 (D03)	06:32	18:57 (D02)	05:52	05:36	05:48	06:16 19:10 (D02)	06:47	17:54 (D03)	07:17		06:53	07:24
	17:02	17:39	19:12 29 18:38 (D03)	19:45 24	19:21 (D02)	20:16	20:40	20:40	20:10 6 19:16 (D02)	19:21 32	18:26 (D03)	18:32		16:52	16:40
15	07:31	07:03	07:21 18:07 (D03)	06:30	18:55 (D02)	05:51	05:36	05:49	06:17 19:06 (D02)	06:48	17:53 (D03)	07:19		06:54	07:25
	17:03	17:41	19:13 32 18:39 (D03)	19:46 26	19:21 (D02)	20:17	20:41	20:39	20:08 13 19:19 (D02)	19:20 33	18:26 (D03)	18:30		16:51	16:41
16	07:30	07:02	07:19 18:06 (D03)	06:28	18:55 (D02)	05:50	05:36	05:49	06:18 19:04 (D02)	06:49	17:52 (D03)	07:20		06:56	07:26
	17:04	17:42	19:14 34 18:40 (D03)	19:47 26	19:21 (D02)	20:18	20:41	20:39	20:07 17 19:21 (D02)	19:18 35	18:27 (D03)	18:28		16:50	16:41
17	07:30	07:00	07:17 18:05 (D03)	06:27	18:54 (D02)	05:49	05:36	05:50	06:19 19:02 (D02)	06:50	17:51 (D03)	07:21		06:57	07:26
	17:05	17:43	19:15 36 18:41 (D03)	19:48 27	19:21 (D02)	20:19	20:41	20:38	20:06 20 19:22 (D02)	19:16 36	18:27 (D03)	18:27		16:49	16:41
18	07:29	06:59	07:16 18:04 (D03)	06:25	18:54 (D02)	05:48	05:36	05:51	06:20 19:01 (D02)	06:51	17:50 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16 37 18:41 (D03)	19:49 27	19:21 (D02)	20:20	20:42	20:37	20:04 22 19:23 (D02)	19:15 37	18:27 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14 18:03 (D03)	06:24	18:53 (D02)	05:47	05:36	05:52	06:21 19:00 (D02)	06:52	17:48 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 38 18:41 (D03)	19:50 28	19:21 (D02)	20:21	20:42	20:37	20:03 24 19:24 (D02)	19:13 38	18:26 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12 18:03 (D03)	06:22	18:53 (D02)	05:47	05:36	05:53	06:22 18:59 (D02)	06:53	17:47 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 38 18:41 (D03)	19:51 28	19:21 (D02)	20:22	20:42	20:36	20:01 25 19:24 (D02)	19:11 39	18:26 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11 18:02 (D03)	06:21	18:53 (D02)	05:46	05:36	05:54	06:23 18:58 (D02)	06:54	17:47 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 39 18:41 (D03)	19:52 27	19:20 (D02)	20:23	20:43	20:35	20:00 27 19:25 (D02)	19:10 39	18:26 (D03)	18:21		16:46	16:43
22	07:27	06:53	07:09 18:02 (D03)	06:19	18:54 (D02)	05:45	05:36	05:54	06:24 18:58 (D02)	06:55	17:47 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 38 18:40 (D03)	19:53 26	19:20 (D02)	20:24	20:43	20:35	19:58 27 19:25 (D02)	19:08 38	18:25 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07 18:02 (D03)	06:18	18:53 (D02)	05:44	05:37	05:55	06:25 18:57 (D02)	06:56	17:46 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 39 18:41 (D03)	19:54 25	19:18 (D02)	20:25	20:43	20:34	19:57 28 19:25 (D02)	19:06 39	18:25 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06 18:02 (D03)	06:17	18:54 (D02)	05:43	05:37	05:56	06:26 18:57 (D02)	06:57	17:46 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 38 18:40 (D03)	19:55 24	19:18 (D02)	20:26	20:43	20:33	19:55 28 19:25 (D02)	19:04 38	18:24 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04 18:01 (D03)	06:15	18:55 (D02)	05:43	05:37	05:57	06:27 18:57 (D02)	06:58	17:46 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 38 18:39 (D03)	19:56 22	19:17 (D02)	20:26	20:43	20:32	19:54 27 19:24 (D02)	19:03 37	18:23 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02 18:01 (D03)	06:14	18:56 (D02)	05:42	05:38	05:58	06:28 18:57 (D02)	06:59	17:46 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25 37 18:38 (D03)	19:57 19	19:15 (D02)	20:27	20:44	20:31	19:52 27 19:24 (D02)	19:01 36	18:22 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01 18:02 (D03)	06:12	18:58 (D02)	05:41	05:38	05:59	06:29 18:57 (D02)	07:00	17:47 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26 36 18:38 (D03)	19:59 16	19:14 (D02)	20:28	20:44	20:30	19:51 26 19:23 (D02)	18:59 34	18:21 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59 18:02 (D03)	06:11	19:00 (D02)	05:41	05:38	06:00	06:30 18:57 (D02)	07:01	17:47 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27 34 18:36 (D03)	20:00 12	19:12 (D02)	20:29	20:44	20:29	19:49 26 19:23 (D02)	18:58 33	18:20 (D03)	18:11		16:42	16:46
29	07:22		06:57 18:03 (D03)	06:10	19:04 (D02)	05:40	05:39	06:01	06:31 18:58 (D02)	07:02	17:48 (D03)	07:34		07:10	07:32
	17:20		19:28 32 18:35 (D03)	20:01 2	19:06 (D02)	20:30	20:44	20:28	19:48 24 19:22 (D02)	18:56 31	18:19 (D03)	18:10		16:42	16:47
30	07:21		06:56 18:04 (D03)	06:08		05:40	05:39	06:02	06:32 18:58 (D02)	07:03	17:49 (D03)	07:35		07:11	07:32
	17:21		19:29 30 18:34 (D03)	20:02		20:31	20:44	20:27	19:46 22 19:20 (D02)	18:54 28	18:17 (D03)	18:09		16:42	16:48
31	07:20		06:54 18:05 (D03)			05:39		06:03	06:33 18:59 (D02)			07:37			07:32
	17:22		19:30 27 18:32 (D03)			20:31		20:26	19:45 20 19:19 (D02)			18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428		375		346		298	288
Total, worst case			706	480				409		734		57			
Sun reduction			0.73	0.82				0.96		0.93		0.84			
Oper. time red.			1.00	1.00				1.00		1.00		1.00			
Wind dir. red.			0.74	0.60				0.59		0.73		0.74			
Total reduction			0.54	0.50				0.56		0.69		0.62			
Total, real			383	238				231		503		36			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 20 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March			April			May	June
1	07:32		15:45 (D04)	07:19	06:43			06:52		18:06 (D03)	06:07	05:39
	16:50	7	15:52 (D04)	17:23	17:57			19:31	21	18:27 (D03)	20:03	20:32
2	07:33		15:48 (D04)	07:18	06:41			06:51		18:08 (D03)	06:06	05:38
	16:50	2	15:50 (D04)	17:25	17:58			19:32	15	18:23 (D03)	20:04	20:33
3	07:33			07:17	06:40			06:49		18:14 (D03)	06:05	05:38
	16:51			17:26	18:00			19:33	2	18:16 (D03)	20:05	20:34
4	07:33			07:16	06:38			06:48			06:03	05:38
	16:52			17:27	18:01			19:34			20:06	20:34
5	07:33			07:15	06:37			06:46			06:02	05:37
	16:53			17:28	18:02			19:35			20:07	20:35
6	07:33			07:14	06:35			06:44			06:01	05:37
	16:54			17:30	18:03			19:36			20:08	20:36
7	07:33			07:13	06:34			06:43			06:00	05:37
	16:55			17:31	18:04			19:37			20:09	20:36
8	07:32			07:12	07:32			06:41			05:59	05:36
	16:56			17:32	19:05			19:39			20:10	20:37
9	07:32			07:10	07:30		18:15 (D03)	06:39			05:57	05:36
	16:57			17:33	19:06	14	18:29 (D03)	19:40			20:11	20:38
10	07:32			07:09	07:29		18:11 (D03)	06:38		19:03 (D02)	05:56	05:36
	16:58			17:35	19:07	21	18:32 (D03)	19:41	12	19:15 (D02)	20:12	20:38
11	07:32			07:08	07:27		18:09 (D03)	06:36		19:00 (D02)	05:55	05:36
	16:59			17:36	19:09	25	18:34 (D03)	19:42	17	19:17 (D02)	20:13	20:39
12	07:32			07:07	07:26		18:07 (D03)	06:35		18:59 (D02)	05:54	05:36
	17:00			17:37	19:10	29	18:36 (D03)	19:43	20	19:19 (D02)	20:14	20:39
13	07:31			07:06	07:24		18:05 (D03)	06:33		18:57 (D02)	05:53	05:36
	17:01			17:38	19:11	31	18:36 (D03)	19:44	22	19:19 (D02)	20:15	20:40
14	07:31			07:04	07:22		18:04 (D03)	06:32		18:56 (D02)	05:52	05:36
	17:02			17:39	19:12	34	18:38 (D03)	19:45	25	19:21 (D02)	20:16	20:40
15	07:31			07:03	07:21		18:03 (D03)	06:30		18:54 (D02)	05:51	05:36
	17:03			17:41	19:13	35	18:38 (D03)	19:46	27	19:21 (D02)	20:17	20:41
16	07:30			07:02	07:19		18:01 (D03)	06:28		18:54 (D02)	05:50	05:36
	17:04			17:42	19:14	37	18:38 (D03)	19:47	27	19:21 (D02)	20:18	20:41
17	07:30			07:00	07:17		18:01 (D03)	06:27		18:53 (D02)	05:49	05:36
	17:05			17:43	19:15	38	18:39 (D03)	19:48	28	19:21 (D02)	20:19	20:41
18	07:29			06:59	07:16		18:00 (D03)	06:25		18:53 (D02)	05:48	05:36
	17:07			17:44	19:16	39	18:39 (D03)	19:49	29	19:22 (D02)	20:20	20:42
19	07:29			06:58	07:14		17:59 (D03)	06:24		18:52 (D02)	05:47	05:36
	17:08			17:46	19:17	40	18:39 (D03)	19:50	29	19:21 (D02)	20:21	20:42
20	07:28			06:56	07:12		17:59 (D03)	06:22		18:53 (D02)	05:47	05:36
	17:09			17:47	19:18	41	18:40 (D03)	19:51	28	19:21 (D02)	20:22	20:42
21	07:28			06:55	07:11		17:59 (D03)	06:21		18:52 (D02)	05:46	05:36
	17:10			17:48	19:19	40	18:39 (D03)	19:52	28	19:20 (D02)	20:23	20:43
22	07:27			06:53	07:09		17:58 (D03)	06:19		18:53 (D02)	05:45	05:36
	17:11			17:49	19:21	40	18:38 (D03)	19:53	27	19:20 (D02)	20:24	20:43
23	07:26			06:52	07:07		17:59 (D03)	06:18		18:52 (D02)	05:44	05:37
	17:12			17:50	19:22	40	18:39 (D03)	19:54	27	19:19 (D02)	20:25	20:43
24	07:26			06:50	07:06		17:58 (D03)	06:17		18:53 (D02)	05:43	05:37
	17:14			17:51	19:23	40	18:38 (D03)	19:55	25	19:18 (D02)	20:26	20:43
25	07:25			06:49	07:04		17:58 (D03)	06:15		18:54 (D02)	05:43	05:37
	17:15			17:53	19:24	39	18:37 (D03)	19:56	23	19:17 (D02)	20:26	20:43
26	07:24			06:48	07:02		17:59 (D03)	06:14		18:55 (D02)	05:42	05:38
	17:16			17:54	19:25	37	18:36 (D03)	19:57	20	19:15 (D02)	20:27	20:44
27	07:23			06:46	07:01		17:59 (D03)	06:12		18:56 (D02)	05:41	05:38
	17:17			17:55	19:26	36	18:35 (D03)	19:59	18	19:14 (D02)	20:28	20:44
28	07:22			06:45	06:59		18:00 (D03)	06:11		18:58 (D02)	05:41	05:38
	17:18			17:56	19:27	33	18:33 (D03)	20:00	15	19:13 (D02)	20:29	20:44
29	07:22				06:57		18:00 (D03)	06:10		19:00 (D02)	05:40	05:39
	17:20				19:28	32	18:32 (D03)	20:01	9	19:09 (D02)	20:30	20:44
30	07:21				06:56		18:02 (D03)	06:08			05:40	05:39
	17:21				19:29	29	18:31 (D03)	20:02			20:31	20:44
31	07:20				06:54		18:03 (D03)				05:39	
	17:22				19:30	25	18:28 (D03)				20:31	
Potential sun hours	298			297	369			398			448	452
Total, worst case		9				775			494			
Sun reduction		0.45				0.73			0.82			
Oper. time red.		1.00				1.00			1.00			
Wind dir. red.		0.89				0.75			0.60			
Total reduction		0.41				0.55			0.50			
Total, real		4				429			246			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 20 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August		September		October		November	December		
1	05:40	06:04		06:34	18:59 (D02)	07:04	17:45 (D03)	06:38	07:12		
	20:44	20:25		19:43 17	19:16 (D02)	18:53 30	18:15 (D03)	18:06	16:41		
2	05:40	06:05		06:35	19:01 (D02)	07:05	17:46 (D03)	06:39	07:13		
	20:44	20:24		19:41 12	19:13 (D02)	18:51 27	18:13 (D03)	17:05	16:41		
3	05:41	06:05		06:36		07:06	17:48 (D03)	06:40	07:14		
	20:43	20:23		19:40		18:49 22	18:10 (D03)	17:04	16:41		
4	05:41	06:06		06:37		07:07	17:51 (D03)	06:41	07:15		
	20:43	20:22		19:38		18:48 17	18:08 (D03)	17:02	16:40		
5	05:42	06:07		06:38		07:08	17:55 (D03)	06:43	07:16		
	20:43	20:21		19:36		18:46 8	18:03 (D03)	17:01	16:40		
6	05:42	06:08		06:39		07:09		06:44	07:17		
	20:43	20:20		19:35		18:44		17:00	16:40		
7	05:43	06:09		06:40		07:10		06:45	07:18		
	20:43	20:19		19:33		18:43		16:59	16:40		
8	05:44	06:10		06:41		07:11		06:46	07:19		
	20:42	20:17		19:31		18:41		16:58	16:40		
9	05:44	06:11		06:42		07:12		06:47	07:20		
	20:42	20:16		19:30		18:39		16:57	16:40		
10	05:45	06:12		06:43	18:01 (D03)	07:13		06:48	07:21		15:37 (D04)
	20:42	20:15		19:28 15	18:16 (D03)	18:38		16:56	16:40 2		15:39 (D04)
11	05:46	06:13		06:44	17:58 (D03)	07:14		06:50	07:22		15:35 (D04)
	20:41	20:14		19:26 21	18:19 (D03)	18:36		16:55	16:40 7		15:42 (D04)
12	05:46	06:14		06:45	17:56 (D03)	07:15		06:51	07:23		15:35 (D04)
	20:41	20:12		19:25 24	18:20 (D03)	18:35		16:54	16:40 9		15:44 (D04)
13	05:47	06:15		06:46	17:53 (D03)	07:16		06:52	07:23		15:35 (D04)
	20:40	20:11		19:23 29	18:22 (D03)	18:33		16:53	16:40 10		15:45 (D04)
14	05:48	06:16	19:07 (D02)	06:47	17:52 (D03)	07:17		06:53	07:24		15:34 (D04)
	20:40	20:10 10	19:17 (D02)	19:21 31	18:23 (D03)	18:32		16:52	16:40 11		15:45 (D04)
15	05:49	06:17	19:05 (D02)	06:48	17:50 (D03)	07:19		06:54	07:25		15:34 (D04)
	20:39	20:08 15	19:20 (D02)	19:20 34	18:24 (D03)	18:30		16:51	16:41 12		15:46 (D04)
16	05:49	06:18	19:03 (D02)	06:49	17:49 (D03)	07:20		06:56	07:26		15:34 (D04)
	20:39	20:07 18	19:21 (D02)	19:18 35	18:24 (D03)	18:28		16:50	16:41 14		15:48 (D04)
17	05:50	06:19	19:01 (D02)	06:50	17:48 (D03)	07:21		06:57	07:26		15:34 (D04)
	20:38	20:06 21	19:22 (D02)	19:16 36	18:24 (D03)	18:27		16:49	16:41 14		15:48 (D04)
18	05:51	06:20	19:00 (D02)	06:51	17:47 (D03)	07:22		06:58	07:27		15:35 (D04)
	20:37	20:04 23	19:23 (D02)	19:15 38	18:25 (D03)	18:25		16:48	16:41 14		15:49 (D04)
19	05:52	06:21	18:59 (D02)	06:52	17:46 (D03)	07:23		06:59	07:28		15:35 (D04)
	20:37	20:03 25	19:24 (D02)	19:13 39	18:25 (D03)	18:24		16:48	16:42 15		15:50 (D04)
20	05:53	06:22	18:58 (D02)	06:53	17:44 (D03)	07:24		07:00	07:28		15:35 (D04)
	20:36	20:01 26	19:24 (D02)	19:11 40	18:24 (D03)	18:22		16:47	16:42 15		15:50 (D04)
21	05:54	06:23	18:57 (D02)	06:54	17:43 (D03)	07:25		07:01	07:29		15:36 (D04)
	20:35	20:00 28	19:25 (D02)	19:10 41	18:24 (D03)	18:21		16:46	16:43 15		15:51 (D04)
22	05:54	06:24	18:57 (D02)	06:55	17:43 (D03)	07:26		07:03	07:29		15:36 (D04)
	20:35	19:58 28	19:25 (D02)	19:08 40	18:23 (D03)	18:20		16:46	16:43 15		15:51 (D04)
23	05:55	06:25	18:56 (D02)	06:56	17:43 (D03)	07:27		07:04	07:30		15:37 (D04)
	20:34	19:57 29	19:25 (D02)	19:06 40	18:23 (D03)	18:18		16:45	16:43 15		15:52 (D04)
24	05:56	06:26	18:56 (D02)	06:57	17:42 (D03)	07:29		07:05	07:30		15:37 (D04)
	20:33	19:55 29	19:25 (D02)	19:04 40	18:22 (D03)	18:17		16:44	16:44 15		15:52 (D04)
25	05:57	06:27	18:56 (D02)	06:58	17:42 (D03)	07:30		07:06	07:31		15:38 (D04)
	20:32	19:54 28	19:24 (D02)	19:03 40	18:22 (D03)	18:15		16:44	16:45 14		15:52 (D04)
26	05:58	06:28	18:56 (D02)	06:59	17:42 (D03)	07:31		07:07	07:31		15:39 (D04)
	20:31	19:52 28	19:24 (D02)	19:01 39	18:21 (D03)	18:14		16:43	16:45 14		15:53 (D04)
27	05:59	06:29	18:56 (D02)	07:00	17:42 (D03)	07:32		07:08	07:31		15:39 (D04)
	20:30	19:51 27	19:23 (D02)	18:59 38	18:20 (D03)	18:13		16:43	16:46 14		15:53 (D04)
28	06:00	06:30	18:56 (D02)	07:01	17:43 (D03)	07:33		07:09	07:32		15:40 (D04)
	20:29	19:49 27	19:23 (D02)	18:58 36	18:19 (D03)	18:11		16:42	16:46 13		15:53 (D04)
29	06:01	06:31	18:57 (D02)	07:02	17:43 (D03)	07:34		07:10	07:32		15:41 (D04)
	20:28	19:48 25	19:22 (D02)	18:56 35	18:18 (D03)	18:10		16:42	16:47 11		15:52 (D04)
30	06:02	06:32	18:58 (D02)	07:03	17:44 (D03)	07:35		07:11	07:32		15:42 (D04)
	20:27	19:46 22	19:20 (D02)	18:54 32	18:16 (D03)	18:09		16:42	16:48 11		15:53 (D04)
31	06:03	06:33	18:59 (D02)			07:37			07:32		15:43 (D04)
	20:26	19:45 20	19:19 (D02)			18:07			16:49 10		15:53 (D04)
Potential sun hours	458	428		375		346		298	288		
Total, worst case		429		752		104			270		
Sun reduction		0.96		0.93		0.84			0.47		
Oper. time red.		1.00		1.00		1.00			1.00		
Wind dir. red.		0.59		0.74		0.75			0.89		
Total reduction		0.57		0.70		0.64			0.43		
Total, real		245		525		66			115		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 21 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March			April			May	June
1	07:32		15:45 (D04)	07:19	06:43			06:52			06:07	05:39
	16:50	11	15:56 (D04)	17:23	17:57			19:31			20:03	20:32
2	07:33		15:46 (D04)	07:18	06:41			06:51			06:06	05:38
	16:50	9	15:55 (D04)	17:25	17:58			19:32			20:04	20:33
3	07:33		15:48 (D04)	07:17	06:40			06:49			06:05	05:38
	16:51	6	15:54 (D04)	17:26	18:00			19:33			20:05	20:34
4	07:33			07:16	06:38			06:48			06:03	05:38
	16:52			17:27	18:01			19:34			20:06	20:34
5	07:33			07:15	06:37			06:46			06:02	05:37
	16:53			17:28	18:02			19:35			20:07	20:35
6	07:33			07:14	06:35			06:44			06:01	05:37
	16:54			17:30	18:03			19:36			20:08	20:36
7	07:33			07:13	06:34		17:15 (D03)	06:43		19:03 (D02)	06:00	05:37
	16:55			17:31	18:04	11	17:26 (D03)	19:37	8	19:11 (D02)	20:09	20:36
8	07:32			07:12	07:32		18:11 (D03)	06:41		18:59 (D02)	05:59	05:36
	16:56			17:32	19:05	18	18:29 (D03)	19:39	14	19:13 (D02)	20:10	20:37
9	07:32			07:10	07:30		18:09 (D03)	06:39		18:57 (D02)	05:57	05:36
	16:57			17:33	19:06	23	18:32 (D03)	19:40	19	19:16 (D02)	20:11	20:38
10	07:32			07:09	07:29		18:06 (D03)	06:38		18:55 (D02)	05:56	05:36
	16:58			17:35	19:07	27	18:33 (D03)	19:41	21	19:16 (D02)	20:12	20:38
11	07:32			07:08	07:27		18:05 (D03)	06:36		18:53 (D02)	05:55	05:36
	16:59			17:36	19:09	30	18:35 (D03)	19:42	24	19:17 (D02)	20:13	20:39
12	07:32			07:07	07:26		18:03 (D03)	06:35		18:53 (D02)	05:54	05:36
	17:00			17:37	19:10	32	18:35 (D03)	19:43	25	19:18 (D02)	20:14	20:39
13	07:31			07:06	07:24		18:02 (D03)	06:33		18:52 (D02)	05:53	05:36
	17:01			17:38	19:11	34	18:36 (D03)	19:44	26	19:18 (D02)	20:15	20:40
14	07:31			07:04	07:22		18:01 (D03)	06:32		18:51 (D02)	05:52	05:36
	17:02			17:39	19:12	36	18:37 (D03)	19:45	27	19:18 (D02)	20:16	20:40
15	07:31			07:03	07:21		18:00 (D03)	06:30		18:51 (D02)	05:51	05:36
	17:03			17:41	19:13	37	18:37 (D03)	19:46	27	19:18 (D02)	20:17	20:41
16	07:30			07:02	07:19		17:59 (D03)	06:28		18:51 (D02)	05:50	05:36
	17:04			17:42	19:14	38	18:37 (D03)	19:47	27	19:18 (D02)	20:18	20:41
17	07:30			07:00	07:17		17:59 (D03)	06:27		18:50 (D02)	05:49	05:36
	17:05			17:43	19:15	38	18:37 (D03)	19:48	27	19:17 (D02)	20:19	20:41
18	07:29			06:59	07:16		17:59 (D03)	06:25		18:51 (D02)	05:48	05:36
	17:07			17:44	19:16	38	18:37 (D03)	19:49	26	19:17 (D02)	20:20	20:42
19	07:29			06:58	07:14		17:58 (D03)	06:24		18:50 (D02)	05:47	05:36
	17:08			17:46	19:17	38	18:36 (D03)	19:50	26	19:16 (D02)	20:21	20:42
20	07:28			06:56	07:12		17:59 (D03)	06:22		18:51 (D02)	05:47	05:36
	17:09			17:47	19:18	38	18:37 (D03)	19:51	25	19:16 (D02)	20:22	20:42
21	07:28			06:55	07:11		17:58 (D03)	06:21		18:51 (D02)	05:46	05:36
	17:10			17:48	19:19	38	18:36 (D03)	19:52	23	19:14 (D02)	20:23	20:43
22	07:27			06:53	07:09		17:58 (D03)	06:19		18:52 (D02)	05:45	05:36
	17:11			17:49	19:21	37	18:35 (D03)	19:53	22	19:14 (D02)	20:24	20:43
23	07:26			06:52	07:07		17:59 (D03)	06:18		18:53 (D02)	05:44	05:37
	17:12			17:50	19:22	36	18:35 (D03)	19:54	19	19:12 (D02)	20:25	20:43
24	07:26			06:50	07:06		17:59 (D03)	06:17		18:55 (D02)	05:43	05:37
	17:14			17:51	19:23	34	18:33 (D03)	19:55	15	19:10 (D02)	20:26	20:43
25	07:25			06:49	07:04		17:59 (D03)	06:15		18:57 (D02)	05:43	05:37
	17:15			17:53	19:24	33	18:32 (D03)	19:56	11	19:08 (D02)	20:26	20:43
26	07:24			06:48	07:02		18:00 (D03)	06:14			05:42	05:38
	17:16			17:54	19:25	30	18:30 (D03)	19:57			20:27	20:44
27	07:23			06:46	07:01		18:02 (D03)	06:12			05:41	05:38
	17:17			17:55	19:26	27	18:29 (D03)	19:59			20:28	20:44
28	07:22			06:45	06:59		18:03 (D03)	06:11			05:41	05:38
	17:18			17:56	19:27	24	18:27 (D03)	20:00			20:29	20:44
29	07:22				06:57		18:04 (D03)	06:10			05:40	05:39
	17:20				19:28	20	18:24 (D03)	20:01			20:30	20:44
30	07:21				06:56		18:08 (D03)	06:08			05:40	05:39
	17:21				19:29	14	18:22 (D03)	20:02			20:31	20:44
31	07:20				06:54						05:39	
	17:22				19:30						20:31	
Potential sun hours	298			297	369			398			448	452
Total, worst case		26				731			412			
Sun reduction		0.45				0.73			0.82			
Oper. time red.		1.00				1.00			1.00			
Wind dir. red.		0.89				0.75			0.60			
Total reduction		0.41				0.56			0.50			
Total, real		11				409			207			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 21 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August			September			October			November	December		
1	05:40	06:04			06:34		18:52 (D02)	07:04		17:41 (D03)	06:38	07:12		
	20:44	20:25			19:43	24	19:16 (D02)	18:53	33	18:14 (D03)	18:06	16:41		
2	05:40	06:05			06:35		18:53 (D02)	07:05		17:42 (D03)	06:39	07:13		
	20:44	20:24			19:41	21	19:14 (D02)	18:51	31	18:13 (D03)	17:05	16:41		
3	05:41	06:05			06:36		18:54 (D02)	07:06		17:43 (D03)	06:40	07:14		
	20:43	20:23			19:40	19	19:13 (D02)	18:49	28	18:11 (D03)	17:04	16:41		
4	05:41	06:06			06:37		18:56 (D02)	07:07		17:45 (D03)	06:41	07:15		
	20:43	20:22			19:38	14	19:10 (D02)	18:48	25	18:10 (D03)	17:02	16:40		
5	05:42	06:07			06:38		18:59 (D02)	07:08		17:47 (D03)	06:43	07:16		
	20:43	20:21			19:36	8	19:07 (D02)	18:46	21	18:08 (D03)	17:01	16:40		
6	05:42	06:08			06:39			07:09		17:50 (D03)	06:44	07:17		
	20:43	20:20			19:35			18:44	15	18:05 (D03)	17:00	16:40		
7	05:43	06:09			06:40			07:10		17:56 (D03)	06:45	07:18		
	20:43	20:19			19:33			18:43	2	17:58 (D03)	16:59	16:40		
8	05:44	06:10			06:41			07:11			06:46	07:19		
	20:42	20:17			19:31			18:41			16:58	16:40		
9	05:44	06:11			06:42			07:12			06:47	07:20		15:36 (D04)
	20:42	20:16			19:30			18:39			16:57	16:40	6	15:42 (D04)
10	05:45	06:12			06:43			07:13			06:48	07:21		15:35 (D04)
	20:42	20:15			19:28			18:38			16:56	16:40	9	15:44 (D04)
11	05:46	06:13			06:44			07:14			06:50	07:22		15:35 (D04)
	20:41	20:14			19:26			18:36			16:55	16:40	11	15:46 (D04)
12	05:46	06:14			06:45			07:15			06:51	07:23		15:35 (D04)
	20:41	20:12			19:25			18:35			16:54	16:40	12	15:47 (D04)
13	05:47	06:15			06:46		17:59 (D03)	07:16			06:52	07:23		15:35 (D04)
	20:40	20:11			19:23	13	18:12 (D03)	18:33			16:53	16:40	13	15:48 (D04)
14	05:48	06:16			06:47		17:56 (D03)	07:17			06:53	07:24		15:34 (D04)
	20:40	20:10			19:21	19	18:15 (D03)	18:32			16:52	16:40	14	15:48 (D04)
15	05:49	06:17			06:48		17:53 (D03)	07:19			06:54	07:25		15:35 (D04)
	20:39	20:08			19:20	24	18:17 (D03)	18:30			16:51	16:41	14	15:49 (D04)
16	05:49	06:18			06:49		17:51 (D03)	07:20			06:56	07:26		15:35 (D04)
	20:39	20:07			19:18	27	18:18 (D03)	18:28			16:50	16:41	15	15:50 (D04)
17	05:50	06:19		19:06 (D02)	06:50		17:50 (D03)	07:21			06:57	07:26		15:35 (D04)
	20:38	20:06	5	19:11 (D02)	19:16	29	18:19 (D03)	18:27			16:49	16:41	15	15:50 (D04)
18	05:51	06:20		19:02 (D02)	06:51		17:48 (D03)	07:22			06:58	07:27		15:35 (D04)
	20:37	20:04	13	19:15 (D02)	19:15	32	18:20 (D03)	18:25			16:48	16:41	16	15:51 (D04)
19	05:52	06:21		19:00 (D02)	06:52		17:46 (D03)	07:23			06:59	07:28		15:36 (D04)
	20:37	20:03	16	19:16 (D02)	19:13	34	18:20 (D03)	18:24			16:48	16:42	16	15:52 (D04)
20	05:53	06:22		18:58 (D02)	06:53		17:45 (D03)	07:24			07:00	07:28		15:36 (D04)
	20:36	20:01	20	19:18 (D02)	19:11	35	18:20 (D03)	18:22			16:47	16:42	16	15:52 (D04)
21	05:54	06:23		18:57 (D02)	06:54		17:44 (D03)	07:25			07:01	07:29		15:37 (D04)
	20:35	20:00	22	19:19 (D02)	19:10	36	18:20 (D03)	18:21			16:46	16:43	16	15:53 (D04)
22	05:54	06:24		18:56 (D02)	06:55		17:43 (D03)	07:26			07:03	07:29		15:37 (D04)
	20:35	19:58	23	19:19 (D02)	19:08	37	18:20 (D03)	18:20			16:46	16:43	16	15:53 (D04)
23	05:55	06:25		18:55 (D02)	06:56		17:42 (D03)	07:27			07:04	07:30		15:38 (D04)
	20:34	19:57	25	19:20 (D02)	19:06	38	18:20 (D03)	18:18			16:45	16:43	16	15:54 (D04)
24	05:56	06:26		18:54 (D02)	06:57		17:42 (D03)	07:29			07:05	07:30		15:38 (D04)
	20:33	19:55	26	19:20 (D02)	19:04	38	18:20 (D03)	18:17			16:44	16:44	16	15:54 (D04)
25	05:57	06:27		18:53 (D02)	06:58		17:41 (D03)	07:30			07:06	07:31		15:38 (D04)
	20:32	19:54	27	19:20 (D02)	19:03	38	18:19 (D03)	18:15			16:44	16:45	16	15:54 (D04)
26	05:58	06:28		18:53 (D02)	06:59		17:41 (D03)	07:31			07:07	07:31		15:40 (D04)
	20:31	19:52	27	19:20 (D02)	19:01	38	18:19 (D03)	18:14			16:43	16:45	15	15:55 (D04)
27	05:59	06:29		18:53 (D02)	07:00		17:41 (D03)	07:32			07:08	07:31		15:40 (D04)
	20:30	19:51	27	19:20 (D02)	18:59	37	18:18 (D03)	18:13			16:43	16:46	15	15:55 (D04)
28	06:00	06:30		18:52 (D02)	07:01		17:41 (D03)	07:33			07:09	07:32		15:41 (D04)
	20:29	19:49	28	19:20 (D02)	18:58	37	18:18 (D03)	18:11			16:42	16:46	14	15:55 (D04)
29	06:01	06:31		18:52 (D02)	07:02		17:41 (D03)	07:34			07:10	07:32		15:41 (D04)
	20:28	19:48	27	19:19 (D02)	18:56	36	18:17 (D03)	18:10			16:42	16:47	14	15:55 (D04)
30	06:02	06:32		18:53 (D02)	07:03		17:41 (D03)	07:35			07:11	07:32		15:43 (D04)
	20:27	19:46	26	19:19 (D02)	18:54	35	18:16 (D03)	18:09			16:42	16:48	13	15:56 (D04)
31	06:03	06:33		18:53 (D02)				07:37				07:32		15:44 (D04)
	20:26	19:45	25	19:18 (D02)				18:07				16:49	12	15:56 (D04)
Potential sun hours	458	428			375			346			298	288		
Total, worst case			337			669			155				320	
Sun reduction			0.96			0.93			0.84				0.47	
Oper. time red.			1.00			1.00			1.00				1.00	
Wind dir. red.			0.60			0.73			0.75				0.89	
Total reduction			0.59			0.69			0.64				0.43	
Total, real			198			465			100				137	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 22 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (97)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	18:53 (D02)	07:04	17:36 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43 (23)	19:16 (D02)	18:53 (37)	18:13 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	18:54 (D02)	07:05	17:36 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41 (20)	19:14 (D02)	18:51 (36)	18:12 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	18:55 (D02)	07:06	17:37 (D03)	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40 (17)	19:12 (D02)	18:49 (34)	18:11 (D03)	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	18:57 (D02)	07:07	17:39 (D03)	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38 (13)	19:10 (D02)	18:48 (31)	18:10 (D03)	17:02	16:40
5	07:33	07:15	06:37 17:14 (D03)	06:46	06:02	05:37	05:42	06:07	06:38		07:08	17:40 (D03)	06:43	07:16
	16:53	17:28	18:02 (6) 17:20 (D03)	19:35	20:07	20:35	20:43	20:21	19:36		18:46 (28)	18:08 (D03)	17:01	16:40
6	07:33	07:14	06:35 17:09 (D03)	06:44	06:01	05:37	05:42	06:08	06:39		07:09	17:41 (D03)	06:44	07:17
	16:54	17:30	18:03 (17) 17:26 (D03)	19:36	20:08	20:36	20:43	20:20	19:35		18:44 (25)	18:06 (D03)	17:00	16:40
7	07:33	07:13	06:34 17:06 (D03)	06:43	06:00	05:37	05:43	06:09	06:40		07:10	17:43 (D03)	06:45	07:18
	16:55	17:31	18:04 (22) 17:28 (D03)	19:37	20:09	20:36	20:43	20:19	19:33		18:43 (20)	18:03 (D03)	16:59	16:40
8	07:32	07:12	07:32 18:03 (D03)	06:41 19:00 (D02)	05:59	05:36	05:44	06:10	06:41		07:11	17:47 (D03)	06:46	07:19
	16:56	17:32	19:05 (27) 18:30 (D03)	19:39 (13) 19:13 (D02)	20:10	20:37	20:42	20:17	19:31		18:41 (12)	17:59 (D03)	16:58	16:40
9	07:32	07:10	07:30 18:02 (D03)	06:39 18:58 (D02)	05:57	05:36	05:44	06:11	06:42		07:12		06:47	07:20
	16:57	17:33	19:06 (30) 18:32 (D03)	19:40 (17) 19:15 (D02)	20:11	20:38	20:42	20:16	19:30		18:40		16:57	16:40
10	07:32	07:09	07:29 18:00 (D03)	06:38 18:56 (D02)	05:56	05:36	05:45	06:12	06:43		07:13		06:48	07:21
	16:58	17:35	19:07 (32) 18:32 (D03)	19:41 (20) 19:16 (D02)	20:12	20:38	20:42	20:15	19:28		18:38		16:56	16:40
11	07:32	07:08	07:27 17:59 (D03)	06:36 18:54 (D02)	05:55	05:36	05:46	06:13	06:44		07:14		06:50	07:22
	16:59	17:36	19:09 (35) 18:34 (D03)	19:42 (23) 19:17 (D02)	20:13	20:39	20:41	20:14	19:26		18:36		16:55	16:40
12	07:32	07:07	07:26 17:58 (D03)	06:35 18:53 (D02)	05:54	05:36	05:46	06:14	06:45		07:15		06:51	07:23
	17:00	17:37	19:10 (36) 18:34 (D03)	19:43 (25) 19:18 (D02)	20:14	20:39	20:41	20:12	19:25		18:35		16:54	16:40
13	07:31	07:06	07:24 17:56 (D03)	06:33 18:52 (D02)	05:53	05:36	05:47	06:15	06:46	17:55 (D03)	07:16		06:52	07:23
	17:01	17:38	19:11 (38) 18:34 (D03)	19:44 (26) 19:18 (D02)	20:15	20:40	20:40	20:11	19:23 (15)	18:10 (D03)	18:33		16:53	16:40
14	07:31	07:04	07:22 17:56 (D03)	06:32 18:51 (D02)	05:52	05:36	05:48	06:16	06:47	17:52 (D03)	07:17		06:53	07:24
	17:02	17:39	19:12 (39) 18:35 (D03)	19:45 (28) 19:19 (D02)	20:16	20:40	20:40	20:10	19:21 (20)	18:12 (D03)	18:32		16:52	16:40
15	07:31	07:03	07:21 17:55 (D03)	06:30 18:50 (D02)	05:51	05:36	05:49	06:17	06:48	17:49 (D03)	07:19		06:54	07:25
	17:03	17:41	19:13 (40) 18:35 (D03)	19:46 (29) 19:19 (D02)	20:17	20:41	20:39	20:08	19:20 (25)	18:14 (D03)	18:30		16:51	16:41
16	07:30	07:02	07:19 17:54 (D03)	06:28 18:50 (D02)	05:50	05:36	05:49	06:18 19:04 (D02)	06:49	17:47 (D03)	07:20		06:56	07:26
	17:04	17:42	19:14 (41) 18:35 (D03)	19:47 (29) 19:19 (D02)	20:18	20:41	20:39	20:07 (10) 19:14 (D02)	19:18 (28)	18:15 (D03)	18:28		16:50	16:41
17	07:30	07:00	07:17 17:54 (D03)	06:27 18:50 (D02)	05:49	05:36	05:50	06:19 19:01 (D02)	06:50	17:45 (D03)	07:21		06:57	07:26
	17:05	17:43	19:15 (41) 18:35 (D03)	19:48 (28) 19:18 (D02)	20:19	20:41	20:38	20:06 (15) 19:16 (D02)	19:16 (32)	18:17 (D03)	18:27		16:49	16:41
18	07:29	06:59	07:16 17:54 (D03)	06:25 18:50 (D02)	05:48	05:36	05:51	06:20 18:59 (D02)	06:51	17:44 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16 (41) 18:35 (D03)	19:49 (29) 19:19 (D02)	20:20	20:42	20:37	20:04 (19) 19:18 (D02)	19:15 (33)	18:17 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14 17:53 (D03)	06:24 18:49 (D02)	05:47	05:36	05:52	06:21 18:58 (D02)	06:52	17:42 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 (41) 18:34 (D03)	19:50 (29) 19:18 (D02)	20:21	20:42	20:37	20:03 (21) 19:19 (D02)	19:13 (36)	18:18 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12 17:54 (D03)	06:22 18:50 (D02)	05:47	05:36	05:53	06:22 18:56 (D02)	06:53	17:40 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 (40) 18:34 (D03)	19:51 (28) 19:18 (D02)	20:22	20:42	20:36	20:01 (24) 19:20 (D02)	19:11 (37)	18:17 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11 17:54 (D03)	06:21 18:50 (D02)	05:46	05:36	05:54	06:23 18:55 (D02)	06:54	17:39 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 (39) 18:33 (D03)	19:52 (26) 19:16 (D02)	20:23	20:43	20:35	20:00 (26) 19:21 (D02)	19:10 (39)	18:18 (D03)	18:21		16:46	16:43
22	07:27	06:53	07:09 17:54 (D03)	06:19 18:51 (D02)	05:45	05:36	05:54	06:24 18:55 (D02)	06:55	17:38 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 (38) 18:32 (D03)	19:53 (25) 19:16 (D02)	20:24	20:43	20:35	19:58 (26) 19:21 (D02)	19:08 (40)	18:18 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07 17:55 (D03)	06:18 18:51 (D02)	05:44	05:37	05:55	06:25 18:54 (D02)	06:56	17:37 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 (37) 18:32 (D03)	19:54 (23) 19:14 (D02)	20:25	20:43	20:34	19:57 (27) 19:21 (D02)	19:06 (41)	18:18 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06 17:55 (D03)	06:17 18:52 (D02)	05:43	05:37	05:56	06:26 18:53 (D02)	06:57	17:37 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 (36) 18:31 (D03)	19:55 (21) 19:13 (D02)	20:26	20:43	20:33	19:55 (29) 19:22 (D02)	19:04 (41)	18:18 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04 17:55 (D03)	06:15 18:54 (D02)	05:43	05:37	05:57	06:27 18:53 (D02)	06:58	17:36 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 (34) 18:29 (D03)	19:56 (18) 19:12 (D02)	20:26	20:43	20:32	19:54 (29) 19:22 (D02)	19:03 (41)	18:17 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02 17:57 (D03)	06:14 18:55 (D02)	05:42	05:38	05:58	06:28 18:52 (D02)	06:59	17:36 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25 (32) 18:29 (D03)	19:57 (14) 19:09 (D02)	20:27	20:44	20:31	19:52 (29) 19:21 (D02)	19:01 (41)	18:17 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01 17:58 (D03)	06:12 18:58 (D02)	05:41	05:38	05:59	06:29 18:52 (D02)	07:00	17:36 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26 (29) 18:27 (D03)	19:59 (8) 19:06 (D02)	20:28	20:44	20:30	19:51 (29) 19:21 (D02)	18:59 (40)	18:16 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59 17:59 (D03)	06:11	05:41	05:38	06:00	06:30 18:52 (D02)	07:01	17:35 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27 (25) 18:24 (D03)	20:00	20:29	20:44	20:29	19:49 (29) 19:21 (D02)	18:58 (41)	18:16 (D03)	18:11		16:42	16:46
29	07:22		06:57 18:00 (D03)	06:10	05:40	05:39	06:01	06:31 18:52 (D02)	07:02	17:35 (D03)	07:34		07:10	07:32
	17:20		19:28 (21) 18:21 (D03)	20:01	20:30	20:44	20:28	19:48 (28) 19:20 (D02)	18:56 (40)	18:15 (D03)	18:10		16:42	16:47
30	07:21		06:56 18:03 (D03)	06:08	05:40	05:39	06:02	06:32 18:53 (D02)	07:03	17:36 (D03)	07:35		07:11	07:32
	17:21		19:29 (16) 18:19 (D03)	20:02	20:31	20:44	20:27	19:46 (26) 19:19 (D02)	18:54 (38)	18:14 (D03)	18:09		16:42	16:48
31	07:20		06:54 18:09 (D03)		05:39		06:03	06:33 18:53 (D02)			07:37			07:32
	17:22		19:30 (3) 18:12 (D03)		20:31		20:26	19:45 (25) 19:18 (D02)			18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428	375		346		298	288
Total, worst case			836	459				392	701		223			
Sun reduction			0.73	0.82				0.96	0.93		0.84			
Oper. time red.			1.00	1.00				1.00	1.00		1.00			
Wind dir. red.			0.76	0.60				0.60	0.74		0.76			
Total reduction			0.56	0.49				0.58	0.69		0.64			
Total, real			465	226				226	486		143			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 23 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (98)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	18:47 (D02)	07:04	17:32 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43 27	19:14 (D02)	18:53 39	18:11 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	18:48 (D02)	07:05	17:31 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41 25	19:13 (D02)	18:51 39	18:10 (D03)	17:05	16:41
3	07:33	07:17	06:40	17:06 (D03) 06:49	06:05	05:38	05:41	06:05	06:36	18:48 (D02)	07:06	17:32 (D03)	06:40	07:14
	16:51	17:26	18:00 16	17:22 (D03) 19:33	20:05	20:34	20:43	20:23	19:40 24	19:12 (D02)	18:49 37	18:09 (D03)	17:04	16:41
4	07:33	07:16	06:38	17:04 (D03) 06:48	06:03	05:38	05:41	06:06	06:37	18:49 (D02)	07:07	17:33 (D03)	06:41	07:15
	16:52	17:27	18:01 21	17:25 (D03) 19:34	20:06	20:34	20:43	20:22	19:38 22	19:11 (D02)	18:48 36	18:09 (D03)	17:02	16:40
5	07:33	07:15	06:37	17:01 (D03) 06:46	18:59 (D02) 06:02	05:37	05:42	06:07	06:38	18:50 (D02)	07:08	17:33 (D03)	06:43	07:16
	16:53	17:28	18:02 25	17:26 (D03) 19:35	10 19:09 (D02) 20:07	20:35	20:43	20:21	19:36 19	19:09 (D02)	18:46 35	18:08 (D03)	17:01	16:40
6	07:33	07:14	06:35	17:00 (D03) 06:44	18:55 (D02) 06:01	05:37	05:42	06:08	06:39	18:51 (D02)	07:09	17:34 (D03)	06:44	07:17
	16:54	17:30	18:03 29	17:29 (D03) 19:36	16 19:11 (D02) 20:08	20:36	20:43	20:20	19:35 16	19:07 (D02)	18:44 32	18:06 (D03)	17:00	16:40
7	07:33	07:13	06:34	16:58 (D03) 06:43	18:54 (D02) 06:00	05:37	05:43	06:09	06:40	18:54 (D02)	07:10	17:35 (D03)	06:45	07:18
	16:55	17:31	18:04 31	17:29 (D03) 19:37	19 19:13 (D02) 20:09	20:36	20:43	20:19	19:33 10	19:04 (D02)	18:43 30	18:05 (D03)	16:59	16:40
8	07:32	07:12	07:32	17:56 (D03) 06:41	18:52 (D02) 05:59	05:36	05:44	06:10	06:41		07:11	17:36 (D03)	06:46	07:19
	16:56	17:32	19:05 34	18:30 (D03) 19:39	22 19:14 (D02) 20:10	20:37	20:42	20:17	19:31		18:41 27	18:03 (D03)	16:58	16:40
9	07:32	07:10	07:30	17:56 (D03) 06:39	18:51 (D02) 05:57	05:36	05:44	06:11	06:42		07:12	17:37 (D03)	06:47	07:20
	16:57	17:33	19:06 35	18:31 (D03) 19:40	24 19:15 (D02) 20:11	20:38	20:42	20:16	19:30		18:39 24	18:01 (D03)	16:57	16:40
10	07:32	07:09	07:29	17:54 (D03) 06:38	18:50 (D02) 05:56	05:36	05:45	06:12	06:43		07:13	17:39 (D03)	06:48	07:21
	16:58	17:35	19:07 37	18:31 (D03) 19:41	25 19:15 (D02) 20:12	20:38	20:42	20:15	19:28		18:38 19	17:58 (D03)	16:56	16:40
11	07:32	07:08	07:27	17:54 (D03) 06:36	18:48 (D02) 05:55	05:36	05:46	06:13	06:44		07:14	17:43 (D03)	06:50	07:22
	16:59	17:36	19:09 38	18:32 (D03) 19:42	27 19:15 (D02) 20:13	20:39	20:41	20:14	19:26		18:36 11	17:54 (D03)	16:55	16:40
12	07:32	07:07	07:26	17:53 (D03) 06:35	18:48 (D02) 05:54	05:36	05:46	06:14	06:45		07:15		06:51	07:23
	17:00	17:37	19:10 39	18:32 (D03) 19:43	28 19:16 (D02) 20:14	20:39	20:41	20:12	19:25		18:35		16:54	16:40
13	07:31	07:06	07:24	17:52 (D03) 06:33	18:47 (D02) 05:53	05:36	05:47	06:15	06:46		07:16		06:52	07:23
	17:01	17:38	19:11 40	18:32 (D03) 19:44	29 19:16 (D02) 20:15	20:40	20:40	20:11	19:23		18:33		16:53	16:40
14	07:31	07:04	07:22	17:52 (D03) 06:32	18:47 (D02) 05:52	05:36	05:48	06:16	06:47		07:17		06:53	07:24
	17:02	17:39	19:12 40	18:32 (D03) 19:45	29 19:16 (D02) 20:16	20:40	20:40	20:10	19:21		18:32		16:52	16:40
15	07:31	07:03	07:21	17:52 (D03) 06:30	18:47 (D02) 05:51	05:36	05:49	06:17	06:48		07:19		06:54	07:25
	17:03	17:41	19:13 40	18:32 (D03) 19:46	28 19:15 (D02) 20:17	20:41	20:39	20:08	19:20		18:30		16:51	16:41
16	07:30	07:02	07:19	17:51 (D03) 06:28	18:47 (D02) 05:50	05:36	05:49	06:18	06:49	17:54 (D03)	07:20		06:56	07:26
	17:04	17:42	19:14 40	18:31 (D03) 19:47	28 19:15 (D02) 20:18	20:41	20:39	20:07	19:18 8	18:02 (D03)	18:28		16:50	16:41
17	07:30	07:00	07:17	17:52 (D03) 06:27	18:47 (D02) 05:49	05:36	05:50	06:19	06:50	17:49 (D03)	07:21		06:57	07:26
	17:05	17:43	19:15 39	18:31 (D03) 19:48	27 19:14 (D02) 20:19	20:41	20:38	20:06	19:16 17	18:06 (D03)	18:27		16:49	16:41
18	07:29	06:59	07:16	17:52 (D03) 06:25	18:48 (D02) 05:48	05:36	05:51	06:20	06:51	17:46 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16 38	18:30 (D03) 19:49	26 19:14 (D02) 20:20	20:42	20:37	20:04	19:15 22	18:08 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14	17:52 (D03) 06:24	18:48 (D02) 05:47	05:36	05:52	06:21	19:02 (D02) 06:52	17:44 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 37	18:29 (D03) 19:50	24 19:12 (D02) 20:21	20:42	20:37	20:03 6	19:08 (D02) 19:13	26 18:10 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12	17:53 (D03) 06:22	18:49 (D02) 05:47	05:36	05:53	06:22	18:58 (D02) 06:53	17:41 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 36	18:29 (D03) 19:51	22 19:11 (D02) 20:22	20:42	20:36	20:01 13	19:11 (D02) 19:11	29 18:10 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11	17:53 (D03) 06:21	18:50 (D02) 05:46	05:36	05:54	06:23	18:56 (D02) 06:54	17:39 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 34	18:27 (D03) 19:52	19 19:09 (D02) 20:23	20:43	20:35	20:00 17	19:13 (D02) 19:10	32 18:11 (D03)	18:21		16:46	16:43
22	07:27	06:53	07:09	17:54 (D03) 06:19	18:51 (D02) 05:45	05:36	05:54	06:24	18:54 (D02) 06:55	17:38 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 32	18:26 (D03) 19:53	17 19:08 (D02) 20:24	20:43	20:35	19:58 20	19:14 (D02) 19:08	34 18:12 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07	17:55 (D03) 06:18	18:53 (D02) 05:44	05:37	05:55	06:25	18:53 (D02) 06:56	17:37 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 30	18:25 (D03) 19:54	12 19:05 (D02) 20:25	20:43	20:34	19:57 22	19:15 (D02) 19:06	35 18:12 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06	17:56 (D03) 06:17	18:58 (D02) 05:43	05:37	05:56	06:26	18:52 (D02) 06:57	17:35 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 27	18:23 (D03) 19:55	2 19:00 (D02) 20:26	20:43	20:33	19:55 24	19:16 (D02) 19:04	37 18:12 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04	17:57 (D03) 06:15	05:43	05:37	05:57	06:27	18:51 (D02) 06:58	17:34 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 23	18:20 (D03) 19:56	20:26	20:43	20:32	19:54 26	19:17 (D02) 19:03	38 18:12 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02	18:00 (D03) 06:14	05:42	05:38	05:58	06:28	18:50 (D02) 06:59	17:34 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25 18	18:18 (D03) 19:57	20:27	20:44	20:31	19:52 27	19:17 (D02) 19:01	38 18:12 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01	18:04 (D03) 06:12	05:41	05:38	05:59	06:29	18:49 (D02) 07:00	17:33 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26 10	18:14 (D03) 19:59	20:28	20:44	20:30	19:51 28	19:17 (D02) 18:59	39 18:12 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	18:49 (D02) 07:01	17:32 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49 28	19:17 (D02) 18:58	40 18:12 (D03)	18:11		16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	18:48 (D02) 07:02	17:32 (D03)	07:34		07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48 29	19:17 (D02) 18:56	40 18:12 (D03)	18:10		16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	18:48 (D02) 07:03	17:32 (D03)	07:35		07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46 28	19:16 (D02) 18:54	39 18:11 (D03)	18:09		16:42	16:48
31	07:20		06:54		05:39		06:03	06:33	18:48 (D02)		07:37			07:32
	17:22		19:30		20:31		20:26	19:45 28	19:16 (D02)		18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428	375		346		298	288
Total, worst case			789	434				296	617		329			
Sun reduction			0.73	0.82				0.96	0.93		0.84			
Oper. time red.			1.00	1.00				1.00	1.00		1.00			
Wind dir. red.			0.77	0.61				0.61	0.73		0.77			
Total reduction			0.57	0.50				0.59	0.69		0.65			
Total, real			446	219				175	423		214			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 24 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (99)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	17:08 (D03)	06:52		06:07	05:39	05:40	06:04	06:34	18:45 (D02)	07:04	17:31 (D03)	06:38	07:12
	16:50	17:23	17:57 12	17:20 (D03)	19:31		20:03	20:32	20:44	20:25	19:43 27	19:12 (D02)	18:53 38	18:09 (D03)	18:06	16:41
2	07:33	07:18	06:41	17:04 (D03)	06:51		06:06	05:38	05:40	06:05	06:35	18:44 (D02)	07:05	17:31 (D03)	06:39	07:13
	16:50	17:25	17:58 19	17:23 (D03)	19:32		20:04	20:33	20:44	20:24	19:41 28	19:12 (D02)	18:51 38	18:09 (D03)	17:05	16:41
3	07:33	07:17	06:40	17:01 (D03)	06:49	18:57 (D02)	06:05	05:38	05:41	06:05	06:36	18:44 (D02)	07:06	17:30 (D03)	06:40	07:14
	16:51	17:26	18:00 23	17:24 (D03)	19:33 10	19:07 (D02)	20:05	20:34	20:43	20:23	19:40 27	19:11 (D02)	18:49 38	18:08 (D03)	17:04	16:41
4	07:33	07:16	06:38	17:00 (D03)	06:48	18:54 (D02)	06:03	05:38	05:41	06:06	06:37	18:45 (D02)	07:07	17:31 (D03)	06:41	07:15
	16:52	17:27	18:01 27	17:27 (D03)	19:34 16	19:10 (D02)	20:06	20:34	20:43	20:22	19:38 25	19:10 (D02)	18:48 37	18:08 (D03)	17:02	16:40
5	07:33	07:15	06:37	16:58 (D03)	06:46	18:52 (D02)	06:02	05:37	05:42	06:07	06:38	18:45 (D02)	07:08	17:31 (D03)	06:43	07:16
	16:53	17:28	18:02 29	17:27 (D03)	19:35 19	19:11 (D02)	20:07	20:35	20:43	20:21	19:36 24	19:09 (D02)	18:46 36	18:07 (D03)	17:01	16:40
6	07:33	07:14	06:35	16:57 (D03)	06:44	18:50 (D02)	06:01	05:37	05:42	06:08	06:39	18:46 (D02)	07:09	17:32 (D03)	06:44	07:17
	16:54	17:30	18:03 32	17:29 (D03)	19:36 22	19:12 (D02)	20:08	20:36	20:43	20:20	19:35 22	19:08 (D02)	18:44 34	18:06 (D03)	17:00	16:40
7	07:33	07:13	06:34	16:55 (D03)	06:43	18:49 (D02)	06:00	05:37	05:43	06:09	06:40	18:47 (D02)	07:10	17:32 (D03)	06:45	07:18
	16:55	17:31	18:04 34	17:29 (D03)	19:37 24	19:13 (D02)	20:09	20:36	20:43	20:19	19:33 19	19:06 (D02)	18:43 33	18:05 (D03)	16:59	16:40
8	07:32	07:12	07:32	17:54 (D03)	06:41	18:48 (D02)	05:59	05:36	05:44	06:10	06:41	18:48 (D02)	07:11	17:33 (D03)	06:46	07:19
	16:56	17:32	19:05 35	18:29 (D03)	19:39 25	19:13 (D02)	20:10	20:37	20:42	20:17	19:31 16	19:04 (D02)	18:41 31	18:04 (D03)	16:58	16:40
9	07:32	07:10	07:30	17:54 (D03)	06:39	18:47 (D02)	05:57	05:36	05:44	06:11	06:42	18:51 (D02)	07:12	17:34 (D03)	06:47	07:20
	16:57	17:33	19:06 36	18:30 (D03)	19:40 27	19:14 (D02)	20:11	20:38	20:42	20:16	19:30 10	19:01 (D02)	18:39 28	18:02 (D03)	16:57	16:40
10	07:32	07:09	07:29	17:53 (D03)	06:38	18:46 (D02)	05:56	05:36	05:45	06:12	06:43		07:13	17:35 (D03)	06:48	07:21
	16:58	17:35	19:07 37	18:30 (D03)	19:41 28	19:14 (D02)	20:12	20:38	20:42	20:15	19:28		18:38 25	18:00 (D03)	16:56	16:40
11	07:32	07:08	07:27	17:53 (D03)	06:36	18:46 (D02)	05:55	05:36	05:46	06:13	06:44		07:14	17:36 (D03)	06:50	07:22
	16:59	17:36	19:09 38	18:31 (D03)	19:42 27	19:13 (D02)	20:13	20:39	20:41	20:14	19:26		18:36 22	17:58 (D03)	16:55	16:40
12	07:32	07:07	07:26	17:52 (D03)	06:35	18:46 (D02)	05:54	05:36	05:46	06:14	06:45		07:15	17:39 (D03)	06:51	07:23
	17:00	17:37	19:10 38	18:30 (D03)	19:43 27	19:13 (D02)	20:14	20:39	20:41	20:12	19:25		18:35 16	17:55 (D03)	16:54	16:40
13	07:31	07:06	07:24	17:52 (D03)	06:33	18:45 (D02)	05:53	05:36	05:47	06:15	06:46		07:16	17:43 (D03)	06:52	07:23
	17:01	17:38	19:11 38	18:30 (D03)	19:44 28	19:13 (D02)	20:15	20:40	20:40	20:11	19:23		18:33 7	17:50 (D03)	16:53	16:40
14	07:31	07:04	07:22	17:52 (D03)	06:32	18:46 (D02)	05:52	05:36	05:48	06:16	06:47		07:17		06:53	07:24
	17:02	17:39	19:12 38	18:30 (D03)	19:45 27	19:13 (D02)	20:16	20:40	20:40	20:10	19:21		18:32		16:52	16:40
15	07:31	07:03	07:21	17:52 (D03)	06:30	18:46 (D02)	05:51	05:36	05:49	06:17	06:48		07:19		06:54	07:25
	17:03	17:41	19:13 37	18:29 (D03)	19:46 25	19:11 (D02)	20:17	20:41	20:39	20:08	19:20		18:30		16:51	16:41
16	07:30	07:02	07:19	17:52 (D03)	06:28	18:47 (D02)	05:50	05:36	05:49	06:18	06:49		07:20		06:56	07:26
	17:04	17:42	19:14 36	18:28 (D03)	19:47 24	19:11 (D02)	20:18	20:41	20:39	20:07	19:18		18:28		16:50	16:41
17	07:30	07:00	07:17	17:53 (D03)	06:27	18:47 (D02)	05:49	05:36	05:50	06:19	06:50		07:21		06:57	07:26
	17:05	17:43	19:15 35	18:28 (D03)	19:48 22	19:09 (D02)	20:19	20:41	20:38	20:06	19:16		18:27		16:49	16:41
18	07:29	06:59	07:16	17:53 (D03)	06:25	18:48 (D02)	05:48	05:36	05:51	06:20	06:51		07:22		06:58	07:27
	17:07	17:44	19:16 34	18:27 (D03)	19:49 20	19:08 (D02)	20:20	20:42	20:37	20:04	19:15		18:25		16:48	16:41
19	07:29	06:58	07:14	17:53 (D03)	06:24	18:49 (D02)	05:47	05:36	05:52	06:21	06:52	17:49 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 32	18:25 (D03)	19:50 17	19:06 (D02)	20:21	20:42	20:37	20:03	19:13 11	18:00 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12	17:55 (D03)	06:22	18:51 (D02)	05:47	05:36	05:53	06:22	06:53	17:45 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 30	18:25 (D03)	19:51 13	19:04 (D02)	20:22	20:42	20:36	20:01	19:11 19	18:04 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11	17:55 (D03)	06:21	18:55 (D02)	05:46	05:36	05:54	06:23	06:54	17:42 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 28	18:23 (D03)	19:52 4	18:59 (D02)	20:23	20:43	20:35	20:00	19:10 23	18:05 (D03)	18:21		16:46	16:43
22	07:27	06:53	07:09	17:57 (D03)	06:19		05:45	05:36	05:54	06:24	18:59 (D02)	06:55	17:40 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 24	18:21 (D03)	19:53		20:24	20:43	20:35	19:58 6	19:05 (D02)	19:08 27	18:07 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07	17:59 (D03)	06:18		05:44	05:37	05:55	06:25	18:55 (D02)	06:56	17:38 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 20	18:19 (D03)	19:54		20:25	20:43	20:34	19:57 13	19:08 (D02)	19:06 30	18:08 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06	18:02 (D03)	06:17		05:43	05:37	05:56	06:26	18:53 (D02)	06:57	17:37 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 13	18:15 (D03)	19:55		20:26	20:43	20:33	19:55 17	19:10 (D02)	19:04 32	18:09 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04		06:15		05:43	05:37	05:57	06:27	18:51 (D02)	06:58	17:36 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24		19:56		20:26	20:43	20:32	19:54 20	19:11 (D02)	19:03 33	18:09 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02		06:14		05:42	05:38	05:58	06:28	18:50 (D02)	06:59	17:34 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25		19:57		20:27	20:44	20:31	19:52 22	19:12 (D02)	19:01 35	18:09 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01		06:12		05:41	05:38	05:59	06:29	18:49 (D02)	07:00	17:33 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26		19:59		20:28	20:44	20:30	19:51 24	19:13 (D02)	18:59 37	18:10 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59		06:11		05:41	05:38	06:00	06:30	18:48 (D02)	07:01	17:33 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27		20:00		20:29	20:44	20:29	19:49 25	19:13 (D02)	18:58 37	18:10 (D03)	18:11		16:42	16:46
29	07:22		06:57		06:10		05:40	05:39	06:01	06:31	18:47 (D02)	07:02	17:32 (D03)	07:34		07:10	07:32
	17:20		19:28		20:01		20:30	20:44	20:28	19:48 26	19:13 (D02)	18:56 38	18:10 (D03)	18:10		16:42	16:47
30	07:21		06:56		06:08		05:40	05:39	06:02	06:32	18:46 (D02)	07:03	17:31 (D03)	07:35		07:11	07:32
	17:21		19:29		20:02		20:31	20:44	20:27	19:46 28	19:14 (D02)	18:54 38	18:09 (D03)	18:09		16:42	16:48
31	07:20		06:54				05:39		06:03	06:33	18:46 (D02)			07:37			07:32
	17:22		19:30				20:31		20:26	19:45 27	19:13 (D02)			18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428		375		346		298		288
Total, worst case			725	405				208		558		383				
Sun reduction			0.73	0.82				0.96		0.93		0.84				
Oper. time red.			1.00	1.00				1.00		1.00		1.00				
Wind dir. red.			0.78	0.62				0.62		0.72		0.78				
Total reduction			0.57	0.51				0.60		0.68		0.66				
Total, real			413	208				125		377		251				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 25 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (100)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	18:46 (D02)	07:04	17:39 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43 26	19:12 (D02)	18:53 34	18:13 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	18:46 (D02)	07:05	17:39 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41 26	19:12 (D02)	18:51 34	18:13 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49 18:57 (D02)	06:05	05:38	05:41	06:05	06:36	18:46 (D02)	07:06	17:39 (D03)	06:40	07:14
	16:51	17:26	18:00	19:33 11 19:08 (D02)	20:05	20:34	20:43	20:23	19:40 25	19:11 (D02)	18:49 33	18:12 (D03)	17:04	16:41
4	07:33	07:16	06:38 17:14 (D03)	06:48 18:55 (D02)	06:03	05:38	05:41	06:06	06:37	18:46 (D02)	07:07	17:41 (D03)	06:41	07:15
	16:52	17:27	18:01 12 17:26 (D03)	19:34 16 19:11 (D02)	20:06	20:34	20:43	20:22	19:38 24	19:10 (D02)	18:48 31	18:12 (D03)	17:02	16:40
5	07:33	07:15	06:37 17:10 (D03)	06:46 18:53 (D02)	06:02	05:37	05:42	06:07	06:38	18:46 (D02)	07:08	17:41 (D03)	06:43	07:16
	16:53	17:28	18:02 18 17:28 (D03)	19:35 19 19:12 (D02)	20:07	20:35	20:43	20:21	19:36 23	19:09 (D02)	18:46 29	18:10 (D03)	17:01	16:40
6	07:33	07:14	06:35 17:08 (D03)	06:44 18:51 (D02)	06:01	05:37	05:42	06:08	06:39	18:47 (D02)	07:09	17:42 (D03)	06:44	07:17
	16:54	17:30	18:03 23 17:31 (D03)	19:36 21 19:12 (D02)	20:08	20:36	20:43	20:20	19:35 21	19:08 (D02)	18:44 27	18:09 (D03)	17:00	16:40
7	07:33	07:13	06:34 17:06 (D03)	06:43 18:50 (D02)	06:00	05:37	05:43	06:09	06:40	18:48 (D02)	07:10	17:43 (D03)	06:45	07:18
	16:55	17:31	18:04 26 17:32 (D03)	19:37 23 19:13 (D02)	20:09	20:36	20:43	20:19	19:33 19	19:07 (D02)	18:43 24	18:07 (D03)	16:59	16:40
8	07:32	07:12	07:32 18:04 (D03)	06:41 18:49 (D02)	05:59	05:36	05:44	06:10	06:41	18:49 (D02)	07:11	17:44 (D03)	06:46	07:19
	16:56	17:32	19:05 28 18:32 (D03)	19:38 24 19:13 (D02)	20:10	20:37	20:42	20:17	19:31 16	19:05 (D02)	18:41 21	18:05 (D03)	16:58	16:40
9	07:32	07:10	07:30 18:03 (D03)	06:39 18:48 (D02)	05:57	05:36	05:44	06:11	06:42	18:51 (D02)	07:12	17:46 (D03)	06:47	07:20
	16:57	17:33	19:06 31 18:34 (D03)	19:40 25 19:13 (D02)	20:11	20:38	20:42	20:16	19:30 11	19:02 (D02)	18:39 16	18:02 (D03)	16:57	16:40
10	07:32	07:09	07:29 18:02 (D03)	06:38 18:48 (D02)	05:56	05:36	05:45	06:12	06:43		07:13	17:50 (D03)	06:48	07:21
	16:58	17:35	19:07 32 18:34 (D03)	19:41 26 19:14 (D02)	20:12	20:38	20:42	20:15	19:28		18:38 7	17:57 (D03)	16:56	16:40
11	07:32	07:08	07:27 18:02 (D03)	06:36 18:47 (D02)	05:55	05:36	05:46	06:13	06:44		07:14		06:50	07:22
	16:59	17:36	19:09 33 18:35 (D03)	19:42 26 19:13 (D02)	20:13	20:39	20:41	20:14	19:26		18:36		16:55	16:40
12	07:32	07:07	07:26 18:01 (D03)	06:35 18:48 (D02)	05:54	05:36	05:46	06:14	06:45		07:15		06:51	07:23
	17:00	17:37	19:10 34 18:35 (D03)	19:43 25 19:13 (D02)	20:14	20:39	20:41	20:12	19:25		18:35		16:54	16:40
13	07:31	07:06	07:24 18:00 (D03)	06:33 18:47 (D02)	05:53	05:36	05:47	06:15	06:46		07:16		06:52	07:23
	17:01	17:38	19:11 34 18:34 (D03)	19:44 25 19:12 (D02)	20:15	20:40	20:40	20:11	19:23		18:33		16:53	16:40
14	07:31	07:04	07:22 18:00 (D03)	06:32 18:48 (D02)	05:52	05:36	05:48	06:16	06:47		07:17		06:53	07:24
	17:02	17:39	19:12 35 18:35 (D03)	19:45 24 19:12 (D02)	20:16	20:40	20:40	20:10	19:21		18:32		16:52	16:40
15	07:31	07:03	07:21 18:00 (D03)	06:30 18:48 (D02)	05:51	05:36	05:49	06:17	06:48		07:19		06:54	07:25
	17:03	17:41	19:13 34 18:34 (D03)	19:46 22 19:10 (D02)	20:17	20:41	20:39	20:08	19:20		18:30		16:51	16:41
16	07:30	07:02	07:19 17:59 (D03)	06:28 18:49 (D02)	05:50	05:36	05:49	06:18	06:49		07:20		06:56	07:26
	17:04	17:42	19:14 34 18:33 (D03)	19:47 21 19:10 (D02)	20:18	20:41	20:39	20:07	19:18		18:28		16:50	16:41
17	07:30	07:00	07:17 18:00 (D03)	06:27 18:50 (D02)	05:49	05:36	05:50	06:19	06:50		07:21		06:57	07:26
	17:05	17:43	19:15 34 18:34 (D03)	19:48 18 19:08 (D02)	20:19	20:41	20:38	20:06	19:16		18:27		16:49	16:41
18	07:29	06:59	07:16 18:00 (D03)	06:25 18:52 (D02)	05:48	05:36	05:51	06:20	06:51 17:59 (D03)		07:22		06:58	07:27
	17:07	17:44	19:16 32 18:32 (D03)	19:49 14 19:06 (D02)	20:20	20:42	20:37	20:04	19:15 7	18:06 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14 18:00 (D03)	06:24 18:54 (D02)	05:47	05:36	05:52	06:21	06:52	17:53 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 31 18:31 (D03)	19:50 8 19:02 (D02)	20:21	20:42	20:37	20:03	19:13 16	18:09 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12 18:01 (D03)	06:22	05:47	05:36	05:53	06:22	06:53	17:50 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 30 18:31 (D03)	19:51	20:22	20:42	20:36	20:01	19:11 21	18:11 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11 18:02 (D03)	06:21	05:46	05:36	05:54	06:23	06:54	17:48 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 27 18:29 (D03)	19:52	20:23	20:43	20:35	20:00	19:10 24	18:12 (D03)	18:21		16:46	16:43
22	07:27	06:53	07:09 18:02 (D03)	06:19	05:45	05:36	05:54	06:24	06:55	17:46 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 25 18:27 (D03)	19:53	20:24	20:43	20:35	19:58	19:08 27	18:13 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07 18:04 (D03)	06:18	05:44	05:37	05:55	06:25	06:56	17:45 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 22 18:26 (D03)	19:54	20:25	20:43	20:34	19:57	19:06 29	18:14 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06 18:06 (D03)	06:17	05:43	05:37	05:56	06:26 18:57 (D02)	06:57	17:44 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 17 18:23 (D03)	19:55	20:26	20:43	20:33	19:55 10 19:07 (D02)	19:04 30	18:14 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04 18:09 (D03)	06:15	05:43	05:37	05:57	06:27 18:55 (D02)	06:58	17:42 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 10 18:19 (D03)	19:56	20:26	20:43	20:32	19:54 14 19:09 (D02)	19:03 33	18:15 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28 18:53 (D02)	06:59	17:42 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52 18 19:11 (D02)	19:01 33	18:15 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29 18:51 (D02)	07:00	17:41 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51 21 19:12 (D02)	18:59 34	18:15 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30 18:50 (D02)	07:01	17:40 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49 22 19:12 (D02)	18:58 35	18:15 (D03)	18:11		16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31 18:49 (D02)	07:02	17:40 (D03)	07:34		07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48 24 19:13 (D02)	18:56 34	18:14 (D03)	18:10		16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32 18:48 (D02)	07:03	17:39 (D03)	07:35		07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46 25 19:13 (D02)	18:54 35	18:14 (D03)	18:09		16:42	16:48
31	07:20		06:54		05:39		06:03	06:33 18:48 (D02)			07:37			07:32
	17:22		19:30		20:31		20:26	19:45 25 19:13 (D02)			18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428	375		346		298	288
Total, worst case			602	348				159	549		256			
Sun reduction			0.73	0.82				0.96	0.93		0.84			
Oper. time red.			1.00	1.00				1.00	1.00		1.00			
Wind dir. red.			0.77	0.62				0.62	0.72		0.77			
Total reduction			0.56	0.51				0.60	0.67		0.65			
Total, real			338	179				96	367		165			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 26 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (101)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	18:49 (D02)	07:04	17:47 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43 24	19:13 (D02)	18:53 30	18:17 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	18:49 (D02)	07:05	17:48 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41 24	19:13 (D02)	18:51 27	18:15 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	18:49 (D02)	07:06	17:49 (D03)	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40 23	19:12 (D02)	18:49 25	18:14 (D03)	17:04	16:41
4	07:33	07:16	06:38	06:48 19:00 (D02)	06:03	05:38	05:41	06:06	06:37	18:49 (D02)	07:07	17:51 (D03)	06:41	07:15
	16:52	17:27	18:01	19:34 10 19:10 (D02)	20:06	20:34	20:43	20:22	19:38 22	19:11 (D02)	18:48 22	18:13 (D03)	17:02	16:40
5	07:33	07:15	06:37	06:46 18:57 (D02)	06:02	05:37	05:42	06:07	06:38	18:50 (D02)	07:08	17:52 (D03)	06:43	07:16
	16:53	17:28	18:02	19:35 15 19:12 (D02)	20:07	20:35	20:43	20:21	19:36 20	19:10 (D02)	18:46 19	18:11 (D03)	17:01	16:40
6	07:33	07:14	06:35	06:44 18:54 (D02)	06:01	05:37	05:42	06:08	06:39	18:50 (D02)	07:09	17:55 (D03)	06:44	07:17
	16:54	17:30	18:03	19:36 19 19:13 (D02)	20:08	20:36	20:43	20:20	19:35 19	19:09 (D02)	18:44 13	18:08 (D03)	17:00	16:40
7	07:33	07:13	06:34 17:20 (D03)	06:43 18:54 (D02)	06:00	05:37	05:43	06:09	06:40	18:52 (D02)	07:10		06:45	07:18
	16:55	17:31	18:04 9 17:29 (D03)	19:37 20 19:14 (D02)	20:09	20:36	20:43	20:19	19:33 15	19:07 (D02)	18:43		16:59	16:40
8	07:32	07:12	07:32 18:16 (D03)	06:41 18:52 (D02)	05:59	05:36	05:44	06:10	06:41	18:54 (D02)	07:11		06:46	07:19
	16:56	17:32	19:05 16 18:32 (D03)	19:38 22 19:14 (D02)	20:10	20:37	20:42	20:17	19:31 10	19:04 (D02)	18:41		16:58	16:40
9	07:32	07:10	07:30 18:14 (D03)	06:39 18:51 (D02)	05:57	05:36	05:44	06:11	06:42		07:12		06:47	07:20
	16:57	17:33	19:06 21 18:35 (D03)	19:40 23 19:14 (D02)	20:11	20:38	20:42	20:16	19:30		18:39		16:57	16:40
10	07:32	07:09	07:29 18:12 (D03)	06:38 18:51 (D02)	05:56	05:36	05:45	06:12	06:43		07:13		06:48	07:21
	16:58	17:35	19:07 24 18:36 (D03)	19:41 24 19:15 (D02)	20:12	20:38	20:42	20:15	19:28		18:38		16:56	16:40
11	07:32	07:08	07:27 18:11 (D03)	06:36 18:50 (D02)	05:55	05:36	05:46	06:13	06:44		07:14		06:50	07:22
	16:59	17:36	19:09 26 18:37 (D03)	19:42 24 19:14 (D02)	20:13	20:39	20:41	20:14	19:26		18:36		16:55	16:40
12	07:32	07:07	07:26 18:09 (D03)	06:35 18:50 (D02)	05:54	05:36	05:46	06:14	06:45		07:15		06:51	07:23
	17:00	17:37	19:10 29 18:38 (D03)	19:43 25 19:15 (D02)	20:14	20:39	20:41	20:12	19:25		18:35		16:54	16:40
13	07:31	07:06	07:24 18:08 (D03)	06:33 18:50 (D02)	05:53	05:36	05:47	06:15	06:46		07:16		06:52	07:23
	17:01	17:38	19:11 30 18:38 (D03)	19:44 24 19:14 (D02)	20:15	20:40	20:40	20:11	19:23		18:33		16:53	16:40
14	07:31	07:04	07:22 18:08 (D03)	06:32 18:50 (D02)	05:52	05:36	05:48	06:16	06:47		07:17		06:53	07:24
	17:02	17:39	19:12 31 18:39 (D03)	19:45 24 19:14 (D02)	20:16	20:40	20:40	20:10	19:21		18:32		16:52	16:40
15	07:31	07:03	07:21 18:07 (D03)	06:30 18:50 (D02)	05:51	05:36	05:49	06:17	06:48		07:19		06:54	07:25
	17:03	17:41	19:13 32 18:39 (D03)	19:46 22 19:12 (D02)	20:17	20:41	20:39	20:08	19:20		18:30		16:51	16:41
16	07:30	07:02	07:19 18:06 (D03)	06:28 18:51 (D02)	05:50	05:36	05:49	06:18	06:49	18:05 (D03)	07:20		06:56	07:26
	17:04	17:42	19:14 32 18:38 (D03)	19:47 21 19:12 (D02)	20:18	20:41	20:39	20:07	19:18 7	18:12 (D03)	18:28		16:50	16:41
17	07:30	07:00	07:17 18:06 (D03)	06:27 18:52 (D02)	05:49	05:36	05:50	06:19	06:50	18:01 (D03)	07:21		06:57	07:26
	17:05	17:43	19:15 33 18:39 (D03)	19:48 18 19:10 (D02)	20:19	20:41	20:38	20:06	19:16 15	18:16 (D03)	18:27		16:49	16:41
18	07:29	06:59	07:16 18:06 (D03)	06:25 18:53 (D02)	05:48	05:36	05:51	06:20	06:51	17:58 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16 32 18:38 (D03)	19:49 16 19:09 (D02)	20:20	20:42	20:37	20:04	19:15 20	18:18 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14 18:05 (D03)	06:24 18:55 (D02)	05:47	05:36	05:52	06:21	06:52	17:55 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 32 18:37 (D03)	19:50 11 19:06 (D02)	20:21	20:42	20:37	20:03	19:13 23	18:18 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12 18:06 (D03)	06:22	05:47	05:36	05:53	06:22	06:53	17:53 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 31 18:37 (D03)	19:51	20:22	20:42	20:36	20:01	19:11 26	18:19 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11 18:06 (D03)	06:21	05:46	05:36	05:53	06:23	06:54	17:52 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 30 18:36 (D03)	19:52	20:23	20:43	20:35	20:00	19:10 28	18:20 (D03)	18:21		16:46	16:42
22	07:27	06:53	07:09 18:06 (D03)	06:19	05:45	05:36	05:54	06:24	06:55	17:51 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 29 18:35 (D03)	19:53	20:24	20:43	20:35	19:58	19:08 29	18:20 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07 18:08 (D03)	06:18	05:44	05:37	05:55	06:25 19:02 (D02)	06:56	17:50 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 26 18:34 (D03)	19:54	20:25	20:43	20:34	19:57 4 19:06 (D02)	19:06 31	18:21 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06 18:08 (D03)	06:17	05:43	05:37	05:56	06:26 18:58 (D02)	06:57	17:49 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 24 18:32 (D03)	19:55	20:26	20:43	20:33	19:55 12 19:10 (D02)	19:04 32	18:21 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04 18:09 (D03)	06:15	05:43	05:37	05:57	06:27 18:56 (D02)	06:58	17:48 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 21 18:30 (D03)	19:56	20:26	20:43	20:32	19:54 16 19:12 (D02)	19:03 33	18:21 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02 18:11 (D03)	06:14	05:42	05:38	05:58	06:28 18:54 (D02)	06:59	17:48 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25 16 18:27 (D03)	19:57	20:27	20:44	20:31	19:52 19 19:13 (D02)	19:01 32	18:20 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01 18:15 (D03)	06:12	05:41	05:38	05:59	06:29 18:53 (D02)	07:00	17:47 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26 9 18:24 (D03)	19:59	20:28	20:44	20:30	19:51 21 19:14 (D02)	18:59 33	18:20 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30 18:52 (D02)	07:01	17:47 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49 22 19:14 (D02)	18:58 32	18:19 (D03)	18:11		16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31 18:51 (D02)	07:02	17:47 (D03)	07:34		07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48 24 19:15 (D02)	18:56 32	18:19 (D03)	18:10		16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32 18:51 (D02)	07:03	17:47 (D03)	07:35		07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46 24 19:15 (D02)	18:54 31	18:18 (D03)	18:09		16:42	16:48
31	07:20		06:54		05:39		06:03	06:33 18:50 (D02)			07:37			07:32
	17:22		19:30		20:31		20:26	19:45 25 19:15 (D02)			18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428	375		346		298	288
Total, worst case			533	318				167	561		136			
Sun reduction			0.73	0.82				0.96	0.93		0.84			
Oper. time red.			1.00	1.00				1.00	1.00		1.00			
Wind dir. red.			0.75	0.62				0.62	0.71		0.75			
Total reduction			0.55	0.51				0.60	0.67		0.63			
Total, real			293	162				100	374		86			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 28 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (102)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March		April		May	June	July	August		September		October		November	December
1	07:32	07:19	06:43		06:52		06:07	05:39	05:40	06:04		06:34		18:49 (D02)	07:04	17:50 (D03)	06:38	07:12
	16:50	17:23	17:57		19:31		20:03	20:32	20:44	20:25		19:43	22	19:11 (D02)	18:53	18:18 (D03)	18:06	16:41
2	07:33	07:18	06:41		06:51		06:06	05:38	05:40	06:05		06:35		18:48 (D02)	07:05	17:50 (D03)	06:39	07:13
	16:50	17:25	17:58		19:32	4	19:06 (D02)	20:04	20:33	20:44	20:24	19:41	23	19:11 (D02)	18:51	18:17 (D03)	17:05	16:41
3	07:33	07:17	06:40		06:49		18:57 (D02)	06:05	05:38	05:41	06:05	06:36		18:48 (D02)	07:06	17:51 (D03)	06:40	07:14
	16:51	17:26	18:00		19:33	13	19:10 (D02)	20:05	20:34	20:43	20:23	19:40	23	19:11 (D02)	18:49	18:15 (D03)	17:04	16:41
4	07:33	07:16	06:38		06:48		18:56 (D02)	06:03	05:38	05:41	06:06	06:37		18:48 (D02)	07:07	17:53 (D03)	06:41	07:15
	16:52	17:27	18:01		19:34	16	19:12 (D02)	20:06	20:34	20:43	20:22	19:38	23	19:11 (D02)	18:48	18:15 (D03)	17:02	16:40
5	07:33	07:15	06:37		06:46		18:54 (D02)	06:02	05:37	05:42	06:07	06:38		18:48 (D02)	07:08	17:54 (D03)	06:43	07:16
	16:53	17:28	18:02		19:35	19	19:13 (D02)	20:07	20:35	20:43	20:21	19:36	22	19:10 (D02)	18:46	18:12 (D03)	17:01	16:40
6	07:33	07:14	06:35		06:44		18:52 (D02)	06:01	05:37	05:42	06:08	06:39		18:48 (D02)	07:09	17:56 (D03)	06:44	07:17
	16:54	17:30	18:03		19:36	21	19:13 (D02)	20:08	20:36	20:43	20:20	19:35	21	19:09 (D02)	18:44	18:09 (D03)	17:00	16:40
7	07:33	07:13	06:34	17:22 (D03)	06:43		18:52 (D02)	06:00	05:37	05:43	06:09	06:40		18:49 (D02)	07:10		06:45	07:18
	16:55	17:31	18:04	9 17:31 (D03)	19:37	22	19:14 (D02)	20:09	20:36	20:43	20:19	19:33	19	19:08 (D02)	18:43		16:59	16:40
8	07:32	07:12	07:32	18:18 (D03)	06:41		18:51 (D02)	05:59	05:36	05:44	06:10	06:41		18:50 (D02)	07:11		06:46	07:19
	16:56	17:32	19:05	16 18:34 (D03)	19:38	23	19:14 (D02)	20:10	20:37	20:42	20:17	19:31	16	19:06 (D02)	18:41		16:58	16:40
9	07:32	07:10	07:30	18:16 (D03)	06:39		18:50 (D02)	05:57	05:36	05:44	06:11	06:42		18:51 (D02)	07:12		06:47	07:20
	16:57	17:33	19:06	20 18:36 (D03)	19:40	23	19:13 (D02)	20:11	20:38	20:42	20:16	19:30	13	19:04 (D02)	18:39		16:57	16:40
10	07:32	07:09	07:29	18:14 (D03)	06:38		18:50 (D02)	05:56	05:36	05:45	06:12	06:43		18:55 (D02)	07:13		06:48	07:21
	16:58	17:35	19:07	23 18:37 (D03)	19:41	23	19:13 (D02)	20:12	20:38	20:42	20:15	19:28	5	19:00 (D02)	18:38		16:56	16:40
11	07:32	07:08	07:27	18:12 (D03)	06:36		18:50 (D02)	05:55	05:36	05:46	06:13	06:44			07:14		06:50	07:22
	16:59	17:36	19:09	26 18:38 (D03)	19:42	22	19:12 (D02)	20:13	20:39	20:41	20:14	19:26			18:36		16:55	16:40
12	07:32	07:07	07:26	18:11 (D03)	06:35		18:50 (D02)	05:54	05:36	05:46	06:14	06:45			07:15		06:51	07:23
	17:00	17:37	19:10	28 18:39 (D03)	19:43	22	19:12 (D02)	20:14	20:39	20:41	20:12	19:25			18:35		16:54	16:40
13	07:31	07:05	07:24	18:10 (D03)	06:33		18:50 (D02)	05:53	05:36	05:47	06:15	06:46			07:16		06:52	07:23
	17:01	17:38	19:11	29 18:39 (D03)	19:44	21	19:11 (D02)	20:15	20:40	20:40	20:11	19:23			18:33		16:53	16:40
14	07:31	07:04	07:22	18:10 (D03)	06:32		18:51 (D02)	05:52	05:36	05:48	06:16	06:47			07:17		06:53	07:24
	17:02	17:39	19:12	30 18:40 (D03)	19:45	20	19:11 (D02)	20:16	20:40	20:40	20:10	19:21			18:32		16:52	16:40
15	07:31	07:03	07:21	18:09 (D03)	06:30		18:52 (D02)	05:51	05:36	05:49	06:17	06:48			07:19		06:54	07:25
	17:03	17:41	19:13	31 18:40 (D03)	19:46	17	19:09 (D02)	20:17	20:41	20:39	20:08	19:20			18:30		16:51	16:41
16	07:30	07:02	07:19	18:09 (D03)	06:28		18:54 (D02)	05:50	05:36	05:49	06:18	06:49			07:20		06:56	07:26
	17:04	17:42	19:14	30 18:39 (D03)	19:47	13	19:07 (D02)	20:18	20:41	20:39	20:07	19:18			18:28		16:50	16:41
17	07:30	07:00	07:17	18:09 (D03)	06:27		18:56 (D02)	05:49	05:36	05:50	06:19	06:50			07:21		06:57	07:26
	17:05	17:43	19:15	31 18:40 (D03)	19:48	8	19:04 (D02)	20:19	20:41	20:38	20:06	19:16			18:27		16:49	16:41
18	07:29	06:59	07:16	18:09 (D03)	06:25			05:48	05:36	05:51	06:20	06:51		18:04 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16	30 18:39 (D03)	19:49			20:20	20:42	20:37	20:04	19:15	12	18:16 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14	18:08 (D03)	06:24			05:47	05:36	05:52	06:21	06:52		18:00 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17	30 18:38 (D03)	19:50			20:21	20:42	20:37	20:03	19:13	17	18:17 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12	18:09 (D03)	06:22			05:47	05:36	05:53	06:22	06:53		17:57 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18	29 18:38 (D03)	19:51			20:22	20:42	20:36	20:01	19:11	22	18:19 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11	18:09 (D03)	06:21			05:46	05:36	05:53	06:23	06:54		17:56 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19	27 18:36 (D03)	19:52			20:23	20:43	20:35	20:00	19:10	24	18:20 (D03)	18:21		16:46	16:42
22	07:27	06:53	07:09	18:10 (D03)	06:19			05:45	05:36	05:54	06:24	06:55		17:54 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21	25 18:35 (D03)	19:53			20:24	20:43	20:35	19:58	19:08	26	18:20 (D03)	18:19		16:46	16:43
23	07:26	06:52	07:07	18:12 (D03)	06:18			05:44	05:37	05:55	06:25	06:56		17:53 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22	22 18:34 (D03)	19:54			20:25	20:43	20:34	19:57	19:06	28	18:21 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06	18:13 (D03)	06:17			05:43	05:37	05:56	06:26	06:57		17:52 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23	18 18:31 (D03)	19:55			20:26	20:43	20:33	19:55	19:04	29	18:21 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04	18:15 (D03)	06:15			05:43	05:37	05:57	06:27	06:58		17:51 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24	13 18:28 (D03)	19:56			20:26	20:43	20:32	19:54	19:03	30	18:21 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02	18:19 (D03)	06:14			05:42	05:38	05:58	06:28	18:58 (D02)		06:59	17:50 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25	3 18:22 (D03)	19:57			20:27	20:44	20:31	19:52	9 19:07 (D02)		19:01	31 18:21 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01		06:12			05:41	05:38	05:59	06:29	18:55 (D02)		07:00	17:50 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26		19:58			20:28	20:44	20:30	19:51	14 19:09 (D02)		18:59	31 18:21 (D03)	18:12		16:43	16:46
28	07:22	06:45	06:59		06:11			05:41	05:38	06:00	06:30	18:54 (D02)		07:01	17:50 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27		20:00			20:29	20:44	20:29	19:49	17 19:11 (D02)		18:58	30 18:20 (D03)	18:11		16:42	16:46
29	07:22		06:57		06:10			05:40	05:39	06:01	06:31	18:52 (D02)		07:02	17:50 (D03)	07:34		07:10	07:32
	17:20		19:28		20:01			20:30	20:44	20:28	19:48	19 19:11 (D02)		18:56	30 18:20 (D03)	18:10		16:42	16:47
30	07:21		06:56		06:08			05:40	05:39	06:02	06:32	18:51 (D02)		07:03	17:50 (D03)	07:35		07:11	07:32
	17:21		19:29		20:02			20:31	20:44	20:27	19:46	21 19:12 (D02)		18:54	29 18:19 (D03)	18:09		16:42	16:48
31	07:20		06:54					05:39		06:03	06:33	18:49 (D02)				07:37			07:32
	17:22		19:30					20:31		20:26	19:44	22 19:11 (D02)				18:07			16:49
Potential sun hours	298	297	369		398		448	452	458	428		375			346		298	288
Total, worst case				470		287					102		526			132		
Sun reduction				0.73		0.82					0.96		0.93			0.84		
Oper. time red.				1.00		1.00					1.00		1.00			1.00		
Wind dir. red.				0.75		0.63					0.63		0.71			0.75		
Total reduction				0.55		0.51					0.60		0.66			0.63		
Total, real				259		148					61		347			84		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 29 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (103)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	18:48 (D02)	07:04	17:48 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43 23	19:11 (D02)	18:53 29	18:17 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51 19:03 (D02)	06:06	05:38	05:40	06:05	06:35	18:48 (D02)	07:05	17:48 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32 2 19:05 (D02)	20:04	20:33	20:44	20:24	19:41 23	19:11 (D02)	18:51 28	18:16 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49 18:57 (D02)	06:05	05:38	05:41	06:05	06:36	18:47 (D02)	07:06	17:49 (D03)	06:40	07:14
	16:51	17:26	18:00	19:33 12 19:09 (D02)	20:05	20:34	20:43	20:23	19:40 24	19:11 (D02)	18:49 26	18:15 (D03)	17:04	16:41
4	07:33	07:16	06:38	06:48 18:56 (D02)	06:03	05:38	05:41	06:06	06:37	18:47 (D02)	07:07	17:51 (D03)	06:41	07:15
	16:52	17:27	18:01	19:34 16 19:12 (D02)	20:06	20:34	20:43	20:22	19:38 23	19:10 (D02)	18:48 23	18:14 (D03)	17:02	16:40
5	07:33	07:15	06:37	06:46 18:53 (D02)	06:02	05:37	05:42	06:07	06:38	18:47 (D02)	07:08	17:52 (D03)	06:43	07:16
	16:53	17:28	18:02	19:35 19 19:12 (D02)	20:07	20:35	20:43	20:21	19:36 23	19:10 (D02)	18:46 20	18:12 (D03)	17:01	16:40
6	07:33	07:14	06:35	06:44 18:52 (D02)	06:01	05:37	05:42	06:08	06:39	18:48 (D02)	07:09	17:54 (D03)	06:44	07:17
	16:54	17:30	18:03	19:36 21 19:13 (D02)	20:08	20:36	20:43	20:20	19:35 21	19:09 (D02)	18:44 15	18:09 (D03)	17:00	16:40
7	07:33	07:13	06:34 17:19 (D03)	06:43 18:51 (D02)	06:00	05:37	05:43	06:09	06:40	18:48 (D02)	07:10	17:58 (D03)	06:45	07:18
	16:55	17:31	18:04 12 17:31 (D03)	19:37 23 19:14 (D02)	20:09	20:36	20:43	20:19	19:33 19	19:07 (D02)	18:43 7	18:05 (D03)	16:59	16:40
8	07:32	07:12	07:32 18:16 (D03)	06:41 18:50 (D02)	05:59	05:36	05:44	06:10	06:41	18:50 (D02)	07:11		06:46	07:19
	16:56	17:32	19:05 17 18:33 (D03)	19:38 23 19:13 (D02)	20:10	20:37	20:42	20:17	19:31 16	19:06 (D02)	18:41		16:58	16:40
9	07:32	07:10	07:30 18:14 (D03)	06:39 18:49 (D02)	05:57	05:36	05:44	06:11	06:42	18:51 (D02)	07:12		06:47	07:20
	16:57	17:33	19:06 22 18:36 (D03)	19:40 24 19:13 (D02)	20:11	20:38	20:42	20:16	19:30 13	19:04 (D02)	18:39		16:57	16:40
10	07:32	07:09	07:29 18:12 (D03)	06:38 18:50 (D02)	05:56	05:36	05:45	06:12	06:43	18:55 (D02)	07:13		06:48	07:21
	16:58	17:35	19:07 25 18:37 (D03)	19:41 23 19:13 (D02)	20:12	20:38	20:42	20:15	19:28 4	18:59 (D02)	18:38		16:56	16:40
11	07:32	07:08	07:27 18:10 (D03)	06:36 18:49 (D02)	05:55	05:36	05:46	06:13	06:44		07:14		06:50	07:22
	16:59	17:36	19:09 27 18:37 (D03)	19:42 23 19:12 (D02)	20:13	20:39	20:41	20:14	19:26		18:36		16:55	16:40
12	07:32	07:07	07:26 18:10 (D03)	06:35 18:50 (D02)	05:54	05:36	05:46	06:14	06:45		07:15		06:51	07:23
	17:00	17:37	19:10 28 18:38 (D03)	19:43 22 19:12 (D02)	20:14	20:39	20:41	20:12	19:25		18:35		16:54	16:40
13	07:31	07:05	07:24 18:09 (D03)	06:33 18:50 (D02)	05:53	05:36	05:47	06:15	06:46		07:16		06:52	07:23
	17:01	17:38	19:11 29 18:38 (D03)	19:44 21 19:11 (D02)	20:15	20:40	20:40	20:11	19:23		18:33		16:53	16:40
14	07:31	07:04	07:22 18:09 (D03)	06:32 18:51 (D02)	05:52	05:36	05:48	06:16	06:47		07:17		06:53	07:24
	17:02	17:39	19:12 30 18:39 (D03)	19:45 20 19:11 (D02)	20:16	20:40	20:40	20:10	19:21		18:32		16:52	16:40
15	07:31	07:03	07:21 18:08 (D03)	06:30 18:51 (D02)	05:51	05:36	05:49	06:17	06:48		07:19		06:54	07:25
	17:03	17:41	19:13 31 18:39 (D03)	19:46 18 19:09 (D02)	20:17	20:41	20:39	20:08	19:20		18:30		16:51	16:41
16	07:30	07:02	07:19 18:07 (D03)	06:28 18:53 (D02)	05:50	05:36	05:49	06:18	06:49		07:20		06:56	07:26
	17:04	17:42	19:14 31 18:38 (D03)	19:47 14 19:07 (D02)	20:18	20:41	20:39	20:07	19:18		18:28		16:50	16:41
17	07:30	07:00	07:17 18:08 (D03)	06:27 18:54 (D02)	05:49	05:36	05:50	06:19	06:50		07:21		06:57	07:26
	17:05	17:43	19:15 31 18:39 (D03)	19:48 10 19:04 (D02)	20:19	20:41	20:38	20:06	19:16		18:27		16:49	16:41
18	07:29	06:59	07:16 18:07 (D03)	06:25	05:48	05:36	05:51	06:20	06:51	18:03 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16 31 18:38 (D03)	19:49	20:20	20:42	20:37	20:04	19:15 11	18:14 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14 18:07 (D03)	06:24	05:47	05:36	05:52	06:21	06:52	17:58 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 30 18:37 (D03)	19:50	20:21	20:42	20:37	20:03	19:13 18	18:16 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12 18:08 (D03)	06:22	05:47	05:36	05:53	06:22	06:53	17:56 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 28 18:36 (D03)	19:51	20:22	20:42	20:36	20:01	19:11 21	18:17 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11 18:08 (D03)	06:21	05:46	05:36	05:53	06:23	06:54	17:54 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 27 18:35 (D03)	19:52	20:23	20:43	20:35	20:00	19:10 24	18:18 (D03)	18:21		16:46	16:42
22	07:27	06:53	07:09 18:09 (D03)	06:19	05:45	05:36	05:54	06:24	06:55	17:53 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 24 18:33 (D03)	19:53	20:24	20:43	20:35	19:58	19:08 26	18:19 (D03)	18:19		16:46	16:43
23	07:26	06:52	07:07 18:10 (D03)	06:18	05:44	05:37	05:55	06:25	06:56	17:52 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 22 18:32 (D03)	19:54	20:25	20:43	20:34	19:57	19:06 28	18:20 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06 18:12 (D03)	06:17	05:43	05:37	05:56	06:26	06:57	17:51 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 18 18:30 (D03)	19:55	20:26	20:43	20:33	19:55	19:04 29	18:20 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04 18:14 (D03)	06:15	05:43	05:37	05:57	06:27	06:58	17:50 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 13 18:27 (D03)	19:56	20:26	20:43	20:32	19:54	19:03 30	18:20 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28 18:57 (D02)	06:59	17:49 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52 11 19:08 (D02)	19:01 31	18:20 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29 18:55 (D02)	07:00	17:49 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26	19:58	20:28	20:44	20:30	19:51 15 19:10 (D02)	18:59 31	18:20 (D03)	18:12		16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30 18:53 (D02)	07:01	17:48 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49 18 19:11 (D02)	18:58 31	18:19 (D03)	18:11		16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31 18:52 (D02)	07:02	17:48 (D03)	07:34		07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48 20 19:12 (D02)	18:56 31	18:19 (D03)	18:10		16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32 18:51 (D02)	07:03	17:48 (D03)	07:35		07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46 21 19:12 (D02)	18:54 30	18:18 (D03)	18:09		16:42	16:48
31	07:20		06:54		05:39		06:03	06:33 18:49 (D02)			07:37			07:32
	17:22		19:30		20:31		20:26	19:44 22 19:11 (D02)			18:07			16:49
Potential sun hours	298	297	369	398	448	452	458	428	375		346		298	288
Total, worst case			476	291				107	530		148			
Sun reduction			0.73	0.82				0.96	0.93		0.84			
Oper. time red.			1.00	1.00				1.00	1.00		1.00			
Wind dir. red.			0.75	0.63				0.63	0.71		0.75			
Total reduction			0.55	0.51				0.60	0.66		0.63			
Total, real			262	150				64	350		94			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 30 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February		March		April		May	June
1	07:32	07:19		06:43		16:50 (D03)	06:52	18:48 (D02)	06:07	05:39
	16:50	17:23		17:57	33	17:23 (D03)	19:31	20	19:08 (D02)	20:03	20:32
2	07:33	07:18		06:41		16:49 (D03)	06:51	18:46 (D02)	06:06	05:38
	16:50	17:25		17:58	34	17:23 (D03)	19:32	22	19:08 (D02)	20:04	20:33
3	07:33	07:17		06:40		16:48 (D03)	06:49	18:44 (D02)	06:05	05:38
	16:51	17:26		18:00	35	17:23 (D03)	19:33	24	19:08 (D02)	20:05	20:34
4	07:33	07:16		06:38		16:48 (D03)	06:48	18:44 (D02)	06:03	05:38
	16:52	17:27		18:01	36	17:24 (D03)	19:34	25	19:09 (D02)	20:06	20:34
5	07:33	07:15		06:37		16:47 (D03)	06:46	18:43 (D02)	06:02	05:37
	16:53	17:28		18:02	37	17:24 (D03)	19:35	26	19:09 (D02)	20:07	20:35
6	07:33	07:14		06:35		16:47 (D03)	06:44	18:42 (D02)	06:01	05:37
	16:54	17:30		18:03	38	17:25 (D03)	19:36	27	19:09 (D02)	20:08	20:36
7	07:33	07:13		06:34		16:46 (D03)	06:43	18:42 (D02)	06:00	05:37
	16:55	17:31		18:04	38	17:24 (D03)	19:37	27	19:09 (D02)	20:09	20:36
8	07:32	07:12		07:32		17:46 (D03)	06:41	18:41 (D02)	05:59	05:36
	16:56	17:32		19:05	37	18:23 (D03)	19:39	28	19:09 (D02)	20:10	20:37
9	07:32	07:10		07:30		17:46 (D03)	06:39	18:42 (D02)	05:57	05:36
	16:57	17:33		19:06	38	18:24 (D03)	19:40	27	19:09 (D02)	20:11	20:38
10	07:32	07:09		07:29		17:46 (D03)	06:38	18:41 (D02)	05:56	05:36
	16:58	17:35		19:07	37	18:23 (D03)	19:41	27	19:08 (D02)	20:12	20:38
11	07:32	07:08		07:27		17:47 (D03)	06:36	18:41 (D02)	05:55	05:36
	16:59	17:36		19:09	36	18:23 (D03)	19:42	25	19:06 (D02)	20:13	20:39
12	07:32	07:07		07:26		17:47 (D03)	06:35	18:42 (D02)	05:54	05:36
	17:00	17:37		19:10	35	18:22 (D03)	19:43	24	19:06 (D02)	20:14	20:39
13	07:31	07:06		07:24		17:47 (D03)	06:33	18:43 (D02)	05:53	05:36
	17:01	17:38		19:11	33	18:20 (D03)	19:44	21	19:04 (D02)	20:15	20:40
14	07:31	07:04		07:22		17:49 (D03)	06:32	18:45 (D02)	05:52	05:36
	17:02	17:39		19:12	31	18:20 (D03)	19:45	18	19:03 (D02)	20:16	20:40
15	07:31	07:03		07:21		17:50 (D03)	06:30	18:46 (D02)	05:51	05:36
	17:03	17:41		19:13	28	18:18 (D03)	19:46	14	19:00 (D02)	20:17	20:41
16	07:30	07:02		07:19		17:51 (D03)	06:28	18:49 (D02)	05:50	05:36
	17:04	17:42		19:14	25	18:16 (D03)	19:47	8	18:57 (D02)	20:18	20:41
17	07:30	07:00		07:17		17:53 (D03)	06:27		05:49	05:36
	17:05	17:43		19:15	21	18:14 (D03)	19:48		20:19	20:41
18	07:29	06:59		07:16		17:55 (D03)	06:25		05:48	05:36
	17:07	17:44		19:16	16	18:11 (D03)	19:49		20:20	20:42
19	07:29	06:58		07:14		18:00 (D03)	06:24		05:47	05:36
	17:08	17:46		19:17	5	18:05 (D03)	19:50		20:21	20:42
20	07:28	06:56		07:12			06:22		05:47	05:36
	17:09	17:47		19:18			19:51		20:22	20:42
21	07:28	06:55		07:11			06:21		05:46	05:36
	17:10	17:48		19:19			19:52		20:23	20:43
22	07:27	06:53		07:09			06:19		05:45	05:36
	17:11	17:49		19:21			19:53		20:24	20:43
23	07:26	06:52	17:04 (D03)	07:07			06:18		05:44	05:37
	17:12	17:50	7 17:11 (D03)	19:22			19:54		20:25	20:43
24	07:26	06:50	16:59 (D03)	07:06			06:17		05:43	05:37
	17:14	17:51	16 17:15 (D03)	19:23			19:55		20:26	20:43
25	07:25	06:49	16:57 (D03)	07:04			06:15		05:43	05:37
	17:15	17:53	21 17:18 (D03)	19:24			19:56		20:26	20:43
26	07:24	06:48	16:54 (D03)	07:02			06:14		05:42	05:38
	17:16	17:54	25 17:19 (D03)	19:25			19:57		20:27	20:44
27	07:23	06:46	16:53 (D03)	07:01			06:12		05:41	05:38
	17:17	17:55	28 17:21 (D03)	19:26			19:59		20:28	20:44
28	07:22	06:45	16:51 (D03)	06:59			06:11		05:41	05:38
	17:18	17:56	31 17:22 (D03)	19:27			20:00		20:29	20:44
29	07:22			06:57			06:10		05:40	05:39
	17:20			19:28			20:01		20:30	20:44
30	07:21			06:56		18:52 (D02)	06:08		05:40	05:39
	17:21			19:29	12	19:04 (D02)	20:02		20:31	20:44
31	07:20			06:54		18:49 (D02)			05:39	
	17:22			19:30	17	19:06 (D02)			20:31	
Potential sun hours	298	297		369			398		448	452
Total, worst case		128		622			363			
Sun reduction		0.62		0.73			0.82			
Oper. time red.		1.00		1.00			1.00			
Wind dir. red.		0.80		0.79			0.64			
Total reduction		0.50		0.58			0.53			
Total, real		64		361			193			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 30 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August		September		October		November	December
1	05:40	06:04		06:34	18:40 (D02)	07:04	17:26 (D03)	06:38	07:12
	20:44	20:25		19:43 25	19:05 (D02)	18:53 34	18:00 (D03)	18:06	16:41
2	05:40	06:05		06:35	18:39 (D02)	07:05	17:25 (D03)	06:39	07:13
	20:44	20:24		19:41 27	19:06 (D02)	18:51 35	18:00 (D03)	17:05	16:41
3	05:41	06:05		06:36	18:39 (D02)	07:06	17:24 (D03)	06:40	07:14
	20:43	20:23		19:40 27	19:06 (D02)	18:49 36	18:00 (D03)	17:04	16:41
4	05:41	06:06		06:37	18:38 (D02)	07:07	17:24 (D03)	06:41	07:15
	20:43	20:22		19:38 28	19:06 (D02)	18:48 37	18:01 (D03)	17:02	16:40
5	05:42	06:07		06:38	18:38 (D02)	07:08	17:24 (D03)	06:43	07:16
	20:43	20:21		19:36 27	19:05 (D02)	18:46 37	18:01 (D03)	17:01	16:40
6	05:42	06:08		06:39	18:38 (D02)	07:09	17:23 (D03)	06:44	07:17
	20:43	20:20		19:35 27	19:05 (D02)	18:44 38	18:01 (D03)	17:00	16:40
7	05:43	06:09		06:40	18:38 (D02)	07:10	17:23 (D03)	06:45	07:18
	20:43	20:19		19:33 26	19:04 (D02)	18:43 37	18:00 (D03)	16:59	16:40
8	05:44	06:10		06:41	18:38 (D02)	07:11	17:22 (D03)	06:46	07:19
	20:42	20:17		19:31 26	19:04 (D02)	18:41 38	18:00 (D03)	16:58	16:40
9	05:44	06:11		06:42	18:38 (D02)	07:12	17:22 (D03)	06:47	07:20
	20:42	20:16		19:30 25	19:03 (D02)	18:39 37	17:59 (D03)	16:57	16:40
10	05:45	06:12		06:43	18:39 (D02)	07:13	17:22 (D03)	06:48	07:21
	20:42	20:15		19:28 22	19:01 (D02)	18:38 36	17:58 (D03)	16:56	16:40
11	05:46	06:13		06:44	18:39 (D02)	07:14	17:22 (D03)	06:50	07:22
	20:41	20:14		19:26 21	19:00 (D02)	18:36 36	17:58 (D03)	16:55	16:40
12	05:46	06:14		06:45	18:41 (D02)	07:15	17:23 (D03)	06:51	07:23
	20:41	20:12		19:25 17	18:58 (D02)	18:35 33	17:56 (D03)	16:54	16:40
13	05:47	06:15		06:46	18:43 (D02)	07:16	17:23 (D03)	06:52	07:23
	20:40	20:11		19:23 12	18:55 (D02)	18:33 32	17:55 (D03)	16:53	16:40
14	05:48	06:16		06:47		07:17	17:24 (D03)	06:53	07:24
	20:40	20:10		19:21		18:32 30	17:54 (D03)	16:52	16:40
15	05:49	06:17		06:48		07:19	17:26 (D03)	06:54	07:25
	20:39	20:08		19:20		18:30 27	17:53 (D03)	16:51	16:41
16	05:49	06:18		06:49		07:20	17:27 (D03)	06:56	07:26
	20:39	20:07		19:18		18:28 24	17:51 (D03)	16:50	16:41
17	05:50	06:19		06:50		07:21	17:29 (D03)	06:57	07:26
	20:38	20:06		19:16		18:27 20	17:49 (D03)	16:49	16:41
18	05:51	06:20		06:51		07:22	17:32 (D03)	06:58	07:27
	20:37	20:04		19:15		18:25 13	17:45 (D03)	16:48	16:41
19	05:52	06:21		06:52		07:23		06:59	07:28
	20:37	20:03		19:13		18:24		16:48	16:42
20	05:53	06:22		06:53		07:24		07:00	07:28
	20:36	20:01		19:11		18:22		16:47	16:42
21	05:54	06:23		06:54		07:25		07:01	07:29
	20:35	20:00		19:10		18:21		16:46	16:43
22	05:54	06:24		06:55		07:26		07:03	07:29
	20:35	19:58		19:08		18:20		16:46	16:43
23	05:55	06:25		06:56		07:27		07:04	07:30
	20:34	19:57		19:06		18:18		16:45	16:43
24	05:56	06:26		06:57		07:29		07:05	07:30
	20:33	19:55		19:04		18:17		16:44	16:44
25	05:57	06:27		06:58	17:39 (D03)	07:30		07:06	07:31
	20:32	19:54		19:03 13	17:52 (D03)	18:15		16:44	16:45
26	05:58	06:28		06:59	17:35 (D03)	07:31		07:07	07:31
	20:31	19:52		19:01 20	17:55 (D03)	18:14		16:43	16:45
27	05:59	06:29	18:51 (D02)	07:00	17:33 (D03)	07:32		07:08	07:31
	20:30	19:51 9	19:00 (D02)	18:59 23	17:56 (D03)	18:13		16:43	16:46
28	06:00	06:30	18:47 (D02)	07:01	17:31 (D03)	07:33		07:09	07:32
	20:29	19:49 15	19:02 (D02)	18:58 27	17:58 (D03)	18:11		16:42	16:46
29	06:01	06:31	18:45 (D02)	07:02	17:29 (D03)	07:34		07:10	07:32
	20:28	19:48 19	19:04 (D02)	18:56 30	17:59 (D03)	18:10		16:42	16:47
30	06:02	06:32	18:44 (D02)	07:03	17:27 (D03)	07:35		07:11	07:32
	20:27	19:46 21	19:05 (D02)	18:54 32	17:59 (D03)	18:09		16:42	16:48
31	06:03	06:33	18:42 (D02)			07:37			07:32
	20:26	19:45 24	19:06 (D02)			18:07			16:49
Potential sun hours	458	428		375		346		298	288
Total, worst case		88		455		580			
Sun reduction		0.96		0.93		0.84			
Oper. time red.		1.00		1.00		1.00			
Wind dir. red.		0.64		0.69		0.80			
Total reduction		0.62		0.65		0.67			
Total, real		55		295		391			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 31 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February			March			April			May	June
1	07:32	07:19			06:43		16:58 (D03)	06:52		18:48 (D02)	06:07	05:39
	16:50	17:23			17:57	27	17:25 (D03)	19:31	20	19:08 (D02)	20:03	20:32
2	07:33	07:18			06:41		16:56 (D03)	06:51		18:46 (D02)	06:06	05:38
	16:50	17:25			17:58	29	17:25 (D03)	19:32	23	19:09 (D02)	20:04	20:33
3	07:33	07:17			06:40		16:55 (D03)	06:49		18:45 (D02)	06:05	05:38
	16:51	17:26			18:00	31	17:26 (D03)	19:33	24	19:09 (D02)	20:05	20:34
4	07:33	07:16			06:38		16:54 (D03)	06:48		18:45 (D02)	06:03	05:38
	16:52	17:27			18:01	33	17:27 (D03)	19:34	25	19:10 (D02)	20:06	20:34
5	07:33	07:15			06:37		16:53 (D03)	06:46		18:44 (D02)	06:02	05:37
	16:53	17:28			18:02	34	17:27 (D03)	19:35	25	19:09 (D02)	20:07	20:35
6	07:33	07:14			06:35		16:53 (D03)	06:44		18:43 (D02)	06:01	05:37
	16:54	17:30			18:03	35	17:28 (D03)	19:36	26	19:09 (D02)	20:08	20:36
7	07:33	07:13			06:34		16:52 (D03)	06:43		18:43 (D02)	06:00	05:37
	16:55	17:31			18:04	35	17:27 (D03)	19:37	26	19:09 (D02)	20:09	20:36
8	07:32	07:12			07:32		17:52 (D03)	06:41		18:43 (D02)	05:59	05:36
	16:56	17:32			19:05	35	18:27 (D03)	19:39	25	19:08 (D02)	20:10	20:37
9	07:32	07:10			07:30		17:52 (D03)	06:39		18:43 (D02)	05:57	05:36
	16:57	17:33			19:06	35	18:27 (D03)	19:40	25	19:08 (D02)	20:11	20:38
10	07:32	07:09			07:29		17:52 (D03)	06:38		18:43 (D02)	05:56	05:36
	16:58	17:35			19:07	34	18:26 (D03)	19:41	24	19:07 (D02)	20:12	20:38
11	07:32	07:08			07:27		17:52 (D03)	06:36		18:43 (D02)	05:55	05:36
	16:59	17:36			19:09	35	18:27 (D03)	19:42	23	19:06 (D02)	20:13	20:39
12	07:32	07:07			07:26		17:52 (D03)	06:35		18:44 (D02)	05:54	05:36
	17:00	17:37			19:10	34	18:26 (D03)	19:43	21	19:05 (D02)	20:14	20:39
13	07:31	07:06			07:24		17:52 (D03)	06:33		18:45 (D02)	05:53	05:36
	17:01	17:38			19:11	32	18:24 (D03)	19:44	18	19:03 (D02)	20:15	20:40
14	07:31	07:04			07:22		17:54 (D03)	06:32		18:47 (D02)	05:52	05:36
	17:02	17:39			19:12	30	18:24 (D03)	19:45	14	19:01 (D02)	20:16	20:40
15	07:31	07:03			07:21		17:54 (D03)	06:30		18:50 (D02)	05:51	05:36
	17:03	17:41			19:13	28	18:22 (D03)	19:46	7	18:57 (D02)	20:17	20:41
16	07:30	07:02			07:19		17:55 (D03)	06:28			05:50	05:36
	17:04	17:42			19:14	25	18:20 (D03)	19:47			20:18	20:41
17	07:30	07:00			07:17		17:57 (D03)	06:27			05:49	05:36
	17:05	17:43			19:15	22	18:19 (D03)	19:48			20:19	20:41
18	07:29	06:59			07:16		17:58 (D03)	06:25			05:48	05:36
	17:07	17:44			19:16	18	18:16 (D03)	19:49			20:20	20:42
19	07:29	06:58			07:14		18:01 (D03)	06:24			05:47	05:36
	17:08	17:46			19:17	11	18:12 (D03)	19:50			20:21	20:42
20	07:28	06:56			07:12			06:22			05:47	05:36
	17:09	17:47			19:18			19:51			20:22	20:42
21	07:28	06:55			07:11			06:21			05:46	05:36
	17:10	17:48			19:19			19:52			20:23	20:43
22	07:27	06:53			07:09			06:19			05:45	05:36
	17:11	17:49			19:21			19:53			20:24	20:43
23	07:26	06:52			07:07			06:18			05:44	05:37
	17:12	17:50			19:22			19:54			20:25	20:43
24	07:26	06:50			07:06			06:17			05:43	05:37
	17:14	17:51			19:23			19:55			20:26	20:43
25	07:25	06:49		17:10 (D03)	07:04			06:15			05:43	05:37
	17:15	17:53	4	17:14 (D03)	19:24			19:56			20:26	20:43
26	07:24	06:48		17:04 (D03)	07:02			06:14			05:42	05:38
	17:16	17:54	15	17:19 (D03)	19:25			19:57			20:27	20:44
27	07:23	06:46		17:02 (D03)	07:01			06:12			05:41	05:38
	17:17	17:55	20	17:22 (D03)	19:26			19:59			20:28	20:44
28	07:22	06:45		16:59 (D03)	06:59			06:11			05:41	05:38
	17:18	17:56	24	17:23 (D03)	19:27			20:00			20:29	20:44
29	07:22				06:57			06:10			05:40	05:39
	17:20				19:28			20:01			20:30	20:44
30	07:21				06:56		18:52 (D02)	06:08			05:40	05:39
	17:21				19:29	12	19:04 (D02)	20:02			20:31	20:44
31	07:20				06:54		18:49 (D02)				05:39	
	17:22				19:30	17	19:06 (D02)				20:31	
Potential sun hours	298	297			369			398			448	452
Total, worst case			63			592			326			
Sun reduction			0.62			0.73			0.82			
Oper. time red.			1.00			1.00			1.00			
Wind dir. red.			0.79			0.78			0.65			
Total reduction			0.49			0.57			0.53			
Total, real			31			340			173			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 31 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August		September		October		November	December
1	05:40	06:04		06:34	18:42 (D02)	07:04	17:31 (D03)	06:38	07:12
	20:44	20:25		19:43 23	19:05 (D02)	18:53 33	18:04 (D03)	18:06	16:41
2	05:40	06:05		06:35	18:41 (D02)	07:05	17:30 (D03)	06:39	07:13
	20:44	20:24		19:41 24	19:05 (D02)	18:51 34	18:04 (D03)	17:05	16:41
3	05:41	06:05		06:36	18:40 (D02)	07:06	17:29 (D03)	06:40	07:14
	20:43	20:23		19:40 25	19:05 (D02)	18:49 35	18:04 (D03)	17:04	16:41
4	05:41	06:06		06:37	18:40 (D02)	07:07	17:30 (D03)	06:41	07:15
	20:43	20:22		19:38 25	19:05 (D02)	18:48 35	18:05 (D03)	17:02	16:40
5	05:42	06:07		06:38	18:39 (D02)	07:08	17:29 (D03)	06:43	07:16
	20:43	20:21		19:36 26	19:05 (D02)	18:46 36	18:05 (D03)	17:01	16:40
6	05:42	06:08		06:39	18:39 (D02)	07:09	17:29 (D03)	06:44	07:17
	20:43	20:20		19:35 26	19:05 (D02)	18:44 35	18:04 (D03)	17:00	16:40
7	05:43	06:09		06:40	18:39 (D02)	07:10	17:29 (D03)	06:45	07:18
	20:43	20:19		19:33 25	19:04 (D02)	18:43 35	18:04 (D03)	16:59	16:40
8	05:44	06:10		06:41	18:39 (D02)	07:11	17:29 (D03)	06:46	07:19
	20:42	20:17		19:31 25	19:04 (D02)	18:41 34	18:03 (D03)	16:58	16:40
9	05:44	06:11		06:42	18:39 (D02)	07:12	17:29 (D03)	06:47	07:20
	20:42	20:16		19:30 24	19:03 (D02)	18:39 33	18:02 (D03)	16:57	16:40
10	05:45	06:12		06:43	18:39 (D02)	07:13	17:29 (D03)	06:48	07:21
	20:42	20:15		19:28 23	19:02 (D02)	18:38 32	18:01 (D03)	16:56	16:40
11	05:46	06:13		06:44	18:40 (D02)	07:14	17:29 (D03)	06:50	07:22
	20:41	20:14		19:26 20	19:00 (D02)	18:36 31	18:00 (D03)	16:55	16:40
12	05:46	06:14		06:45	18:41 (D02)	07:15	17:30 (D03)	06:51	07:23
	20:41	20:12		19:25 18	18:59 (D02)	18:35 28	17:58 (D03)	16:54	16:40
13	05:47	06:15		06:46	18:43 (D02)	07:16	17:31 (D03)	06:52	07:23
	20:40	20:11		19:23 13	18:56 (D02)	18:33 26	17:57 (D03)	16:53	16:40
14	05:48	06:16		06:47	18:47 (D02)	07:17	17:32 (D03)	06:53	07:24
	20:40	20:10		19:21 5	18:52 (D02)	18:32 23	17:55 (D03)	16:52	16:40
15	05:49	06:17		06:48		07:19	17:35 (D03)	06:54	07:25
	20:39	20:08		19:20		18:30 18	17:53 (D03)	16:51	16:41
16	05:49	06:18		06:49		07:20	17:38 (D03)	06:56	07:26
	20:39	20:07		19:18		18:28 12	17:50 (D03)	16:50	16:41
17	05:50	06:19		06:50		07:21		06:57	07:26
	20:38	20:06		19:16		18:27		16:49	16:41
18	05:51	06:20		06:51		07:22		06:58	07:27
	20:37	20:04		19:15		18:25		16:48	16:41
19	05:52	06:21		06:52		07:23		06:59	07:28
	20:37	20:03		19:13		18:24		16:48	16:42
20	05:53	06:22		06:53		07:24		07:00	07:28
	20:36	20:01		19:11		18:22		16:47	16:42
21	05:54	06:23		06:54		07:25		07:01	07:29
	20:35	20:00		19:10		18:21		16:46	16:43
22	05:54	06:24		06:55		07:26		07:03	07:29
	20:35	19:58		19:08		18:20		16:46	16:43
23	05:55	06:25		06:56		07:27		07:04	07:30
	20:34	19:57		19:06		18:18		16:45	16:43
24	05:56	06:26		06:57	17:46 (D03)	07:29		07:05	07:30
	20:33	19:55		19:04 8	17:54 (D03)	18:17		16:44	16:44
25	05:57	06:27		06:58	17:42 (D03)	07:30		07:06	07:31
	20:32	19:54		19:03 16	17:58 (D03)	18:15		16:44	16:45
26	05:58	06:28		06:59	17:39 (D03)	07:31		07:07	07:31
	20:31	19:52		19:01 21	18:00 (D03)	18:14		16:43	16:45
27	05:59	06:29		07:00	17:37 (D03)	07:32		07:08	07:31
	20:30	19:51		18:59 24	18:01 (D03)	18:13		16:43	16:46
28	06:00	06:30	18:51 (D02)	07:01	17:35 (D03)	07:33		07:09	07:32
	20:29	19:49 8	18:59 (D02)	18:58 27	18:02 (D03)	18:11		16:42	16:46
29	06:01	06:31	18:48 (D02)	07:02	17:33 (D03)	07:34		07:10	07:32
	20:28	19:48 14	19:02 (D02)	18:56 30	18:03 (D03)	18:10		16:42	16:47
30	06:02	06:32	18:46 (D02)	07:03	17:32 (D03)	07:35		07:11	07:32
	20:27	19:46 18	19:04 (D02)	18:54 32	18:04 (D03)	18:09		16:42	16:48
31	06:03	06:33	18:44 (D02)			07:37			07:32
	20:26	19:45 21	19:05 (D02)			18:07			16:49
Potential sun hours	458	428		375		346		298	288
Total, worst case		61		460		480			
Sun reduction		0.96		0.93		0.84			
Oper. time red.		1.00		1.00		1.00			
Wind dir. red.		0.65		0.70		0.79			
Total reduction		0.62		0.65		0.67			
Total, real		38		299		320			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 32 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (106)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March		April	May	June	July	August	September		October		November	December
1	07:32	07:19	06:43		06:52	06:07	05:39	05:40	06:04	06:34		07:04	17:50 (D03)	06:38	07:12
	16:50	17:23	17:57		19:31	20:03	20:32	20:44	20:25	19:43		18:53	28 18:18 (D03)	18:06	16:41
2	07:33	07:18	06:41		06:51	06:06	05:38	05:40	06:04	06:35		07:05	17:50 (D03)	06:39	07:13
	16:50	17:25	17:58		19:32	20:04	20:33	20:44	20:24	19:41		18:51	28 18:18 (D03)	17:05	16:41
3	07:33	07:17	06:40		06:49	06:05	05:38	05:41	06:05	06:36		07:06	17:50 (D03)	06:40	07:14
	16:51	17:26	18:00		19:33	20:05	20:34	20:43	20:23	19:40		18:49	27 18:17 (D03)	17:04	16:41
4	07:33	07:16	06:38		06:48	06:03	05:38	05:41	06:06	06:37		07:07	17:51 (D03)	06:41	07:15
	16:52	17:27	18:01		19:34	20:06	20:34	20:43	20:22	19:38		18:48	26 18:17 (D03)	17:02	16:40
5	07:33	07:15	06:37	17:20 (D03)	06:46	06:02	05:37	05:42	06:07	06:38		07:08	17:51 (D03)	06:43	07:16
	16:53	17:28	18:02	13 17:33 (D03)	19:35	20:07	20:35	20:43	20:21	19:36		18:46	25 18:16 (D03)	17:01	16:40
6	07:33	07:14	06:35	17:18 (D03)	06:44	06:01	05:37	05:42	06:08	06:39		07:09	17:52 (D03)	06:44	07:17
	16:54	17:30	18:03	18 17:36 (D03)	19:36	20:08	20:36	20:43	20:20	19:35		18:44	22 18:14 (D03)	17:00	16:40
7	07:33	07:13	06:34	17:16 (D03)	06:43	06:00	05:37	05:43	06:09	06:40		07:10	17:53 (D03)	06:45	07:18
	16:55	17:31	18:04	21 17:37 (D03)	19:37	20:09	20:36	20:43	20:19	19:33		18:43	20 18:13 (D03)	16:59	16:40
8	07:32	07:12	07:32	18:14 (D03)	06:41	05:58	05:36	05:44	06:10	06:41		07:11	17:55 (D03)	06:46	07:19
	16:56	17:32	19:05	24 18:38 (D03)	19:38	20:10	20:37	20:42	20:17	19:31		18:41	15 18:10 (D03)	16:58	16:40
9	07:32	07:10	07:30	18:14 (D03)	06:39	05:57	05:36	05:44	06:11	06:42		07:12	17:57 (D03)	06:47	07:20
	16:57	17:33	19:06	25 18:39 (D03)	19:40	20:11	20:38	20:42	20:16	19:30		18:39	10 18:07 (D03)	16:57	16:40
10	07:32	07:09	07:29	18:12 (D03)	06:38	05:56	05:36	05:45	06:12	06:43		07:13		06:48	07:21
	16:58	17:35	19:07	27 18:39 (D03)	19:41	20:12	20:38	20:42	20:15	19:28		18:38		16:56	16:40
11	07:32	07:08	07:27	18:11 (D03)	06:36	05:55	05:36	05:46	06:13	06:44		07:14		06:50	07:22
	16:59	17:36	19:09	28 18:39 (D03)	19:42	20:13	20:39	20:41	20:14	19:26		18:36		16:55	16:40
12	07:32	07:07	07:26	18:11 (D03)	06:35	05:54	05:36	05:46	06:14	06:45		07:15		06:51	07:23
	17:00	17:37	19:10	29 18:40 (D03)	19:43	20:14	20:39	20:41	20:12	19:25		18:35		16:54	16:40
13	07:31	07:05	07:24	18:11 (D03)	06:33	05:53	05:36	05:47	06:15	06:46		07:16		06:52	07:23
	17:01	17:38	19:11	28 18:39 (D03)	19:44	20:15	20:40	20:40	20:11	19:23		18:33		16:53	16:40
14	07:31	07:04	07:22	18:11 (D03)	06:32	05:52	05:36	05:48	06:16	06:47		07:17		06:53	07:24
	17:02	17:39	19:12	28 18:39 (D03)	19:45	20:16	20:40	20:40	20:10	19:21		18:32		16:52	16:40
15	07:31	07:03	07:21	18:11 (D03)	06:30	05:51	05:36	05:49	06:17	06:48		07:19		06:54	07:25
	17:03	17:41	19:13	28 18:39 (D03)	19:46	20:17	20:41	20:39	20:08	19:20		18:30		16:51	16:41
16	07:30	07:02	07:19	18:11 (D03)	06:28	05:50	05:36	05:49	06:18	06:49		07:20		06:56	07:26
	17:04	17:42	19:14	26 18:37 (D03)	19:47	20:18	20:41	20:39	20:07	19:18		18:28		16:50	16:41
17	07:30	07:00	07:17	18:12 (D03)	06:27	05:49	05:36	05:50	06:19	06:50		07:21		06:57	07:26
	17:05	17:43	19:15	25 18:37 (D03)	19:48	20:19	20:41	20:38	20:06	19:16		18:27		16:49	16:41
18	07:29	06:59	07:16	18:12 (D03)	06:25	05:48	05:36	05:51	06:20	06:51		07:22		06:58	07:27
	17:07	17:44	19:16	24 18:36 (D03)	19:49	20:20	20:42	20:37	20:04	19:15		18:25		16:48	16:41
19	07:29	06:58	07:14	18:13 (D03)	06:24	05:47	05:36	05:52	06:21	06:52		07:23		06:59	07:28
	17:08	17:46	19:17	21 18:34 (D03)	19:50	20:21	20:42	20:37	20:03	19:13		18:24		16:48	16:42
20	07:28	06:56	07:12	18:15 (D03)	06:22	05:47	05:36	05:53	06:22	06:53		07:24		07:00	07:28
	17:09	17:47	19:18	18 18:33 (D03)	19:51	20:22	20:42	20:36	20:01	19:11		18:22		16:47	16:42
21	07:28	06:55	07:11	18:16 (D03)	06:21	05:46	05:36	05:53	06:23	06:54		07:25		07:01	07:29
	17:10	17:48	19:19	14 18:30 (D03)	19:52	20:23	20:43	20:35	20:00	19:10		18:21		16:46	16:42
22	07:27	06:53	07:09	18:21 (D03)	06:19	05:45	05:36	05:54	06:24	06:55	18:02 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21	3 18:24 (D03)	19:53	20:24	20:43	20:35	19:58	19:08	11 18:13 (D03)	18:19		16:46	16:43
23	07:26	06:52	07:07		06:18	05:44	05:37	05:55	06:25	06:56	17:59 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22		19:54	20:25	20:43	20:34	19:57	19:06	16 18:15 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06		06:17	05:43	05:37	05:56	06:26	06:57	17:57 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23		19:55	20:26	20:43	20:33	19:55	19:04	20 18:17 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04		06:15	05:43	05:37	05:57	06:27	06:58	17:55 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24		19:56	20:26	20:43	20:32	19:54	19:03	23 18:18 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02		06:14	05:42	05:38	05:58	06:28	06:59	17:53 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25		19:57	20:27	20:44	20:31	19:52	19:01	25 18:18 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01		06:12	05:41	05:38	05:59	06:29	07:00	17:52 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26		19:58	20:28	20:44	20:30	19:51	18:59	27 18:19 (D03)	18:12		16:43	16:46
28	07:22	06:45	06:59		06:11	05:41	05:38	06:00	06:30	07:01	17:51 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27		20:00	20:29	20:44	20:29	19:49	18:58	28 18:19 (D03)	18:11		16:42	16:46
29	07:22		06:57		06:10	05:40	05:39	06:01	06:31	07:02	17:51 (D03)	07:34		07:10	07:32
	17:20		19:28		20:01	20:30	20:44	20:28	19:48	18:56	28 18:19 (D03)	18:10		16:42	16:47
30	07:21		06:56		06:08	05:40	05:39	06:02	06:32	07:03	17:50 (D03)	07:35		07:11	07:32
	17:21		19:29		20:02	20:31	20:44	20:27	19:46	18:54	29 18:19 (D03)	18:09		16:42	16:48
31	07:20		06:54			05:39		06:03	06:33			07:37			07:32
	17:22		19:30			20:31		20:26	19:44			18:07			16:49
Potential sun hours	298	297	369		398	448	452	458	428	375		346		298	288
Total, worst case				400							207		201		
Sun reduction				0.73							0.93		0.84		
Oper. time red.				1.00							1.00		1.00		
Wind dir. red.				0.76							0.76		0.76		
Total reduction				0.55							0.70		0.64		
Total, real				221							146		128		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 33 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (107)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March			April	May	June	July	August	September			October			November	December
1	07:32	07:19	06:43			06:52	06:07	05:39	05:40	06:04	06:34			07:04		17:56 (D03)	06:38	07:12
	16:50	17:23	17:57			19:31	20:03	20:32	20:44	20:25	19:43			18:53	25	18:21 (D03)	18:06	16:41
2	07:33	07:18	06:41			06:51	06:06	05:38	05:40	06:05	06:35			07:05		17:56 (D03)	06:39	07:13
	16:50	17:25	17:58			19:32	20:04	20:33	20:44	20:24	19:41			18:51	24	18:20 (D03)	17:05	16:41
3	07:33	07:17	06:40			06:49	06:05	05:38	05:41	06:05	06:36			07:06		17:57 (D03)	06:40	07:14
	16:51	17:26	18:00			19:33	20:05	20:34	20:43	20:23	19:40			18:49	21	18:18 (D03)	17:04	16:41
4	07:33	07:16	06:38			06:48	06:03	05:38	05:41	06:06	06:37			07:07		18:00 (D03)	06:41	07:15
	16:52	17:27	18:01			19:34	20:06	20:34	20:43	20:22	19:38			18:48	17	18:17 (D03)	17:02	16:40
5	07:33	07:15	06:37			06:46	06:02	05:37	05:42	06:07	06:38			07:08		18:02 (D03)	06:43	07:16
	16:53	17:28	18:02			19:35	20:07	20:35	20:43	20:21	19:36			18:46	12	18:14 (D03)	17:01	16:40
6	07:33	07:14	06:35			06:44	06:01	05:37	05:42	06:08	06:39			07:09			06:44	07:17
	16:54	17:30	18:03			19:36	20:08	20:36	20:43	20:20	19:35			18:44			17:00	16:40
7	07:33	07:13	06:34			06:43	06:00	05:37	05:43	06:09	06:40			07:10			06:45	07:18
	16:55	17:31	18:04			19:37	20:09	20:36	20:43	20:19	19:33			18:43			16:59	16:40
8	07:32	07:12	07:32		18:26 (D03)	06:41	05:58	05:36	05:44	06:10	06:41			07:11			06:46	07:19
	16:56	17:32	19:05	9	18:35 (D03)	19:38	20:10	20:37	20:42	20:17	19:31			18:41			16:58	16:40
9	07:32	07:10	07:30		18:23 (D03)	06:39	05:57	05:36	05:44	06:11	06:42			07:12			06:47	07:20
	16:57	17:33	19:06	16	18:39 (D03)	19:40	20:11	20:38	20:42	20:16	19:30			18:39			16:57	16:40
10	07:32	07:09	07:29		18:20 (D03)	06:38	05:56	05:36	05:45	06:12	06:43			07:13			06:48	07:21
	16:58	17:35	19:07	20	18:40 (D03)	19:41	20:12	20:38	20:42	20:15	19:28			18:38			16:56	16:40
11	07:32	07:08	07:27		18:18 (D03)	06:36	05:55	05:36	05:46	06:13	06:44			07:14			06:50	07:22
	16:59	17:36	19:09	23	18:41 (D03)	19:42	20:13	20:39	20:41	20:14	19:26			18:36			16:55	16:40
12	07:32	07:07	07:26		18:17 (D03)	06:35	05:54	05:36	05:46	06:14	06:45			07:15			06:51	07:23
	17:00	17:37	19:10	25	18:42 (D03)	19:43	20:14	20:39	20:41	20:12	19:25			18:35			16:54	16:40
13	07:31	07:05	07:24		18:16 (D03)	06:33	05:53	05:36	05:47	06:15	06:46			07:16			06:52	07:23
	17:01	17:38	19:11	26	18:42 (D03)	19:44	20:15	20:40	20:40	20:11	19:23			18:33			16:53	16:40
14	07:31	07:04	07:22		18:16 (D03)	06:32	05:52	05:36	05:48	06:16	06:47			07:17			06:53	07:24
	17:02	17:39	19:12	27	18:43 (D03)	19:45	20:16	20:40	20:40	20:10	19:21			18:32			16:52	16:40
15	07:31	07:03	07:21		18:15 (D03)	06:30	05:51	05:36	05:49	06:17	06:48			07:19			06:54	07:25
	17:03	17:41	19:13	28	18:43 (D03)	19:46	20:17	20:41	20:39	20:08	19:20			18:30			16:51	16:41
16	07:30	07:02	07:19		18:14 (D03)	06:28	05:50	05:36	05:49	06:18	06:49			07:20			06:56	07:26
	17:04	17:42	19:14	29	18:43 (D03)	19:47	20:18	20:41	20:39	20:07	19:18			18:28			16:50	16:41
17	07:30	07:00	07:17		18:14 (D03)	06:27	05:49	05:36	05:50	06:19	06:50			07:21			06:57	07:26
	17:05	17:43	19:15	29	18:43 (D03)	19:48	20:19	20:41	20:38	20:06	19:16			18:27			16:49	16:41
18	07:29	06:59	07:16		18:14 (D03)	06:25	05:48	05:36	05:51	06:20	06:51		18:09 (D03)	07:22			06:58	07:27
	17:07	17:44	19:16	28	18:42 (D03)	19:49	20:20	20:42	20:37	20:04	19:15	10	18:19 (D03)	18:25			16:48	16:41
19	07:29	06:58	07:14		18:14 (D03)	06:24	05:47	05:36	05:52	06:21	06:52		18:05 (D03)	07:23			06:59	07:28
	17:08	17:46	19:17	27	18:41 (D03)	19:50	20:21	20:42	20:37	20:03	19:13	16	18:21 (D03)	18:24			16:48	16:42
20	07:28	06:56	07:12		18:15 (D03)	06:22	05:47	05:36	05:53	06:22	06:53		18:03 (D03)	07:24			07:00	07:28
	17:09	17:47	19:18	26	18:41 (D03)	19:51	20:22	20:42	20:36	20:01	19:11	19	18:22 (D03)	18:22			16:47	16:42
21	07:28	06:55	07:11		18:15 (D03)	06:21	05:46	05:36	05:53	06:23	06:54		18:01 (D03)	07:25			07:01	07:29
	17:10	17:48	19:19	25	18:40 (D03)	19:52	20:23	20:43	20:35	20:00	19:10	22	18:23 (D03)	18:21			16:46	16:42
22	07:27	06:53	07:09		18:15 (D03)	06:19	05:45	05:36	05:54	06:24	06:55		18:00 (D03)	07:26			07:03	07:29
	17:11	17:49	19:21	23	18:38 (D03)	19:53	20:24	20:43	20:35	19:58	19:08	24	18:24 (D03)	18:19			16:46	16:43
23	07:26	06:52	07:07		18:17 (D03)	06:18	05:44	05:37	05:55	06:25	06:56		17:58 (D03)	07:27			07:04	07:30
	17:12	17:50	19:22	20	18:37 (D03)	19:54	20:25	20:43	20:34	19:57	19:06	27	18:25 (D03)	18:18			16:45	16:43
24	07:26	06:50	07:06		18:18 (D03)	06:17	05:43	05:37	05:56	06:26	06:57		17:57 (D03)	07:29			07:05	07:30
	17:14	17:51	19:23	17	18:35 (D03)	19:55	20:26	20:43	20:33	19:55	19:04	28	18:25 (D03)	18:17			16:44	16:44
25	07:25	06:49	07:04		18:20 (D03)	06:15	05:43	05:37	05:57	06:27	06:58		17:57 (D03)	07:30			07:06	07:31
	17:15	17:53	19:24	12	18:32 (D03)	19:56	20:26	20:43	20:32	19:54	19:03	28	18:25 (D03)	18:15			16:44	16:45
26	07:24	06:48	07:02			06:14	05:42	05:38	05:58	06:28	06:59		17:56 (D03)	07:31			07:07	07:31
	17:16	17:54	19:25			19:57	20:27	20:44	20:31	19:52	19:01	29	18:25 (D03)	18:14			16:43	16:45
27	07:23	06:46	07:01			06:12	05:41	05:38	05:59	06:29	07:00		17:56 (D03)	07:32			07:08	07:31
	17:17	17:55	19:26			19:58	20:28	20:44	20:30	19:51	18:59	28	18:24 (D03)	18:12			16:43	16:46
28	07:22	06:45	06:59			06:11	05:41	05:38	06:00	06:30	07:01		17:55 (D03)	07:33			07:09	07:32
	17:18	17:56	19:27			20:00	20:29	20:44	20:29	19:49	18:58	29	18:24 (D03)	18:11			16:42	16:46
29	07:22		06:57			06:10	05:40	05:39	06:01	06:31	07:02		17:55 (D03)	07:34			07:10	07:32
	17:20		19:28			20:01	20:30	20:44	20:28	19:48	18:56	28	18:23 (D03)	18:10			16:42	16:47
30	07:21		06:56			06:08	05:40	05:39	06:02	06:32	07:03		17:55 (D03)	07:35			07:11	07:32
	17:21		19:29			20:02	20:31	20:44	20:27	19:46	18:54	27	18:22 (D03)	18:09			16:42	16:48
31	07:20		06:54				05:39		06:03	06:33				07:37				07:32
	17:22		19:30				20:31		20:26	19:44				18:07				16:49
Potential sun hours	298	297	369			398	448	452	458	428	375			346			298	288
Total, worst case				410								315			99			
Sun reduction				0.73								0.93			0.84			
Oper. time red.				1.00								1.00			1.00			
Wind dir. red.				0.74								0.74			0.74			
Total reduction				0.54								0.69			0.63			
Total, real				223								218			62			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 34 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March			April	May	June
1	07:33		15:44 (D03)	07:19			06:43		17:03 (D02)	06:52	06:07	05:39
	16:50	30	16:14 (D03)	17:23			17:57	18	17:21 (D02)	19:31	20:03	20:32
2	07:33		15:45 (D03)	07:18			06:41		17:05 (D02)	06:51	06:06	05:38
	16:50	29	16:14 (D03)	17:25			17:58	13	17:18 (D02)	19:32	20:04	20:33
3	07:33		15:45 (D03)	07:17			06:40		17:07 (D02)	06:49	06:05	05:38
	16:51	30	16:15 (D03)	17:26			18:00	8	17:15 (D02)	19:33	20:05	20:34
4	07:33		15:46 (D03)	07:16			06:38			06:48	06:03	05:38
	16:52	29	16:15 (D03)	17:27			18:01			19:34	20:06	20:34
5	07:33		15:46 (D03)	07:15			06:37			06:46	06:02	05:37
	16:53	30	16:16 (D03)	17:28			18:02			19:35	20:07	20:35
6	07:33		15:46 (D03)	07:14			06:35			06:44	06:01	05:37
	16:54	30	16:16 (D03)	17:30			18:03			19:36	20:08	20:36
7	07:33		15:47 (D03)	07:13			06:34			06:43	06:00	05:37
	16:55	30	16:17 (D03)	17:31			18:04			19:37	20:09	20:36
8	07:32		15:47 (D03)	07:12			07:32			06:41	05:58	05:36
	16:56	29	16:16 (D03)	17:32			19:05			19:39	20:10	20:37
9	07:32		15:47 (D03)	07:10			07:30			06:39	05:57	05:36
	16:57	30	16:17 (D03)	17:33			19:06			19:40	20:11	20:38
10	07:32		15:48 (D03)	07:09			07:29			06:38	05:56	05:36
	16:58	30	16:18 (D03)	17:35			19:07			19:41	20:12	20:38
11	07:32		15:49 (D03)	07:08			07:27			06:36	05:55	05:36
	16:59	29	16:18 (D03)	17:36			19:09			19:42	20:13	20:39
12	07:32		15:49 (D03)	07:07			07:26			06:35	05:54	05:36
	17:00	29	16:18 (D03)	17:37			19:10			19:43	20:14	20:39
13	07:31		15:50 (D03)	07:06			07:24			06:33	05:53	05:36
	17:01	28	16:18 (D03)	17:38			19:11			19:44	20:15	20:40
14	07:31		15:50 (D03)	07:04			07:22			06:32	05:52	05:36
	17:02	28	16:18 (D03)	17:39			19:12			19:45	20:16	20:40
15	07:31		15:51 (D03)	07:03			07:21			06:30	05:51	05:36
	17:03	28	16:19 (D03)	17:41			19:13			19:46	20:17	20:41
16	07:30		15:51 (D03)	07:02		17:07 (D02)	07:19			06:28	05:50	05:36
	17:04	27	16:18 (D03)	17:42	11	17:18 (D02)	19:14			19:47	20:18	20:41
17	07:30		15:52 (D03)	07:00		17:05 (D02)	07:17			06:27	05:49	05:36
	17:05	27	16:19 (D03)	17:43	15	17:20 (D02)	19:15			19:48	20:19	20:42
18	07:29		15:53 (D03)	06:59		17:04 (D02)	07:16			06:25	05:48	05:36
	17:07	25	16:18 (D03)	17:44	18	17:22 (D02)	19:16			19:49	20:20	20:42
19	07:29		15:54 (D03)	06:58		17:02 (D02)	07:14			06:24	05:47	05:36
	17:08	24	16:18 (D03)	17:46	20	17:22 (D02)	19:17			19:50	20:21	20:42
20	07:28		15:55 (D03)	06:56		17:02 (D02)	07:12			06:22	05:47	05:36
	17:09	23	16:18 (D03)	17:47	22	17:24 (D02)	19:18			19:51	20:22	20:42
21	07:28		15:57 (D03)	06:55		17:00 (D02)	07:11			06:21	05:46	05:36
	17:10	21	16:18 (D03)	17:48	24	17:24 (D02)	19:19			19:52	20:23	20:43
22	07:27		15:58 (D03)	06:53		17:00 (D02)	07:09			06:19	05:45	05:36
	17:11	19	16:17 (D03)	17:49	24	17:24 (D02)	19:21			19:53	20:24	20:43
23	07:26		15:59 (D03)	06:52		17:01 (D02)	07:07			06:18	05:44	05:37
	17:12	16	16:15 (D03)	17:50	24	17:25 (D02)	19:22			19:54	20:25	20:43
24	07:26		16:01 (D03)	06:50		17:00 (D02)	07:06			06:17	05:43	05:37
	17:14	13	16:14 (D03)	17:51	24	17:24 (D02)	19:23			19:55	20:26	20:43
25	07:25		16:05 (D03)	06:49		17:01 (D02)	07:04			06:15	05:43	05:37
	17:15	7	16:12 (D03)	17:53	23	17:24 (D02)	19:24			19:56	20:26	20:43
26	07:24			06:48		17:00 (D02)	07:02			06:14	05:42	05:38
	17:16			17:54	23	17:23 (D02)	19:25			19:57	20:27	20:44
27	07:23			06:46		17:01 (D02)	07:01			06:12	05:41	05:38
	17:17			17:55	22	17:23 (D02)	19:26			19:59	20:28	20:44
28	07:22			06:45		17:02 (D02)	06:59			06:11	05:41	05:38
	17:18			17:56	20	17:22 (D02)	19:27			20:00	20:29	20:44
29	07:22						06:57			06:10	05:40	05:39
	17:20						19:28			20:01	20:30	20:44
30	07:21						06:56			06:08	05:40	05:39
	17:21						19:29			20:02	20:31	20:44
31	07:20						06:54				05:39	
	17:22						19:30				20:31	
Potential sun hours	298			297			369			398	448	452
Total, worst case		641			270			39				
Sun reduction		0.45			0.62			0.73				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.89			0.81			0.81				
Total reduction		0.40			0.51			0.60				
Total, real		259			137			23				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 34 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October		November		December		
1	05:40	06:04	06:34	07:04		06:38		07:12		15:31 (D03)
	20:44	20:25	19:43	18:53		18:06		16:41	29	16:00 (D03)
2	05:40	06:04	06:35	07:05		06:39		07:13		15:31 (D03)
	20:44	20:24	19:41	18:51		17:05		16:41	30	16:01 (D03)
3	05:41	06:05	06:36	07:06		06:40		07:14		15:31 (D03)
	20:43	20:23	19:40	18:49		17:04		16:41	30	16:01 (D03)
4	05:41	06:06	06:37	07:07		06:41		07:15		15:32 (D03)
	20:43	20:22	19:38	18:48		17:02		16:40	29	16:01 (D03)
5	05:42	06:07	06:38	07:08		06:43		07:16		15:32 (D03)
	20:43	20:21	19:36	18:46		17:01		16:40	30	16:02 (D03)
6	05:42	06:08	06:39	07:09		06:44		07:17		15:33 (D03)
	20:43	20:20	19:35	18:44		17:00		16:40	29	16:02 (D03)
7	05:43	06:09	06:40	07:10		06:45		07:18		15:33 (D03)
	20:43	20:19	19:33	18:43		16:59		16:40	30	16:03 (D03)
8	05:44	06:10	06:41	07:11		06:46		07:19		15:34 (D03)
	20:42	20:17	19:31	18:41		16:58		16:40	29	16:03 (D03)
9	05:44	06:11	06:42	07:12		06:47		07:20		15:33 (D03)
	20:42	20:16	19:30	18:39		16:57		16:40	30	16:03 (D03)
10	05:45	06:12	06:43	07:13		06:48		07:21		15:34 (D03)
	20:42	20:15	19:28	18:38		16:56		16:40	29	16:03 (D03)
11	05:46	06:13	06:44	07:14	17:40 (D02)	06:50		07:22		15:34 (D03)
	20:41	20:14	19:26	18:36	11 17:51 (D02)	16:55		16:40	30	16:04 (D03)
12	05:46	06:14	06:45	07:15	17:37 (D02)	06:51		07:23		15:35 (D03)
	20:41	20:12	19:25	18:35	16 17:53 (D02)	16:54		16:40	29	16:04 (D03)
13	05:47	06:15	06:46	07:16	17:35 (D02)	06:52		07:23		15:36 (D03)
	20:40	20:11	19:23	18:33	19 17:54 (D02)	16:53		16:40	29	16:05 (D03)
14	05:48	06:16	06:47	07:17	17:34 (D02)	06:53		07:24		15:36 (D03)
	20:40	20:10	19:21	18:32	20 17:54 (D02)	16:52		16:40	28	16:04 (D03)
15	05:49	06:17	06:48	07:19	17:34 (D02)	06:54		07:25		15:36 (D03)
	20:39	20:08	19:20	18:30	22 17:56 (D02)	16:51		16:41	29	16:05 (D03)
16	05:49	06:18	06:49	07:20	17:33 (D02)	06:56		07:26		15:37 (D03)
	20:39	20:07	19:18	18:28	23 17:56 (D02)	16:50		16:41	29	16:06 (D03)
17	05:50	06:19	06:50	07:21	17:32 (D02)	06:57	15:38 (D03)	07:26		15:37 (D03)
	20:38	20:06	19:16	18:27	24 17:56 (D02)	16:49	7 15:45 (D03)	16:41	29	16:06 (D03)
18	05:51	06:20	06:51	07:22	17:32 (D02)	06:58	15:35 (D03)	07:27		15:38 (D03)
	20:37	20:04	19:15	18:25	24 17:56 (D02)	16:48	13 15:48 (D03)	16:41	28	16:06 (D03)
19	05:52	06:21	06:52	07:23	17:31 (D02)	06:59	15:34 (D03)	07:28		15:39 (D03)
	20:37	20:03	19:13	18:24	24 17:55 (D02)	16:48	16 15:50 (D03)	16:42	28	16:07 (D03)
20	05:53	06:22	06:53	07:24	17:31 (D02)	07:00	15:33 (D03)	07:28		15:39 (D03)
	20:36	20:01	19:11	18:22	24 17:55 (D02)	16:47	19 15:52 (D03)	16:42	28	16:07 (D03)
21	05:53	06:23	06:54	07:25	17:31 (D02)	07:01	15:32 (D03)	07:29		15:40 (D03)
	20:35	20:00	19:10	18:21	23 17:54 (D02)	16:46	21 15:53 (D03)	16:42	28	16:08 (D03)
22	05:54	06:24	06:55	07:26	17:33 (D02)	07:03	15:31 (D03)	07:29		15:40 (D03)
	20:35	19:58	19:08	18:19	21 17:54 (D02)	16:46	23 15:54 (D03)	16:43	28	16:08 (D03)
23	05:55	06:25	06:56	07:27	17:33 (D02)	07:04	15:30 (D03)	07:30		15:41 (D03)
	20:34	19:57	19:06	18:18	20 17:53 (D02)	16:45	24 15:54 (D03)	16:43	28	16:09 (D03)
24	05:56	06:26	06:57	07:29	17:34 (D02)	07:05	15:31 (D03)	07:30		15:41 (D03)
	20:33	19:55	19:04	18:17	17 17:51 (D02)	16:44	25 15:56 (D03)	16:44	28	16:09 (D03)
25	05:57	06:27	06:58	07:30	17:35 (D02)	07:06	15:30 (D03)	07:31		15:41 (D03)
	20:32	19:54	19:03	18:15	14 17:49 (D02)	16:44	27 15:57 (D03)	16:45	28	16:09 (D03)
26	05:58	06:28	06:59	07:31	17:37 (D02)	07:07	15:30 (D03)	07:31		15:42 (D03)
	20:31	19:52	19:01	18:14	10 17:47 (D02)	16:43	27 15:57 (D03)	16:45	28	16:10 (D03)
27	05:59	06:29	07:00	07:32		07:08	15:30 (D03)	07:31		15:42 (D03)
	20:30	19:51	18:59	18:12		16:43	28 15:58 (D03)	16:46	29	16:11 (D03)
28	06:00	06:30	07:01	07:33		07:09	15:30 (D03)	07:32		15:42 (D03)
	20:29	19:49	18:58	18:11		16:42	28 15:58 (D03)	16:46	29	16:11 (D03)
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	20:28	19:48	18:56	18:10		16:42	28 15:58 (D03)	16:47	28	16:11 (D03)
30	06:02	06:32	07:03	07:35		07:11	15:30 (D03)	07:32		15:44 (D03)
	20:27	19:46	18:54	18:09		16:42	29 15:59 (D03)	16:48	29	16:13 (D03)
31	06:03	06:33		07:37				07:32		15:44 (D03)
	20:26	19:45		18:07				16:49	29	16:13 (D03)
Potential sun hours	458	428	375	346		298		288		
Total, worst case					312		315		894	
Sun reduction					0.84		0.61		0.47	
Oper. time red.					1.00		1.00		1.00	
Wind dir. red.					0.81		0.89		0.89	
Total reduction					0.69		0.55		0.42	
Total, real					215		172		377	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 35 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (109)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:33		15:55 (D03)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		15:39 (D03)
	16:50	24	16:19 (D03)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	28	16:07 (D03)
2	07:33		15:55 (D03)	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39			07:13		15:40 (D03)
	16:50	24	16:19 (D03)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	27	16:07 (D03)
3	07:33		15:55 (D03)	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40			07:14		15:40 (D03)
	16:51	25	16:20 (D03)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	28	16:08 (D03)
4	07:33		15:55 (D03)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		15:41 (D03)
	16:52	26	16:21 (D03)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40	27	16:08 (D03)
5	07:33		15:55 (D03)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		15:41 (D03)
	16:53	26	16:21 (D03)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	27	16:08 (D03)
6	07:33		15:56 (D03)	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17		15:42 (D03)
	16:54	26	16:22 (D03)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40	26	16:08 (D03)
7	07:33		15:56 (D03)	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45			07:18		15:43 (D03)
	16:55	27	16:23 (D03)	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59			16:40	26	16:09 (D03)
8	07:32		15:56 (D03)	07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46			07:19		15:43 (D03)
	16:56	27	16:23 (D03)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58			16:40	26	16:09 (D03)
9	07:32		15:56 (D03)	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47			07:20		15:43 (D03)
	16:57	28	16:24 (D03)	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57			16:40	25	16:08 (D03)
10	07:32		15:57 (D03)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48			07:21		15:44 (D03)
	16:58	27	16:24 (D03)	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56			16:40	24	16:08 (D03)
11	07:32		15:57 (D03)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50			07:22		15:45 (D03)
	16:59	28	16:25 (D03)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55			16:40	24	16:09 (D03)
12	07:32		15:57 (D03)	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51			07:23		15:45 (D03)
	17:00	28	16:25 (D03)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54			16:40	24	16:09 (D03)
13	07:31		15:58 (D03)	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52			07:23		15:46 (D03)
	17:01	28	16:26 (D03)	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53			16:40	24	16:10 (D03)
14	07:31		15:57 (D03)	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		15:43 (D03)	07:24		15:46 (D03)
	17:02	29	16:26 (D03)	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	10	15:53 (D03)	16:40	23	16:09 (D03)
15	07:31		15:58 (D03)	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		15:42 (D03)	07:25		15:47 (D03)
	17:03	28	16:26 (D03)	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	14	15:56 (D03)	16:41	23	16:10 (D03)
16	07:30		15:58 (D03)	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		15:40 (D03)	07:26		15:48 (D03)
	17:04	28	16:26 (D03)	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	18	15:58 (D03)	16:41	22	16:10 (D03)
17	07:30		15:59 (D03)	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		15:39 (D03)	07:26		15:48 (D03)
	17:05	28	16:27 (D03)	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	20	15:59 (D03)	16:41	22	16:10 (D03)
18	07:29		15:59 (D03)	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		15:38 (D03)	07:27		15:49 (D03)
	17:07	28	16:27 (D03)	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	22	16:00 (D03)	16:41	22	16:11 (D03)
19	07:29		16:00 (D03)	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59		15:38 (D03)	07:28		15:50 (D03)
	17:08	27	16:27 (D03)	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	23	16:01 (D03)	16:42	22	16:12 (D03)
20	07:28		16:01 (D03)	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00		15:38 (D03)	07:28		15:50 (D03)
	17:09	26	16:27 (D03)	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	24	16:02 (D03)	16:42	21	16:11 (D03)
21	07:28		16:02 (D03)	06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01		15:37 (D03)	07:29		15:51 (D03)
	17:10	25	16:27 (D03)	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	25	16:02 (D03)	16:42	21	16:12 (D03)
22	07:27		16:03 (D03)	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03		15:37 (D03)	07:29		15:51 (D03)
	17:11	24	16:27 (D03)	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	26	16:03 (D03)	16:43	21	16:12 (D03)
23	07:26		16:03 (D03)	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04		15:36 (D03)	07:30		15:52 (D03)
	17:12	23	16:26 (D03)	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	27	16:03 (D03)	16:43	21	16:13 (D03)
24	07:26		16:04 (D03)	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05		15:37 (D03)	07:30		15:52 (D03)
	17:14	22	16:26 (D03)	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	28	16:05 (D03)	16:44	21	16:13 (D03)
25	07:25		16:06 (D03)	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		15:37 (D03)	07:31		15:52 (D03)
	17:15	20	16:26 (D03)	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	28	16:05 (D03)	16:45	22	16:14 (D03)
26	07:24		16:07 (D03)	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		15:37 (D03)	07:31		15:53 (D03)
	17:16	18	16:25 (D03)	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	28	16:05 (D03)	16:45	22	16:15 (D03)
27	07:23		16:09 (D03)	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		15:37 (D03)	07:31		15:53 (D03)
	17:17	14	16:23 (D03)	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	28	16:05 (D03)	16:46	22	16:15 (D03)
28	07:22		16:12 (D03)	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		15:37 (D03)	07:32		15:53 (D03)
	17:18	9	16:21 (D03)	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	29	16:06 (D03)	16:46	23	16:16 (D03)
29	07:22				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		15:38 (D03)	07:32		15:53 (D03)
	17:20				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	28	16:06 (D03)	16:47	23	16:16 (D03)
30	07:21				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		15:38 (D03)	07:32		15:54 (D03)
	17:21				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	28	16:06 (D03)	16:48	23	16:17 (D03)
31	07:20				06:54		05:39		06:03	06:33		07:37				07:32		15:54 (D03)
	17:22				19:30		20:31		20:26	19:45		18:07				16:49	24	16:18 (D03)
Potential sun hours	298			297	369	398	448	452	458	428	375	346	298			288		
Total, worst case		693												406			734	
Sun reduction		0.45												0.61			0.47	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.89												0.89			0.89	
Total reduction		0.40												0.54			0.42	
Total, real		277												220			306	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 36 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (110)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:33		16:01 (D03)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		15:44 (D03)
	16:50	19	16:20 (D03)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	26	16:10 (D03)
2	07:33		16:01 (D03)	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39			07:13		15:44 (D03)
	16:50	20	16:21 (D03)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	26	16:10 (D03)
3	07:33		16:01 (D03)	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40			07:14		15:45 (D03)
	16:51	21	16:22 (D03)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	25	16:10 (D03)
4	07:33		16:01 (D03)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		15:46 (D03)
	16:52	21	16:22 (D03)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40	24	16:10 (D03)
5	07:33		16:01 (D03)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		15:46 (D03)
	16:53	22	16:23 (D03)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	24	16:10 (D03)
6	07:33		16:01 (D03)	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17		15:47 (D03)
	16:54	23	16:24 (D03)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40	23	16:10 (D03)
7	07:33		16:01 (D03)	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45			07:18		15:48 (D03)
	16:55	24	16:25 (D03)	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59			16:40	22	16:10 (D03)
8	07:32		16:01 (D03)	07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46			07:19		15:49 (D03)
	16:56	24	16:25 (D03)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58			16:40	22	16:11 (D03)
9	07:32		16:01 (D03)	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47			07:20		15:49 (D03)
	16:57	25	16:26 (D03)	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57			16:40	21	16:10 (D03)
10	07:32		16:01 (D03)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48			07:21		15:50 (D03)
	16:58	26	16:27 (D03)	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56			16:40	20	16:10 (D03)
11	07:32		16:02 (D03)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50			07:22		15:51 (D03)
	16:59	26	16:28 (D03)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55			16:40	19	16:10 (D03)
12	07:32		16:01 (D03)	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		15:47 (D03)	07:23		15:52 (D03)
	17:00	27	16:28 (D03)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	10	15:57 (D03)	16:40	18	16:10 (D03)
13	07:31		16:02 (D03)	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		15:45 (D03)	07:23		15:53 (D03)
	17:01	27	16:29 (D03)	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	14	15:59 (D03)	16:40	18	16:11 (D03)
14	07:31		16:01 (D03)	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		15:43 (D03)	07:24		15:53 (D03)
	17:02	28	16:29 (D03)	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	18	16:01 (D03)	16:40	17	16:10 (D03)
15	07:31		16:02 (D03)	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		15:43 (D03)	07:25		15:54 (D03)
	17:03	28	16:30 (D03)	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	20	16:03 (D03)	16:41	16	16:10 (D03)
16	07:30		16:02 (D03)	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		15:42 (D03)	07:26		15:55 (D03)
	17:04	28	16:30 (D03)	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	21	16:03 (D03)	16:41	16	16:11 (D03)
17	07:30		16:03 (D03)	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		15:41 (D03)	07:26		15:55 (D03)
	17:05	28	16:31 (D03)	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	23	16:04 (D03)	16:41	16	16:11 (D03)
18	07:29		16:03 (D03)	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		15:40 (D03)	07:27		15:56 (D03)
	17:07	27	16:30 (D03)	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	25	16:05 (D03)	16:41	15	16:11 (D03)
19	07:29		16:04 (D03)	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59		15:41 (D03)	07:28		15:57 (D03)
	17:08	27	16:31 (D03)	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	25	16:06 (D03)	16:42	15	16:12 (D03)
20	07:28		16:04 (D03)	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00		15:40 (D03)	07:28		15:57 (D03)
	17:09	27	16:31 (D03)	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	27	16:07 (D03)	16:42	15	16:12 (D03)
21	07:28		16:05 (D03)	06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01		15:40 (D03)	07:29		15:58 (D03)
	17:10	27	16:32 (D03)	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	27	16:07 (D03)	16:42	15	16:13 (D03)
22	07:27		16:05 (D03)	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03		15:40 (D03)	07:29		15:58 (D03)
	17:11	27	16:32 (D03)	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	27	16:07 (D03)	16:43	15	16:13 (D03)
23	07:26		16:06 (D03)	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04		15:40 (D03)	07:30		15:59 (D03)
	17:12	25	16:31 (D03)	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	27	16:07 (D03)	16:43	15	16:14 (D03)
24	07:26		16:06 (D03)	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05		15:41 (D03)	07:30		15:59 (D03)
	17:14	25	16:31 (D03)	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	27	16:08 (D03)	16:44	15	16:14 (D03)
25	07:25		16:08 (D03)	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		15:41 (D03)	07:31		15:59 (D03)
	17:15	23	16:31 (D03)	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	28	16:09 (D03)	16:45	15	16:14 (D03)
26	07:24		16:09 (D03)	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		15:41 (D03)	07:31		16:00 (D03)
	17:16	21	16:30 (D03)	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	28	16:09 (D03)	16:45	15	16:15 (D03)
27	07:23		16:10 (D03)	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		15:41 (D03)	07:31		16:00 (D03)
	17:17	20	16:30 (D03)	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	28	16:09 (D03)	16:46	16	16:16 (D03)
28	07:22		16:11 (D03)	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		15:42 (D03)	07:32		16:00 (D03)
	17:18	18	16:29 (D03)	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	27	16:09 (D03)	16:46	16	16:16 (D03)
29	07:22		16:13 (D03)		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		15:42 (D03)	07:32		16:00 (D03)
	17:20	14	16:27 (D03)		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	27	16:09 (D03)	16:47	17	16:17 (D03)
30	07:21		16:15 (D03)		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		15:42 (D03)	07:32		16:01 (D03)
	17:21	10	16:25 (D03)		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	27	16:09 (D03)	16:48	17	16:18 (D03)
31	07:20				06:54		05:39		06:03	06:33		07:37				07:32		16:01 (D03)
	17:22				19:30		20:31		20:26	19:45		18:07				16:49	18	16:19 (D03)
Potential sun hours	298			297	369	398	448	452	458	428	375	346	298			288		
Total, worst case		708												456			572	
Sun reduction		0.45												0.61			0.47	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.88												0.88			0.88	
Total reduction		0.40												0.54			0.42	
Total, real		282												246			238	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 37 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (111)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:32		16:09 (D03)	07:19		16:20 (D03)	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		15:49 (D03)
	16:50	11	16:20 (D03)	17:23	9	16:29 (D03)	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	23	16:12 (D03)
2	07:33		16:08 (D03)	07:18			06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39			07:13		15:50 (D03)
	16:50	13	16:21 (D03)	17:25			17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	22	16:12 (D03)
3	07:33		16:08 (D03)	07:17			06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40			07:14		15:51 (D03)
	16:51	14	16:22 (D03)	17:26			18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	21	16:12 (D03)
4	07:33		16:08 (D03)	07:16			06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		15:52 (D03)
	16:52	15	16:23 (D03)	17:27			18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40	20	16:12 (D03)
5	07:33		16:08 (D03)	07:15			06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		15:53 (D03)
	16:53	16	16:24 (D03)	17:28			18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	19	16:12 (D03)
6	07:33		16:08 (D03)	07:14			06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17		15:54 (D03)
	16:54	17	16:25 (D03)	17:30			18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40	17	16:11 (D03)
7	07:33		16:08 (D03)	07:13			06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45			07:18		15:55 (D03)
	16:55	18	16:26 (D03)	17:31			18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59			16:40	16	16:11 (D03)
8	07:32		16:07 (D03)	07:12			07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46			07:19		15:56 (D03)
	16:56	20	16:27 (D03)	17:32			19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58			16:40	15	16:11 (D03)
9	07:32		16:07 (D03)	07:10			07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47			07:20		15:56 (D03)
	16:57	21	16:28 (D03)	17:33			19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57			16:40	14	16:10 (D03)
10	07:32		16:07 (D03)	07:09			07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48		15:50 (D03)	07:21		15:57 (D03)
	16:58	22	16:29 (D03)	17:35			19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	10	16:00 (D03)	16:40	13	16:10 (D03)
11	07:32		16:07 (D03)	07:08			07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50		15:49 (D03)	07:22		15:59 (D03)
	16:59	23	16:30 (D03)	17:36			19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	14	16:03 (D03)	16:40	11	16:10 (D03)
12	07:32		16:07 (D03)	07:07			07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		15:47 (D03)	07:23		16:00 (D03)
	17:00	23	16:30 (D03)	17:37			19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	17	16:04 (D03)	16:40	9	16:09 (D03)
13	07:31		16:07 (D03)	07:06			07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		15:46 (D03)	07:23		16:02 (D03)
	17:01	24	16:31 (D03)	17:38			19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	19	16:05 (D03)	16:40	7	16:09 (D03)
14	07:31		16:06 (D03)	07:04			07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		15:45 (D03)	07:24		16:03 (D03)
	17:02	25	16:31 (D03)	17:39			19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	21	16:06 (D03)	16:40	5	16:08 (D03)
15	07:31		16:07 (D03)	07:03			07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		15:45 (D03)	07:25		16:05 (D03)
	17:03	26	16:33 (D03)	17:41			19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	23	16:08 (D03)	16:41	1	16:06 (D03)
16	07:30		16:06 (D03)	07:02			07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		15:44 (D03)	07:26		
	17:04	27	16:33 (D03)	17:42			19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	24	16:08 (D03)	16:41		
17	07:30		16:07 (D03)	07:00			07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		15:44 (D03)	07:26		
	17:05	27	16:34 (D03)	17:43			19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	25	16:09 (D03)	16:41		
18	07:29		16:07 (D03)	06:59			07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		15:43 (D03)	07:27		
	17:07	27	16:34 (D03)	17:44			19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	26	16:09 (D03)	16:41		
19	07:29		16:08 (D03)	06:58			07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59		15:44 (D03)	07:28		
	17:08	27	16:35 (D03)	17:46			19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	26	16:10 (D03)	16:42		
20	07:28		16:08 (D03)	06:56			07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00		15:44 (D03)	07:28		
	17:09	27	16:35 (D03)	17:47			19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	27	16:11 (D03)	16:42		
21	07:28		16:09 (D03)	06:55			07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01		15:44 (D03)	07:29		
	17:10	27	16:36 (D03)	17:48			19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	27	16:11 (D03)	16:42		
22	07:27		16:09 (D03)	06:53			07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03		15:44 (D03)	07:29		
	17:11	27	16:36 (D03)	17:49			19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	27	16:11 (D03)	16:43		
23	07:26		16:09 (D03)	06:52			07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04		15:44 (D03)	07:30		
	17:12	26	16:35 (D03)	17:50			19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	27	16:11 (D03)	16:43		
24	07:26		16:09 (D03)	06:50			07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05		15:45 (D03)	07:30		
	17:14	26	16:35 (D03)	17:51			19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	27	16:12 (D03)	16:44		
25	07:25		16:11 (D03)	06:49			07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		15:45 (D03)	07:31		
	17:15	25	16:36 (D03)	17:53			19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	27	16:12 (D03)	16:45		
26	07:24		16:11 (D03)	06:48			07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		15:46 (D03)	07:31		
	17:16	24	16:35 (D03)	17:54			19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	26	16:12 (D03)	16:45		
27	07:23		16:12 (D03)	06:46			07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		15:46 (D03)	07:31		
	17:17	23	16:35 (D03)	17:55			19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	26	16:12 (D03)	16:46		
28	07:22		16:13 (D03)	06:45			06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		15:46 (D03)	07:32		
	17:18	21	16:34 (D03)	17:56			19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	26	16:12 (D03)	16:46		
29	07:22		16:14 (D03)				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		15:47 (D03)	07:32		16:10 (D03)
	17:20	19	16:33 (D03)				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	24	16:11 (D03)	16:47	4	16:14 (D03)
30	07:21		16:15 (D03)				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		15:48 (D03)	07:32		16:10 (D03)
	17:21	17	16:32 (D03)				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	23	16:11 (D03)	16:48	7	16:17 (D03)
31	07:20		16:17 (D03)				06:54		05:39		06:03	06:33		07:37				07:32		16:09 (D03)
	17:22	14	16:31 (D03)				19:30		20:31		20:26	19:45		18:07				16:49	9	16:18 (D03)
Potential sun hours	298			297			369	398	448	452	458	428	375	346	298			288		
Total, worst case		672			9											492			233	
Sun reduction		0.45			0.62											0.61			0.47	
Oper. time red.		1.00			1.00											1.00			1.00	
Wind dir. red.		0.88			0.88											0.88			0.88	
Total reduction		0.40			0.55											0.54			0.41	
Total, real		267			5											265			97	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 38 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (112)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:32			07:19		16:23 (D03)	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		16:04 (D03)
	16:50			17:23	19	16:42 (D03)	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	10	16:14 (D03)
2	07:33			07:18		16:24 (D03)	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39			07:13		16:07 (D03)
	16:50			17:25	17	16:41 (D03)	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	5	16:12 (D03)
3	07:33			07:17		16:26 (D03)	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40			07:14		
	16:51			17:26	13	16:39 (D03)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41		
4	07:33			07:16		16:29 (D03)	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		
	16:52			17:27	8	16:37 (D03)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40		
5	07:33			07:15			06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		
	16:53			17:28			18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40		
6	07:33			07:14			06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17		
	16:54			17:30			18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40		
7	07:33			07:13			06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45		15:58 (D03)	07:18		
	16:55			17:31			18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	9	16:07 (D03)	16:40		
8	07:32			07:12			07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46		15:57 (D03)	07:19		
	16:56			17:32			19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	13	16:10 (D03)	16:40		
9	07:32			07:10			07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47		15:55 (D03)	07:20		
	16:57			17:33			19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	17	16:12 (D03)	16:40		
10	07:32		16:24 (D03)	07:09			07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48		15:54 (D03)	07:21		
	16:58	4	16:28 (D03)	17:35			19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	19	16:13 (D03)	16:40		
11	07:32		16:22 (D03)	07:08			07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50		15:54 (D03)	07:22		
	16:59	9	16:31 (D03)	17:36			19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	20	16:14 (D03)	16:40		
12	07:32		16:21 (D03)	07:07			07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		15:53 (D03)	07:23		
	17:00	12	16:33 (D03)	17:37			19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	22	16:15 (D03)	16:40		
13	07:31		16:20 (D03)	07:06			07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		15:52 (D03)	07:23		
	17:01	14	16:34 (D03)	17:38			19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	23	16:15 (D03)	16:40		
14	07:31		16:19 (D03)	07:04			07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		15:52 (D03)	07:24		
	17:02	16	16:35 (D03)	17:39			19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	24	16:16 (D03)	16:40		
15	07:31		16:19 (D03)	07:03			07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		15:52 (D03)	07:25		
	17:03	18	16:37 (D03)	17:41			19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	25	16:17 (D03)	16:40		
16	07:30		16:18 (D03)	07:02			07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		15:52 (D03)	07:26		
	17:04	19	16:37 (D03)	17:42			19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	25	16:17 (D03)	16:41		
17	07:30		16:18 (D03)	07:00			07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		15:52 (D03)	07:26		
	17:05	21	16:39 (D03)	17:43			19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	25	16:17 (D03)	16:41		
18	07:29		16:18 (D03)	06:59			07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		15:52 (D03)	07:27		
	17:07	21	16:39 (D03)	17:44			19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	25	16:17 (D03)	16:41		
19	07:29		16:18 (D03)	06:58			07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59		15:53 (D03)	07:28		
	17:08	23	16:41 (D03)	17:46			19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	25	16:18 (D03)	16:42		
20	07:28		16:18 (D03)	06:56			07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00		15:53 (D03)	07:28		
	17:09	23	16:41 (D03)	17:47			19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	25	16:18 (D03)	16:42		
21	07:28		16:18 (D03)	06:55			07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01		15:53 (D03)	07:29		
	17:10	24	16:42 (D03)	17:48			19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	24	16:17 (D03)	16:42		
22	07:27		16:18 (D03)	06:53			07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03		15:54 (D03)	07:29		
	17:11	25	16:43 (D03)	17:49			19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	23	16:17 (D03)	16:43		
23	07:26		16:18 (D03)	06:52			07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04		15:54 (D03)	07:30		
	17:12	25	16:43 (D03)	17:50			19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	23	16:17 (D03)	16:43		
24	07:26		16:18 (D03)	06:50			07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05		15:56 (D03)	07:30		
	17:14	25	16:43 (D03)	17:51			19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	21	16:17 (D03)	16:44		
25	07:25		16:19 (D03)	06:49			07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		15:56 (D03)	07:31		
	17:15	25	16:44 (D03)	17:53			19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	21	16:17 (D03)	16:45		
26	07:24		16:19 (D03)	06:48			07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		15:57 (D03)	07:31		
	17:16	25	16:44 (D03)	17:54			19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	20	16:17 (D03)	16:45		
27	07:23		16:19 (D03)	06:46			07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		15:58 (D03)	07:31		
	17:17	25	16:44 (D03)	17:55			19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	18	16:16 (D03)	16:46		
28	07:22		16:20 (D03)	06:45			06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		15:59 (D03)	07:32		
	17:18	24	16:44 (D03)	17:56			19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16	16:15 (D03)	16:46		
29	07:22		16:20 (D03)				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		16:00 (D03)	07:32		
	17:20	23	16:43 (D03)				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	15	16:15 (D03)	16:47		
30	07:21		16:21 (D03)				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		16:01 (D03)	07:32		
	17:21	22	16:43 (D03)				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	13	16:14 (D03)	16:48		
31	07:20		16:22 (D03)				06:54		05:39		06:03	06:33		07:37				07:32		
	17:22	20	16:42 (D03)				19:30		20:31		20:26	19:44		18:07				16:49		
Potential sun hours	298			297			369	398	448	452	458	428	375	346	298			288		
Total, worst case		443			57											491			15	
Sun reduction		0.45			0.62											0.61			0.47	
Oper. time red.		1.00			1.00											1.00			1.00	
Wind dir. red.		0.88			0.88											0.88			0.88	
Total reduction		0.39			0.54											0.53			0.41	
Total, real		175			31											263			6	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 39 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (113)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March			April	May	June
1	07:33		15:55 (D03)	07:19			06:43		17:06 (D02)	06:52	06:07	05:39
	16:50	23	16:18 (D03)	17:23			17:57	23	17:29 (D02)	19:31	20:03	20:32
2	07:33		15:55 (D03)	07:18			06:41		17:06 (D02)	06:51	06:06	05:38
	16:50	23	16:18 (D03)	17:25			17:58	22	17:28 (D02)	19:32	20:04	20:33
3	07:33		15:55 (D03)	07:17			06:40		17:06 (D02)	06:49	06:05	05:38
	16:51	24	16:19 (D03)	17:26			18:00	21	17:27 (D02)	19:33	20:05	20:34
4	07:33		15:56 (D03)	07:16			06:38		17:07 (D02)	06:48	06:03	05:38
	16:52	24	16:20 (D03)	17:27			18:01	19	17:26 (D02)	19:34	20:06	20:34
5	07:33		15:56 (D03)	07:15			06:37		17:08 (D02)	06:46	06:02	05:37
	16:53	25	16:21 (D03)	17:28			18:02	16	17:24 (D02)	19:35	20:07	20:35
6	07:33		15:56 (D03)	07:14			06:35		17:10 (D02)	06:44	06:01	05:37
	16:54	26	16:22 (D03)	17:30			18:03	13	17:23 (D02)	19:36	20:08	20:36
7	07:33		15:56 (D03)	07:13			06:34		17:14 (D02)	06:43	06:00	05:37
	16:55	26	16:22 (D03)	17:31			18:04	4	17:18 (D02)	19:37	20:09	20:36
8	07:32		15:56 (D03)	07:12			07:32			06:41	05:58	05:36
	16:56	26	16:22 (D03)	17:32			19:05			19:39	20:10	20:37
9	07:32		15:56 (D03)	07:10			07:30			06:39	05:57	05:36
	16:57	27	16:23 (D03)	17:33			19:06			19:40	20:11	20:38
10	07:32		15:56 (D03)	07:09			07:29			06:38	05:56	05:36
	16:58	28	16:24 (D03)	17:35			19:07			19:41	20:12	20:38
11	07:32		15:57 (D03)	07:08			07:27			06:36	05:55	05:36
	16:59	28	16:25 (D03)	17:36			19:09			19:42	20:13	20:39
12	07:32		15:56 (D03)	07:07			07:26			06:35	05:54	05:36
	17:00	29	16:25 (D03)	17:37			19:10			19:43	20:14	20:39
13	07:31		15:57 (D03)	07:06			07:24			06:33	05:53	05:36
	17:01	29	16:26 (D03)	17:38			19:11			19:44	20:15	20:40
14	07:31		15:57 (D03)	07:04			07:22			06:32	05:52	05:36
	17:02	29	16:26 (D03)	17:39			19:12			19:45	20:16	20:40
15	07:31		15:57 (D03)	07:03			07:21			06:30	05:51	05:36
	17:03	30	16:27 (D03)	17:41			19:13			19:46	20:17	20:41
16	07:30		15:57 (D03)	07:02			07:19			06:28	05:50	05:36
	17:04	30	16:27 (D03)	17:42			19:14			19:47	20:18	20:41
17	07:30		15:58 (D03)	07:00			07:17			06:27	05:49	05:36
	17:05	30	16:28 (D03)	17:43			19:15			19:48	20:19	20:41
18	07:29		15:58 (D03)	06:59			07:16			06:25	05:48	05:36
	17:07	29	16:27 (D03)	17:44			19:16			19:49	20:20	20:42
19	07:29		15:59 (D03)	06:58			07:14			06:24	05:47	05:36
	17:08	29	16:28 (D03)	17:46			19:17			19:50	20:21	20:42
20	07:28		15:59 (D03)	06:56		17:13 (D02)	07:12			06:22	05:47	05:36
	17:09	29	16:28 (D03)	17:47	10	17:23 (D02)	19:18			19:51	20:22	20:42
21	07:28		16:00 (D03)	06:55		17:10 (D02)	07:11			06:21	05:46	05:36
	17:10	29	16:29 (D03)	17:48	15	17:25 (D02)	19:19			19:52	20:23	20:43
22	07:27		16:00 (D03)	06:53		17:09 (D02)	07:09			06:19	05:45	05:36
	17:11	29	16:29 (D03)	17:49	18	17:27 (D02)	19:21			19:53	20:24	20:43
23	07:26		16:01 (D03)	06:52		17:08 (D02)	07:07			06:18	05:44	05:37
	17:12	27	16:28 (D03)	17:50	20	17:28 (D02)	19:22			19:54	20:25	20:43
24	07:26		16:01 (D03)	06:50		17:07 (D02)	07:06			06:17	05:43	05:37
	17:14	27	16:28 (D03)	17:51	22	17:29 (D02)	19:23			19:55	20:26	20:43
25	07:25		16:03 (D03)	06:49		17:07 (D02)	07:04			06:15	05:43	05:37
	17:15	25	16:28 (D03)	17:53	23	17:30 (D02)	19:24			19:56	20:26	20:43
26	07:24		16:04 (D03)	06:48		17:06 (D02)	07:02			06:14	05:42	05:38
	17:16	24	16:28 (D03)	17:54	23	17:29 (D02)	19:25			19:57	20:27	20:44
27	07:23		16:05 (D03)	06:46		17:06 (D02)	07:01			06:12	05:41	05:38
	17:17	22	16:27 (D03)	17:55	24	17:30 (D02)	19:26			19:59	20:28	20:44
28	07:22		16:06 (D03)	06:45		17:05 (D02)	06:59			06:11	05:41	05:38
	17:18	20	16:26 (D03)	17:56	24	17:29 (D02)	19:27			20:00	20:29	20:44
29	07:22		16:08 (D03)				06:57			06:10	05:40	05:39
	17:20	17	16:25 (D03)				19:28			20:01	20:30	20:44
30	07:21		16:10 (D03)				06:56			06:08	05:40	05:39
	17:21	13	16:23 (D03)				19:29			20:02	20:31	20:44
31	07:20		16:13 (D03)				06:54				05:39	
	17:22	7	16:20 (D03)				19:30				20:31	
Potential sun hours	298			297			369			398	448	452
Total, worst case		784			179			118				
Sun reduction		0.45			0.62			0.73				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.89			0.80			0.80				
Total reduction		0.40			0.50			0.59				
Total, real		315			90			70				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 39 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (113)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October		November		December	
1	05:40	06:04	06:34	07:04		06:38		07:12	15:39 (D03)
	20:44	20:25	19:43	18:53		18:06		16:41 28	16:07 (D03)
2	05:40	06:04	06:35	07:05		06:39		07:13	15:39 (D03)
	20:44	20:24	19:41	18:51		17:05		16:41 28	16:07 (D03)
3	05:41	06:05	06:36	07:06		06:40		07:14	15:40 (D03)
	20:43	20:23	19:40	18:49		17:04		16:41 27	16:07 (D03)
4	05:41	06:06	06:37	07:07		06:41		07:15	15:41 (D03)
	20:43	20:22	19:38	18:48		17:02		16:40 26	16:07 (D03)
5	05:42	06:07	06:38	07:08		06:43		07:16	15:41 (D03)
	20:43	20:21	19:36	18:46		17:01		16:40 27	16:08 (D03)
6	05:42	06:08	06:39	07:09		06:44		07:17	15:42 (D03)
	20:43	20:20	19:35	18:44		17:00		16:40 26	16:08 (D03)
7	05:43	06:09	06:40	07:10	17:48 (D02)	06:45		07:18	15:43 (D03)
	20:43	20:19	19:33	18:43 9	17:57 (D02)	16:59		16:40 25	16:08 (D03)
8	05:44	06:10	06:41	07:11	17:45 (D02)	06:46		07:19	15:44 (D03)
	20:42	20:17	19:31	18:41 14	17:59 (D02)	16:58		16:40 24	16:08 (D03)
9	05:44	06:11	06:42	07:12	17:43 (D02)	06:47		07:20	15:43 (D03)
	20:42	20:16	19:30	18:39 17	18:00 (D02)	16:57		16:40 24	16:07 (D03)
10	05:45	06:12	06:43	07:13	17:41 (D02)	06:48		07:21	15:44 (D03)
	20:42	20:15	19:28	18:38 20	18:01 (D02)	16:56		16:40 23	16:07 (D03)
11	05:46	06:13	06:44	07:14	17:40 (D02)	06:50	15:44 (D03)	07:22	15:45 (D03)
	20:41	20:14	19:26	18:36 22	18:02 (D02)	16:55 8	15:52 (D03)	16:40 23	16:08 (D03)
12	05:46	06:14	06:45	07:15	17:39 (D02)	06:51	15:41 (D03)	07:23	15:46 (D03)
	20:41	20:12	19:25	18:35 23	18:02 (D02)	16:54 14	15:55 (D03)	16:40 22	16:08 (D03)
13	05:47	06:15	06:46	07:16	17:38 (D02)	06:52	15:39 (D03)	07:23	15:47 (D03)
	20:40	20:11	19:23	18:33 24	18:02 (D02)	16:53 18	15:57 (D03)	16:40 21	16:08 (D03)
14	05:48	06:16	06:47	07:17	17:38 (D02)	06:53	15:38 (D03)	07:24	15:47 (D03)
	20:40	20:10	19:21	18:32 24	18:02 (D02)	16:52 20	15:58 (D03)	16:40 21	16:08 (D03)
15	05:49	06:17	06:48	07:19	17:38 (D02)	06:54	15:38 (D03)	07:25	15:48 (D03)
	20:39	20:08	19:20	18:30 24	18:02 (D02)	16:51 22	16:00 (D03)	16:41 20	16:08 (D03)
16	05:49	06:18	06:49	07:20	17:38 (D02)	06:56	15:37 (D03)	07:26	15:49 (D03)
	20:39	20:07	19:18	18:28 24	18:02 (D02)	16:50 24	16:01 (D03)	16:41 20	16:09 (D03)
17	05:50	06:19	06:50	07:21	17:38 (D02)	06:57	15:36 (D03)	07:26	15:49 (D03)
	20:38	20:06	19:16	18:27 23	18:01 (D02)	16:49 25	16:01 (D03)	16:41 19	16:08 (D03)
18	05:51	06:20	06:51	07:22	17:39 (D02)	06:58	15:35 (D03)	07:27	15:50 (D03)
	20:37	20:04	19:15	18:25 21	18:00 (D02)	16:48 27	16:02 (D03)	16:41 19	16:09 (D03)
19	05:52	06:21	06:52	07:23	17:39 (D02)	06:59	15:36 (D03)	07:28	15:51 (D03)
	20:37	20:03	19:13	18:24 20	17:59 (D02)	16:48 27	16:03 (D03)	16:42 19	16:10 (D03)
20	05:53	06:22	06:53	07:24	17:40 (D02)	07:00	15:35 (D03)	07:28	15:51 (D03)
	20:36	20:01	19:11	18:22 17	17:57 (D02)	16:47 29	16:04 (D03)	16:42 19	16:10 (D03)
21	05:53	06:23	06:54	07:25	17:42 (D02)	07:01	15:35 (D03)	07:29	15:52 (D03)
	20:35	20:00	19:10	18:21 13	17:55 (D02)	16:46 29	16:04 (D03)	16:42 19	16:11 (D03)
22	05:54	06:24	06:55	07:26	17:45 (D02)	07:03	15:35 (D03)	07:29	15:52 (D03)
	20:35	19:58	19:08	18:19 8	17:53 (D02)	16:46 29	16:04 (D03)	16:43 19	16:11 (D03)
23	05:55	06:25	06:56	07:27		07:04	15:35 (D03)	07:30	15:53 (D03)
	20:34	19:57	19:06	18:18		16:45 29	16:04 (D03)	16:43 19	16:12 (D03)
24	05:56	06:26	06:57	07:29		07:05	15:36 (D03)	07:30	15:53 (D03)
	20:33	19:55	19:04	18:17		16:44 29	16:05 (D03)	16:44 19	16:12 (D03)
25	05:57	06:27	06:58	07:30		07:06	15:36 (D03)	07:31	15:53 (D03)
	20:32	19:54	19:03	18:15		16:44 30	16:06 (D03)	16:45 19	16:12 (D03)
26	05:58	06:28	06:59	07:31		07:07	15:36 (D03)	07:31	15:54 (D03)
	20:31	19:52	19:01	18:14		16:43 30	16:06 (D03)	16:45 19	16:13 (D03)
27	05:59	06:29	07:00	07:32		07:08	15:36 (D03)	07:31	15:54 (D03)
	20:30	19:51	18:59	18:12		16:43 30	16:06 (D03)	16:46 20	16:14 (D03)
28	06:00	06:30	07:01	07:33		07:09	15:37 (D03)	07:32	15:54 (D03)
	20:29	19:49	18:58	18:11		16:42 29	16:06 (D03)	16:46 20	16:14 (D03)
29	06:01	06:31	07:02	07:34		07:10	15:37 (D03)	07:32	15:54 (D03)
	20:28	19:48	18:56	18:10		16:42 29	16:06 (D03)	16:47 21	16:15 (D03)
30	06:02	06:32	07:03	07:35		07:11	15:37 (D03)	07:32	15:55 (D03)
	20:27	19:46	18:54	18:09		16:42 29	16:06 (D03)	16:48 21	16:16 (D03)
31	06:03	06:33		07:37				07:32	15:55 (D03)
	20:26	19:45		18:07				16:49 22	16:17 (D03)
Potential sun hours	458	428	375	346		298		288	
Total, worst case					303		507		679
Sun reduction					0.84		0.61		0.47
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.80		0.89		0.89
Total reduction					0.68		0.55		0.42
Total, real					206		276		285

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 40 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (114)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:32		07:19		16:32 (D03)	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38		16:04 (D03)	07:12
	16:50		17:23	23	16:55 (D03)	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	21	16:25 (D03)	16:41
2	07:33		07:18		16:31 (D03)	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39		16:03 (D03)	07:13
	16:50		17:25	25	16:56 (D03)	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	22	16:25 (D03)	16:41
3	07:33		07:17		16:31 (D03)	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40		16:02 (D03)	07:14
	16:51		17:26	25	16:56 (D03)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	23	16:25 (D03)	16:41
4	07:33		07:16		16:31 (D03)	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41		16:02 (D03)	07:15
	16:52		17:27	25	16:56 (D03)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	25	16:27 (D03)	16:40
5	07:33		07:15		16:32 (D03)	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43		16:02 (D03)	07:16
	16:53		17:28	25	16:57 (D03)	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	25	16:27 (D03)	16:40
6	07:33		07:14		16:32 (D03)	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44		16:01 (D03)	07:17
	16:54		17:30	25	16:57 (D03)	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	26	16:27 (D03)	16:40
7	07:33		07:13		16:33 (D03)	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45		16:01 (D03)	07:18
	16:55		17:31	24	16:57 (D03)	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	25	16:26 (D03)	16:40
8	07:32		07:12		16:33 (D03)	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46		16:02 (D03)	07:19
	16:56		17:32	24	16:57 (D03)	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	25	16:27 (D03)	16:40
9	07:32		07:10		16:33 (D03)	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47		16:02 (D03)	07:20
	16:57		17:33	22	16:55 (D03)	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	25	16:27 (D03)	16:40
10	07:32		07:09		16:34 (D03)	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48		16:02 (D03)	07:21
	16:58		17:35	21	16:55 (D03)	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	24	16:26 (D03)	16:40
11	07:32		07:08		16:36 (D03)	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50		16:04 (D03)	07:22
	16:59		17:36	18	16:54 (D03)	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	22	16:26 (D03)	16:40
12	07:32		07:07		16:37 (D03)	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		16:04 (D03)	07:23
	17:00		17:37	16	16:53 (D03)	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	22	16:26 (D03)	16:40
13	07:31		07:05		16:39 (D03)	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		16:05 (D03)	07:23
	17:01		17:38	11	16:50 (D03)	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	20	16:25 (D03)	16:40
14	07:31		07:04			07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		16:06 (D03)	07:24
	17:02		17:39			19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	17	16:23 (D03)	16:40
15	07:31		07:03			07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		16:08 (D03)	07:25
	17:03		17:41			19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	15	16:23 (D03)	16:40
16	07:30		07:02			07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		16:10 (D03)	07:26
	17:04		17:42			19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	11	16:21 (D03)	16:41
17	07:30		07:00			07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		16:12 (D03)	07:26
	17:05		17:43			19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	7	16:19 (D03)	16:41
18	07:29		06:59			07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58			07:27
	17:07		17:44			19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48			16:41
19	07:29		06:58			07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59			07:28
	17:08		17:46			19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48			16:42
20	07:28		06:56			07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00			07:28
	17:09		17:47			19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47			16:42
21	07:28		06:55			07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01			07:29
	17:10		17:48			19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46			16:42
22	07:27		06:53			07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03			07:29
	17:11		17:49			19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46			16:43
23	07:26		06:52			07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04			07:30
	17:12		17:50			19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45			16:43
24	07:26		06:50			07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05			07:30
	17:14		17:51			19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44			16:44
25	07:25	16:39 (D03)	06:49			07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06			07:31
	17:15	7 16:46 (D03)	17:53			19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44			16:45
26	07:24	16:37 (D03)	06:48			07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07			07:31
	17:16	11 16:48 (D03)	17:54			19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43			16:45
27	07:23	16:35 (D03)	06:46			07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08			07:31
	17:17	15 16:50 (D03)	17:55			19:26	19:58	20:28	20:44	20:30	19:51	18:59	18:12	16:43			16:46
28	07:22	16:34 (D03)	06:45			06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	17:12 (D03)	07:09		07:32
	17:18	18 16:52 (D03)	17:56			19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	5 17:17 (D03)	16:42		16:46
29	07:22	16:33 (D03)				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	17:08 (D03)	07:10		07:32
	17:20	20 16:53 (D03)				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	12 17:20 (D03)	16:42		16:47
30	07:21	16:32 (D03)				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	17:06 (D03)	07:11		07:32
	17:21	22 16:54 (D03)				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16 17:22 (D03)	16:42		16:48
31	07:20	16:32 (D03)				06:54		05:39		06:03	06:33		07:37	17:05 (D03)			07:32
	17:22	22 16:54 (D03)				19:30		20:31		20:26	19:44		18:07	19 17:24 (D03)			16:49
Potential sun hours	298		297			369	398	448	452	458	428	375	346		298		288
Total, worst case		115		284										52		355	
Sun reduction		0.45		0.62										0.84		0.61	
Oper. time red.		1.00		1.00										1.00		1.00	
Wind dir. red.		0.86		0.86										0.86		0.86	
Total reduction		0.39		0.54										0.73		0.53	
Total, real		45		152										38		187	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 41 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (115)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	07:33		15:46 (D03)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12		
	16:50	13	15:59 (D03)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41		
2	07:33		15:47 (D03)	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39	07:13		
	16:50	12	15:59 (D03)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41		
3	07:33		15:48 (D03)	07:17	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40	07:14		
	16:51	10	15:58 (D03)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41		
4	07:33		15:50 (D03)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15		
	16:52	8	15:58 (D03)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40		
5	07:33		15:53 (D03)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16		
	16:53	3	15:56 (D03)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40		
6	07:33			07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17		
	16:54			17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40		
7	07:33			07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18		15:40 (D03)
	16:55			17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40	3	15:43 (D03)
8	07:32			07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46	07:19		15:38 (D03)
	16:56			17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40	8	15:46 (D03)
9	07:32			07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20		15:37 (D03)
	16:57			17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40	9	15:46 (D03)
10	07:32			07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21		15:36 (D03)
	16:58			17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40	12	15:48 (D03)
11	07:32			07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22		15:36 (D03)
	16:59			17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40	13	15:49 (D03)
12	07:32			07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23		15:36 (D03)
	17:00			17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40	14	15:50 (D03)
13	07:31			07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23		15:36 (D03)
	17:01			17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40	15	15:51 (D03)
14	07:31			07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24		15:36 (D03)
	17:02			17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40	15	15:51 (D03)
15	07:31			07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25		15:36 (D03)
	17:03			17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:40	16	15:52 (D03)
16	07:30			07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26		15:37 (D03)
	17:04			17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41	16	15:53 (D03)
17	07:30			07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26		15:36 (D03)
	17:05			17:43	19:15	19:48	20:19	20:42	20:38	20:06	19:16	18:27	16:49	16:41	17	15:53 (D03)
18	07:29			06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27		15:37 (D03)
	17:07			17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41	17	15:54 (D03)
19	07:29			06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28		15:38 (D03)
	17:08			17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42	17	15:55 (D03)
20	07:28			06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28		15:38 (D03)
	17:09			17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42	17	15:55 (D03)
21	07:28			06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01	07:29		15:39 (D03)
	17:10			17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:42	17	15:56 (D03)
22	07:27			06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29		15:39 (D03)
	17:11			17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	16:43	17	15:56 (D03)
23	07:26			06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30		15:40 (D03)
	17:12			17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43	17	15:57 (D03)
24	07:26			06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30		15:40 (D03)
	17:14			17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44	17	15:57 (D03)
25	07:25			06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31		15:40 (D03)
	17:15			17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45	17	15:57 (D03)
26	07:24			06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31		15:41 (D03)
	17:16			17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45	17	15:58 (D03)
27	07:23			06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31		15:42 (D03)
	17:17			17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	16:46	16	15:58 (D03)
28	07:22			06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32		15:42 (D03)
	17:18			17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46	16	15:58 (D03)
29	07:22				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32		15:43 (D03)
	17:20				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47	15	15:58 (D03)
30	07:21				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32		15:44 (D03)
	17:21				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48	15	15:59 (D03)
31	07:20				06:54		05:39		06:03	06:33		07:37		07:32		15:45 (D03)
	17:22				19:30		20:31		20:26	19:45		18:07		16:49	14	15:59 (D03)
Potential sun hours	298			297	369	398	448	452	458	428	375	346	298	288		
Total, worst case		46													367	
Sun reduction		0.45													0.47	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.89													0.89	
Total reduction		0.40													0.42	
Total, real		18													154	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 42 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (116)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:33		15:50 (D03)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		15:39 (D03)
	16:50	25	16:15 (D03)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	20	15:59 (D03)
2	07:33		15:51 (D03)	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39			07:13		15:39 (D03)
	16:50	24	16:15 (D03)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	21	16:00 (D03)
3	07:33		15:51 (D03)	07:17	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40			07:14		15:39 (D03)
	16:51	25	16:16 (D03)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	22	16:01 (D03)
4	07:33		15:52 (D03)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		15:39 (D03)
	16:52	24	16:16 (D03)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40	23	16:02 (D03)
5	07:33		15:52 (D03)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		15:39 (D03)
	16:53	24	16:16 (D03)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	23	16:02 (D03)
6	07:33		15:53 (D03)	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17		15:39 (D03)
	16:54	24	16:17 (D03)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40	24	16:03 (D03)
7	07:33		15:54 (D03)	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45			07:18		15:40 (D03)
	16:55	23	16:17 (D03)	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59			16:40	23	16:03 (D03)
8	07:32		15:54 (D03)	07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46			07:19		15:40 (D03)
	16:56	22	16:16 (D03)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58			16:40	24	16:04 (D03)
9	07:32		15:55 (D03)	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47			07:20		15:39 (D03)
	16:57	22	16:17 (D03)	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57			16:40	25	16:04 (D03)
10	07:32		15:56 (D03)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48			07:21		15:40 (D03)
	16:58	21	16:17 (D03)	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56			16:40	24	16:04 (D03)
11	07:32		15:57 (D03)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50			07:22		15:40 (D03)
	16:59	20	16:17 (D03)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55			16:40	25	16:05 (D03)
12	07:32		15:57 (D03)	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51			07:23		15:41 (D03)
	17:00	19	16:16 (D03)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54			16:40	25	16:06 (D03)
13	07:31		15:59 (D03)	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52			07:23		15:41 (D03)
	17:01	18	16:17 (D03)	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53			16:40	25	16:06 (D03)
14	07:31		15:59 (D03)	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53			07:24		15:41 (D03)
	17:02	17	16:16 (D03)	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52			16:40	25	16:06 (D03)
15	07:31		16:01 (D03)	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54			07:25		15:42 (D03)
	17:03	14	16:15 (D03)	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51			16:40	25	16:07 (D03)
16	07:30		16:02 (D03)	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56			07:26		15:43 (D03)
	17:04	12	16:14 (D03)	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50			16:41	25	16:08 (D03)
17	07:30		16:05 (D03)	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57			07:26		15:42 (D03)
	17:05	8	16:13 (D03)	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49			16:41	26	16:08 (D03)
18	07:29			06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58			07:27		15:43 (D03)
	17:07			17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48			16:41	25	16:08 (D03)
19	07:29			06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59			07:28		15:44 (D03)
	17:08			17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48			16:42	25	16:09 (D03)
20	07:28			06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00			07:28		15:44 (D03)
	17:09			17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47			16:42	25	16:09 (D03)
21	07:28			06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01			07:29		15:45 (D03)
	17:10			17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46			16:42	25	16:10 (D03)
22	07:27			06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03			07:29		15:45 (D03)
	17:11			17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46			16:43	25	16:10 (D03)
23	07:26			06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04			07:30		15:46 (D03)
	17:12			17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45			16:43	25	16:11 (D03)
24	07:26			06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05			07:30		15:46 (D03)
	17:14			17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44			16:44	25	16:11 (D03)
25	07:25			06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		15:44 (D03)	07:31		15:46 (D03)
	17:15			17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	7	15:51 (D03)	16:45	25	16:11 (D03)
26	07:24			06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		15:42 (D03)	07:31		15:47 (D03)
	17:16			17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	11	15:53 (D03)	16:45	26	16:13 (D03)
27	07:23			06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		15:40 (D03)	07:31		15:47 (D03)
	17:17			17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	14	15:54 (D03)	16:46	26	16:13 (D03)
28	07:22			06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		15:40 (D03)	07:32		15:48 (D03)
	17:18			17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16	15:56 (D03)	16:46	25	16:13 (D03)
29	07:22				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		15:39 (D03)	07:32		15:48 (D03)
	17:20				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	18	15:57 (D03)	16:47	25	16:13 (D03)
30	07:21				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		15:38 (D03)	07:32		15:49 (D03)
	17:21				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	19	15:57 (D03)	16:48	25	16:14 (D03)
31	07:20				06:54		05:39		06:03	06:33		07:37				07:32		15:50 (D03)
	17:22				19:30		20:31		20:26	19:45		18:07				16:49	25	16:15 (D03)
Potential sun hours	298			297	369	398	448	452	458	428	375	346	298			288		
Total, worst case		342												85			757	
Sun reduction		0.45												0.61			0.47	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.89												0.89			0.89	
Total reduction		0.40												0.54			0.42	
Total, real		137												46			317	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 43 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (117)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:39	06:03	06:34	07:04	06:38	07:12
	16:49	17:23	17:57	19:31	20:03	20:32	20:43	20:25	19:43	18:52	18:06	16:41
2	07:32	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39	07:13
	16:50	17:24	17:58	19:32	20:04	20:33	20:43	20:24	19:41	18:51	17:05	16:41
3	07:32	07:17	06:40	06:49	06:04	05:38	05:40	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	17:59	19:33	20:05	20:33	20:43	20:23	19:39	18:49	17:03	16:41
4	07:33	07:16	06:38	06:47	06:03	05:37	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:47	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:42	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:32	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:29	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:32	07:12	06:33	06:42	05:59	05:36	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:42	20:18	19:33	18:43	16:59	16:40
8	07:32	07:11	07:32	06:41	05:58	05:36	05:43	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:39	20:11	20:37	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:34	19:07	19:40	20:12	20:38	20:41	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:45	06:13	06:44	07:14	06:49	07:22
	16:59	17:36	19:08	19:41	20:13	20:39	20:41	20:13	19:26	18:36	16:55	16:40
12	07:31	07:07	07:25	06:34	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:22
	17:00	17:37	19:09	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	05:53	05:35	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:31	05:52	05:35	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:31	16:52	16:40
15	07:30	07:03	07:20	06:30	05:51	05:35	05:48	06:17	06:48	07:18	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:40	20:39	20:08	19:20	18:30	16:51	16:40
16	07:30	07:01	07:19	06:28	05:50	05:35	05:49	06:18	06:49	07:19	06:55	07:25
	17:04	17:42	19:14	19:47	20:18	20:41	20:38	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:35	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:05	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:06	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:14	18:25	16:48	16:41
19	07:29	06:57	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:27
	17:08	17:45	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:41
20	07:28	06:56	07:12	06:22	05:46	05:36	05:52	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:27	06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01	07:28
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:09	18:21	16:46	16:42
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:02	07:29
	17:11	17:49	19:20	19:53	20:24	20:43	20:34	19:58	19:08	18:19	16:45	16:43
23	07:26	06:52	07:07	06:18	05:44	05:36	05:55	06:25	06:56	07:27	07:04	07:29
	17:12	17:50	19:21	19:54	20:24	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:25	06:50	07:06	06:16	05:43	05:37	05:56	06:26	06:57	07:28	07:05	07:30
	17:13	17:51	19:22	19:55	20:25	20:43	20:33	19:55	19:04	18:16	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:30
	17:15	17:52	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:44
26	07:24	06:47	07:02	06:14	05:42	05:37	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:43	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:58	20:28	20:43	20:30	19:51	18:59	18:12	16:43	16:46
28	07:22	06:44	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:31
	17:18	17:56	19:27	19:59	20:29	20:44	20:29	19:49	18:57	18:11	16:42	16:46
29	07:21		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:19		19:28	20:00	20:30	20:44	20:28	19:47	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:01	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:01	20:30	20:43	20:27	19:46	18:54	18:08	16:41	16:48
31	07:20		06:54		05:39		06:02	06:33		07:36		07:32
	17:22		19:30		20:31		20:26	19:44		18:07		16:48
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 44 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (118)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March			April		May		June		July		August		September			October			November	December
1	07:33		07:19		06:43			06:53		06:07		05:39		05:40		06:04		06:34			07:04		07:46 (D01)	06:38	07:13
	16:50		17:24		17:57			19:31		20:03		20:32		20:44		20:26		19:43			18:53	31	08:17 (D01)	18:06	16:41
2	07:33		07:18		06:42			06:51		06:06		05:38		05:40		06:05		06:35			07:05		07:46 (D01)	06:39	07:14
	16:51		17:25		17:59			19:32		20:04		20:33		20:44		20:25		19:41			18:51	31	08:17 (D01)	17:05	16:41
3	07:33		07:17		06:40		07:23 (D01)	06:49		06:05		05:38		05:41		06:06		06:36			07:06		07:46 (D01)	06:40	07:15
	16:51		17:26		18:00	4	07:27 (D01)	19:33		20:05		20:34		20:44		20:23		19:40			18:49	30	08:16 (D01)	17:04	16:41
4	07:33		07:16		06:39		07:17 (D01)	06:48		06:03		05:38		05:41		06:07		06:37			07:07		07:46 (D01)	06:42	07:16
	16:52		17:27		18:01	14	07:31 (D01)	19:34		20:06		20:35		20:43		20:22		19:38			18:48	29	08:15 (D01)	17:02	16:41
5	07:33		07:15		06:37		07:14 (D01)	06:46		06:02		05:37		05:42		06:08		06:38			07:08		07:46 (D01)	06:43	07:17
	16:53		17:28		18:02	19	07:33 (D01)	19:35		20:07		20:35		20:43		20:21		19:37			18:46	28	08:14 (D01)	17:01	16:40
6	07:33		07:14		06:35		07:12 (D01)	06:44		06:01		05:37		05:42		06:09		06:39			07:09		07:47 (D01)	06:44	07:18
	16:54		17:30		18:03	23	07:35 (D01)	19:37		20:08		20:36		20:43		20:20		19:35			18:45	26	08:13 (D01)	17:00	16:40
7	07:33		07:13		06:34		07:11 (D01)	06:43		06:00		05:37		05:43		06:09		06:40			07:10		07:47 (D01)	06:45	07:18
	16:55		17:31		18:04	25	07:36 (D01)	19:38		20:09		20:37		20:43		20:19		19:33			18:43	24	08:11 (D01)	16:59	16:40
8	07:33		07:12		07:32		08:10 (D01)	06:41		05:59		05:36		05:44		06:10		06:41			07:11		07:49 (D01)	06:46	07:19
	16:56		17:32		19:05	27	08:37 (D01)	19:39		20:10		20:37		20:42		20:18		19:32			18:41	21	08:10 (D01)	16:58	16:40
9	07:32		07:11		07:31		08:08 (D01)	06:40		05:57		05:36		05:44		06:11		06:42			07:12		07:50 (D01)	06:47	07:20
	16:57		17:33		19:07	29	08:37 (D01)	19:40		20:11		20:38		20:42		20:16		19:30			18:40	17	08:07 (D01)	16:57	16:40
10	07:32		07:09		07:29		08:07 (D01)	06:38		05:56		05:36		05:45		06:12		06:43			07:13		07:53 (D01)	06:49	07:21
	16:58		17:35		19:08	30	08:37 (D01)	19:41		20:12		20:38		20:42		20:15		19:28			18:38	11	08:04 (D01)	16:56	16:40
11	07:32		07:08		07:27		08:07 (D01)	06:36		05:55		05:36		05:46		06:13		06:44			07:14			06:50	07:22
	16:59		17:36		19:09	31	08:38 (D01)	19:42		20:13		20:39		20:41		20:14		19:27			18:36			16:55	16:40
12	07:32		07:07		07:26		08:06 (D01)	06:35		05:54		05:36		05:46		06:14		06:45			07:15			06:51	07:23
	17:00		17:37		19:10	32	08:38 (D01)	19:43		20:14		20:39		20:41		20:13		19:25			18:35			16:54	16:40
13	07:32		07:06		07:24		08:06 (D01)	06:33		05:53		05:36		05:47		06:15		06:46			07:17			06:52	07:24
	17:01		17:38		19:11	31	08:37 (D01)	19:44		20:15		20:40		20:40		20:11		19:23			18:33			16:53	16:40
14	07:31		07:04		07:22		08:06 (D01)	06:32		05:52		05:36		05:48		06:16		06:47			07:18			06:53	07:24
	17:02		17:40		19:12	31	08:37 (D01)	19:45		20:16		20:40		20:40		20:10		19:22			18:32			16:52	16:40
15	07:31		07:03		07:21		08:06 (D01)	06:30		05:51		05:36		05:49		06:17		06:48			07:19			06:55	07:25
	17:03		17:41		19:13	30	08:36 (D01)	19:46		20:17		20:41		20:39		20:09		19:20			18:30			16:51	16:41
16	07:30		07:02		07:19		08:05 (D01)	06:29		05:50		05:36		05:49		06:18		06:49			07:20			06:56	07:26
	17:04		17:42		19:14	30	08:35 (D01)	19:47		20:18		20:41		20:39		20:07		19:18			18:29			16:50	16:41
17	07:30		07:00		07:18		08:06 (D01)	06:27		05:49		05:36		05:50		06:19		06:50			07:21			06:57	07:26
	17:06		17:43		19:15	29	08:35 (D01)	19:48		20:19		20:42		20:38		20:06		19:16			18:27			16:49	16:41
18	07:29		06:59		07:16		08:07 (D01)	06:26		05:48		05:36		05:51		06:20		06:51			07:22			06:58	07:27
	17:07		17:44		19:16	27	08:34 (D01)	19:49		20:20		20:42		20:38		20:04		19:15			18:26			16:49	16:41
19	07:29		06:58		07:14		08:07 (D01)	06:24		05:48		05:36		05:52		06:21		06:52			07:23			06:59	07:28
	17:08		17:46		19:17	25	08:32 (D01)	19:50		20:21		20:42		20:37		20:03		19:13			18:24			16:48	16:42
20	07:28		06:56		07:13		08:09 (D01)	06:23		05:47		05:36		05:53		06:22		06:53			07:24			07:00	07:28
	17:09		17:47		19:19	22	08:31 (D01)	19:51		20:22		20:43		20:36		20:01		19:11			18:23			16:47	16:42
21	07:28		06:55		07:11		08:10 (D01)	06:21		05:46		05:36		05:54		06:23		06:54		07:59 (D01)	07:25			07:02	07:29
	17:10		17:48		19:20	18	08:28 (D01)	19:52		20:23		20:43		20:35		20:00		19:10	12	08:11 (D01)	18:21			16:46	16:43
22	07:27		06:54		07:09		08:12 (D01)	06:20		05:45		05:37		05:54		06:24		06:55		07:56 (D01)	07:26			07:03	07:29
	17:11		17:49		19:21	13	08:25 (D01)	19:53		20:24		20:43		20:35		19:59		19:08	17	08:13 (D01)	18:20			16:46	16:43
23	07:26		06:52		07:08			06:18		05:44		05:37		05:55		06:25		06:56		07:53 (D01)	07:28			07:04	07:30
	17:13		17:50		19:22			19:54		20:25		20:43		20:34		19:57		19:06	22	08:15 (D01)	18:18			16:45	16:44
24	07:26		06:51		07:06			06:17		05:44		05:37		05:56		06:26		06:57		07:52 (D01)	07:29			07:05	07:30
	17:14		17:52		19:23			19:56		20:26		20:43		20:33		19:56		19:05	24	08:16 (D01)	18:17			16:45	16:44
25	07:25		06:49		07:04			06:15		05:43		05:37		05:57		06:27		06:58		07:50 (D01)	07:30			07:06	07:31
	17:15		17:53		19:24			19:57		20:27		20:44		20:32		19:54		19:03	27	08:17 (D01)	18:15			16:44	16:45
26	07:24		06:48		07:03			06:14		05:42		05:38		05:58		06:28		06:59		07:49 (D01)	07:31			07:07	07:31
	17:16		17:54		19:25			19:58		20:27		20:44		20:31		19:52		19:01	28	08:17 (D01)	18:14			16:43	16:45
27	07:23		06:46		07:01			06:13		05:42		05:38		05:59		06:29		07:00		07:48 (D01)	07:32			07:08	07:31
	17:17		17:55		19:26			19:59		20:28		20:44		20:30		19:51		19:00	30	08:18 (D01)	18:13			16:43	16:46
28	07:23		06:45		06:59			06:11		05:41		05:38		06:00		06:30		07:01		07:47 (D01)	07:33			07:09	07:32
	17:19		17:56		19:27			20:00		20:29		20:44		20:30		19:49		18:58	31	08:18 (D01)	18:11			16:43	16:47
29	07:22				06:58			06:10		05:40		05:39		06:01		06:31		07:02		07:47 (D01)	07:34			07:10	07:32
	17:20				19:28			20:01		20:30		20:44		20:29		19:48		18:56	31	08:18 (D01)	18:10			16:42	16:47
30	07:21				06:56			06:09		05:40		05:39		06:02		06:32		07:03		07:46 (D01)	07:36			07:12	07:32
	17:21				19:29			20:02		20:31		20:44		20:28		19:46		18:54	32	08:18 (D01)	18:09			16:42	16:48
31	07:20				06:54					05:39				06:03		06:33					07:37				07:32
	17:22				19:30					20:32				20:27		19:45					18:07				16:49
Potential sun hours	298		297		369			398		448		452		458		428		375			346			298	288
Total, worst case						490													254			248			
Sun reduction						0.73													0.93			0.84			
Oper. time red.						1.00													1.00			1.00			
Wind dir. red.						0.54													0.54			0.54			
Total reduction						0.40													0.51			0.46			
Total, real						194													128			113			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 45 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (119)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February			March			April	May	June	July	August	September			October			November	December
1	07:33	07:19			06:43		07:20 (D01)	06:53	06:07	05:39	05:40	06:04	06:34			07:04		07:53 (D01)	06:38	07:13
	16:50	17:24			17:57	20	07:40 (D01)	19:31	20:03	20:32	20:44	20:26	19:43			18:53	28	08:21 (D01)	18:06	16:41
2	07:33	07:18			06:42		07:18 (D01)	06:51	06:06	05:38	05:40	06:05	06:35			07:05		07:52 (D01)	06:39	07:14
	16:51	17:25			17:59	23	07:41 (D01)	19:32	20:04	20:33	20:44	20:25	19:41			18:51	29	08:21 (D01)	17:05	16:41
3	07:33	07:17			06:40		07:17 (D01)	06:49	06:05	05:38	05:41	06:06	06:36			07:06		07:51 (D01)	06:40	07:15
	16:51	17:26			18:00	26	07:43 (D01)	19:33	20:05	20:34	20:44	20:23	19:40			18:49	30	08:21 (D01)	17:04	16:41
4	07:33	07:16			06:39		07:15 (D01)	06:48	06:03	05:38	05:41	06:07	06:37			07:07		07:50 (D01)	06:42	07:16
	16:52	17:27			18:01	28	07:43 (D01)	19:34	20:06	20:35	20:43	20:22	19:38			18:48	31	08:21 (D01)	17:02	16:41
5	07:33	07:15			06:37		07:14 (D01)	06:46	06:02	05:37	05:42	06:08	06:38			07:08		07:50 (D01)	06:43	07:17
	16:53	17:28			18:02	29	07:43 (D01)	19:35	20:07	20:35	20:43	20:21	19:37			18:46	31	08:21 (D01)	17:01	16:40
6	07:33	07:14			06:35		07:14 (D01)	06:44	06:01	05:37	05:42	06:09	06:39			07:09		07:50 (D01)	06:44	07:18
	16:54	17:30			18:03	30	07:44 (D01)	19:37	20:08	20:36	20:43	20:20	19:35			18:45	30	08:20 (D01)	17:00	16:40
7	07:33	07:13			06:34		07:13 (D01)	06:43	06:00	05:37	05:43	06:09	06:40			07:10		07:50 (D01)	06:45	07:18
	16:55	17:31			18:04	31	07:44 (D01)	19:38	20:09	20:37	20:43	20:19	19:33			18:43	30	08:20 (D01)	16:59	16:40
8	07:33	07:12			07:32		08:13 (D01)	06:41	05:59	05:36	05:44	06:10	06:41			07:11		07:50 (D01)	06:46	07:19
	16:56	17:32			19:05	31	08:44 (D01)	19:39	20:10	20:37	20:42	20:18	19:32			18:41	29	08:19 (D01)	16:58	16:40
9	07:32	07:11			07:31		08:13 (D01)	06:40	05:57	05:36	05:44	06:11	06:42			07:12		07:50 (D01)	06:47	07:20
	16:57	17:33			19:07	30	08:43 (D01)	19:40	20:11	20:38	20:42	20:16	19:30			18:40	28	08:18 (D01)	16:57	16:40
10	07:32	07:09			07:29		08:12 (D01)	06:38	05:56	05:36	05:45	06:12	06:43			07:13		07:50 (D01)	06:49	07:21
	16:58	17:35			19:08	31	08:43 (D01)	19:41	20:12	20:38	20:42	20:15	19:28			18:38	27	08:17 (D01)	16:56	16:40
11	07:32	07:08			07:27		08:13 (D01)	06:36	05:55	05:36	05:46	06:13	06:44			07:14		07:51 (D01)	06:50	07:22
	16:59	17:36			19:09	30	08:43 (D01)	19:42	20:13	20:39	20:41	20:14	19:27			18:36	25	08:16 (D01)	16:55	16:40
12	07:32	07:07			07:26		08:13 (D01)	06:35	05:54	05:36	05:46	06:14	06:45			07:15		07:52 (D01)	06:51	07:23
	17:00	17:37			19:10	28	08:41 (D01)	19:43	20:14	20:39	20:41	20:13	19:25			18:35	22	08:14 (D01)	16:54	16:40
13	07:32	07:06			07:24		08:13 (D01)	06:33	05:53	05:36	05:47	06:15	06:46			07:17		07:53 (D01)	06:52	07:24
	17:01	17:38			19:11	27	08:40 (D01)	19:44	20:15	20:40	20:40	20:11	19:23			18:33	19	08:12 (D01)	16:53	16:40
14	07:31	07:04			07:22		08:14 (D01)	06:32	05:52	05:36	05:48	06:16	06:47			07:18		07:56 (D01)	06:53	07:24
	17:02	17:40			19:12	25	08:39 (D01)	19:45	20:16	20:40	20:40	20:10	19:22			18:32	14	08:10 (D01)	16:52	16:40
15	07:31	07:03			07:21		08:15 (D01)	06:30	05:51	05:36	05:49	06:17	06:48			07:19		08:00 (D01)	06:55	07:25
	17:03	17:41			19:13	22	08:37 (D01)	19:46	20:17	20:41	20:39	20:09	19:20			18:30	6	08:06 (D01)	16:51	16:41
16	07:30	07:02			07:19		08:16 (D01)	06:29	05:50	05:36	05:49	06:18	06:49			07:20			06:56	07:26
	17:04	17:42			19:14	19	08:35 (D01)	19:47	20:18	20:41	20:39	20:07	19:18			18:29			16:50	16:41
17	07:30	07:00			07:18		08:18 (D01)	06:27	05:49	05:36	05:50	06:19	06:50			07:21			06:57	07:26
	17:06	17:43			19:15	15	08:33 (D01)	19:48	20:19	20:42	20:38	20:06	19:16			18:27			16:49	16:41
18	07:29	06:59			07:16		08:22 (D01)	06:26	05:48	05:36	05:51	06:20	06:51			07:22			06:58	07:27
	17:07	17:44			19:16	6	08:28 (D01)	19:49	20:20	20:42	20:38	20:04	19:15			18:26			16:49	16:41
19	07:29	06:58			07:14			06:24	05:48	05:36	05:52	06:21	06:52			07:23			06:59	07:28
	17:08	17:46			19:17			19:50	20:21	20:42	20:37	20:03	19:13			18:24			16:48	16:42
20	07:28	06:56			07:13			06:23	05:47	05:36	05:53	06:22	06:53			07:24			07:00	07:28
	17:09	17:47			19:19			19:51	20:22	20:43	20:36	20:01	19:11			18:23			16:47	16:42
21	07:28	06:55			07:11			06:21	05:46	05:36	05:54	06:23	06:54			07:25			07:02	07:29
	17:10	17:48			19:20			19:52	20:23	20:43	20:35	20:00	19:10			18:21			16:46	16:43
22	07:27	06:54			07:09			06:20	05:45	05:37	05:54	06:24	06:55			07:26			07:03	07:29
	17:11	17:49			19:21			19:53	20:24	20:43	20:35	19:59	19:08			18:20			16:46	16:43
23	07:26	06:52			07:08			06:18	05:44	05:37	05:55	06:25	06:56			07:28			07:04	07:30
	17:13	17:50			19:22			19:54	20:25	20:43	20:34	19:57	19:06			18:18			16:45	16:44
24	07:26	06:51			07:06			06:17	05:44	05:37	05:56	06:26	06:57			07:29			07:05	07:30
	17:14	17:52			19:23			19:56	20:26	20:43	20:33	19:56	19:05			18:17			16:45	16:44
25	07:25	06:49			07:04			06:15	05:43	05:37	05:57	06:27	06:58			07:30			07:06	07:31
	17:15	17:53			19:24			19:57	20:27	20:44	20:32	19:54	19:03			18:15			16:44	16:45
26	07:24	06:48			07:03			06:14	05:42	05:38	05:58	06:28	06:59		08:02 (D01)	07:31			07:07	07:31
	17:16	17:54			19:25			19:58	20:27	20:44	20:31	19:52	19:01	13	08:15 (D01)	18:14			16:43	16:45
27	07:23	06:46		07:25 (D01)	07:01			06:13	05:42	05:38	05:59	06:29	07:00		07:59 (D01)	07:32			07:08	07:31
	17:17	17:55	10	07:35 (D01)	19:26			19:59	20:28	20:44	20:30	19:51	19:00	18	08:17 (D01)	18:13			16:43	16:46
28	07:23	06:45		07:22 (D01)	06:59			06:11	05:41	05:38	06:00	06:30	07:01		07:57 (D01)	07:33			07:09	07:32
	17:19	17:56	16	07:38 (D01)	19:27			20:00	20:29	20:44	20:30	19:49	18:58	21	08:18 (D01)	18:11			16:43	16:47
29	07:22				06:58			06:10	05:40	05:39	06:01	06:31	07:02		07:55 (D01)	07:34			07:10	07:32
	17:20				19:28			20:01	20:30	20:44	20:29	19:48	18:56	24	08:19 (D01)	18:10			16:42	16:47
30	07:21				06:56			06:09	05:40	05:39	06:02	06:32	07:03		07:54 (D01)	07:36			07:12	07:32
	17:21				19:29			20:02	20:31	20:44	20:28	19:46	18:54	26	08:20 (D01)	18:09			16:42	16:48
31	07:20				06:54				05:39		06:03	06:33				07:37				07:32
	17:22				19:30				20:32		20:27	19:45				18:07				16:49
Potential sun hours	298	297			369			398	448	452	458	428	375			346			298	288
Total, worst case			26			451								102			379			
Sun reduction			0.62			0.73								0.93			0.84			
Oper. time red.			1.00			1.00								1.00			1.00			
Wind dir. red.			0.53			0.53								0.53			0.53			
Total reduction			0.33			0.39								0.49			0.45			
Total, real			9			175								50			169			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 46 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (120)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:40	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 47 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (121)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	07:32		15:41 (D04)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12		
	16:50	14	15:55 (D04)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41		
2	07:33		15:42 (D04)	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13		
	16:50	13	15:55 (D04)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41		
3	07:33		15:44 (D04)	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14		
	16:51	11	15:55 (D04)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41		
4	07:33		15:45 (D04)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15		
	16:52	9	15:54 (D04)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40		
5	07:33		15:47 (D04)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16		
	16:53	6	15:53 (D04)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40		
6	07:33			07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17		
	16:54			17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40		
7	07:33			07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18		15:35 (D04)
	16:55			17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40	5	15:40 (D04)
8	07:32			07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19		15:32 (D04)
	16:56			17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40	9	15:41 (D04)
9	07:32			07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20		15:32 (D04)
	16:57			17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:40	16:57	16:40	11	15:43 (D04)
10	07:32			07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21		15:31 (D04)
	16:58			17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40	13	15:44 (D04)
11	07:32			07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22		15:31 (D04)
	16:59			17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40	14	15:45 (D04)
12	07:32			07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23		15:31 (D04)
	17:00			17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40	15	15:46 (D04)
13	07:31			07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23		15:32 (D04)
	17:01			17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40	16	15:48 (D04)
14	07:31			07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24		15:31 (D04)
	17:02			17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40	17	15:48 (D04)
15	07:31			07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25		15:31 (D04)
	17:03			17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41	18	15:49 (D04)
16	07:30			07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26		15:32 (D04)
	17:04			17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41	18	15:50 (D04)
17	07:30			07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26		15:31 (D04)
	17:05			17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41	19	15:50 (D04)
18	07:29			06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27		15:32 (D04)
	17:07			17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41	19	15:51 (D04)
19	07:29			06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28		15:33 (D04)
	17:08			17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42	19	15:52 (D04)
20	07:28			06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28		15:33 (D04)
	17:09			17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42	19	15:52 (D04)
21	07:28			06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29		15:34 (D04)
	17:10			17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43	19	15:53 (D04)
22	07:27			06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29		15:34 (D04)
	17:11			17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43	19	15:53 (D04)
23	07:26			06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30		15:35 (D04)
	17:12			17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43	19	15:54 (D04)
24	07:26			06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30		15:35 (D04)
	17:14			17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44	19	15:54 (D04)
25	07:25			06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31		15:35 (D04)
	17:15			17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45	19	15:54 (D04)
26	07:24			06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31		15:36 (D04)
	17:16			17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45	19	15:55 (D04)
27	07:23			06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31		15:37 (D04)
	17:17			17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46	18	15:55 (D04)
28	07:22			06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32		15:37 (D04)
	17:18			17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46	18	15:55 (D04)
29	07:22				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32		15:38 (D04)
	17:20				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47	17	15:55 (D04)
30	07:21				06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32		15:39 (D04)
	17:21				19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48	17	15:56 (D04)
31	07:20				06:54		05:39		06:03	06:33		07:37		07:32		15:40 (D04)
	17:22				19:30		20:31		20:26	19:45		18:07		16:49	16	15:56 (D04)
Potential sun hours	298			297	369	398	448	452	458	428	375	346	298	288		
Total, worst case		53													412	
Sun reduction		0.45													0.47	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.89													0.89	
Total reduction		0.40													0.42	
Total, real		21													173	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 48 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (122)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:40	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:49	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:20	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 49 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (123)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:40	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:49	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:20	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 50 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (124)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	18:46 (D03)	05:39	19:36 (D02)	05:40	19:07 (D03)	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03 37	19:23 (D03)	20:32 10	19:46 (D02)	20:44	20:01 (D02)	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	18:47 (D03)	05:38	19:38 (D02)	05:40	19:05 (D03)	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04 35	19:22 (D03)	20:33 7	19:45 (D02)	20:44	20:00 (D02)	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	18:47 (D03)	05:38		05:41	19:03 (D03)	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05 34	19:21 (D03)	20:34		20:43	19:59 (D02)	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	18:47 (D03)	05:38		05:41	19:02 (D03)	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06 34	19:21 (D03)	20:34		20:43	19:58 (D02)	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	18:48 (D03)	05:37		05:42	19:00 (D03)	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07 40	19:44 (D02)	20:35		20:43	19:57 (D02)	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	18:49 (D03)	05:37		05:42	18:59 (D03)	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08 42	19:46 (D02)	20:36		20:43	19:56 (D02)	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	18:50 (D03)	05:37		05:43	18:58 (D03)	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09 43	19:47 (D02)	20:36		20:43	19:55 (D02)	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	18:51 (D03)	05:36		05:44	18:58 (D03)	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10 43	19:48 (D02)	20:37		20:42	19:54 (D02)	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	18:53 (D03)	05:36		05:44	18:57 (D03)	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11 42	19:49 (D02)	20:38		20:42	19:30 (D03)	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	18:53 (D03)	05:36		05:45 19:47 (D02)	18:56 (D03)	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12 41	19:49 (D02)	20:38		20:42 4 19:51 (D02)	19:31 (D03)	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	18:55 (D03)	05:36		05:46 19:45 (D02)	18:56 (D03)	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13 39	19:50 (D02)	20:39		20:41 9 19:54 (D02)	19:31 (D03)	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	18:58 (D03)	05:36		05:46 19:44 (D02)	18:55 (D03)	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14 35	19:51 (D02)	20:39		20:41 12 19:56 (D02)	19:32 (D03)	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	19:27 (D02)	05:36		05:47 19:42 (D02)	18:54 (D03)	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15 25	19:52 (D02)	20:40		20:40 14 19:56 (D02)	19:31 (D03)	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32 19:01 (D03)	05:52	19:28 (D02)	05:36		05:48 19:42 (D02)	18:53 (D03)	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45 14 19:15 (D03)	20:16 25	19:53 (D02)	20:40		20:40 16 19:58 (D02)	19:31 (D03)	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30 18:57 (D03)	05:51	19:27 (D02)	05:36		05:49 19:41 (D02)	18:53 (D03)	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46 20 19:17 (D03)	20:17 27	19:54 (D02)	20:41		20:39 18 19:59 (D02)	19:31 (D03)	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28 18:56 (D03)	05:50	19:27 (D02)	05:36		05:49 19:41 (D02)	18:53 (D03)	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47 23 19:19 (D03)	20:18 27	19:54 (D02)	20:41		20:39 19 20:00 (D02)	19:31 (D03)	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27 18:53 (D03)	05:49	19:27 (D02)	05:36		05:50 19:40 (D02)	18:53 (D03)	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48 27 19:20 (D03)	20:19 26	19:53 (D02)	20:41		20:38 20 20:00 (D02)	19:31 (D03)	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25 18:52 (D03)	05:48	19:27 (D02)	05:36		05:51 19:39 (D02)	18:52 (D03)	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49 30 19:22 (D03)	20:20 26	19:53 (D02)	20:42		20:37 22 20:01 (D02)	19:30 (D03)	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24 18:50 (D03)	05:47	19:27 (D02)	05:36		05:52 19:39 (D02)	18:52 (D03)	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50 32 19:22 (D03)	20:21 26	19:53 (D02)	20:42		20:37 23 20:02 (D02)	19:30 (D03)	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22 18:50 (D03)	05:47	19:27 (D02)	05:36		05:53 19:39 (D02)	18:53 (D03)	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51 33 19:23 (D03)	20:22 26	19:53 (D02)	20:42		20:36 23 20:02 (D02)	19:29 (D03)	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21 18:48 (D03)	05:46	19:28 (D02)	05:36		05:54 19:39 (D02)	18:53 (D03)	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52 35 19:23 (D03)	20:23 25	19:53 (D02)	20:43		20:35 24 20:03 (D02)	19:29 (D03)	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19 18:48 (D03)	05:45	19:28 (D02)	05:36		05:54 19:38 (D02)	18:53 (D03)	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53 36 19:24 (D03)	20:24 25	19:53 (D02)	20:43		20:35 24 20:02 (D02)	19:28 (D03)	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18 18:47 (D03)	05:44	19:28 (D02)	05:37		05:55 19:38 (D02)	18:54 (D03)	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54 37 19:24 (D03)	20:25 24	19:52 (D02)	20:43		20:34 25 20:03 (D02)	19:27 (D03)	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17 18:47 (D03)	05:43	19:30 (D02)	05:37		05:56 19:38 (D02)	18:54 (D03)	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55 37 19:24 (D03)	20:26 22	19:52 (D02)	20:43		20:33 25 20:03 (D02)	19:26 (D03)	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15 18:47 (D03)	05:43	19:30 (D02)	05:37		05:57 19:38 (D02)	18:55 (D03)	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56 37 19:24 (D03)	20:26 22	19:52 (D02)	20:43		20:32 26 20:04 (D02)	19:54 30 19:25 (D03)	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14 18:46 (D03)	05:42	19:30 (D02)	05:38		05:58 19:38 (D02)	06:28 18:56 (D03)	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57 38 19:24 (D03)	20:27 21	19:51 (D02)	20:44		20:31 26 20:04 (D02)	19:52 27 19:23 (D03)	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12 18:46 (D03)	05:41	19:31 (D02)	05:38		05:59 19:38 (D02)	06:29 18:58 (D03)	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59 38 19:24 (D03)	20:28 20	19:51 (D02)	20:44		20:30 26 20:04 (D02)	19:51 23 19:21 (D03)	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11 18:46 (D03)	05:41	19:32 (D02)	05:38		06:00 19:38 (D02)	06:30 18:59 (D03)	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00 38 19:24 (D03)	20:29 18	19:50 (D02)	20:44		20:29 26 20:04 (D02)	19:49 20 19:19 (D03)	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10 18:46 (D03)	05:40	19:33 (D02)	05:39		06:01 19:37 (D02)	06:31 19:02 (D03)	07:02	07:34	07:10	07:32
	17:20		19:28	20:01 37 19:23 (D03)	20:30 17	19:50 (D02)	20:44		20:28 26 20:03 (D02)	19:48 14 19:16 (D03)	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08 18:46 (D03)	05:40	19:34 (D02)	05:39		06:02 19:37 (D02)	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02 37 19:23 (D03)	20:31 14	19:48 (D02)	20:44		20:27 26 20:03 (D02)	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39	19:35 (D02)			06:03 19:11 (D03)	06:33		07:37		07:32
	17:22		19:30		20:31 13	19:48 (D02)			20:26 30 20:02 (D02)	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448		452		458	428	375	346	298	288
Total, worst case				549	894		17		464	1018				
Sun reduction				0.82	0.92		0.94		0.97	0.96				
Oper. time red.				1.00	1.00		1.00		1.00	1.00				
Wind dir. red.				0.57	0.52		0.50		0.50	0.56				
Total reduction				0.46	0.48		0.47		0.48	0.53				
Total, real				255	430		8		224	544				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 51 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (125)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 52 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (126)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 53 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (127)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:23 (D03)	06:07	19:09 (D02)	05:39	05:40	06:04	06:34	18:30 (D03)	07:04	06:38	07:12
	16:50	17:23	17:57	19:31 33	18:56 (D03)	20:03 10	19:19 (D02)	20:32	20:44	20:25	19:43 12	18:42 (D03)	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	18:24 (D03)	06:06		05:38	05:40	06:05	06:35	18:27 (D03)	07:05	06:39	07:13
	16:50	17:25	17:58	19:32 32	18:56 (D03)	20:04		20:33	20:44	20:24	19:41 17	18:44 (D03)	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	18:23 (D03)	06:05		05:38	05:41	06:05	06:36	18:25 (D03)	07:06	06:40	07:14
	16:51	17:26	18:00	19:33 32	18:55 (D03)	20:05		20:34	20:43	20:23	19:40 21	18:46 (D03)	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	18:24 (D03)	06:03		05:38	05:41	06:06	06:37	18:23 (D03)	07:07	06:41	07:15
	16:52	17:27	18:01	19:34 31	18:55 (D03)	20:06		20:34	20:43	20:22	19:38 24	18:47 (D03)	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	18:24 (D03)	06:02		05:37	05:42	06:07	06:38	18:22 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02	19:35 30	18:54 (D03)	20:07		20:35	20:43	20:21	19:36 26	18:48 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	18:24 (D03)	06:01		05:37	05:42	06:08	06:39	18:20 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03	19:36 28	18:52 (D03)	20:08		20:36	20:43	20:20	19:35 28	18:48 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	18:25 (D03)	06:00		05:37	05:43	06:09	06:40	18:19 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04	19:37 27	18:52 (D03)	20:09		20:36	20:43	20:19	19:33 30	18:49 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	18:26 (D03)	05:59		05:36	05:44	06:10	06:41	18:18 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05	19:38 24	18:50 (D03)	20:10		20:37	20:42	20:17	19:31 31	18:49 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	18:27 (D03)	05:57		05:36	05:44	06:11	06:42	18:18 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06	19:40 21	18:48 (D03)	20:11		20:38	20:42	20:16	19:30 31	18:49 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	18:29 (D03)	05:56		05:36	05:45	06:12	06:43	18:17 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07	19:41 17	18:46 (D03)	20:12		20:38	20:42	20:15	19:28 32	18:49 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	18:31 (D03)	05:55		05:36	05:46	06:13 19:21 (D02)	06:44	18:17 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09	19:42 11	18:42 (D03)	20:13		20:39	20:41	20:14 4 19:25 (D02)	19:26 32	18:49 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35		05:54		05:36	05:46	06:14 19:17 (D02)	06:45	18:16 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10	19:43		20:14		20:39	20:41	20:12 12 19:29 (D02)	19:25 32	18:48 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33		05:53		05:36	05:47	06:15 19:14 (D02)	06:46	18:16 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11	19:44		20:15		20:40	20:40	20:11 15 19:29 (D02)	19:23 32	18:48 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32		05:52		05:36	05:48	06:16 19:13 (D02)	06:47	18:16 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12	19:45		20:16		20:40	20:40	20:10 17 19:30 (D02)	19:21 31	18:47 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	19:12 (D02)	05:51		05:36	05:49	06:17 19:12 (D02)	06:48	18:16 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13	19:46 10	19:22 (D02)	20:17		20:41	20:39	20:08 19 19:31 (D02)	19:20 30	18:46 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	19:10 (D02)	05:50		05:36	05:49	06:18 19:11 (D02)	06:49	18:17 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14	19:47 14	19:24 (D02)	20:18		20:41	20:39	20:07 21 19:32 (D02)	19:18 28	18:45 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	19:08 (D02)	05:49		05:36	05:50	06:19 19:10 (D02)	06:50	18:17 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15	19:48 17	19:25 (D02)	20:19		20:41	20:38	20:06 22 19:32 (D02)	19:16 27	18:44 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	19:07 (D02)	05:48		05:36	05:51	06:20 19:09 (D02)	06:51	18:18 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16	19:49 20	19:27 (D02)	20:20		20:42	20:37	20:04 24 19:33 (D02)	19:15 24	18:42 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	19:05 (D02)	05:47		05:36	05:52	06:21 19:09 (D02)	06:52	18:18 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17	19:50 22	19:27 (D02)	20:21		20:42	20:37	20:03 24 19:33 (D02)	19:13 21	18:39 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	19:05 (D02)	05:47		05:36	05:53	06:22 19:09 (D02)	06:53	18:20 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18	19:51 23	19:28 (D02)	20:22		20:42	20:36	20:01 24 19:33 (D02)	19:11 17	18:37 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	19:04 (D02)	05:46		05:36	05:54	06:23 19:09 (D02)	06:54	18:23 (D03)	07:25	07:01	07:29
	17:10	17:48	19:19	19:52 23	19:27 (D02)	20:23		20:43	20:35	20:00 23 19:32 (D02)	19:10 10	18:33 (D03)	18:21	16:46	16:43
22	07:27	06:53	07:09 18:40 (D03)	06:19	19:04 (D02)	05:45		05:36	05:54	06:24 19:09 (D02)	06:55		07:26	07:03	07:29
	17:11	17:49	19:21 6 18:46 (D03)	19:53 24	19:28 (D02)	20:24		20:43	20:35	19:58 23 19:32 (D02)	19:08		18:20	16:46	16:43
23	07:26	06:52	07:07 18:36 (D03)	06:18	19:03 (D02)	05:44		05:37	05:55	06:25 19:09 (D02)	06:56		07:27	07:04	07:30
	17:12	17:50	19:22 15 18:51 (D03)	19:54 24	19:27 (D02)	20:25		20:43	20:34	19:57 22 19:31 (D02)	19:06		18:18	16:45	16:43
24	07:26	06:50	07:06 18:33 (D03)	06:17	19:03 (D02)	05:43		05:37	05:56	06:26 19:09 (D02)	06:57		07:29	07:05	07:30
	17:14	17:51	19:23 20 18:53 (D03)	19:55 24	19:27 (D02)	20:26		20:43	20:33	19:55 21 19:30 (D02)	19:04		18:17	16:44	16:44
25	07:25	06:49	07:04 18:30 (D03)	06:15	19:04 (D02)	05:43		05:37	05:57	06:27 19:10 (D02)	06:58		07:30	07:06	07:31
	17:15	17:53	19:24 24 18:54 (D03)	19:56 23	19:27 (D02)	20:26		20:43	20:32	19:54 19 19:29 (D02)	19:03		18:15	16:44	16:45
26	07:24	06:48	07:02 18:28 (D03)	06:14	19:03 (D02)	05:42		05:38	05:58	06:28 19:11 (D02)	06:59		07:31	07:07	07:31
	17:16	17:54	19:25 26 18:54 (D03)	19:57 23	19:26 (D02)	20:27		20:44	20:31	19:52 17 19:28 (D02)	19:01		18:14	16:43	16:45
27	07:23	06:46	07:01 18:28 (D03)	06:12	19:04 (D02)	05:41		05:38	05:59	06:29 19:12 (D02)	07:00		07:32	07:08	07:31
	17:17	17:55	19:26 28 18:56 (D03)	19:58 21	19:25 (D02)	20:28		20:44	20:30	19:51 14 19:26 (D02)	18:59		18:13	16:43	16:46
28	07:22	06:45	06:59 18:26 (D03)	06:11	19:05 (D02)	05:41		05:38	06:00	06:30 19:14 (D02)	07:01		07:33	07:09	07:32
	17:18	17:56	19:27 30 18:56 (D03)	20:00 19	19:24 (D02)	20:29		20:44	20:29	19:49 9 19:23 (D02)	18:58		18:11	16:42	16:46
29	07:22		06:57 18:25 (D03)	06:10	19:05 (D02)	05:40		05:39	06:01	06:31	07:02		07:34	07:10	07:32
	17:20		19:28 31 18:56 (D03)	20:01 17	19:22 (D02)	20:30		20:44	20:28	19:48	18:56		18:10	16:42	16:47
30	07:21		06:56 18:25 (D03)	06:08	19:07 (D02)	05:40		05:39	06:02	06:32	07:03		07:35	07:11	07:32
	17:21		19:29 32 18:57 (D03)	20:02 14	19:21 (D02)	20:31		20:44	20:27	19:46	18:54		18:09	16:42	16:48
31	07:20		06:54 18:24 (D03)			05:39			06:03	06:33			07:37		07:32
	17:22		19:30 32 18:56 (D03)			20:31			20:26	19:44			18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			244	604	10			330	536			
Sun reduction			0.73	0.82	0.92			0.96	0.93			
Oper. time red.			1.00	1.00	1.00			1.00	1.00			
Wind dir. red.			0.69	0.62	0.56			0.56	0.69			
Total reduction			0.50	0.51	0.52			0.54	0.64			
Total, real			123	307	5			177	343			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 54 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (128)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:23 (D03) 06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31 32	18:55 (D03) 20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	18:24 (D03) 06:06	05:38	05:40	06:05	06:35	18:29 (D03) 07:05	06:39	07:13
	16:50	17:25	17:58	19:32 31	18:55 (D03) 20:04	20:33	20:44	20:24	19:41 12	18:41 (D03) 18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	18:23 (D03) 06:05	05:38	05:41	06:05	06:36	18:26 (D03) 07:06	06:40	07:14
	16:51	17:26	18:00	19:33 31	18:54 (D03) 20:05	20:34	20:43	20:23	19:40 17	18:43 (D03) 18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	18:24 (D03) 06:03	05:38	05:41	06:06	06:37	18:24 (D03) 07:07	06:41	07:15
	16:52	17:27	18:01	19:34 30	18:54 (D03) 20:06	20:34	20:43	20:22	19:38 21	18:45 (D03) 18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	18:24 (D03) 06:02	05:37	05:42	06:07	06:38	18:22 (D03) 07:08	06:43	07:16
	16:53	17:28	18:02	19:35 28	18:52 (D03) 20:07	20:35	20:43	20:21	19:36 24	18:46 (D03) 18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	18:25 (D03) 06:01	05:37	05:42	06:08	06:39	18:21 (D03) 07:09	06:44	07:17
	16:54	17:30	18:03	19:36 26	18:51 (D03) 20:08	20:36	20:43	20:20	19:35 26	18:47 (D03) 18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	18:26 (D03) 06:00	05:37	05:43	06:09	06:40	18:19 (D03) 07:10	06:45	07:18
	16:55	17:31	18:04	19:37 24	18:50 (D03) 20:09	20:36	20:43	20:19	19:33 28	18:47 (D03) 18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	18:27 (D03) 05:59	05:36	05:44	06:10	06:41	18:18 (D03) 07:11	06:46	07:19
	16:56	17:32	19:05	19:38 21	18:48 (D03) 20:10	20:37	20:42	20:17	19:31 30	18:48 (D03) 18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	18:28 (D03) 05:57	05:36	05:44	06:11	06:42	18:18 (D03) 07:12	06:47	07:20
	16:57	17:33	19:06	19:40 17	18:45 (D03) 20:11	20:38	20:42	20:16	19:30 30	18:48 (D03) 18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	18:31 (D03) 05:56	05:36	05:45	06:12	06:43	18:17 (D03) 07:13	06:48	07:21
	16:58	17:35	19:07	19:41 12	18:43 (D03) 20:12	20:38	20:42	20:15	19:28 31	18:48 (D03) 18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	18:16 (D03) 07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26 32	18:48 (D03) 18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14 19:20 (D02)	06:45	18:16 (D03) 07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12 4 19:24 (D02)	19:25 32	18:48 (D03) 18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	05:53	05:36	05:47	06:15 19:15 (D02)	06:46	18:16 (D03) 07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11 11 19:26 (D02)	19:23 31	18:47 (D03) 18:33	16:53	16:40
14	07:31	07:04	07:22	06:32 19:13 (D02)	05:52	05:36	05:48	06:16 19:13 (D02)	06:47	18:16 (D03) 07:17	06:53	07:24
	17:02	17:39	19:12	19:45 7 19:20 (D02)	20:16	20:40	20:40	20:10 15 19:28 (D02)	19:21 31	18:47 (D03) 18:32	16:52	16:40
15	07:31	07:03	07:21	06:30 19:09 (D02)	05:51	05:36	05:49	06:17 19:12 (D02)	06:48	18:16 (D03) 07:19	06:54	07:25
	17:03	17:41	19:13	19:46 14 19:23 (D02)	20:17	20:41	20:39	20:08 17 19:29 (D02)	19:20 30	18:46 (D03) 18:30	16:51	16:41
16	07:30	07:02	07:19	06:28 19:08 (D02)	05:50	05:36	05:49	06:18 19:11 (D02)	06:49	18:16 (D03) 07:20	06:56	07:26
	17:04	17:42	19:14	19:47 17 19:25 (D02)	20:18	20:41	20:39	20:07 19 19:30 (D02)	19:18 29	18:45 (D03) 18:28	16:50	16:41
17	07:30	07:00	07:17	06:27 19:06 (D02)	05:49	05:36	05:50	06:19 19:10 (D02)	06:50	18:16 (D03) 07:21	06:57	07:26
	17:05	17:43	19:15	19:48 19 19:25 (D02)	20:19	20:41	20:38	20:06 21 19:31 (D02)	19:16 28	18:44 (D03) 18:27	16:49	16:41
18	07:29	06:59	07:16	06:25 19:05 (D02)	05:48	05:36	05:51	06:20 19:09 (D02)	06:51	18:17 (D03) 07:22	06:58	07:27
	17:07	17:44	19:16	19:49 21 19:26 (D02)	20:20	20:42	20:37	20:04 22 19:31 (D02)	19:15 25	18:42 (D03) 18:25	16:48	16:41
19	07:29	06:58	07:14	06:24 19:04 (D02)	05:47	05:36	05:52	06:21 19:08 (D02)	06:52	18:17 (D03) 07:23	06:59	07:28
	17:08	17:46	19:17	19:50 22 19:26 (D02)	20:21	20:42	20:37	20:03 23 19:31 (D02)	19:13 23	18:40 (D03) 18:24	16:48	16:42
20	07:28	06:56	07:12	06:22 19:04 (D02)	05:47	05:36	05:53	06:22 19:08 (D02)	06:53	18:18 (D03) 07:24	07:00	07:28
	17:09	17:47	19:18	19:51 23 19:27 (D02)	20:22	20:42	20:36	20:01 23 19:31 (D02)	19:11 19	18:37 (D03) 18:22	16:47	16:42
21	07:28	06:55	07:11	06:21 19:03 (D02)	05:46	05:36	05:53	06:23 19:08 (D02)	06:54	18:21 (D03) 07:25	07:01	07:29
	17:10	17:48	19:19	19:52 23 19:26 (D02)	20:23	20:43	20:35	20:00 23 19:31 (D02)	19:10 14	18:35 (D03) 18:21	16:46	16:42
22	07:27	06:53	07:09 18:36 (D03)	06:19 19:03 (D02)	05:45	05:36	05:54	06:24 19:08 (D02)	06:55	18:26 (D03) 07:26	07:03	07:29
	17:11	17:49	19:21 12 18:48 (D03)	19:53 24 19:27 (D02)	20:24	20:43	20:35	19:58 23 19:31 (D02)	19:08 3	18:29 (D03) 18:20	16:46	16:43
23	07:26	06:52	07:07 18:34 (D03)	06:18 19:02 (D02)	05:44	05:37	05:55	06:25 19:08 (D02)	06:56	07:27	07:04	07:30
	17:12	17:50	19:22 18 18:52 (D03)	19:54 24 19:26 (D02)	20:25	20:43	20:34	19:57 23 19:31 (D02)	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06 18:31 (D03)	06:17 19:03 (D02)	05:43	05:37	05:56	06:26 19:08 (D02)	06:57	07:29	07:05	07:30
	17:14	17:51	19:23 22 18:53 (D03)	19:55 23 19:26 (D02)	20:26	20:43	20:33	19:55 22 19:30 (D02)	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04 18:29 (D03)	06:15 19:03 (D02)	05:43	05:37	05:57	06:27 19:08 (D02)	06:58	07:30	07:06	07:31
	17:15	17:53	19:24 25 18:54 (D03)	19:56 22 19:25 (D02)	20:26	20:43	20:32	19:54 21 19:29 (D02)	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02 18:27 (D03)	06:14 19:03 (D02)	05:42	05:38	05:58	06:28 19:09 (D02)	06:59	07:31	07:07	07:31
	17:16	17:54	19:25 27 18:54 (D03)	19:57 21 19:24 (D02)	20:27	20:44	20:31	19:52 19 19:28 (D02)	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01 18:27 (D03)	06:12 19:04 (D02)	05:41	05:38	05:59	06:29 19:10 (D02)	07:00	07:32	07:08	07:31
	17:17	17:55	19:26 28 18:55 (D03)	19:58 19 19:23 (D02)	20:28	20:44	20:30	19:51 16 19:26 (D02)	18:59	18:12	16:43	16:46
28	07:22	06:45	06:59 18:25 (D03)	06:11 19:05 (D02)	05:41	05:38	06:00	06:30 19:11 (D02)	07:01	07:33	07:09	07:32
	17:18	17:56	19:27 30 18:55 (D03)	20:00 17 19:22 (D02)	20:29	20:44	20:29	19:49 13 19:24 (D02)	18:58	18:11	16:42	16:46
29	07:22		06:57 18:24 (D03)	06:10 19:06 (D02)	05:40	05:39	06:01	06:31 19:14 (D02)	07:02	07:34	07:10	07:32
	17:20		19:28 31 18:55 (D03)	20:01 14 19:20 (D02)	20:30	20:44	20:28	19:48 7 19:21 (D02)	18:56	18:10	16:42	16:47
30	07:21		06:56 18:25 (D03)	06:08 19:08 (D02)	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29 31 18:56 (D03)	20:02 10 19:18 (D02)	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54 18:24 (D03)		05:39		06:03	06:33		07:37		07:32
	17:22		19:30 31 18:55 (D03)		20:31		20:26	19:44		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			255	572				322	516			
Sun reduction			0.73	0.82				0.96	0.93			
Oper. time red.			1.00	1.00				1.00	1.00			
Wind dir. red.			0.69	0.62				0.56	0.69			
Total reduction			0.50	0.51				0.54	0.64			
Total, real			129	291				174	331			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 57 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (129)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:43	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:41
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:42	20:19	19:33	18:43	16:59	16:40
8	07:32	07:11	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:41	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:40	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:49	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:27
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:20	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:25	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:30
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:58	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:31
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:44		18:07		16:49
Potential sun hours	298	297	369	398	448	451	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 58 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (130)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March	April			May			June		
1	07:32		08:19 (N05)	07:19		16:50 (N02)	06:43	06:53			06:07		06:48 (M10)	05:39		19:18 (M08)
	16:50	26	08:45 (N05)	17:24	11	17:01 (N02)	17:57	19:31			20:03	27	07:15 (M10)	20:32	50	20:08 (M08)
2	07:32		08:19 (N05)	07:18		16:50 (N02)	06:41	06:51			06:06		06:48 (M10)	05:39		19:17 (M08)
	16:51	26	08:45 (N05)	17:25	12	17:02 (N02)	17:59	19:32			20:04	27	07:15 (M10)	20:33	51	20:08 (M08)
3	07:32		08:20 (N05)	07:17		16:49 (N02)	06:40	06:49			06:05		06:47 (M10)	05:38		19:18 (M08)
	16:52	26	08:46 (N05)	17:26	14	17:03 (N02)	18:00	19:33			20:05	28	19:42 (M08)	20:33	51	20:09 (M08)
4	07:32		08:20 (N05)	07:16		16:49 (N02)	06:38	06:48			06:03		06:48 (M10)	05:38		19:17 (M08)
	16:52	26	08:46 (N05)	17:27	16	17:05 (N02)	18:01	19:34			20:06	31	19:43 (M08)	20:34	52	20:09 (M08)
5	07:32		08:20 (N05)	07:15		16:49 (N02)	06:37	06:46			06:02		06:49 (M10)	05:37		19:18 (M08)
	16:53	26	08:46 (N05)	17:29	17	17:06 (N02)	18:02	19:35			20:07	33	19:44 (M08)	20:35	52	20:10 (M08)
6	07:32		08:20 (N05)	07:14		16:50 (N02)	06:35	06:44			06:01		06:49 (M10)	05:37		19:18 (M08)
	16:54	26	08:46 (N05)	17:30	18	17:08 (N02)	18:03	19:36			20:08	36	19:45 (M08)	20:35	53	20:11 (M08)
7	07:32		08:21 (N05)	07:12		16:50 (N02)	06:34	06:43			06:00		06:50 (M10)	05:37		19:19 (M08)
	16:55	26	08:47 (N05)	17:31	19	17:09 (N02)	18:04	19:37			20:09	37	19:46 (M08)	20:36	53	20:12 (M08)
8	07:32		08:22 (N05)	07:11		16:49 (N02)	07:32	06:41			05:59		06:52 (M10)	05:37		19:18 (M08)
	16:56	25	08:47 (N05)	17:32	21	17:10 (N02)	19:05	19:38			20:10	36	19:47 (M08)	20:37	54	20:12 (M08)
9	07:32		08:23 (N05)	07:10		16:50 (N02)	07:30	06:40			05:58		06:53 (M10)	05:36		19:18 (M08)
	16:57	25	08:48 (N05)	17:33	21	17:11 (N02)	19:06	19:39			20:11	35	19:48 (M08)	20:37	54	20:12 (M08)
10	07:32		08:24 (N05)	07:09		16:50 (N02)	07:29	06:38			05:56		06:55 (M10)	05:36		19:19 (M08)
	16:58	24	08:48 (N05)	17:35	23	17:13 (N02)	19:08	19:41			20:12	34	19:49 (M08)	20:38	54	20:13 (M08)
11	07:32		08:24 (N05)	07:08		16:51 (N02)	07:27	06:36			05:55		06:59 (M10)	05:36		19:19 (M08)
	16:59	23	08:47 (N05)	17:36	23	17:14 (N02)	19:09	19:42			20:13	28	19:50 (M08)	20:38	55	20:14 (M08)
12	07:31		08:25 (N05)	07:07		16:52 (N02)	07:26	06:35			05:54		19:24 (M08)	05:36		19:19 (M08)
	17:00	23	08:48 (N05)	17:37	24	17:16 (N02)	19:10	19:43			20:14	27	19:51 (M08)	20:39	55	20:14 (M08)
13	07:31		08:26 (N05)	07:05		16:52 (N02)	07:24	06:33			05:53		19:23 (M08)	05:36		19:19 (M08)
	17:01	22	08:48 (N05)	17:38	24	17:16 (N02)	19:11	19:44			20:15	29	19:52 (M08)	20:40	56	20:15 (M08)
14	07:31		08:26 (N05)	07:04		16:54 (N02)	07:22	06:32			05:52		19:22 (M08)	05:36		19:20 (M08)
	17:02	21	08:47 (N05)	17:40	23	17:17 (N02)	19:12	19:45			20:16	31	19:53 (M08)	20:40	55	20:15 (M08)
15	07:30		08:27 (N05)	07:03		16:55 (N02)	07:21	06:30			05:51		19:22 (M08)	05:36		19:20 (M08)
	17:03	20	08:47 (N05)	17:41	21	17:16 (N02)	19:13	19:46			20:17	32	19:54 (M08)	20:40	55	20:15 (M08)
16	07:30		08:28 (N05)	07:02		16:57 (N02)	07:19	06:29			05:50		19:21 (M08)	05:36		19:20 (M08)
	17:05	19	08:47 (N05)	17:42	17	17:14 (N02)	19:14	19:47			20:18	34	19:55 (M08)	20:41	56	20:16 (M08)
17	07:30		08:30 (N05)	07:00		17:00 (N02)	07:17	06:27			05:49		19:20 (M08)	05:36		19:20 (M08)
	17:06	17	08:47 (N05)	17:43	11	17:11 (N02)	19:15	19:48			20:19	35	19:55 (M08)	20:41	56	20:16 (M08)
18	07:29		08:31 (N05)	06:59			07:16	06:26			05:49		19:20 (M08)	05:36		19:20 (M08)
	17:07	14	08:45 (N05)	17:44			19:16	19:49			20:20	36	19:56 (M08)	20:42	56	20:16 (M08)
19	07:29		08:33 (N05)	06:57			07:14	06:24		07:02 (M10)	05:48		19:19 (M08)	05:36		19:20 (M08)
	17:08	12	08:45 (N05)	17:46			19:17	19:50	2	07:04 (M10)	20:21	38	19:57 (M08)	20:42	56	20:16 (M08)
20	07:28		08:35 (N05)	06:56			07:12	06:23		06:57 (M10)	05:47		19:19 (M08)	05:36		19:20 (M08)
	17:09	7	08:42 (N05)	17:47			19:18	19:51	13	07:10 (M10)	20:22	40	19:59 (M08)	20:42	56	20:16 (M08)
21	07:27			06:55			07:11	06:21		06:54 (M10)	05:46		19:19 (M08)	05:36		19:21 (M08)
	17:10			17:48			19:19	19:52	17	07:11 (M10)	20:23	40	19:59 (M08)	20:42	57	20:18 (M08)
22	07:27			06:53			07:09	06:20		06:53 (M10)	05:45		19:18 (M08)	05:37		19:21 (M08)
	17:11			17:49			19:21	19:53	20	07:13 (M10)	20:23	42	20:00 (M08)	20:43	56	20:17 (M08)
23	07:26			06:52			07:07	06:18		06:52 (M10)	05:44		19:18 (M08)	05:37		19:21 (M08)
	17:13			17:50			19:22	19:54	22	07:14 (M10)	20:24	42	20:00 (M08)	20:43	56	20:17 (M08)
24	07:25			06:50			07:06	06:17		06:50 (M10)	05:44		19:18 (M08)	05:37		19:21 (M08)
	17:14			17:52			19:23	19:55	24	07:14 (M10)	20:25	44	20:02 (M08)	20:43	56	20:17 (M08)
25	07:25			06:49			07:04	06:15		06:50 (M10)	05:43		19:18 (M08)	05:37		19:22 (M08)
	17:15			17:53			19:24	19:56	25	07:15 (M10)	20:26	44	20:02 (M08)	20:43	56	20:18 (M08)
26	07:24			06:47			07:02	06:14		06:48 (M10)	05:42		19:17 (M08)	05:38		19:22 (M08)
	17:16			17:54			19:25	19:57	27	07:15 (M10)	20:27	46	20:03 (M08)	20:43	56	20:18 (M08)
27	07:23			06:46			07:01	06:13		06:48 (M10)	05:42		19:18 (M08)	05:38		19:22 (M08)
	17:17			17:55			19:26	19:58	27	07:15 (M10)	20:28	46	20:04 (M08)	20:43	56	20:18 (M08)
28	07:22		16:53 (N02)	06:44			06:59	06:11		06:48 (M10)	05:41		19:17 (M08)	05:39		19:23 (M08)
	17:19	2	16:55 (N02)	17:56			19:27	19:59	28	07:16 (M10)	20:29	47	20:04 (M08)	20:43	55	20:18 (M08)
29	07:21		16:52 (N02)				06:57	06:10		06:47 (M10)	05:41		19:18 (M08)	05:39		19:22 (M08)
	17:20	5	16:57 (N02)				19:28	20:00	28	07:15 (M10)	20:30	48	20:06 (M08)	20:43	56	20:18 (M08)
30	07:21		16:51 (N02)				06:56	06:09		06:47 (M10)	05:40		19:17 (M08)	05:39		19:23 (M08)
	17:21	7	16:58 (N02)				19:29	20:02	28	07:15 (M10)	20:30	49	20:06 (M08)	20:43	55	20:18 (M08)
31	07:20		16:50 (N02)				06:54				05:39		19:17 (M08)			
	17:22	9	16:59 (N02)				19:30				20:31	50	20:07 (M08)			
Potential sun hours	298			297			369	398			447			451		
Total, worst case		457			315				261			1152			1639	
Sun reduction		0.45			0.62				0.82			0.92			0.94	
Oper. time red.		1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.41			0.85				0.76			0.52			0.47	
Total reduction		0.18			0.52				0.62			0.48			0.43	
Total, real		83			164				162			549			712	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 58 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (130)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July			August			September	October			November			December		
1	05:40		19:23 (M08)	06:04		19:34 (M08)	06:34	07:04			06:38		16:20 (N02)	07:12		08:06 (N05)
	20:43	55	20:18 (M08)	20:25	27	20:01 (M08)	19:43	18:53			18:06	22	16:42 (N02)	16:41	23	08:29 (N05)
2	05:40		19:24 (M08)	06:05		07:07 (M10)	06:35	07:05			06:39		16:19 (N02)	07:13		08:06 (N05)
	20:43	54	20:18 (M08)	20:24	32	20:00 (M08)	19:41	18:51			17:05	22	16:41 (N02)	16:41	24	08:30 (N05)
3	05:41		19:23 (M08)	06:06		07:04 (M10)	06:36	07:06			06:40		16:19 (N02)	07:14		08:06 (N05)
	20:43	55	20:18 (M08)	20:23	36	19:59 (M08)	19:40	18:49			17:04	20	16:39 (N02)	16:41	25	08:31 (N05)
4	05:41		19:24 (M08)	06:07		07:02 (M10)	06:37	07:07			06:41		16:19 (N02)	07:15		08:06 (N05)
	20:43	54	20:18 (M08)	20:22	36	19:58 (M08)	19:38	18:48			17:03	19	16:38 (N02)	16:41	25	08:31 (N05)
5	05:42		19:24 (M08)	06:08		07:01 (M10)	06:38	07:08			06:42		16:19 (N02)	07:16		08:06 (N05)
	20:43	53	20:17 (M08)	20:21	37	19:57 (M08)	19:36	18:46			17:01	18	16:37 (N02)	16:41	26	08:32 (N05)
6	05:43		19:24 (M08)	06:09		07:00 (M10)	06:39	07:09			06:44		16:19 (N02)	07:17		08:07 (N05)
	20:43	53	20:17 (M08)	20:20	36	19:56 (M08)	19:35	18:44			17:00	17	16:36 (N02)	16:40	25	08:32 (N05)
7	05:43		19:24 (M08)	06:10		06:59 (M10)	06:40	07:10			06:45		16:19 (N02)	07:18		08:07 (N05)
	20:42	53	20:17 (M08)	20:18	35	19:55 (M08)	19:33	18:43			16:59	15	16:34 (N02)	16:40	26	08:33 (N05)
8	05:44		19:25 (M08)	06:11		06:58 (M10)	06:41	07:11			06:46		16:20 (N02)	07:19		08:07 (N05)
	20:42	52	20:17 (M08)	20:17	32	19:53 (M08)	19:31	18:41			16:58	14	16:34 (N02)	16:40	26	08:33 (N05)
9	05:45		19:25 (M08)	06:12		06:57 (M10)	06:42	07:12			06:47		16:21 (N02)	07:20		08:08 (N05)
	20:42	52	20:17 (M08)	20:16	31	19:52 (M08)	19:30	18:40			16:57	12	16:33 (N02)	16:40	26	08:34 (N05)
10	05:45		19:25 (M08)	06:12		06:57 (M10)	06:43	07:13			06:48		16:21 (N02)	07:21		08:08 (N05)
	20:41	51	20:16 (M08)	20:15	26	07:23 (M10)	19:28	18:38			16:56	10	16:31 (N02)	16:40	27	08:35 (N05)
11	05:46		19:25 (M08)	06:13		06:56 (M10)	06:44	07:14			06:49		16:21 (N02)	07:22		08:09 (N05)
	20:41	51	20:16 (M08)	20:14	28	07:24 (M10)	19:26	18:36			16:55	9	16:30 (N02)	16:40	26	08:35 (N05)
12	05:47		19:26 (M08)	06:14		06:56 (M10)	06:45	07:15			06:51		16:23 (N02)	07:22		08:10 (N05)
	20:40	50	20:16 (M08)	20:12	28	07:24 (M10)	19:25	18:35			16:54	7	16:30 (N02)	16:40	26	08:36 (N05)
13	05:47		19:25 (M08)	06:15		06:56 (M10)	06:46	07:16			06:52		16:24 (N02)	07:23		08:09 (N05)
	20:40	49	20:14 (M08)	20:11	28	07:24 (M10)	19:23	18:33			16:53	5	16:29 (N02)	16:40	26	08:35 (N05)
14	05:48		19:26 (M08)	06:16		06:56 (M10)	06:47	07:17			06:53		16:25 (N02)	07:24		08:10 (N05)
	20:39	48	20:14 (M08)	20:10	28	07:24 (M10)	19:21	18:32			16:52	2	16:27 (N02)	16:41	26	08:36 (N05)
15	05:49		19:26 (M08)	06:17		06:55 (M10)	06:48	07:18			06:54			07:25		08:11 (N05)
	20:39	48	20:14 (M08)	20:08	27	07:22 (M10)	19:20	18:30			16:51			16:41	26	08:37 (N05)
16	05:50		19:27 (M08)	06:18		06:55 (M10)	06:49	07:20			06:55			07:25		08:12 (N05)
	20:38	47	20:14 (M08)	20:07	27	07:22 (M10)	19:18	18:29			16:50			16:41	26	08:38 (N05)
17	05:50		19:26 (M08)	06:19		06:55 (M10)	06:50	07:21			06:57			07:26		08:11 (N05)
	20:38	46	20:12 (M08)	20:05	27	07:22 (M10)	19:16	18:27			16:49			16:41	26	08:37 (N05)
18	05:51		19:27 (M08)	06:20		06:56 (M10)	06:51	07:22			06:58			07:27		08:12 (N05)
	20:37	45	20:12 (M08)	20:04	25	07:21 (M10)	19:15	18:26			16:49			16:42	26	08:38 (N05)
19	05:52		19:27 (M08)	06:21		06:56 (M10)	06:52	07:23			06:59			07:27		08:12 (N05)
	20:37	45	20:12 (M08)	20:03	24	07:20 (M10)	19:13	18:24			16:48			16:42	26	08:38 (N05)
20	05:53		19:28 (M08)	06:22		06:57 (M10)	06:53	07:24			07:00			07:28		08:13 (N05)
	20:36	43	20:11 (M08)	20:01	22	07:19 (M10)	19:11	18:23			16:47			16:42	26	08:39 (N05)
21	05:54		19:28 (M08)	06:23		06:58 (M10)	06:54	07:25			07:01			07:28		08:13 (N05)
	20:35	43	20:11 (M08)	20:00	19	07:17 (M10)	19:10	18:21			16:47			16:43	26	08:39 (N05)
22	05:55		19:29 (M08)	06:24		06:59 (M10)	06:55	07:26			07:02		08:11 (N05)	07:29		08:14 (N05)
	20:34	41	20:10 (M08)	19:58	17	07:16 (M10)	19:08	18:20			16:46	7	08:18 (N05)	16:43	26	08:40 (N05)
23	05:55		19:29 (M08)	06:25		07:02 (M10)	06:56	07:27			07:03		08:09 (N05)	07:29		08:14 (N05)
	20:34	39	20:08 (M08)	19:57	11	07:13 (M10)	19:06	18:18			16:45	12	08:21 (N05)	16:44	26	08:40 (N05)
24	05:56		19:29 (M08)	06:26			06:57	07:28		17:34 (N02)	07:05		08:08 (N05)	07:30		08:15 (N05)
	20:33	39	20:08 (M08)	19:55			19:04	18:17	3	17:37 (N02)	16:45	14	08:22 (N05)	16:44	26	08:41 (N05)
25	05:57		19:30 (M08)	06:27			06:58	07:30		17:28 (N02)	07:06		08:08 (N05)	07:30		08:15 (N05)
	20:32	37	20:07 (M08)	19:54			19:03	18:15	14	17:42 (N02)	16:44	16	08:24 (N05)	16:45	26	08:41 (N05)
26	05:58		19:30 (M08)	06:28			06:59	07:31		17:26 (N02)	07:07		08:07 (N05)	07:31		08:15 (N05)
	20:31	36	20:06 (M08)	19:52			19:01	18:14	18	17:44 (N02)	16:44	19	08:26 (N05)	16:45	26	08:41 (N05)
27	05:59		19:31 (M08)	06:29			07:00	07:32		17:25 (N02)	07:08		08:06 (N05)	07:31		08:16 (N05)
	20:30	35	20:06 (M08)	19:51			18:59	18:13	21	17:46 (N02)	16:43	20	08:26 (N05)	16:46	27	08:43 (N05)
28	06:00		19:32 (M08)	06:30			07:01	07:33		17:23 (N02)	07:09		08:06 (N05)	07:31		08:17 (N05)
	20:29	33	20:05 (M08)	19:49			18:58	18:11	24	17:47 (N02)	16:43	21	08:27 (N05)	16:47	26	08:43 (N05)
29	06:01		19:33 (M08)	06:31			07:02	07:34		17:22 (N02)	07:10		08:06 (N05)	07:32		08:17 (N05)
	20:28	31	20:04 (M08)	19:48			18:56	18:10	24	17:46 (N02)	16:42	22	08:28 (N05)	16:47	26	08:43 (N05)
30	06:02		19:33 (M08)	06:32			07:03	07:35		17:21 (N02)	07:11		08:06 (N05)	07:32		08:17 (N05)
	20:27	30	20:03 (M08)	19:46			18:54	18:09	23	17:44 (N02)	16:42	23	08:29 (N05)	16:48	26	08:43 (N05)
31	06:03		19:33 (M08)	06:33				07:37		17:20 (N02)				07:32		08:17 (N05)
	20:26	28	20:01 (M08)	19:44				18:07	23	17:43 (N02)				16:49	27	08:44 (N05)
Potential sun hours	458			428			375	346			299			288		
Total, worst case		1396			639				150			346			801	
Sun reduction		0.97			0.96				0.84			0.61			0.47	
Oper. time red.		1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.47			0.69				0.85			0.64			0.38	
Total reduction		0.45			0.66				0.71			0.39			0.18	
Total, real		626			422				106			134			144	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 59 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (131)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April		May		June	July	August		September	October	November	December
1	07:32	07:19	06:43	06:53		06:07	07:37 (M04)	05:39	05:40	06:04		06:34	07:04	06:38	07:12
	16:50	17:24	17:58	19:31		20:03	21 07:58 (M04)	20:32	20:44	20:25		19:43	18:53	18:06	16:42
2	07:33	07:18	06:42	06:51		06:06	07:39 (M04)	05:39	05:41	06:05		06:35	07:05	06:39	07:13
	16:51	17:25	17:59	19:32		20:04	18 07:57 (M04)	20:33	20:43	20:24		19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49		06:05	07:40 (M04)	05:38	05:41	06:06		06:36	07:06	06:40	07:14
	16:52	17:26	18:00	19:33		20:05	16 07:56 (M04)	20:34	20:43	20:23		19:40	18:50	17:04	16:41
4	07:33	07:16	06:38	06:48		06:04	07:41 (M04)	05:38	05:42	06:07		06:37	07:07	06:41	07:15
	16:53	17:27	18:01	19:34		20:06	12 07:53 (M04)	20:34	20:43	20:22		19:38	18:48	17:03	16:41
5	07:33	07:15	06:37	06:46		06:02	07:46 (M04)	05:38	05:42	06:08		06:38	07:08	06:43	07:16
	16:53	17:29	18:02	19:35		20:07	3 07:49 (M04)	20:35	20:43	20:21		19:37	18:46	17:01	16:41
6	07:33	07:14	06:35	06:45		06:01		05:37	05:43	06:09		06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:37		20:08		20:36	20:43	20:20		19:35	18:45	17:00	16:40
7	07:33	07:13	06:34	06:43		06:00		05:37	05:43	06:10		06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:38		20:09		20:36	20:43	20:19		19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41		05:59		05:37	05:44	06:11	07:53 (M04)	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39		20:10		20:37	20:42	20:17	7 08:00 (M04)	19:32	18:41	16:58	16:40
9	07:32	07:10	07:31	06:40		05:58		05:37	05:45	06:12	07:50 (M04)	06:42	07:12	06:47	07:20
	16:57	17:34	19:07	19:40		20:11		20:38	20:42	20:16	13 08:03 (M04)	19:30	18:40	16:57	16:40
10	07:32	07:09	07:29	06:38		05:57		05:36	05:45	06:13	07:48 (M04)	06:43	07:13	06:49	07:21
	16:58	17:35	19:08	19:41		20:12		20:38	20:42	20:15	17 08:05 (M04)	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:37		05:56		05:36	05:46	06:14	07:47 (M04)	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42		20:13		20:39	20:41	20:14	19 08:06 (M04)	19:27	18:37	16:55	16:40
12	07:32	07:07	07:26	06:35		05:54		05:36	05:47	06:15	07:46 (M04)	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43		20:14		20:39	20:41	20:12	21 08:07 (M04)	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33		05:53		05:36	05:47	06:16	07:45 (M04)	06:46	07:17	06:52	07:23
	17:01	17:39	19:11	19:44		20:15		20:40	20:40	20:11	23 08:08 (M04)	19:23	18:33	16:53	16:41
14	07:31	07:04	07:22	06:32		05:52		05:36	05:48	06:17	07:44 (M04)	06:47	07:18	06:53	07:24
	17:02	17:40	19:12	19:45		20:16		20:40	20:40	20:10	25 08:09 (M04)	19:22	18:32	16:52	16:41
15	07:31	07:03	07:21	06:30	07:46 (M04)	05:51		05:36	05:49	06:18	07:44 (M04)	06:48	07:19	06:54	07:25
	17:04	17:41	19:13	19:46	12 07:58 (M04)	20:17		20:41	20:39	20:08	25 08:09 (M04)	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:29	07:44 (M04)	05:50		05:36	05:50	06:19	07:43 (M04)	06:49	07:20	06:56	07:26
	17:05	17:42	19:14	19:47	16 08:00 (M04)	20:18		20:41	20:39	20:07	27 08:10 (M04)	19:18	18:29	16:50	16:41
17	07:30	07:00	07:18	06:27	07:41 (M04)	05:50		05:36	05:51	06:20	07:43 (M04)	06:50	07:21	06:57	07:26
	17:06	17:43	19:15	19:48	20 08:01 (M04)	20:19		20:41	20:38	20:06	27 08:10 (M04)	19:16	18:27	16:50	16:41
18	07:29	06:59	07:16	06:26	07:40 (M04)	05:49		05:36	05:51	06:21	07:41 (M04)	06:51	07:22	06:58	07:27
	17:07	17:45	19:16	19:49	23 08:03 (M04)	20:20		20:42	20:37	20:04	28 08:09 (M04)	19:15	18:26	16:49	16:42
19	07:29	06:58	07:14	06:24	07:38 (M04)	05:48		05:36	05:52	06:22	07:41 (M04)	06:52	07:23	06:59	07:27
	17:08	17:46	19:17	19:50	25 08:03 (M04)	20:21		20:42	20:37	20:03	28 08:09 (M04)	19:13	18:24	16:48	16:42
20	07:28	06:56	07:13	06:23	07:38 (M04)	05:47		05:36	05:53	06:22	07:41 (M04)	06:53	07:24	07:00	07:28
	17:09	17:47	19:19	19:51	26 08:04 (M04)	20:22		20:42	20:36	20:01	28 08:09 (M04)	19:11	18:23	16:47	16:42
21	07:28	06:55	07:11	06:21	07:38 (M04)	05:46		05:37	05:54	06:23	07:41 (M04)	06:54	07:25	07:01	07:29
	17:10	17:48	19:20	19:52	26 08:04 (M04)	20:23		20:43	20:35	20:00	28 08:09 (M04)	19:10	18:21	16:47	16:43
22	07:27	06:53	07:09	06:20	07:36 (M04)	05:45		05:37	05:55	06:24	07:41 (M04)	06:55	07:26	07:03	07:29
	17:12	17:49	19:21	19:53	28 08:04 (M04)	20:24		20:43	20:35	19:58	27 08:08 (M04)	19:08	18:20	16:46	16:43
23	07:26	06:52	07:08	06:18	07:36 (M04)	05:45		05:37	05:56	06:25	07:42 (M04)	06:56	07:28	07:04	07:30
	17:13	17:51	19:22	19:54	28 08:04 (M04)	20:25		20:43	20:34	19:57	25 08:07 (M04)	19:06	18:18	16:45	16:44
24	07:26	06:51	07:06	06:17	07:35 (M04)	05:44		05:37	05:56	06:26	07:42 (M04)	06:57	07:29	07:05	07:30
	17:14	17:52	19:23	19:55	28 08:03 (M04)	20:26		20:43	20:33	19:55	25 08:07 (M04)	19:05	18:17	16:45	16:44
25	07:25	06:49	07:04	06:15	07:36 (M04)	05:43		05:38	05:57	06:27	07:43 (M04)	06:58	07:30	07:06	07:30
	17:15	17:53	19:24	19:56	27 08:03 (M04)	20:26		20:43	20:32	19:54	22 08:05 (M04)	19:03	18:16	16:44	16:45
26	07:24	06:48	07:03	06:14	07:36 (M04)	05:42		05:38	05:58	06:28	07:44 (M04)	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:58	27 08:03 (M04)	20:27		20:44	20:31	19:52	20 08:04 (M04)	19:01	18:14	16:44	16:46
27	07:23	06:46	07:01	06:13	07:35 (M04)	05:42		05:38	05:59	06:29	07:46 (M04)	07:00	07:32	07:08	07:31
	17:18	17:55	19:26	19:59	27 08:02 (M04)	20:28		20:44	20:30	19:51	16 08:02 (M04)	19:00	18:13	16:43	16:46
28	07:23	06:45	06:59	06:11	07:36 (M04)	05:41		05:39	06:00	06:30	07:48 (M04)	07:01	07:33	07:09	07:32
	17:19	17:56	19:27	20:00	26 08:02 (M04)	20:29		20:44	20:29	19:49	12 08:00 (M04)	18:58	18:11	16:43	16:47
29	07:22		06:58	06:10	07:37 (M04)	05:41		05:39	06:01	06:31		07:02	07:34	07:10	07:32
	17:20		19:28	20:01	24 08:01 (M04)	20:30		20:44	20:28	19:48		18:56	18:10	16:42	16:47
30	07:21		06:56	06:09	07:36 (M04)	05:40		05:40	06:02	06:32		07:03	07:36	07:11	07:32
	17:21		19:29	20:02	23 07:59 (M04)	20:31		20:44	20:27	19:46		18:55	18:09	16:42	16:48
31	07:20		06:54			05:40			06:03	06:33			07:37		07:32
	17:22		19:30			20:31			20:26	19:45			18:08		16:49
Potential sun hours	298	297	369	398		448		451	458	428		375	346	299	288
Total, worst case					386		70				463				
Sun reduction					0.82		0.92				0.96				
Oper. time red.					1.00		1.00				1.00				
Wind dir. red.					0.70		0.70				0.70				
Total reduction					0.57		0.64				0.67				
Total, real					220		45				309				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 60 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (132)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May		June		July		August	September	October	November	December
1	07:32	07:19	06:43	06:53	06:07		05:39		06:56 (M03)	05:40	07:02 (M03)	06:04	06:34	07:04	06:38	07:12
	16:50	17:24	17:58	19:31	20:03		20:32	27	07:23 (M03)	20:44	26 07:28 (M03)	20:25	19:43	18:53	18:06	16:42
2	07:33	07:18	06:42	06:51	06:06		05:39		06:55 (M03)	05:41	07:02 (M03)	06:05	06:35	07:05	06:39	07:13
	16:51	17:25	17:59	19:32	20:04		20:33	27	07:22 (M03)	20:43	26 07:28 (M03)	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05		05:38		06:56 (M03)	05:41	07:02 (M03)	06:06	06:36	07:06	06:40	07:14
	16:52	17:26	18:00	19:33	20:05		20:34	27	07:23 (M03)	20:43	26 07:28 (M03)	20:23	19:40	18:50	17:04	16:41
4	07:33	07:16	06:39	06:48	06:04		05:38		06:56 (M03)	05:42	07:02 (M03)	06:07	06:37	07:07	06:41	07:15
	16:53	17:27	18:01	19:34	20:06		20:34	27	07:23 (M03)	20:43	27 07:29 (M03)	20:22	19:38	18:48	17:03	16:41
5	07:33	07:15	06:37	06:46	06:02		05:38		06:56 (M03)	05:42	07:02 (M03)	06:08	06:38	07:08	06:43	07:16
	16:53	17:29	18:02	19:35	20:07		20:35	27	07:23 (M03)	20:43	27 07:29 (M03)	20:21	19:37	18:46	17:01	16:41
6	07:33	07:14	06:35	06:45	06:01		05:37		06:56 (M03)	05:43	07:03 (M03)	06:09	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:37	20:08		20:36	27	07:23 (M03)	20:43	26 07:29 (M03)	20:20	19:35	18:45	17:00	16:41
7	07:33	07:13	06:34	06:43	06:00		05:37		06:57 (M03)	05:43	07:03 (M03)	06:10	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:38	20:09		20:36	26	07:23 (M03)	20:43	27 07:30 (M03)	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59		05:37		06:57 (M03)	05:44	07:03 (M03)	06:11	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10		20:37	27	07:24 (M03)	20:42	27 07:30 (M03)	20:17	19:32	18:41	16:58	16:40
9	07:32	07:10	07:31	06:40	05:58		05:37		06:57 (M03)	05:45	07:03 (M03)	06:12	06:42	07:12	06:47	07:20
	16:57	17:34	19:07	19:40	20:11		20:38	26	07:23 (M03)	20:42	27 07:30 (M03)	20:16	19:30	18:40	16:57	16:40
10	07:32	07:09	07:29	06:38	05:57		05:36		06:57 (M03)	05:45	07:04 (M03)	06:13	06:43	07:13	06:49	07:21
	16:58	17:35	19:08	19:41	20:12		20:38	26	07:23 (M03)	20:42	27 07:31 (M03)	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:37	05:56		05:36		06:57 (M03)	05:46	07:03 (M03)	06:14	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13		20:39	27	07:24 (M03)	20:41	27 07:30 (M03)	20:14	19:27	18:37	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54		05:36		06:58 (M03)	05:47	07:04 (M03)	06:15	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14		20:39	26	07:24 (M03)	20:41	27 07:31 (M03)	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53		05:36		06:58 (M03)	05:47	07:04 (M03)	06:16	06:46	07:17	06:52	07:23
	17:01	17:39	19:11	19:44	20:15		20:40	26	07:24 (M03)	20:40	27 07:31 (M03)	20:11	19:23	18:33	16:53	16:41
14	07:31	07:04	07:22	06:32	05:52		05:36		06:58 (M03)	05:48	07:04 (M03)	06:17	06:47	07:18	06:53	07:24
	17:02	17:40	19:12	19:45	20:16		20:40	26	07:24 (M03)	20:40	26 07:30 (M03)	20:10	19:22	18:32	16:52	16:41
15	07:31	07:03	07:21	06:30	05:51		05:36		06:59 (M03)	05:49	07:04 (M03)	06:18	06:48	07:19	06:54	07:25
	17:04	17:41	19:13	19:46	20:17		20:41	25	07:24 (M03)	20:39	26 07:30 (M03)	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:29	05:50		05:36		06:59 (M03)	05:50	07:05 (M03)	06:19	06:49	07:20	06:56	07:26
	17:05	17:42	19:14	19:47	20:18		20:41	25	07:24 (M03)	20:39	26 07:31 (M03)	20:07	19:18	18:29	16:50	16:41
17	07:30	07:00	07:18	06:27	05:50	07:04 (M03)	05:36		06:59 (M03)	05:51	07:06 (M03)	06:20	06:50	07:21	06:57	07:26
	17:06	17:43	19:15	19:48	20:19	8 07:12 (M03)	20:41	25	07:24 (M03)	20:38	25 07:31 (M03)	20:06	19:16	18:27	16:50	16:41
18	07:29	06:59	07:16	06:26	05:49	07:01 (M03)	05:36		06:59 (M03)	05:51	07:05 (M03)	06:21	06:51	07:22	06:58	07:27
	17:07	17:45	19:16	19:49	20:20	13 07:14 (M03)	20:42	25	07:24 (M03)	20:37	25 07:30 (M03)	20:04	19:15	18:26	16:49	16:42
19	07:29	06:58	07:14	06:24	05:48	07:00 (M03)	05:36		06:59 (M03)	05:52	07:06 (M03)	06:22	06:52	07:23	06:59	07:28
	17:08	17:46	19:18	19:50	20:21	15 07:15 (M03)	20:42	25	07:24 (M03)	20:37	24 07:30 (M03)	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:13	06:23	05:47	06:59 (M03)	05:36		07:00 (M03)	05:53	07:07 (M03)	06:23	06:53	07:24	07:00	07:28
	17:09	17:47	19:19	19:51	20:22	18 07:17 (M03)	20:42	25	07:25 (M03)	20:36	23 07:30 (M03)	20:01	19:11	18:23	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	06:58 (M03)	05:37		07:00 (M03)	05:54	07:07 (M03)	06:24	06:54	07:25	07:01	07:29
	17:10	17:48	19:20	19:52	20:23	20 07:18 (M03)	20:43	25	07:25 (M03)	20:35	22 07:29 (M03)	20:00	19:10	18:21	16:47	16:43
22	07:27	06:53	07:09	06:20	05:45	06:57 (M03)	05:37		07:00 (M03)	05:55	07:08 (M03)	06:24	06:55	07:26	07:03	07:29
	17:12	17:49	19:21	19:53	20:24	22 07:19 (M03)	20:43	25	07:25 (M03)	20:35	21 07:29 (M03)	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:08	06:18	05:45	06:57 (M03)	05:37		07:00 (M03)	05:56	07:09 (M03)	06:25	06:56	07:28	07:04	07:30
	17:13	17:51	19:22	19:54	20:25	23 07:20 (M03)	20:43	25	07:25 (M03)	20:34	19 07:28 (M03)	19:57	19:06	18:18	16:45	16:44
24	07:26	06:51	07:06	06:17	05:44	06:57 (M03)	05:37		07:01 (M03)	05:56	07:10 (M03)	06:26	06:57	07:29	07:05	07:30
	17:14	17:52	19:23	19:55	20:26	23 07:20 (M03)	20:43	25	07:26 (M03)	20:33	16 07:26 (M03)	19:55	19:05	18:17	16:45	16:44
25	07:25	06:49	07:04	06:15	05:43	06:56 (M03)	05:38		07:01 (M03)	05:57	07:11 (M03)	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	24 07:20 (M03)	20:43	25	07:26 (M03)	20:32	14 07:25 (M03)	19:54	19:03	18:16	16:44	16:45
26	07:24	06:48	07:03	06:14	05:42	06:56 (M03)	05:38		07:01 (M03)	05:58	07:13 (M03)	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:58	20:27	25 07:21 (M03)	20:44	25	07:26 (M03)	20:31	11 07:24 (M03)	19:52	19:01	18:14	16:44	16:46
27	07:23	06:46	07:01	06:13	05:42	06:56 (M03)	05:38		07:02 (M03)	05:59	07:16 (M03)	06:29	07:00	07:32	07:08	07:31
	17:18	17:55	19:26	19:59	20:28	25 07:21 (M03)	20:44	25	07:27 (M03)	20:30	5 07:21 (M03)	19:51	19:00	18:13	16:43	16:46
28	07:23	06:45	06:59	06:11	05:41	06:56 (M03)	05:39		07:01 (M03)	06:00		06:30	07:01	07:33	07:09	07:32
	17:19	17:56	19:27	20:00	20:29	26 07:22 (M03)	20:44	26	07:27 (M03)	20:29		19:49	18:58	18:11	16:43	16:47
29	07:22		06:58	06:10	05:41	06:56 (M03)	05:39		07:01 (M03)	06:01		06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	26 07:22 (M03)	20:44	26	07:27 (M03)	20:28		19:48	18:56	18:10	16:42	16:48
30	07:21		06:56	06:09	05:40	06:56 (M03)	05:40		07:02 (M03)	06:02		06:32	07:03	07:36	07:11	07:32
	17:21		19:29	20:02	20:31	27 07:23 (M03)	20:44	26	07:28 (M03)	20:27		19:46	18:55	18:09	16:42	16:48
31	07:20		06:54		05:40	06:55 (M03)				06:03		06:33		07:37		07:32
	17:22		19:30		20:31	27 07:22 (M03)				20:26		19:45		18:08		16:49
Potential sun hours	298	297	369	398	448		451			458		428	375	346	299	288
Total, worst case						322		775			630					
Sun reduction						0.92		0.94			0.97					
Oper. time red.						1.00		1.00			1.00					
Wind dir. red.						0.80		0.80			0.80					
Total reduction						0.74		0.75			0.78					
Total, real						237		584			490					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 61 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (133)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May		June		July		August	September	October	November	December
1	07:32	07:19	06:43	06:53	06:07		05:39		06:54 (M03)	05:40	06:59 (M03)	06:04	06:34	07:04	06:38	07:12
	16:50	17:24	17:58	19:31	20:03		20:32	26	07:20 (M03)	20:44	26 07:25 (M03)	20:25	19:43	18:53	18:06	16:42
2	07:33	07:18	06:42	06:51	06:06		05:39		06:54 (M03)	05:41	07:00 (M03)	06:05	06:35	07:05	06:39	07:13
	16:51	17:25	17:59	19:32	20:04		20:33	26	07:20 (M03)	20:43	26 07:26 (M03)	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05		05:38		06:54 (M03)	05:41	07:00 (M03)	06:06	06:36	07:06	06:40	07:14
	16:52	17:26	18:00	19:33	20:05		20:34	26	07:20 (M03)	20:43	26 07:26 (M03)	20:23	19:40	18:50	17:04	16:41
4	07:33	07:16	06:39	06:48	06:04		05:38		06:54 (M03)	05:42	07:00 (M03)	06:07	06:37	07:07	06:41	07:15
	16:53	17:27	18:01	19:34	20:06		20:34	27	07:21 (M03)	20:43	27 07:27 (M03)	20:22	19:38	18:48	17:03	16:41
5	07:33	07:15	06:37	06:46	06:02		05:38		06:54 (M03)	05:42	07:00 (M03)	06:08	06:38	07:08	06:43	07:16
	16:53	17:29	18:02	19:35	20:07		20:35	26	07:20 (M03)	20:43	26 07:26 (M03)	20:21	19:37	18:46	17:01	16:41
6	07:33	07:14	06:35	06:45	06:01		05:37		06:54 (M03)	05:43	07:00 (M03)	06:09	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:37	20:08		20:36	27	07:21 (M03)	20:43	27 07:27 (M03)	20:20	19:35	18:45	17:00	16:41
7	07:33	07:13	06:34	06:43	06:00		05:37		06:55 (M03)	05:43	07:01 (M03)	06:10	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:38	20:09		20:36	26	07:21 (M03)	20:43	27 07:28 (M03)	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59		05:37		06:55 (M03)	05:44	07:01 (M03)	06:11	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10		20:37	27	07:22 (M03)	20:42	26 07:27 (M03)	20:17	19:32	18:41	16:58	16:40
9	07:32	07:10	07:31	06:40	05:58		05:37		06:54 (M03)	05:45	07:01 (M03)	06:12	06:42	07:12	06:47	07:20
	16:57	17:34	19:07	19:40	20:11		20:38	27	07:21 (M03)	20:42	27 07:28 (M03)	20:16	19:30	18:40	16:57	16:40
10	07:32	07:09	07:29	06:38	05:57		05:36		06:55 (M03)	05:45	07:02 (M03)	06:13	06:43	07:13	06:49	07:21
	16:58	17:35	19:08	19:41	20:12		20:38	26	07:21 (M03)	20:42	26 07:28 (M03)	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:37	05:56		05:36		06:55 (M03)	05:46	07:01 (M03)	06:14	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13		20:39	26	07:21 (M03)	20:41	27 07:28 (M03)	20:14	19:27	18:37	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54		05:36		06:56 (M03)	05:47	07:02 (M03)	06:15	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14		20:39	26	07:22 (M03)	20:41	26 07:28 (M03)	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53		05:36		06:56 (M03)	05:47	07:02 (M03)	06:16	06:46	07:17	06:52	07:23
	17:01	17:39	19:11	19:44	20:15		20:40	26	07:22 (M03)	20:40	26 07:28 (M03)	20:11	19:23	18:33	16:53	16:41
14	07:31	07:04	07:22	06:32	05:52		05:36		06:56 (M03)	05:48	07:02 (M03)	06:17	06:47	07:18	06:53	07:24
	17:02	17:40	19:12	19:45	20:16		20:40	26	07:22 (M03)	20:40	26 07:28 (M03)	20:10	19:22	18:32	16:52	16:41
15	07:31	07:03	07:21	06:30	05:51		05:36		06:56 (M03)	05:49	07:03 (M03)	06:18	06:48	07:19	06:54	07:25
	17:04	17:41	19:13	19:46	20:17		20:41	26	07:22 (M03)	20:39	25 07:28 (M03)	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:29	05:50		05:36		06:57 (M03)	05:50	07:03 (M03)	06:19	06:49	07:20	06:56	07:26
	17:05	17:42	19:14	19:47	20:18		20:41	25	07:22 (M03)	20:39	25 07:28 (M03)	20:07	19:18	18:29	16:50	16:41
17	07:30	07:00	07:18	06:27	05:50		05:36		06:57 (M03)	05:51	07:04 (M03)	06:20	06:50	07:21	06:57	07:26
	17:06	17:43	19:15	19:48	20:19		20:41	25	07:22 (M03)	20:38	24 07:28 (M03)	20:06	19:16	18:27	16:50	16:41
18	07:29	06:59	07:16	06:26	05:49		07:02 (M03)	05:36	06:57 (M03)	05:51	07:04 (M03)	06:21	06:51	07:22	06:58	07:27
	17:07	17:45	19:16	19:49	20:20	7	07:09 (M03)	20:42	25 07:22 (M03)	20:37	23 07:27 (M03)	20:04	19:15	18:26	16:49	16:42
19	07:29	06:58	07:14	06:24	05:48		06:59 (M03)	05:36	06:57 (M03)	05:52	07:04 (M03)	06:22	06:52	07:23	06:59	07:28
	17:08	17:46	19:18	19:50	20:21	12	07:11 (M03)	20:42	25 07:22 (M03)	20:37	23 07:27 (M03)	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:13	06:23	05:47		06:59 (M03)	05:36	06:58 (M03)	05:53	07:05 (M03)	06:23	06:53	07:24	07:00	07:28
	17:09	17:47	19:19	19:51	20:22	15	07:14 (M03)	20:42	25 07:23 (M03)	20:36	21 07:26 (M03)	20:01	19:11	18:23	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46		06:57 (M03)	05:37	06:58 (M03)	05:54	07:06 (M03)	06:24	06:54	07:25	07:01	07:29
	17:10	17:48	19:20	19:52	20:23	18	07:15 (M03)	20:43	25 07:23 (M03)	20:35	20 07:26 (M03)	20:00	19:10	18:21	16:47	16:43
22	07:27	06:53	07:09	06:20	05:45		06:56 (M03)	05:37	06:58 (M03)	05:55	07:07 (M03)	06:24	06:55	07:26	07:03	07:29
	17:12	17:49	19:21	19:53	20:24	19	07:15 (M03)	20:43	25 07:23 (M03)	20:35	18 07:25 (M03)	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:08	06:18	05:45		06:56 (M03)	05:37	06:58 (M03)	05:56	07:09 (M03)	06:25	06:56	07:28	07:04	07:30
	17:13	17:51	19:22	19:54	20:25	21	07:17 (M03)	20:43	25 07:23 (M03)	20:34	16 07:25 (M03)	19:57	19:06	18:18	16:45	16:44
24	07:26	06:51	07:06	06:17	05:44		06:55 (M03)	05:37	06:59 (M03)	05:56	07:09 (M03)	06:26	06:57	07:29	07:05	07:30
	17:14	17:52	19:23	19:55	20:26	22	07:17 (M03)	20:43	25 07:24 (M03)	20:33	14 07:23 (M03)	19:55	19:05	18:17	16:45	16:44
25	07:25	06:49	07:04	06:15	05:43		06:55 (M03)	05:38	06:59 (M03)	05:57	07:11 (M03)	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	22	07:17 (M03)	20:43	25 07:24 (M03)	20:32	10 07:21 (M03)	19:54	19:03	18:16	16:44	16:45
26	07:24	06:48	07:03	06:14	05:42		06:55 (M03)	05:38	06:59 (M03)	05:58	07:15 (M03)	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:58	20:27	23	07:18 (M03)	20:44	25 07:24 (M03)	20:31	2 07:17 (M03)	19:52	19:01	18:14	16:44	16:46
27	07:23	06:46	07:01	06:13	05:42		06:54 (M03)	05:38	06:59 (M03)	05:59		06:29	07:00	07:32	07:08	07:31
	17:18	17:55	19:26	19:59	20:28	24	07:18 (M03)	20:44	26 07:25 (M03)	20:30		19:51	19:00	18:13	16:43	16:46
28	07:23	06:45	06:59	06:11	05:41		06:54 (M03)	05:39	06:59 (M03)	06:00		06:30	07:01	07:33	07:09	07:32
	17:19	17:56	19:27	20:00	20:29	25	07:19 (M03)	20:44	26 07:25 (M03)	20:29		19:49	18:58	18:11	16:43	16:47
29	07:22		06:58	06:10	05:41		06:54 (M03)	05:39	06:59 (M03)	06:01		06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	25	07:19 (M03)	20:44	26 07:25 (M03)	20:28		19:48	18:56	18:10	16:42	16:48
30	07:21		06:56	06:09	05:40		06:54 (M03)	05:40	07:00 (M03)	06:02		06:32	07:03	07:36	07:11	07:32
	17:21		19:29	20:02	20:31	26	07:20 (M03)	20:44	26 07:26 (M03)	20:27		19:46	18:55	18:09	16:42	16:48
31	07:20		06:54		05:40		06:54 (M03)			06:03		06:33		07:37		07:32
	17:22		19:30		20:31	26	07:20 (M03)			20:26		19:45		18:08		16:49
Potential sun hours	298	297	369	398	448			451		458		428	375	346	299	288
Total, worst case						285		773		590						
Sun reduction						0.92		0.94		0.97						
Oper. time red.						1.00		1.00		1.00						
Wind dir. red.						0.80		0.80		0.80						
Total reduction						0.74		0.76		0.78						
Total, real						211		585		461						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 62 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (134)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:32		07:19		08:41 (M04)	06:53	06:07	05:39	05:40	06:04	06:34	07:04		06:38		08:03 (M03)	07:12
	16:50		17:24	23	09:04 (M04)	17:58	19:31	20:03	20:32	20:44	20:25	19:43	18:53		18:06	28	08:31 (M03)	16:42
2	07:33		07:18		08:42 (M04)	06:42	06:51	06:06	05:39	05:40	06:05	06:35	07:05		06:39		08:04 (M03)	07:13
	16:51		17:25	22	09:04 (M04)	17:59	19:32	20:04	20:33	20:44	20:24	19:41	18:51		17:05	26	08:30 (M03)	16:41
3	07:33		07:17		08:42 (M04)	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06		06:40		08:05 (M03)	07:14
	16:52		17:26	21	09:03 (M04)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:50		17:04	24	08:29 (M03)	16:41
4	07:33		07:16		08:43 (M04)	06:38	06:48	06:04	05:38	05:42	06:07	06:37	07:07		06:41		08:07 (M03)	07:15
	16:52		17:27	20	09:03 (M04)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48		17:03	22	08:29 (M04)	16:41
5	07:33		07:15		08:40 (M03)	06:37	06:46	06:02	05:38	05:42	06:08	06:38	07:08		06:43		08:08 (M03)	07:16
	16:53		17:29	22	09:02 (M04)	18:02	19:35	20:07	20:35	20:43	20:21	19:37	18:46		17:01	23	08:31 (M04)	16:41
6	07:33		07:14		08:38 (M03)	06:35	06:44	06:01	05:37	05:43	06:09	06:39	07:09		06:44		08:11 (M03)	07:17
	16:54		17:30	23	09:01 (M04)	18:03	19:37	20:08	20:36	20:43	20:20	19:35	18:45		17:00	21	08:32 (M04)	16:40
7	07:33		07:13		08:37 (M03)	06:34	06:43	06:00	05:37	05:43	06:10	06:40	07:10		06:45		08:13 (M04)	07:18
	16:55		17:31	22	08:59 (M03)	18:04	19:38	20:09	20:36	20:43	20:19	19:33	18:43		16:59	20	08:33 (M04)	16:40
8	07:32		07:12		08:36 (M03)	07:32	06:41	05:59	05:37	05:44	06:11	06:41	07:11		06:46		08:13 (M04)	07:19
	16:56		17:32	24	09:00 (M03)	19:05	19:39	20:10	20:37	20:42	20:17	19:32	18:41		16:58	21	08:34 (M04)	16:40
9	07:32		07:10		08:34 (M03)	07:31	06:40	05:58	05:36	05:45	06:12	06:42	07:12		06:47		08:13 (M04)	07:20
	16:57		17:34	26	09:00 (M03)	19:07	19:40	20:11	20:38	20:42	20:16	19:30	18:40		16:57	22	08:35 (M04)	16:40
10	07:32		07:09		08:33 (M03)	07:29	06:38	05:57	05:36	05:45	06:13	06:43	07:13		06:49		08:12 (M04)	07:21
	16:58		17:35	29	09:02 (M03)	19:08	19:41	20:12	20:38	20:42	20:15	19:28	18:38		16:56	23	08:35 (M04)	16:40
11	07:32		07:08		08:33 (M03)	07:27	06:36	05:55	05:36	05:46	06:14	06:44	07:14		06:50		08:13 (M04)	07:22
	16:59		17:36	30	09:03 (M03)	19:09	19:42	20:13	20:39	20:41	20:14	19:27	18:36		16:55	23	08:36 (M04)	16:40
12	07:32		07:07		08:32 (M03)	07:26	06:35	05:54	05:36	05:47	06:15	06:45	07:15		06:51		08:12 (M04)	07:23
	17:00		17:37	31	09:03 (M03)	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35		16:54	24	08:36 (M04)	16:40
13	07:31		07:06		08:31 (M03)	07:24	06:33	05:53	05:36	05:47	06:16	06:46	07:17		06:52		08:12 (M04)	07:23
	17:01		17:39	32	09:03 (M03)	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33		16:53	24	08:36 (M04)	16:41
14	07:31		07:04		08:31 (M03)	07:22	06:32	05:52	05:36	05:48	06:17	06:47	07:18		06:53		08:12 (M04)	07:24
	17:02		17:40	33	09:04 (M03)	19:12	19:45	20:16	20:40	20:40	20:10	19:22	18:32		16:52	24	08:36 (M04)	16:41
15	07:31		07:03		08:31 (M03)	07:21	06:30	05:51	05:36	05:49	06:18	06:48	07:19	09:13 (M03)	06:54		08:14 (M04)	07:25
	17:04		17:41	33	09:04 (M03)	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	10 09:23 (M03)	16:51	23	08:37 (M04)	16:41
16	07:30		07:02		08:31 (M03)	07:19	06:29	05:50	05:36	05:50	06:19	06:49	07:20	09:09 (M03)	06:56		08:14 (M04)	07:26
	17:05		17:42	33	09:04 (M03)	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:29	17 09:26 (M03)	16:50	22	08:36 (M04)	16:41
17	07:30		07:00		08:31 (M03)	07:18	06:27	05:49	05:36	05:51	06:20	06:50	07:21	09:07 (M03)	06:57		08:14 (M04)	07:26
	17:06		17:43	33	09:04 (M03)	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	21 09:28 (M03)	16:50	22	08:36 (M04)	16:41
18	07:29	08:46 (M04)	06:59		08:31 (M03)	07:16	06:26	05:49	05:36	05:51	06:21	06:51	07:22	09:05 (M03)	06:58		08:15 (M04)	07:27
	17:07	7 08:53 (M04)	17:45	33	09:04 (M03)	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:26	24 09:29 (M03)	16:49	21	08:36 (M04)	16:42
19	07:29	08:45 (M04)	06:58		08:31 (M03)	07:14	06:24	05:48	05:36	05:52	06:21	06:52	07:23	09:04 (M03)	06:59		08:16 (M04)	07:28
	17:08	11 08:56 (M04)	17:46	32	09:03 (M03)	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	26 09:30 (M03)	16:48	20	08:36 (M04)	16:42
20	07:28	08:43 (M04)	06:56		08:31 (M03)	07:13	06:23	05:47	05:36	05:53	06:22	06:53	07:24	09:03 (M03)	07:00		08:17 (M04)	07:28
	17:09	14 08:57 (M04)	17:47	31	09:02 (M03)	19:19	19:51	20:22	20:42	20:36	20:01	19:11	18:23	28 09:31 (M03)	16:47	18	08:35 (M04)	16:42
21	07:28	08:43 (M04)	06:55		08:32 (M03)	07:11	06:21	05:46	05:37	05:54	06:23	06:54	07:25	09:03 (M03)	07:01		08:18 (M04)	07:29
	17:10	16 08:59 (M04)	17:48	30	09:02 (M03)	19:20	19:52	20:23	20:43	20:35	20:00	19:10	18:21	30 09:33 (M03)	16:47	16	08:34 (M04)	16:43
22	07:27	08:42 (M04)	06:53		08:32 (M03)	07:09	06:20	05:45	05:37	05:55	06:24	06:55	07:26	09:02 (M03)	07:03		08:19 (M04)	07:29
	17:12	18 09:00 (M04)	17:49	28	09:00 (M03)	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	31 09:33 (M03)	16:46	14	08:33 (M04)	16:43
23	07:26	08:41 (M04)	06:52		08:34 (M03)	07:08	06:18	05:45	05:37	05:56	06:25	06:56	07:28	09:01 (M03)	07:04		08:21 (M04)	07:30
	17:13	20 09:01 (M04)	17:51	26	09:00 (M03)	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	32 09:33 (M03)	16:45	11	08:32 (M04)	16:44
24	07:26	08:41 (M04)	06:51		08:34 (M03)	07:06	06:17	05:44	05:37	05:56	06:26	06:57	07:29	09:01 (M03)	07:05		08:24 (M04)	07:30
	17:14	21 09:02 (M04)	17:52	23	08:57 (M03)	19:23	19:55	20:26	20:43	20:33	19:55	19:05	18:17	32 09:33 (M03)	16:45	7	08:31 (M04)	16:44
25	07:25	08:41 (M04)	06:49		08:36 (M03)	07:04	06:15	05:43	05:38	05:57	06:27	06:58	07:30	09:00 (M03)	07:06			07:31
	17:15	22 09:03 (M04)	17:53	20	08:56 (M03)	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	33 09:33 (M03)	16:44			16:45
26	07:24	08:41 (M04)	06:48		08:38 (M03)	07:03	06:14	05:42	05:38	05:58	06:28	06:59	07:31	09:01 (M03)	07:07			07:31
	17:16	23 09:04 (M04)	17:54	15	08:53 (M03)	19:25	19:58	20:27	20:44	20:31	19:52	19:01	18:14	33 09:34 (M03)	16:44			16:45
27	07:23	08:41 (M04)	06:46		08:42 (M03)	07:01	06:13	05:42	05:38	05:59	06:29	07:00	07:32	09:01 (M03)	07:08			07:31
	17:18	23 09:04 (M04)	17:55	7	08:49 (M03)	19:26	19:59	20:28	20:44	20:30	19:51	19:00	18:13	33 09:34 (M03)	16:43			16:46
28	07:23	08:40 (M04)	06:45			06:59	06:11	05:41	05:39	06:00	06:30	07:01	07:33	09:01 (M03)	07:09			07:32
	17:19	24 09:04 (M04)	17:56			19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	32 09:33 (M03)	16:43			16:47
29	07:22	08:40 (M04)				06:58	06:10	05:41	05:39	06:01	06:31	07:02	07:34	09:01 (M03)	07:10			07:32
	17:20	24 09:04 (M04)				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	32 09:33 (M03)	16:42			16:47
30	07:21	08:41 (M04)				06:56	06:09	05:40	05:40	06:02	06:32	07:03	07:36	09:01 (M03)	07:11			07:32
	17:21	23 09:04 (M04)				19:29	20:02	20:31	20:44	20:27	19:46	18:55	18:09	31 09:32 (M03)	16:42			16:48
31	07:20	08:41 (M04)				06:54		05:40		06:03	06:33		07:37	09:03 (M03)				07:32
	17:22	23 09:04 (M04)				19:30		20:31		20:26	19:45		18:08	29 09:32 (M03)				16:49
Potential sun hours	298		297			369	398	448	451	458	428	375	346		299			288
Total, worst case		269		702										474		499		
Sun reduction		0.45		0.62										0.84		0.61		
Oper. time red.		1.00		1.00										1.00		1.00		
Wind dir. red.		0.39		0.39										0.39		0.39		
Total reduction		0.17		0.24										0.33		0.24		
Total, real		47		169										155		117		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 63 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (135)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March		April	May	June	July	August	September	October	November	December
1	07:32		07:19		08:39 (M04)	06:43	08:26 (M03)	06:53	06:07	05:39	05:40	06:04	06:34	07:04	06:38	08:11 (M04)	07:12
	16:50		17:24	24	09:03 (M04)	17:58	33	08:59 (M03)	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	21	08:32 (M04)	16:42
2	07:33		07:18		08:39 (M04)	06:42		08:26 (M03)	06:51	06:06	05:39	05:40	06:05	06:35	07:05	06:39		08:10 (M04)	07:13
	16:51		17:25	25	09:04 (M04)	17:59	32	08:58 (M03)	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	23	08:33 (M04)	16:41
3	07:33		07:17		08:39 (M04)	06:40		08:26 (M03)	06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40		08:09 (M04)	07:14
	16:52		17:26	25	09:04 (M04)	18:00	30	08:56 (M03)	19:33	20:05	20:34	20:43	20:23	19:40	18:50	17:04	24	08:33 (M04)	16:41
4	07:33		07:16		08:39 (M04)	06:38		08:28 (M03)	06:48	06:04	05:38	05:42	06:07	06:37	07:07	06:41		08:10 (M04)	07:15
	16:52		17:27	25	09:04 (M04)	18:01	27	08:55 (M03)	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:03	24	08:34 (M04)	16:41
5	07:33		07:15		08:39 (M04)	06:37		08:28 (M03)	06:46	06:02	05:38	05:42	06:08	06:38	07:08	06:43		08:09 (M04)	07:16
	16:53		17:29	25	09:04 (M04)	18:02	25	08:53 (M03)	19:35	20:07	20:35	20:43	20:21	19:37	18:46	17:01	25	08:34 (M04)	16:41
6	07:33		07:14		08:39 (M04)	06:35		08:30 (M03)	06:44	06:01	05:37	05:43	06:09	06:39	07:09	09:10 (M03)	06:44	08:09 (M04)	07:17
	16:54		17:30	25	09:04 (M04)	18:03	22	08:52 (M03)	19:37	20:08	20:36	20:43	20:20	19:35	18:45	14	09:24 (M03)	17:00	25	08:34 (M04)	16:40
7	07:33		07:13		08:40 (M04)	06:34		08:32 (M03)	06:43	06:00	05:37	05:43	06:10	06:40	07:10	09:07 (M03)	06:45	08:09 (M04)	07:18
	16:55		17:31	24	09:04 (M04)	18:04	17	08:49 (M03)	19:38	20:09	20:36	20:43	20:19	19:33	18:43	19	09:26 (M03)	16:59	25	08:34 (M04)	16:40
8	07:32		07:12		08:41 (M04)	07:32		09:36 (M03)	06:41	05:59	05:37	05:44	06:11	06:41	07:11	09:05 (M03)	06:46	08:10 (M04)	07:19
	16:56		17:32	23	09:04 (M04)	19:05	9	09:45 (M03)	19:39	20:10	20:37	20:42	20:17	19:32	18:41	23	09:28 (M03)	16:58	25	08:35 (M04)	16:40
9	07:32		07:10		08:41 (M04)	07:31			06:40	05:58	05:36	05:45	06:12	06:42	07:12	09:03 (M03)	06:47	08:10 (M04)	07:20
	16:57		17:34	22	09:03 (M04)	19:07			19:40	20:11	20:38	20:42	20:16	19:30	18:40	26	09:29 (M03)	16:57	25	08:35 (M04)	16:40
10	07:32		07:09		08:42 (M04)	07:29			06:38	05:57	05:36	05:45	06:13	06:43	07:13	09:01 (M03)	06:49	08:10 (M04)	07:21
	16:58		17:35	20	09:02 (M04)	19:08			19:41	20:12	20:38	20:42	20:15	19:28	18:38	29	09:30 (M03)	16:56	24	08:34 (M04)	16:40
11	07:32		07:08		08:43 (M04)	07:27			06:36	05:55	05:36	05:46	06:14	06:44	07:14	09:00 (M03)	06:50	08:11 (M04)	07:22
	16:59		17:36	18	09:01 (M04)	19:09			19:42	20:13	20:39	20:41	20:14	19:27	18:36	31	09:31 (M03)	16:55	24	08:35 (M04)	16:40
12	07:32		07:07		08:45 (M04)	07:26			06:35	05:54	05:36	05:47	06:15	06:45	07:15	08:59 (M03)	06:51	08:12 (M04)	07:23
	17:00		17:37	14	08:59 (M04)	19:10			19:43	20:14	20:39	20:41	20:12	19:25	18:35	33	09:32 (M03)	16:54	22	08:34 (M04)	16:40
13	07:31		07:06		08:38 (M03)	07:24			06:33	05:53	05:36	05:47	06:16	06:46	07:17	08:58 (M03)	06:52	08:12 (M04)	07:23
	17:01		17:39	18	08:56 (M04)	19:11			19:44	20:15	20:40	20:40	20:11	19:23	18:33	34	09:32 (M03)	16:53	21	08:33 (M04)	16:41
14	07:31		07:04		08:36 (M03)	07:22			06:32	05:52	05:36	05:48	06:17	06:47	07:18	08:58 (M03)	06:53	08:13 (M04)	07:24
	17:02		17:40	18	08:54 (M03)	19:12			19:45	20:16	20:40	20:40	20:10	19:22	18:32	34	09:32 (M03)	16:52	19	08:32 (M04)	16:41
15	07:31		07:03		08:34 (M03)	07:21			06:30	05:51	05:36	05:49	06:18	06:48	07:19	08:58 (M03)	06:54	08:15 (M04)	07:25
	17:04		17:41	22	08:56 (M03)	19:13			19:46	20:17	20:41	20:39	20:08	19:20	18:30	36	09:34 (M03)	16:51	17	08:32 (M04)	16:41
16	07:30		07:02		08:32 (M03)	07:19			06:29	05:50	05:36	05:50	06:19	06:49	07:20	08:58 (M03)	06:56	08:17 (M04)	07:26
	17:05		17:42	26	08:58 (M03)	19:14			19:47	20:18	20:41	20:39	20:07	19:18	18:29	36	09:34 (M03)	16:50	13	08:30 (M04)	16:41
17	07:30		07:00		08:30 (M03)	07:18			06:27	05:49	05:36	05:51	06:20	06:50	07:21	08:57 (M03)	06:57	08:19 (M04)	07:26
	17:06		17:43	29	08:59 (M03)	19:15			19:48	20:19	20:41	20:38	20:06	19:16	18:27	36	09:33 (M03)	16:50	9	08:28 (M04)	16:41
18	07:29		06:59		08:30 (M03)	07:16			06:26	05:49	05:36	05:51	06:20	06:51	07:22	08:57 (M03)	06:58				07:27
	17:07		17:45	30	09:00 (M03)	19:16			19:49	20:20	20:42	20:37	20:04	19:15	18:26	36	09:33 (M03)	16:49			16:42
19	07:29		06:58		08:28 (M03)	07:14			06:24	05:48	05:36	05:52	06:21	06:52	07:23	08:57 (M03)	06:59				07:28
	17:08		17:46	32	09:00 (M03)	19:17			19:50	20:21	20:42	20:37	20:03	19:13	18:24	36	09:33 (M03)	16:48			16:42
20	07:28		06:56		08:28 (M03)	07:13			06:23	05:47	05:36	05:53	06:22	06:53	07:24	08:57 (M03)	07:00				07:28
	17:09		17:47	33	09:01 (M03)	19:19			19:51	20:22	20:42	20:36	20:01	19:11	18:23	35	09:32 (M03)	16:47			16:42
21	07:28		06:55		08:27 (M03)	07:11			06:21	05:46	05:37	05:54	06:23	06:54	07:25	08:58 (M03)	07:01				07:29
	17:10		17:48	35	09:02 (M03)	19:20			19:52	20:23	20:43	20:35	20:00	19:10	18:21	34	09:32 (M03)	16:47			16:43
22	07:27		06:53		08:26 (M03)	07:09			06:20	05:45	05:37	05:55	06:24	06:55	07:26	08:58 (M03)	07:03				07:29
	17:12		17:49	36	09:02 (M03)	19:21			19:53	20:24	20:43	20:35	19:58	19:08	18:20	33	09:31 (M03)	16:46			16:43
23	07:26		06:52		08:26 (M03)	07:08			06:18	05:45	05:37	05:56	06:25	06:56	07:28	08:59 (M03)	07:04				07:30
	17:13		17:51	36	09:02 (M03)	19:22			19:54	20:25	20:43	20:34	19:57	19:06	18:18	31	09:30 (M03)	16:45			16:44
24	07:26		06:51		08:25 (M03)	07:06			06:17	05:44	05:37	05:56	06:26	06:57	07:29	08:59 (M03)	07:05				07:30
	17:14		17:52	37	09:02 (M03)	19:23			19:55	20:26	20:43	20:33	19:55	19:05	18:17	30	09:29 (M03)	16:45			16:44
25	07:25	08:46 (M04)	06:49		08:26 (M03)	07:04			06:15	05:43	05:38	05:57	06:27	06:58	07:30	09:00 (M03)	07:06				07:31
	17:15	9 08:55 (M04)	17:53	36	09:02 (M03)	19:24			19:56	20:26	20:43	20:32	19:54	19:03	18:15	28	09:28 (M03)	16:44			16:45
26	07:24	08:44 (M04)	06:48		08:25 (M03)	07:03			06:14	05:42	05:38	05:58	06:28	06:59	07:31	09:02 (M03)	07:07				07:31
	17:16	14 08:58 (M04)	17:54	36	09:01 (M03)	19:25			19:58	20:27	20:44	20:31	19:52	19:01	18:14	25	09:27 (M03)	16:44			16:45
27	07:23	08:42 (M04)	06:46		08:26 (M03)	07:01			06:13	05:42	05:38	05:59	06:29	07:00	07:32	09:04 (M03)	07:08				07:31
	17:18	17 08:59 (M04)	17:55	35	09:01 (M03)	19:26			19:59	20:28	20:44	20:30	19:51	19:00	18:13	21	09:25 (M03)	16:43			16:46
28	07:23	08:41 (M04)	06:45		08:25 (M03)	06:59			06:11	05:41	05:39	06:00	06:30	07:01	07:33	09:06 (M03)	07:09				07:32
	17:19	19 09:00 (M04)	17:56	35	09:00 (M03)	19:27			20:00	20:29	20:44	20:29	19:49	18:58	18:11	17	09:23 (M03)	16:43			16:47
29	07:22	08:40 (M04)				06:58			06:10	05:41	05:39	06:01	06:31	07:02	07:34	09:09 (M03)	07:10				07:32
	17:20	21 09:01 (M04)				19:28			20:01	20:30	20:44	20:28	19:48	18:56	18:10	18	09:27 (M04)	16:42			16:47
30	07:21	08:40 (M04)				06:56			06:09	05:40	05:40	06:02	06:32	07:03	07:36	09:13 (M04)	07:11				07:32
	17:21	22 09:02 (M04)				19:29			20:02	20:31	20:44	20:27	19:46	18:55	18:09	16	09:29 (M04)	16:42			16:48
31	07:20	08:39 (M04)				06:54				05:40		06:03	06:33		07:37	09:13 (M04)					07:32
	17:22	24 09:03 (M04)				19:30				20:31		20:26	19:45		18:08	18	09:31 (M04)				16:49
Potential sun hours	298		297		369		398	448	451	458	428	375	346	299	288
Total, worst case		126		764		195								729		366	
Sun reduction		0.45		0.62		0.73								0.84		0.61	
Oper. time red.		1.00		1.00		1.00								1.00		1.00	
Wind dir. red.		0.39		0.40		0.41								0.41		0.39	
Total reduction		0.17		0.25		0.30								0.34		0.23	
Total, real		22		190		58								250		86	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 64 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (136)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March		April	May	June	July	August	September	October		November		December
1	07:32		07:19		08:50 (M04)	06:43	08:47 (M03)	06:53	06:07	05:39	05:40	06:04	06:34	07:04		06:38	08:15 (M03)	07:12
	16:50		17:24	26	09:16 (M04)	17:58	23 09:10 (M03)	19:31	20:03	20:32	20:44	20:25	19:43	18:53		18:06	32 08:47 (M03)	16:42
2	07:33		07:18		08:51 (M04)	06:42	08:49 (M03)	06:51	06:06	05:39	05:40	06:05	06:35	07:05		06:39	08:16 (M03)	07:13
	16:51		17:25	25	09:16 (M04)	17:59	18 09:07 (M03)	19:32	20:04	20:33	20:43	20:24	19:41	18:51		17:05	30 08:46 (M03)	16:41
3	07:33		07:17		08:51 (M04)	06:40	08:52 (M03)	06:49	06:05	05:38	05:41	06:06	06:36	07:06		06:40	08:18 (M03)	07:14
	16:52		17:26	24	09:15 (M04)	18:00	10 09:02 (M03)	19:33	20:05	20:34	20:43	20:23	19:40	18:50		17:04	26 08:44 (M03)	16:41
4	07:33		07:16		08:52 (M04)	06:38		06:48	06:04	05:38	05:42	06:07	06:37	07:07		06:41	08:20 (M03)	07:15
	16:52		17:27	22	09:14 (M04)	18:01		19:34	20:06	20:34	20:43	20:22	19:38	18:48		17:03	23 08:43 (M03)	16:41
5	07:33		07:15		08:53 (M04)	06:37		06:46	06:02	05:38	05:42	06:08	06:38	07:08		06:43	08:22 (M03)	07:16
	16:53		17:29	21	09:14 (M04)	18:02		19:35	20:07	20:35	20:43	20:21	19:37	18:46		17:01	20 08:42 (M04)	16:41
6	07:33		07:14		08:52 (M03)	06:35		06:44	06:01	05:37	05:43	06:09	06:39	07:09		06:44	08:23 (M04)	07:17
	16:54		17:30	20	09:12 (M04)	18:03		19:37	20:08	20:36	20:43	20:20	19:35	18:45		17:00	21 08:44 (M04)	16:40
7	07:33		07:13		08:50 (M03)	06:34		06:43	06:00	05:37	05:43	06:10	06:40	07:10		06:45	08:22 (M04)	07:18
	16:55		17:31	24	09:14 (M03)	18:04		19:38	20:09	20:36	20:43	20:19	19:33	18:43		16:59	22 08:44 (M04)	16:40
8	07:32		07:12		08:49 (M03)	07:32		06:41	05:59	05:37	05:44	06:11	06:41	07:11		06:46	08:22 (M04)	07:19
	16:56		17:32	27	09:16 (M03)	19:05		19:39	20:10	20:37	20:42	20:17	19:32	18:41		16:58	24 08:46 (M04)	16:40
9	07:32		07:10		08:46 (M03)	07:31		06:40	05:58	05:36	05:45	06:12	06:42	07:12		06:47	08:21 (M04)	07:20
	16:57		17:34	30	09:16 (M03)	19:07		19:40	20:11	20:38	20:42	20:16	19:30	18:40		16:57	26 08:47 (M04)	16:40
10	07:32		07:09		08:46 (M03)	07:29		06:38	05:57	05:36	05:45	06:13	06:43	07:13		06:49	08:21 (M04)	07:21
	16:58		17:35	31	09:17 (M03)	19:08		19:41	20:12	20:38	20:42	20:15	19:28	18:38		16:56	26 08:47 (M04)	16:40
11	07:32		07:08		08:45 (M03)	07:27		06:36	05:55	05:36	05:46	06:14	06:44	07:14	09:24 (M03)	06:50	08:21 (M04)	07:22
	16:59		17:36	34	09:19 (M03)	19:09		19:42	20:13	20:39	20:41	20:14	19:27	18:36	15 09:39 (M03)	16:55	27 08:48 (M04)	16:40
12	07:32		07:07		08:44 (M03)	07:26		06:35	05:54	05:36	05:47	06:15	06:45	07:15	09:21 (M03)	06:51	08:21 (M04)	07:23
	17:00		17:37	36	09:20 (M03)	19:10		19:43	20:14	20:39	20:41	20:12	19:25	18:35	21 09:42 (M03)	16:54	27 08:48 (M04)	16:40
13	07:31		07:06		08:43 (M03)	07:24		06:33	05:53	05:36	05:47	06:16	06:46	07:17	09:19 (M03)	06:52	08:21 (M04)	07:23
	17:01		17:39	37	09:20 (M03)	19:11		19:44	20:15	20:40	20:40	20:11	19:23	18:33	25 09:44 (M03)	16:53	27 08:48 (M04)	16:41
14	07:31		07:04		08:43 (M03)	07:22		06:32	05:52	05:36	05:48	06:17	06:47	07:18	09:17 (M03)	06:53	08:21 (M04)	07:24
	17:02		17:40	37	09:20 (M03)	19:12		19:45	20:16	20:40	20:40	20:10	19:22	18:32	28 09:45 (M03)	16:52	27 08:48 (M04)	16:41
15	07:31	08:56 (M04)	07:03		08:42 (M03)	07:21		06:30	05:51	05:36	05:49	06:18	06:48	07:19	09:17 (M03)	06:54	08:22 (M04)	07:25
	17:03	7 09:03 (M04)	17:41	39	09:21 (M03)	19:13		19:46	20:17	20:41	20:39	20:08	19:20	18:30	30 09:47 (M03)	16:51	27 08:49 (M04)	16:41
16	07:30	08:53 (M04)	07:02		08:41 (M03)	07:19		06:29	05:50	05:36	05:50	06:19	06:49	07:20	09:15 (M03)	06:56	08:22 (M04)	07:26
	17:05	12 09:05 (M04)	17:42	39	09:20 (M03)	19:14		19:47	20:18	20:41	20:39	20:07	19:18	18:29	33 09:48 (M03)	16:50	27 08:49 (M04)	16:41
17	07:30	08:53 (M04)	07:00		08:41 (M03)	07:18		06:27	05:49	05:36	05:50	06:20	06:50	07:21	09:14 (M03)	06:57	08:22 (M04)	07:26
	17:06	14 09:07 (M04)	17:43	40	09:21 (M03)	19:15		19:48	20:19	20:41	20:38	20:06	19:16	18:27	35 09:49 (M03)	16:50	26 08:48 (M04)	16:41
18	07:29	08:51 (M04)	06:59		08:42 (M03)	07:16		06:26	05:49	05:36	05:51	06:20	06:51	07:22	09:13 (M03)	06:58	08:23 (M04)	07:27
	17:07	17 09:08 (M04)	17:45	39	09:21 (M03)	19:16		19:49	20:20	20:42	20:37	20:04	19:15	18:26	36 09:49 (M03)	16:49	25 08:48 (M04)	16:42
19	07:29	08:51 (M04)	06:58		08:41 (M03)	07:14		06:24	05:48	05:36	05:52	06:21	06:52	07:23	09:12 (M03)	06:59	08:24 (M04)	07:28
	17:08	19 09:10 (M04)	17:46	39	09:20 (M03)	19:17		19:50	20:21	20:42	20:37	20:03	19:13	18:24	38 09:50 (M03)	16:48	25 08:49 (M04)	16:42
20	07:28	08:50 (M04)	06:56		08:41 (M03)	07:13		06:23	05:47	05:36	05:53	06:22	06:53	07:24	09:12 (M03)	07:00	08:25 (M04)	07:28
	17:09	21 09:11 (M04)	17:47	40	09:21 (M03)	19:19		19:51	20:22	20:42	20:36	20:01	19:11	18:23	38 09:50 (M03)	16:47	23 08:48 (M04)	16:42
21	07:28	08:50 (M04)	06:55		08:42 (M03)	07:11		06:21	05:46	05:37	05:54	06:23	06:54	07:25	09:12 (M03)	07:01	08:25 (M04)	07:29
	17:10	23 09:13 (M04)	17:48	39	09:21 (M03)	19:20		19:52	20:23	20:43	20:35	20:00	19:10	18:21	39 09:51 (M03)	16:47	23 08:48 (M04)	16:43
22	07:27	08:50 (M04)	06:53		08:41 (M03)	07:09		06:20	05:45	05:37	05:55	06:24	06:55	07:26	09:12 (M03)	07:03	08:26 (M04)	07:29
	17:12	23 09:13 (M04)	17:49	38	09:19 (M03)	19:21		19:53	20:24	20:43	20:35	19:58	19:08	18:20	39 09:51 (M03)	16:46	21 08:47 (M04)	16:43
23	07:26	08:49 (M04)	06:52		08:42 (M03)	07:08		06:18	05:45	05:37	05:56	06:25	06:56	07:28	09:11 (M03)	07:04	08:27 (M04)	07:30
	17:13	25 09:14 (M04)	17:51	37	09:19 (M03)	19:22		19:54	20:25	20:43	20:34	19:57	19:06	18:18	40 09:51 (M03)	16:45	19 08:46 (M04)	16:44
24	07:26	08:49 (M04)	06:51		08:42 (M03)	07:06		06:17	05:44	05:37	05:56	06:26	06:57	07:29	09:11 (M03)	07:05	08:29 (M04)	07:30
	17:14	25 09:14 (M04)	17:52	36	09:18 (M03)	19:23		19:55	20:26	20:43	20:33	19:55	19:05	18:17	40 09:51 (M03)	16:45	17 08:46 (M04)	16:44
25	07:25	08:49 (M04)	06:49		08:43 (M03)	07:04		06:15	05:43	05:38	05:57	06:27	06:58	07:30	09:11 (M03)	07:06	08:31 (M04)	07:31
	17:15	27 09:16 (M04)	17:53	34	09:17 (M03)	19:24		19:56	20:26	20:43	20:32	19:54	19:03	18:15	40 09:51 (M03)	16:44	14 08:45 (M04)	16:45
26	07:24	08:49 (M04)	06:48		08:43 (M03)	07:03		06:14	05:42	05:38	05:58	06:28	06:59	07:31	09:11 (M03)	07:07	08:32 (M04)	07:31
	17:16	27 09:16 (M04)	17:54	32	09:15 (M03)	19:25		19:58	20:27	20:44	20:31	19:52	19:01	18:14	39 09:50 (M03)	16:44	12 08:44 (M04)	16:45
27	07:23	08:49 (M04)	06:46		08:45 (M03)	07:01		06:13	05:42	05:38	05:59	06:29	07:00	07:32	09:12 (M03)	07:08	08:35 (M04)	07:31
	17:18	27 09:16 (M04)	17:55	29	09:14 (M03)	19:26		19:59	20:28	20:44	20:30	19:51	19:00	18:13	39 09:51 (M03)	16:43	7 08:42 (M04)	16:46
28	07:23	08:49 (M04)	06:45		08:45 (M03)	06:59		06:11	05:41	05:39	06:00	06:30	07:01	07:33	09:12 (M03)	07:09		07:32
	17:19	27 09:16 (M04)	17:56	27	09:12 (M03)	19:27		20:00	20:29	20:44	20:29	19:49	18:58	18:11	38 09:50 (M03)	16:43		16:47
29	07:22	08:49 (M04)				06:58		06:10	05:41	05:39	06:01	06:31	07:02	07:34	09:13 (M03)	07:10		07:32
	17:20	27 09:16 (M04)				19:28		20:01	20:30	20:44	20:28	19:48	18:56	18:10	36 09:49 (M03)	16:42		16:47
30	07:21	08:49 (M04)				06:56		06:09	05:40	05:39	06:02	06:32	07:03	07:36	09:13 (M03)	07:11		07:32
	17:21	27 09:16 (M04)				19:29		20:02	20:31	20:44	20:27	19:46	18:54	18:09	35 09:48 (M03)	16:42		16:48
31	07:20	08:50 (M04)				06:54			05:40		06:03	06:33		07:37	09:15 (M03)			07:32
	17:22	26 09:16 (M04)				19:30			20:31		20:26	19:45		18:08	33 09:48 (M03)			16:49
Potential sun hours	298		297		369		398	448	451	458	428	375	346			299		288
Total, worst case		374		902		51								717			624	
Sun reduction		0.45		0.62		0.73								0.84			0.61	
Oper. time red.		1.00		1.00		1.00								1.00			1.00	
Wind dir. red.		0.38		0.39		0.39								0.39			0.38	
Total reduction		0.17		0.24		0.28								0.33			0.23	
Total, real		64		216		14								233			146	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 65 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (137)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March	April	May	June	July	August	September	October	November	December
1	07:32		07:19		08:47 (M04)	06:43	06:53	06:07	05:39	05:40	06:04	06:34	07:04	06:38	08:09 (M03)	07:12
	16:50		17:24	23	09:10 (M04)	17:58	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	32	08:41 (M03)	16:42
2	07:33		07:18		08:48 (M04)	06:42	06:51	06:06	05:39	05:40	06:05	06:35	07:05	06:39		08:09 (M03)	07:13
	16:51		17:25	21	09:09 (M04)	17:59	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	31	08:40 (M03)	16:41
3	07:33		07:17		08:47 (M03)	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40		08:10 (M03)	07:14
	16:52		17:26	22	09:09 (M04)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:50	17:04	29	08:39 (M03)	16:41
4	07:33		07:16		08:45 (M03)	06:38	06:48	06:04	05:38	05:42	06:07	06:37	07:07	06:41		08:12 (M03)	07:15
	16:52		17:27	23	09:08 (M04)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:03	27	08:39 (M03)	16:41
5	07:33		07:15		08:44 (M03)	06:37	06:46	06:02	05:38	05:42	06:08	06:38	07:08	06:43		08:13 (M03)	07:16
	16:53		17:29	23	09:07 (M03)	18:02	19:35	20:07	20:35	20:43	20:21	19:37	18:46	17:01	25	08:38 (M03)	16:41
6	07:33		07:14		08:43 (M03)	06:35	06:44	06:01	05:37	05:43	06:09	06:39	07:09	06:44		08:14 (M03)	07:17
	16:54		17:30	25	09:08 (M03)	18:03	19:37	20:08	20:36	20:43	20:20	19:35	18:45	17:00	22	08:36 (M03)	16:40
7	07:33		07:13		08:42 (M03)	06:34	06:43	06:00	05:37	05:43	06:10	06:40	07:10	06:45		08:16 (M03)	07:18
	16:55		17:31	28	09:10 (M03)	18:04	19:38	20:09	20:36	20:43	20:19	19:33	18:43	16:59	22	08:38 (M04)	16:40
8	07:32		07:12		08:41 (M03)	07:32	06:41	05:59	05:37	05:44	06:11	06:41	07:11	06:46		08:19 (M03)	07:19
	16:56		17:32	30	09:11 (M03)	19:05	19:39	20:10	20:37	20:42	20:17	19:32	18:41	16:58	21	08:40 (M04)	16:40
9	07:32		07:10		08:39 (M03)	07:31	06:40	05:58	05:36	05:45	06:12	06:42	07:12	06:47		08:19 (M04)	07:20
	16:57		17:34	32	09:11 (M03)	19:07	19:40	20:11	20:38	20:42	20:16	19:30	18:40	16:57	21	08:40 (M04)	16:40
10	07:32		07:09		08:39 (M03)	07:29	06:38	05:57	05:36	05:45	06:13	06:43	07:13	06:49		08:18 (M04)	07:21
	16:58		17:35	33	09:12 (M03)	19:08	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	23	08:41 (M04)	16:40
11	07:32		07:08		08:39 (M03)	07:27	06:36	05:55	05:36	05:46	06:14	06:44	07:14	06:50		08:19 (M04)	07:22
	16:59		17:36	33	09:12 (M03)	19:09	19:42	20:13	20:39	20:41	20:14	19:27	18:36	16:55	23	08:42 (M04)	16:40
12	07:32		07:07		08:39 (M03)	07:26	06:35	05:54	05:36	05:47	06:15	06:45	07:15	06:51		08:18 (M04)	07:23
	17:00		17:37	34	09:13 (M03)	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	24	08:42 (M04)	16:40
13	07:31		07:06		08:38 (M03)	07:24	06:33	05:53	05:36	05:47	06:16	06:46	07:17	06:52		08:18 (M04)	07:23
	17:01		17:39	35	09:13 (M03)	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	25	08:43 (M04)	16:41
14	07:31		07:04		08:38 (M03)	07:22	06:32	05:52	05:36	05:48	06:17	06:47	07:18	06:53		08:18 (M04)	07:24
	17:02		17:40	35	09:13 (M03)	19:12	19:45	20:16	20:40	20:40	20:10	19:22	18:32	16:52	25	08:43 (M04)	16:41
15	07:31	08:51 (M04)	07:03		08:38 (M03)	07:21	06:30	05:51	05:36	05:49	06:18	06:48	07:19	09:21 (M03)	06:54	08:19 (M04)	07:25
	17:04	8 08:59 (M04)	17:41	35	09:13 (M03)	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	9 09:30 (M03)	16:51	25 08:44 (M04)	16:41
16	07:30	08:49 (M04)	07:02		08:38 (M03)	07:19	06:29	05:50	05:36	05:50	06:19	06:49	07:20	09:17 (M03)	06:56	08:19 (M04)	07:26
	17:05	12 09:01 (M04)	17:42	35	09:13 (M03)	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:29	17 09:34 (M03)	16:50	25 08:44 (M04)	16:41
17	07:30	08:48 (M04)	07:00		08:38 (M03)	07:18	06:27	05:49	05:36	05:50	06:20	06:50	07:21	09:15 (M03)	06:57	08:19 (M04)	07:26
	17:06	15 09:03 (M04)	17:43	34	09:12 (M03)	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	21 09:36 (M03)	16:50	24 08:43 (M04)	16:41
18	07:29	08:47 (M04)	06:59		08:38 (M03)	07:16	06:26	05:49	05:36	05:51	06:20	06:51	07:22	09:13 (M03)	06:58	08:19 (M04)	07:27
	17:07	17 09:04 (M04)	17:45	34	09:12 (M03)	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:26	24 09:37 (M03)	16:49	24 08:43 (M04)	16:42
19	07:29	08:47 (M04)	06:58		08:38 (M03)	07:14	06:24	05:48	05:36	05:52	06:21	06:52	07:23	09:11 (M03)	06:59	08:20 (M04)	07:28
	17:08	18 09:05 (M04)	17:46	33	09:11 (M03)	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	28 09:39 (M03)	16:48	24 08:44 (M04)	16:42
20	07:28	08:46 (M04)	06:56		08:39 (M03)	07:13	06:23	05:47	05:36	05:53	06:22	06:53	07:24	09:10 (M03)	07:00	08:21 (M04)	07:28
	17:09	20 09:06 (M04)	17:47	32	09:11 (M03)	19:19	19:51	20:22	20:42	20:36	20:01	19:11	18:23	29 09:39 (M03)	16:47	22 08:43 (M04)	16:42
21	07:28	08:46 (M04)	06:55		08:40 (M03)	07:11	06:21	05:46	05:37	05:54	06:23	06:54	07:25	09:10 (M03)	07:01	08:21 (M04)	07:29
	17:10	22 09:08 (M04)	17:48	30	09:10 (M03)	19:20	19:52	20:23	20:43	20:35	20:00	19:10	18:21	31 09:41 (M03)	16:47	22 08:43 (M04)	16:43
22	07:27	08:46 (M04)	06:53		08:40 (M03)	07:09	06:20	05:45	05:37	05:55	06:24	06:55	07:26	09:09 (M03)	07:03	08:22 (M04)	07:29
	17:12	22 09:08 (M04)	17:49	29	09:09 (M03)	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	33 09:42 (M03)	16:46	20 08:42 (M04)	16:43
23	07:26	08:45 (M04)	06:52		08:41 (M03)	07:08	06:18	05:45	05:37	05:56	06:25	06:56	07:28	09:08 (M03)	07:04	08:23 (M04)	07:30
	17:13	24 09:09 (M04)	17:51	27	09:08 (M03)	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	34 09:42 (M03)	16:45	19 08:42 (M04)	16:44
24	07:26	08:45 (M04)	06:51		08:42 (M03)	07:06	06:17	05:44	05:37	05:56	06:26	06:57	07:29	09:08 (M03)	07:05	08:25 (M04)	07:30
	17:14	24 09:09 (M04)	17:52	23	09:05 (M03)	19:23	19:55	20:26	20:43	20:33	19:55	19:05	18:17	34 09:42 (M03)	16:45	17 08:42 (M04)	16:44
25	07:25	08:46 (M04)	06:49		08:44 (M03)	07:04	06:15	05:43	05:38	05:57	06:27	06:58	07:30	09:07 (M03)	07:06	08:26 (M04)	07:31
	17:15	24 09:10 (M04)	17:53	20	09:04 (M03)	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	35 09:42 (M03)	16:44	15 08:41 (M04)	16:45
26	07:24	08:46 (M04)	06:48		08:46 (M03)	07:03	06:14	05:42	05:38	05:58	06:28	06:59	07:31	09:08 (M03)	07:07	08:28 (M04)	07:31
	17:16	25 09:11 (M04)	17:54	14	09:00 (M03)	19:25	19:58	20:27	20:44	20:31	19:52	19:01	18:14	35 09:43 (M03)	16:44	12 08:40 (M04)	16:45
27	07:23	08:46 (M04)	06:46			07:01	06:13	05:42	05:38	05:59	06:29	07:00	07:32	09:08 (M03)	07:08	08:30 (M04)	07:31
	17:18	25 09:11 (M04)	17:55			19:26	19:59	20:28	20:44	20:30	19:51	19:00	18:13	35 09:43 (M03)	16:43	8 08:38 (M04)	16:46
28	07:23	08:46 (M04)	06:45			06:59	06:11	05:41	05:39	06:00	06:30	07:01	07:33	09:07 (M03)	07:09		07:32
	17:19	25 09:11 (M04)	17:56			19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	36 09:43 (M03)	16:43		16:47
29	07:22	08:46 (M04)				06:58	06:10	05:41	05:39	06:01	06:31	07:02	07:34	09:07 (M03)	07:10		07:32
	17:20	25 09:11 (M04)				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	35 09:42 (M03)	16:42		16:47
30	07:21	08:46 (M04)				06:56	06:09	05:40	05:39	06:02	06:32	07:03	07:36	09:07 (M03)	07:11		07:32
	17:21	25 09:11 (M04)				19:29	20:02	20:31	20:44	20:27	19:46	18:55	18:09	35 09:42 (M03)	16:42		16:48
31	07:20	08:47 (M04)				06:54		05:40		06:03	06:33		07:37	09:09 (M03)			07:32
	17:22	23 09:10 (M04)				19:30		20:31		20:26	19:45		18:08	33 09:42 (M03)			16:49
Potential sun hours	298		297			369	398	448	451	458	428	375	346		299		288
Total, worst case		354		743										504		607	
Sun reduction		0.45		0.62										0.84		0.61	
Oper. time red.		1.00		1.00										1.00		1.00	
Wind dir. red.		0.38		0.39										0.39		0.38	
Total reduction		0.17		0.24										0.33		0.23	
Total, real		61		178										164		142	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 66 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (138)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March		April	May	June	July	August	September		October		November	December
1	07:33	07:19	06:43		06:53	06:07	05:39	05:40	06:04	06:34		07:04	08:17 (M03)	06:38	07:12
	16:50	17:24	17:58		19:31	20:03	20:32	20:44	20:25	19:43		18:53	08:41 (M03)	18:06	16:42
2	07:33	07:18	06:42		06:51	06:06	05:39	05:40	06:05	06:35		07:05	08:17 (M03)	06:39	07:13
	16:51	17:25	17:59		19:32	20:04	20:33	20:44	20:24	19:41		18:51	08:41 (M03)	17:05	16:41
3	07:33	07:17	06:40		06:49	06:05	05:38	05:41	06:06	06:36		07:06	08:16 (M03)	06:40	07:14
	16:52	17:26	18:00		19:33	20:05	20:34	20:43	20:23	19:40		18:50	08:41 (M03)	17:04	16:41
4	07:33	07:16	06:39		07:48 (M03)	06:48	06:04	05:38	05:42	06:07	06:37	07:07	08:16 (M03)	06:41	07:15
	16:53	17:27	18:01	8	07:56 (M03)	19:34	20:06	20:34	20:43	20:22	19:38	18:48	08:40 (M03)	17:03	16:41
5	07:33	07:15	06:37		07:44 (M03)	06:46	06:02	05:38	05:42	06:08	06:38	07:08	08:16 (M03)	06:43	07:16
	16:53	17:29	18:02	14	07:58 (M03)	19:35	20:07	20:35	20:43	20:21	19:37	18:46	08:39 (M03)	17:01	16:41
6	07:33	07:14	06:35		07:43 (M03)	06:45	06:01	05:37	05:43	06:09	06:39	07:09	08:17 (M03)	06:44	07:17
	16:54	17:30	18:03	17	08:00 (M03)	19:37	20:08	20:36	20:43	20:20	19:35	18:45	08:38 (M03)	17:00	16:40
7	07:33	07:13	06:34		07:41 (M03)	06:43	06:00	05:37	05:43	06:10	06:40	07:10	08:18 (M03)	06:45	07:18
	16:55	17:31	18:04	20	08:01 (M03)	19:38	20:09	20:36	20:43	20:19	19:33	18:43	08:37 (M03)	16:59	16:40
8	07:33	07:12	07:32		08:40 (M03)	06:41	05:59	05:37	05:44	06:11	06:41	07:11	08:19 (M03)	06:46	07:19
	16:56	17:32	19:05	22	09:02 (M03)	19:39	20:10	20:37	20:42	20:18	19:32	18:41	08:35 (M03)	16:58	16:40
9	07:32	07:10	07:31		08:39 (M03)	06:40	05:58	05:37	05:45	06:12	06:42	07:12	08:21 (M03)	06:47	07:20
	16:57	17:34	19:07	23	09:02 (M03)	19:40	20:11	20:38	20:42	20:16	19:30	18:40	08:32 (M03)	16:57	16:40
10	07:32	07:09	07:29		08:38 (M03)	06:38	05:57	05:36	05:45	06:13	06:43	07:13	08:25 (M03)	06:49	07:21
	16:58	17:35	19:08	24	09:02 (M03)	19:41	20:12	20:38	20:42	20:15	19:28	18:38	08:27 (M03)	16:56	16:40
11	07:32	07:08	07:27		08:38 (M03)	06:37	05:56	05:36	05:46	06:14	06:44	07:14		06:50	07:22
	16:59	17:36	19:09	24	09:02 (M03)	19:42	20:13	20:39	20:41	20:14	19:27	18:37		16:55	16:40
12	07:32	07:07	07:26		08:37 (M03)	06:35	05:54	05:36	05:47	06:15	06:45	07:15		06:51	07:23
	17:00	17:37	19:10	25	09:02 (M03)	19:43	20:14	20:39	20:41	20:12	19:25	18:35		16:54	16:40
13	07:31	07:06	07:24		08:37 (M03)	06:33	05:53	05:36	05:47	06:16	06:46	07:17		06:52	07:23
	17:01	17:39	19:11	24	09:01 (M03)	19:44	20:15	20:40	20:40	20:11	19:23	18:33		16:53	16:41
14	07:31	07:04	07:23		08:38 (M03)	06:32	05:52	05:36	05:48	06:17	06:47	07:18		06:53	07:24
	17:02	17:40	19:12	22	09:00 (M03)	19:45	20:16	20:40	20:40	20:10	19:22	18:32		16:52	16:41
15	07:31	07:03	07:21		08:38 (M03)	06:30	05:51	05:36	05:49	06:18	06:48	07:19		06:54	07:25
	17:04	17:41	19:13	21	08:59 (M03)	19:46	20:17	20:41	20:39	20:08	19:20	18:30		16:51	16:41
16	07:30	07:02	07:19		08:38 (M03)	06:29	05:50	05:36	05:50	06:19	06:49	07:20		06:56	07:26
	17:05	17:42	19:14	19	08:57 (M03)	19:47	20:18	20:41	20:39	20:07	19:18	18:29		16:50	16:41
17	07:30	07:00	07:18		08:40 (M03)	06:27	05:50	05:36	05:51	06:20	06:50	07:21		06:57	07:26
	17:06	17:43	19:15	16	08:56 (M03)	19:48	20:19	20:41	20:38	20:06	19:17	18:27		16:50	16:41
18	07:29	06:59	07:16		08:41 (M03)	06:26	05:49	05:36	05:51	06:21	06:51	07:22		06:58	07:27
	17:07	17:45	19:16	12	08:53 (M03)	19:49	20:20	20:42	20:37	20:04	19:15	18:26		16:49	16:42
19	07:29	06:58	07:14		08:46 (M03)	06:24	05:48	05:36	05:52	06:22	06:52	07:23		06:59	07:28
	17:08	17:46	19:18	1	08:47 (M03)	19:50	20:21	20:42	20:37	20:03	19:13	18:24		16:48	16:42
20	07:28	06:56	07:13			06:23	05:47	05:36	05:53	06:23	06:53	07:24		07:00	07:28
	17:09	17:47	19:19			19:51	20:22	20:42	20:36	20:01	19:11	18:23		16:47	16:42
21	07:28	06:55	07:11			06:21	05:46	05:37	05:54	06:23	06:54	07:25		07:01	07:29
	17:10	17:48	19:20			19:52	20:23	20:43	20:35	20:00	19:10	18:21		16:47	16:43
22	07:27	06:53	07:09			06:20	05:45	05:37	05:55	06:24	06:55	07:26		07:03	07:29
	17:12	17:49	19:21			19:53	20:24	20:43	20:35	19:58	19:08	18:20		16:46	16:43
23	07:26	06:52	07:08			06:18	05:45	05:37	05:56	06:25	06:56	07:28		07:04	07:30
	17:13	17:51	19:22			19:54	20:25	20:43	20:34	19:57	19:06	18:18		16:45	16:44
24	07:26	06:51	07:06			06:17	05:44	05:37	05:56	06:26	06:57	07:29		07:05	07:30
	17:14	17:52	19:23			19:55	20:26	20:43	20:33	19:55	19:05	18:17		16:45	16:44
25	07:25	06:49	07:04			06:15	05:43	05:38	05:57	06:27	06:58	08:26 (M03)		07:06	07:31
	17:15	17:53	19:24			19:57	20:26	20:43	20:32	19:54	19:03	10 08:36 (M03)		16:44	16:45
26	07:24	06:48	07:03			06:14	05:42	05:38	05:58	06:28	06:59	08:23 (M03)		07:07	07:31
	17:16	17:54	19:25			19:58	20:27	20:44	20:31	19:52	19:01	15 08:38 (M03)		16:44	16:46
27	07:23	06:46	07:01			06:13	05:42	05:38	05:59	06:29	07:00	08:21 (M03)		07:08	07:31
	17:18	17:55	19:26			19:59	20:28	20:44	20:30	19:51	19:00	18 08:39 (M03)		16:43	16:46
28	07:23	06:45	06:59			06:11	05:41	05:39	06:00	06:30	07:01	08:20 (M03)		07:09	07:32
	17:19	17:56	19:27			20:00	20:29	20:44	20:29	19:49	18:58	20 08:40 (M03)		16:43	16:47
29	07:22		06:58			06:10	05:41	05:39	06:01	06:31	07:02	08:19 (M03)		07:10	07:32
	17:20		19:28			20:01	20:30	20:44	20:28	19:48	18:56	22 08:41 (M03)		16:42	16:47
30	07:21		06:56			06:09	05:40	05:40	06:02	06:32	07:03	08:18 (M03)		07:11	07:32
	17:21		19:29			20:02	20:31	20:44	20:28	19:46	18:55	23 08:41 (M03)		16:42	16:48
31	07:20		06:54				05:40		06:03	06:33			07:37		07:32
	17:22		19:30				20:31		20:26	19:45			18:08		16:49
Potential sun hours	298	297	369		398	448	451	458	428	375		346		299	288
Total, worst case				292							108		189		
Sun reduction				0.73							0.93		0.84		
Oper. time red.				1.00							1.00		1.00		
Wind dir. red.				0.51							0.51		0.51		
Total reduction				0.37							0.48		0.43		
Total, real				109							51		81		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 67 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (139)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March			April	May	June	July	August	September			October			November	December
1	07:33	07:19	06:43			06:53	06:07	05:39	05:40	06:04	06:34			07:04		08:14 (M03)	06:38	07:12
	16:50	17:24	17:58			19:31	20:03	20:32	20:44	20:25	19:43			18:53	12	08:26 (M03)	18:06	16:42
2	07:33	07:18	06:42			06:51	06:06	05:39	05:40	06:05	06:35			07:05		08:19 (M03)	06:39	07:13
	16:51	17:25	17:59			19:32	20:04	20:33	20:44	20:24	19:41			18:51	2	08:21 (M03)	17:05	16:41
3	07:33	07:17	06:40			06:49	06:05	05:38	05:41	06:06	06:36			07:06			06:40	07:14
	16:52	17:26	18:00			19:33	20:05	20:34	20:43	20:23	19:40			18:50			17:04	16:41
4	07:33	07:16	06:39			06:48	06:04	05:38	05:42	06:07	06:37			07:07			06:41	07:15
	16:53	17:27	18:01			19:34	20:06	20:34	20:43	20:22	19:38			18:48			17:03	16:41
5	07:33	07:15	06:37			06:46	06:02	05:38	05:42	06:08	06:38			07:08			06:43	07:16
	16:53	17:29	18:02			19:35	20:07	20:35	20:43	20:21	19:37			18:46			17:01	16:41
6	07:33	07:14	06:35			06:45	06:01	05:37	05:43	06:09	06:39			07:09			06:44	07:17
	16:54	17:30	18:03			19:37	20:08	20:36	20:43	20:20	19:35			18:45			17:00	16:40
7	07:33	07:13	06:34			06:43	06:00	05:37	05:43	06:10	06:40			07:10			06:45	07:18
	16:55	17:31	18:04			19:38	20:09	20:36	20:43	20:19	19:33			18:43			16:59	16:40
8	07:33	07:12	07:32			06:41	05:59	05:37	05:44	06:11	06:41			07:11			06:46	07:19
	16:56	17:32	19:05			19:39	20:10	20:37	20:42	20:18	19:32			18:41			16:58	16:40
9	07:32	07:10	07:31			06:40	05:58	05:37	05:45	06:12	06:42			07:12			06:47	07:20
	16:57	17:34	19:07			19:40	20:11	20:38	20:42	20:16	19:30			18:40			16:57	16:40
10	07:32	07:09	07:29			06:38	05:57	05:36	05:45	06:13	06:43			07:13			06:49	07:21
	16:58	17:35	19:08			19:41	20:12	20:38	20:42	20:15	19:28			18:38			16:56	16:40
11	07:32	07:08	07:27			06:37	05:56	05:36	05:46	06:14	06:44			07:14			06:50	07:22
	16:59	17:36	19:09			19:42	20:13	20:39	20:41	20:14	19:27			18:37			16:55	16:40
12	07:32	07:07	07:26		08:36 (M03)	06:35	05:54	05:36	05:47	06:15	06:45			07:15			06:51	07:23
	17:00	17:37	19:10	9	08:45 (M03)	19:43	20:14	20:39	20:41	20:12	19:25			18:35			16:54	16:40
13	07:31	07:06	07:24		08:32 (M03)	06:33	05:53	05:36	05:47	06:16	06:46			07:17			06:52	07:23
	17:01	17:39	19:11	16	08:48 (M03)	19:44	20:15	20:40	20:40	20:11	19:23			18:33			16:53	16:41
14	07:31	07:04	07:23		08:31 (M03)	06:32	05:52	05:36	05:48	06:17	06:47			07:18			06:53	07:24
	17:02	17:40	19:12	19	08:50 (M03)	19:45	20:16	20:40	20:40	20:10	19:22			18:32			16:52	16:41
15	07:31	07:03	07:21		08:29 (M03)	06:30	05:51	05:36	05:49	06:18	06:48			07:19			06:54	07:25
	17:04	17:41	19:13	21	08:50 (M03)	19:46	20:17	20:41	20:39	20:08	19:20			18:30			16:51	16:41
16	07:30	07:02	07:19		08:28 (M03)	06:29	05:50	05:36	05:50	06:19	06:49		08:23 (M03)	07:20			06:56	07:26
	17:05	17:42	19:14	22	08:50 (M03)	19:47	20:18	20:41	20:39	20:07	19:18	4	08:27 (M03)	18:29			16:50	16:41
17	07:30	07:00	07:18		08:27 (M03)	06:27	05:50	05:36	05:51	06:20	06:50		08:18 (M03)	07:21			06:57	07:26
	17:06	17:43	19:15	24	08:51 (M03)	19:48	20:19	20:41	20:38	20:06	19:17	12	08:30 (M03)	18:27			16:50	16:41
18	07:29	06:59	07:16		08:26 (M03)	06:26	05:49	05:36	05:51	06:21	06:51		08:16 (M03)	07:22			06:58	07:27
	17:07	17:45	19:16	25	08:51 (M03)	19:49	20:20	20:42	20:37	20:04	19:15	16	08:32 (M03)	18:26			16:49	16:42
19	07:29	06:58	07:14		08:25 (M03)	06:24	05:48	05:36	05:52	06:22	06:52		08:14 (M03)	07:23			06:59	07:28
	17:08	17:46	19:18	25	08:50 (M03)	19:50	20:21	20:42	20:37	20:03	19:13	19	08:33 (M03)	18:24			16:48	16:42
20	07:28	06:56	07:13		08:26 (M03)	06:23	05:47	05:36	05:53	06:23	06:53		08:13 (M03)	07:24			07:00	07:28
	17:09	17:47	19:19	25	08:51 (M03)	19:51	20:22	20:42	20:36	20:01	19:11	21	08:34 (M03)	18:23			16:47	16:42
21	07:28	06:55	07:11		08:25 (M03)	06:21	05:46	05:37	05:54	06:23	06:54		08:12 (M03)	07:25			07:01	07:29
	17:10	17:48	19:20	25	08:50 (M03)	19:52	20:23	20:43	20:35	20:00	19:10	23	08:35 (M03)	18:21			16:47	16:43
22	07:27	06:53	07:09		08:25 (M03)	06:20	05:45	05:37	05:55	06:24	06:55		08:11 (M03)	07:26			07:03	07:29
	17:12	17:49	19:21	24	08:49 (M03)	19:53	20:24	20:43	20:35	19:58	19:08	24	08:35 (M03)	18:20			16:46	16:43
23	07:26	06:52	07:08		08:26 (M03)	06:18	05:45	05:37	05:56	06:25	06:56		08:10 (M03)	07:28			07:04	07:30
	17:13	17:51	19:22	22	08:48 (M03)	19:54	20:25	20:43	20:34	19:57	19:06	25	08:35 (M03)	18:18			16:45	16:44
24	07:26	06:51	07:06		08:26 (M03)	06:17	05:44	05:37	05:56	06:26	06:57		08:10 (M03)	07:29			07:05	07:30
	17:14	17:52	19:23	20	08:46 (M03)	19:55	20:26	20:43	20:33	19:55	19:05	25	08:35 (M03)	18:17			16:45	16:44
25	07:25	06:49	07:04		08:27 (M03)	06:15	05:43	05:38	05:57	06:27	06:58		08:10 (M03)	07:30			07:06	07:31
	17:15	17:53	19:24	17	08:44 (M03)	19:56	20:26	20:43	20:32	19:54	19:03	25	08:35 (M03)	18:16			16:44	16:45
26	07:24	06:48	07:03		08:29 (M03)	06:14	05:42	05:38	05:58	06:28	06:59		08:10 (M03)	07:31			07:07	07:31
	17:16	17:54	19:25	14	08:43 (M03)	19:58	20:27	20:44	20:31	19:52	19:01	24	08:34 (M03)	18:14			16:44	16:46
27	07:23	06:46	07:01		08:32 (M03)	06:13	05:42	05:38	05:59	06:29	07:00		08:10 (M03)	07:32			07:08	07:31
	17:18	17:55	19:26	7	08:39 (M03)	19:59	20:28	20:44	20:30	19:51	19:00	23	08:33 (M03)	18:13			16:43	16:46
28	07:23	06:45	06:59			06:11	05:41	05:39	06:00	06:30	07:01		08:10 (M03)	07:33			07:09	07:32
	17:19	17:56	19:27			20:00	20:29	20:44	20:29	19:49	18:58	22	08:32 (M03)	18:11			16:43	16:47
29	07:22		06:58			06:10	05:41	05:39	06:01	06:31	07:02		08:11 (M03)	07:34			07:10	07:32
	17:20		19:28			20:01	20:30	20:44	20:28	19:48	18:56	20	08:31 (M03)	18:10			16:42	16:47
30	07:21		06:56			06:09	05:40	05:40	06:02	06:32	07:03		08:12 (M03)	07:36			07:11	07:32
	17:21		19:29			20:02	20:31	20:44	20:28	19:46	18:55	17	08:29 (M03)	18:09			16:42	16:48
31	07:20		06:54				05:40		06:03	06:33				07:37				07:32
	17:22		19:30				20:31		20:26	19:45				18:08				16:49
Potential sun hours	298	297	369			398	448	451	458	428	375			346			299	288
Total, worst case				315								300			14			
Sun reduction				0.73								0.93			0.84			
Oper. time red.				1.00								1.00			1.00			
Wind dir. red.				0.54								0.54			0.54			
Total reduction				0.39								0.50			0.45			
Total, real				123								150			6			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 68 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (140)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March		April		May	June	July	August	September		October	November	December
1	07:32	07:19	06:43		06:52		18:32 (D03)	06:07	05:39	05:40	06:04	06:34		07:04	06:38	07:12
	16:50	17:23	17:57		19:31	29	19:01 (D03)	20:03	20:32	20:44	20:25	19:43		18:53	18:06	16:41
2	07:33	07:18	06:41		06:51		18:32 (D03)	06:06	05:38	05:40	06:05	06:35	18:37 (D03)	07:05	06:39	07:13
	16:50	17:25	17:58		19:32	29	19:01 (D03)	20:04	20:33	20:43	20:24	19:41	11 18:48 (D03)	18:51	17:05	16:41
3	07:33	07:17	06:40		06:49		18:32 (D03)	06:05	05:38	05:41	06:05	06:36	18:34 (D03)	07:06	06:40	07:14
	16:51	17:26	18:00		19:33	28	19:00 (D03)	20:05	20:34	20:43	20:23	19:40	16 18:50 (D03)	18:49	17:04	16:41
4	07:33	07:16	06:38		06:48		18:32 (D03)	06:03	05:38	05:41	06:06	06:37	18:32 (D03)	07:07	06:41	07:15
	16:52	17:27	18:01		19:34	28	19:00 (D03)	20:06	20:34	20:43	20:22	19:38	20 18:52 (D03)	18:48	17:02	16:40
5	07:33	07:15	06:37		06:46		18:32 (D03)	06:02	05:37	05:42	06:07	06:38	18:30 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02		19:35	27	18:59 (D03)	20:07	20:35	20:43	20:21	19:36	23 18:53 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35		06:44		18:32 (D03)	06:01	05:37	05:42	06:08	06:39	18:29 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03		19:36	25	18:57 (D03)	20:08	20:36	20:43	20:20	19:35	24 18:53 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34		06:43		18:34 (D03)	06:00	05:37	05:43	06:09	06:40	18:27 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04		19:37	23	18:57 (D03)	20:09	20:36	20:43	20:19	19:33	27 18:54 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32		06:41		18:35 (D03)	05:59	05:36	05:44	06:10	06:41	18:26 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05		19:38	20	18:55 (D03)	20:10	20:37	20:42	20:17	19:31	28 18:54 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30		06:39		18:36 (D03)	05:57	05:36	05:44	06:11	06:42	18:26 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06		19:40	16	18:52 (D03)	20:11	20:38	20:42	20:16	19:30	28 18:54 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29		06:38		18:39 (D03)	05:56	05:36	05:45	06:12	06:43	18:25 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07		19:41	11	18:50 (D03)	20:12	20:38	20:42	20:15	19:28	29 18:54 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27		06:36			05:55	05:36	05:46	06:13	06:44	18:25 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09		19:42			20:13	20:39	20:41	20:14	19:26	29 18:54 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26		06:35			05:54	05:36	05:46	06:14	06:45	18:24 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10		19:43			20:14	20:39	20:41	20:12	19:25	30 18:54 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24		06:33			05:53	05:36	05:47	06:15	06:46	18:24 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11		19:44			20:15	20:40	20:40	20:11	19:23	29 18:53 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22		06:32			05:52	05:36	05:48	06:16	06:47	18:24 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12		19:45			20:16	20:40	20:40	20:10	19:21	28 18:52 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21		06:30			05:51	05:36	05:49	06:17	06:48	18:25 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13		19:46			20:17	20:41	20:39	20:08	19:20	26 18:51 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19		06:28			05:50	05:36	05:49	06:18	06:49	18:25 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14		19:47			20:18	20:41	20:39	20:07	19:18	25 18:50 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17		06:27			05:49	05:36	05:50	06:19	06:50	18:26 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15		19:48			20:19	20:41	20:38	20:06	19:16	23 18:49 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16		06:25			05:48	05:36	05:51	06:20	06:51	18:27 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16		19:49			20:20	20:42	20:37	20:04	19:15	20 18:47 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14		06:24			05:47	05:36	05:52	06:21	06:52	18:28 (D03)	07:23	06:59	07:27
	17:08	17:46	19:17		19:50			20:21	20:42	20:37	20:03	19:13	16 18:44 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12		06:22			05:47	05:36	05:53	06:22	06:53	18:30 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18		19:51			20:22	20:42	20:36	20:01	19:11	10 18:40 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11		06:21			05:46	05:36	05:53	06:23	06:54		07:25	07:01	07:29
	17:10	17:48	19:19		19:52			20:23	20:43	20:35	20:00	19:10		18:21	16:46	16:42
22	07:27	06:53	07:09		06:19			05:45	05:36	05:54	06:24	06:55		07:26	07:03	07:29
	17:11	17:49	19:21		19:53			20:24	20:43	20:35	19:58	19:08		18:19	16:46	16:43
23	07:26	06:52	07:07	18:46 (D03)	06:18			05:44	05:37	05:55	06:25	06:56		07:27	07:04	07:30
	17:12	17:50	19:22	8 18:54 (D03)	19:54			20:25	20:43	20:34	19:57	19:06		18:18	16:45	16:43
24	07:26	06:50	07:06	18:42 (D03)	06:17			05:43	05:37	05:56	06:26	06:57		07:29	07:05	07:30
	17:14	17:51	19:23	15 18:57 (D03)	19:55			20:26	20:43	20:33	19:55	19:04		18:17	16:44	16:44
25	07:25	06:49	07:04	18:39 (D03)	06:15			05:43	05:37	05:57	06:27	06:58		07:30	07:06	07:30
	17:15	17:53	19:24	19 18:58 (D03)	19:56			20:26	20:43	20:32	19:54	19:03		18:15	16:44	16:45
26	07:24	06:48	07:02	18:37 (D03)	06:14			05:42	05:38	05:58	06:28	06:59		07:31	07:07	07:31
	17:16	17:54	19:25	22 18:59 (D03)	19:57			20:27	20:44	20:31	19:52	19:01		18:14	16:43	16:45
27	07:23	06:46	07:01	18:36 (D03)	06:12			05:41	05:38	05:59	06:29	07:00		07:32	07:08	07:31
	17:17	17:55	19:26	25 19:01 (D03)	19:58			20:28	20:44	20:30	19:51	18:59		18:12	16:43	16:46
28	07:22	06:45	06:59	18:35 (D03)	06:11			05:41	05:38	06:00	06:30	07:01		07:33	07:09	07:32
	17:18	17:56	19:27	26 19:01 (D03)	20:00			20:29	20:44	20:29	19:49	18:58		18:11	16:42	16:46
29	07:22		06:57	18:33 (D03)	06:10			05:40	05:39	06:01	06:31	07:02		07:34	07:10	07:32
	17:20		19:28	28 19:01 (D03)	20:01			20:30	20:44	20:28	19:48	18:56		18:10	16:42	16:47
30	07:21		06:56	18:33 (D03)	06:08			05:40	05:39	06:02	06:32	07:03		07:35	07:11	07:32
	17:21		19:29	29 19:02 (D03)	20:02			20:31	20:44	20:27	19:46	18:54		18:09	16:42	16:48
31	07:20		06:54	18:32 (D03)				05:39		06:03	06:33			07:37		07:32
	17:22		19:30	29 19:01 (D03)				20:31		20:26	19:44			18:07		16:49
Potential sun hours	298	297	369		398			448	452	458	428	375		346	298	288
Total, worst case				201		236							442			
Sun reduction				0.73		0.82							0.93			
Oper. time red.				1.00		1.00							1.00			
Wind dir. red.				0.68		0.68							0.68			
Total reduction				0.49		0.55							0.63			
Total, real				99		131							278			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com

Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 69 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (141)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:21 (D03)	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31 29	18:50 (D03)	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	18:22 (D03)	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32 28	18:50 (D03)	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	18:22 (D03)	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33 26	18:48 (D03)	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	18:24 (D03)	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34 24	18:48 (D03)	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	18:25 (D03)	06:02	05:37	05:42	06:07	06:38 18:25 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02	19:35 20	18:45 (D03)	20:07	20:35	20:43	20:21	19:36 11	18:36 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	18:26 (D03)	06:01	05:37	05:42	06:08	06:39 18:22 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03	19:36 17	18:43 (D03)	20:08	20:36	20:43	20:20	19:35 17	18:39 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	18:29 (D03)	06:00	05:37	05:43	06:09	06:40 18:20 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04	19:37 11	18:40 (D03)	20:09	20:36	20:43	20:19	19:33 20	18:40 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41 18:18 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31 24	18:42 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42 18:16 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30 26	18:42 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43 18:15 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28 28	18:43 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44 18:14 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26 29	18:43 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35 19:10 (D02)	05:54	05:36	05:46	06:14	06:45 18:13 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10	19:43 9 19:19 (D02)	20:14	20:39	20:41	20:12	19:25 30	18:43 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33 19:06 (D02)	05:53	05:36	05:47	06:15	06:46 18:13 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11	19:44 15 19:21 (D02)	20:15	20:40	20:40	20:11	19:23 30	18:43 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32 19:05 (D02)	05:52	05:36	05:48	06:16	06:47 18:12 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12	19:45 18 19:23 (D02)	20:16	20:40	20:40	20:10	19:21 31	18:43 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30 19:03 (D02)	05:51	05:36	05:49	06:17 19:15 (D02)	06:48 18:12 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13	19:46 20 19:23 (D02)	20:17	20:41	20:39	20:08 6 19:21 (D02)	19:20 31	18:43 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28 19:03 (D02)	05:50	05:36	05:49	06:18 19:11 (D02)	06:49 18:12 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14	19:47 21 19:24 (D02)	20:18	20:41	20:39	20:07 13 19:24 (D02)	19:18 30	18:42 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27 19:01 (D02)	05:49	05:36	05:50	06:19 19:10 (D02)	06:50 18:11 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15	19:48 23 19:24 (D02)	20:19	20:41	20:38	20:06 15 19:25 (D02)	19:16 31	18:42 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25 19:01 (D02)	05:48	05:36	05:51	06:20 19:08 (D02)	06:51 18:12 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16	19:49 23 19:24 (D02)	20:20	20:42	20:37	20:04 18 19:26 (D02)	19:15 29	18:41 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14 18:36 (D03)	06:24 19:00 (D02)	05:47	05:36	05:52	06:21 19:07 (D02)	06:52 18:11 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17 8 18:44 (D03)	19:50 24 19:24 (D02)	20:21	20:42	20:37	20:03 20 19:27 (D02)	19:13 28	18:39 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12 18:32 (D03)	06:22 19:01 (D02)	05:47	05:36	05:53	06:22 19:06 (D02)	06:53 18:11 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18 16 18:48 (D03)	19:51 23 19:24 (D02)	20:22	20:42	20:36	20:01 22 19:28 (D02)	19:11 27	18:38 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11 18:29 (D03)	06:21 19:00 (D02)	05:46	05:36	05:53	06:23 19:05 (D02)	06:54 18:12 (D03)	07:25	07:01	07:29
	17:10	17:48	19:19 21 18:50 (D03)	19:52 23 19:23 (D02)	20:23	20:43	20:35	20:00 23 19:28 (D02)	19:10 24	18:36 (D03)	18:21	16:46	16:42
22	07:27	06:53	07:09 18:27 (D03)	06:19 19:01 (D02)	05:45	05:36	05:54	06:24 19:05 (D02)	06:55 18:13 (D03)	07:26	07:03	07:29
	17:11	17:49	19:21 24 18:51 (D03)	19:53 22 19:23 (D02)	20:24	20:43	20:35	19:58 23 19:28 (D02)	19:08 21	18:34 (D03)	18:20	16:46	16:43
23	07:26	06:52	07:07 18:26 (D03)	06:18 19:00 (D02)	05:44	05:37	05:55	06:25 19:05 (D02)	06:56 18:15 (D03)	07:27	07:04	07:30
	17:12	17:50	19:22 26 18:52 (D03)	19:54 22 19:22 (D02)	20:25	20:43	20:34	19:57 23 19:28 (D02)	19:06 17	18:32 (D03)	18:18	16:45	16:43
24	07:26	06:50	07:06 18:25 (D03)	06:17 19:01 (D02)	05:43	05:37	05:56	06:26 19:04 (D02)	06:57 18:18 (D03)	07:29	07:05	07:30
	17:14	17:51	19:23 27 18:52 (D03)	19:55 20 19:21 (D02)	20:26	20:43	20:33	19:55 24 19:28 (D02)	19:04 11 18:29 (D03)	18:17	16:44	16:44
25	07:25	06:49	07:04 18:23 (D03)	06:15 19:03 (D02)	05:43	05:37	05:57	06:27 19:04 (D02)	06:58	07:30	07:06	07:31
	17:15	17:53	19:24 30 18:53 (D03)	19:56 17 19:20 (D02)	20:26	20:43	20:32	19:54 23 19:27 (D02)	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02 18:22 (D03)	06:14 19:03 (D02)	05:42	05:38	05:58	06:28 19:04 (D02)	06:59	07:31	07:07	07:31
	17:16	17:54	19:25 30 18:52 (D03)	19:57 15 19:18 (D02)	20:27	20:44	20:31	19:52 23 19:27 (D02)	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01 18:22 (D03)	06:12 19:05 (D02)	05:41	05:38	05:59	06:29 19:05 (D02)	07:00	07:32	07:08	07:31
	17:17	17:55	19:26 31 18:53 (D03)	19:58 11 19:16 (D02)	20:28	20:44	20:30	19:51 21 19:26 (D02)	18:59	18:12	16:43	16:46
28	07:22	06:45	06:59 18:22 (D03)	06:11 19:09 (D02)	05:41	05:38	06:00	06:30 19:05 (D02)	07:01	07:33	07:09	07:32
	17:18	17:56	19:27 31 18:53 (D03)	20:00 4 19:13 (D02)	20:29	20:44	20:29	19:49 20 19:25 (D02)	18:58	18:11	16:42	16:46
29	07:22		06:57 18:21 (D03)	06:10	05:40	05:39	06:01	06:31 19:06 (D02)	07:02	07:34	07:10	07:32
	17:20		19:28 31 18:52 (D03)	20:01	20:30	20:44	20:28	19:48 17 19:23 (D02)	18:56	18:10	16:42	16:47
30	07:21		06:56 18:21 (D03)	06:08	05:40	05:39	06:02	06:32 19:08 (D02)	07:03	07:35	07:11	07:32
	17:21		19:29 31 18:52 (D03)	20:02	20:31	20:44	20:27	19:46 14 19:22 (D02)	18:54	18:09	16:42	16:48
31	07:20		06:54 18:21 (D03)		05:39		06:03	06:33 19:09 (D02)		07:37		07:32
	17:22		19:30 30 18:51 (D03)		20:31		20:26	19:44 9 19:18 (D02)		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			336	465				314	495			
Sun reduction			0.73	0.82				0.96	0.93			
Oper. time red.			1.00	1.00				1.00	1.00			
Wind dir. red.			0.70	0.62				0.58	0.70			
Total reduction			0.51	0.51				0.55	0.65			
Total, real			172	236				174	324			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 70 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (142)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March			April			May	June	July	August	September			October	November	December
1	07:32	07:19	06:43			06:52		18:29 (D03)	06:07	05:39	05:40	06:04	06:34			07:04	06:38	07:12
	16:50	17:23	17:57			19:31	28	18:57 (D03)	20:03	20:32	20:44	20:25	19:43			18:53	18:06	16:41
2	07:33	07:18	06:41			06:51		18:30 (D03)	06:06	05:38	05:40	06:05	06:35			07:05	06:39	07:13
	16:50	17:25	17:58			19:32	27	18:57 (D03)	20:04	20:33	20:43	20:24	19:41			18:51	17:05	16:41
3	07:33	07:17	06:40			06:49		18:30 (D03)	06:05	05:38	05:41	06:05	06:36			07:06	06:40	07:14
	16:51	17:26	18:00			19:33	25	18:55 (D03)	20:05	20:34	20:43	20:23	19:40			18:49	17:04	16:41
4	07:33	07:16	06:38			06:48		18:31 (D03)	06:03	05:38	05:41	06:06	06:37			07:07	06:41	07:15
	16:52	17:27	18:01			19:34	24	18:55 (D03)	20:06	20:34	20:43	20:22	19:38			18:48	17:02	16:40
5	07:33	07:15	06:37			06:46		18:32 (D03)	06:02	05:37	05:42	06:07	06:38		18:32 (D03)	07:08	06:43	07:16
	16:53	17:28	18:02			19:35	21	18:53 (D03)	20:07	20:35	20:43	20:21	19:36	12	18:44 (D03)	18:46	17:01	16:40
6	07:33	07:14	06:35			06:44		18:33 (D03)	06:01	05:37	05:42	06:08	06:39		18:29 (D03)	07:09	06:44	07:17
	16:54	17:30	18:03			19:36	17	18:50 (D03)	20:08	20:36	20:43	20:20	19:35	17	18:46 (D03)	18:44	17:00	16:40
7	07:33	07:13	06:34			06:43		18:36 (D03)	06:00	05:37	05:43	06:09	06:40		18:27 (D03)	07:10	06:45	07:18
	16:55	17:31	18:04			19:37	12	18:48 (D03)	20:09	20:36	20:43	20:19	19:33	21	18:48 (D03)	18:43	16:59	16:40
8	07:32	07:12	07:32			06:41			05:59	05:36	05:44	06:10	06:41		18:26 (D03)	07:11	06:46	07:19
	16:56	17:32	19:05			19:38			20:10	20:37	20:42	20:17	19:31	23	18:49 (D03)	18:41	16:58	16:40
9	07:32	07:10	07:30			06:39			05:57	05:36	05:44	06:11	06:42		18:24 (D03)	07:12	06:47	07:20
	16:57	17:33	19:06			19:40			20:11	20:38	20:42	20:16	19:30	25	18:49 (D03)	18:39	16:57	16:40
10	07:32	07:09	07:29			06:38			05:56	05:36	05:45	06:12	06:43		18:23 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07			19:41			20:12	20:38	20:42	20:15	19:28	27	18:50 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27			06:36			05:55	05:36	05:46	06:13	06:44		18:22 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09			19:42			20:13	20:39	20:41	20:14	19:26	28	18:50 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26			06:35			05:54	05:36	05:46	06:14	06:45		18:22 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10			19:43			20:14	20:39	20:41	20:12	19:25	28	18:50 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24			06:33			05:53	05:36	05:47	06:15	06:46		18:21 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11			19:44			20:15	20:40	20:40	20:11	19:23	29	18:50 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22			06:32			05:52	05:36	05:48	06:16	06:47		18:21 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12			19:45			20:16	20:40	20:40	20:10	19:21	29	18:50 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21			06:30			05:51	05:36	05:49	06:17	06:48		18:20 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13			19:46			20:17	20:41	20:39	20:08	19:20	29	18:49 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19			06:28			05:50	05:36	05:49	06:18	06:49		18:20 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14			19:47			20:18	20:41	20:39	20:07	19:18	29	18:49 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17			06:27			05:49	05:36	05:50	06:19	06:50		18:20 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15			19:48			20:19	20:41	20:38	20:06	19:16	28	18:48 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16			06:25			05:48	05:36	05:51	06:20	06:51		18:21 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16			19:49			20:20	20:42	20:37	20:04	19:15	26	18:47 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14			06:24			05:47	05:36	05:52	06:21	06:52		18:20 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17			19:50			20:21	20:42	20:37	20:03	19:13	25	18:45 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12			06:22			05:47	05:36	05:53	06:22	06:53		18:21 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18			19:51			20:22	20:42	20:36	20:01	19:11	22	18:43 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11		18:41 (D03)	06:21			05:46	05:36	05:53	06:23	06:54		18:22 (D03)	07:25	07:01	07:29
	17:10	17:48	19:19	12	18:53 (D03)	19:52			20:23	20:43	20:35	20:00	19:10	19	18:41 (D03)	18:21	16:46	16:42
22	07:27	06:53	07:09		18:37 (D03)	06:19			05:45	05:36	05:54	06:24	06:55		18:24 (D03)	07:26	07:03	07:29
	17:11	17:49	19:21	18	18:55 (D03)	19:53			20:24	20:43	20:35	19:58	19:08	15	18:39 (D03)	18:19	16:46	16:43
23	07:26	06:52	07:07		18:36 (D03)	06:18			05:44	05:37	05:55	06:25	06:56		18:28 (D03)	07:27	07:04	07:30
	17:12	17:50	19:22	21	18:57 (D03)	19:54			20:25	20:43	20:34	19:57	19:06	6	18:34 (D03)	18:18	16:45	16:43
24	07:26	06:50	07:06		18:34 (D03)	06:17			05:43	05:37	05:56	06:26	06:57			07:29	07:05	07:30
	17:14	17:51	19:23	24	18:58 (D03)	19:55			20:26	20:43	20:33	19:55	19:04			18:17	16:44	16:44
25	07:25	06:49	07:04		18:33 (D03)	06:15			05:43	05:37	05:57	06:27	06:58			07:30	07:06	07:30
	17:15	17:53	19:24	25	18:58 (D03)	19:56			20:26	20:43	20:32	19:54	19:03			18:15	16:44	16:45
26	07:24	06:48	07:02		18:31 (D03)	06:14			05:42	05:38	05:58	06:28	06:59			07:31	07:07	07:31
	17:16	17:54	19:25	28	18:59 (D03)	19:57			20:27	20:44	20:31	19:52	19:01			18:14	16:43	16:45
27	07:23	06:46	07:01		18:31 (D03)	06:12			05:41	05:38	05:59	06:29	07:00			07:32	07:08	07:31
	17:17	17:55	19:26	28	18:59 (D03)	19:58			20:28	20:44	20:30	19:51	18:59			18:12	16:43	16:46
28	07:22	06:45	06:59		18:30 (D03)	06:11			05:41	05:38	06:00	06:30	07:01			07:33	07:09	07:32
	17:18	17:56	19:27	29	18:59 (D03)	20:00			20:29	20:44	20:29	19:49	18:58			18:11	16:42	16:46
29	07:22		06:57		18:29 (D03)	06:10			05:40	05:39	06:01	06:31	07:02			07:34	07:10	07:32
	17:20		19:28	30	18:59 (D03)	20:01			20:30	20:44	20:28	19:48	18:56			18:10	16:42	16:47
30	07:21		06:56		18:30 (D03)	06:08			05:40	05:39	06:02	06:32	07:03			07:35	07:11	07:32
	17:21		19:29	29	18:59 (D03)	20:02			20:31	20:44	20:27	19:46	18:54			18:09	16:42	16:48
31	07:20		06:54		18:29 (D03)				05:39		06:03	06:33				07:37		07:32
	17:22		19:30	29	18:58 (D03)				20:31		20:26	19:44				18:07		16:49
Potential sun hours	298	297	369			398			448	452	458	428	375			346	298	288
Total, worst case				273			154							438				
Sun reduction				0.73			0.82							0.93				
Oper. time red.				1.00			1.00							1.00				
Wind dir. red.				0.69			0.69							0.69				
Total reduction				0.50			0.56							0.64				
Total, real				137			87							281				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 71 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (143)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:19 (D03)	06:07	05:39	05:40	06:04	06:34	18:57 (D02)	07:04	06:38	07:12
	16:50	17:23	17:57	19:31 16	18:35 (D03)	20:03	20:32	20:44	20:25	19:43 20	19:17 (D02)	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	18:23 (D03)	06:06	05:38	05:40	06:05	06:35	18:58 (D02)	07:05	06:39	07:13
	16:50	17:25	17:58	19:32 8	18:31 (D03)	20:04	20:33	20:44	20:24	19:41 17	19:15 (D02)	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49		06:05	05:38	05:41	06:05	06:36	18:59 (D02)	07:06	06:40	07:14
	16:51	17:26	18:00	19:33		20:05	20:34	20:43	20:23	19:40 14	19:13 (D02)	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48		06:03	05:38	05:41	06:06	06:37	19:02 (D02)	07:07	06:41	07:15
	16:52	17:27	18:01	19:34		20:06	20:34	20:43	20:22	19:38 8	19:10 (D02)	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46		06:02	05:37	05:42	06:07	06:38		07:08	06:43	07:16
	16:53	17:28	18:02	19:35		20:07	20:35	20:43	20:21	19:36		18:46	17:01	16:40
6	07:33	07:14	06:35	06:44		06:01	05:37	05:42	06:08	06:39		07:09	06:44	07:17
	16:54	17:30	18:03	19:36		20:08	20:36	20:43	20:20	19:35		18:44	17:00	16:40
7	07:33	07:13	06:34	06:43		06:00	05:37	05:43	06:09	06:40		07:10	06:45	07:18
	16:55	17:31	18:04	19:37		20:09	20:36	20:43	20:19	19:33		18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	19:05 (D02)	05:59	05:36	05:44	06:10	06:41		07:11	06:46	07:19
	16:56	17:32	19:05	19:38 8	19:13 (D02)	20:10	20:37	20:42	20:17	19:31		18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	19:02 (D02)	05:57	05:36	05:44	06:11	06:42		07:12	06:47	07:20
	16:57	17:33	19:06	19:40 13	19:15 (D02)	20:11	20:38	20:42	20:16	19:30		18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	19:00 (D02)	05:56	05:36	05:45	06:12	06:43	18:17 (D03)	07:13	06:48	07:21
	16:58	17:35	19:07	19:41 17	19:17 (D02)	20:12	20:38	20:42	20:15	19:28 7	18:24 (D03)	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	18:58 (D02)	05:55	05:36	05:46	06:13	06:44	18:13 (D03)	07:14	06:50	07:22
	16:59	17:36	19:09	19:42 20	19:18 (D02)	20:13	20:39	20:41	20:14	19:26 14	18:27 (D03)	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	18:58 (D02)	05:54	05:36	05:46	06:14	06:45	18:10 (D03)	07:15	06:51	07:23
	17:00	17:37	19:10	19:43 21	19:19 (D02)	20:14	20:39	20:41	20:12	19:25 19	18:29 (D03)	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	18:56 (D02)	05:53	05:36	05:47	06:15	06:46	18:08 (D03)	07:16	06:52	07:23
	17:01	17:38	19:11	19:44 23	19:19 (D02)	20:15	20:40	20:40	20:11	19:23 23	18:31 (D03)	18:33	16:53	16:40
14	07:31	07:04	07:22 18:27 (D03)	06:32	18:56 (D02)	05:52	05:36	05:48	06:16	06:47	18:06 (D03)	07:17	06:53	07:24
	17:02	17:39	19:12 12 18:39 (D03)	19:45 24	19:20 (D02)	20:16	20:40	20:40	20:10	19:21 26	18:32 (D03)	18:32	16:52	16:40
15	07:31	07:03	07:21 18:23 (D03)	06:30	18:55 (D02)	05:51	05:36	05:49	06:17	06:48	18:05 (D03)	07:19	06:54	07:25
	17:03	17:41	19:13 18 18:41 (D03)	19:46 24	19:19 (D02)	20:17	20:41	20:39	20:08	19:20 27	18:32 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19 18:21 (D03)	06:28	18:56 (D02)	05:50	05:36	05:49	06:18	06:49	18:04 (D03)	07:20	06:56	07:26
	17:04	17:42	19:14 22 18:43 (D03)	19:47 23	19:19 (D02)	20:18	20:41	20:39	20:07	19:18 29	18:33 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17 18:20 (D03)	06:27	18:55 (D02)	05:49	05:36	05:50	06:19	06:50	18:03 (D03)	07:21	06:57	07:26
	17:05	17:43	19:15 25 18:45 (D03)	19:48 23	19:18 (D02)	20:19	20:41	20:38	20:06	19:16 30	18:33 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16 18:18 (D03)	06:25	18:56 (D02)	05:48	05:36	05:51	06:20	06:51	18:02 (D03)	07:22	06:58	07:27
	17:07	17:44	19:16 27 18:45 (D03)	19:49 22	19:18 (D02)	20:20	20:42	20:37	20:04	19:15 31	18:33 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14 18:16 (D03)	06:24	18:55 (D02)	05:47	05:36	05:52	06:21 19:08 (D02)	06:52	18:00 (D03)	07:23	06:59	07:28
	17:08	17:46	19:17 29 18:45 (D03)	19:50 22	19:17 (D02)	20:21	20:42	20:37	20:03 6 19:14 (D02)	19:13 32	18:32 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12 18:16 (D03)	06:22	18:56 (D02)	05:47	05:36	05:53	06:22 19:05 (D02)	06:53	18:00 (D03)	07:24	07:00	07:28
	17:09	17:47	19:18 30 18:46 (D03)	19:51 20	19:16 (D02)	20:22	20:42	20:36	20:01 12 19:17 (D02)	19:11 32	18:32 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11 18:15 (D03)	06:21	18:57 (D02)	05:46	05:36	05:53	06:23 19:03 (D02)	06:54	18:00 (D03)	07:25	07:01	07:29
	17:10	17:48	19:19 31 18:46 (D03)	19:52 18	19:15 (D02)	20:23	20:43	20:35	20:00 16 19:19 (D02)	19:10 31	18:31 (D03)	18:21	16:46	16:42
22	07:27	06:53	07:09 18:14 (D03)	06:19	18:58 (D02)	05:45	05:36	05:54	06:24 19:01 (D02)	06:55	17:59 (D03)	07:26	07:03	07:29
	17:11	17:49	19:21 32 18:46 (D03)	19:53 15	19:13 (D02)	20:24	20:43	20:35	19:58 19 19:20 (D02)	19:08 32	18:31 (D03)	18:20	16:46	16:43
23	07:26	06:52	07:07 18:15 (D03)	06:18	19:00 (D02)	05:44	05:37	05:55	06:25 19:00 (D02)	06:56	17:59 (D03)	07:27	07:04	07:30
	17:12	17:50	19:22 31 18:46 (D03)	19:54 11	19:11 (D02)	20:25	20:43	20:34	19:57 20 19:20 (D02)	19:06 31	18:30 (D03)	18:18	16:45	16:43
24	07:26	06:50	07:06 18:14 (D03)	06:17	19:04 (D02)	05:43	05:37	05:56	06:26 18:59 (D02)	06:57	18:00 (D03)	07:29	07:05	07:30
	17:14	17:51	19:23 32 18:46 (D03)	19:55 3	19:07 (D02)	20:26	20:43	20:33	19:55 22 19:21 (D02)	19:04 29	18:29 (D03)	18:17	16:44	16:44
25	07:25	06:49	07:04 18:14 (D03)	06:15		05:43	05:37	05:57	06:27 18:58 (D02)	06:58	18:00 (D03)	07:30	07:06	07:31
	17:15	17:53	19:24 31 18:45 (D03)	19:56		20:26	20:43	20:32	19:54 23 19:21 (D02)	19:03 28	18:28 (D03)	18:15	16:44	16:45
26	07:24	06:48	07:02 18:13 (D03)	06:14		05:42	05:38	05:58	06:28 18:58 (D02)	06:59	18:01 (D03)	07:31	07:07	07:31
	17:16	17:54	19:25 31 18:44 (D03)	19:57		20:27	20:44	20:31	19:52 23 19:21 (D02)	19:01 25	18:26 (D03)	18:14	16:43	16:45
27	07:23	06:46	07:01 18:14 (D03)	06:12		05:41	05:38	05:59	06:29 18:57 (D02)	07:00	18:02 (D03)	07:32	07:08	07:31
	17:17	17:55	19:26 30 18:44 (D03)	19:58		20:28	20:44	20:30	19:51 24 19:21 (D02)	18:59 23	18:25 (D03)	18:12	16:43	16:46
28	07:22	06:45	06:59 18:15 (D03)	06:11		05:41	05:38	06:00	06:30 18:57 (D02)	07:01	18:03 (D03)	07:33	07:09	07:32
	17:18	17:56	19:27 27 18:42 (D03)	20:00		20:29	20:44	20:29	19:49 24 19:21 (D02)	18:58 20	18:23 (D03)	18:11	16:42	16:46
29	07:22		06:57 18:15 (D03)	06:10		05:40	05:39	06:01	06:31 18:57 (D02)	07:02	18:05 (D03)	07:34	07:10	07:32
	17:20		19:28 26 18:41 (D03)	20:01		20:30	20:44	20:28	19:48 23 19:20 (D02)	18:56 15	18:20 (D03)	18:10	16:42	16:47
30	07:21		06:56 18:17 (D03)	06:08		05:40	05:39	06:02	06:32 18:57 (D02)	07:03	18:09 (D03)	07:35	07:11	07:32
	17:21		19:29 23 18:40 (D03)	20:02		20:31	20:44	20:27	19:46 23 19:20 (D02)	18:54 7	18:16 (D03)	18:09	16:42	16:48
31	07:20		06:54 18:17 (D03)			05:39		06:03	06:33 18:57 (D02)			07:37		07:32
	17:22		19:30 20 18:37 (D03)			20:31		20:26	19:44 21 19:18 (D02)			18:07		16:49
Potential sun hours	298	297	369	398		448	452	458	428	375		346	298	288
Total, worst case			477	331					256	570				
Sun reduction			0.73	0.82					0.96	0.93				
Oper. time red.			1.00	1.00					1.00	1.00				
Wind dir. red.			0.73	0.61					0.60	0.71				
Total reduction			0.53	0.50					0.57	0.66				
Total, real			254	165					147	379				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688
Jacob Runner / jrunner@edrdpc.com
Calculated:
4/27/2020 10:38 PM/3.3.274

SHADOW - Calendar

Shadow receptor: 72 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (144)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:15 (D03)	06:07	05:39	05:40	06:04	06:34	18:56 (D02)	07:04	17:57 (D03)	06:38	07:12
	16:50	17:23	17:57	19:31 14	18:29 (D03)	20:03	20:32	20:44	20:25	19:43 20	19:16 (D02)	18:53 18	18:15 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	18:21 (D03)	06:06	05:38	05:40	06:05	06:35	18:57 (D02)	07:05	17:59 (D03)	06:39	07:13
	16:50	17:25	17:58	19:32 1	18:22 (D03)	20:04	20:33	20:44	20:24	19:41 18	19:15 (D02)	18:51 13	18:12 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49		06:05	05:38	05:41	06:05	06:36	18:59 (D02)	07:06		06:40	07:14
	16:51	17:26	18:00	19:33		20:05	20:34	20:43	20:23	19:40 14	19:13 (D02)	18:49		17:04	16:41
4	07:33	07:16	06:38	06:48		06:03	05:38	05:41	06:06	06:37	19:02 (D02)	07:07		06:41	07:15
	16:52	17:27	18:01	19:34		20:06	20:34	20:43	20:22	19:38 7	19:09 (D02)	18:48		17:02	16:40
5	07:33	07:15	06:37	06:46		06:02	05:37	05:42	06:07	06:38		07:08		06:43	07:16
	16:53	17:28	18:02	19:35		20:07	20:35	20:43	20:21	19:36		18:46		17:01	16:40
6	07:33	07:14	06:35	06:44		06:01	05:37	05:42	06:08	06:39		07:09		06:44	07:17
	16:54	17:30	18:03	19:36		20:08	20:36	20:43	20:20	19:35		18:44		17:00	16:40
7	07:33	07:13	06:34	06:43		06:00	05:37	05:43	06:09	06:40		07:10		06:45	07:18
	16:55	17:31	18:04	19:37		20:09	20:36	20:43	20:19	19:33		18:43		16:59	16:40
8	07:32	07:12	07:32	06:41	19:05 (D02)	05:59	05:36	05:44	06:10	06:41		07:11		06:46	07:19
	16:56	17:32	19:05	19:38 7	19:12 (D02)	20:10	20:37	20:42	20:17	19:31		18:41		16:58	16:40
9	07:32	07:10	07:30	06:39	19:01 (D02)	05:57	05:36	05:44	06:11	06:42		07:12		06:47	07:20
	16:57	17:33	19:06	19:40 14	19:15 (D02)	20:11	20:38	20:42	20:16	19:30		18:39		16:57	16:40
10	07:32	07:09	07:29	06:38	18:59 (D02)	05:56	05:36	05:45	06:12	06:43		07:13		06:48	07:21
	16:58	17:35	19:07	19:41 18	19:17 (D02)	20:12	20:38	20:42	20:15	19:28		18:38		16:56	16:40
11	07:32	07:08	07:27 18:24 (D03)	06:36	18:57 (D02)	05:55	05:36	05:46	06:13	06:44	18:08 (D03)	07:14		06:50	07:22
	16:59	17:36	19:09 8 18:32 (D03)	19:42 20	19:17 (D02)	20:13	20:39	20:41	20:14	19:26 13	18:21 (D03)	18:36		16:55	16:40
12	07:32	07:07	07:26 18:19 (D03)	06:35	18:57 (D02)	05:54	05:36	05:46	06:14	06:45	18:05 (D03)	07:15		06:51	07:23
	17:00	17:37	19:10 17 18:36 (D03)	19:43 22	19:19 (D02)	20:14	20:39	20:41	20:12	19:25 19	18:24 (D03)	18:35		16:54	16:40
13	07:31	07:06	07:24 18:16 (D03)	06:33	18:55 (D02)	05:53	05:36	05:47	06:15	06:46	18:02 (D03)	07:16		06:52	07:23
	17:01	17:38	19:11 22 18:38 (D03)	19:44 24	19:19 (D02)	20:15	20:40	20:40	20:11	19:23 23	18:25 (D03)	18:33		16:53	16:40
14	07:31	07:04	07:22 18:15 (D03)	06:32	18:55 (D02)	05:52	05:36	05:48	06:16	06:47	18:00 (D03)	07:17		06:53	07:24
	17:02	17:39	19:12 25 18:40 (D03)	19:45 25	19:20 (D02)	20:16	20:40	20:40	20:10	19:21 26	18:26 (D03)	18:32		16:52	16:40
15	07:31	07:03	07:21 18:13 (D03)	06:30	18:54 (D02)	05:51	05:36	05:49	06:17	06:48	17:59 (D03)	07:19		06:54	07:25
	17:03	17:41	19:13 28 18:41 (D03)	19:46 25	19:19 (D02)	20:17	20:41	20:39	20:08	19:20 28	18:27 (D03)	18:30		16:51	16:41
16	07:30	07:02	07:19 18:11 (D03)	06:28	18:54 (D02)	05:50	05:36	05:49	06:18	06:49	17:57 (D03)	07:20		06:56	07:26
	17:04	17:42	19:14 30 18:41 (D03)	19:47 26	19:20 (D02)	20:18	20:41	20:39	20:07	19:18 31	18:28 (D03)	18:28		16:50	16:41
17	07:30	07:00	07:17 18:11 (D03)	06:27	18:53 (D02)	05:49	05:36	05:50	06:19	06:50	17:56 (D03)	07:21		06:57	07:26
	17:05	17:43	19:15 31 18:42 (D03)	19:48 26	19:19 (D02)	20:19	20:41	20:38	20:06	19:16 32	18:28 (D03)	18:27		16:49	16:41
18	07:29	06:59	07:16 18:09 (D03)	06:25	18:54 (D02)	05:48	05:36	05:51	06:20 19:05 (D02)	06:51	17:55 (D03)	07:22		06:58	07:27
	17:07	17:44	19:16 33 18:42 (D03)	19:49 25	19:19 (D02)	20:20	20:42	20:37	20:04 11 19:16 (D02)	19:15 33	18:28 (D03)	18:25		16:48	16:41
19	07:29	06:58	07:14 18:08 (D03)	06:24	18:53 (D02)	05:47	05:36	05:52	06:21 19:03 (D02)	06:52	17:53 (D03)	07:23		06:59	07:28
	17:08	17:46	19:17 34 18:42 (D03)	19:50 25	19:18 (D02)	20:21	20:42	20:37	20:03 15 19:18 (D02)	19:13 35	18:28 (D03)	18:24		16:48	16:42
20	07:28	06:56	07:12 18:08 (D03)	06:22	18:54 (D02)	05:47	05:36	05:53	06:22 19:01 (D02)	06:53	17:53 (D03)	07:24		07:00	07:28
	17:09	17:47	19:18 35 18:43 (D03)	19:51 24	19:18 (D02)	20:22	20:42	20:36	20:01 18 19:19 (D02)	19:11 34	18:27 (D03)	18:22		16:47	16:42
21	07:28	06:55	07:11 18:08 (D03)	06:21	18:54 (D02)	05:46	05:36	05:54	06:23 19:00 (D02)	06:54	17:52 (D03)	07:25		07:01	07:29
	17:10	17:48	19:19 34 18:42 (D03)	19:52 22	19:16 (D02)	20:23	20:43	20:35	20:00 20 19:20 (D02)	19:10 35	18:27 (D03)	18:21		16:46	16:43
22	07:27	06:53	07:09 18:07 (D03)	06:19	18:55 (D02)	05:45	05:36	05:54	06:24 18:59 (D02)	06:55	17:52 (D03)	07:26		07:03	07:29
	17:11	17:49	19:21 35 18:42 (D03)	19:53 20	19:15 (D02)	20:24	20:43	20:35	19:58 22 19:21 (D02)	19:08 35	18:27 (D03)	18:20		16:46	16:43
23	07:26	06:52	07:07 18:07 (D03)	06:18	18:56 (D02)	05:44	05:37	05:55	06:25 18:58 (D02)	06:56	17:52 (D03)	07:27		07:04	07:30
	17:12	17:50	19:22 35 18:42 (D03)	19:54 17	19:13 (D02)	20:25	20:43	20:34	19:57 23 19:21 (D02)	19:06 34	18:26 (D03)	18:18		16:45	16:43
24	07:26	06:50	07:06 18:07 (D03)	06:17	18:57 (D02)	05:43	05:37	05:56	06:26 18:57 (D02)	06:57	17:52 (D03)	07:29		07:05	07:30
	17:14	17:51	19:23 34 18:41 (D03)	19:55 15	19:12 (D02)	20:26	20:43	20:33	19:55 25 19:22 (D02)	19:04 34	18:26 (D03)	18:17		16:44	16:44
25	07:25	06:49	07:04 18:07 (D03)	06:15	19:00 (D02)	05:43	05:37	05:57	06:27 18:57 (D02)	06:58	17:52 (D03)	07:30		07:06	07:31
	17:15	17:53	19:24 33 18:40 (D03)	19:56 10	19:10 (D02)	20:26	20:43	20:32	19:54 25 19:22 (D02)	19:03 33	18:25 (D03)	18:15		16:44	16:45
26	07:24	06:48	07:02 18:07 (D03)	06:14		05:42	05:38	05:58	06:28 18:56 (D02)	06:59	17:52 (D03)	07:31		07:07	07:31
	17:16	17:54	19:25 32 18:39 (D03)	19:57		20:27	20:44	20:31	19:52 26 19:22 (D02)	19:01 32	18:24 (D03)	18:14		16:43	16:45
27	07:23	06:46	07:01 18:08 (D03)	06:12		05:41	05:38	05:59	06:29 18:56 (D02)	07:00	17:52 (D03)	07:32		07:08	07:31
	17:17	17:55	19:26 31 18:39 (D03)	19:59		20:28	20:44	20:30	19:51 25 19:21 (D02)	18:59 31	18:23 (D03)	18:13		16:43	16:46
28	07:22	06:45	06:59 18:08 (D03)	06:11		05:41	05:38	06:00	06:30 18:56 (D02)	07:01	17:53 (D03)	07:33		07:09	07:32
	17:18	17:56	19:27 29 18:37 (D03)	20:00		20:29	20:44	20:29	19:49 25 19:21 (D02)	18:58 28	18:21 (D03)	18:11		16:42	16:46
29	07:22		06:57 18:09 (D03)	06:10		05:40	05:39	06:01	06:31 18:56 (D02)	07:02	17:54 (D03)	07:34		07:10	07:32
	17:20		19:28 26 18:35 (D03)	20:01		20:30	20:44	20:28	19:48 24 19:20 (D02)	18:56 26	18:20 (D03)	18:10		16:42	16:47
30	07:21		06:56 18:11 (D03)	06:08		05:40	05:39	06:02	06:32 18:56 (D02)	07:03	17:55 (D03)	07:35		07:11	07:32
	17:21		19:29 23 18:34 (D03)	20:02		20:31	20:44	20:27	19:46 24 19:20 (D02)	18:54 23	18:18 (D03)	18:09		16:42	16:48
31	07:20		06:54 18:12 (D03)			05:39		06:03	06:33 18:57 (D02)			07:37			07:32
	17:22		19:30 20 18:32 (D03)			20:31		20:26	19:45 22 19:19 (D02)			18:07			16:49
Potential sun hours	298	297	369	398		448	452	458	428	375		346		298	288
Total, worst case			595	380					305	644		31			
Sun reduction			0.73	0.82					0.96	0.93		0.84			
Oper. time red.			1.00	1.00					1.00	1.00		1.00			
Wind dir. red.			0.74	0.60					0.60	0.72		0.74			
Total reduction			0.54	0.49					0.57	0.68		0.62			
Total, real			321	188					175	435		19			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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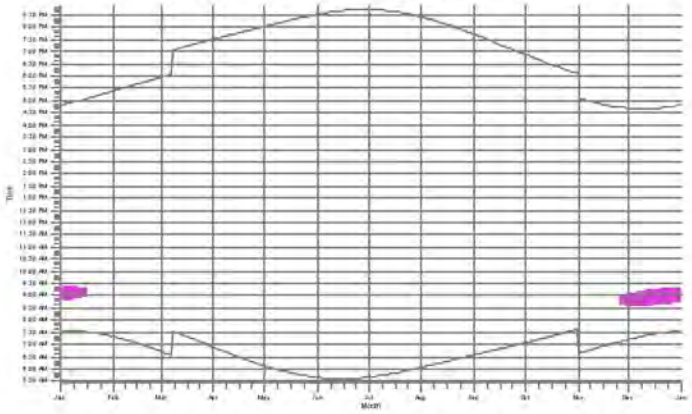
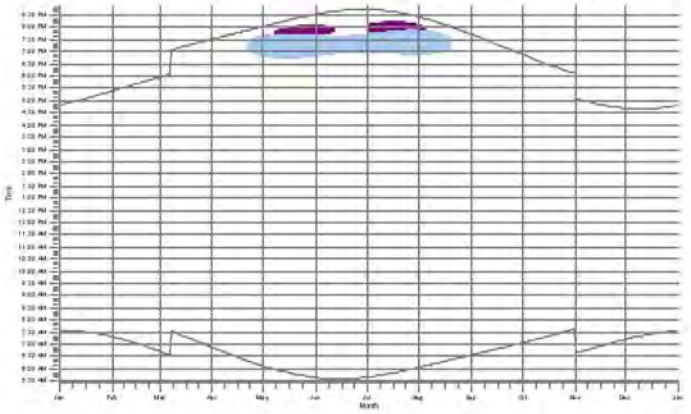
SHADOW - Calendar, graphical

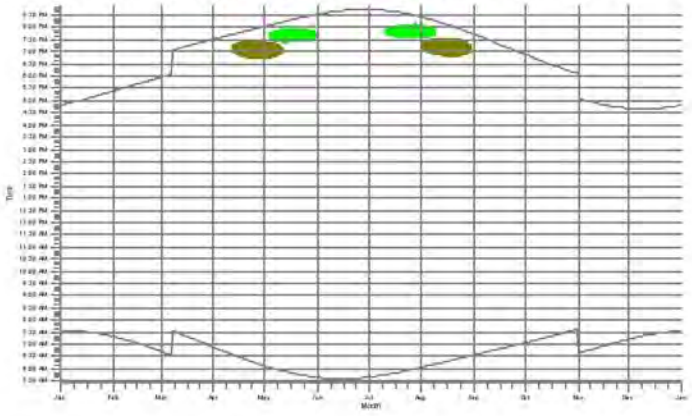
1: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (76)



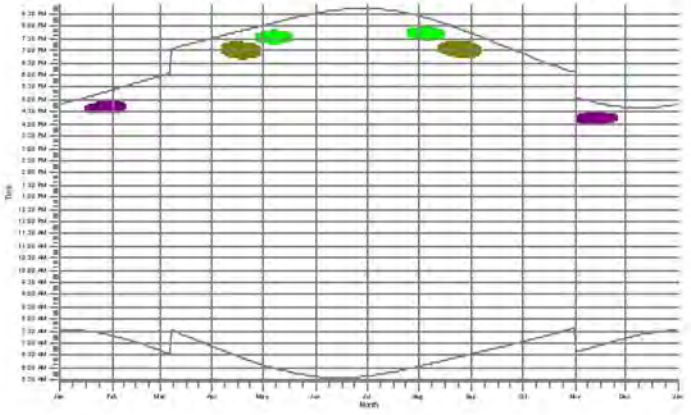
2: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (77)



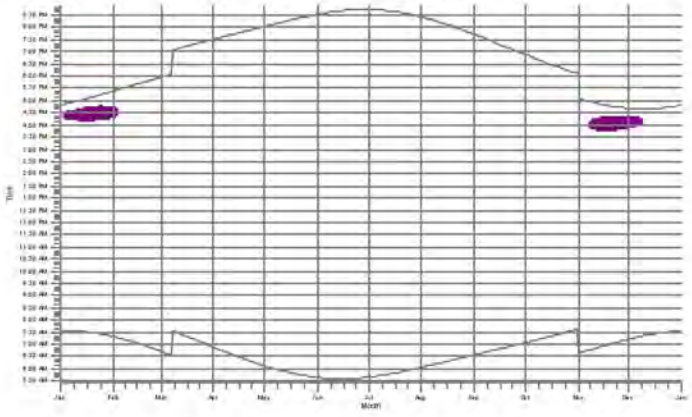
3: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (78)



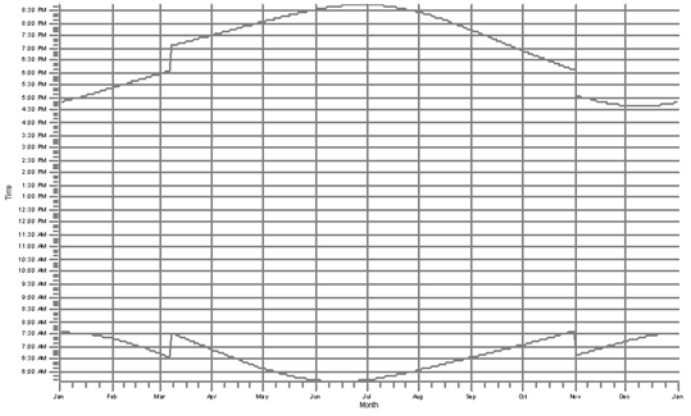
4: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)



5: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (80)



6: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (81)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)
D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)
D04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (78)
D05: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (82)
L04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (102)

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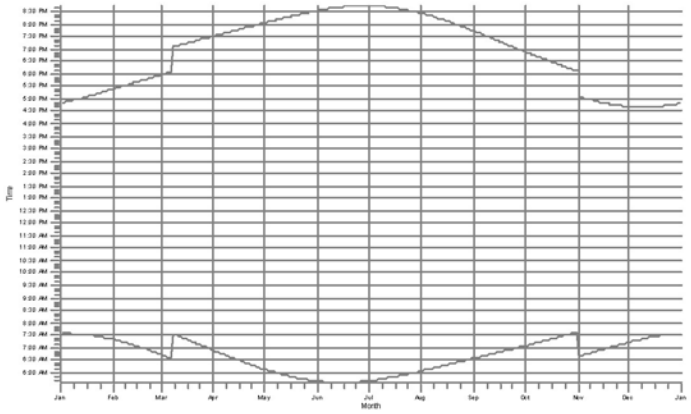
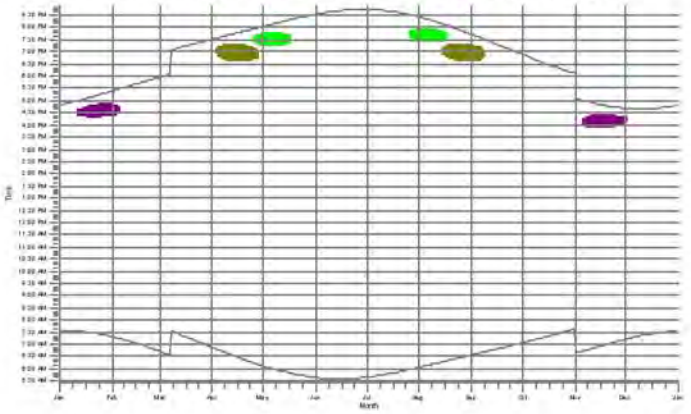
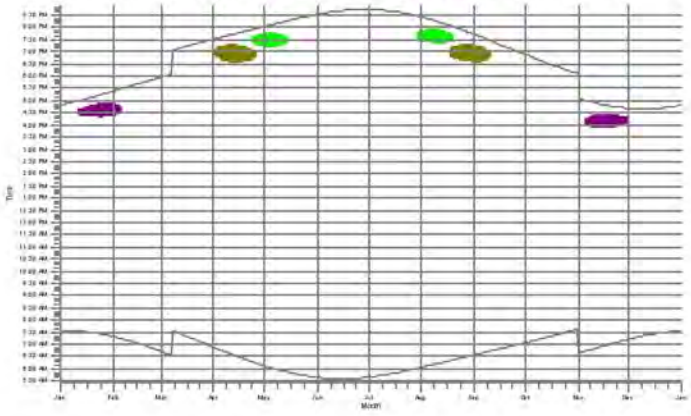
7: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (82)



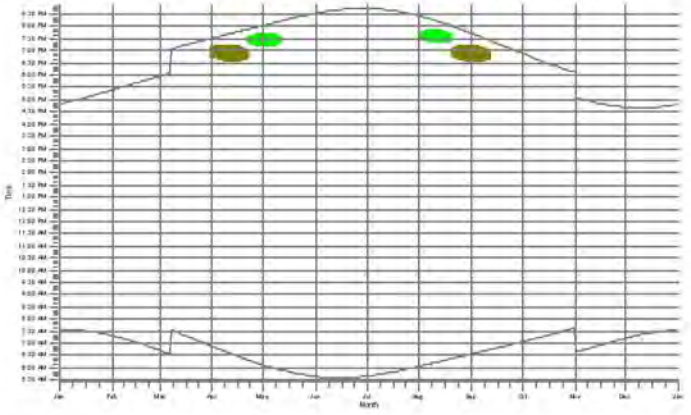
8: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)



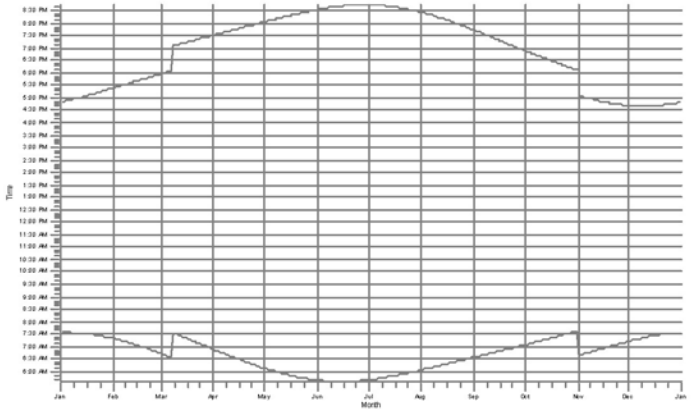
9: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)



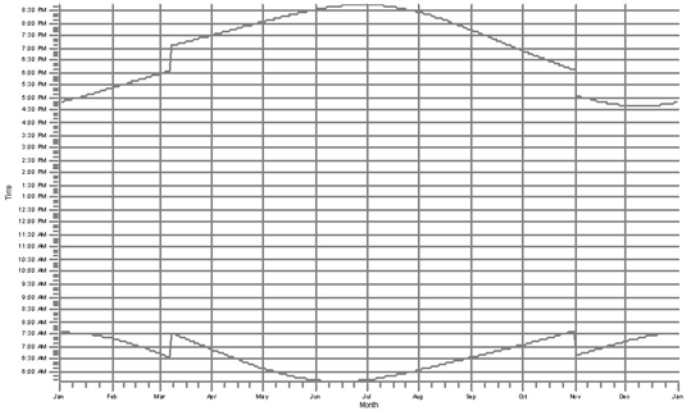
10: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (85)



11: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (86)



12: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (87)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

D04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (78)

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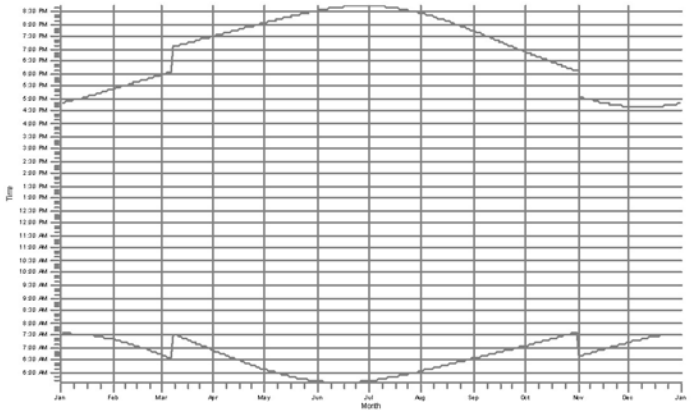
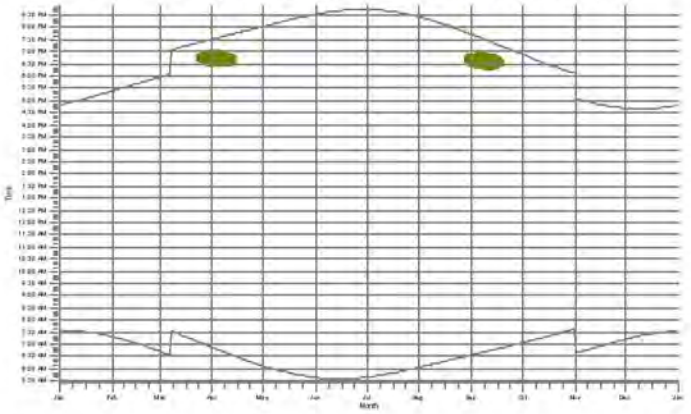
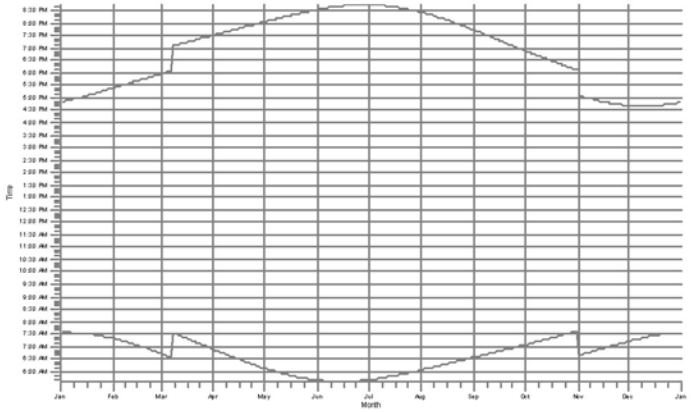
13: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (88)



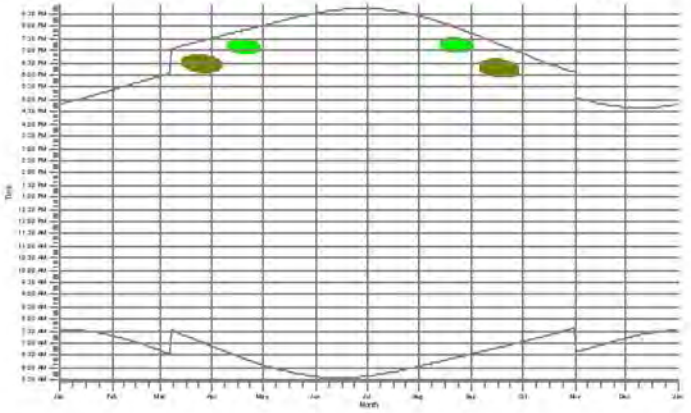
14: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (89)



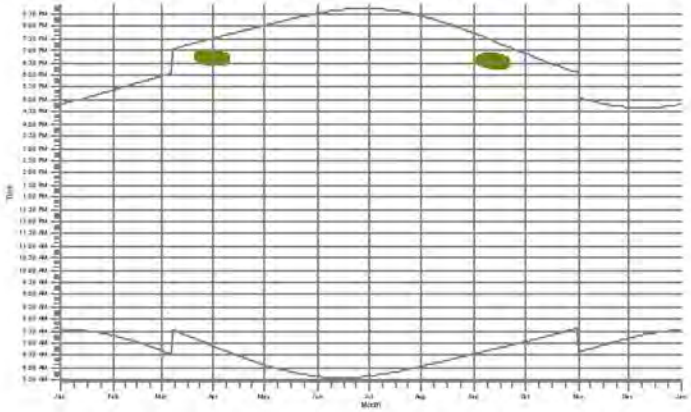
15: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (90)



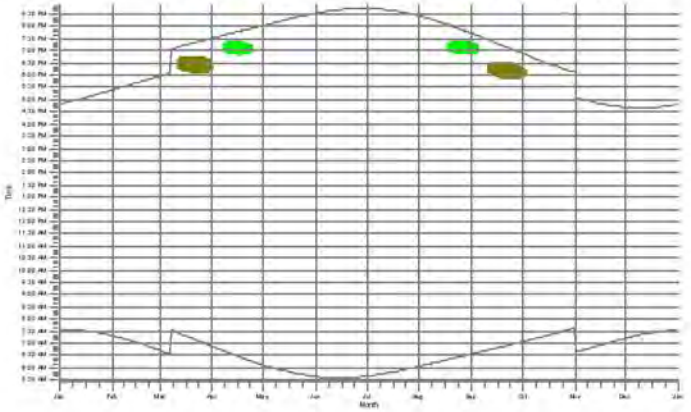
16: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (91)



17: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (92)



18: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (93)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

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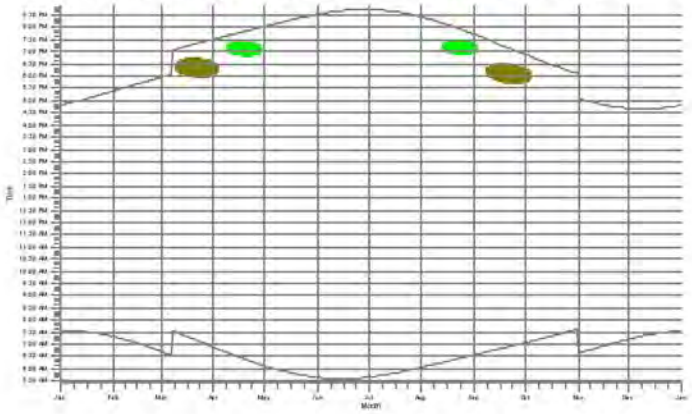
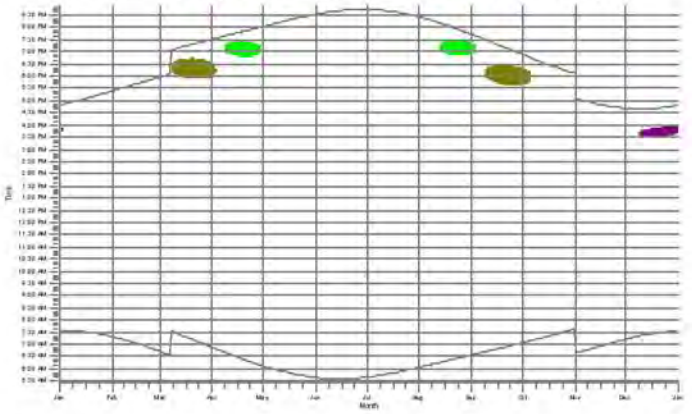
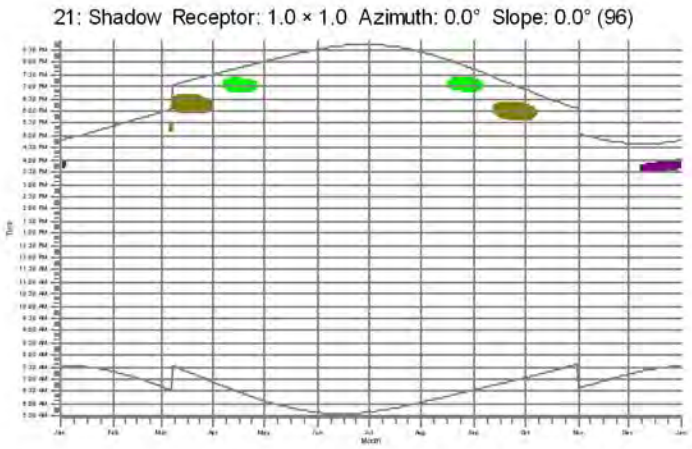
19: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (94)



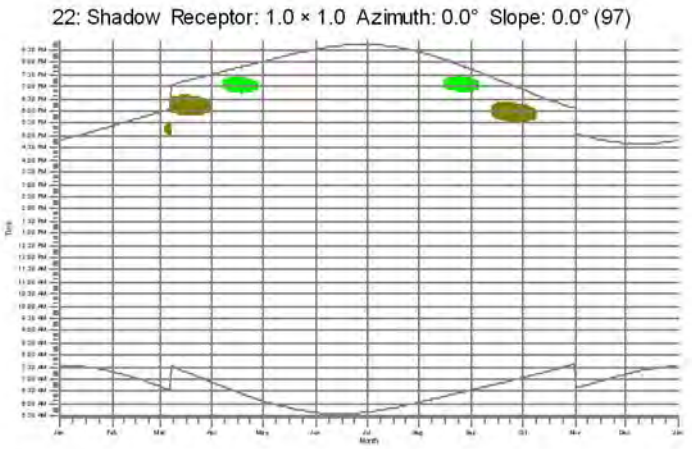
20: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)



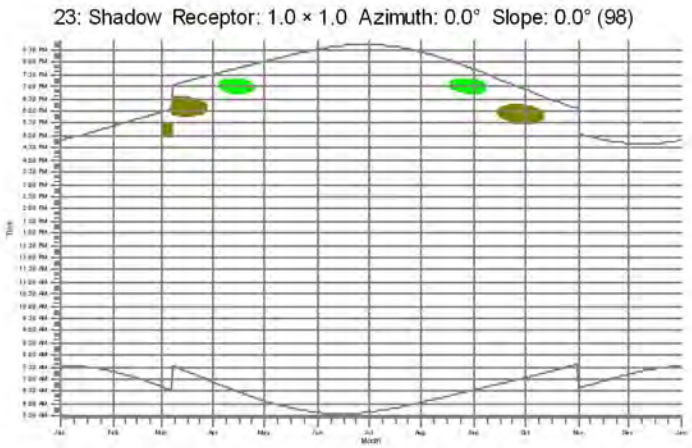
21: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)



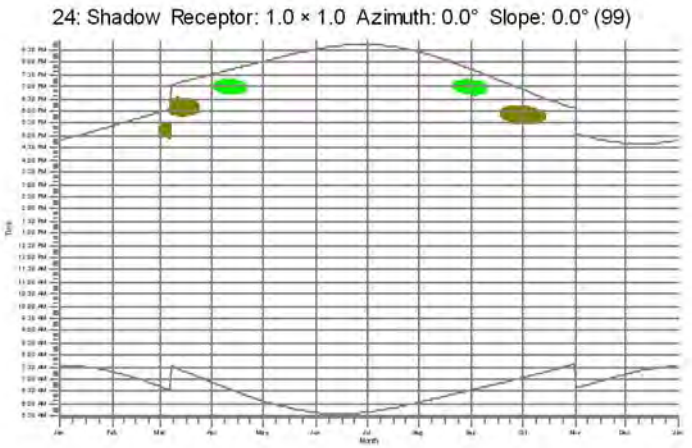
22: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (97)



23: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (98)



24: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (99)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

D04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (78)

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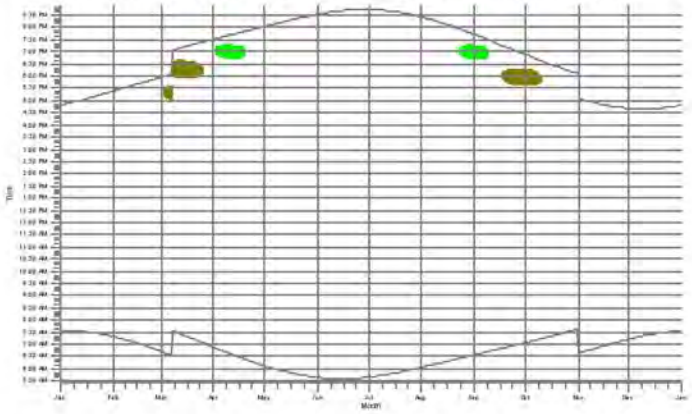
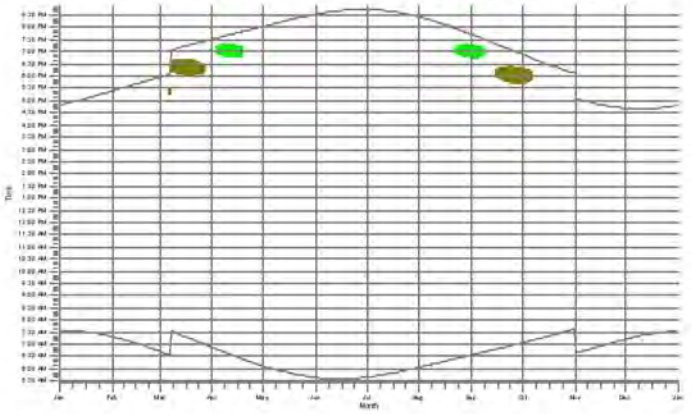
SHADOW - Calendar, graphical

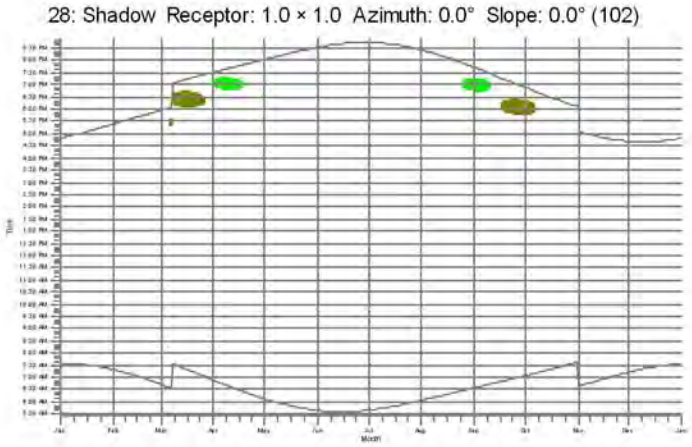
25: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (100)



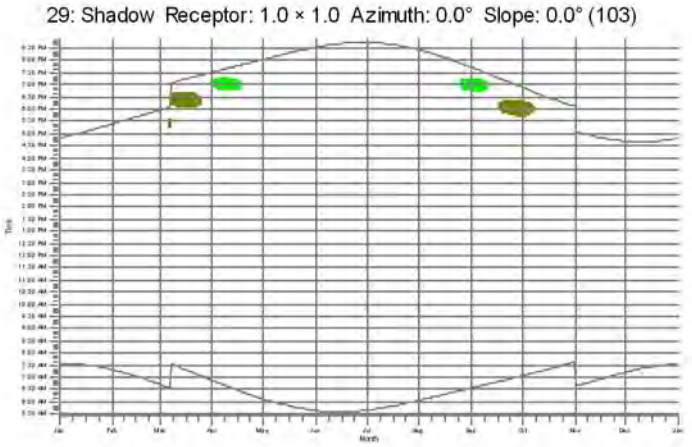
26: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (101)



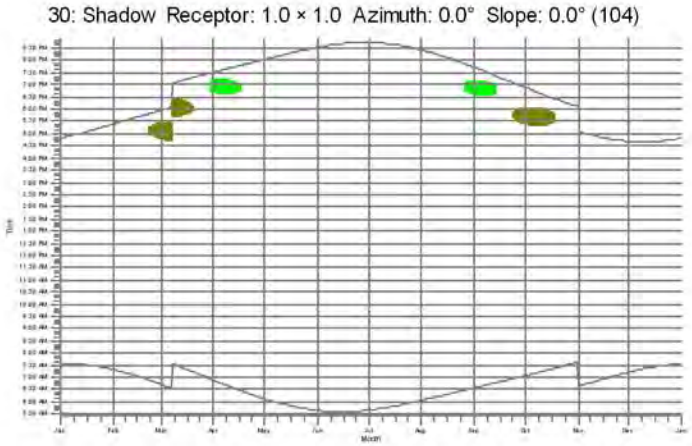
28: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (102)



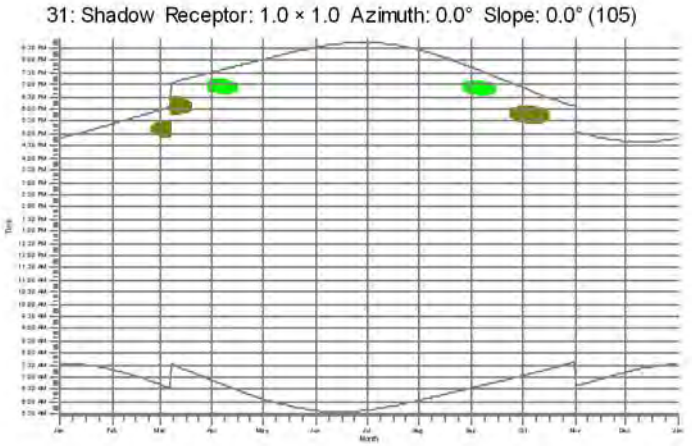
29: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (103)



30: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)



31: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

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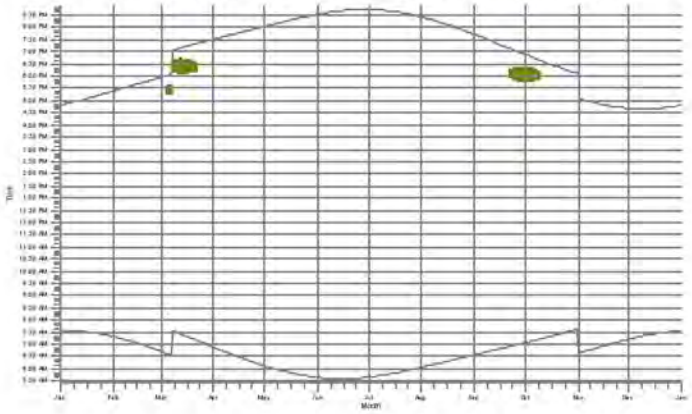
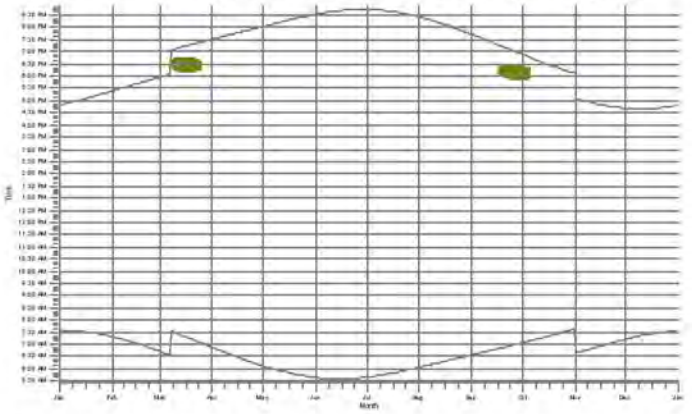
SHADOW - Calendar, graphical

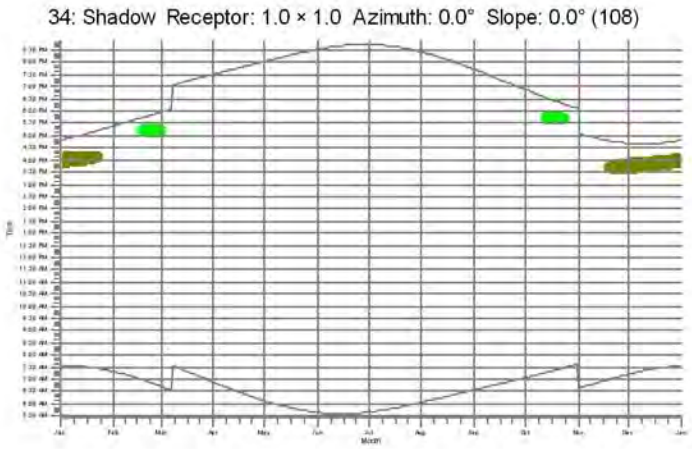
32: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (106)



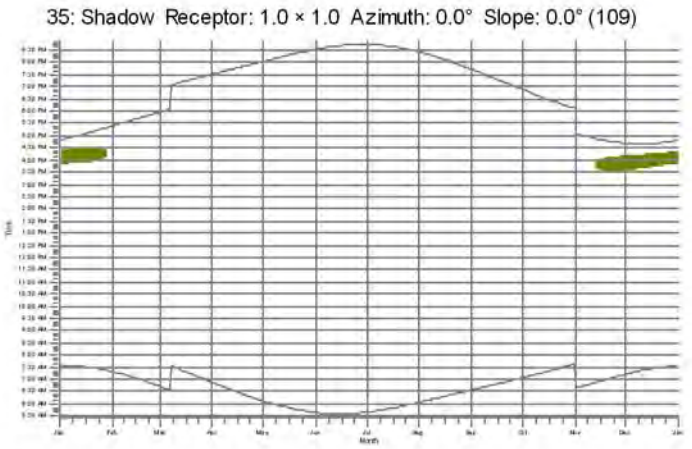
33: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (107)



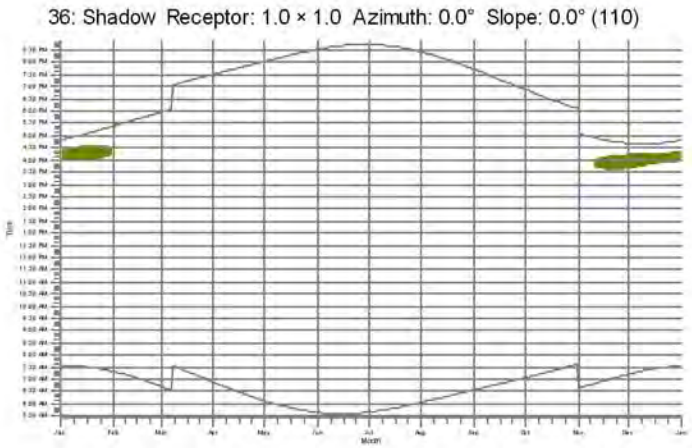
34: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)



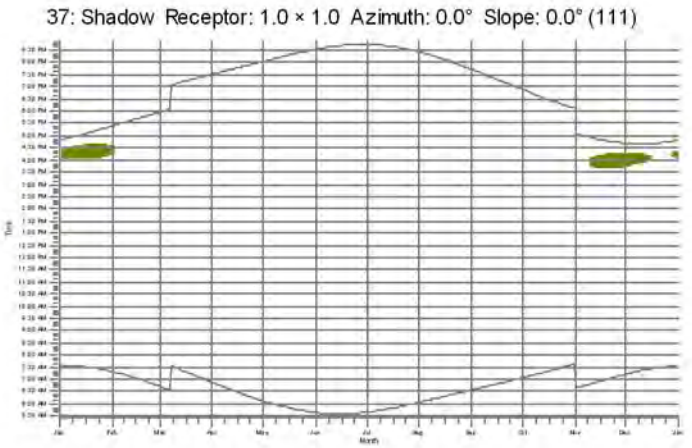
35: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (109)



36: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (110)



37: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (111)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

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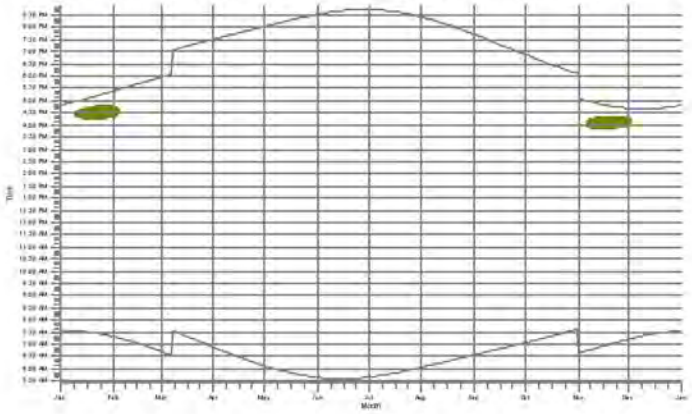
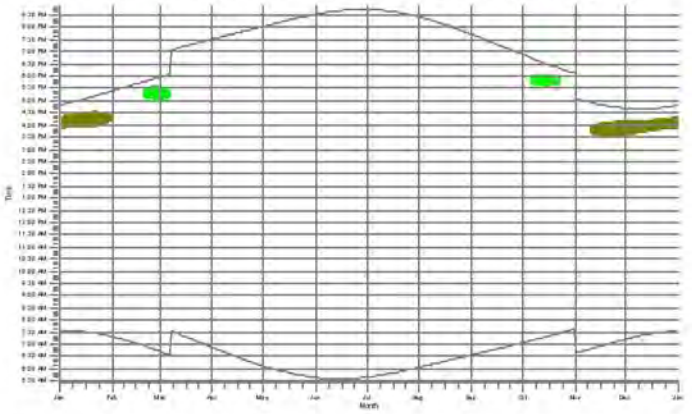
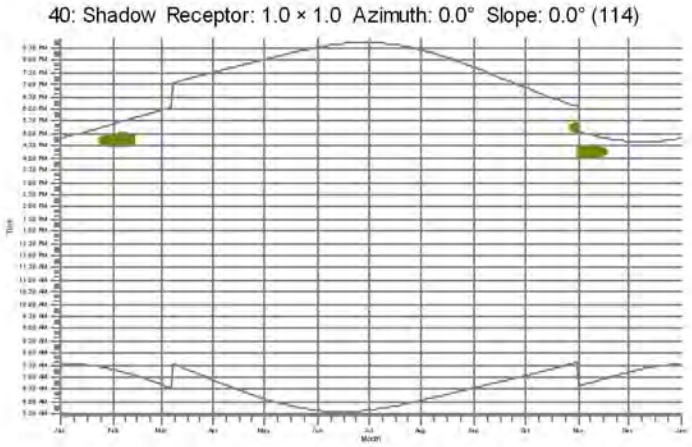
38: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (112)



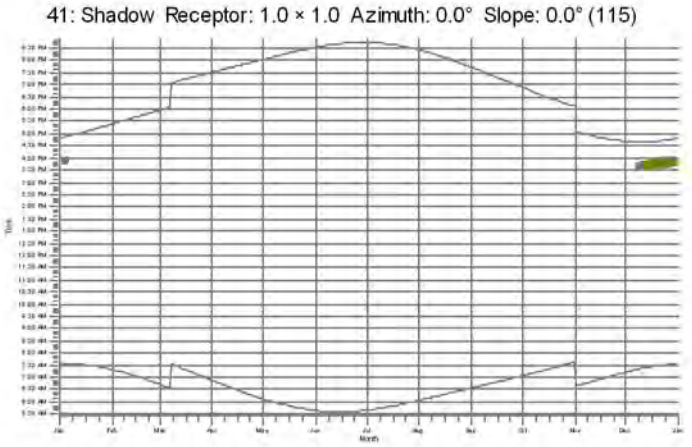
39: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (113)



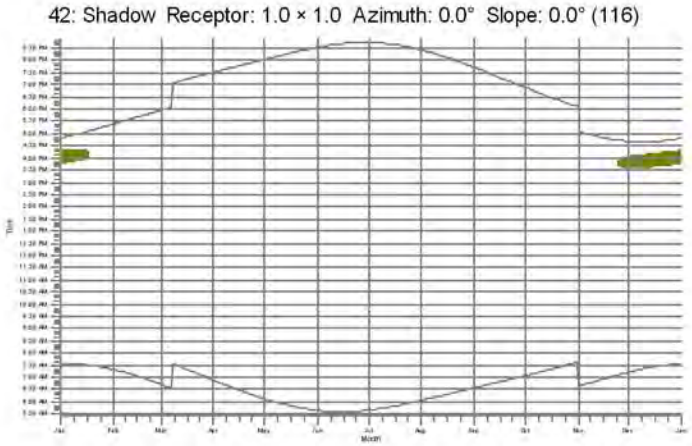
40: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (114)



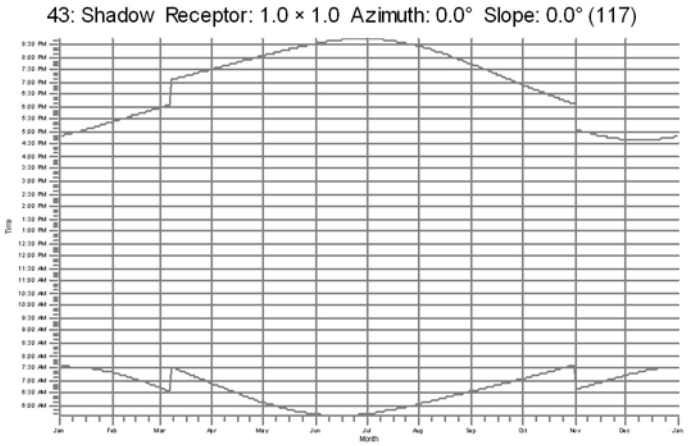
41: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (115)



42: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (116)



43: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (117)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

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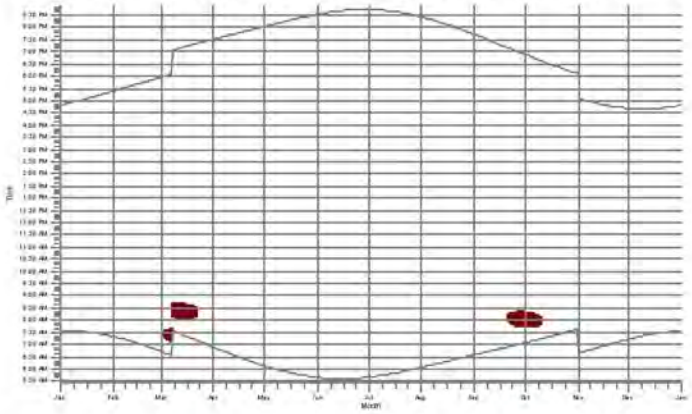
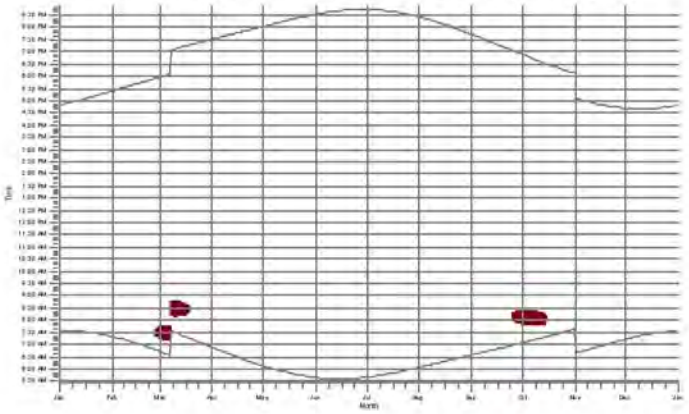
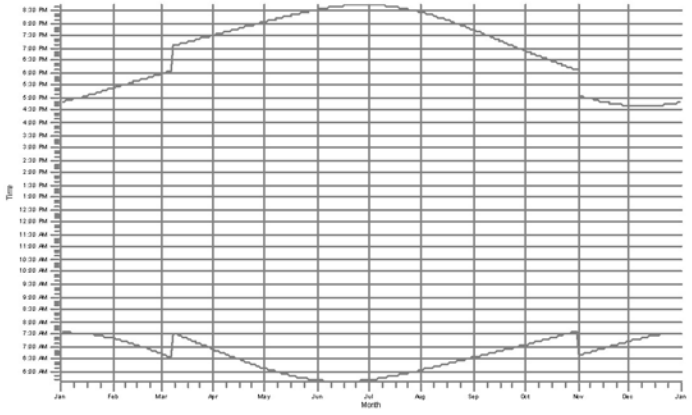
44: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (118)



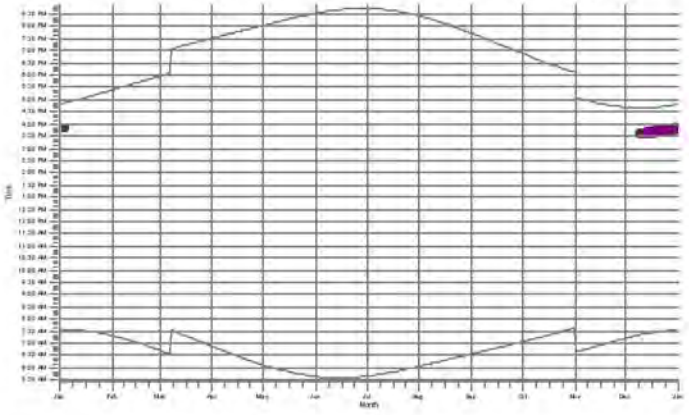
45: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (119)



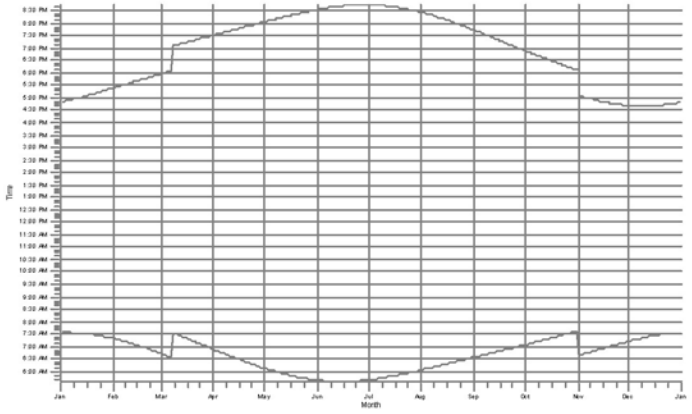
46: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (120)



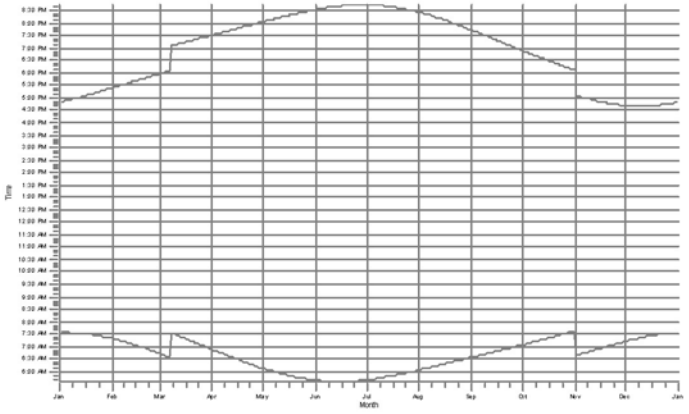
47: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (121)



48: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (122)



49: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (123)



WTGs

D01: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (75)

D04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (78)

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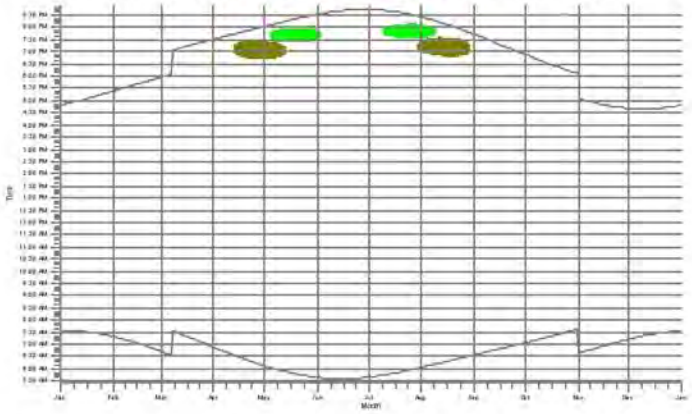
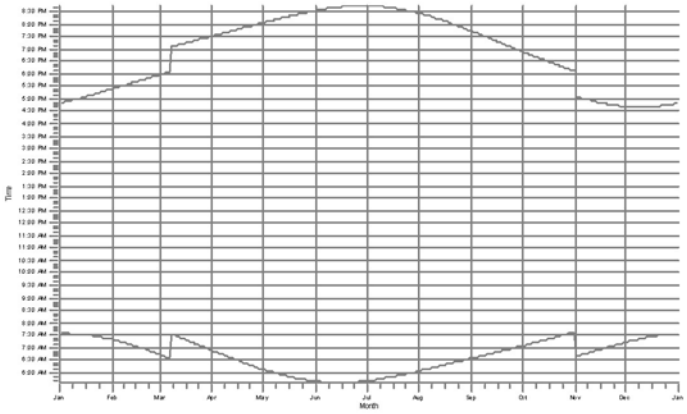
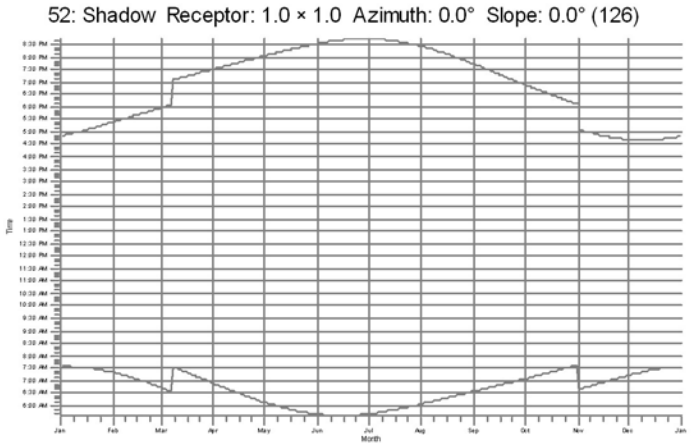
50: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (124)



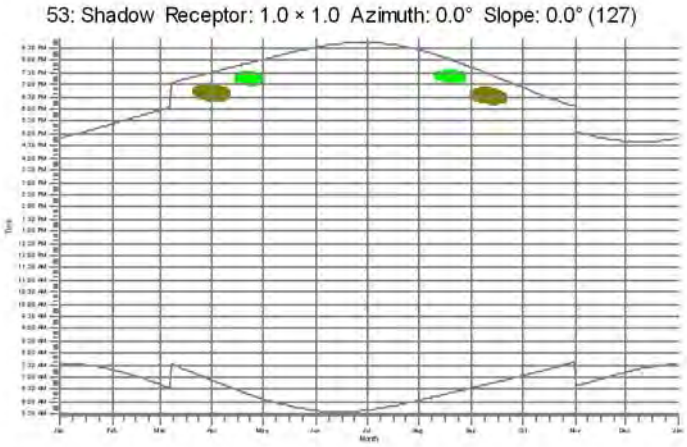
51: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (125)



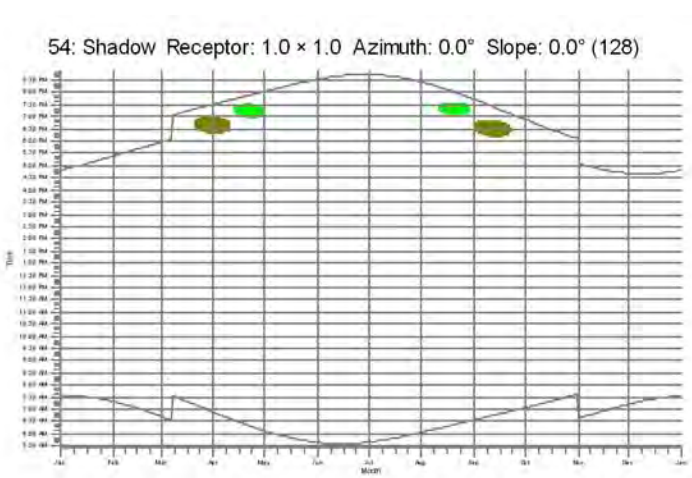
52: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (126)



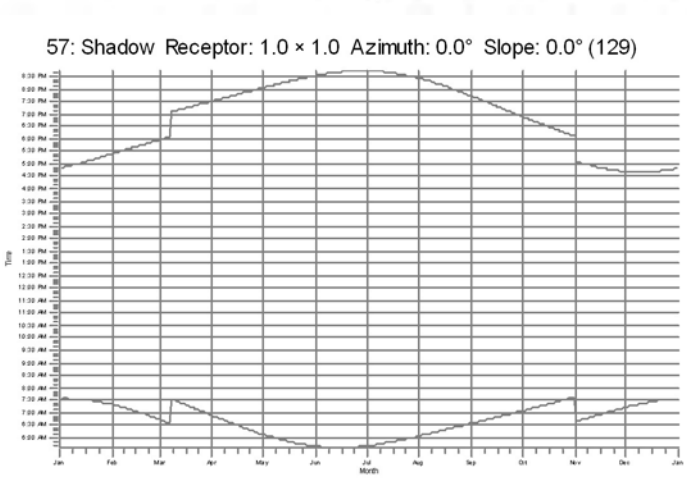
53: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (127)



54: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (128)



57: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (129)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)

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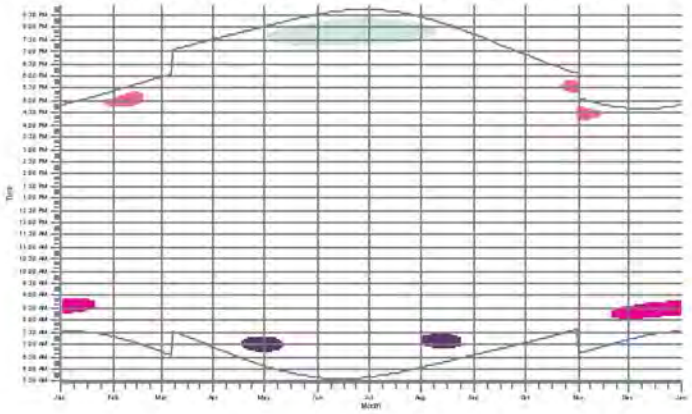
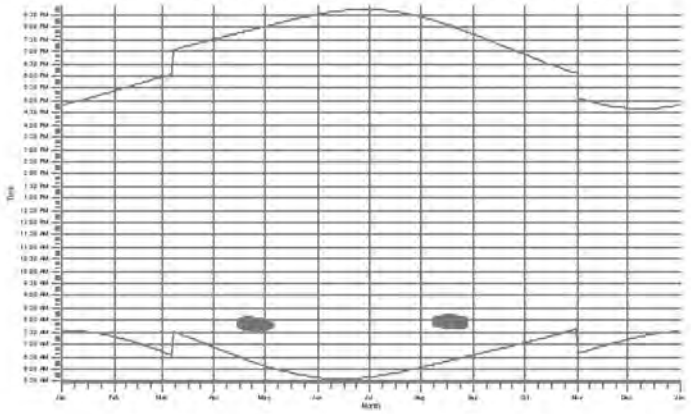
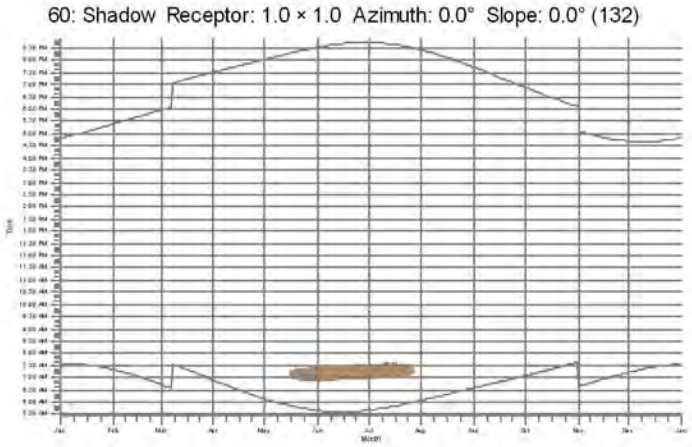
58: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (130)



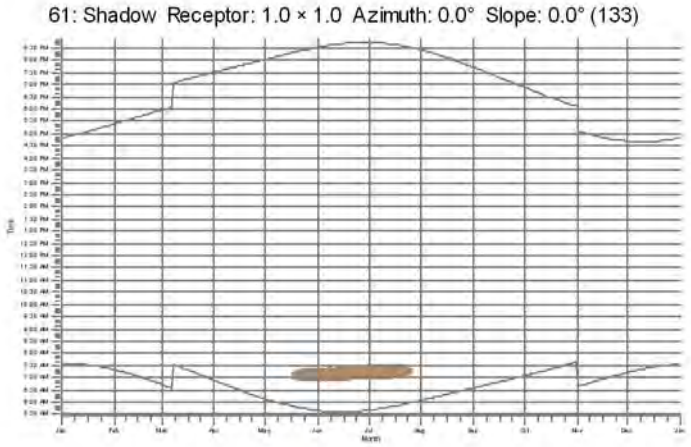
59: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (131)



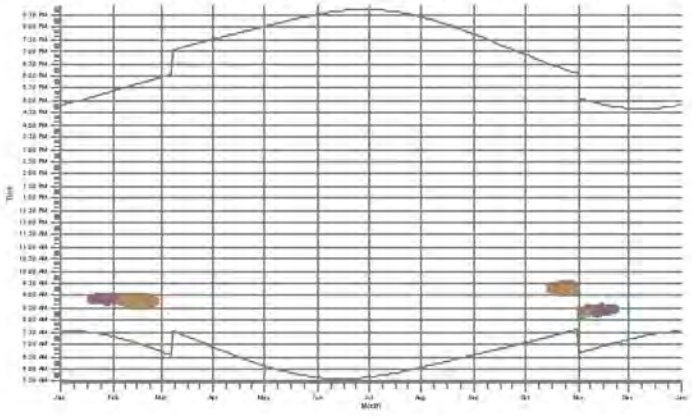
60: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (132)



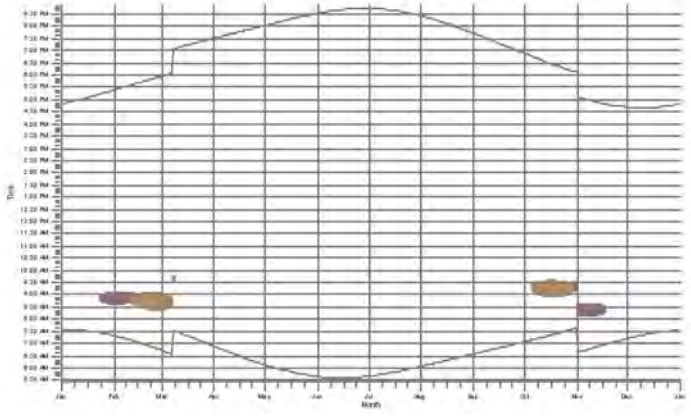
61: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (133)



62: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (134)



63: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (135)



WTGs

N02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (127)
M08: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (128)
M10: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (130)
N05: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (133)
M04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (137)
M03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (138)

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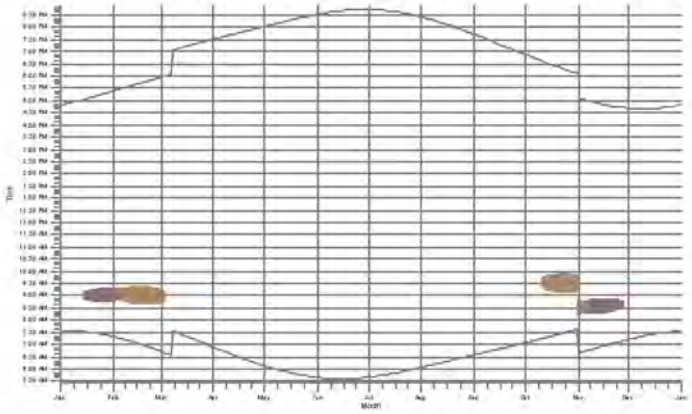
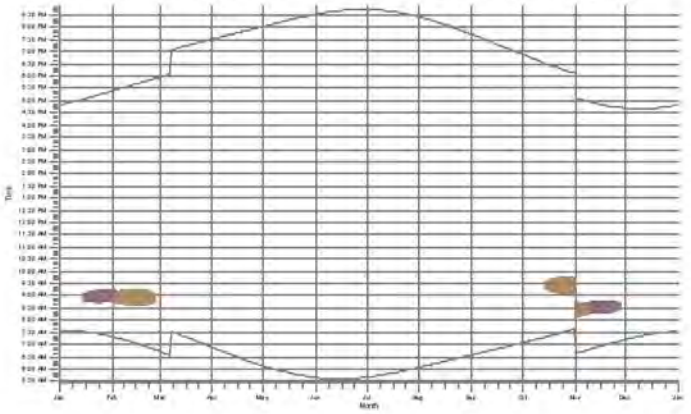
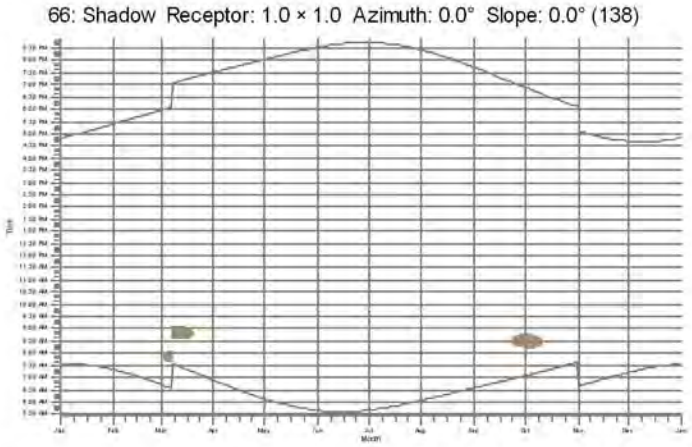
64: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (136)



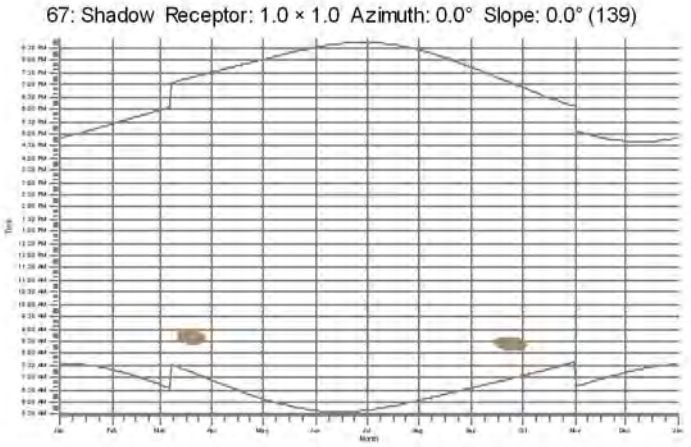
65: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (137)



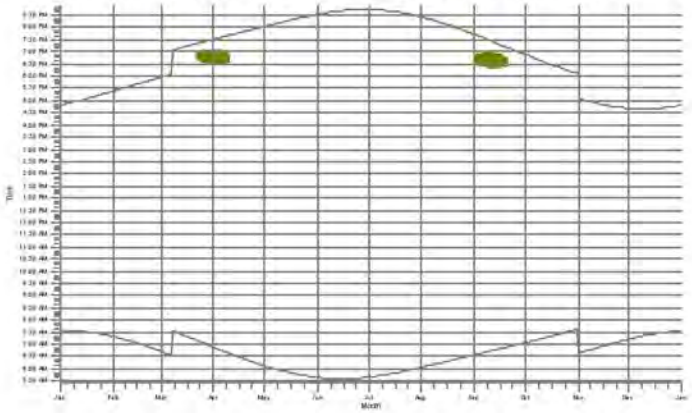
66: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (138)



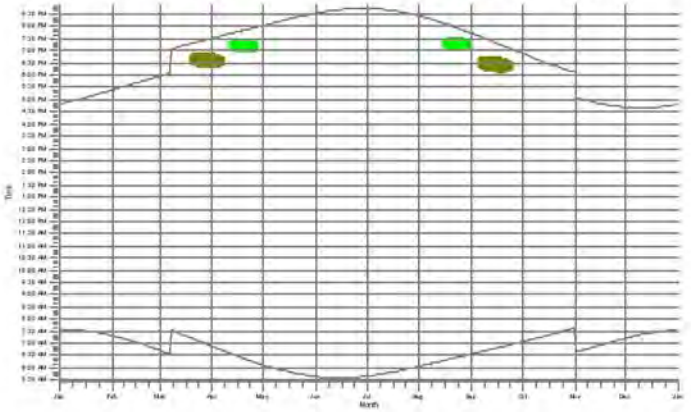
67: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (139)



68: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (140)



69: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (141)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)
D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)
M04: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (137)
M03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (138)

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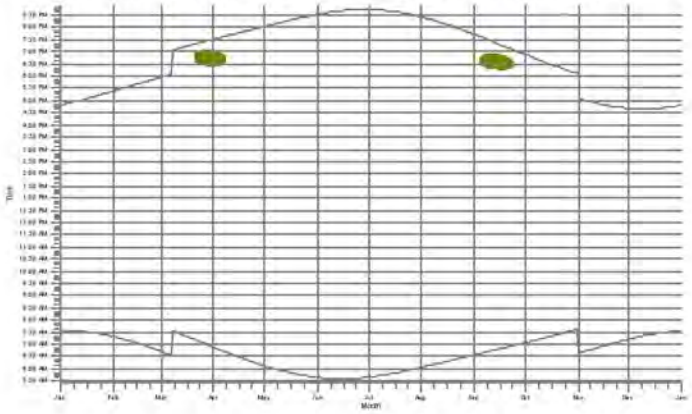
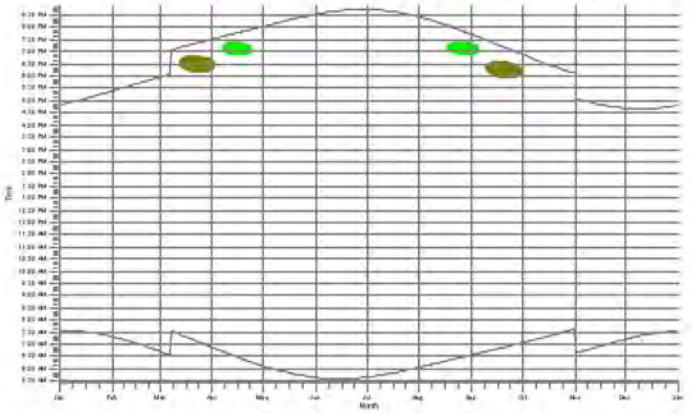
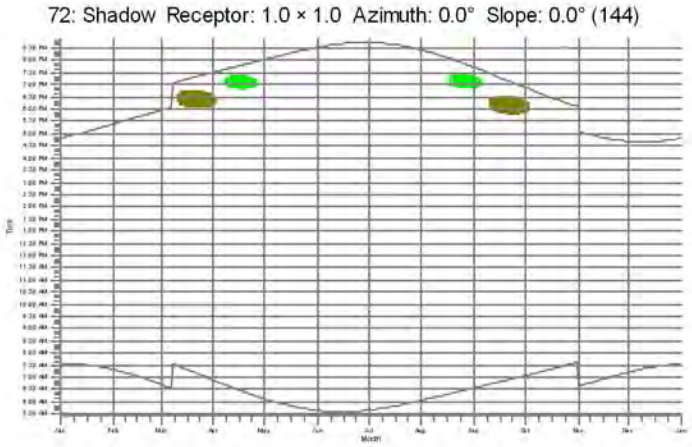
70: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (142)



71: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (143)



72: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (144)



WTGs

D02: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (76)

D03: VESTAS V162 5600 162.0 IOI hub: 125.0 m (TOT: 206.0 m) (77)