AGENDA
REGULAR MEETING
SAN BENITO COUNTY AIRPORT LAND USE COMMISSION

DATE: Thursday, October 15, 2020
6:00 P.M.

LOCATION: Via- Zoom

Attendance at the ALUC meeting is closed to the public per Executive Order N-29-30. The public may join meeting by Zoom: https://zoom.us/join per the instructions provided at the end of the agenda:

Meeting ID: 884-1026-3621

COMMISSIONERS: Chair Ignacio Velazquez, Vice Chair Peter Hernandez,
Jaime De La Cruz, Mary Vazquez Edge, and Rolan Resendiz
Alternates: San Benito County: Mark Medina;
City of San Juan Bautista: César E. Flores

Persons who wish to address the Board of Directors must complete a Speaker Card and give it to the Clerk prior to addressing the Board. Those who wish to address the Board on an agenda item will be heard when the Chairperson calls for comments from the audience. Following recognition, persons desiring to speak are requested to advance to the podium and state their name and address. After hearing audience comments, the Public Comment portion of the agenda item will be closed. ***The opportunity to address the Board of Director's on items of interest not appearing on the agenda will be provided during Section C. Public Comment.***

6:00 P.M. CALL TO ORDER:

A. **ACKNOWLEDGE** Certificate of Posting

B. NOTICE OF TEMPORARY PROCEDURES FOR AIRPORT LAND USE COMMISSION MEETINGS
(Please see Zoom instructions at the end of the agenda)

Pursuant to California Governor Gavin Newsom's Executive Order N-29-20 issued on March 17, 2020, relating to the convening of public meetings in response to the COVID-19 pandemic. Additionally, members of the Airport Land Use Commission can attend the meeting via teleconference and to participate in the meeting to the same extent as if they were present.

C. **PUBLIC COMMENT:** (Opportunity to address the Board on items of interest not appearing on the agenda. No action may be taken unless provided by Govt. Code Sec. 54954.2. **Speakers are limited to 3 minutes.**)

CONSENT AGENDA:

(These matters shall be considered as a whole and without discussion unless a particular item is removed from the Consent Agenda. Members of the public who wish to speak on a Consent Agenda item must submit a Speaker Card to the Clerk and wait for recognition from the Chairperson. Approval of a consent item means approval as recommended on the Staff Report.)

1. **APPROVE** Airport Land Use Commission Draft Meeting Minutes Dated September 17, 2020 – Gomez

2. **FIND** Project No. 2020-14, Associated with Assessor Parcel No. 051-100-031, Located at 773 San Felipe Road in the City of Hollister, CONSISTENT with the 2012 Hollister Municipal Airport Land Use Compatibility Plan - Lezama

Adjourn to ALUC Meeting on Thursday, November 19, 2020. Agenda Deadline is Tuesday, November 03, 2020 at 12:00 P.M

In compliance with the Americans with Disabilities Act (ADA), if requested, the Agenda can be made available in appropriate alternative formats to persons with a disability. If an individual wishes to request an alternative agenda format, please contact the Clerk of the Council four (4) days prior to the meeting at (831) 637-7665. The Council of Governments Board of Directors meeting facility is accessible to persons with disabilities. If you need special assistance to participate in this meeting, please contact the Clerk of the Council's office at (831) 637-7665 at least 48 ours before the meeting to enable the Council of Governments to make reasonable arrangements to ensure accessibility.

ZOOM INSTRUCTIONS:

Members of the public are encouraged to participate in Board meetings in the following ways:

1. Remote Viewing
   Members of the public who wish to watch the meeting can view the meeting online through Zoom. Instructions for participating via Zoom are included below.

2. Written Comments & Email Public Comment

   Members of the public may submit comments via email by 5:00 PM. on the Wednesday prior to the Board meeting to the Clerk of the Board at monica@sanbenitocog.org. Regardless of whether the matter is on the agenda. Every effort will be made to provide Board Members with your comments before the agenda item is heard.

3. Airport Land Use Commission meeting - Zoom Instructions for remote Participants:
   Each meeting will have a meeting ID, which is a unique number associated with an instant or scheduled meeting. Three ways to attend zoom meetings:

1. Over the phone (Audio only):
   - (669) 900-6833 or (408) 638-0968.

2. Open the Web-browser:
   - https://zoom.us/join

3. Smart device Application:
   · Apple App store: https://apps.apple.com/us/app/id546505307

   · Android App store: https://play.google.com/store/apps/detailsZid=u.s.zoom.videomeetings

Zoom Audio Only (phone)

If you are calling in as audio-only, please dial (669) 900-6833 or (408) 638-0968.

1. It will ask you to enter the Meeting ID, 884-1026-3621, followed by the "#" key, which can be found at the top page of the agenda. The meeting agenda can be found at: http://www.sanbenitocog.org/wp-content/uploads/2020/10/ALUC_Packet_101520.pdf

2. It will then ask for a Participant ID, press the "#" key to continue.

3. Once you enter the zoom meeting, you will automatically be placed on mute.

4. Public Comment: If you are using a phone, please press the "*9" to raise your hand, zoom facilitator will unmute you when your turn arrives.
   Zoom on Web-browser or Zoom app on Tablet or Smartphone

   If joining through web-browser launch: https://zoom.us/join or launch the Zoom app on your Tablet or Smartphone

1. Select **"JOIN A MEETING"**
2. The participant will be prompted to enter **Meeting ID,** 884-1026-3621 and name to join the meeting. Which can be found at the top page of the agenda. The meeting agenda can be found at: http://www.sanbenitocog.org/wp-content/uploads/2020/010/ALUC_Packet_101520.pdf
3. You can launch audio through your computer or set it up through the phone. Follow instructions provided by Zoom.
4. **Public Comment:** Click **"Raise hand"** icon, the zoom facilitator will unmute you when your turn arrives.

Public Comment Guidelines

- If participating on zoom Once you are selected, you will hear that you have been unmuted: State your first name, last name, and county you reside in for the record.
- The Local Transportation Authority welcomes your comments.
- Each individual speaker will be limited to a presentation total of three (3) minutes.
- Please keep your comments, brief, to the point, and do not repeat prior testimony, so that as many people as possible can be heard. Your cooperation is appreciated.

CERTIFICATE OF POSTING

Pursuant to Government Code Section #54954.2(a) the Meeting Agenda for the Airport Land Use Commission on **October 15, 2020** at **6:00 P.M.** was posted at the following locations freely accessible to the public:

The front entrance of the Old San Benito County Courthouse, Monterey Street, Hollister, CA 95023, and the Council of Governments Office, 330 Tres Pinos Rd., Ste. C7, Hollister, CA 95023 at the following date and time:

On the **9th day of October 2020,** on or before **6:00 P.M.**

The meeting agenda was also posted on the Council of San Benito County Governments website, www.sanbenitocog.org, under Meetings, ALUC, Meeting Schedule

I, Monica Gomez, swear under penalty of perjury that the foregoing is true and correct.

BY: _____

Monica Gomez
Secretary II
Council of San Benito County Governments

Agenda Item: 1

San Benito County
AIRPORT LAND USE COMMISSION
REGULAR MEETING
(Zoom Platform)

September 17, 2020 6:00 P.M.

MINUTES

MEMBERS PRESENT:
Chair Ignacio Velazquez, Vice-Chair Peter Hernandez, Jaime De La Cruz, and Mary Vazquez Edge, Rolan Resendiz

STAFF PRESENT:
Executive Director, Mary Gilbert; Transportation Planner, Regina Valentine, Transportation Planner, Veronica Lezama; Administrative Services Specialist, Kathy Postigo; Secretary, Monica Gomez; Office Assistant, Griselda Arevalo; Deputy County Counsel, Shirley Murphy

CALL TO ORDER:

Chair Velazquez called the meeting to order at 7:14 P.M.

A. Acknowledge Certificate of Posting

A motion was made by Director Vazquez Edge, and seconded by Director De La Cruz, to acknowledge the Certificate of Posting. Vote: 5/0 motion passes.

B. NOTICE OF TEMPORARY PROCEDURES FOR AIRPORT LAND USE COMMISSION MEETINGS

Pursuant to California Governor Gavin Newsom's Executive Order N-29-20 issued on March 17, 2020, relating to the convening of public meetings in response to the COVID-19 pandemic. Additionally, members of the COG Board are allowed to attend the meeting via teleconference and to participate in the meeting to the same extent as if they were present.

Chair Velazquez reminded members of the public that an overview of temporary procedures (Zoom etiquette) for ALUC meetings was attached to the agenda.

C. PUBLIC COMMENT: None

CONSENT AGENDA:

1. **Approve** Airport Land Use Commission Draft Meeting Minutes dated August 20, 2020 – Gomez

2. **Find** Project No. 2020-02, Associated with Assessor Parcel No. 053-420-0370, Located at 1891 Airway Drive in the City of Hollister, **Consistent** with the 2012 Hollister Municipal Airport Land Use Compatibility Plan – Lezama

There was no public comment on the Consent Agenda.

A motion was made by Director De La Cruz, and seconded by Director Vazquez Edge, to approve Consent Agenda Items 1&2. Vote: 5/0 motion passes.

A motion was made by Director Hernandez, and seconded by Director De La Cruz, to adjourn the ALUC Meeting at 7:16 p.m. Vote: 5/0 motion passes.

ADJOURN TO ALUC MEETING THURSDAY OCTOBER 15, 2020.

Airport Land Use Commission
San Benito County

Agenda Item__2____

Staff Report

To:	Airport Land Use Commission	
From:	Veronica Lezama, Transportation Planner	Telephone: (831) 637-7665
Date:	October 15, 2020	
Subject:	Land Use Consistency Determination	

Recommendation:

FIND Project No. 2020-14, Associated with Assessor Parcel No. 051-100-031, Located at 773 San Felipe Road in the City of Hollister, CONSISTENT with the 2012 Hollister Municipal Airport Land Use Compatibility Plan.

Summary:

The ALUC application associated with assessor parcel number 051-100-031 was reviewed in accordance with the adopted 2012 Hollister Municipal Airport Land Use Compatibility Plan.

Financial Considerations:

The Airport Land Use Commission (ALUC) has an adopted application fee structure. The fee consists of a minimum $300 non-refundable payment that is submitted at the time the application is provided to ALUC.

Background:

Land use actions proposed within the Hollister Municipal Airport Influence Area (Attachment 1) are subject to ALUC review to determine consistency with the Hollister Municipal Airport Land Use Compatibility Plan. The purpose of the Compatibility Plan is to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards.

Staff Analysis:

ALUC staff received an application for a Consistency Determination with the adopted 2012 Hollister Municipal Airport Land Use Compatibility Plan.

Project Description:

The applicant is requesting to subdivide an 8.36-acre parcel into four lots consisting of 3.04 acres, 4.50 acres, 0.34 acres and 0.48 acres located at 773 San Felipe Road in Hollister (Attachment 2). The applicant is specifically proposing to construct 219,990 square feet of indoor

greenhouse buildings for a cannabis cultivation facility on existing commercial and fallow land, including onsite parking, drainage, and landscape improvements (Attachment 3).

During a project review, the Airport Land Use Commission considers several Compatibility Plan policies including: ***Noise, Safety, Airspace Protection***, and ***Overflight***. An analysis of each of the four compatibility factors is discussed below.

Noise Policy 3.2.

The Noise Policy objective is to avoid establishment of noise-sensitive land uses in the portions of airport environs that are exposed to significant levels of aircraft noise. The magnitude noise impacts are depicted by four contours, which show the greatest annualized noise impacts anticipated to be generated by the airport over the next 20 years.

The project is proposed outside of the Noise Contours (Attachment 4). As such, the project does not require additional noise attenuation measures beyond what is required by the California Building Code. As a result, the proposed project is consistent with the Hollister Municipal Airport Land Use Compatibility Plan's Noise Policy.

Safety Policy 3.3.

The Safety Policy objective is to minimize the risks associated with an off-airport aircraft accident or emergency landing. The policy focuses on reducing the potential consequences of such events by limiting sensitive land uses (i.e. residential) and intensities of non-residential uses (i.e. commercial, industrial, etc.). This policy is defined in terms of the geographic distribution of where accidents are most likely to occur based on the six safety zones.

The project is proposed within the Safety Zone 6 (Attachment 5)- the least restrictive of the Safety Zones. According to Table 2: Safety Compatibility Criteria, the *Indoor Storage* use is Normally Compatible and allowed within Safety Zone 6 (Attachment 6). As an additional condition of compatibility, the project must also comply with the indicated usage intensity limits and other listed conditions identified in Table 2: Safety Compatibility Criteria (Attachment 6). The project's usage intensities are proposed at 14-20 employees and will not exceed those allowed in Safety Zone 6. As such, the project is consistent with the Compatibility Plan's Safety Policy.

Airspace Protection Policy 3.4.

The Airspace Protection Policy seeks to prevent creation of land use features that can be hazards to the airspace required by aircraft in flight and have the potential for causing an aircraft accident to occur.

In evaluating the airspace protection compatibility of the proposed development, three categories of hazards to airspace shall be considered: physical, visual, and electronic. The categories of hazard applicable to the project are outlined in bold below.

a. **The height of structures and other objects situated near the airport are a primary determinant of physical hazards to the airport airspace.**

   ALUC Staff Analysis: The project is proposed outside of the Critical Airspace Protection Zone and any object in this zone is allowed to have a height of up to 35 feet above the ground. The project structures will not exceed 20 feet in height and therefore consistent with the Federal Regulation 49 CFR Part 77, which establishes standards and notification requirements for objects affecting navigable airspace.

b. **Land use features that have the potential to attract birds and certain other wildlife to the airport area are also to be evaluated as a form of physical hazards (FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*).**

   ALUC Staff Analysis: The applicant is proposing two detention basins designed not hold standing water after storm events so as to not attract birds, basin pumps shall be sized and programmed accordingly to drain within 24 hours. The detention basin design is consistent with the Compatibility Plan.

c. **Visual hazards of concern include certain types of lights, sources of glare, and sources of dust, steam, or smoke.**

   ALUC Staff Analysis: The applicant is proposing the construction of 219,990 square feet of indoor glass greenhouse buildings for a cannabis cultivation facility. San Benito Airport Land Use Commission staff requested that the applicant provide a glare study as greenhouses may have the potential to pose hazard to pilots in the form of glare. The applicant provided a Solar Glare Analysis Study to evaluate the potential for solar glare from the project for airplanes on the final approach to the airport (Attachment 7).

   The impact of glare depends on the interaction between the position of the sun, the angle and orientation of the reflective surface, the reflectivity of the surface, the size of the project, and the relative location of the observer. “Green” rated glare indicates a low potential for after-image, “yellow” rated glare indicates the potential for after-image exists, and “red” rated glare indicates the potential for retinal damage.

The report concluded that the preparer of the study “Solas does not expect the Project to produce red-grade glare at the evaluated flight paths. The model predicts yellow-grade glare at FP1. The results of the GlareGauge analysis identified that the following location would experience yellow-grade glare:

- FP1 — Northwest-bound descent (Runway 31) — There is potential for temporary afterimage (yellow-grade glare) from the glass roofs for a total of **93 minutes** per year. The glare occurs

in April and August around 6:30 p.m. standard time (7:30 p.m. daylight savings time) for up to 12 minutes per day. The effects of green-grade glare are considered negligible as it has a low risk of after-image. The results demonstrate that yellow-grade glare may be present for short periods during evenings in April and August.

The study also specifies three other locations that will experience green-grade glare, see page 15 of the Solar Glare Analysis. "Green" rated glare indicates a low potential for after-image.

The study results indicate that there is no incidence of red-grade glare predicted from the proposed greenhouses. Pilots landing at runway 31 of the Hollister Municipal Airport are expected to experience short durations of yellow-grade glare from the Project. The remaining three flight paths are predicted to observe green-grade glare from the greenhouse roofs.

a. Electronic hazards are ones that may cause interference with aircraft communications or navigation.

   Staff Analysis: None

The proposed project is consistent with the Compatibility Plan's Airspace Protection Policy.

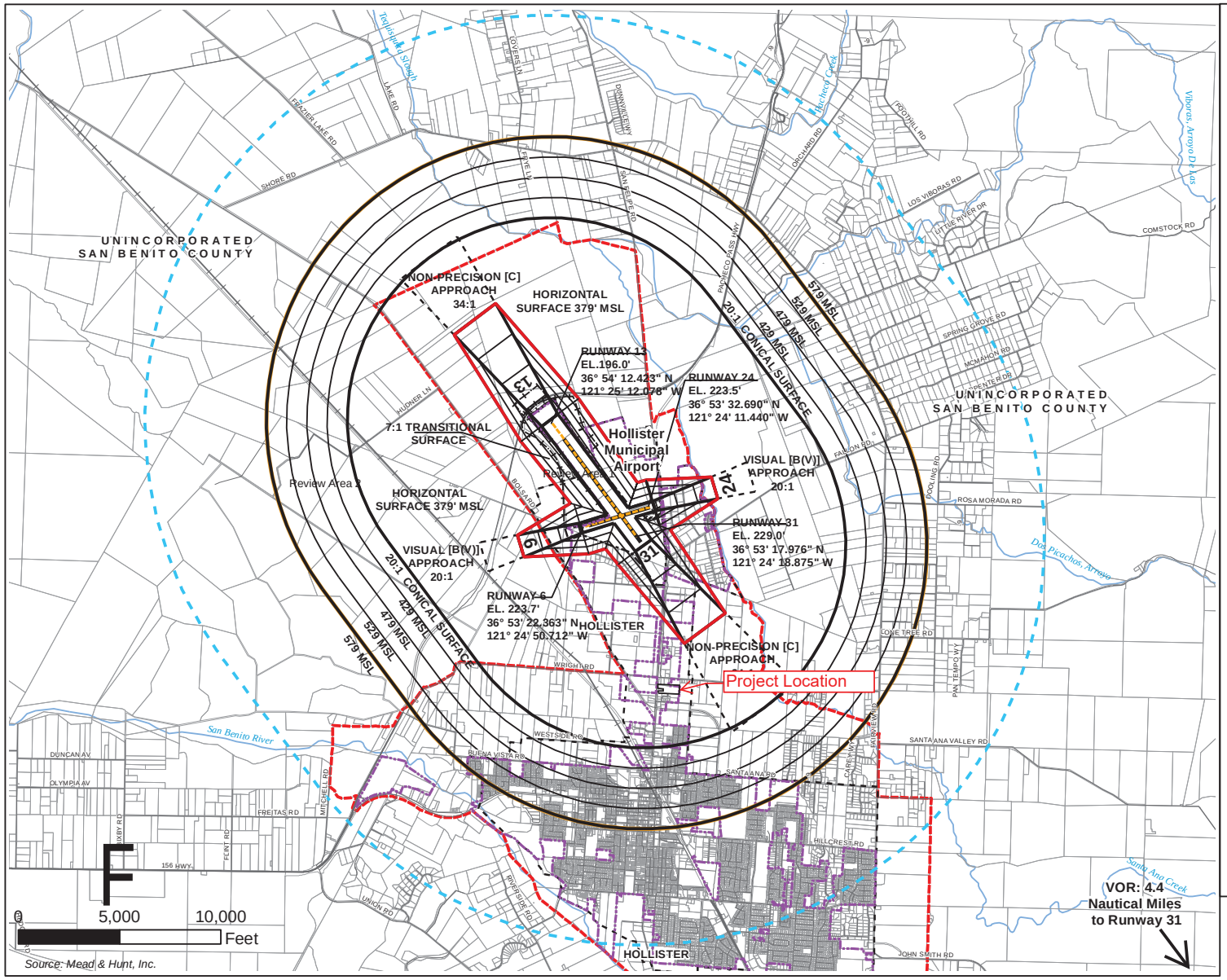
Overflight Policy 3.5.

The Overflight Compatibility Policy is intended to help notify people, through real estate disclosures, about the presence of aircraft overflight near airports so that they can make informed decisions regarding acquisition or lease of property in the affected areas. Overflight policies do not apply to non-residential development. The applicant is proposing a non-residential use and is therefore consistent with the Overflight Compatibility Policy.

Executive Director Review: *MG* Counsel Review: N/A

Supporting Attachment(s):

1. Compatibility Policy Map: Airport Influence Area
2. Project Location Map
3. Project Site Plan
4. Noise Contour Map
5. Safety Zones Map
6. Table 2: Safety Compatibility Criteria
7. Glare Analysis Report



Source: Mead & Hunt, Inc.

Legend

- Existing Airport Property
- Future Property Acquisition
- Hollister City Limits
- Hollister Sphere of Influence
- Hollister Planning Area Boundary
- Existing Runway- 13-31 length: 6,350', 6-24 length: 3,150'
- Future Runway- 13-31 length: 7,000', 6-24 length: 3,357'
- Roads
- Railroads
- Parcels
- Rivers

Policy Boundaries

- Airport Influence Area
- Airspace Protection Zone [1]
- Critical Airspace Protection Zone [2]
- FAA Height Notification Surface [3]

Notes

1. The Airspace Protection Zones are drawn in accordance with FAR Part 77, Subpart C and reflect the future runway lengths and instrument approaches for all runways except Runway 31. For Runway 31, the existing runway end location and instrument approach type are reflected, as the existing airspace surface are generally more restrictive than the airspace surfaces reflecting the future runway end and approach type.

2. The Critical Airspace Protection Zone encompasses the primary surface and the critical portions of the approach and transitional surfaces to where these surfaces intersect with the horizontal surface.

3. The FAA Height Notification Zone is established in accordance with FAR Part 77, Subpart B.

Hollister Municipal Airport
Land Use Compatibility Plan

Map 4

Compatability Policy Map: Airspace Protection Zones

Attachment:2

County of San Benito

Legend

- ☐ Parcels
- California County Boundaries
  - ☐ <all other values>
  - 🟥 San Benito
- ☐ City Limit
- 🟧 Tentative Subdivision
- ━ Hollister Airport Runways
- ─ Tentative Streets
- 🟩 Park

1: 36,112

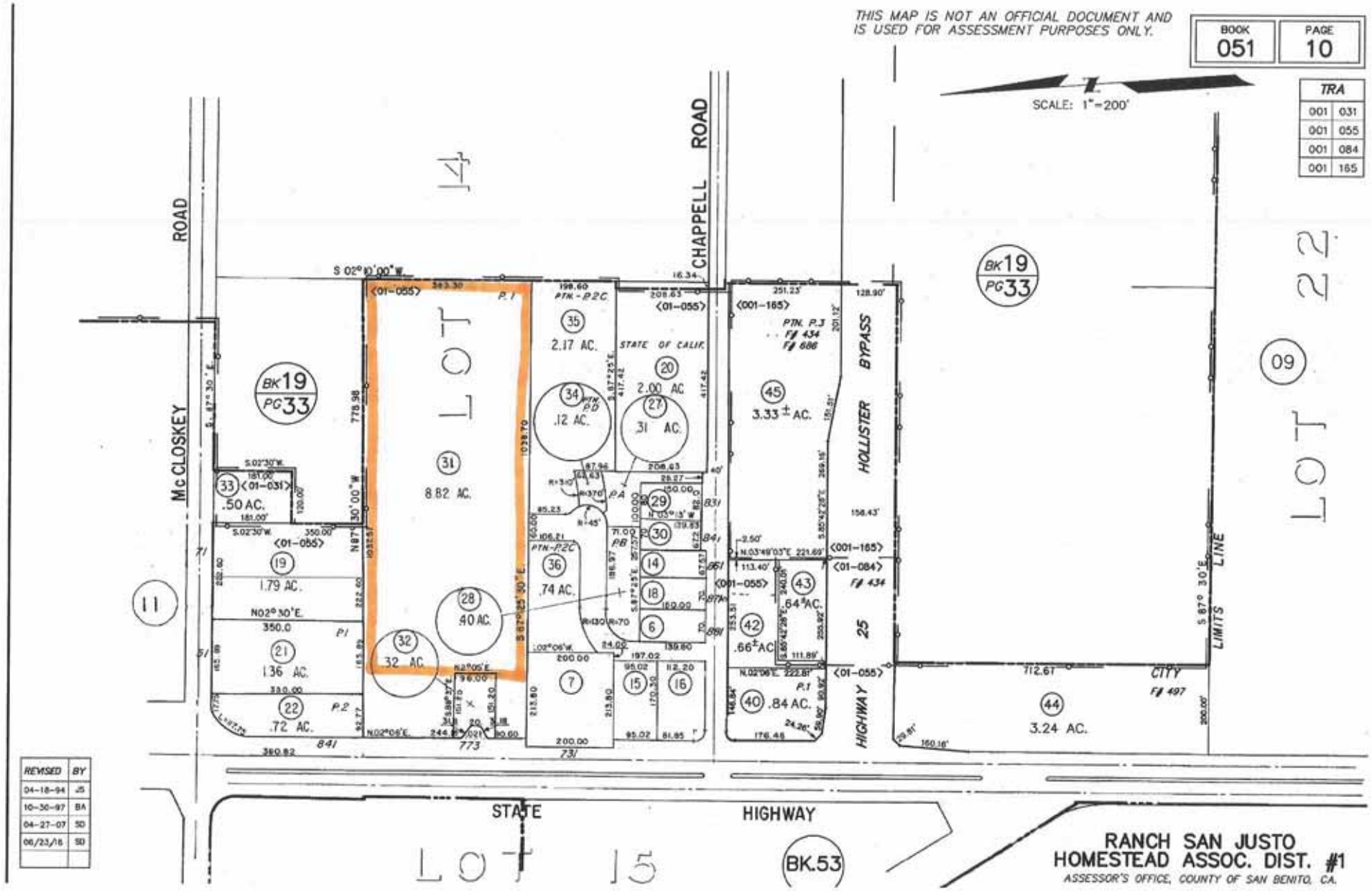
6,018.7 0 3,009.33 6,018.7 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

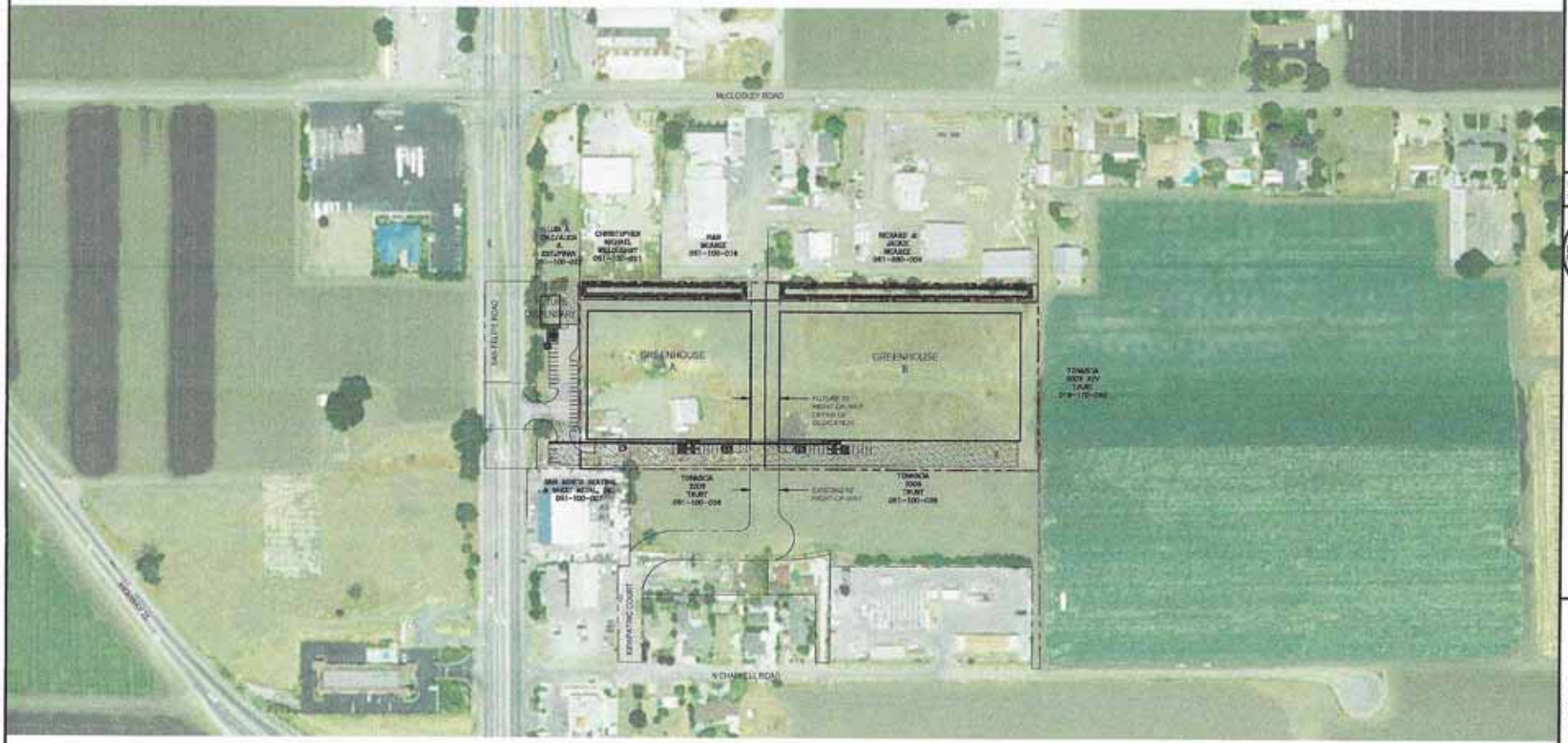
©County of San Benito, GIS Services

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Notes



ATTACHMENT 3



PROJECT TEAM

OWNER/APPLICANT
FELIPE NINE, LLC
10 HARRIS COURT, SUITE B-1
MONTEREY, CA 93940

(831) 649-6229

CIVIL ENGINEER
WHITSON ENGINEERS
8 HARRIS COURT
MONTEREY, CA 93940

ANDREW HUNTER, RCE 67730
(831) 649-5225

DEVELOPMENT NOTES

PROPERTY DATA

ASSESSOR'S PARCEL NO.:	051-100-031
PARCEL SIZE:	8.34 AC
GENERAL PLAN DESIGNATION:	NORTH GATEWAY COMMERCIAL
EXISTING ZONING:	NORTH GATEWAY NG

AREA

SITE AREA:	8.34 AC
PROPOSED LOTS:	4 LOTS
PARCEL A:	3.84 AC
PARCEL B:	4.50 AC
PARCEL C:	8.34 AC
PARCEL D:	0.48 AC

PROPOSED BUILDING SIZE:	219,960 SF

LOT COVERAGE

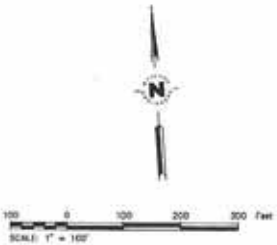
BUILDING AREA:	61%
PAVED AREA:	0%
LANDSCAPE AREA:	8%

"REMAINING LOT COVERAGE TO BE A PERVIOUS GRAVEL SURFACE OR UNIMPROVED"

PARKING DATA

TOTAL PARKING STALLS:	23
NUMBER OF ADA STALLS:	4

VICINITY MAP
SCALE: 1" = 3000'

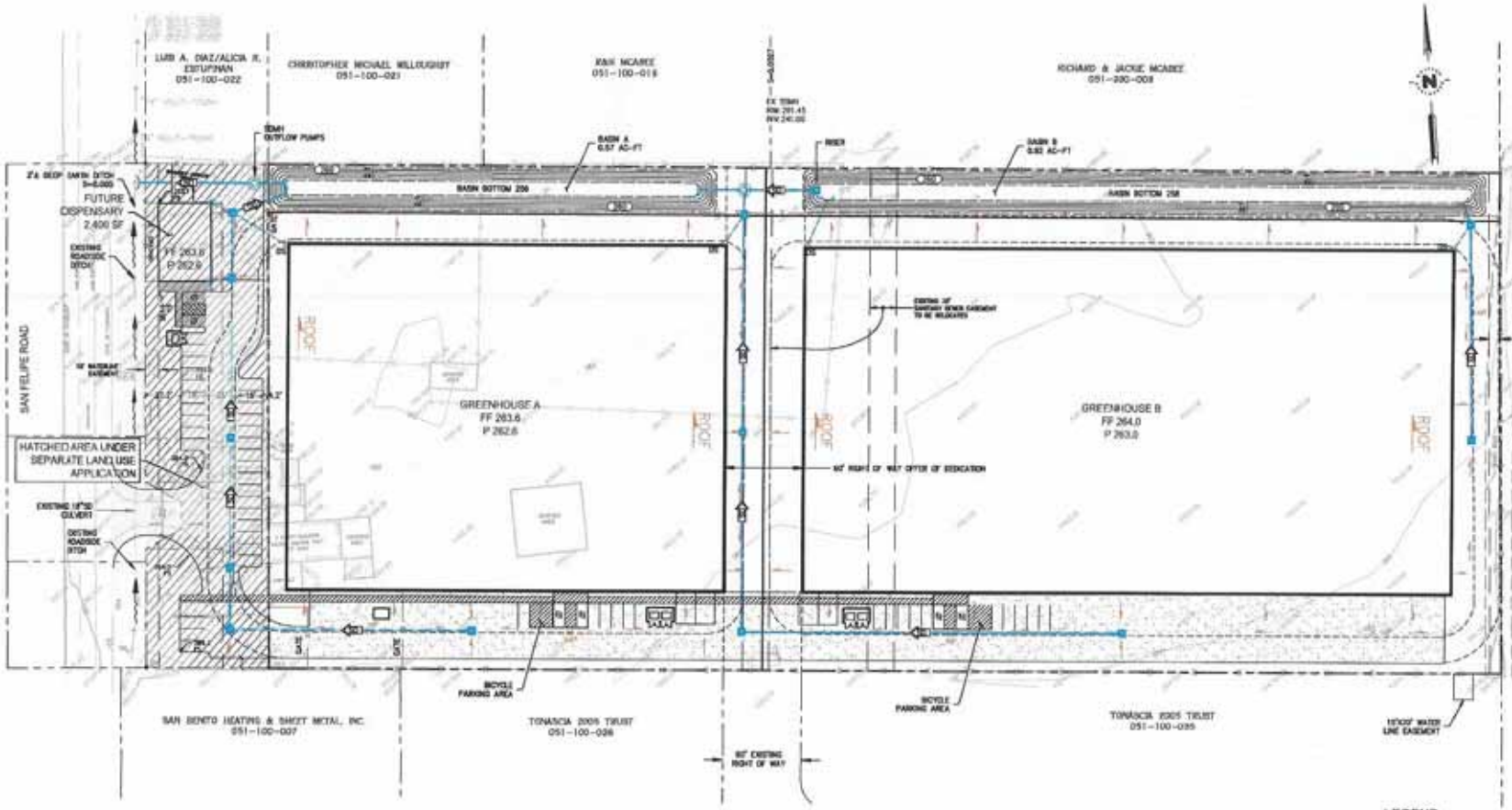


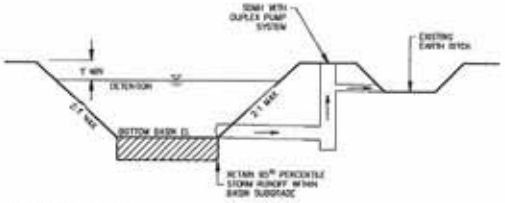
NOT FOR CONSTRUCTION

WHITSON ENGINEERS
8 Harris Court • Monterey, CA 93940
831 649-5225 • Fax 831 373-5063
Civil Engineering • Land Surveying • Project Management

FELIPE 9 - 773 SAN FELIPE ROAD
HOLLISTER CALIFORNIA
AERIAL SITE PLAN
DEVELOPMENT PLAN SET
APN: 051-100-031

C0.1





BASIN DESIGN CRITERIA:

1. BASIN WILL BE DESIGNED WITH A TWO PUMP STRUCTURE TO RELEASE STORM WATER AT THE 10-YEAR PRE-DEVELOPMENT FLOW RATE,THE 2-YEAR PRE-DEVELOPMENT FLOW RATE, AND 90% OF THE PRE-DEVELOPMENT 100-YEAR DESIGN STORM.
2. BASIN IS DESIGNED TO NOT HOLD STANDING WATER AFTER STORM EVENTS SO AS TO NOT ATTRACT BIRDS. BASIN PUMPS SHALL BE SIZED AND PROGRAMMED ACCORDINGLY TO DRAIN WITHIN 24 HOURS.

1 TYPICAL BASIN DETAIL
NOT TO SCALE

PRELIMINARY STORMWATER CALCULATIONS

AREA DESCRIPTION	EXISTING AREA BREAKDOWN (SF)
PERVIOUS AREA	739,251 (16.96 ACRES)
IMPERVIOUS AREA	240,000 (5.51 ACRES)
TOTAL	979,217 (22.47 ACRES)
PERCENT IMPERVIOUS	40%
WATER MANAGEMENT ZONE	1
ASSUMED SOIL TYPE	C (SANDY/SIL SILTY CLAY LOAM)
85TH PERCENTILE 24-HOUR RAINFALL DEPTH	1.2 IN
2-YEAR PRE-DEVELOPMENT FLOW	1.1 CFS
10-YEAR PRE-DEVELOPMENT FLOW	3.9 CFS
ASSUMED INFILTRATION RATE	0.1 IN/HR
TOTAL REQUIRED BASIN VOLUME	1.3 AF
TOTAL BASIN VOLUME PROVIDED	1.46 AF

NOTES:

1. TOPOGRAPHIC SURVEY WAS PERFORMED BY REPUBLIC NATIONAL ON FEBRUARY 23, 2014 AND SUPPLEMENTAL TOPOGRAPHIC SURVEY BY WHITSON ENGINEERS ON JUNE 22 AND 23, 2017.
2. THIS MAP PORTRAYS THE SITE AT THE TIME OF THE SURVEY AND DOES NOT SHOW SOILS OR GEOLOGY INFORMATION, UNDERGROUND CONDITIONS, ZONING OR REGULATORY INFORMATION.
3. ELEVATIONS SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). ELEVATIONS WERE DETERMINED THROUGH STATIC GPS OBSERVATIONS AND THE USE OF THE NATIONAL GEODETIC SURVEY'S ONLINE POSITION USER SERVICE (OPUS). AN ESTABLISHED NAVD88 ELEVATION OF 208.30 FEET FOR A 2-1/2" BRASS DISC IN THE TOP OF A CONCRETE HEADWALL FOR A STORM DRAIN PIPE LOCATED AT THE NORTHWEST CORNER OF MCCLOSKEY ROAD AND SAN FELIPE ROAD (HIGHWAY #156 FRONTAGE ROAD), DESIGNATED CITY OF HOLLISTER BENCHMARK #33, IS THE LOCAL BENCHMARK TO WHICH ALL ELEVATIONS SHOWN HEREON ARE REFERENCED.

LEGEND

DESCRIPTION	PROPOSED	EXISTING
STORM DRAIN PIPE		
DIRECTION OF FLOW		
STORM DRAIN INLET		
STORM DRAIN CULVERT		
STORM DRAIN MANHOLE (SDMH)		
DEMONSTRATE (DE)		
DRAIN		
AC PAVEMENT		

40 0 40 80 120 Feet
SCALE: 1" = 40'

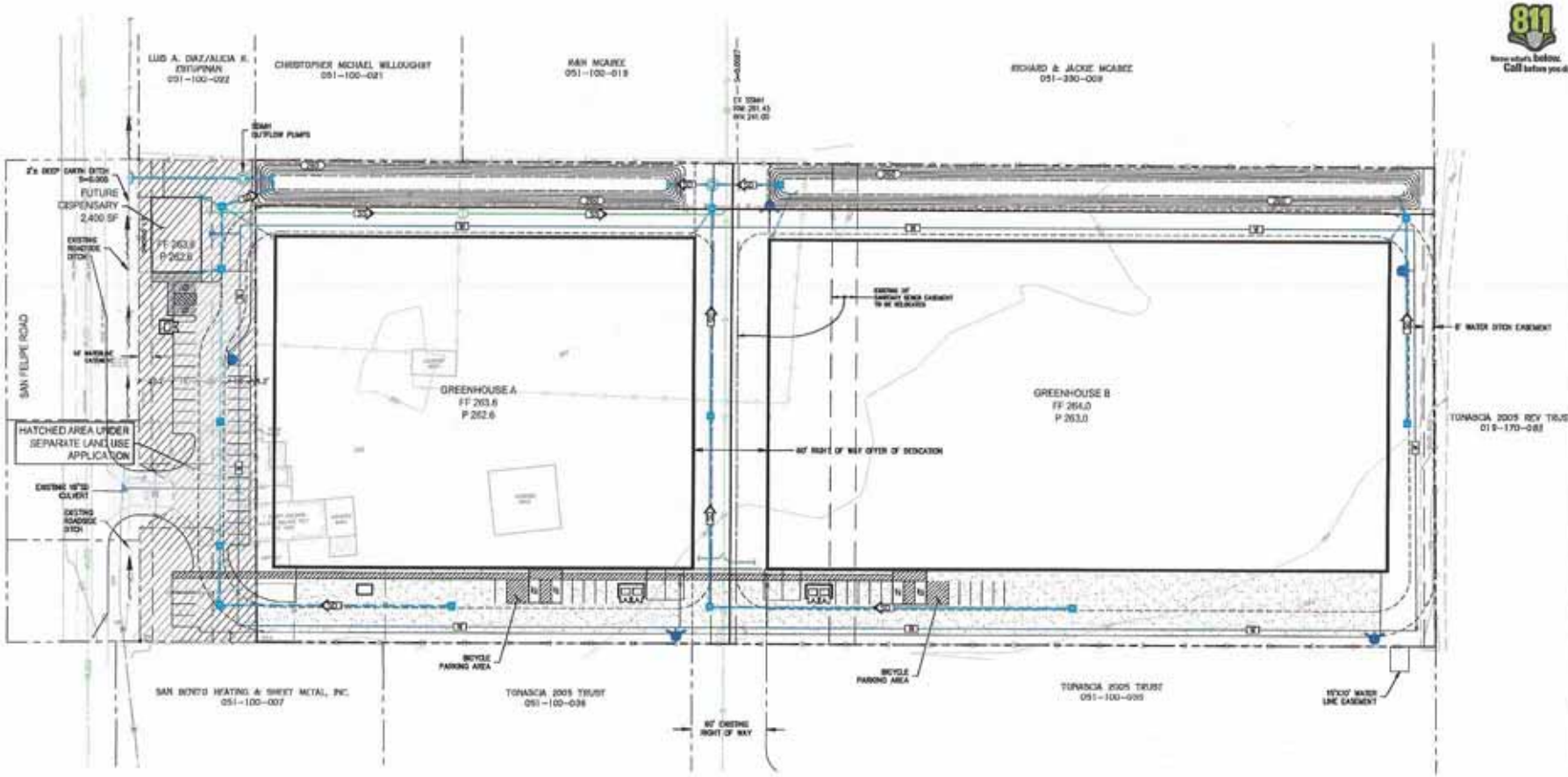
NOT FOR CONSTRUCTION

811 Know what's below. Call before you dig.

WHITSON ENGINEERS
6 Harris Court • Monterey, CA 93940
831 649-5225 • Fax 831 373-5963
Civil Engineering • Land Surveying • Project Management

FELIPE 9 - 773 SAN FELIPE ROAD
HOLLISTER CALIFORNIA
CONCEPTUAL GRADING AND DRAINAGE PLAN
DEVELOPMENT PLAN SET
APN 051-100-031

C1.1



NOTE:

1. SEE CONCEPTUAL GRADING AND DRAINAGE PLAN FOR PRELIMINARY STORMWATER CALCULATIONS AND BASIN STORAGE.

LEGEND

DESCRIPTION	PROPOSED	EXISTING
STORM DRAIN		
STORM DRAIN MAIN		
SANITARY SEWER MAIN		
FIRE HYDRANT		
WATER METER		
WATER VALVE		
STORM DRAIN VAULT (S)		
STORM DRAIN CLEANOUT		
STORM DRAIN MANHOLE (SDMH)		
SDMH INLET (DI)		
SDMH INLET (DI)		

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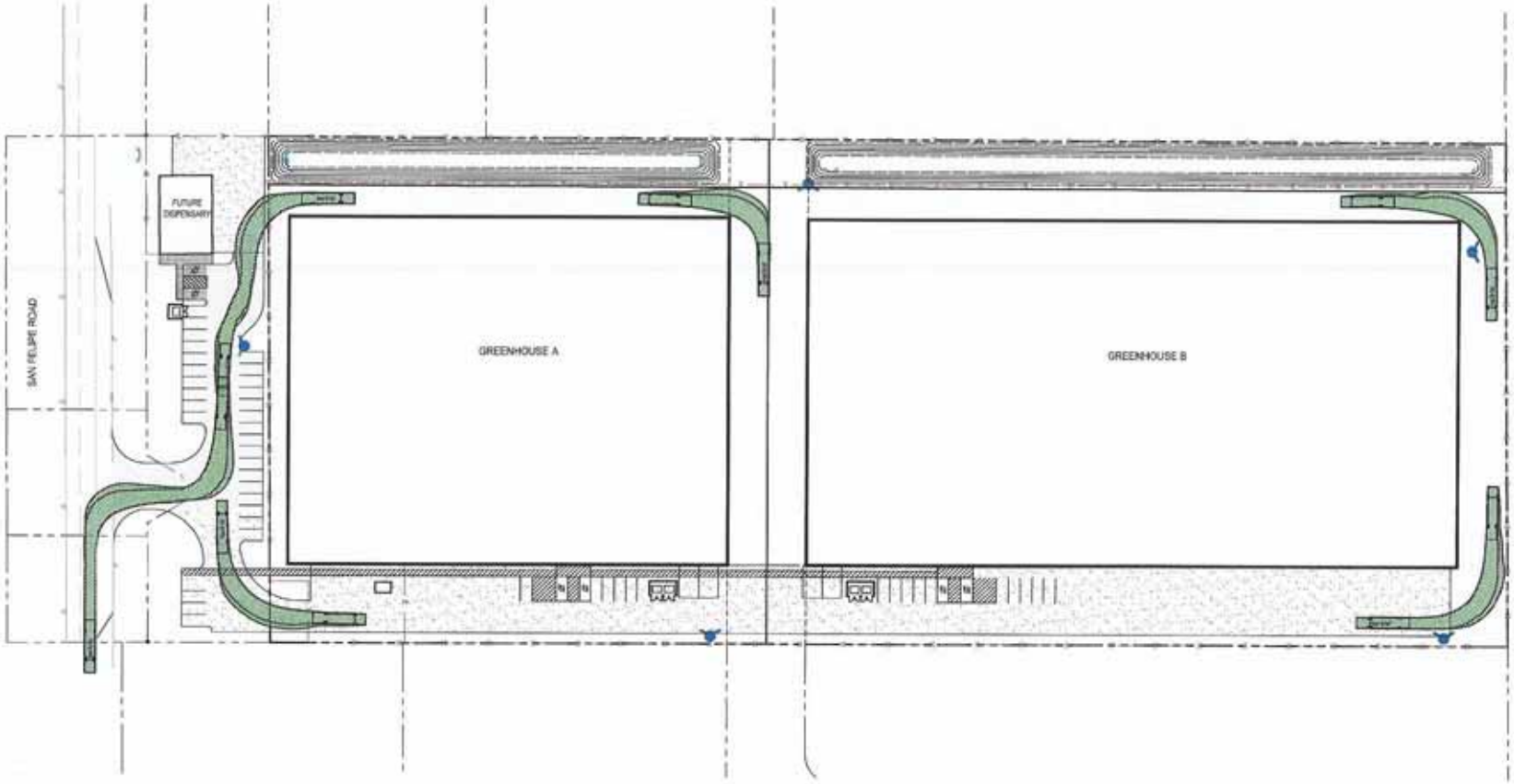
CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT

DRAFT

FELIPE 9 - 773 SAN FELIPE ROAD
HOLLISTER CALIFORNIA
CONCEPTUAL UTILITY PLAN
DEVELOPMENT PLAN SET
APN 051-100-031

C2.1



Garage Fire Truck
Length 35'0"
Width 8'0"
Height 13'0" (Fully Height)
No Tow, Ground Clearance
Track Width
Lock-to-Lock Time
Max Wheel Angle

NOTE:

FIRE DEPARTMENT TO DETERMINE FINAL EXTENTS AND TYPE OF ALL-WEATHER ACCESS ROADS

N

40 0 40 80 120 Feet

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

811 Know what's below. Call before you dig.

WHITSON ENGINEERS

6 Harris Court • Monterey, CA 93940
831 649-5225 • Fax 831 373-3053

Civil Engineering • Land Surveying • Project Management

FELIPE 9 - 773 SAN FELIPE ROAD

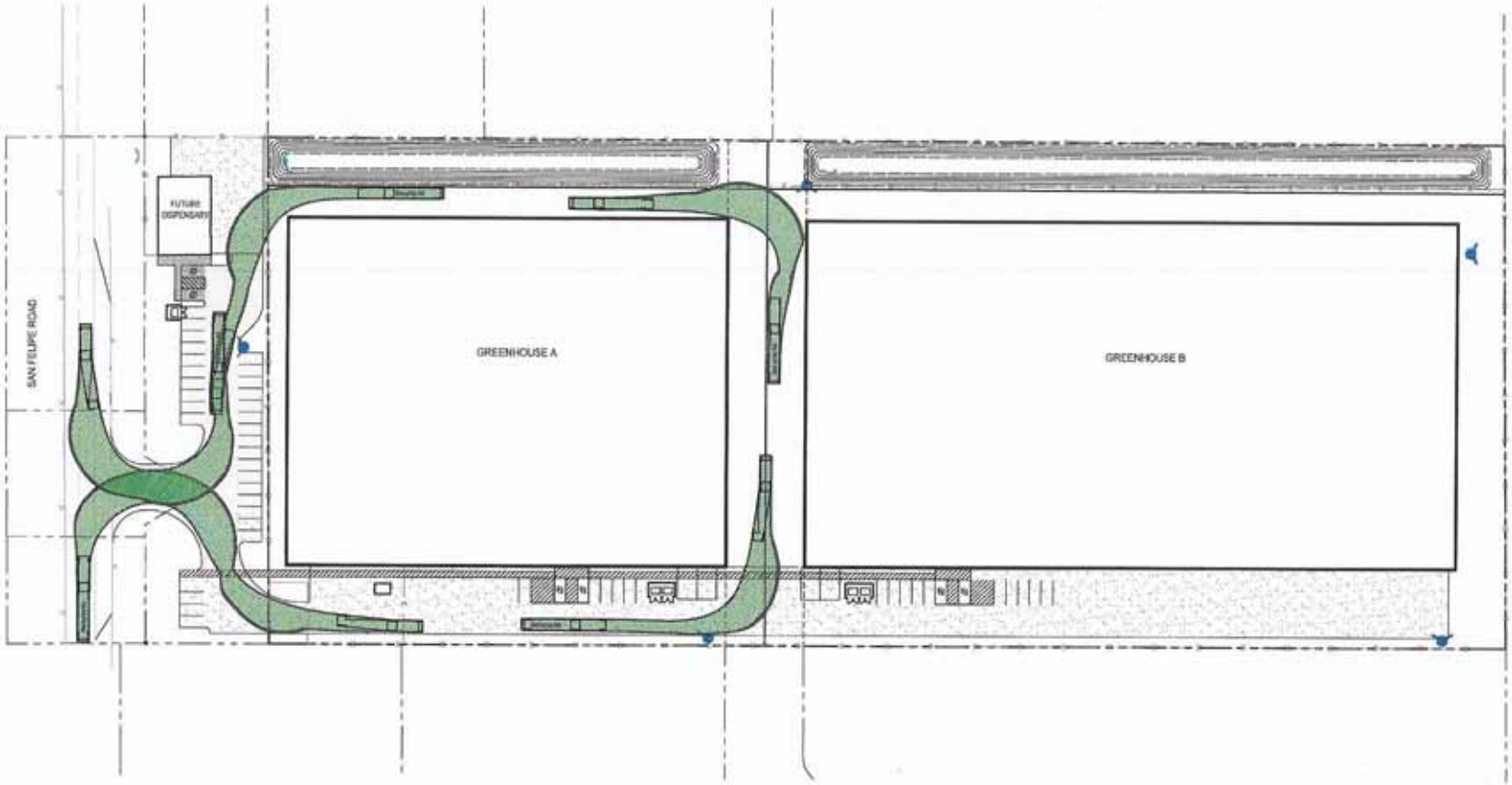
HOLLISTER CALIFORNIA

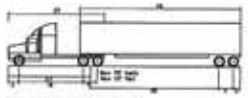
TURNING ANALYSIS - FIRE TRUCK

DEVELOPMENT PLAN SET

APN: 051-108-031

SHEET C3.1





California Legal Design Vehicle
Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock-to-Lock Time
Max Steering Angle (Virtual)

SCALE: 1" = 40'

NOT FOR CONSTRUCTION

WHITSON ENGINEERS
6 Harris Court • Monterey, CA 93940
831 649-5225 • Fax 831 373-5068
Civil Engineering • Land Surveying • Project Management

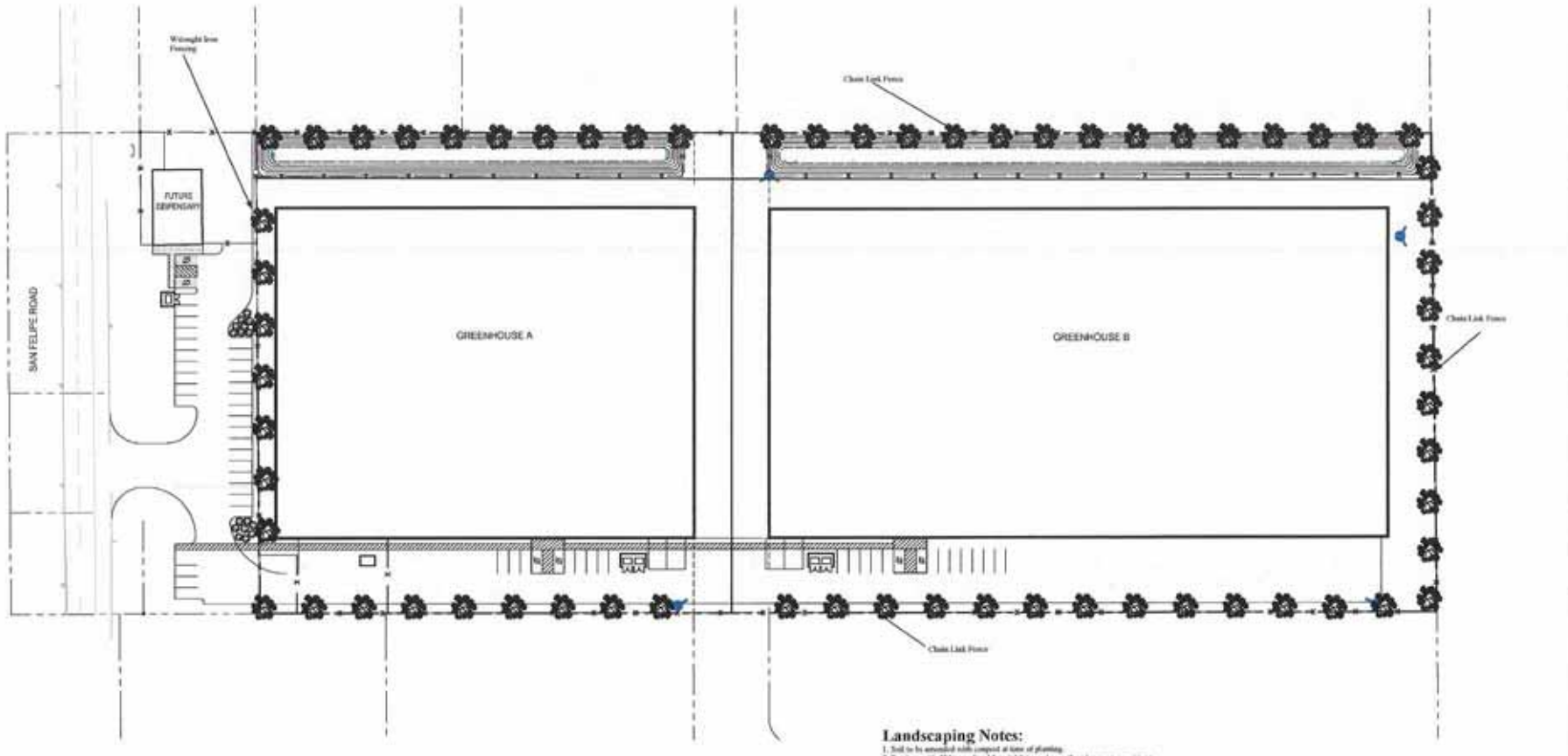
DRAFT

DATE 1/26/18
SCALE 1"=40'
DWN. CB
CHK.
JOB NO. 2017-00

NO.	BY	DATE	DESCRIPTION

FELIPE 9 - 773 SAN FELIPE ROAD
HOLLISTER CALIFORNIA
TURNING ANALYSIS - LARGE DELIVERY
DEVELOPMENT PLAN SET
APN: 051-109-031

SHEET C3.2



Landscaping Notes:

1. Soil to be amended with compost at time of planting.
2. Napkins with 3" layer of mulch to inhibit weed growth and conserve moisture.
3. Entire perimeter will be fenced. Wrought iron fencing as shown on the San Felipe Road side and chain link as shown on the remaining sides of the property.

Plant List

Symbol	Qty/Size	Name
	68/15 gal.	Trees, choose from: Olea europaea - Olive (Sublime type); Quercus ilex - Holly Oak; Laurus nobilis - Sweet Bay
	16/5 gal.	Low Shrubs, choose from: Artemisia 'Powis Castle' - Wormwood; Cistus salviifolius 'Prostratus' - Sagebrush Rockrose; Lavandula dentata - French Lavender

SCALE: 1" = 40'

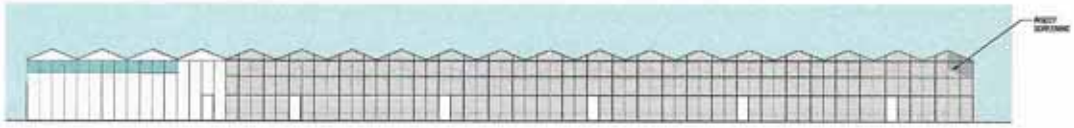
Coats Consulting
PO Box 1356
Carmel, CA 93921
831-250-7192

Conceptual Landscape Plan
Scale: 1" = 40'
Date: 6/17/2019

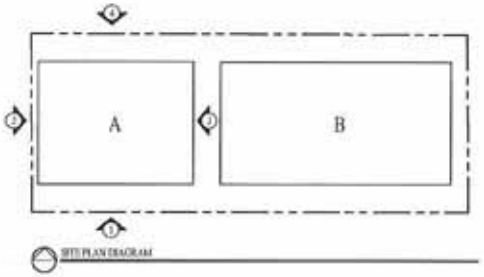
FELIPE 9 - 773 SAN FELIPE ROAD
HOLLISTER CALIFORNIA
APN 051-100-031

SHEET
L1.1

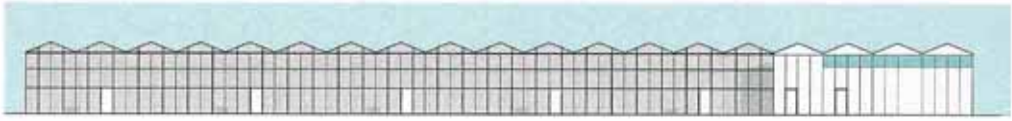
4 GREENHOUSE A - NORTH ELEVATION



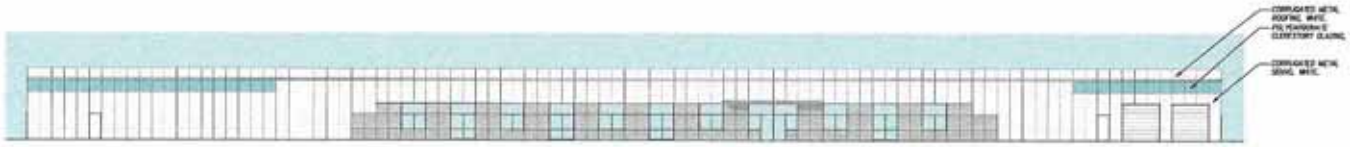
3 GREENHOUSE A - EAST ELEVATION



SITE PLAN DIAGRAM



2 GREENHOUSE A - WEST ELEVATION

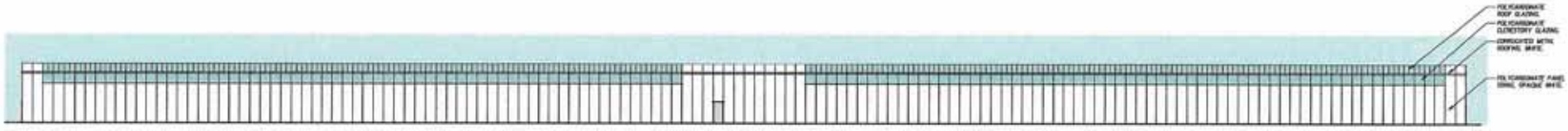


1 GREENHOUSE A - SOUTH ELEVATION

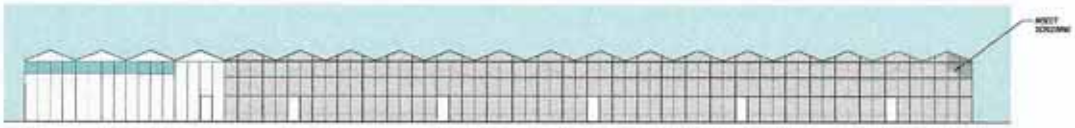
FELIPE 9 - 773 SAN FELIPE ROAD

GREENHOUSE A BUILDING ELEVATIONS

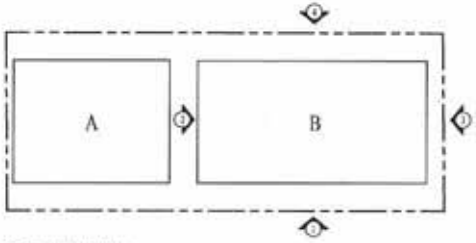
MARCH 14, 2019



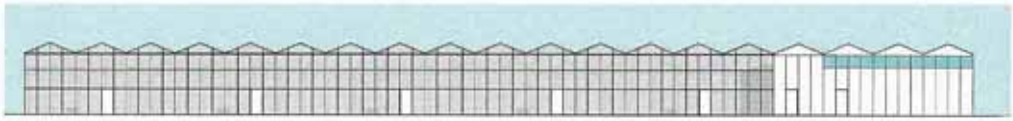
4 GREENHOUSE A - NORTH ELEVATION



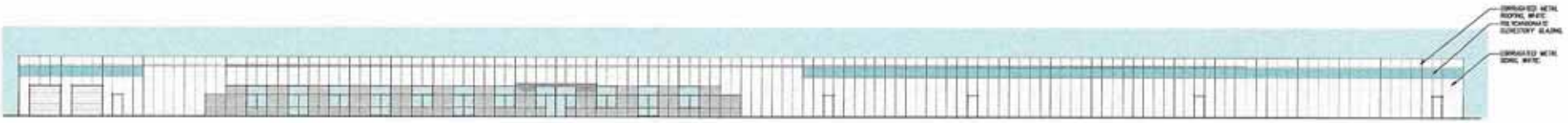
3 GREENHOUSE A - EAST ELEVATION



SITE PLAN DIAGRAM



2 GREENHOUSE A - WEST ELEVATION

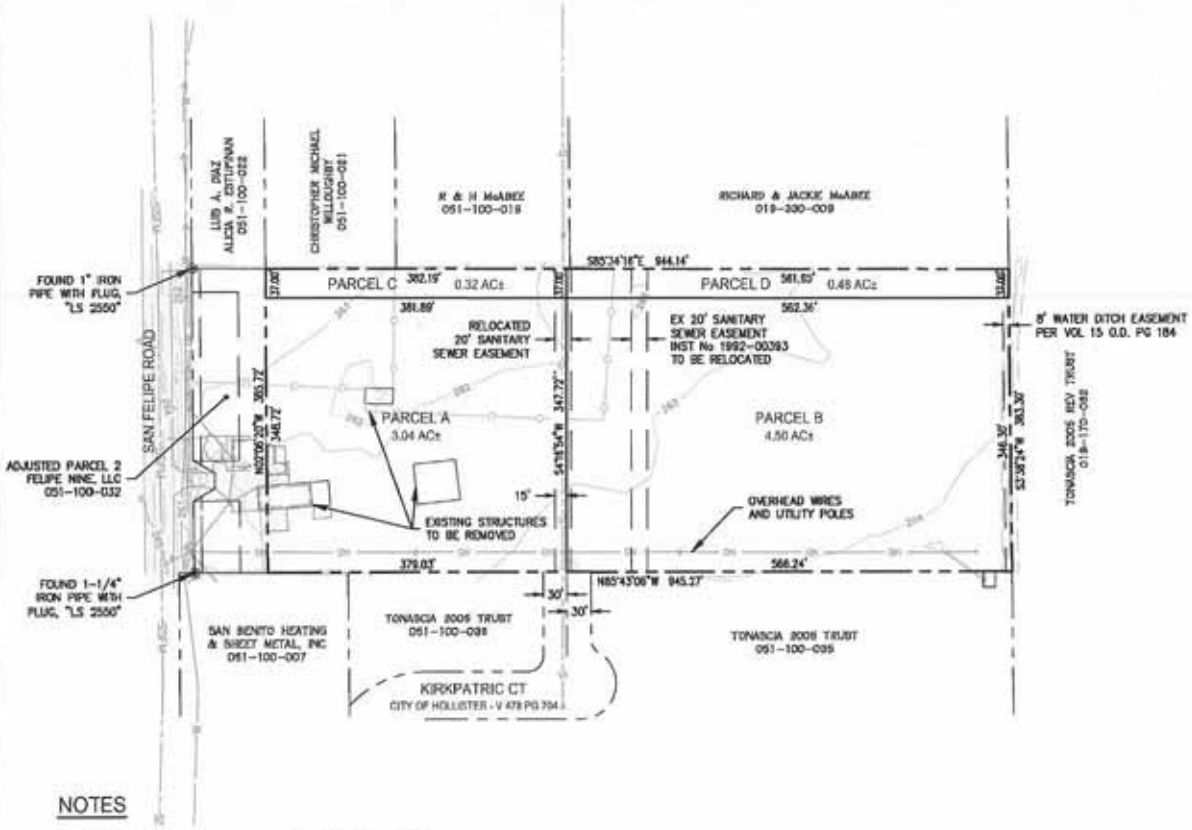


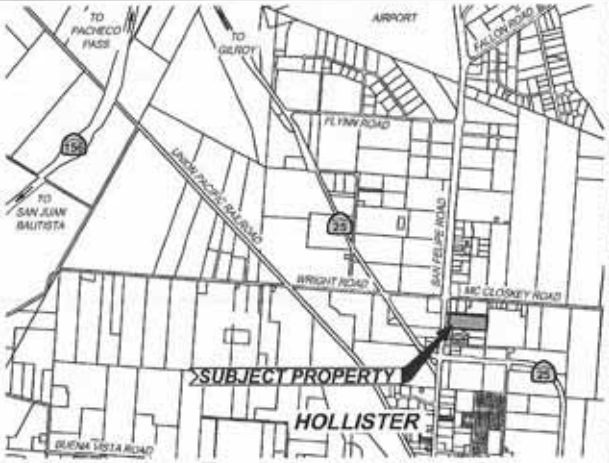
1 GREENHOUSE A - SOUTH ELEVATION

FELIPE 9 - 773 SAN FELIPE ROAD

GREENHOUSE B BUILDING ELEVATIONS

MARCH 14, 2019





VICINITY MAP
SCALE: 1" = 2000'

LEGEND

- SUBJECT PROPERTY LINE
- ADJACENT PROPERTY LINE
- PROPOSED PARCEL LINE
- CENTERLINE
- MONUMENT AS NOTED
- EXISTING CONTOUR

NOTES

1.	OWNER	MOONEY HOLDINGS, LLC 10 HARRIS COURT, SUITE B-1 MONTEREY, CA 93940
2.	ENGINEER:	WHITSON ENGINEERS 6 HARRIS COURT MONTEREY, CA 93940
3.	LEGAL DESCRIPTION	BEING ALL OF ADJUSTED PARCEL 1, AS SHOWN ON THAT CERTAIN DEED FILED FOR RECORD _____, 2018 IN BOOK ____ OF OFFICIAL RECORD, AT PAGE ____, SAN BENITO COUNTY RECORDS
4.	CONTOUR INTERVAL:	1 FOOT
5.	A.P.N.:	051-100-031
6.	SITE AREA:	±8.34 ACRES
7.	EXISTING ZONING:	NORTH GATE COMMERCIAL (NG)
8.	EXISTING LAND USE:	AGRICULTURE
9.	PROPOSED LAND USE:	CANNABIS CULTIVATION AND MANUFACTURING FACILITIES
10.	GENERAL PLAN DESIGNATION:	NORTH GATE COMMERCIAL
11.	NUMBER OF PROPOSED PARCELS:	4
12.	NO IMPROVEMENTS REQUIRED OR PROPOSED AS A PART OF THIS MAP	

N

100 0 100 200 300 FT.
SCALE: 1" = 100'

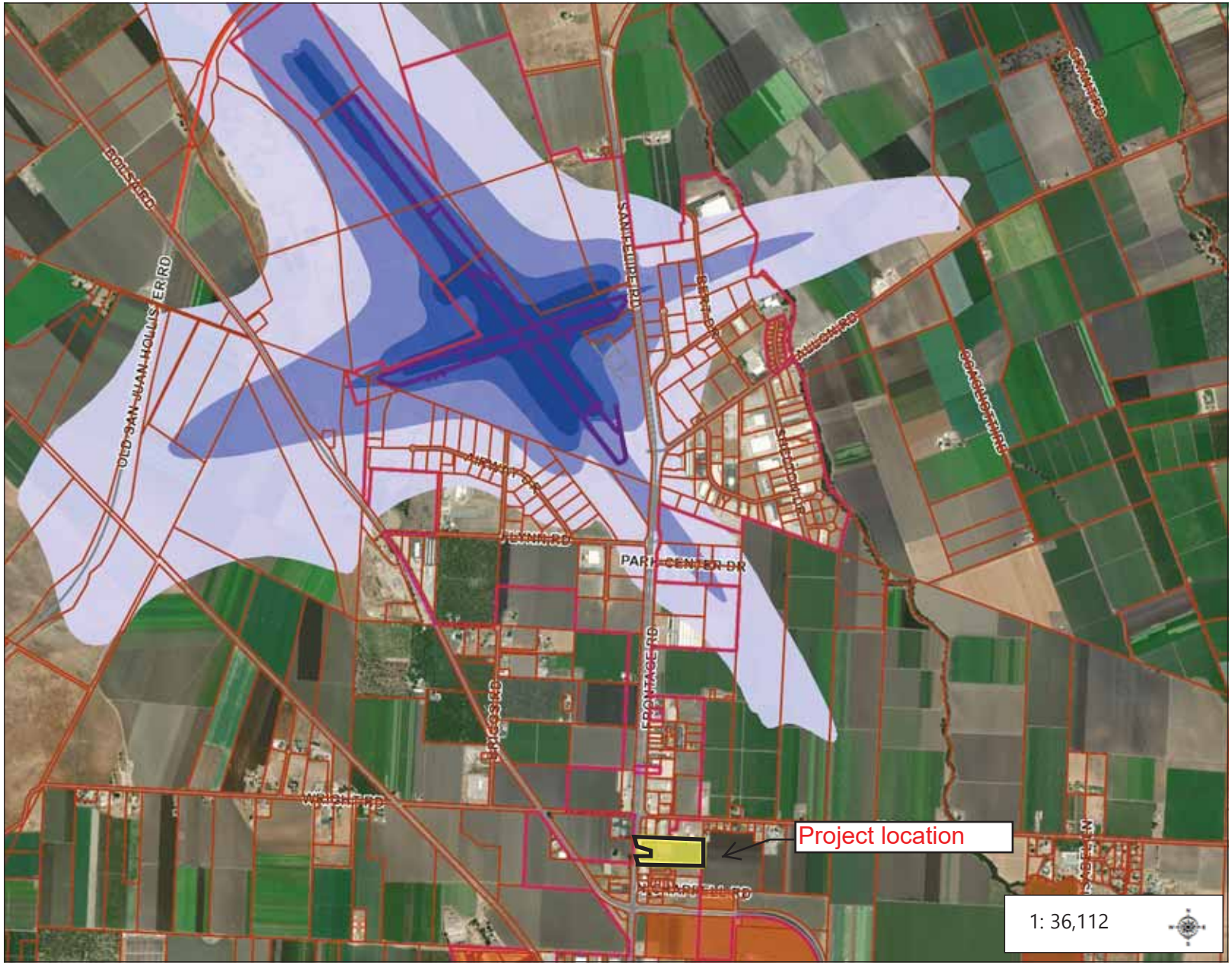
TENTATIVE PARCEL MAP
FELIPE 9

PORTION OF HOMESTEAD LOT 14, RANCHO SAN JUSTO
CITY OF HOLLISTER, COUNTY OF SAN BENITO
STATE OF CALIFORNIA

PREPARED BY:
WHITSON ENGINEERS
6 Harris Court • Monterey, CA 93940
831 649-5225 • Fax 831 373-5065
CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT
DATE: OCTOBER 22, 2018 JOB NO. 3627.00

ATTACHMENT 4

County of San Benito



Legend

- Parcels
- California County Boundaries
  - <all other values>
  - San Benito
- City Limit
- Tentative Subdivision
- Hollister Airport Runways
- Hollister Airport Noise Impact Z
  - 55 - 60 dB CNEL
  - 60 - 65 dB CNEL
  - 65 - 70 dB CNEL
  - 70+ dB CNEL
- Tentative Streets
- Park

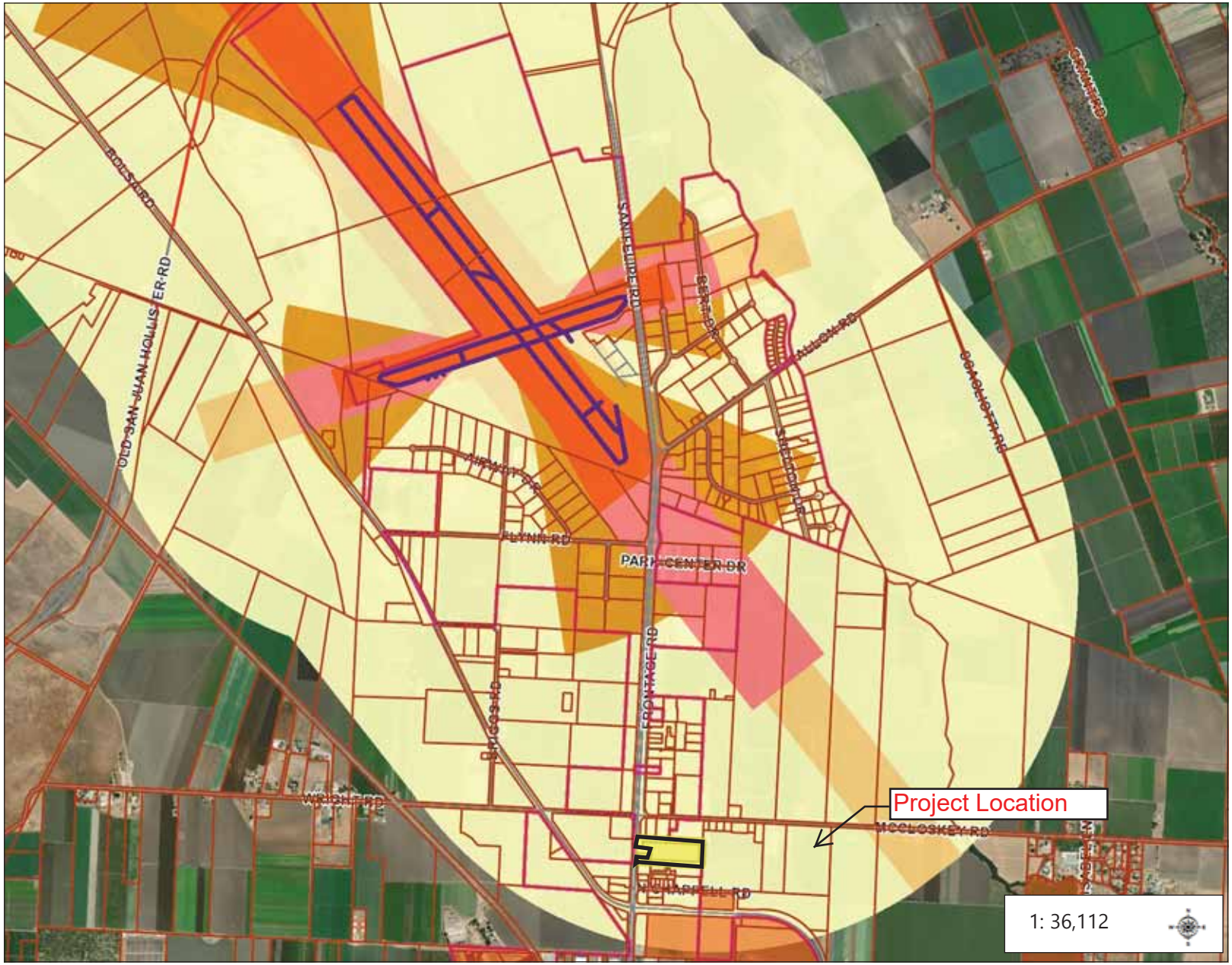
Notes

6,018.7 0 3,009.33 6,018.7 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

County of San Benito



Legend

- Parcels
- California County Boundaries
  - <all other values>
  - San Benito
- City Limit
- Tentative Subdivision
- Hollister Airport Runways
- Hollister Airport Safety Zones
  - Runway Protection Zone
  - Inner Approach/Departure Zone
  - Inner Turning Zone
  - Outer Approach/Departure Zone
  - Sideline Zone
  - Traffic Pattern Zone
- Tentative Streets
- Park

Notes

6,018.7 0 3,009.33 6,018.7 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Usage Intensity Criteria [1]	Safety Zone						Additional Criteria
	1	2	3	4	5	6	
Max. Sitewide Average Intensity (people/acre) Max. Single-Acre Intensity (people/acre)	10 20	60 120	100 300	150 450	100 300	300 1,200	Numbers below indicate zone in which condition applies
Land Use Category [2]	**Land Use Acceptability** (see page 2-49 for legend)						
Eating/Drinking Establishments: restaurants, fast-food dining, bars [approx. 60 s.f./person] [6]							2-5: Intensity limits as indicated
Limited Retail/Wholesale: furniture, automobiles, heavy equipment, lumber yards, nurseries [approx. 250 s.f./person] [6]							2, 5: Intensity limits as indicated; design site to place parking inside and bldgs outside of zone if possible
Offices: professional services, doctors, finance, civic; radio, television & recording studios, office space associated with other listed uses [approx. 215 s.f./person] [6]							2-5: Intensity limits as indicated
Personal & Miscellaneous Services: barbers, car washes, print shops [approx. 200 s.f./person] [6]							2-5: Intensity limits as indicated
Vehicle Fueling: gas stations and fueling facilities at trucking & transportation terminals							5: Allowed only if airport serving
Industrial, Manufacturing, and Storage Uses							
Hazardous Materials Production: oil refineries, chemical plants							3-6: Allowed only if alternative site outside zone would not serve intended function; Fire Marshal to determine if special design features should be incorporated into structure to withstand damage from aircraft collision; exercise caution with uses creating plumes and other airspace hazards [3]
Heavy Industrial							2-5: Avoid bulk production/storage of hazardous (flammable, explosive, corrosive, or toxic) materials; permitting agencies to evaluate possible need for special measures to minimize hazards if struck by aircraft
Light Industrial, High Intensity: food products preparation, electronic equipment [approx. 200 s.f./person] [6]							2-5: Intensity limits as indicated; avoid bulk production/storage of hazardous (flammable, explosive, corrosive, or toxic) materials; permitting agencies to evaluate possible need for special measures to minimize hazards if struck by aircraft
Light Industrial, Low Intensity: machine shops, wood products, auto repair [approx. 350 s.f./person] [6]							2 - 4: Intensity limits as indicated 5: Single story only; max. 10% in mezzanine 2-5: Avoid bulk production/storage of hazardous (flammable, explosive, corrosive, or toxic) materials; permitting agencies to evaluate possible need for special measures to minimize hazards if struck by aircraft
Indoor Storage: wholesale sales, warehouses, mini/other indoor storage, barns, greenhouses [approx. 1,000 s.f./person] [6]						X	2: Single story only; max. 10% in mezzanine

Table 2, continued

Land Use Acceptability		Interpretation/Comments
	Normally Compatible	Normal examples of the use are compatible under the presumption that usage criteria will be met. Atypical examples may require review to ensure compliance with usage intensity criteria. Noise, airspace protection, and/or overflight limitations may apply.
	Conditional	Use is compatible if indicated usage intensity limit and/or other listed conditions are met.
	Incompatible	Use should not be permitted under any circumstances.

Notes

[1] Usage intensity criteria applicable to all nonresidential development (i.e., Normally Compatible as well as Conditional land uses). Nonresidential development must satisfy both forms of intensity limits (see Policy 3.3.6). See Note 6 below and Policy 3.3.7 for information on how to calculate nonresidential intensity. Up to 10% of total floor area may be devoted to ancillary use (see Policy 3.3.6(c)).

[2] Multiple land use categories and compatibility criteria may apply to a project. Land uses not specifically listed shall be evaluated using the criteria for similar uses.

[3] These uses may pose hazards to flight as they may attract birds or other wildlife; generate dust or other visual hazards; or create physical hazards (e.g., power lines or other tall objects). See *Section 3.4* for applicable airspace protection policies.

[4] Capacity of people for Large and Major Assembly Facilities obtained from International Building Code.

[5] Residential density limits provided in terms of dwelling units per acre (du/ac). Construction of a single-family home, including a second dwelling unit as defined by state law, allowed on a legal lot of record if such use is permitted by local land use regulations. A family day care home (serving ≤ 14 children) may be established in any dwelling. See *Policies 1.4.5* and *3.3.5(h).*

[6] Common occupancy load factors (approximate number of square feet per person) source: Mead & Hunt, Inc. based upon information from various sources including building and fire codes, facility management industry sources, and ALUC surveys. The common occupancy load factors represent the maximum occupancy during a normal peak period occupancy, not on the highest attainable occupancy used in building and fire codes. Common occupancy load factors provided in the table for specific land uses may be used as a means of calculating the usage intensity of a proposed development. See Policy 3.3.7 for other methods of calculating usage intensities.

Table 2, continued

Solar Glare Analysis Report – Felipe 9 Greenhouses

The Orosco Group, Hollister, California

Version 2.0

Issued for Use

2 October 2020

Delivered to: Geary Coats, Coats Consulting

Solas Energy Consulting Inc.
Suite 282, 1721 29 Ave SW
Calgary, Alberta, Canada T2T 6T7

Phone: 403-454-9463
Email: pmcgarrigle@solasenergyconsulting.com
Web: www.solasenergyconsulting.com

Acknowledgement

Prepared by: Keith Knudsen
Jason Mah
Paula McGarrigle

Document Purpose

This report provides an assessment of glare hazard from the proposed Felipe 9 Greenhouse Project in Hollister, California, USA.

Document History

Felipe 9 Solar Glare Analysis

Version	Date	Comments
1.0	29 September 2020	Issued for Review
2.0	2 October 2020	Issued for Use

Disclaimer

Table of Contents

Table of Figures

Table of Tables

Table of Appendices

Glossary

Term	Description
After-image	Visual image that persists after the stimulus that caused it has stopped.
ALUC	Airport Land Use Commission
Azimuth	Horizontal angle of the Sun around an object. North is 0°, east is 90°, south is 180°, and west is 270°.
Coats	Coats Consulting
FAA	Federal Aviation Administration
FP	Flight path
mrad	Measure of angle, 1/1000th of a radian
Orosco	The Orosco Group
SGHAT	Solar Glare Hazard Analysis Tool
Subtended Angle	Size of an object divided by the distance from the observer.
W/m^2	Watts per square metre

1 INTRODUCTION

The Orosco Group (Orosco) is proposing to build multiple greenhouses in the city of Hollister, California. The Felipe 9 project (Project) will be located at the north end of the city in San Benito County, approximately 1.5 miles south of the Hollister Municipal Airport.

The San Benito County Airport Land Use Commission (ALUC) reviews development proposals that may affect operations at the Hollister Municipal Airport, Frazier Lake Airpark, and surrounding areas. The ALUC has requested that Orosco provide an analysis of potential impacts to aviation due to solar glare from the Project. Reflective surfaces, like the glass roof sections of the greenhouses, may reflect sunlight and produce glare along flight paths at the Hollister Municipal Airport.

Solas Energy Consulting Inc. (Solas) was retained by Coats Consulting (Coats) to conduct a solar glare analysis for flight paths at the Hollister Municipal Airport. This report documents the potential for solar glare from the Project for airplanes on final approach to the airport.

2 PROJECT DESCRIPTION

Orosco's Felipe 9 project will include two greenhouses situated on a nine-acre parcel of land at the north end of the City of Hollister, California. The Project is on the east side of San Felipe Road, between California State Route 25 to the south and McCloskey Road to the north. The nearest Hollister Municipal Airport runway is about 1.2 miles north of the Project. The immediate surrounding area includes residential buildings, commercial establishments, and farmland. The approximate location of the Project is shown in Figure 1. The parcel currently contains two abandoned structures and vacant land. The greenhouses will be approximately two storeys tall, and they will incorporate tempered glass for the roofs.

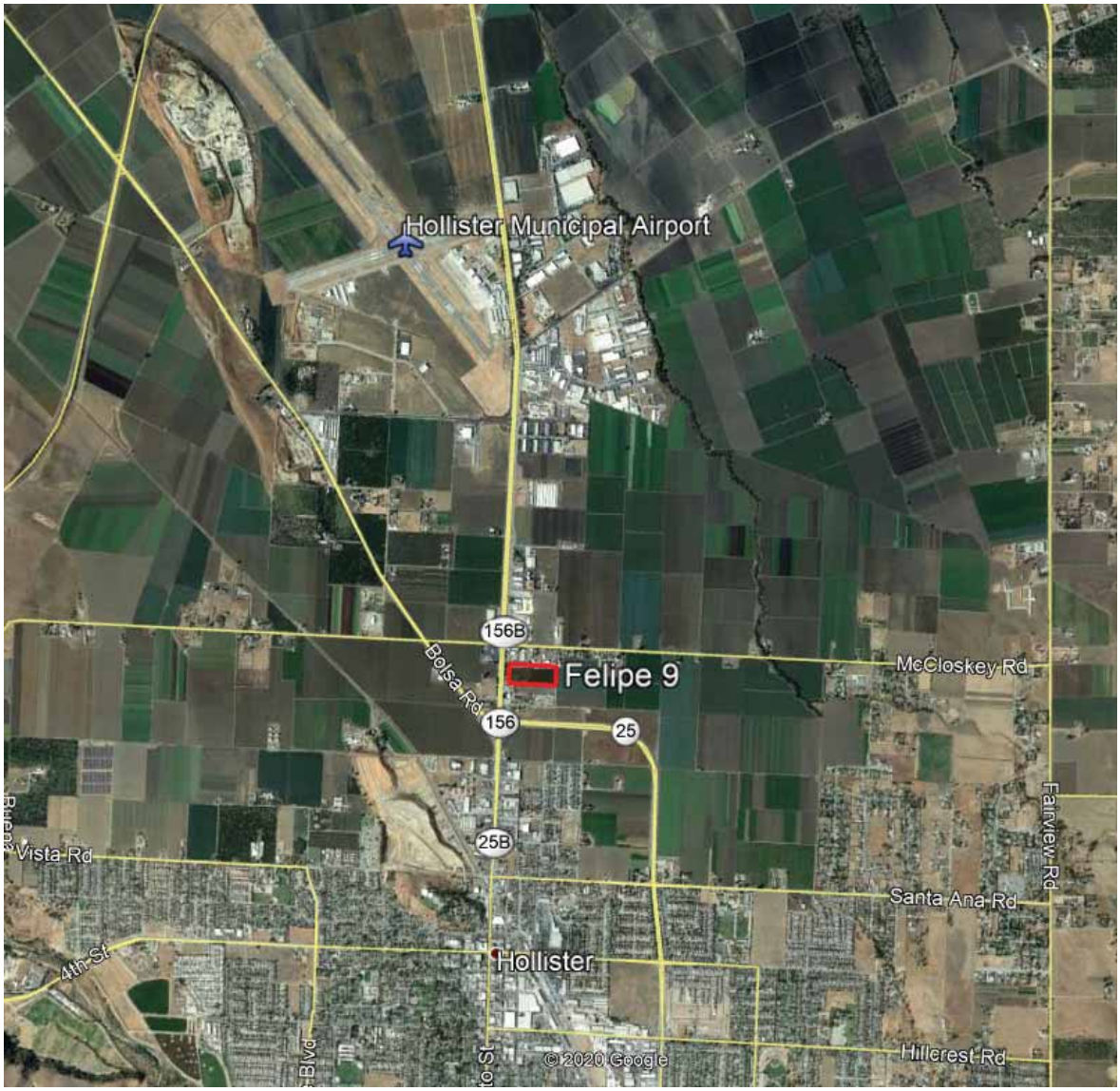


Figure 1: Location of the Project and proximity to Hollister and the Hollister Municipal Airport

Issued for Use

Figure 2 outlines the Project area in red and shows the greenhouses as the dark interior areas.

Figure 2: Project Boundary and Proposed Felipe 9 Greenhouses

3 PROJECT ASSUMPTIONS

The Project is located on approximately nine acres of land, with the greenhouses occupying about five acres. Solas used multiple sources to determine the site elevation, including publicly available topographic contours from the Google Maps interface, and a preliminary grading and drainage plan provided by Coats. Solas assumed a constant ground elevation of 261 feet above sea level for the entire site. This value represents the current minimum elevation at the site, which results in a conservative glare analysis. A change of grade will affect the results of the glare analysis.

The Project greenhouses will have roof sections built with tempered glass. The roofs are designed with multiple peaks and a slope of approximately 23 degrees facing both north and south (azimuth angles of four and 184 degrees, respectively). The roof line starts 17.0 feet above ground level, extending to a height of 20.1 feet at the top.[1] Solas modelled the roofing as smooth glass without anti-reflective coating. The side walls of the greenhouses were not modelled in this analysis.

The model assumes the reflective surface lies in a plane defined by the outlined area, so the analysis was completed at the top and bottom extents of the roof to determine glare from different parts of the glass panes. The analysis was also run at an intermediate height above ground of 18.5 feet to help identify trends in the frequency and size of glare.

Solas based the location of the greenhouses on the satellite imagery maps provided by Coats. A single footprint was evaluated instead of two buildings separated by an access road, resulting in a more conservative analysis. Two overlapping footprints with identical dimensions were plotted to model the north- and south-facing sections of the roofs. The more conservative values were kept for simultaneous instances of glare from both footprints.

Detailed input parameters and assumptions can be found in Appendix A.

[1] Data provided by Coats.

4 GLARE REGULATIONS AND RECEPTORS

The Federal Aviation Administration (FAA) reviews solar PV facilities that are proposed in proximity to airstrips for the potential of glare. Similar review may be completed for other glare-producing objects like mirrored or highly reflective building features. The FAA may accept an evaluation using one of the following levels of assessment:[2]

1. a qualitative analysis of potential impact in consultation with the Air Traffic Control Tower, pilots, and airport officials;
2. a demonstration field test with solar panels at the proposed site in coordination with Air Traffic Control Tower personnel; or,
3. a geometric analysis to determine days and times when there may be an ocular impact.

This analysis falls into the third category referenced above. This report summarizes the results using geometric analysis (ForgeSolar's Solar Glare Hazard Analysis Tool (SGHAT), or GlareGauge[3]) for the Project.

The Hollister Municipal Airport Land Use Compatibility Plan states that developments that may produce visual hazards, such as glare, are subject to additional review by the ALUC. Along with the review conducted by the ALUC, sources of glare must be consistent with FAA rules and regulations.[4]

Solas evaluated multiple flight paths (FPs) for airplane landing approaches at the Hollister Municipal Airport. Standard flight landing paths (FP1-4) were modelled using standard FAA evaluation parameters. Solas did not model an air traffic control tower since the Hollister Municipal Airport does not have a control tower. Specific parameters used to analyze flight operations can be found in Appendix A.

Solas analyzed the potential for glare at the receptors shown in Figure 3. Four flight paths (landing approaches represented by green lines) were evaluated.

[2] https://www.faa.gov/airports/environmental/policy_guidance/media/FAA-Airport-Solar-Guide-2018.pdf, accessed: September 16, 2020.
[3] Copyright, Sims Industries, 2015
[4] http://sanbenitocog.org/wp-content/uploads/2018/10/ADOPTED-ALUCP-June-2012.pdf, accessed: September 16, 2020.

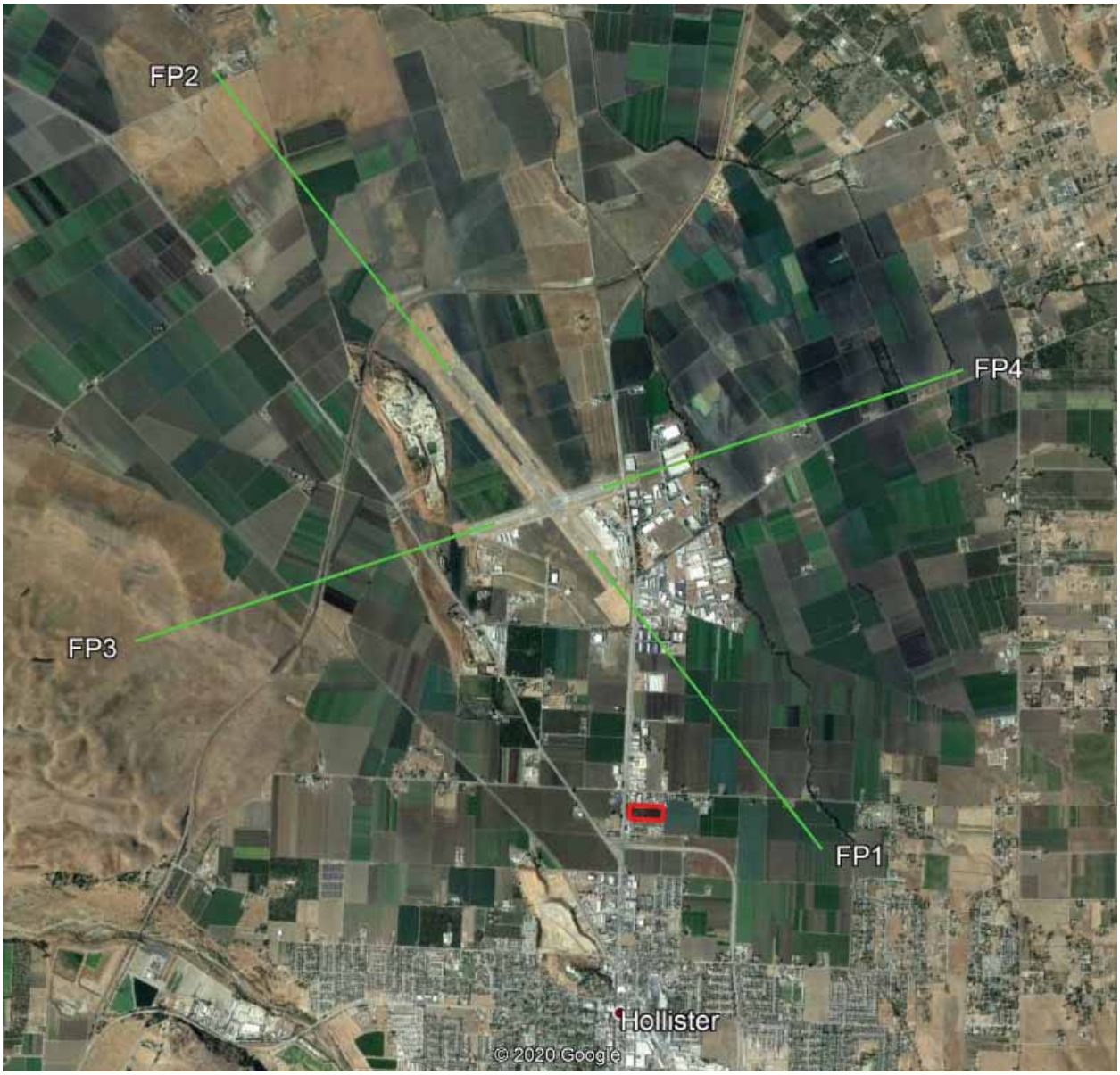


Figure 3: Felipe 9 Project with Flight Paths Identified

Table 1 describes the receptors used in the analysis. The horizontal viewing angle for flight routes is limited to 50 degrees in either direction from the direction of travel. Solas does not consider glare outside of this field of view to be a risk to the pilot.[5]

Table 1: Description of Receptors

Receptor Number	Location	Description
FP1	Hollister Municipal Airport	Northwest-bound descent at runway 31, 2-mile approach from 603 feet above landing threshold
FP2	Hollister Municipal Airport	Southeast-bound descent at runway 13, 2-mile approach from 603 feet above landing threshold
FP3	Hollister Municipal Airport	Northeast-bound descent runway 6, 2-mile approach from 603 feet above landing threshold
FP4	Hollister Municipal Airport	Southwest-bound descent at runway 24, 2-mile approach from 603 feet above landing threshold

[5] Rogers, J. A., et al., Federal Aviation Administration, Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach, 2015.

5 GLARE PREDICTION METHOD

The impact of glare depends on the interaction between the position of the sun, the angle and orientation of the reflective surface, the reflectivity of the surface, the size of the project, and the relative location of the observer. The modelling software assumes there is no cloud cover and does not include screening effects from existing or proposed foliage, terrain, buildings or other obstacles. The model is therefore considered to be conservative.

The sun's position is described using the angle of elevation and solar azimuth. The angle of elevation is the angle between the horizon and the centre of the sun. The azimuth is measured as the angle from true north in a clockwise direction.

Solas performed the glare analysis using the ForgeSolar GlareGauge[6] software tool. This tool uses project inputs and solar positioning calculations to determine if glare will occur at identified observation points. If glare is found, the tool calculates the retinal irradiance (brightness) and subtended angle (size divided by distance) of the glare source. These two factors predict ocular hazards ranging from temporary after-image to retinal burn. Minor topographic features are not always identified in GlareGauge due to the resolution of topographic contours from Google Earth.

"Green" rated glare indicates a low potential for after-image, "yellow" rated glare indicates the potential for after-image exists, and "red" rated glare indicates the potential for retinal damage. Glare that is beyond 50 degrees from a driver's or pilot's line-of-sight does not constitute a safety hazard.[7]

The amount of light reflected by a surface depends on the sunlight's angle of incidence at the surface as illustrated in Figure 4.

[6] Copyright, Sims Industries, 2015

[7] Ho, C. K. and Sims, C. A., Sandia National Laboratories, 2016, Solar Glare Hazard Analysis Tool (SGHAT) User's Manual v. 3.0.

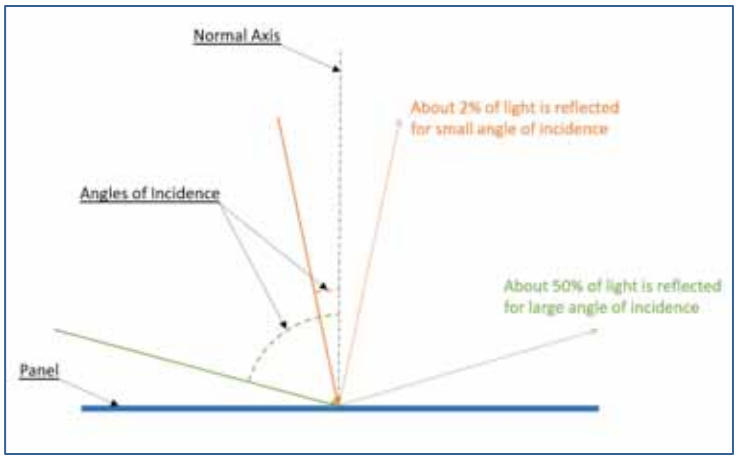


Figure 4: Reflected Light and Angle of Incidence (illustration only) on a reflective surface/panel.

Glass with anti-reflective coating may reflect approximately two percent of incident sunlight on average, which is less than the amount of light open water and uncoated glass typically reflect. Open water and uncoated glass reflect approximately ten percent of incident sunlight.[8,9] The software models the reflectivity for each angle of incidence based on experiments Sandia National Laboratories performed for a variety of different solar PV module types.[10] Very little light is reflected when the sun is nearly perpendicular to the glass, but more light is reflected when the sun is at a shallow angle to the glass.

All flight paths have been modelled using a +/- 50-degree field-of-view based on the standard approach in the ForgeSolar software and the report entitled "Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach".[11]

5.1 Limitations of the Model

This analysis aims to provide an indication of the glare that may be produced by the proposed reflective surfaces on the greenhouse roofs. The prediction methods employed in the analysis have uncertainty. The following lists some of the limitations inherent in the analysis.

- The base model assumes clear skies at all times. The model does not use historical weather pattern data. This results in a total cumulative duration of glare that is likely higher than what will occur over the course of a year.
- The model does not consider shading.

[8] Lasnier and Ang, 1990, Photovoltaic Engineering Handbook. Taylor & Francis, New York.
[9] US EPA, 2013, AERSURFACE User's guide, EPA-454/B-08-001.
[10] Ho, C. K. and Sims, C. A., Sandia National Laboratories, 2016, Solar Glare Hazard Analysis Tool (SGHAT) User's Manual v. 3.0.
[11] Rogers, J. A., et al., Federal Aviation Administration, Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach, 2015.

- Obstructions such as foliage, structures, and hills between the greenhouses and observation points are not modelled by ForgeSolar's GlareGauge software tool.
    - The model does not consider the impact of trees and foliage as it is variable.
- Ocular and perceived hazards differ from person to person, depending on multiple environmental, optical, and human factors.
- Changes in the site and rooftop elevations from the assumptions may change the results of the analysis.
- Footprints encompassing large areas may have reduced accuracy due to the calculation method limitations.
    - Subdivided areas may provide more accurate information related to glare spot locations, but the glare spot size will be limited by the smaller subdivided footprint.
    - The larger, undivided footprint will have more accurate glare spot size results.

A separate analysis could be performed to evaluate the impact of topographical features available in Google Earth on the predicted glare. Combining the corresponding instances of glare from the analysis of subdivided areas with the glare spot sizes from the analysis of undivided footprints partially overcomes the calculation limitations for large footprints. This method provides a more accurate estimate of the potential glare than assessing undivided and subdivided footprints separately.

6 ANALYSIS RESULTS

The following sections provide the results of the glare analysis and illustrative examples of the predicted glare.

6.1 North and South-facing reflective surface with 23-degree slope

Solas does not expect the Project to produce red-grade glare at the evaluated flight paths. The model predicts yellow-grade glare at FP1. Results assume there are clear skies year-round and there is no screening between the greenhouses and the flight paths.

Table 2 summarizes the results and level of glare at the receptors as minutes per year assuming clear skies. Time of day is provided in standard time year-round. The results of the GlareGauge analysis identified that the following location will experience yellow-grade glare:

- FP1 — Northwest-bound descent (Runway 31) — There is potential for temporary after-image (yellow-grade glare) from the glass roofs for a total of **93 minutes** per year. The glare occurs in April and August around 6:30 p.m. standard time (7:30 p.m. daylight savings time) for up to 12 minutes per day. These results assume there are clear skies year-round.

The results of the GlareGauge analysis identified that the following locations will experience green-grade glare:

- FP2 — Southeast-bound descent (Runway 13) — There is low potential for temporary after-image (green-grade glare) from the glass roofs for a total of **321 minutes** (approximately five hours) per year. The glare occurs in March and October between 7:04 and 10:48 a.m. standard time (8:04 and 11:48 a.m. daylight savings time) for up to 35 minutes per day. These results assume there are clear skies year-round.
- FP3 — Northeast-bound descent (Runway 6) — There is low potential for temporary after-image (green-grade glare) from the glass roofs for a total of **222 minutes** (approximately four hours) per year. The glare occurs in March and September between 6:48 and 8:18 a.m. standard time (7:48 and 9:18 a.m. daylight savings time) for up to 24 minutes per day. These results assume there are clear skies year-round.
- FP4 — Southwest-bound descent (Runway 24) — There is low potential for temporary after-image (green-grade glare) from the glass roofs for a total of **163 minutes** (approximately three hours) per year. The glare occurs in March and September around 2:00 p.m. standard time (3:00 p.m. daylight savings time) for up to 17 minutes per day. These results assume there are clear skies year-round.

FP1 is also expected to experience green-grade glare from the Project, but it is minor compared with the instances of yellow-grade glare. Changes to the modelling assumptions (see Appendix A) will affect these results.

Table 2: Glare Hazard by Receptor assuming year-round Clear Skies, in Minutes per Year

Location	Receptor	Hazard Level	Module Elevation		
			17.0 ft	18.5 ft	20.1 ft
Northwest-bound descent (Runway 31)	FP1	G	976	974	969
		Y	93	91	90
		R	-	-	-
Southeast-bound descent (Runway 13)	FP2	G	321	320	320
		Y	-	-	-
		R	-	-	-
Northeast-bound descent (Runway 6)	FP3	G	222	216	219
		Y	-	-	-
		R	-	-	-
Southwest-bound descent (Runway 24)	FP4	G	160	163	160
		Y	-	-	-
		R	-	-	-

Table 2 indicates that the northwest-bound landing approach, FP1, experiences yellow glare. Glare along the airport landing approach can cause real or perceived impairment of a pilot's ability to land their plane.[12] Solas expects all flight paths to observe glare from the south-facing roof glass, but only FP1 will experience glare from the north-facing glass. All yellow glare at FP1 originates from the south-facing glass roof panes.

A summary of the cumulative duration of the highest level of glare predicted for each of the above receptors is provided in Figure 5. These results assume there are clear skies year-round.

[12] Rogers, J. A., et al., Federal Aviation Administration, Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach, 2015.

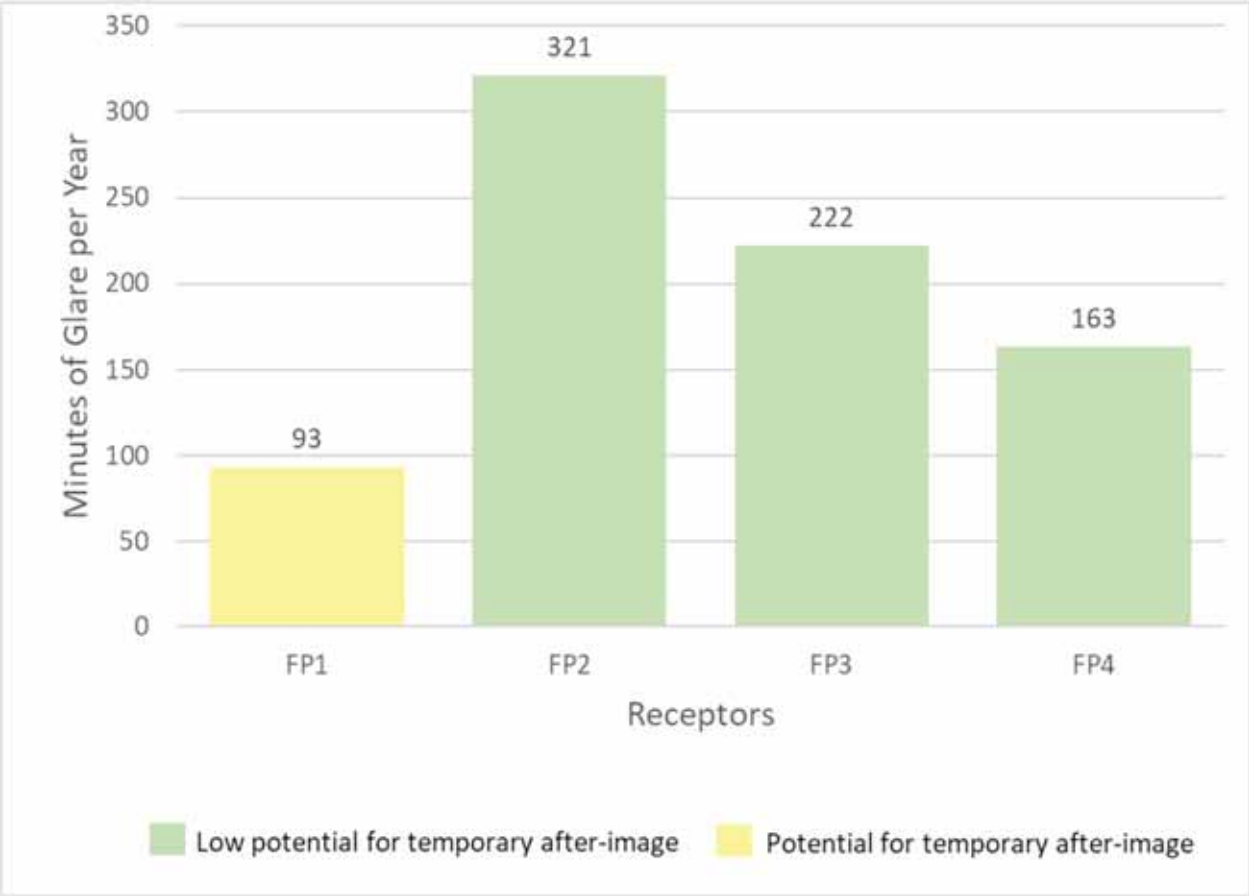


Figure 5: Annual Yellow-Grade Glare at affected Receptors near the Project (Clear skies year-round)

Table 3 shows the timeframes for the occurrence of glare and reports only the highest-intensity glare for each case and location. The cells in the table are colour-coded to match the intensity level and show the time of day, dates, and duration of the glare. The results demonstrate that yellow-grade glare may be present for short periods during evenings in April and August.

Table 3: Seasonality and Duration of the Highest Level of Glare at each Receptor (Clear skies year-round)

Receptor	Module Elevation		
	17.0 ft	18.5 ft	20.1 ft
FP1	6:23 PM-6:43 PM 14 Apr-19 Apr; 21 Aug-27 Aug Up to 12 mins.	6:23 PM-6:43 PM 13 Apr-19 Apr; 21 Aug-27 Aug Up to 12 mins.	6:23 PM-6:43 PM 13 Apr-19 Apr; 21 Aug-27 Aug Up to 12 mins.
FP2	7:04 AM-10:48 AM 2 Mar-12 Mar; 29 Sep-9 Oct Up to 34 mins.	7:04 AM-10:48 AM 2 Mar-12 Mar; 29 Sep-9 Oct Up to 35 mins.	7:04 AM-10:47 AM 2 Mar-12 Mar; 29 Sep-9 Oct Up to 34 mins.
FP3	6:48 AM-8:18 AM 10 Mar-15 Mar; 25 Sep-1 Oct Up to 24 mins.	6:49 AM-8:18 AM 10 Mar-15 Mar; 25 Sep-1 Oct Up to 24 mins.	6:49 AM-8:18 AM 10 Mar-15 Mar; 25 Sep-1 Oct Up to 24 mins.
FP4	1:19 PM-2:47 PM 11 Mar-16 Mar; 24 Sep-30 Sep Up to 16 mins.	1:19 PM-2:47 PM 11 Mar-16 Mar; 24 Sep-30 Sep Up to 17 mins.	1:19 PM-2:47 PM 11 Mar-16 Mar; 24 Sep-30 Sep Up to 16 mins.

6.2 Detailed Glare Results Examples

Sections 6.2.1 and 6.2.2 describe the glare hazard at two receptors as examples.

6.2.1 Northwest-bound Descent with a 2-mile Approach (FP1, Runway 31)

FP1 represents an airplane landing at runway 31 of the Hollister Municipal Airport with a 2-mile approach from the southeast. The Project greenhouses are on the left side of the airplane on landing. The flight path utilizes the standard three-degree descent slope and field-of-view of 50 degrees in either direction from straight ahead. Figure 6 illustrates the time of day and seasonality for glare hazard for FP1 from the roof elevation of 17.0 feet (the bottom extent of the roof). The potential for after-image from yellow-grade glare occurs between 6:23 and 6:43 p.m. standard time (7:23 and 7:43 p.m. daylight savings time) in April and August. The effects of green-grade glare are considered negligible as it has a low risk of after-image.

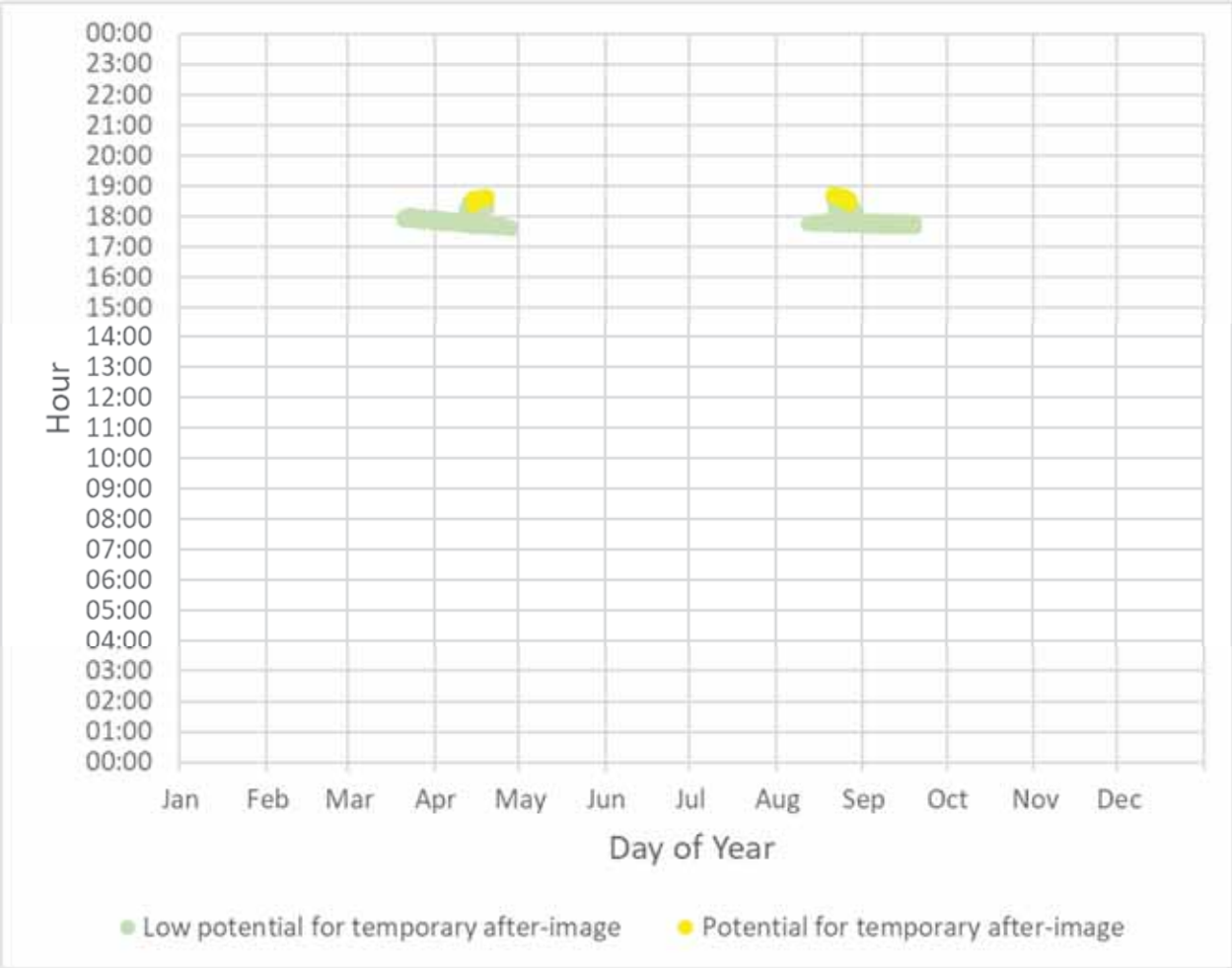


Figure 6: Time of Glare Hazard for FP1 (Clear skies year-round)

Figure 7 shows the daily duration for each level of glare that may be experienced at FP1. This flight path can experience up to 12 minutes of yellow glare and 37 minutes of green glare in a day (up to 45 minutes of combined glare per day). Approximately nine percent of the glare is classified in the yellow category. These results assume there are clear skies year-round.

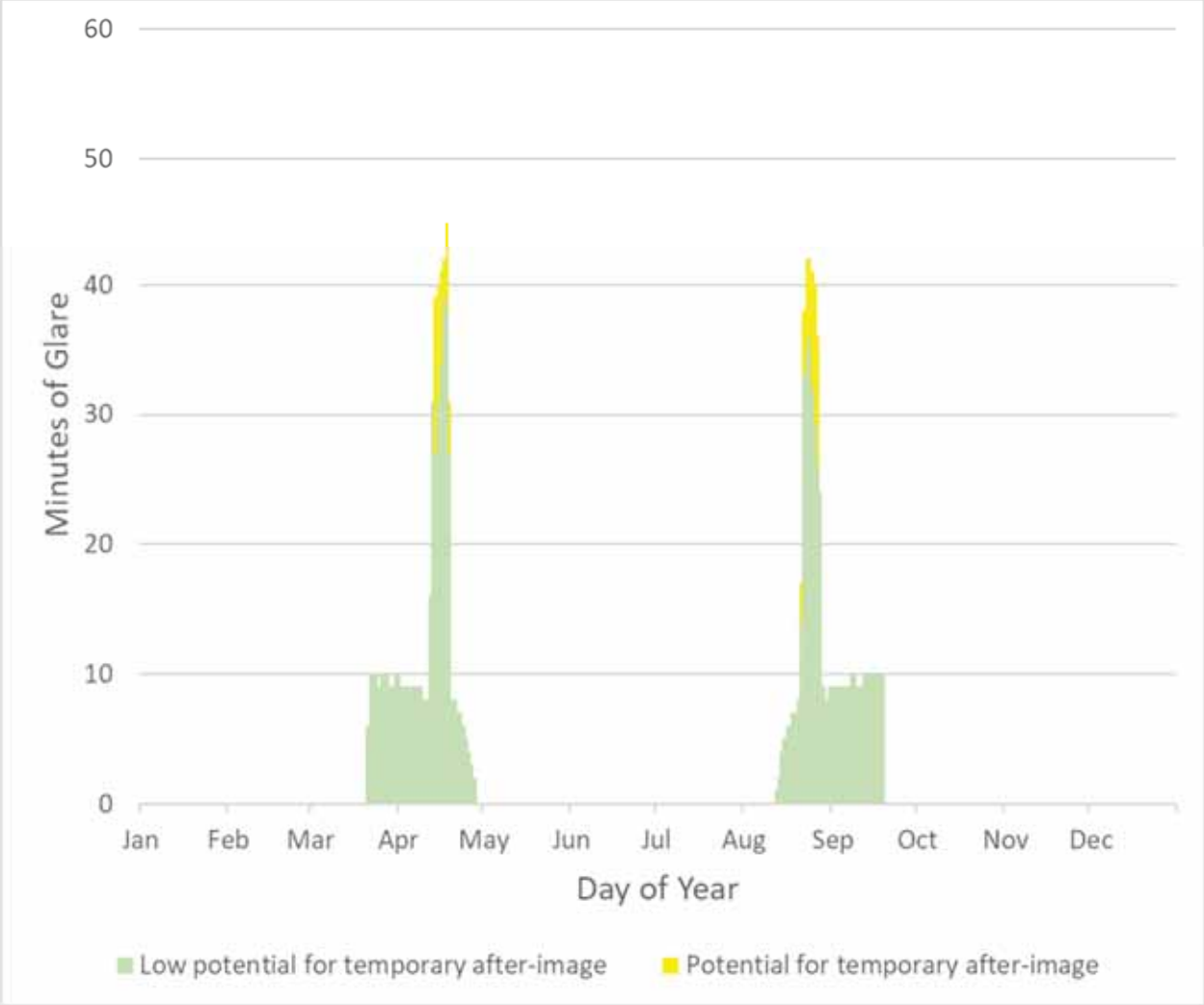


Figure 7: Daily Duration of Glare at FP1 (Clear skies year-round)

Figure 8 plots the glare hazard according to the size of the glare spot (Subtended Source Angle), brightness of the glare (Retinal Irradiance), and the glare level (green, yellow, and red zones). The size and brightness of the glare spots are displayed using logarithmic scales. At FP1, the glare is 400 times dimmer than staring at the sun but will appear up to three times bigger than the perceived diameter of the sun viewed from the same location. These results assume there are clear skies year-round.

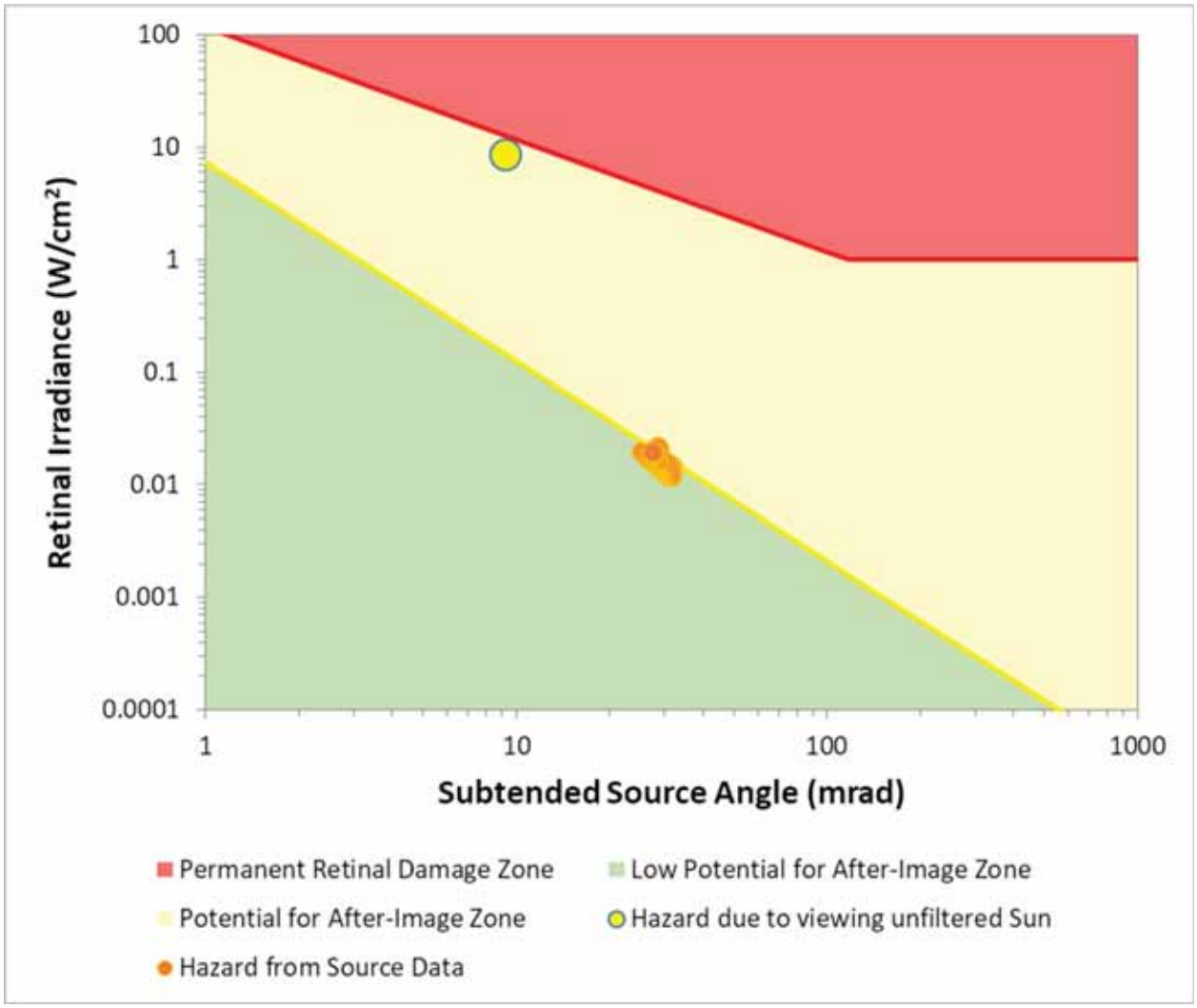


Figure 8: Log-Log Hazard Plot for FP1 (Clear skies year-round)

6.2.2 Southeast-bound Descent with a 2-mile Approach (FP2, Runway 13)

FP2 represents an airplane landing at runway 13 of the Hollister Municipal Airport with a 2-mile approach from the northwest. The Project greenhouses remain southeast of the airplane as it lands. The flight path utilizes the standard three-degree descent slope and field-of-view of 50 degrees in either direction from straight ahead. Figure 9 illustrates the time of day and seasonality for glare hazard for FP2 from the roof elevation of 17.0 feet (the bottom extent of the roof). The low potential for after-image from green-grade glare occurs between 7:04 and 10:48 a.m. standard time (8:04 and 11:48 a.m. daylight savings time) in March and October. The effects of green-grade glare are considered negligible as it has a low risk of after-image.

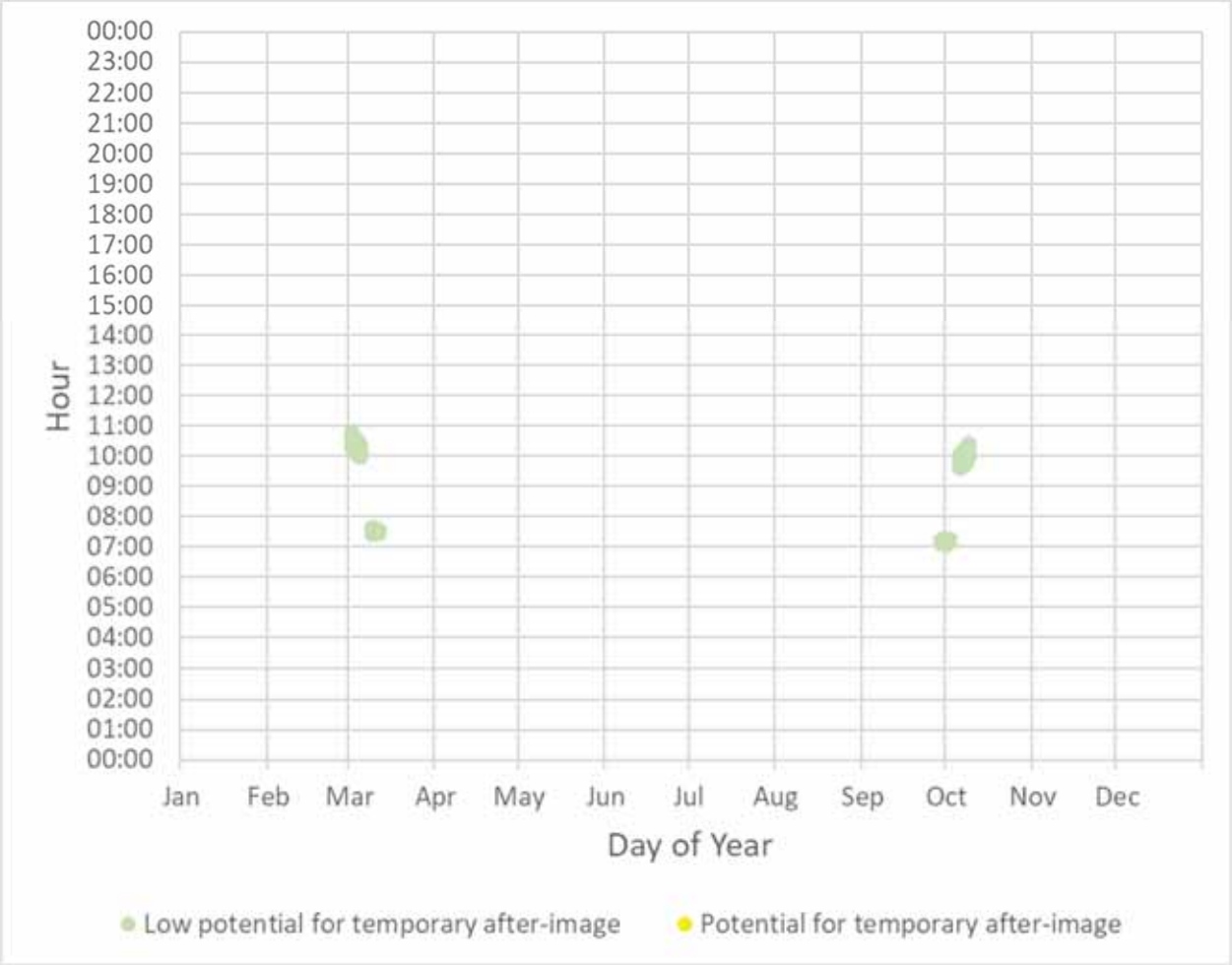


Figure 9: Time of Glare Hazard for FP2 (Clear skies year-round)

Figure 10 shows the daily duration for each level of glare that may be experienced at FP2. This flight path can experience up to 34 minutes of green glare in a day. None of the glare is classified in the yellow category. These results assume there are clear skies year-round.

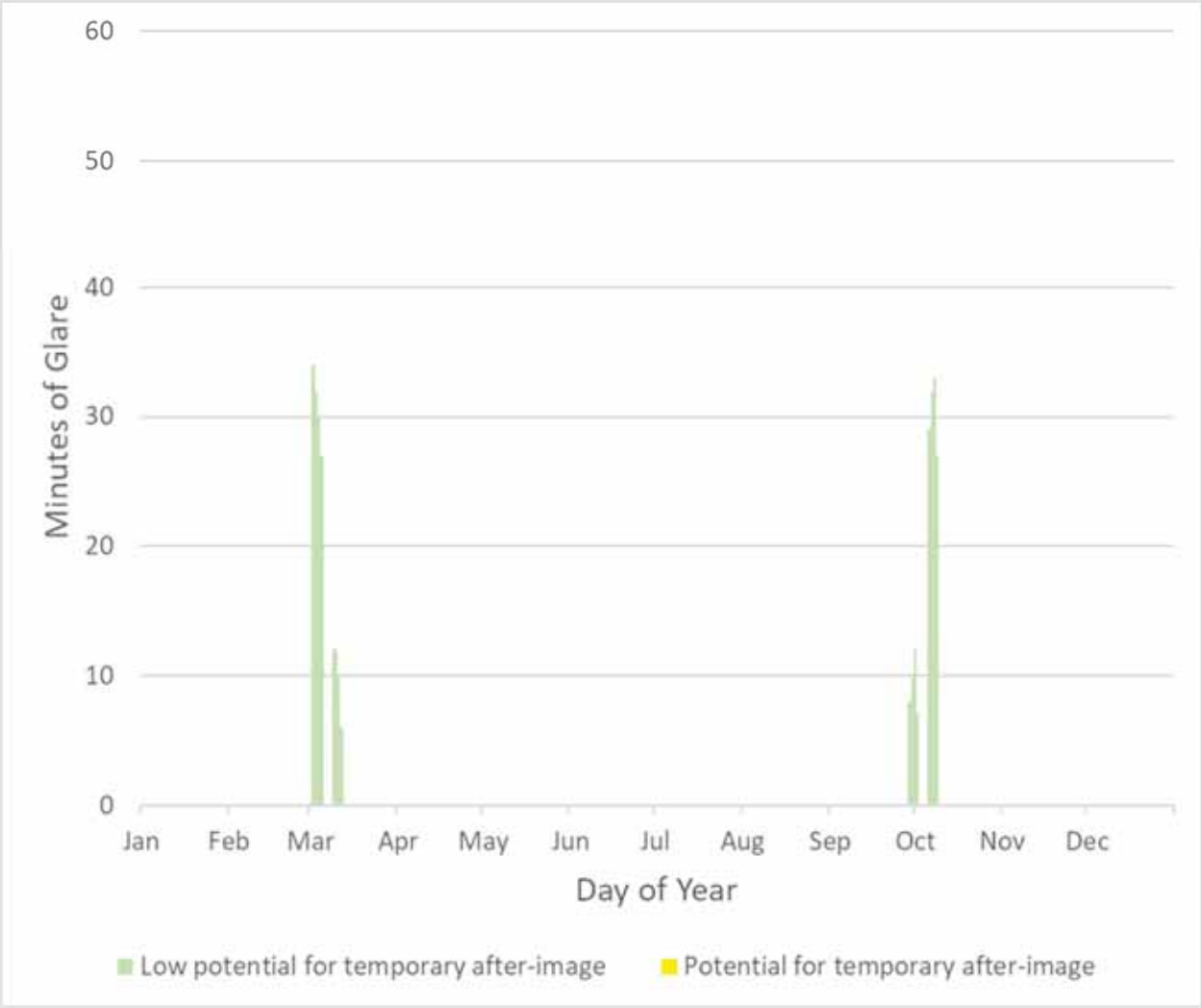


Figure 10: Daily Duration of Glare at FP2 (Clear skies year-round)

Figure 11 plots the glare hazard according to the size of the glare spot (Subtended Source Angle), brightness of the glare (Retinal Irradiance), and the glare level (green, yellow, and red zones). The size and brightness of the glare spots are displayed using logarithmic scales. At FP2, the glare is 425 times dimmer than staring at the sun but will appear up to two times bigger than the perceived diameter of the sun viewed from the same location. These results assume there are clear skies year-round.

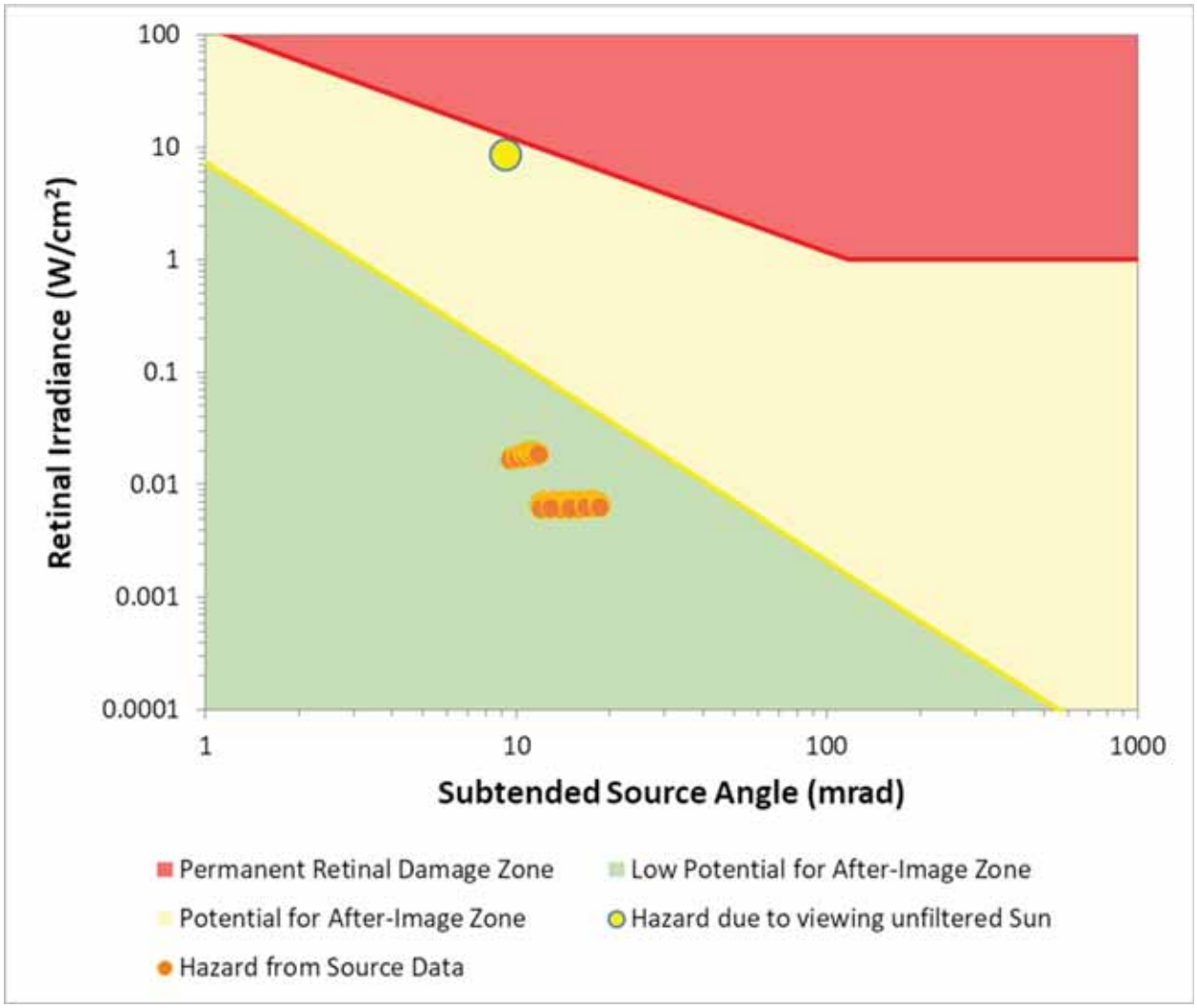


Figure 11: Log-Log Hazard Plot for FP2 (Clear skies year-round)

6.3 Glare Visual Representation

Solas developed a catalogue of glare representations to help stakeholders understand and visualize the glare they may experience from solar PV projects. Solas' glare catalogue includes a range of images depicting glare of varying intensity from actual solar arrays and buildings. The irradiance of the glare shown in Figure 12 is of similar intensity to the glare that Solas predicts observers will experience from the Project. Solas expects glare to reach up to 213 watts per square metre (W/m^2), while the figure below provides a representation at an irradiance level of 190 W/m^2.

Figure 12: Solas Glare Catalogue Image (190 W/m^2) at a similar irradiance level to those expected at the Project

Figure 13 shows reference points for glare irradiance levels from various solar PV facilities and buildings. This figure is shown to provide context for the glare representation above.

158 W/m^2
(green)

190 W/m^2
(yellow)

279 W/m^2
(yellow)

Figure 13: Glare Irradiance Level Reference Points from the Solas Glare Catalogue

7 GLARE-MITIGATING FEATURES

Glare has been predicted from the greenhouses using base assumptions and the GlareGauge software. Solas completed additional analyses to model real-world features that could reduce the glare impact.

7.1 Cloud Cover and Typical Weather Patterns

The GlareGauge model assumes that clear skies occur every day of the year resulting in glare durations that are higher than observers are likely to experience. Solas obtained the fraction of days with less than 20 percent cloud cover for each month of the year using modelled data normalized over 30 years. Solas incorporated Meteoblue's data for Hollister, which is believed to be somewhat representative.[13]

Solas adjusted the predicted annual duration of yellow-grade glare to account for the potential of cloudy days as the "Adjusted Case". Clouds reduce reflection by diffusing sunlight. For this analysis, Solas conservatively downgraded glare hazard levels by one category on cloudy days. On many days, the cloud cover may be sufficient to eliminate the glare completely. Figure 14 shows the comparison between glare assuming clear skies versus typical annual cloud cover. Due to cloud cover, yellow-grade glare is reduced by 44 percent on average in the Adjusted Case.

[13] https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/hollister_united-states-of-america_5357499, accessed: September 15, 2020.

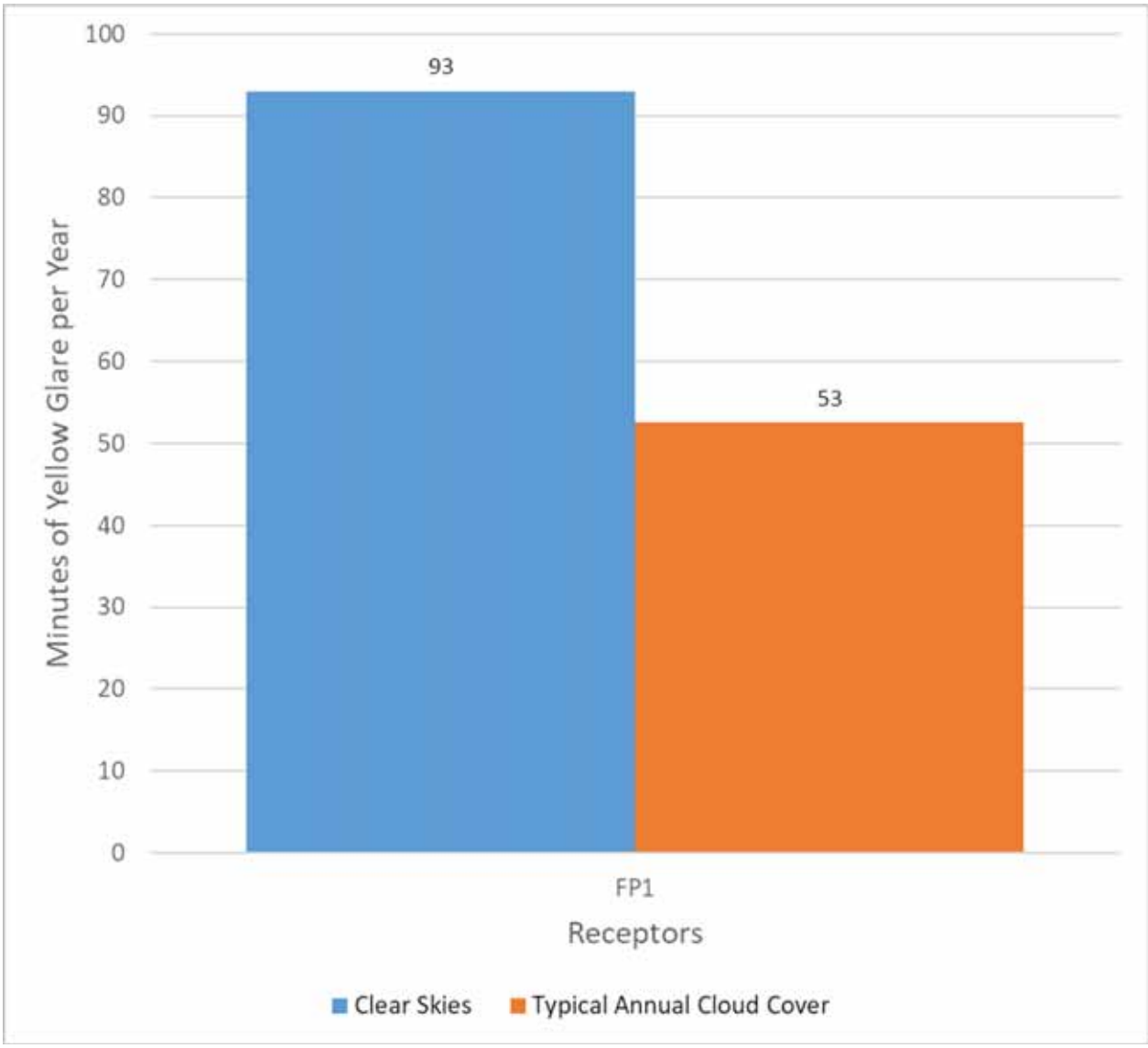


Figure 14: Annual Glare Durations for Clear Skies Assumption and Typical Cloud Cover (Adjusted Case)

8 CONCLUSIONS AND DISCUSSION

The analysis results indicate that there is no incidence of red-grade glare predicted from the Felipe 9 greenhouses. Pilots landing at runway 31 (FP1) of the Hollister Municipal Airport are expected to experience short durations of yellow-grade glare from the Project. The remaining three flight paths are predicted to observe green-grade glare from the greenhouse roofs. Yellow glare is only produced at the evaluated receptors by the south-facing glass panes, while the north-facing glass only produces green glare. The greenhouse side walls were not evaluated in this analysis.

One landing approach at the Hollister Municipal Airport is expected to observe yellow glare, while the rest are only expected to experience green glare. FP1 simulates the two-mile landing approach to runway 31 from the southeast. Aviators utilizing this route may see up to 93 minutes of yellow glare in a year for short periods during April and August evenings. Yellow glare may be present around 6:30 p.m. standard time (7:30 p.m. daylight savings time) for up to 12 minutes per day. Additional green glare may be observed for up to 976 minutes per year between March and April, and August and September. Green glare may be present between 5:36 and 6:43 p.m. standard time for up to 37 minutes per day. Combined, yellow and green glare may appear for up to 45 minutes per day. The glare seen from flight paths will look much dimmer than the sun but will appear larger.

Glare predicted to be produced by the solar PV array is categorized in both the “yellow” and the “green” levels, indicating an observer may experience an after-image if the observer looks at a glare spot. The size and intensity of the glare spot and resulting after-image are dependent on the distance between the observer and the array. An increase in the distance between the observer and array will decrease the impact and after-image created by the glare. The after-image an observer may experience could temporarily appear as a slightly darker or discoloured spot or line in the observer’s vision. The effects of green-grade glare are considered negligible as it has a low risk of after-image.

Cloud cover and typical weather patterns provide a variable source of glare mitigation. Clouds may diffuse incident sunlight, lessening the impact of reflections from the solar modules. The impact of cloud cover was assessed using modelled weather data normalized over 30 years. Since glare may not be fully mitigated by clouds, glare levels were assumed to be downgraded by one category on cloudy days. Glare was downgraded by approximately 44 percent on average in the Adjusted Case.

Based on the information associated with the geographic configuration of the glass panes on the greenhouse roofs, glare from the Project has a low potential to pose a risk to flight operations at the Hollister Municipal Airport. Changes to the Project layout or specifications will affect the results of the analysis.

Appendix A ForgeSolar Modelling Assumptions

Greenhouse Roof Parameters

Roof azimuth: 4 degrees (north) and 184 degrees (south)
Roof tilt/slope: 23 degrees
Material: Smooth glass without anti-reflective coating
Vary reflectivity with sun position? Yes
Ground elevation: 261 feet (minimum elevation)
Height above ground: assessed at 17.0 feet, 18.5 feet, and 20.1 feet

Flight Path Parameters

Glide slope: 3 degrees
Plane height above threshold ground elevation (2 miles from threshold): 603 feet
Plane height above ground (at threshold): 50 feet
Horizontal/Azimuthal viewing angle: 50 degrees from centre
Maximum downward viewing angle: 30 degrees from horizontal