Request for Proposal

June 12, 2020

Glenn-Colusa Irrigation District (GCID or District) is seeking proposals for survey work by California licensed professionals.

One electronic copy in Portable Document Format (PDF) of individual proposals must be received by GCID no later than 3 p.m. on July 10, 2020. Hardcopy submittals will not be considered. Submittals received after the deadline will not be considered.

Electronic copy by email should be delivered to

> Glenn-Colusa Irrigation District
> RE: Gradient Facility Project Surveying Proposal
> hdawley@gcid.net

Questions about this Request for Proposal (RFP) should be directed in writing to Holly Dawley at hdawley@gcid.net. GCID reserves the right to reject any and all proposals.

Key Survey Purposes/Outcomes

- Identify locations of the Sacramento River, its bank, GCID features (e.g. the in-river GCID Gradient Facility), erosion, private property, public property
- Support easement and use agreements and mapping for parcels along the west side of the inlet channel
- Identify GCID ownership on the west side of the river
- Identify ownership and property lines on the east side of the river, including the District's access easement
- Obtain basis for development of project improvements, including design, permitting, and construction
- Develop appropriate mapping, digital integration, and control points
- Update the GCID boundary description

1.0 Introduction, Contracting Entity

GCID is the largest irrigation district in the Sacramento Valley. The District's boundaries cover approximately 175,000 acres including 140,000 acres that are farmed. Additionally, the District provides service to 1,200 acres of private habitat land and 21,000 acres of protected federal wildlife refuges.

The Hamilton City Pumping Plant (HCPP), GCID's only diversion from the Sacramento River, is located approximately 4 miles northwest of Hamilton City. The HCPP diverts water into the District's 65-mile long Main Canal, which conveys water into a complex system of nearly 1,000 miles of canals, laterals and drains. A significant portion of the conveyance infrastructure was constructed in the early 1900s.

2.0 Project Background and Location

GCID has several ongoing activities occurring at the HCPP and the corresponding reach of the Sacramento River. This Scope of Services described within this RFP is intended to directly support these efforts. A task map is provided as Attachment A to show the general location of the individual tasks with respect to major District infrastructure. The District intends to resolve several ongoing ownership, access, and easement issues as well as begin to conduct repairs in the Sacramento River associated with ongoing maintenance of the in-river Gradient Facility. A description of the Gradient Facility is attached for reference (Attachment B).

The resolution of District ownership at the HCPP must then be integrated into the District's boundary description, which was last revised in August 1998, and can be made available upon request. Furthermore, since this time, annexations and detachments of parcels to and from the District, respectively, have modified its boundary. Consequently, these changes must likewise be incorporated into the boundary description to reflect the current District boundary.

3.0 Scope of Services

The anticipated work associated with this RFP is described as tasks herein. Control points will be provided based on previous horizontal and vertical control survey work, which is provided as Attachment C.

The anticipated deliverables, subject to change upon a successful award and contract negotiation are provided in Table 1.

Table 1
Anticipated Deliverables for GCID HCPP Surveying Project
GCID Request for Proposal, Hamilton City Pumping Plant Surveying Project

Task	Digital Deliverable	Hard Copy Deliverable
1—Inlet Canal Property Line and Delineation	➢ PDF Survey summary of methodology, equipment utilized, property corners/monuments set, photos (Report), recorded Record of Survey ➢ AutoCAD Civil3D or other AutoCAD format ➢ .CSV point file in Point, Northing, Easting, Description (PNEZD) format ➢ Scans of any additional property research compiled to support the survey	➢ Report with original or copy of recorded Record of Survey
2—Sacramento River East Bank Property Line and GCID Access Easement	➢ PDF Report with recorded Record of Survey ➢ AutoCAD Civil3D or other AutoCAD format ➢ .CSV point file in PNEZD format ➢ Scans of any additional property research compiled to support the survey	➢ Report with original or copy of recorded Record of Survey
3—Topographic Data	➢ Report ➢ PDF map ➢ AutoCAD Civil3D or other AutoCAD format ➢ .CSV point file in PNEZD format	➢ Report with map
4—Update GCID Boundary Description	➢ PDF Report ➢ Updated GCID Boundary Description in Microsoft Word and PDF ➢ Index map of the 1998 and updated GCID Boundary in the following formats: PDF, AutoCAD Civil 3D, and ArcGIS map with shapefile. (Each parcel that has annexed or detached since 1998 to be delineated in separate layer and shapefile features.)	➢ 11x17 map of the 1998 GCID Boundary Index Map to be attached to the 1998 GCID Boundary Description ➢ Updated GCID Boundary Description with 11x17 Index Map attachment
5—Bathymetric Data (Optional Task)	➢ PDF Report ➢ PDF map ➢ AutoCAD Civil3D or other AutoCAD format ➢ .CSV point file in PNEZD format	➢ Report with map

Task 1. Inlet Canal Property Line and Delineation

GCID owns the property along the inlet channel; however, the exact property line location has not been identified on site. All landowner contact should be coordinated through GCID. Task 1 will provide property line information to support GCID's effort to obtain long-term land use agreements from identified landowners. Task 1 work includes identifying the property line locations, finding/setting property corners and setting monuments/control points as recommended by the survey team.

Task 2. Sacramento River East Bank Property Line and GCID Access Easement

Significant erosion has occurred along the east bank of the Sacramento River across from Montgomery Island which is owned by a private landowner. The location of the private property line is unknown and where the property line is located relative to the easterly Sacramento River erosion is also unknown. Task 2 would consist of working with GCID staff and the current landowner, to identify the location of the property line which would inform additional access easement needs as well as erosion reduction alternatives.

GCID has acquired an access easement through the private landowner's property in order to access the easterly bank. The work would include mapping this easement, staking to verify location, control points, etc. to insure continued access to support future project activities on the east bank.

Task 3. Topographic Data

Task 3 includes obtaining topographic and recent aerial photos as well as water surface from the northern tip of Montgomery Island to a point 100 feet downstream of the confluence of the Bypass Channel with the Sacramento River. The new data will be used to update and confirm survey information that has been previously performed for evaluation of the Gradient Facility (see Attachment B); a copy of the survey data will be provided by GCID. The data, along with data from Task 5 (optional) if proposed, should be used to understand the amount of erosion and deposition on river bars upstream and downstream of the Gradient Facility.

Task 4. Update the GCID Boundary Description

The legal description developed from Task 1 shall be integrated into the District's boundary description. Additionally, a series of annexation and detachments of parcels throughout the District have since occurred the latest revision to the GCID boundary description in August 1998. These collective modifications must likewise be incorporated into an update of the GCID boundary description.

GCID has the metes and bounds legal descriptions with corresponding exhibit maps on-file for each of these parcels, which were prepared by professional land surveyors during the annexation and detachment process. Since August 1998, thirty-one parcels, totaling 2,748.7 acres, have been annexed to the District, while thirty-one parcels that comprise 1,486.8 acres have been detached from the District service area,

Task 5. Bathymetric Data - Optional

Task 5 is considered optional based on applicant resources, availability, and capabilities. There is no obligation to include this task in the applicant's RFP response. This task would involve collecting bathymetric data that would be added to the Task 3 data. For this task, bathymetric and velocity data will be obtained using an Acoustic Doppler Current Profiler (ADCP). Data will be obtained at and immediately below the Gradient Facility and at selected cross-sections upstream and downstream of the Gradient Facility, including the river channels on the east and west side of the mid-river gravel bar to a point 100 feet downstream of the confluence of the Bypass Channel to the Sacramento River. The data at and immediately below the Gradient Facility will be used to compare to previous surveys and determine the extent of erosion in the scour hole and the island bar south of the gradient and river channels on the east and west side of the bar. The additional surveys will provide bathymetric and velocity data to improve the accuracy of the hydraulic model previously prepared and compare to cross-section data from previous hydraulic models and surveys. There may be seasonal constraints associated with river flows regarding the implementation of this task.

4.0 Proposal Content

The proposal may not exceed 15 pages (8-1/2" x 11"). Team member resumes may be added as an attachment and not counted toward the SOQ page limit. No individual resume should exceed 1 page. An example contract including insurance terms must be provided as an attachment. The example contract will not count toward the page limit. Table of Contents and cover letters also do not count toward the page limit.

Section 1—Cover Letter

Section 1 shall be a maximum two-page Cover Letter and introduction, and shall include the name and address of the organization submitting the proposal, together with the name, address and telephone number of the contact person who will be authorized to make representations for the organization, and the Firm's federal tax ID number. The cover letter shall include a statement that the proposal is valid for 60 days after receipt.

Section 2—Table of Contents

Section 2 shall be a detailed Table of Contents and shall include an outline of the submittal, identified by sequential page number and by section reference number and section title as described herein.

Section 3—Project Team and Relevant Experience

Section 3 should list key Team Members and associated relevant experience for the team. This section should explain the organization of the key team members and include job roles and responsibilities as they relate to this proposal, e.g. Project Manager. This is also the section where any potential conflicts or perceived conflicts should be disclosed. It is expected that the Project Manager of this proposal will be a licensed CA land surveyor. If this is not the case, this should be identified and explained with in the proposal. Listed relevant projects should have description, dates, photo(s), and contact person/reference with name, title, and phone number.

Section 4—Work Approach and Schedule

Section 4 should demonstrate the Team's ability to implement the scope of services, respectfully interact with landowners, be mindful of environmental and regulatory restrictions, implement field safety plans, and work near water bodies. A schedule should be provided including mobilization, field work, demobilization, and delivery of final product.

Section 5—Cost Proposal

Section 5 should provide a detailed cost proposal for all tasks listed in Scope of Services. The cost proposal should be all-inclusive: all insurance, overhead, profit, and any other cost must be included. Any assumptions that had to be made to provide the cost proposal should be stated. A rate schedule should be included.

5.0 Evaluation Criteria

The proposal responses will be evaluated by a panel of GCID employees who will prioritize the following:

- Responsiveness to the RFP (completeness and quality of the response)
- Experience of the firm and key team members in providing services within the technical areas mentioned in the Scope of Services
- Ability to work confidentially without conflict

GCID may select an applicant based on the evaluation criteria described above or may invite the top-rated teams to participate in a brief interview. If GCID is unable to negotiate a fee structure with the team identified as the most qualified, GCID may choose to negotiate with the next most qualified team and continue until successful in

negotiating a fee structure acceptable to GCID. GCID may also choose not to enter into negotiations with any of the applicants.

6.0 Timing and Schedule

The following timing and schedule are estimated and are subject to change.

July 6, 2020, 12 p.m.	Final day and time for submittal of questions regarding the RFP that will be responded to.
July 8, 2020, 5 p.m.	Responses to questions will be provided no later than this day.
July 10, 2020, 3 p.m.	***All responses to this RFP must be submitted on or before 3:00 p.m.***
July 24, 2020	Approximate candidate selection

7.0 General Terms

7.1 Any questions related to this RFP are to be directed in writing to GCID contact person, Holly Dawley at hdawley@gcid.net

7.2 All questions and responses related to the RFP will be provided by email to the requesting entity's contact person. Questions and Answers will be posted on the GCID website to ensure that all respondents receive the same information. No questions will be accepted or answered after 12 p.m. July 6, 2020. Any questions and responses will be compiled and returned to the requesting firm (electronically) no later than 2 business days after the request.

7.3 Any and all costs including travel, if required, associated with the development and delivery of the RFP response to the GCID is the full responsibility of the responding entity with no reimbursement due by the GCID.

7.4 All work performed for GCID, including all documents associated with the tasks, shall become the exclusive property of GCID.

7.5 All information and materials submitted to the District in response to this RFP may be reproduced by GCID for the purpose of providing copies to authorized personnel involved in the evaluation of the proposals but shall be exempt from public inspection under the California Public Records Act until such time as a contract(s) is/are awarded. Contract awards are a matter of public record. Once a Contract is executed, Proposals submitted in response to this RFP are subject to public disclosure as required by law. Your submission of a proposal is considered your consent to GCID's

disclosure of the Proposal. GCID shall not be liable for disclosure of information or records related to this Solicitation.

7.6 The selected applicant agrees to file tax returns and pay all applicable taxes including possessory use taxes that may be levied as a result of use as managed by the selected applicant.

7.7 The selected applicant shall indemnify and hold harmless GCID's volunteers and employees from liability of any nature or kind due to the use of any copyrighted or uncopyrighted composition, trade secret, patented or unpatented invention, article, service or appliance furnished or used as a result of this solicitation and any potential subsequent purchase order or contract.

7.8 The selected consultant(s) will need to provide insurance certificate(s) for Commercial General Liability, Automobile Liability, Workers' Compensation and Employer's Liability, and Professional Liability.

7.9 The opening of proposals in response to this RFP is not subject to attendance by the general public. This restriction is necessitated by the fact that the contract award is subject to negotiations; it would be unfair for competing companies to know the prices quoted by one another.

7.10 The successful applicant must be prepared to begin work promptly following execution of the contract.

7.11 Applicants are reminded that it is their responsibility to:

7.11a Read carefully all of the contents of this entire RFP.

7.11b Ask for clarification in writing before submission due date.

7.11c Address all requirements and follow all procedures of this RFP.

7.12 Immediately inform the RFP Contact Person of any problems with this RFP solicitation.

7.13 Submit all responses by the required dates and times.

8.0 Reserved Rights

8.1 Issuance of this RFP in no way constitutes a commitment by GCID to award a contract. If GCID determines it is in the best interest to do so, no applicant may be selected and no contract may be executed.

8.2 Upon acceptable pricing negotiations and contract award, the selected applicant shall be required to execute a contract with GCID. GCID may modify the contractual requirements of the contract prior to execution of a contract for services.

8.3 GCID reserves the right to request additional information from applicants that have submitted proposals in response to this RFP and to enter into negotiations with more than one applicant.

8.4 GCID reserves the right to reject any or all proposals received if GCID determine that it is in GCID's best interest to do so. Further, GCID may cancel or amend this RFP at any time and may submit similar solicitations in the future.

8.5 GCID may reject any proposal that does not meet all of the mandatory requirements of this RFP.

8.6 GCID may request clarification of any submitted information and may request additional information on any or all responses provided and may waive minor inconsistencies deemed to be irrelevant.

8.7 GCID may award more than one contract if it is in the District's best interest.

Attachment A

Task Map

Walch Ave.

Capay Ave. (Co. Rd. 2)

2nd Ave.

Cutler Ave.

18-001-105

SA-1-220

SCREEN

GCID INTAKE CHANNEL

GCID Fish Screen

GCID BYPASS CHANNEL

SACRAMENTO RIVER

GCID 4

GCID Main Pump Station

PUMP RESET

Co. Rd. W (1st. Ave.)

Co. Rd. 6

Co. Rd. 203

Montgomery Island

Task 1

Task 2

Task 3

Task 5

Vicinity Map

Red Bluff

Tehama

Deer Creek

Black Butte Lake

Chico

Glenn

Lake Orowille

Yuba

Yuba City

Colusa

Lake

Beale Air Force Base

Sutter

Clearlake

SACRAMENTO VALLEY

Tasks 1-3 and Task 5

GCID Service Area

Task 4

Legend

- GeoTerra Control Points
- GradientFacility
- Permanent Channel Improvement Easement, Doc. No. 2002-0053682 Butte Co.
- Permanent Road Easement, Doc. No. 2002-0053682 Butte Co.
- Book 106 Pg. 371, Parcel 1 Tehama Co.
- Book 106 Pg. 371, Parcel 2 Tehama Co.
- Book 570 Pg. 446, Parcel 1 Glenn Co.
- Book 570 Pg. 446, Parcel 2 Glenn Co.
- GCID Boundary

N

0 250 500 1,000 1,500 2,000 Feet

Attachment A: Task Map

Vicinity Map and GCID Montgomery Island (Island #9) Area Map

SERVING OUR LANDS AND ENVIRONMENT SUSTAINABLY
GCID
100 YEARS OF DEDICATION
1920-2020

Attachment B

Gradient Facility Summary

Sacramento River Channel Restoration

A major flood in January 1970 significantly changed the shape and flow of the Sacramento River downstream of the Glenn-Colusa Irrigation District (GCID) intake channel. Approximately 4 miles north of Hamilton City, a meander was cut off, which reduced the river reach by approximately 2.5 miles (RM 202.5 to RM 205). The riverbed gradient within this reach continued to degrade with seasonal flood events. The degraded river gradient decreased water surface elevations by 3 feet at the GCID diversion, leaving much of the fish screen out of the water. The lower water elevations contributed to unacceptable fishery losses at the existing drum screen facility.

In 1989, the NOAA Fisheries (formerly the National Marine Fisheries Service) designated the winter-run Chinook salmon as an endangered species. In 1990, federal legislation listed the fish as threatened. Growing resource agency (NOAA Fisheries, California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers [USACE], U.S. Bureau of Reclamation [USBR], and California Department of Water Resources)

Upstream view of Sacramento River gradient facility and rock slope protection

Stabilization of the Sacramento River channel is essential to the success of GCID's fish screen project.

GCID
GLENN-COLUSA IRRIGATION DISTRICT

In-river construction using drag line

In-river excavation

In-river construction using longitudinal berm

Project Objectives

- Ensure fish-friendly flow conditions by emulating natural riffles on the riverbed
- Achieve efficient screen operation by restoring and maintaining the original water surface elevations at the fish screen
- Facilitate safe and effective fish passage across the screen by providing appropriate water velocities
- Provide appropriate water surface elevations to safely conduct fish through the bypass system under gravity flow
- Enable recreational boat navigation in the vicinity of the GCID intake by providing sufficient water depth in the main river channel

concern over the loss of juvenile salmon at the GCID intake led to a federal court injunction against GCID pumping any water out of the river. A stipulated agreement was reached in 1991 that allowed GCID to divert a limited amount of water during the winter-run Chinook's peak migration period, if improvements were made to the intake and exit channels and screening facilities.

During the early 1990s, GCID and the resource agencies began a joint effort to develop a long-term solution. The existing drum screen facility was retrofit with a vertical flat-plate fish screen facility to enable GCID to divert at lower river levels and still allow for safe fish passage. This screen was only an interim solution because it did not meet the resource agencies' new and more stringent performance criteria.

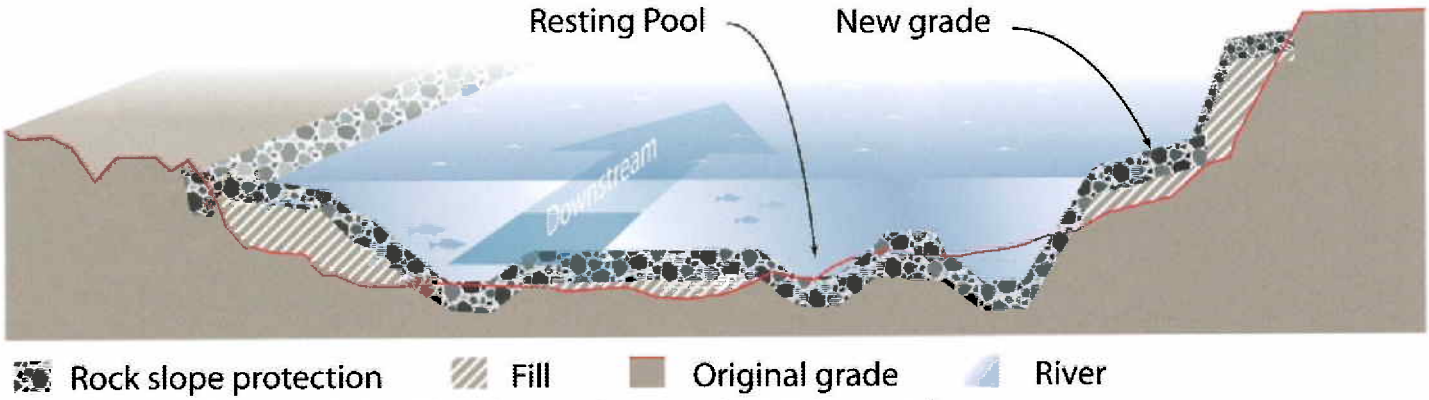
To protect fish and facilitate their safe passage past the GCID intake and pump station, GCID and USBR completed construction of a flat-plate fish screen facility. This approximately 1,100-foot-long structure consists of the 480-foot interim screen, installed in 1993 and upgraded in 2000, and a 620-foot screen extension, completed in 2000.

The Gradient Facility Project

A long-term solution known as the Gradient Facility was developed to control the meandering of the Sacramento River so that the flow would not be reduced at the intake again.

The USACE was the lead agency for the design and construction of the gradient facility (or riffle) in the Sacramento River. The gradient

Beneath the Surface



Cross-section view of the gradient facility, which emulates naturally occurring riffles in the Sacramento River

facility is critical to the long-term proper operation of the new fish screen structure under inevitable changing river conditions. It ensures effective fish screen operation by stabilizing the riverbed to provide the required water surface elevation at the fish screen.

It also facilitates safe and effective fish passage by providing adequate flow velocity past the screen, as well as flow conditions that enable the screen facility fish bypass system to safely conduct fish downstream of the screens under gravity flow. The design of the gradient facility emulates naturally occurring riffles in the Sacramento River and provides sufficient water depth for recreational boating through this reach of the river.

Gradient Facility Components

To achieve the desired natural riffle configuration, the in-river portion of the gradient facility includes sheet piles placed at specified elevations and intervals in the riverbed. The top of the structure is as much as 4 feet above the original riverbed. The rock slope protection is supplemented by 3 sheet-pile cutoff walls that extend beyond either riverbank to protect the gradient facility during storms. The buried sheet piles are surrounded and covered by rock slope protection, which extends 1,000 feet along the river channel and along approximately 2,500 feet of the levee banks, both upstream and downstream of the structure. The rock slope protection maintains the proper

Major Project Elements

- Gradient facility consisting of sheet piles and rock slope protection to emulate natural riffles and stabilize the riverbed
- Bank and channel rock slope protection to maintain the river channel alignment and protect the gradient facility and fish screen from damage during high flows
- Revegetation of the construction site and offsite habitat restoration to mitigate and compensate for effects of construction activities

GCID
GLENN-COLUSA IRRIGATION DISTRICT

Replanted vegetation along the banks of the gradient facility

Aerial photo of gradient facility construction on east side of river

Sheetpile wall with rock slope protection in place

Installation of one of the sheet pile cutoff walls

Project Challenges

- Completion of the project in one construction season to comply with regulatory restrictions on the annual timing and duration of in-river construction to minimize impacts to fish
- Concurrent construction of both the fish screen and gradient facility
- Uninterrupted delivery of irrigation water supplies during construction

river channel alignment and protects the gradient facility and fish screen from damage during high flows. A backwater effect resulting in slightly higher water surface elevations upstream is generated by a slight downstream constriction of the protected banks.

Revegetation

Rock slope protection was covered with fill materials to create a surface to replant riparian vegetation including grass seed and trees, such as willows, elder, ash, alder, valley oak, sycamore, and cottonwood.

Attachment C

GeoTerra Control Point Report

Mapping Control Survey Overview

This project required nine Ground Control Points (GCP's) to be established for controlling airborne LiDAR and imagery for mapping of a portion of the Sacramento River near the Glenn-Colusa Irrigation District (GCID) main canal pump station. The mapping was performed for Anchor QEA on behalf of GCID for a hydrology study of the river near the pump station. The project covers an area approximately 7 miles x 3 miles and encompasses from approximately River Mile 202 through River Mile 210 along the Sacramento River in Butte, Glenn and Tehama counties in north central California. In addition to the required nine GCP's, eight additional points were included in the control network to include one Continuously Operating Reference Station (CORS) (P344) that is a part of The Plate Boundary Observatory (PBO) network of permanent, continuously operating Global Positioning System (GPS) stations. PBO shares the data from this CORS with National Geodetic Survey (NGS) who has a published position on the CORS. Additionally, seven river staff gauges were surveyed with all but one having a benchmark surveyed nearby from which elevations were transferred with digital differential levels to the top of each staff gauge. Altogether, 30 points are included in this survey.

Historically, the survey work in the area has been published as both NAD27 and NAD83 horizontally with at least two different realizations of NAD83 as well as both NGVD29 and NAVD88 vertically. After discussions with Anchor QEA and GCID, it was decided to base the current mapping project on current horizontal and vertical datums; i.e. NAD83(2011)(2010.0) and NAVD88. Many of the existing monuments that were included in the project were added ONLY to give an approximate check on the current work and to provide adequate ties from the historic data to current data to allow for future transformations, if needed.

Methodology

For this project the basis is P344, fixing that point at the NGS published latitude, longitude and ellipsoid height in NAD83(2011)(Epoch 2010.0). A local base at point SA-1-220 was initially surveyed relative to point P344 and then all other points surveyed relative to both P344 and SA-1-220. Global Navigation Satellite System (GNSS) observations were made between 09-Jan-2018 and 13-Jan-2018 utilizing Leica GX1230/AX1202GG geodetic GNSS receivers. Each point was observed for a minimum of 10 minutes, then equipment broken down and reset and

re-observed for a second 10 minute observation. The staff gauges were surveyed with a much shorter time of one to two minutes with a single occupation as the horizontal position was only required to be +/- one meter, with the critical component being the elevation which was established by leveling from a nearby control point. The observations were then combined in a least squares adjustment resulting in an adjusted position for each point.

The resulting vector data was processed and adjusted within Leica Geo Office (LGO) software Version 8.4. The accuracy of the 23 adjusted points relative to P344 (excluding the seven staff gauges) was better than 0.012 meters (0.04 feet) in any direction horizontally and 0.019 meters (0.06 feet) vertically at 95% confidence which met project accuracy requirements.

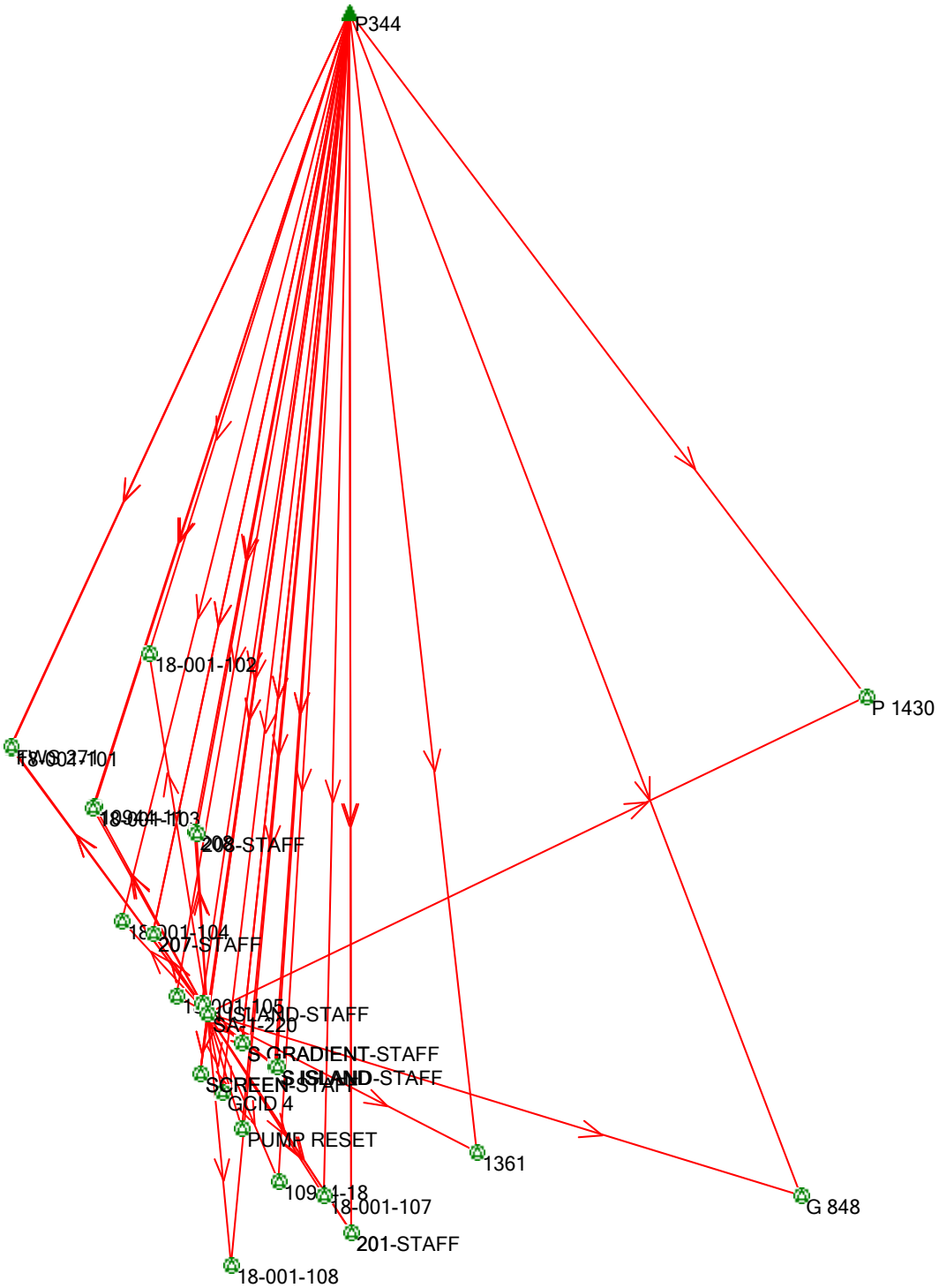
Orthometric heights were derived by applying the NGS geoid model GEOID12B to the adjusted ellipsoid heights and then adjusting for a best fit to NGS published NAVD88 orthometric heights at G 848 and P 1340.

Note that in addition to P344, nine of the points had previously published horizontal and or vertical data. Except for the elevations held on the two points noted above AND the held position of P344, NONE of the existing published data was held fixed to the record; therefore, the values reported herein will NOT agree with the previously published values and instead reflect the current surveyed values.

Point Description Sheets

A Point Description Sheet was prepared for each of the points in the control network. Please consult these sheets for individual point data.

I hereby certify that this survey was conducted under my supervision during January 2018.



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GeoTerra, Inc.
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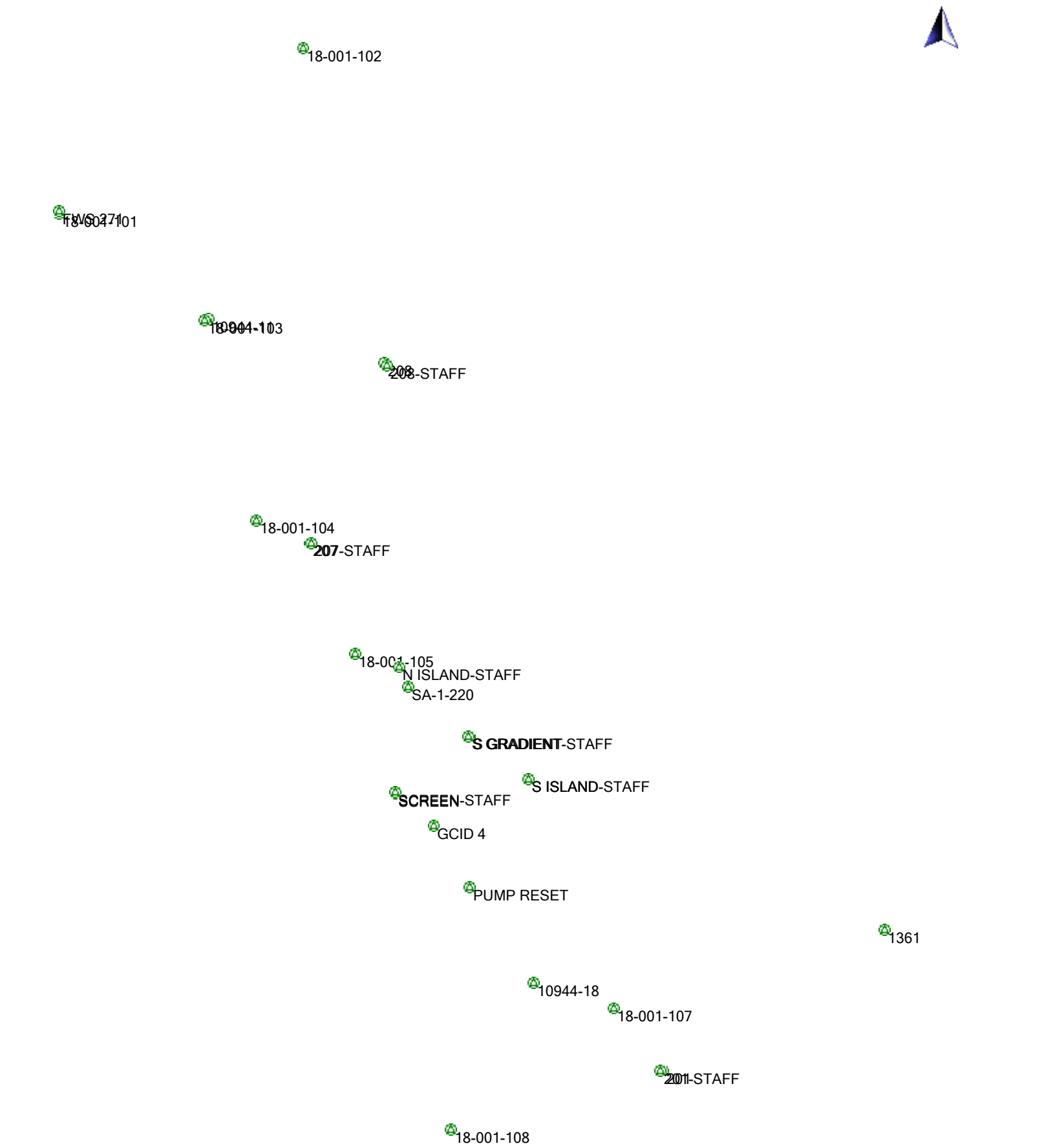
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SCREEN-STAFF
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Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 10944-11

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 49' 33.61952" N
Longitude: 122° 04' 15.19157" W
Ellipsoid Height: 26.712 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 739,709.783 Meters
Easting: 1,993,931.399 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,426,864.51 US Feet
Easting: 6,541,756.60 US Feet
θ: -0° 02' 40.890"
Scale Factor: 0.99999833
Elevation Factor: 0.99999581
Combined Factor: 0.99999414

NAVD 88 Orthometric Elevation

54.862 Meters 179.99 US Feet

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

Found 5/8" X 30" long rebar with 2" diameter aluminum cap; top of cap is flush with ground. Point is located approximately 2.8 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station and at the intersection of Clark Avenue (east-west) and River Avenue (north). See previous description by Andregg, Inc. in 2008 report by Ayres Associates for the US Army, Corps of Engineers, Sacramento District. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the previously surveyed position.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 10944-18

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 46' 38.47641" N
Longitude: 122° 02' 23.87569" W
Ellipsoid Height: 21.110 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 734,306.461 Meters
Easting: 1,996,576.178 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,409,137.12 US Feet
Easting: 6,550,433.68 US Feet
θ: -0° 01' 30.709"
Scale Factor: 0.99998770
Elevation Factor: 0.99999669
Combined Factor: 0.99998438

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

49.166 Meters 161.31 US Feet

Found 5/8" X 30" long rebar with 2" diameter aluminum cap; top of cap is flush with ground. Point is located approximately 0.9 miles SE of the office at the Glenn-Colusa Irrigation District Pump Station and on the NE side of Road 203. See previous description by Andregg, Inc. in 2008 report by Ayres Associates for the US Army, Corps of Engineers, Sacramento District. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the previously surveyed position.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 1361

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 46' 52.42559" N
Longitude: 122° 00' 23.67226" W
Ellipsoid Height: 17.725 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 734,735.941 Meters
Easting: 1,999,436.700 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,410,546.17 US Feet
Easting: 6,559,818.57 US Feet
θ: -0° 00' 14.925"
Scale Factor: 0.99998852
Elevation Factor: 0.99999722
Combined Factor: 0.99998574

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

45.660 Meters 149.80 US Feet

Found 1/2" rebar (no cap); added plastic aerial target. Top of rebar is 0.1 ft. below grade and aerial target. Point is located approx. 2.3 miles SE of the office at the Glenn-Colusa Irrigation District Pump Station, on the south side of Nord Gianella Rd., approx. 2.6 road miles west of the intersection with Folsom St. in Nord, approx. 19 ft. south of the center of the road, 35 ft. south of a power pole, 6 ft. north of the north top of bank on a drainage ditch and 71 ft. east of a gate at the end of the public road. See previous description by Andregg, Inc. in 2008 report by Ayres Assoc. for the US Army, Corps of Engineers, Sacramento District. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the previously surveyed position.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 18-001-101

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 50' 01.36232" N
Longitude: 122° 05' 06.44732" W
Ellipsoid Height: 24.911 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 740,566.473 Meters
Easting: 1,992,713.310 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,429,675.17 US Feet
Easting: 6,537,760.25 US Feet
θ: -0° 03' 13.205"
Scale Factor: 1.00000009
Elevation Factor: 0.99999609
Combined Factor: 0.99999618

NAVD 88 Orthometric Elevation

53.110 Meters 174.25 US Feet

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.009 Meters

Set a MAG brand masonry nail ¼" diameter X 2 ½" long with painted aerial target. Point is located approximately 3.6 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station, on east side of 4th Avenue, approximately 0.5 miles north of the intersection with Clark Avenue, approximately 85 feet south of the north end of 4th Avenue, approximately 6 feet east of the center of pavement on 4th Avenue and 4 feet west of the east edge of pavement.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 18-001-102

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 50' 45.12867" N
Longitude: 122° 03' 42.71722" W
Ellipsoid Height: 21.904 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 741,914.710 Meters
Easting: 1,994,705.159 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,434,098.51 US Feet
Easting: 6,544,295.18 US Feet
θ: -0° 02' 20.416"
Scale Factor: 1.00000289
Elevation Factor: 0.99999656
Combined Factor: 0.99999945

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.011 Meters

NAVD 88 Orthometric Elevation

50.014 Meters 164.09 US Feet

Set 5/8" X 30" long rebar with 2" diameter aluminum GeoTerra cap and plastic aerial target; top of cap is flush with ground. Point is located approximately 4.0 miles north of the office at the Glenn-Colusa Irrigation District Pump Station, on the right bank of the Sacramento River at approximate River Mile 210.2 and approximatly 450 feet (scaled distance) NW of the current center of the river.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
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Point Designation: 18-001-103

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 49' 33.33437" N
Longitude: 122° 04' 16.83030" W
Ellipsoid Height: 26.864 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 739,701.019 Meters
Easting: 1,993,892.422 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,426,835.76 US Feet
Easting: 6,541,628.72 US Feet
θ: -0° 02' 41.923"
Scale Factor: 0.99999832
Elevation Factor: 0.99999579
Combined Factor: 0.99999410

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

55.015 Meters 180.49 US Feet

Set a MAG brand masonry nail ¼" diameter X 2 ½" long with painted aerial target. Point is located approximately 2.8 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station, on the south side of Clark Avenue (east-west), approximately 108 feet west of the center of River Avenue (north), approximately 7 feet south of the center of pavement on Clark Avenue and 4 feet north of the south edge of pavement.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
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Point Designation: 18-001-104

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 48' 40.60292" N
Longitude: 122° 03' 58.82743" W
Ellipsoid Height: 23.214 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 738,074.358 Meters
Easting: 1,994,319.354 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,421,498.95 US Feet
Easting: 6,543,029.41 US Feet
θ: -0° 02' 30.573"
Scale Factor: 0.99999504
Elevation Factor: 0.99999636
Combined Factor: 0.99999140

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

51.353 Meters 168.48 US Feet

Set a MAG brand masonry nail ¼" diameter X 2 ½" long with painted aerial target. Point is located approximately 1.8 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station, on east side of Third Avenue (north-south), approximately 62 feet south of the center of the intersection with Moller Avenue (west), approximately 5 feet east of the center of pavement on Third Avenue and 5 feet west of the east edge of pavement.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
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Point Designation: 18-001-105

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 48' 05.16776" N
Longitude: 122° 03' 25.12023" W
Ellipsoid Height: 25.906 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 736,980.932 Meters
Easting: 1,995,120.414 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,417,911.61 US Feet
Easting: 6,545,657.56 US Feet
θ: -0° 02' 09.322"
Scale Factor: 0.99999287
Elevation Factor: 0.99999594
Combined Factor: 0.99998881

NAVD 88 Orthometric Elevation

54.014 Meters 177.21 US Feet

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.007 Meters

Set a MAG brand masonry nail ¼" diameter X 2 ½" long with painted aerial target. Point is located approximately 1.0 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station, on east side of 2nd Avenue, approximately 1000 feet (scaled distance) south of the intersection with Walch Avenue, centered on field road to east along south side of orange tree grove and 1 foot west of the east edge of pavement on 2nd Avenue.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: 18-001-107

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 46' 31.70543" N
Longitude: 122° 01' 56.52545" W
Ellipsoid Height: 18.940 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 734,097.376 Meters
Easting: 1,997,226.960 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,408,451.14 US Feet
Easting: 6,552,568.78 US Feet
θ: -0° 01' 13.466"
Scale Factor: 0.99998730
Elevation Factor: 0.99999703
Combined Factor: 0.99998433

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.009 Meters

NAVD 88 Orthometric Elevation

46.970 Meters 154.10 US Feet

Set a MAG brand masonry nail ¼" diameter X 2 ½" long with painted aerial target. Point is located approximately 1.3 miles SE of the office at the Glenn-Colusa Irrigation District Pump Station, approximately 320 feet west of the east end of Road 8 (Lindsay Avenue), 3 feet south of the center of pavement, 37 feet SW of a power pole, 51 feet NW of a second power pole and 30 feet NE of a telephone pole.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
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Point Designation: 18-001-108

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 45' 59.56712" N
Longitude: 122° 02' 51.91650" W
Ellipsoid Height: 20.222 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 733,106.770 Meters
Easting: 1,995,908.258 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,405,201.13 US Feet
Easting: 6,548,242.34 US Feet
θ: -0° 01' 48.388"
Scale Factor: 0.99998543
Elevation Factor: 0.99999683
Combined Factor: 0.99998226

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.012 Meters

NAVD 88 Orthometric Elevation

48.312 Meters 158.50 US Feet

Set a MAG brand masonry nail ¼" diameter X 2 ½" long at NW corner of 12" wide X 19' long angled painted stop bar. Point is located approximately 1.5 miles south of the office at the Glenn-Colusa Irrigation District Pump Station, at the intersection of Road 9 (Wyo Avenue) east-west and Road W (1st Avenue) north, 25 feet north of the centerline stripe on Road 9 and 18 feet west of the center of Road W.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
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Point Designation: 201

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 46' 14.90944" N
Longitude: 122° 01' 39.27777" W
Ellipsoid Height: 16.700 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 733,579.230 Meters
Easting: 1,997,637.258 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,406,751.19 US Feet
Easting: 6,553,914.90 US Feet
θ: -0° 01' 02.591"
Scale Factor: 0.99998632
Elevation Factor: 0.99999738
Combined Factor: 0.99998370

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.009 Meters

NAVD 88 Orthometric Elevation

44.715 Meters 146.70 US Feet

Set 5/8" X 30" long rebar with 2" diameter aluminum GeoTerra cap; top of cap is flush with ground. Point is located approximately 1.7 miles SE of the office at the Glenn-Colusa Irrigation District Pump Station and on the left bank of the Sacramento River. Point is a reference BM for a water level staff gauge located at approximate River Mile 201.5 which bears N78°W, 70 feet from the point. Transferred elevation from the BM to the 6.66 foot mark on the staff gauge using differential levels.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: 201-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 46' 15.05195" N
Longitude: 122° 01' 40.16019" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 733,583.631 Meters
Easting: 1,997,616.259 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,406,765.63 US Feet
Easting: 6,553,846.01 US Feet
θ: -0° 01' 03.148"
Scale Factor: 0.99998633
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

41.016 Meters 134.57 US Feet

Found U-post with attached 6.66 foot staff gauge. Point is located approximately 1.7 miles SE of the office at the Glenn-Colusa Irrigation District Pump Station and on the left bank of the Sacramento River. Point is a water level staff gauge located at approximate River Mile 201.5 which bears N78°W, 70 feet from point 201. Transferred elevation from point 201 to the 6.66 foot mark on the staff gauge using differential levels.

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Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 207

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 48' 34.49419" N
Longitude: 122° 03' 40.43440" W
Ellipsoid Height: 15.677 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 737,885.646 Meters
Easting: 1,994,756.716 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,420,879.83 US Feet
Easting: 6,544,464.32 US Feet
θ: -0° 02' 18.977"
Scale Factor: 0.99999466
Elevation Factor: 0.99999754
Combined Factor: 0.99999220

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

43.798 Meters 143.69 US Feet

Set 5/8" X 30" long rebar with 2" diameter aluminum GeoTerra cap; top of cap is flush with ground. Point is located approximately 1.6 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station and on the left bank of the Sacramento River. Point is a reference BM for a water level staff gauge located at approximate River Mile 206.9 which bears S73°E, 21 feet from the point. Transferred elevation from the BM to the 10.00 foot mark on the staff gauge using differential levels.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: 207-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 48' 34.43499" N
Longitude: 122° 03' 40.18360" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 737,883.816 Meters
Easting: 1,994,762.680 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,420,873.82 US Feet
Easting: 6,544,483.89 US Feet
θ: - 0° 02' 18.819
Scale Factor: 0.99999466
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

43.971 Meters 144.26 US Feet

Found U-post with attached 10.00 foot staff gauge. Point is located approximately 1.6 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station and on the left bank of the Sacramento River. Point is a water level staff gauge located at approximate River Mile 206.9 which bears S73°E, 21 feet from point 207. Transferred elevation from point 207 to the 10.00 foot mark on the staff gauge using differential levels.

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Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: 208

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 49' 22.10156" N
Longitude: 122° 03' 14.87525" W
Ellipsoid Height: 20.324 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 739,353.560 Meters
Easting: 1,995,365.544 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,425,695.80 US Feet
Easting: 6,546,461.79 US Feet
θ: -0° 02' 02.863"
Scale Factor: 0.99999761
Elevation Factor: 0.99999681
Combined Factor: 0.99999442

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.009 Meters

NAVD 88 Orthometric Elevation

48.415 Meters 158.84 US Feet

Set 5/8" X 30" long rebar with 2" diameter aluminum GeoTerra cap; top of cap is flush with ground. Point is located approximately 2.3 miles north of the office at the Glenn-Colusa Irrigation District Pump Station and on the right bank of the Sacramento River. Point is a reference BM for a water level staff gauge located at approximate River Mile 208.2 which bears S42°E, 121 feet from the point. Transferred elevation from the BM to the 3.33 foot mark on the staff gauge using differential levels.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: 208-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 49' 21.21202" N
Longitude: 122° 03' 13.84743" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 739,326.110 Meters
Easting: 1,995,389.971 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,425,605.75 US Feet
Easting: 6,546,541.93 US Feet
θ: -0° 02' 02.215"
Scale Factor: 0.99999756
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

44.961 Meters 147.51 US Feet

Found U-post with attached 3.33 foot staff gauge. Point is located approximately 2.3 miles north of the office at the Glenn-Colusa Irrigation District Pump Station and on the right bank of the Sacramento River. Point is a water level staff gauge located at approximate River Mile 208.2 which bears S42°E, 121 feet from point 208. Transferred elevation from point 208 to the 3.33 foot mark on the staff gauge using differential levels.

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Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: FWS 271

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 50' 02.09830" N
Longitude: 122° 05' 06.37859" W
Ellipsoid Height: 24.898 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 740,589.170 Meters
Easting: 1,992,714.965 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,429,749.64 US Feet
Easting: 6,537,765.68 US Feet
θ: -0° 03' 13.162"
Scale Factor: 1.00000013
Elevation Factor: 0.99999609
Combined Factor: 0.99999623

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

53.098 Meters 174.20 US Feet

Found 3 1/4" diameter US Department of the Interior (USDI) Fish & Wildlife Service aluminum cap 0.5' below grade. Point is located approximately 3.7 miles NW of the office at the Glenn-Colusa Irrigation District Pump Station and at the north end of 4th Avenue. This point is in the NGS database with a PID of DL9166. See the NGS data sheet for more detailed information. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the National Geodetic Survey (NGS) published position.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: G 848

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 46' 31.97148" N
Longitude: 121° 57' 07.62455" W
Ellipsoid Height: 18.376 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 734,106.168 Meters
Easting: 2,004,102.138 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,408,479.99 US Feet
Easting: 6,575,125.10 US Feet
θ: +0° 01' 48.677
Scale Factor: 0.99998731
Elevation Factor: 0.99999712
Combined Factor: 0.99998443

Horiz. Method: GPS
Vert. Method: NGS Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± 0.012 Meters

NAVD 88 Orthometric Elevation

46.143 Meters 151.39 US Feet

Found 3 1/2" diameter USC&GS brass disk set in concrete abutment for railroad bridge. Point is located approximately 5.2 miles east of the office at the Glenn-Colusa Irrigation District Pump Station, approximately 0.4 miles SE of Nord, CA, approximately 175 feet (scaled distance) NW of the center of Nord Highway, 6 feet SW of the SW rail of Union Pacific Railroad tracks and at a concrete railroad bridge. This point is in the NGS database with a PID = KS1086. See NGS data sheet for additional details. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the National Geodetic Survey (NGS) published position (EXCEPT orthometric height).

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: GCID 4

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 20.02544" N
Longitude: 122° 02' 57.77057" W
Ellipsoid Height: 21.821 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 735,588.290 Meters
Easting: 1,995,770.276 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,413,342.58 US Feet
Easting: 6,547,789.65 US Feet
θ: -0° 01' 52.079"
Scale Factor: 0.99999015
Elevation Factor: 0.99999658
Combined Factor: 0.99998673

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.011 Meters

NAVD 88 Orthometric Elevation

49.907 Meters 163.74 US Feet

Found PK nail with 2" diameter shiner; added painted aerial target. Point is located in parking lot on north side of shop/office building at the Glenn-Colusa Irrigation District Pump Station, 79 feet west of the NW corner of the office, 80 feet NW of the NW corner of the shop, 25 feet SE of the north end of a concrete retaining wall and 4 feet east of the east face of the retaining wall. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the previously surveyed position.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
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Point Designation: N ISLAND-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 48' 01.70634" N
Longitude: 122° 03' 09.89966" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 736,873.957 Meters
Easting: 1,995,482.432 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,417,560.64 US Feet
Easting: 6,546,845.28 US Feet
θ: -0° 01' 59.726"
Scale Factor: 0.99999266
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

43.786 Meters 143.66 US Feet

Found U-post with attached 3.33 foot staff gauge. Point is located approximately 0.8 miles north of the office at the Glenn-Colusa Irrigation District (GCID) Pump Station and on the right bank of the Sacramento River, the left bank of the GCID intake channel and at the north end of the island formed by the river and the intake channel. Point is a water level staff gauge located at approximate River Mile 206.0 which bears N25°W, 582 feet from point SA-1-220. Transferred elevation from point SA-1-220 to the 3.33 foot mark on the staff gauge using differential levels.

MONUMENT PHOTO NOT AVAILABLE	MONUMENT PHOTO NOT AVAILABLE

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: P 1430

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 50' 25.16287" N
Longitude: 121° 56' 26.97890" W
Ellipsoid Height: 30.997 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 741,298.768 Meters
Easting: 2,005,064.728 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,432,077.71 US Feet
Easting: 6,578,283.20 US Feet
θ: +0° 02' 14.303
Scale Factor: 1.00000160
Elevation Factor: 0.99999514
Combined Factor: 0.99999674

Horiz. Method: GPS
Vert. Method: NGS Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± 0.007 Meters

NAVD 88 Orthometric Elevation

58.684 Meters 192.53 US Feet

Found 9/16" diameter NGS stainless steel rod in monument box. Point is located approximately 6.8 miles NE of the office at the Glenn-Colusa Irrigation District Pump Station, at the intersection of State Highway 99 and Cana Highway, approximately 98 feet (scaled distance) SW of the center of State Highway 99 and approximately 65 feet (scaled distance) SE of the center of Cana Highway. This point is in the NGS database with a PID = KS1922. See NGS data sheet for additional details. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the National Geodetic Survey (NGS) published position (EXCEPT orthometric height).

Point Description Sheet

Prepared By:

GeoTerra
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860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: P344

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 55' 44.82982" N
Longitude: 122° 01' 40.64393" W
Ellipsoid Height: 50.259 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 751,156.884 Meters
Easting: 1,997,610.152 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,464,420.54 US Feet
Easting: 6,553,825.97 US Feet
θ: -0° 01' 03.453"
Scale Factor: 1.00002328
Elevation Factor: 0.99999212
Combined Factor: 1.00001540

Horiz. Method: NGS CORS Fixed
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.000 Meters

NAVD 88 Orthometric Elevation

78.214 Meters 256.61 US Feet

Point is the Antenna Reference Point (ARP) of a Continuously Operating Reference Station (CORS) and is a part of The Plate Boundary Observatory (PBO) network of permanent, continuously operating Global Positioning System (GPS) stations. PBO also shares the data from P344 with the National Geodetic Survey (NGS). Raw GNSS observation data is available from https://www.unavco.org/instrumentation/networks/status/pbo/overview/P344. Note that for this project the NGS value was held fixed and the data shown hereon WILL NOT agree with the PBO published position.

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Point Description Sheet

Prepared By:

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Point Designation: PUMP RESET

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 03.48846" N
Longitude: 122° 02' 45.63254" W
Ellipsoid Height: 21.460 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 735,078.114 Meters
Easting: 1,996,058.819 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,411,668.78 US Feet
Easting: 6,548,736.31 US Feet
θ: -0° 01' 44.426"
Scale Factor: 0.99998917
Elevation Factor: 0.99999663
Combined Factor: 0.99998580

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.009 Meters

NAVD 88 Orthometric Elevation

49.534 Meters 162.51 US Feet

Found 2" diameter Glenn County aluminum disk set in concrete curb on bridge. Point is located approximately 0.4 miles SE of the office at the Glenn-Colusa Irrigation District (GCID) Pump Station, at the intersection of Road 203 (Canal Road) and Road 204, in the top of the NE bridge curb of Road 204 crossing over the main GCID canal. This point is in the NGS database with a PID = DL9196. See NGS data sheet for additional details. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the National Geodetic Survey (NGS) published position.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

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Eugene, OR 97402
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Point Designation: S GRADIENT

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 43.40064" N
Longitude: 122° 02' 45.65592" W
Ellipsoid Height: 14.316 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 736,309.067 Meters
Easting: 1,996,058.887 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,415,707.33 US Feet
Easting: 6,548,736.53 US Feet
θ: -0° 01' 44.441"
Scale Factor: 0.99999156
Elevation Factor: 0.99999775
Combined Factor: 0.99998931

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.010 Meters

NAVD 88 Orthometric Elevation

42.387 Meters 139.07 US Feet

Set 5/8" X 30" long rebar with 2" diameter aluminum GeoTerra cap; top of cap is flush with ground. Point is located approximately 0.5 miles NE of the office at the Glenn-Colusa Irrigation District (GCID) Pump Station on the right bank of the Sacramento River and east side of the island formed by the river and the GCID bypass channel. Point is a reference BM for a water level staff gauge located at approximate River Mile 205.6 which bears West, 42 feet from the point. Transferred elevation from the BM to the 10.00 foot mark on the staff gauge using differential levels.

Point Description Sheet

Prepared By:

GeoTerra
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860 McKinley Street
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Point Designation: S GRADIENT-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 43.44874" N
Longitude: 122° 02' 46.19542" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 736,310.557 Meters
Easting: 1,996,046.052 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,415,712.22 US Feet
Easting: 6,548,694.42 US Feet
θ: -0° 01' 44.781"
Scale Factor: 0.99999156
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

43.172 Meters 141.64 US Feet

Found U-post with attached 10.00 foot staff gauge. Point is located approximately 0.5 miles NE of the office at the Glenn-Colusa Irrigation District (GCID) Pump Station on the right bank of the Sacramento River and east side of the island formed by the river and the GCID bypass channel. Point is a water level staff gauge located at approximate River Mile 205.6 which bears West, 42 feet from point S Gradient. Transferred elevation from point S Gradient to the 10.00 foot mark on the staff gauge using differential levels.

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Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
www.GeoTerra.us

Point Designation: S ISLAND

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 32.24085" N
Longitude: 122° 02' 25.61444" W
Ellipsoid Height: 16.344 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 735,964.654 Meters
Easting: 1,996,535.539 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,414,577.37 US Feet
Easting: 6,550,300.35 US Feet
θ: -0° 01' 31.805"
Scale Factor: 0.99999088
Elevation Factor: 0.99999744
Combined Factor: 0.99998832

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.007 Meters

NAVD 88 Orthometric Elevation

44.396 Meters 145.65 US Feet

Set 5/8" X 30" long rebar with 2" diameter aluminum GeoTerra cap; top of cap is flush with ground. Point is located approximately 0.5 miles NE of the office at the Glenn-Colusa Irrigation District (GCID) Pump Station and on the right bank of the Sacramento River, the left bank of the GCID bypass channel and at the SE tip of the island formed by the river and the bypass channel. Point is a reference BM for a water level staff gauge located at approximate River Mile 205.1 which bears N60°E, 23 feet from the point. Transferred elevation from the BM to the 3.33 foot mark on the staff gauge using differential levels.

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
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Point Designation: S ISLAND-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 32.35417" N
Longitude: 122° 02' 25.36172" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 735,968.147 Meters
Easting: 1,996,541.553 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,414,588.83 US Feet
Easting: 6,550,320.08 US Feet
θ: -0° 01' 31.646"
Scale Factor: 0.99999089
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

42.079 Meters 138.05 US Feet

Found U-post with attached 3.33 foot staff gauge. Point is located approximately 0.5 miles NE of the office at the Glenn-Colusa Irrigation District (GCID) Pump Station and on the right bank of the Sacramento River, the left bank of the GCID bypass channel and at the SE tip of the island formed by the river and the bypass channel. Point is a water level staff gauge located at approximate River Mile 205.1 which bears N60°E, 23 feet from point S Island. Transferred elevation from point S Island to the 3.33 foot mark on the staff gauge using differential levels.

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Point Description Sheet

Prepared By:

GeoTerra

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Eugene, OR 97402
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www.GeoTerra.us

Point Designation: SA-1-220

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 56.49688" N
Longitude: 122° 03' 06.73551" W
Ellipsoid Height: 21.799 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 736,713.246 Meters
Easting: 1,995,557.613 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,417,033.37 US Feet
Easting: 6,547,091.94 US Feet
θ: -0° 01' 57.731"
Scale Factor: 0.99999235
Elevation Factor: 0.99999658
Combined Factor: 0.99998893

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.003 Meters

NAVD 88 Orthometric Elevation

49.891 Meters 163.68 US Feet

Found 2" OD iron pipe with 2" iron cap, set in concrete; top of cap is 0.1 feet above ground level (AGL). Point is located near north end of island, approximately 0.7 miles north of the office at the Glenn-Colusa Irrigation District Pump Station, approximately 30 feet west of the center of a gravel road, approximately 42 feet east of the center of a gravel road, 30 feet south of a 24" diameter tree and 0.5 feet east of a green steel fence post. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the previously surveyed position.

Point Description Sheet

Prepared By:

GeoTerra

Aerial Imagery | Mapping | LiDAR | GIS | control Surveying

860 McKinley Street
Eugene, OR 97402
(541) 343-8877
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Point Designation: SCREEN

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 28.35447" N
Longitude: 122° 03' 11.22461" W
Ellipsoid Height: 19.794 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 735,845.351 Meters
Easting: 1,995,450.311 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,414,185.96 US Feet
Easting: 6,546,739.90 US Feet
θ: -0° 02' 00.561"
Scale Factor: 0.99999065
Elevation Factor: 0.99999689
Combined Factor: 0.99998755

NAVD 88 Orthometric Elevation

47.892 Meters 157.13 US Feet

Horiz. Method: GPS
Vert. Method: GPS Derived
Error Ellipse Semi major axis (95% Confidence Level)
± 0.011 Meters

Found 3 1/2" diameter US Department of the Interior (USDI) brass disk, set in concrete structure. Point is located near NW end of an approximately 1100 foot long screen structure at the Glenn-Colusa Irrigation District Pump Station, approximately 6 feet SE of NW pool wall and 1.5 feet NE of NE pool wall. Monument does NOT have a station ID stamping. Point is a reference BM for a water level staff gauge located on upstream face of screen structure which bears N13°E, 21 feet from the point. Transferred elevation from the BM to the 155.00 foot mark on the staff gauge using differential levels. Note that the position of this mark was surveyed relative to CORS P344 during the current project and the data shown hereon WILL NOT agree with the previously surveyed position (if in existence).

Point Description Sheet

Prepared By:

GeoTerra
Aerial Imagery | Mapping | LiDAR | GIS | control Surveying
860 McKinley Street
Eugene, OR 97402
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Point Designation: SCREEN-STAFF

NAD 83 (2011) Geodetic Coordinates

Latitude: 39° 47' 28.55871" N
Longitude: 122° 03' 11.16202" W
Ellipsoid Height: Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 735,851.649 Meters
Easting: 1,995,451.804 Meters

NAD 83 (2011) State Plane Coordinates Zone 0402, California Zone 2

Northing: 2,414,206.62 US Feet
Easting: 6,546,744.80 US Feet
θ: -0° 02' 00.522"
Scale Factor: 0.99999066
Elevation Factor:
Combined Factor:

Horiz. Method: GPS
Vert. Method: Leveled
Error Ellipse Semi major axis (95% Confidence Level)
± Meters

NAVD 88 Orthometric Elevation

47.957 Meters 157.34 US Feet

Found 155.00 foot staff gauge attached to the upstream face of screen structure. Point is located near NW end of an approximately 1100 foot long screen structure at the Glenn-Colusa Irrigation District Pump Station. Point bears N13°E, 21 feet from point SCREEN. Transferred elevation from point SCREEN to the 155.00 foot mark on the staff gauge using differential levels.

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