

FY20/21 Maintenance and Monitoring

AD98-2, Calle del Barco

City of Malibu, California

Yeh Project No.: 220-277

June 23, 2022



Prepared for:

City of Malibu
23825 Stuart Ranch Rd.
Malibu, California 90265
Attn: Mr. Arthur Aladjajian

Prepared by:

Yeh and Associates, Inc.
56 East Main St., Suite 104
Ventura, California 93001
Phone: 805-481-9590

June 23, 2022

Project No. 220-277

City of Malibu
23825 Stuart Ranch Rd.
Malibu, California 90265

Attn: Mr. Arthur Aladjajian, Public Works Superintendent

Subject: Annual Monitoring and Maintenance Report FY20/21, City of Malibu Assessment District 98-2, Calle del Barco, Malibu, CA

Dear Mr. Aladjajian:

Yeh and Associates, Inc. is pleased to submit this monitoring and maintenance report FY20/21 City of Malibu Assessment District AD-2, Calle del Barco in Malibu, California. This report was prepared in accordance with our Agreement for Professional Services, dated June 22, 2020 between the City of Malibu and Yeh and Associates, Inc. This report provides geotechnical an annual summary of monitoring and maintenance for the project over fiscal year July 1, 2020 to June 30, 2021.

The geotechnical services consisted of monitoring and maintenance, data management, public outreach, reporting, and capital improvement planning. A map showing the location of the maintenance and monitoring facilities are provided on Plate 1. Plate 2 provides a summary of maintenance activities performed during the monitoring year.

We appreciate the opportunity to be of service. Please contact Loree Berry at 805-289-9590 x271 or lberry@yeh-eng.com if you have questions or require additional information.

Sincerely,
YEH AND ASSOCIATES, INC.


Nick Simon
Project Geologist


Loree A. Berry, PE
Senior Project Manager

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1. PURPOSE AND SCOPE OF STUDY

Yeh and Associates (Yeh) was retained by the City of Malibu (City) to perform maintenance and monitoring of the existing geotechnical instrumentation and dewatering facilities within the City of Malibu's Malibu Road Landslide Assessment District, 98-2. The project location is shown by the polygon on Figure 1. This report presents monitoring results, a maintenance summary, and facilities status for the monitoring year July 2020 through July 2021 (monitoring year). Yeh monitors groundwater levels, surveys slope inclinometers, measures the dewatering flow from dewatering wells and horizontal drains. Yeh also oversees and maintains function of the monitoring and dewatering facilities. Plate 1 shows the approximate locations of the assessment district facilities. Table 1 summarizes the equipment inventory and the approximate frequency of monitoring and maintenance over the monitoring year. Plate 2 and Section 4.0 of this report and provides detailed summary of the maintenance activities performed during this monitoring period.

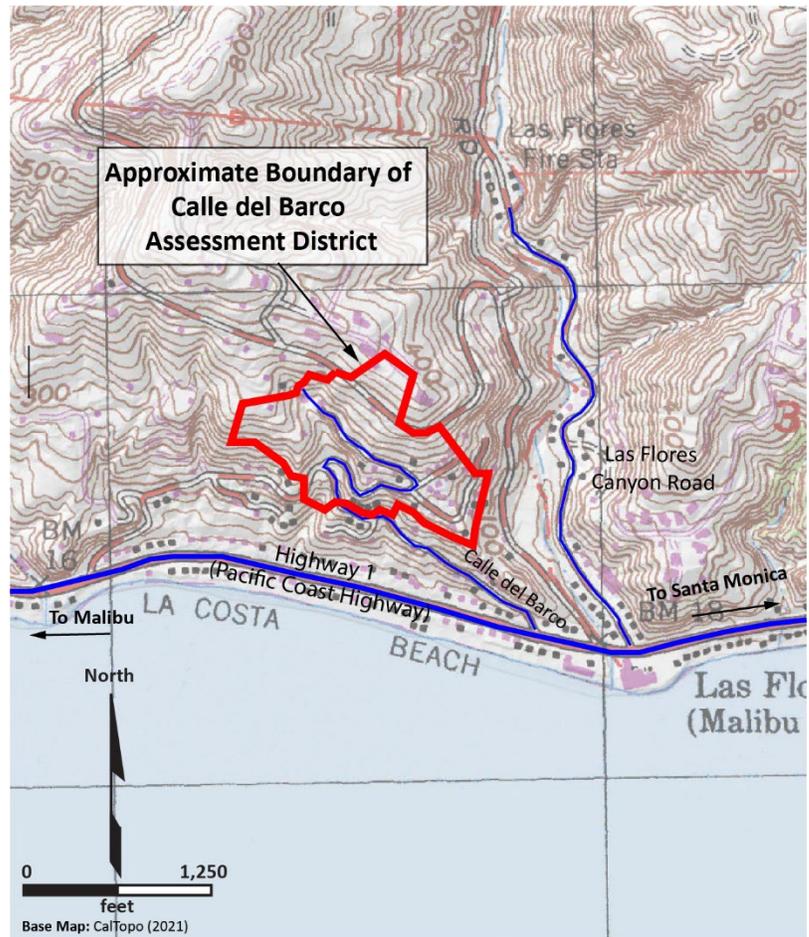


Figure 1: Project Location Map

Table 1. Summary of Annual Monitoring and Maintenance

| Type of Monitoring Instrument or Dewatering Device | Number of Locations | Brief Description | Monitoring Frequency | Maintenance Effort ¹ |
|--|---------------------|--|---|---------------------------------|
| Standpipe piezometer | 8 | 2.75-inch perforated PVC casing used to measure depth to groundwater using electric sounder or by a transducer/datalogger | monthly; hourly data from pressure transducer | Low |
| Inclinometer survey casings | 12 | 1.5-inch and 2.75-inch diameter grooved casings made of PVC, used to survey for shear displacement by an inclinometer probe | quarterly | low |
| Dewatering wells | 11 | 6-inch or 12-inch diameter steel or PVC casings equipped with 0.5 to 1.5HP submersible pump and connected to electrical controls, pumped water flows through meter and into conveyance piping to discharge | monthly | high |
| Horizontal Drains (hydraugers) | 11 | 1-inch to 1.5-inch perforated PVC casings drilled slightly higher than horizontal into slope through the soldier pile wall along Rambla Orienta and at the toe of the landslide below Rambla Vista. Installed hundreds to thousands of feet into the slope and used to drain groundwater that intercepts the casing. Flow can be measured from the hydraugers before it flows to discharge | monthly | medium |
| Big Rock Mesa Rain Gauge #1239 | 1 | Documented Rainfall, Data obtained from Los Angeles County Public Works | monthly | N/A |
| Notes: | | | | |
| ¹ - maintenance effort (generalized): "high" – services monthly, "medium" – services quarterly, "low" – services annually | | | | |

2. MONITORING

The following provides the result of monitoring the water level in standpipe piezometers and the results of inclinometer surveys performed. For the purposes of discussion and context throughout the report, the monitoring results are discussed with respect to three areas within the landslide boundaries: Rambla Pacifico, Calle Del Barco and Rambla Vista:

- **Rambla Pacifico** - the northern most geographic region and near the headscarp portion of the landslide.
- **Calle del Barco** - encompasses the middle portion of the landslide boundary, along Calle Del Barco.
- **Rambla Vista** - located near the southern portion of the landslide boundary, near the toe of the landslide.

2.1 GROUNDWATER LEVELS

Groundwater levels were measured approximately monthly in 8 standpipe piezometers shown on Plate 1. Groundwater level data and hydrographs for individual standpipes are presented in Appendix A for the FY20/21 monitoring year. Water levels are acquired by lowering an electric probe into the standpipe to contact the groundwater surface and manually record the depth to water.



Table 2 summarizes the average groundwater levels over the monitoring year for standpipe water levels within each of the three subregion and their change from the prior monitoring year.

Table 2: Summary of Average Groundwater Elevations¹

| Area Averaged | Total No. of Standpipes Monitored | 2020-2021 Average Groundwater Elevation (ft) | Change in Average Groundwater Elevation from Prior Monitoring Period (ft) | 2020-2021 Average Peak Groundwater Elevation (ft) | Change in Average Peak Groundwater Elevation from Prior Monitoring Period (ft) |
|-----------------|-----------------------------------|--|---|---|--|
| Rambla Vista | 2 | 161.2 | -1.9 | 163.9 | -2.5 |
| Calle Del Barco | 4 | 242.2 | +1.0 | 245.0 | -7.5 |
| Rambla Pacifico | 2 | 350.4 | +1.5 | 350.7 | +0.9 |

Notes: ¹ Comparison between the current and prior monitoring periods for the eight standpipe piezometers measured during the current monitoring period: SI-4, SI-5, SI-7, SI-9, SI-13, SI-14, SI-15, SI-16

2.1.1 RAMBLA VISTA REGION

Two standpipes are in use for groundwater level monitoring in the Rambla Vista Region. The average groundwater level for the Rambla Vista Region decreased by 1.9 feet since the prior monitoring year. Annual average groundwater levels measured in SI-7 remained consistent and measurements in SI-4 decreased by 3.7 feet.

2.1.2 CALLE DEL BARCO REGION

Five standpipes are in use for groundwater level monitoring in the Calle Del Barco region; however, results from the FY20/21 monitoring year include only 4 locations as SI-8 was not able to be accessed due to private property limitations. During the FY20/21 monitoring year, the calculated average for the measured 4 locations increased by 1.0 foot since the prior monitoring year. The rise reflects a temporary water level increase in SI-5 of 15.6-feet between December 2020 and April 2021 that coincides with the mechanical failure of nearby dewatering well W-M. The pump in dewatering well W-M was replaced on May 13, 2021 and water levels in SI-5 have steadily decreased by 10.3 feet as of June 9, 2021. The peak average for the same data set decreased by 7.5 feet as compared to the prior monitoring year.

2.1.3 RAMBLA PACIFICO REGION

Two standpipes are in use for groundwater level monitoring in the Rambla Pacifico Region. Average groundwater levels within the Rambla Pacifico Region increased by 1.5-feet since the previous monitoring year. Water levels within individual standpipes SI-13 and SI-14 had both steadily increased since approximately 2018. Standpipe SI-13 had risen approximately 4.8-feet and SI-14 had risen approximately 2.5-feet. Measurements at both locations show declining water levels over the monitoring year since December 2020.



2.2 SLOPE INCLINOMETERS

2.2.1 SUMMARY OF SLOPE INCLINOMETER MONITORING EVENTS

At the start of the monitoring year, inclinometer surveys were performed with a new DGSI AT system inclinometer probe, cable and electronics to replace the DGSI classic system probe that had been in use by the previous consultant since at least 2004. The AT system inclinometer was chosen for more repeatable and accurate positioning of the probe on the casing. The introduction of a new probe and cable necessitated a new baseline survey for each of the useable inclinometer casings.

Page B-1 provides a historic summary of the Calle del Barco inclinometers. Appendix B provides profile change plots for each of the inclinometers surveyed over the FY20/21 monitoring year. Inclinometers were assessed for distinct shear-type movement. Inclinometer survey results for each of sub-region is summarized below:

2.2.2 RAMBLA VISTA

Three inclinometers are currently monitored within the Rambla Vista Region; SI-4, SI-7 and SI-10. Those inclinometers did not display potential measurable shear-type movement over the current monitoring year.

2.2.3 CALLE DEL BARCO

There are seven inclinometers located in the Calle del Barco Region: SI-5, SI-8, SI-9, SI-11, and SI-15. SI-8 was not surveyed during the FY20/21 monitoring year due to lack of access to a private property. The six inclinometer locations surveyed over the FY20/21 monitoring year did not display potential measurable shear-type movement over that time.

2.2.4 RAMBLA PACIFICO

There are two inclinometers currently surveyed in the Rambla Pacifico Region; SI-13 and SI-14. Neither of the inclinometers displayed quantifiable shear-type displacement. SI-13 displayed up to about 0.2 inches of deformation above a depth of 20 feet. This is consistent with previously noted “bowing” in the upper portion of the casing, which could be caused by settlement of casing backfill. Additional survey methods would be required to exclude or identify a specific cause of the apparent deformation.

3. WATER BUDGET TRACKING

3.1 RAINFALL DATA

Yeh obtained rainfall data for the 2020-2021 monitoring year from the Big Rock Mesa Rain Gauge #1239 operated by the Los Angeles County Department of Public Works. Plate 3 - Rainfall Graph displays historical monthly and average annual rainfall for the Big Rock Mesa area from October 1968 through June 2021. Prior to 1984, rainfall data was obtained from the Carbon Canyon Rain Gauge



#447C and after 1984 from the onsite Big Rock Mesa Rain Gauge #1239. Rainfall for Big Rock Mesa area for the 2020-2021 monitoring year totaled 3.67 inches, which is 11.7 inches below the 53-year area average of 15.3 inches.

Plate 5 – Summary of Groundwater Levels, Dewatering, and Rainfall shows annual rainfall deviation from the 53-year mean and compares rainfall changes to total dewatering output. Dewatering production typically reacts to rainfall totals. During the 2020-2021 monitoring year, total dewatering production decreased in response to well below average rainfall.

3.2 DEWATERING

Yeh tracks dewatering production for active pumping dewatering wells installed throughout the assessment district and passive horizontal drains (hydraugers) installed along Rambla Orienta and at the toe of the landslide. During the 2020-2021 monitoring year dewatering production averaged 359 gpd, a decrease of 31% from the previous monitoring years average production of 517 gpd. These values represented a decrease of 53% from the historical annual average production of 758 gpd and 76% less than the maximum average annual production of 1,497 gpd recorded during the 1994-1995 monitoring year.

3.2.1 DEWATERING WELL PRODUCTION

Yeh performed monthly monitoring of production for the 11 active district dewatering wells. Well production is measured approximately monthly for each well by reading flow totalizers that are installed along the discharge line. Production data and well status for individual wells is included in Page C-1 through C-3. A graph showing total well production since 1993 is included on Plate 4.

During the 2020-2021 monitoring year, the average total well production was 265 gpd which is 16% lower than last year's average production of 314 gpd and 41% less than the historical production average of 529 gpd calculated from 1992 to present. These values are 78% less than the maximum annual average production of 1,182 gpd recorded during the 2004-2005 monitoring year.

Well production typically varies in response to rainfall totals. The dewatering well production decrease over this monitoring year is consistent with the historically low rainfall totals and extended drought conditions at the project.

3.3 HYDRAUGER PRODUCTION

Hydrauger production is measured directly from a sampling port installed on each hydrauger. Yeh performed monthly monitoring to measure flow from 11 hydraugers, of which four to six locations have recorded consistent flow in recent years. Some of the other hydraugers flow intermittently in response to rainfall. Production data and status for individual hydraugers is included in Appendix C. A graph showing total hydrauger production since 1992 is included on Plate 4.



During the 2020-2021 monitoring year, the average monthly hydrauger production was 94 gpd which is approximately 54% less than last year's average monthly production of 203 gpd and 59% less than the historical average production calculated from 1992 to present of 229 gpd. These values are 79% less than the maximum average annual production of 455 gpd recorded during the 1996-1997 monitoring year.

Hydrauger production typically varies in response to rainfall totals. The decrease in hydrauger production over this monitoring year is consistent with the historically low rainfall totals and extended drought conditions at the project.

4. MAINTENANCE AND CAPITAL IMPROVEMENTS

A summary table of the maintenance and capital improvement activities performed over this monitoring year is provided on Plate 2. Typical maintenance activities to dewatering wells include assessing and replacing or repairing dewatering well pumps, well electronics and well controls; Typical maintenance to hydraugeters included PVC repairs within the conveyance piping for discharge. Capital improvements include replacement and rehabilitation of existing facilities and special projects to improve the monitoring and maintenance capabilities.

5. ADDITIONAL OBSERVATIONS AND MONITORING

- Rainfall totals for the 2020-2021 monitoring year were the driest on record for the area.

6. RECOMMENDATIONS FOR MAINTENANCE AND CAPITAL IMPROVEMENTS

- A modern form of repeatable surface survey should be re-introduced and continued for the project as a consistent means to observe and evaluate potential land movement throughout the extent of the assessment district area and more specifically in-between inclinometer casing locations.
- Install replacement hydraugeters near the toe of the landslide to replace hydraugeters that are dry, degraded, damaged, and vulnerable to being buried by soil and rock debris.
- Install dewatering well near the near the headscarp in vicinity of SI-14.

7. REFERENCES

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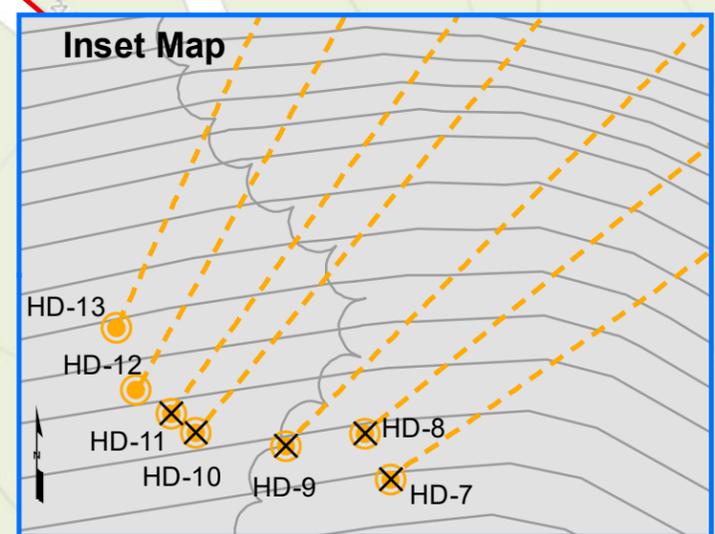
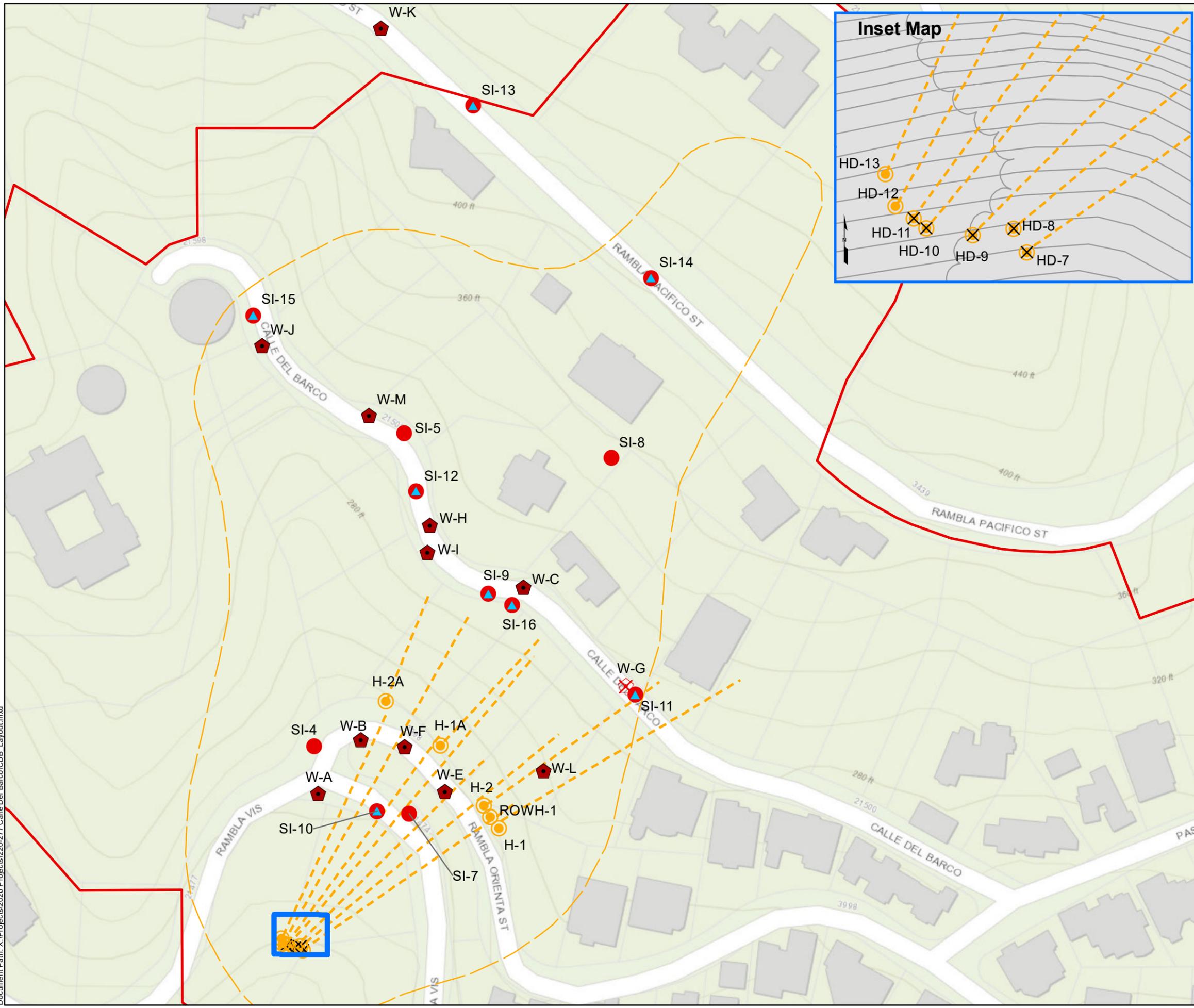
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**CALLE DEL BARCO LANDSLIDE
ASSESSMENT DISTRICT
MALIBU, CALIFORNIA
MONITORING INSTRUMENTATION
AND
DEWATERING FACILITIES MAP**

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services



- Active Dewatering Well
- Inactive Dewatering Well
- Slope Inclinometer/Standpipe Piezometer
- Pneumatic Piezometers
- Nonproducing Hydrauger
- Producing Hydrauger
- Hydrauger Installed Length
- District Boundary
- Approximate Landslide

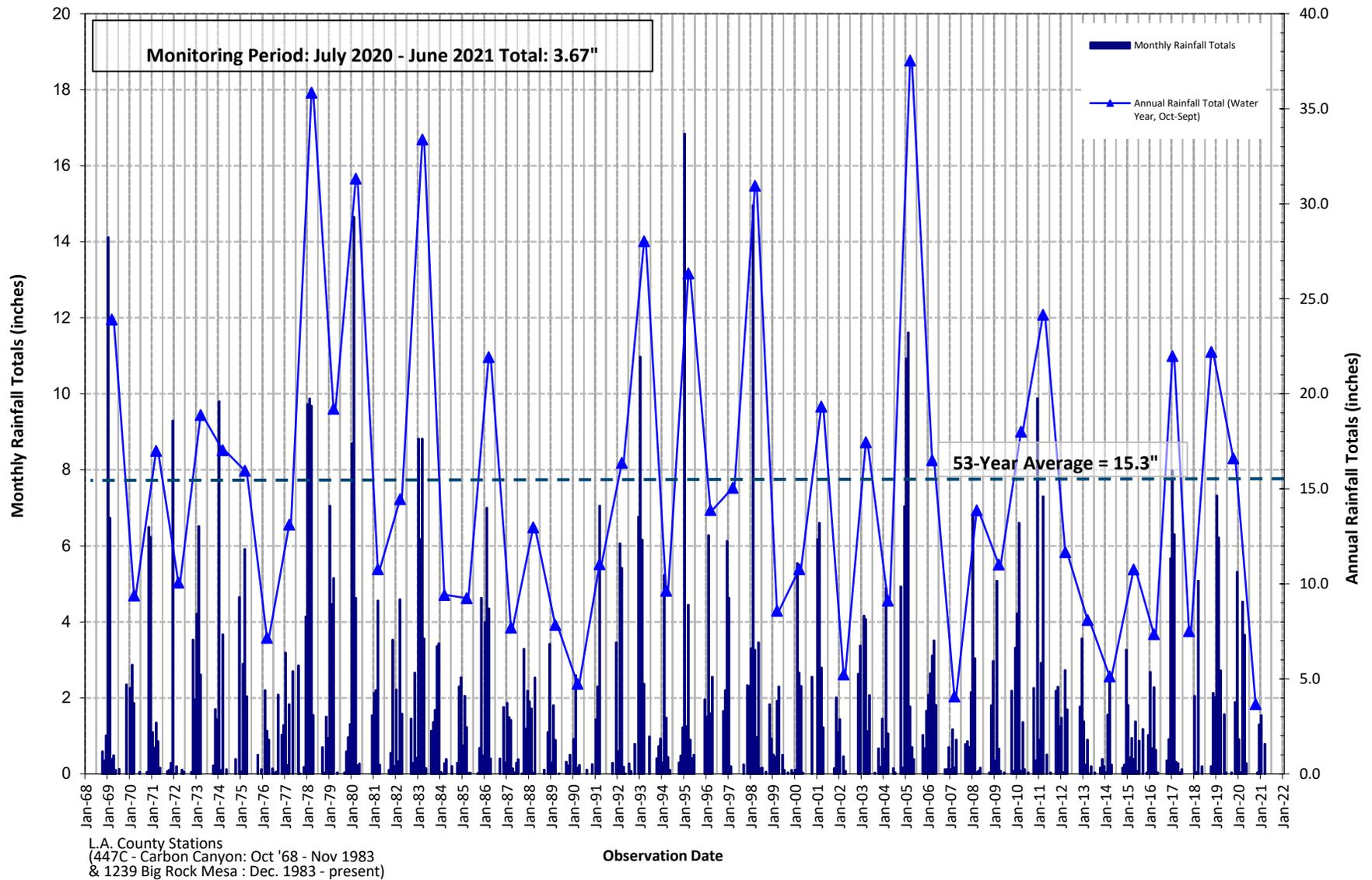


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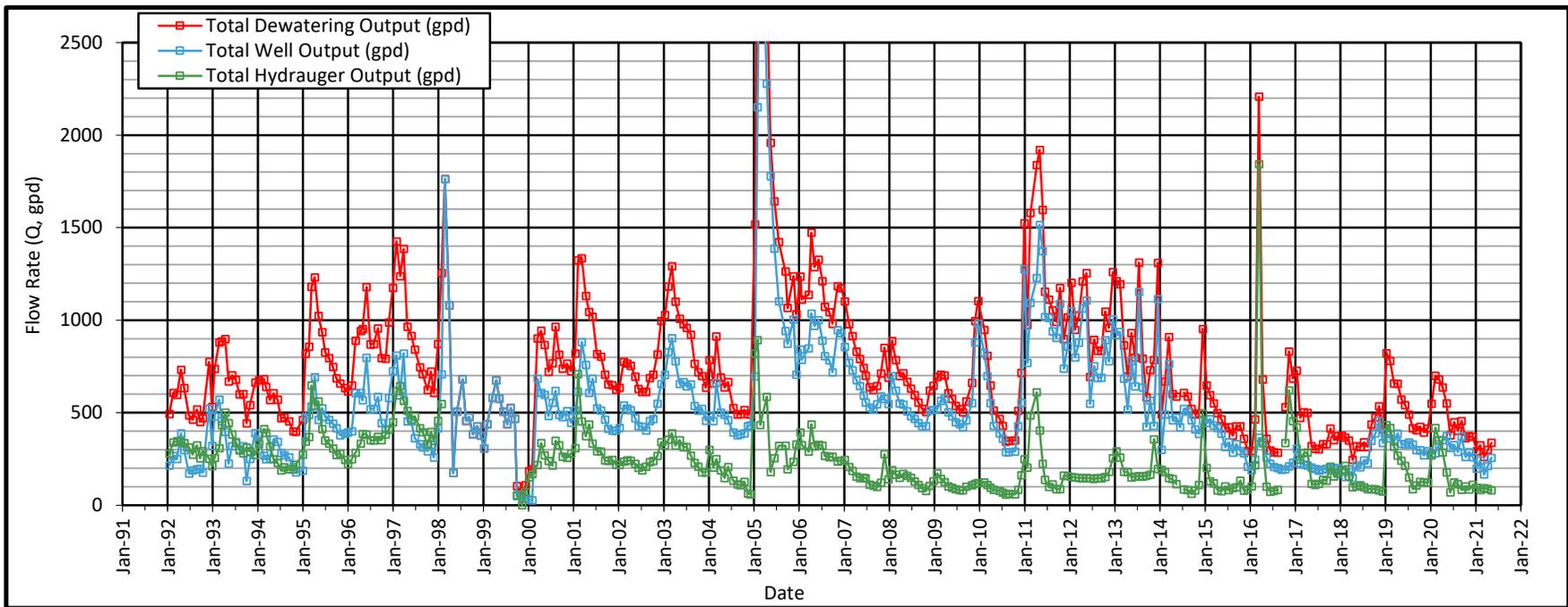
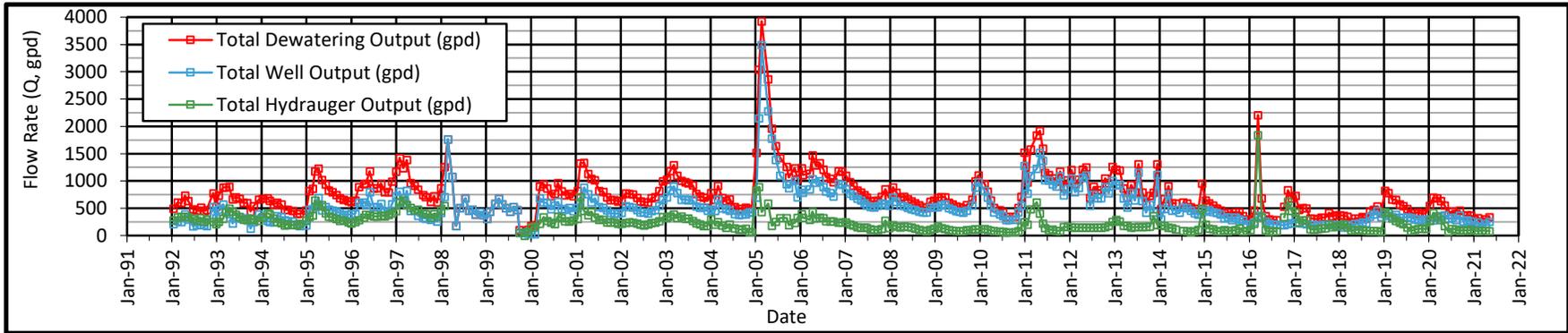
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FY20/21 MAINTENANCE SUMMARY

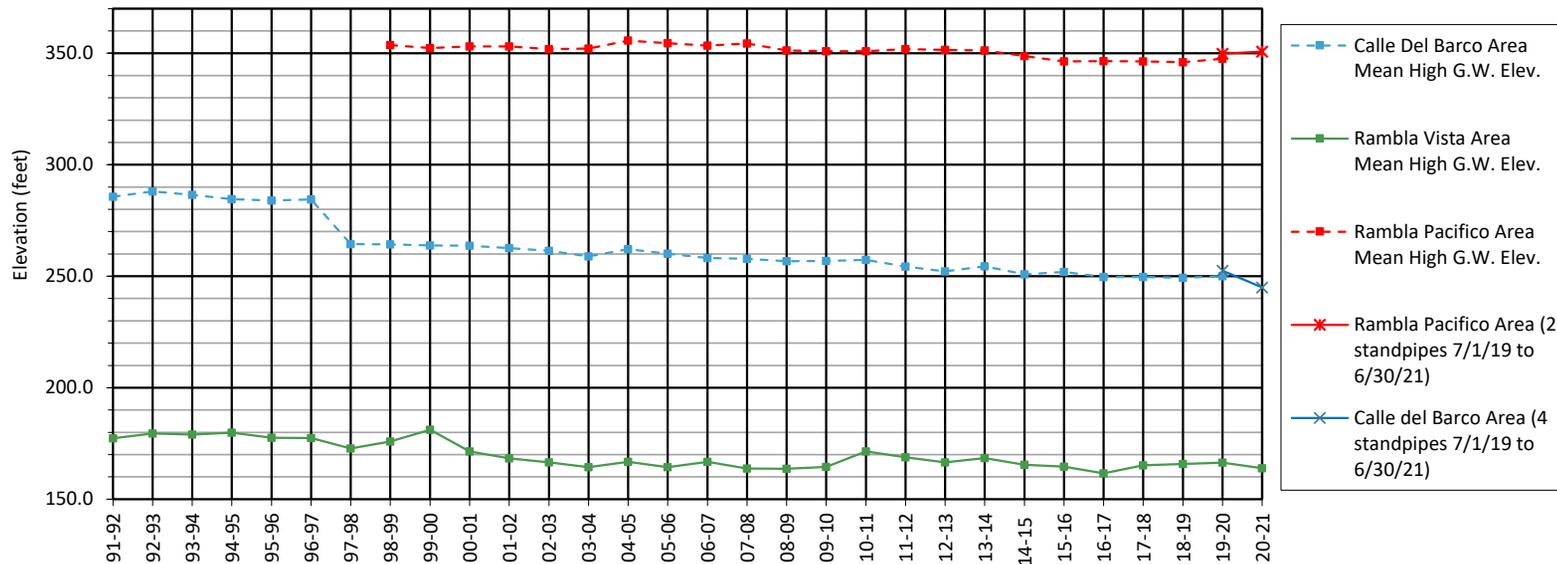
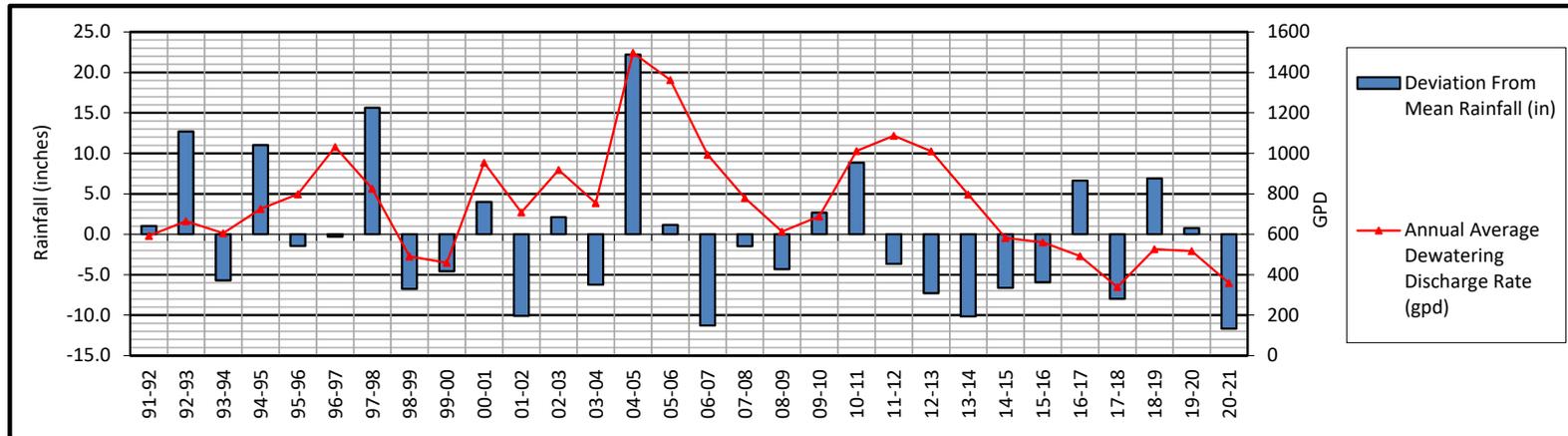
| Date Entered | Facility | Description/Observation | Status/Resolution |
|-------------------------|------------------------------|--|--|
| DEWATERING WELLS | | | |
| Feb-21 | W-M | no production at February monthly reading. 3/2/21: Yeh assess well, pump immediately spiked amps and switched off by pump-saver, no access to obtain a water level in well. | 3/4/21: Coast Pump replaced pump saver and pump controller to test electrical, both units are good. 3/19/21: Coast Pump removed pump, which was severely corroded and deteriorating. 3/22/21: Well Rehabilitation Services video logged well and recommend well rehabilitation to reduce corrosive conditons. 4/26-4/27/21: Well Rehabilitation Services chemical treats well, scrub casing and swabbed well to treat filter pack. 5/13/21: Coast Pump installs new pump with sounding tube. Returned to service |
| Sep-20 | W-J | low/intermittent production since approximately 9/2020, pump appears to be shutting off by pump saver at inconsistent intervals, well has never been video logged. Historic record of root intrusion. Previous efforts to manage roots have been unsuccessful. | 3/19/21: Coast Pump removed pump; observed mild to moderate corrosion, well casing intruded by numerous fine and a few large roots. 3/22/21: Well Rehabilitation Services video logged well and recommend well rehabilitation to reduce corrosive conditons and remove roots. 4/26 and 4/27/21: Well Rehabilitation Services chemical treats well, strub casing and swabbed well to treat filter pack. 5/13/21: Coast Pump installs new pump with sounding tube. Returned to Service. |
| Jul-20 | W-C | Pump attacment not secure and risk of being lost. Well cover damaged. Well has not ever been video logged or assessed. | 3/19/21: Coast Pump removed pump. 3/22/21: Well Rehabilitation Services perfom video log. No rehabilitation recommended at this time. 5/13/21: replace well cover and fabricate and install an improved pump support connection, replace pump with sounding tube. Returned to service. |
| Jul-20 | W-B | no/low production, sounded total well depth and pump depth does not match depths reported since 1998. Well is previously reported as approximately 150 feet deep but no as-built information available. Yeh measured well to be approximately 30 feet deep. Unsure if lower casing was lost or previous reporting was incorrect. | 8/12/21: Coast Pump removed pump. 8/24/21: Well Rehabilitation services perform video log and recommend attempt to vacume sediment thought to have accumulated. 10/4/21: Well Rehabilitation Servcies attempt to recover depth with vac truck and gained approximately 2.3 additional feet of casing. Original depth remains unconfirmed. 10/14/21: Well Rehabilitation Services perform post work video log. 12/13/21: Coast Pump replaced pump with sounding tube at 29 feet deep. Returned to Service. |
| HYDRAUGERS | | | |
| Jul-20 | H-1 | hydrauger casing broken inside wall and flow is leaking along gutter | 3/25/21: Burns Pacific Construction repaired condition |
| Jul-20 | lower cluster discharge line | Buried by soil, Yeh repeatedly digging out hydrauger ports during monthly monitoring. | Managing condition and developing plan to perform larger scale excavation and long term protection. |
| Jul-20 | Rambla Orienta | heavy vegetation along soldier pile wall, difficult to access for inventory or repair | Scheduled for removal during next monitoring year. |
| INCLINOMETERS | | | |
| No entries | -- | -- | -- |



RAINFALL GRAPH
 Landslide Assessment Districts
 Malibu, California



TOTAL DISCHARGE - WELLS AND HYDRAUGERS
 Calle del Barco Landslide Assessment District
 Malibu, California



GROUNDWATER LEVELS, DEWATERING AND RAINFALL
 Calle del Barco Landslide Assessment District
 Malibu, California

APPENDIX A - GROUNDWATER LEVELS

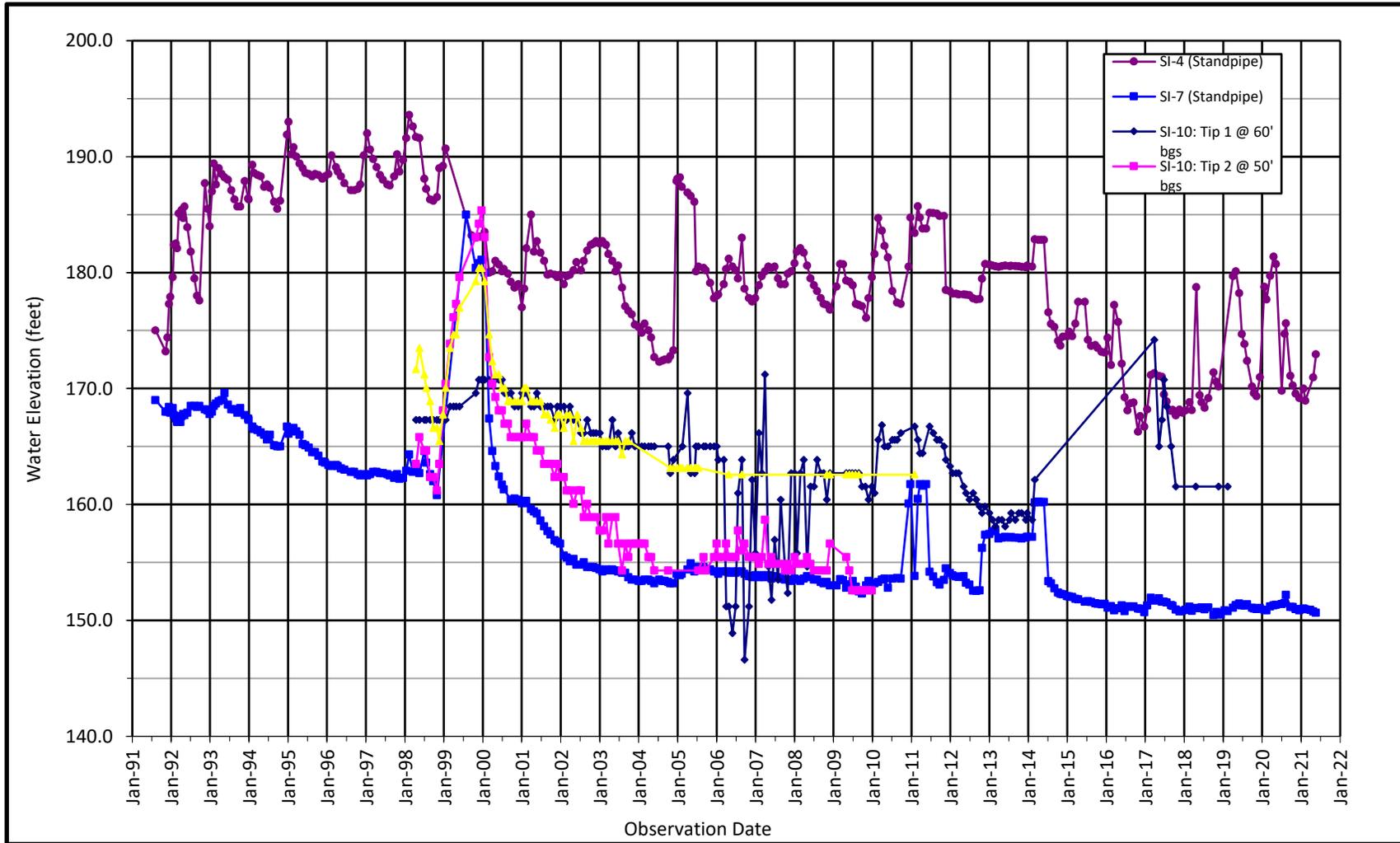
| CALLE DEL BARCO LAD - Standpipe Piezometer Information | | | | | |
|---|--------------------------|-------------------|---------------------------|--------------|-------|
| Standpipe ID | Reference Elevation (ft) | Casing Depth (ft) | Perforation Interval (ft) | Installed By | Notes |
| SI-4 | 207.0 | 81.0 | Unknown | Unknown | |
| SI-5 | 302.0 | 100.0 | Unknown | Unknown | |
| SI-7 | 201.0 | 106.0 | Unknown | Unknown | |
| SI-8 | 352.0 | 131.0 | Unknown | Unknown | |
| SI-9 | 298.0 | 100.0 | Unknown | Unknown | |
| SI-13 | 424.0 | 82.0 | 75-80 | BYA | |
| SI-14 | 408.0 | 80.0 | 73-78 | BYA | |
| SI-15 | 301.0 | 78.0 | 71-76 | BYA | |
| SI-16 | 297.0 | 90.0 | Unknown | Unknown | |

| CALLE DEL BARCO LAD - Pneumatic Piezometer Information | | | | | | |
|---|----------------|----------------------|----------------|----------------|--------------|------------------|
| Piezometer ID | Tip No. | Reference Elev. (ft) | Tip depth (ft) | Tip Elev. (ft) | Installed By | Notes |
| SI-9 | 1 | 298 | 68 | 230 | BYA | functioning |
| | 2 | | 38 | 260 | BYA | 0 PSI |
| SI-10 | 1 | 202 | 60 | 142 | BYA | functioning |
| | 2* | | 50 | 152 | BYA | blocked air line |
| | 3 | | 40 | 162 | BYA | 0 PSI |
| | 4 | | 20 | 182 | BYA | 0 PSI |
| SI-11 | 1 | 291.5 | 60 | 231.5 | BYA | functioning |
| | 2 ^a | | 50 | 241.5 | BYA | functioning |
| | 3* | | 40 | 251.5 | BYA | air line leak |
| | 4 ^a | | 20 | 271.5 | BYA | blocked air line |
| SI-12 | 1 | 301 | 60 | 241 | BYA | functioning |
| | 2 | | 50 | 251 | BYA | functioning |
| | 3* | | 40 | 261 | BYA | functioning |
| | 4 ^a | | 20 | 281 | BYA | 0 PSI |
| SI-13 | 1 ^a | 424 | 70 | 354 | BYA | readings <0.3PSI |
| | 2 ^a | | 50 | 374 | BYA | readings <0.3PSI |
| SI-14 | 1 | 408 | 68 | 340 | BYA | functioning |
| | 2 | | 48 | 360 | BYA | functioning |
| SI-15 | 1 | 301 | 66 | 235 | BYA | functioning |
| | 2* | | 36 | 265 | BYA | non functioning |
| SI-16 | 1 | 297 | 70 | 227 | BYA | functioning |
| | 2 | | 40 | 257 | BYA | functioning |

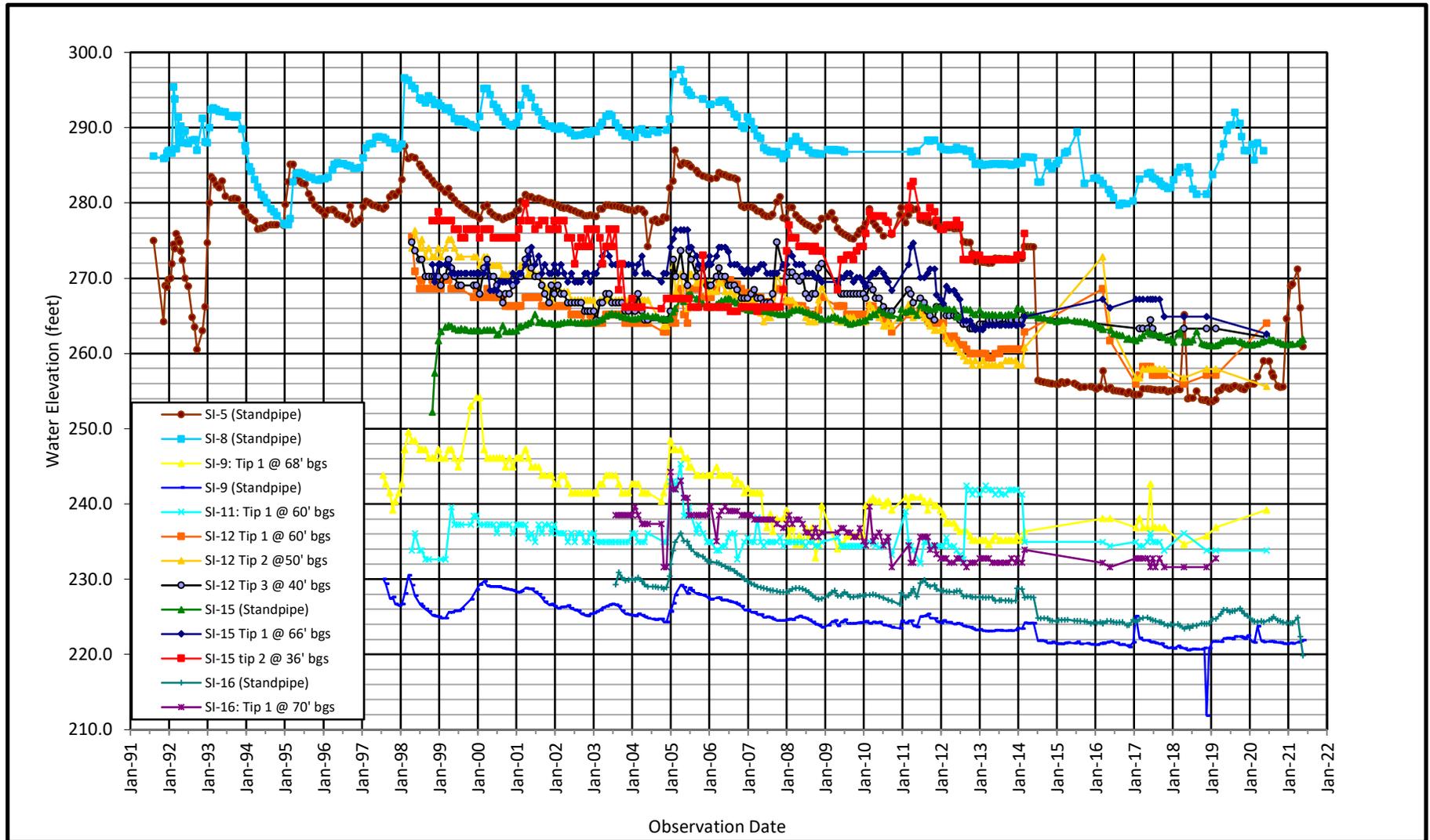
* - Piezometer not functioning

^a - functionality not certain, readings not included in calculation of area averages

| CALLE DEL BARCO - SUMMARY OF GROUNDWATER DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------|--------|-------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|-----------------------|----------------|-------------|----------------|----------------|---------------|--|
| Piezometer I.D. | | 91-92* | 92-93 | 93-94 | 94-95 | 95-96 | 96-97 | 97-98 | 98-99 | 99-00** | 00-01 | 01-02 | 02-03 | 03-04 | 04-05 | 05-06 | 06-07 | 07-08 | 08-09 | 09-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | Highest Ever Recorded | Mean '91 - '21 | Stand. Dev. | 20-21 vs 97-98 | 20-21 vs 19-20 | 20-21 vs Mean | |
| Rambla Vista | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SI-4 | Mean El. | 180.9 | 184.9 | 187.3 | 188.9 | 188.6 | 188.8 | 190.1 | 187.9 | 182.0 | 180.4 | 180.1 | 181.8 | 176.1 | 180.5 | 179.6 | 179.5 | 180.4 | 178.7 | 179.8 | 182.0 | 181.1 | 179.6 | 181.3 | 175.2 | 174.2 | 169.0 | 169.3 | 172.9 | 174.9 | 171.2 | Mar-98 | 180.2 | 5.7 | -18.9 | -3.7 | -9.0 | |
| | Max El. | 185.7 | 189.4 | 189.3 | 193.0 | 190.1 | 192.0 | 193.6 | 190.7 | 183.5 | 185.0 | 181.7 | 182.7 | 180.6 | 188.2 | 181.2 | 183.0 | 182.1 | 180.7 | 182.9 | 182.9 | 185.2 | 180.7 | 182.9 | 177.5 | 177.5 | 171.3 | 178.8 | 180.1 | 181.4 | 175.6 | 193.6 | 183.8 | 5.3 | -18.0 | -5.7 | -8.2 | |
| SI-7 | Mean El. | 167.8 | 168.5 | 167.3 | 165.8 | 163.9 | 162.7 | 162.8 | 162.7 | 173.9 | 160.3 | 156.5 | 154.5 | 153.6 | 153.8 | 154.3 | 153.9 | 153.6 | 153.2 | 153.1 | 158.2 | 153.7 | 155.7 | 158.2 | 152.4 | 151.3 | 151.3 | 151.1 | 150.9 | 151.1 | 151.1 | Aug-99 | 157.6 | 6.4 | -11.6 | 0.0 | -6.4 | |
| | Max El. | 169.0 | 169.6 | 168.6 | 166.7 | 165.1 | 163.0 | 164.3 | 164.6 | 185.0 | 161.7 | 158.6 | 155.0 | 154.2 | 154.9 | 154.6 | 154.2 | 153.8 | 153.6 | 153.6 | 161.8 | 154.5 | 157.7 | 160.2 | 153.4 | 151.7 | 151.9 | 151.6 | 151.5 | 151.4 | 152.2 | 185.0 | 158.9 | 7.7 | -12.1 | 0.8 | -6.7 | |
| SI-10 TIP-1 | Mean El. | | | | | | | 167.3 | 167.7 | 170.6 | 169.3 | 168.1 | 166.0 | 165.2 | 164.5 | 161.2 | 158.2 | 158.5 | 162.4 | 163.0 | 165.5 | 163.9 | 159.3 | 159.3 | | | 168.8 | 165.5 | 161.6 | -- | -- | Apr-07 | 164.3 | 3.8 | | | | |
| | Max El. | | | | | | | 167.3 | 168.5 | 170.8 | 170.8 | 168.5 | 167.3 | 166.2 | 169.6 | 165.0 | 171.2 | 163.9 | 163.9 | 166.8 | 166.7 | 166.7 | 161.0 | 162.1 | | | 174.2 | 170.8 | 161.6 | -- | -- | 174.2 | 167.1 | 3.5 | | | | |
| SI-10 TIP-2 | Mean El. | | | | | | | 164.7 | 168.7 | 177.0 | 166.2 | 162.4 | 158.8 | 155.9 | 154.3 | 155.5 | 156.0 | 154.9 | 154.8 | 152.6 | -- | -- | -- | -- | | | -- | -- | -- | -- | -- | -- | Jan-99 | 160.1 | 7.2 | | | |
| | Max El. | | | | | | | 165.8 | 179.6 | 185.4 | 168.1 | 164.7 | 161.2 | 156.6 | 154.3 | 156.6 | 158.7 | 155.5 | 156.6 | 152.6 | -- | -- | -- | -- | | | -- | -- | -- | -- | -- | -- | 185.4 | 162.7 | 10.0 | | | |
| Area Average | Mean El. | 174.4 | 176.7 | 177.3 | 177.4 | 176.3 | 175.7 | 171.2 | 171.7 | 175.9 | 169.0 | 166.8 | 165.3 | 162.7 | 163.3 | 162.6 | 161.9 | 161.8 | 162.3 | 162.1 | 168.6 | 166.2 | 164.9 | 166.3 | 163.8 | 162.8 | 160.2 | 161.9 | 163.0 | 161.2 | | 167.1 | 5.9 | -10.0 | -1.9 | -6.0 | | |
| | Max El. | 177.4 | 179.5 | 179.0 | 179.9 | 177.6 | 177.5 | 172.8 | 175.8 | 181.2 | 171.4 | 168.4 | 166.6 | 164.4 | 166.8 | 164.4 | 166.8 | 163.8 | 163.4 | 164.4 | 171.4 | 168.8 | 166.5 | 168.4 | 165.4 | 164.6 | 161.6 | 165.2 | 165.8 | 163.9 | | 169.6 | 6.0 | -8.8 | -2.5 | -5.7 | | |
| Change vs Prior | Mean El. | | 2.3 | 0.6 | 0.0 | -1.1 | -0.5 | -4.5 | 0.5 | 4.1 | -6.8 | -2.2 | -1.5 | -2.6 | 0.6 | -0.7 | -0.1 | 0.4 | -0.1 | 6.4 | -2.3 | -1.4 | 1.4 | -2.5 | -1.0 | -2.6 | 0.0 | 1.7 | 1.1 | -1.9 | | | | | | | | |
| | Max El. | | 2.2 | -0.6 | 0.9 | -2.3 | -0.1 | -4.8 | 3.1 | 5.3 | -9.8 | -3.0 | -1.8 | -2.2 | 2.4 | -2.4 | 2.4 | -3.0 | -0.1 | 0.7 | 7.0 | -2.6 | -2.3 | 1.9 | -3.0 | -0.9 | -2.9 | 3.6 | 0.6 | 0.6 | -2.5 | | | | | | | |
| Calle Del Barco | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SI-5 | Mean El. | 271.9 | 273.5 | 278.9 | 280.1 | 279.9 | 278.8 | 282.6 | 282.6 | 278.9 | 279.1 | 279.9 | 278.8 | 278.8 | 281.2 | 283.9 | 280.6 | 278.7 | 276.5 | 278.1 | 277.1 | 273.3 | 273.1 | 256.1 | 255.7 | 254.9 | 255.9 | 254.4 | 256.0 | 261.7 | Mar-98 | 273.3 | 9.9 | -20.9 | 5.8 | -11.5 | | |
| | Max El. | 275.9 | 283.5 | 280.9 | 285.1 | 282.6 | 280.2 | 287.5 | 285.1 | 279.9 | 281.1 | 280.6 | 279.7 | 279.6 | 287.0 | 285.1 | 283.7 | 280.8 | 278.7 | 279.2 | 279.4 | 277.8 | 276.6 | 274.2 | 256.4 | 257.7 | 255.3 | 265.1 | 255.5 | 259.0 | 271.2 | 287.5 | 276.1 | 9.9 | -16.3 | 12.2 | -4.9 | |
| SI-8 | Mean El. | 288.6 | 290.0 | 287.5 | 279.8 | 283.8 | 286.0 | 290.7 | 293.0 | 291.9 | 292.2 | 290.5 | 289.8 | 289.6 | 293.2 | 293.7 | 290.7 | 287.2 | 286.9 | 286.8 | 286.9 | -- | -- | 285.5 | 285.0 | 283.4 | 281.4 | 283.1 | 284.4 | 288.6 | -- | Apr-05 | 287.8 | 3.7 | | | | |
| | Max El. | 295.4 | 292.6 | 292.1 | 284.0 | 285.3 | 288.7 | 296.6 | 294.2 | 295.2 | 295.2 | 292.7 | 291.8 | 291.6 | 297.7 | 294.7 | 293.6 | 288.8 | 287.5 | 286.8 | 286.9 | -- | -- | 286.1 | 286.8 | 289.4 | 284.0 | 284.8 | 289.6 | 292.0 | -- | 297.7 | 290.5 | 4.1 | | | | |
| SI-9 | Mean El. | | | | | | | 228.2 | 225.6 | 228.2 | 228.7 | 226.8 | 225.8 | 225.6 | 226.1 | 227.7 | 226.1 | 224.7 | 224.2 | 224.0 | 224.6 | 224.6 | 223.4 | 223.5 | 221.6 | 221.5 | 221.9 | 221.1 | 220.5 | 222.2 | 221.6 | Apr-98 | 224.5 | 2.5 | -6.6 | -0.6 | -2.9 | |
| | Max El. | | | | | | | 230.5 | 226.7 | 229.7 | 229.0 | 228.3 | 226.6 | 226.7 | 229.2 | 228.8 | 227.2 | 225.1 | 224.8 | 224.6 | 224.5 | 224.5 | 224.1 | 224.2 | 221.8 | 221.7 | 225.1 | 221.6 | 222.2 | 223.8 | 221.9 | 230.5 | 225.6 | 2.7 | -8.6 | -1.9 | -3.7 | |
| SI-15 | Mean El. | | | | | | | 261.0 | 263.1 | 263.3 | 264.2 | 264.3 | 264.9 | 265.5 | 266.9 | 266.3 | 265.5 | 264.9 | 264.6 | 265.4 | 265.9 | 265.4 | 265.3 | 264.5 | 263.8 | 262.3 | 262.2 | 261.5 | 261.4 | 261.5 | Jul-05 & Aug-05 | 264.1 | 1.7 | | 0.0 | -2.6 | | |
| | Max El. | | | | | | | 263.7 | 263.3 | 264.2 | 265.2 | 265.2 | 265.3 | 267.7 | 267.8 | 265.8 | 265.5 | 265.8 | 265.9 | 266.4 | 265.9 | 266.4 | 264.8 | 264.8 | 264.8 | 264.3 | 262.9 | 262.9 | 261.8 | 261.9 | 267.8 | 264.9 | 1.7 | | 0.1 | -3.0 | | |
| SI-16 | Mean El. | | | | | | | 229.8 | 231.6 | 232.7 | 230.1 | 228.5 | 227.9 | 227.9 | 227.7 | 228.8 | 227.6 | 227.6 | 224.6 | 224.3 | 224.4 | 224.0 | 224.5 | 224.8 | 224.8 | 224.5 | 224.9 | 224.6 | 225.1 | 223.9 | Apr-05 | 227.3 | 2.7 | | -1.2 | -3.4 | | |
| | Max El. | | | | | | | 230.9 | 236.1 | 234.5 | 231.7 | 228.8 | 228.5 | 228.3 | 228.7 | 229.9 | 228.5 | 228.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 225.0 | 225.0 | 236.1 | 228.4 | 3.4 | | -1.1 | -3.4 | | |
| SI-9 TIP-1 | Mean El. | | | | | | | 244.1 | 246.7 | 248.7 | 245.9 | 243.5 | 242.1 | 242.3 | 245.2 | 244.1 | 242.0 | 236.8 | 235.7 | 237.6 | 240.2 | 239.0 | 235.5 | 235.4 | | | 238.1 | 238.3 | 236.4 | 236.3 | 239.2 | -- | Jan-Feb-00 | 240.6 | 4.1 | | | |
| | Max El. | | | | | | | 249.6 | 247.3 | 254.2 | 247.3 | 245.0 | 243.8 | 243.8 | 248.4 | 245.0 | 243.8 | 239.2 | 239.8 | 240.8 | 240.9 | 240.9 | 236.3 | 236.3 | | | 238.1 | 242.7 | 236.9 | 239.2 | 239.2 | -- | 254.2 | 242.6 | 4.7 | | | |
| SI-9 TIP-2 | Mean El. | | | | | | | 267.8 | 263.8 | 261.2 | 262.9 | | | | 266.5 | 261.2 | | | | | | | | | | | | | | | | | Mar-98 | 263.9 | 2.8 | | | |
| | Max El. | | | | | | | 274.3 | 266.9 | 261.2 | 263.5 | | | | 270.4 | 261.2 | | | | | | | | | | | | | | | | | 274.3 | 266.2 | 5.3 | | | |
| SI-11 TIP-1 | Mean El. | | | | | | | 235.0 | 234.4 | 237.5 | 236.8 | 236.3 | 235.3 | 235.2 | 240.0 | 235.7 | 235.3 | 235.0 | 234.7 | 234.5 | 235.0 | 234.3 | 240.3 | 240.9 | | | 234.7 | 235.0 | 235.0 | 233.8 | 233.8 | -- | Apr-05 | 235.8 | 2.1 | | | |
| | Max El. | | | | | | | 236.1 | 239.6 | 238.4 | 237.3 | 237.3 | 236.1 | 236.1 | 245.3 | 239.6 | 238.2 | 235.5 | 235.5 | 235.0 | 239.0 | 235.5 | 242.4 | 241.9 | | | 235.0 | 236.1 | 236.1 | 233.8 | 233.8 | -- | 245.3 | 237.4 | 2.9 | | | |
| SI-11 TIP-2 | Mean El. | | | | | | | 242.7 | 243.7 | 243.8 | 242.8 | 242.7 | | | 242.9 | 242.7 | 242.7 | 242.8 | 242.9 | 242.5 | 242.1 | 242.1 | 242.1 | 242.3 | | | | | 243.6 | 243.2 | -- | Jan-00 | 242.8 | 0.6 | | | | |
| | Max El. | | | | | | | 242.7 | 245.0 | 246.1 | 243.8 | 243.8 | 242.7 | | | 245.0 | 243.2 | 243.2 | 243.2 | 243.2 | 242.7 | 242.1 | 242.1 | 242.3 | | | | | 245.0 | 243.2 | -- | 246.1 | 243.6 | 1.2 | | | | |
| SI-12 TIP-1 | Mean El. | | | | | | | 273.2 | 269.1 | 268.0 | 266.9 | 266.4 | 264.6 | 264.4 | 264.6 | 268.5 | 268.1 | 266.9 | 265.9 | 265.5 | 264.7 | 263.6 | 260.1 | 260.7 | | | 265.2 | 257.6 | 256.9 | 257.1 | 264.0 | -- | May-98 | 264.6 | 4.1 | | | |
| | Max El. | | | | | | | 275.5 | 269.8 | 268.6 | 267.5 | 267.5 | 265.2 | 265.2 | 268.6 | 269.8 | 269.8 | 268.6 | 267.5 | 266.3 | 265.7 | 265.7 | 261.1 | 262.9 | | | 268.6 | 258.3 | 257.1 | 257.1 | 264.0 | -- | 275.5 | 265.9 | 4.5 | | | |
| SI-12 TIP-2 | Mean El. | | | | | | | 275.2 | 273.9 | 272.5 | 270.9 | 268.7 | 266.9 | 267.1 | 267.1 | 269.2 | 266.7 | 266.7 | 265.2 | 264.8 | 264.6 | 263.0 | 258.9 | 259.0 | | | 268.3 | 257.4 | 257.7 | 257.9 | 255.6 | -- | Jun-98 | 265.3 | 5.6 | | | |
| | Max El. | | | | | | | 276.3 | 275.2 | 272.9 | 271.7 | 270.6 | 267.1 | 267.1 | 271.7 | 270.6 | 268.3 | 270.6 | 268.8 | 266.5 | 266.5 | 265.4 | 260.2 | 260.8 | | | 272.9 | 257.9 | 257.9 | 257.9 | 255.6 | -- | 276.3 | 266.9 | 6.1 | | | |
| SI-12 TIP-3 | Mean El. | | | | | | | 274.2 | 270.8 | 269.8 | 269.7 | 268.3 | 266.4 | 266.1 | 268.8 | 270.7 | 267.9 | 269.9 | 268.9 | 267.9 | 266.6 | 265.6 | 263.9 | 264.4 | | | -- | 263.6 | 262.9 | 263.3 | 262.2 | -- | Oct-07 | 267.2 | 3.1 | | | |
| | Max El. | | | | | | | 274.8 | 272.5 | 272.5 | 273.7 | 270.2 | 267.9 | 267.9 | 273.7 | 273.7 | 269.1 | 274.8 | 271.9 | 269.1 | 268.5 | 267.3 | 2 | | | | | | | | | | | | | | | |



GROUNDWATER HYDROGRAPH
Rambla Vista
Calle del Barco Landslide Assessment District
Malibu, California

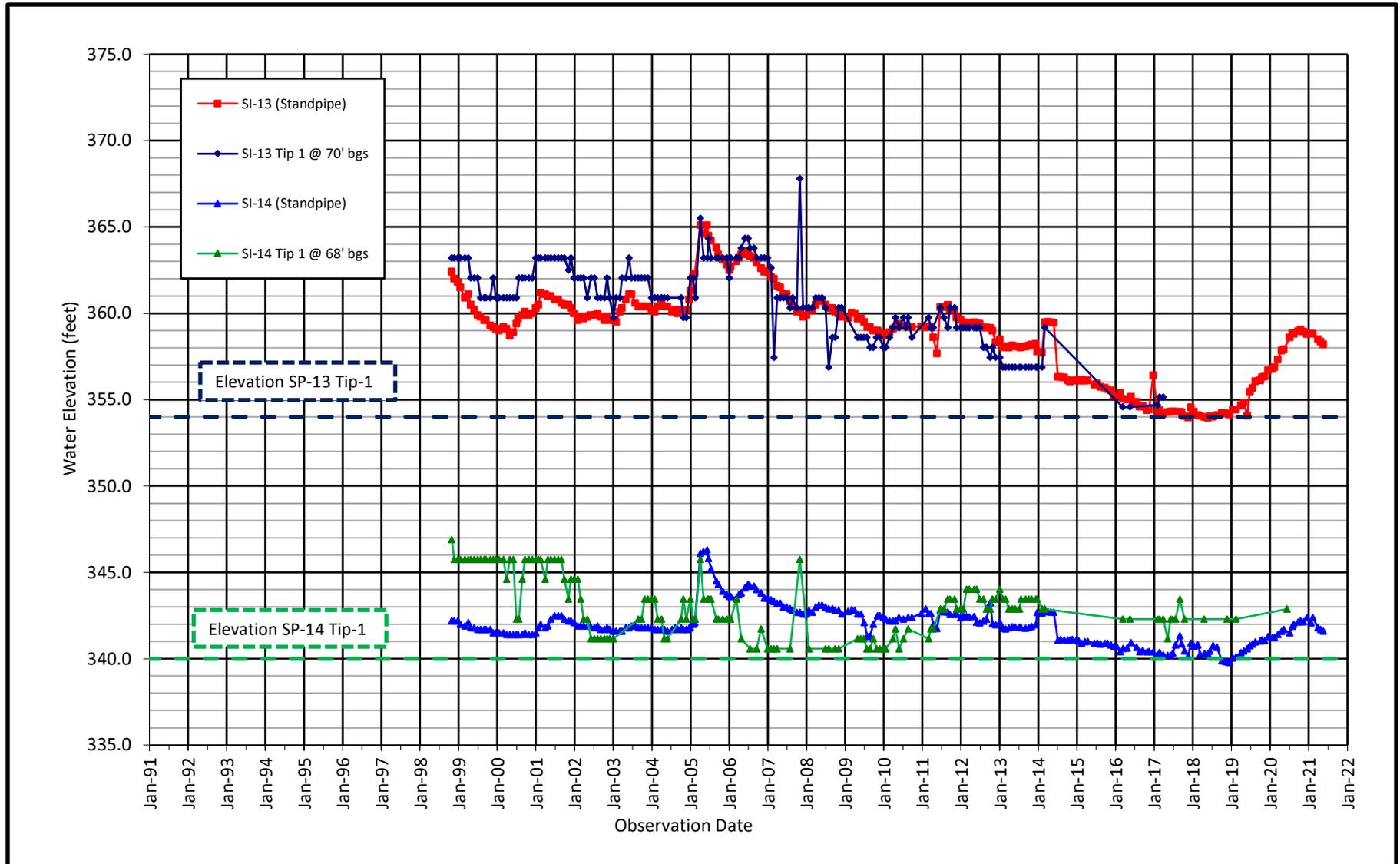


GROUNDWATER HYDROGRAPH

Calle del Barco

Calle del Barco Landslide Assessment District

Malibu, California



GROUNDWATER HYDROGRAPH

Rambla Pacifico

Calle del Barco Landslide Assessment District
 Malibu, California

APPENDIX B - SLOPE INCLINOMETERS

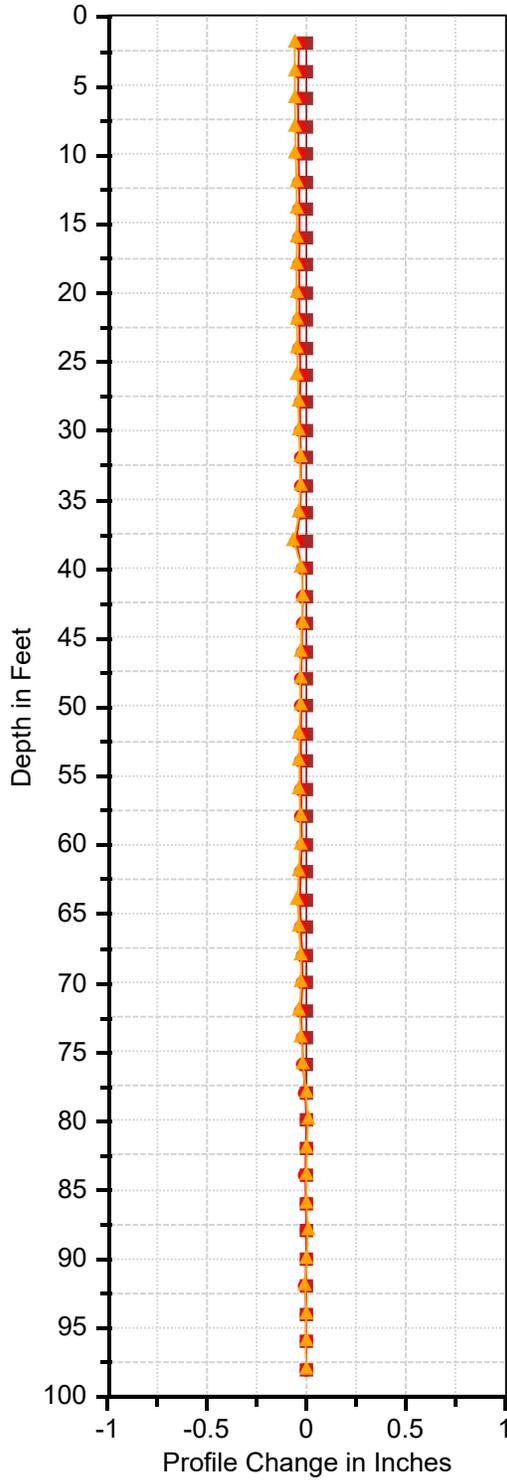
| Slope Inclinometer Interpretation Summary | | | | | | | | | | | | | | | | | |
|---|-------|-------|--------|-------|-------|-------------|-------|-------|-------|----------|---------|---------|---------|----------|----------|----------|----------|
| | SI-1* | SI-1A | SI-2** | SI-3 | SI-4 | SI-5 | SI-6 | SI-7 | SI-8 | SI-9 | SI-10 | SI-11 | SI-12 | SI-13 | SI-14 | SI-15 | SI-16 |
| Installation Details | | | | | | | | | | | | | | | | | |
| Surface Elev. (ft) 4/00 | 295.0 | 297.0 | 298.0 | 207.0 | 206.0 | 302.0 | 295.0 | 200.0 | 335.0 | 298.0 | 202.0 | 291.5 | 301.0 | 405.0 | 398.0 | 304.0 | 295.0 |
| Original DEPTH (ft.) | 64.0 | NI | NI | NI | 76.0 | 100.0 | NI | 100.0 | 130.0 | 100.0 | 60.0 | 60.0 | 60.0 | 80.0 | 78.0 | 76.0 | 88.0 |
| Current DEPTH (ft.) | 64.0 | NI | NI | NI | 78.0 | 96.0 | NI | 102.0 | 130.0 | 96.0 | 62.0 | 57.0 | 56.0 | 78.0 | 76.0 | 72.0 | 86.0 |
| STATUS | D | D | D | D | F | F | D | F | F | F | F | F | F | F | F | F | F |
| READING INTERVAL | N/A | N/A | N/A | N/A | Semi | Semi | N/A | Semi | Semi | Qrtly | Semi | Semi | Semi | Semi | Semi | Semi | Qrtly |
| DATE OF INSTALLATION | NI | NI | NI | NI | NI | NI | NI | NI | NI | NI | 3/13/98 | 3/12/98 | 3/12/98 | 9/1998 | 9/1998 | 9/1998 | 8/8/03 |
| DATE FIRST BASE READING | NI | NI | NI | NI | NI | NI | NI | NI | NI | 12/22/97 | 3/16/98 | 3/13/98 | 3/16/98 | 10/12/98 | 10/12/98 | 10/23/98 | 8/13/03 |
| DEPTH of MOVEMENT (ft)*** | NI | NI | NI | NI | 17-22 | 0-10, 36-38 | 15.0 | 40.0 | 15-17 | 53, 44 | 35-38 | 0-55 | 54 | 0-30 | 8.0 | 0-25, 77 | 46, 87 |
| A+ Axis orientation | NI | NI | NI | NI | 0 | 38.0 | NI | 28.0 | 22.0 | 212.0 | 244.0 | 258.0 | 238.0 | 210.0 | 224.0 | 190.0 | 210 est. |
| Interpretation Movement (inches) | | | | | | | | | | | | | | | | | |
| 2020-2021 | NR | NR | NR | NR | -- | -- | NR | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- |
| 2019-2020 | NR | NR | NR | NR | -- | -- | NR | -- | 0.1 | 0.2 | -- | -- | -- | -- | -- | -- | -- |
| 2018-2019 | NR | NR | NR | NR | 0.1 | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2017-2018 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2016-2017 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | <0.1 |
| 2015-2016 | NR | NR | NR | NR | -- | <0.05 | NR | -- | -- | 0.2 | -- | -- | -- | -- | -- | -- | -- |
| 2014-2015 | NR | NR | NR | NR | -- | 0.1 | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | <0.1 |
| 2013-2014 | NR | NR | NR | NR | -- | 0.1 | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | <0.1 |
| 2012-2013 | NR | NR | NR | NR | -- | 0.1 | NR | -- | -- | 0.15 | 0.1 | -- | 0.1 | -- | -- | -- | 0.2 |
| 2011-2012 | NR | NR | NR | NR | -- | -- | NR | <0.05 | 0.1 | 0.15 | -- | 0.2 | -- | -- | -- | 0.1 | 0.35 |
| 2010-2011 | NR | NR | NR | NR | -- | -- | NR | <0.05 | 0.05 | <0.05 | -- | -- | -- | -- | -- | -- | -- |
| 2009-2010 | NR | NR | NR | NR | -- | -- | NR | -- | -- | 0.2 | -- | 0.1 | -- | -- | -- | -- | 0.1 |
| 2008-2009 | NR | NR | NR | NR | -- | -- | NR | NA | -- | 0.1 | -- | -- | -- | -- | -- | -- | -- |
| 2007-2008 | NR | NR | NR | NR | -- | -- | NR | -- | -- | 0.1 | -- | -- | -- | -- | -- | -- | -- |
| 2006-2007 | NR | NR | NR | NR | -- | <0.1 | NR | -- | -- | 0.2 | -- | -- | -- | -- | 0.2 | -- | 0.2 |
| 2005-2006 | NR | NR | NR | NR | -- | -- | NR | -- | -- | 0.1 | -- | -- | <0.1 | -- | 0.15 | -- | 0.1 |
| 2004-2005 | NR | NR | NR | NR | -- | 0.45 | NR | <0.1 | 0.1 | 0.5 | -- | <0.1 | 0.11 | -- | -- | -- | 0.35 |
| 2003-2004 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2002-2003 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2001-2002 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2000-2001 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1999-2000 | NR | NR | NR | NR | -- | -- | NR | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1998-1999 | NR | NR | NR | NR | -- | 0.16 | NR | 0.11 | -- | 2.19 | -- | -- | -- | -- | -- | -- | -- |
| 1997-1998 | NR | NR | NR | NR | 0.22 | 0.4 | NR | 0.66 | 0.32 | 13 | 0.22 | -- | -- | NR | NR | NR | NR |
| 1996-1997 | NR | NR | NR | NR | NA | NA | NR | NA | NA | NR | NR | NR | NR | NR | NR | NR | NR |
| 1995-1996 | NR | NR | NR | NR | NA | NA | NR | NA | NA | NR | NR | NR | NR | NR | NR | NR | NR |

| | | | |
|--|---|--|--|
| KEY: | | NOTES: | |
| D Destroyed | -- No clearly defined interpreted movement | * Original SI-1 installed in 1978, and was destroyed. | *** Referenced to current depth of SI (see note below) |
| F Functioning | NR No reading | SI-65 (installed in 1979) was renamed to SI-1 | **** SI-4, SI-7, and SI-10 were extended 6 feet upwards during reconstruction of the road in 1999 and interpretations are referenced to their current depth. |
| B New baseline in 1999 | NA Data not available | ** Original SI-2 installed in 1978, and was destroyed. | |
| NI No information | | SI-90 (installed in 1979) was renamed to SI-2 | |
| -- Shaded yellow to indicate inclinometer does penetrate basal rupture. | | | |
| -- Shaded blue to indicate inclinometer does NOT penetrate basal rupture. | | | |
| -- Shaded gray to indicate inclinometer is no longer monitored. | | | |

SLOPE INCLINOMETER INFORMATION
 Calle del Barco Landslide Assessment District
 Malibu, California

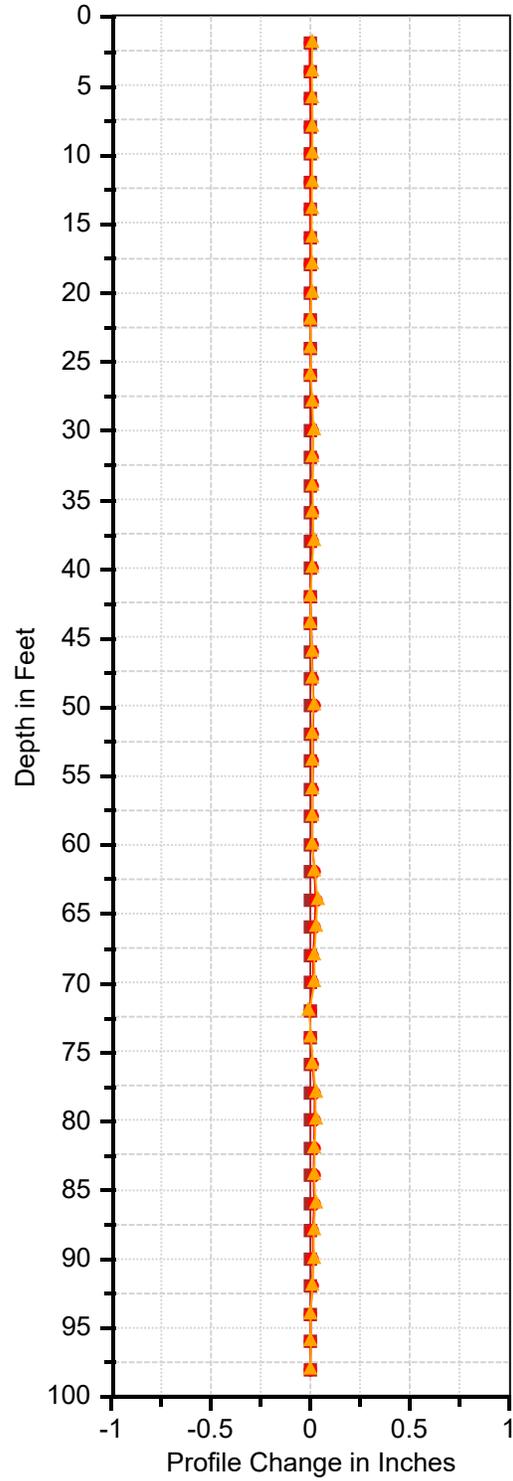
CDB SI-5 A

8/7/2020 5/3/2021 8/4/2021



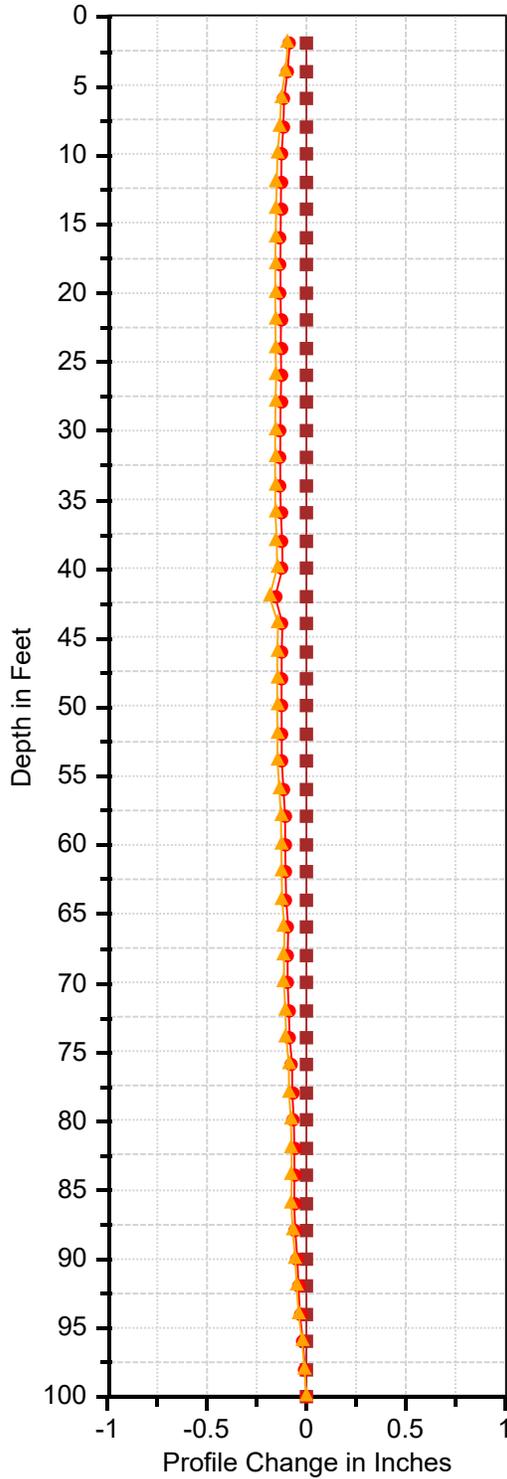
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8/7/2020 5/3/2021 8/4/2021



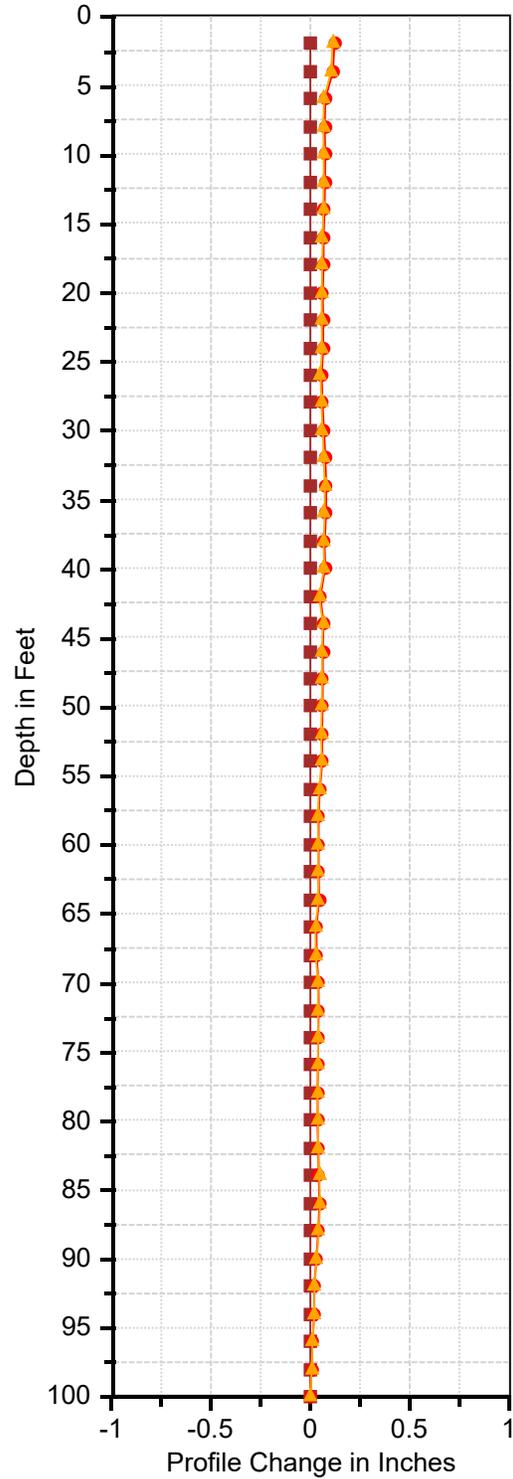
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8/7/2020 5/4/2021 8/4/2021



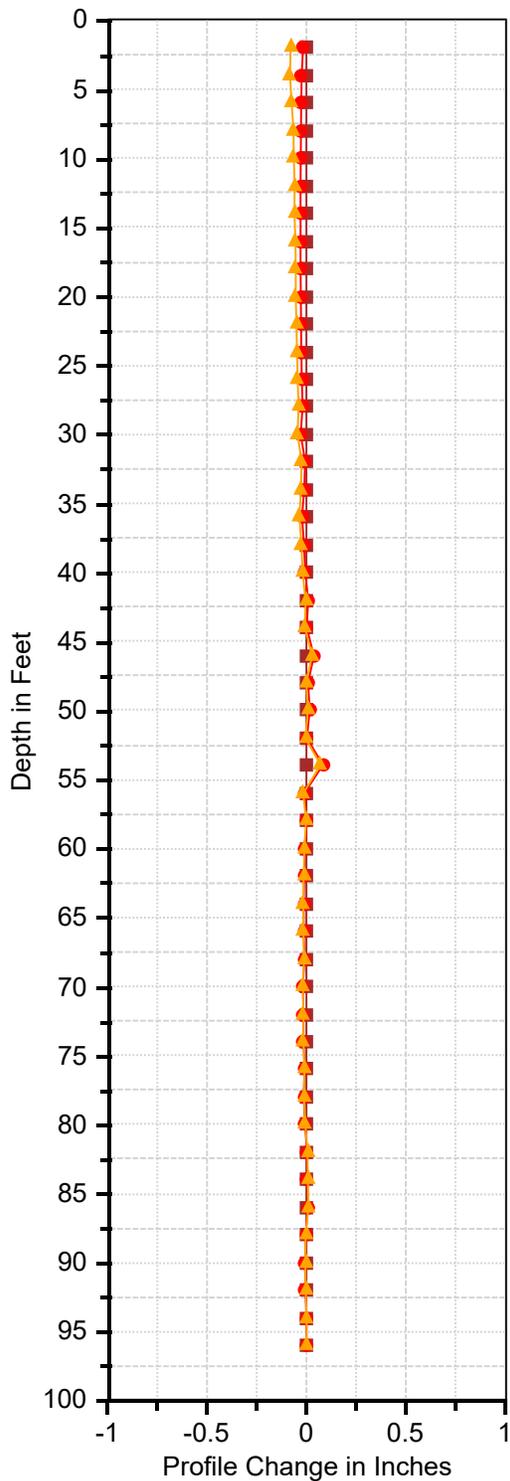
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8/7/2020 5/4/2021 8/4/2021



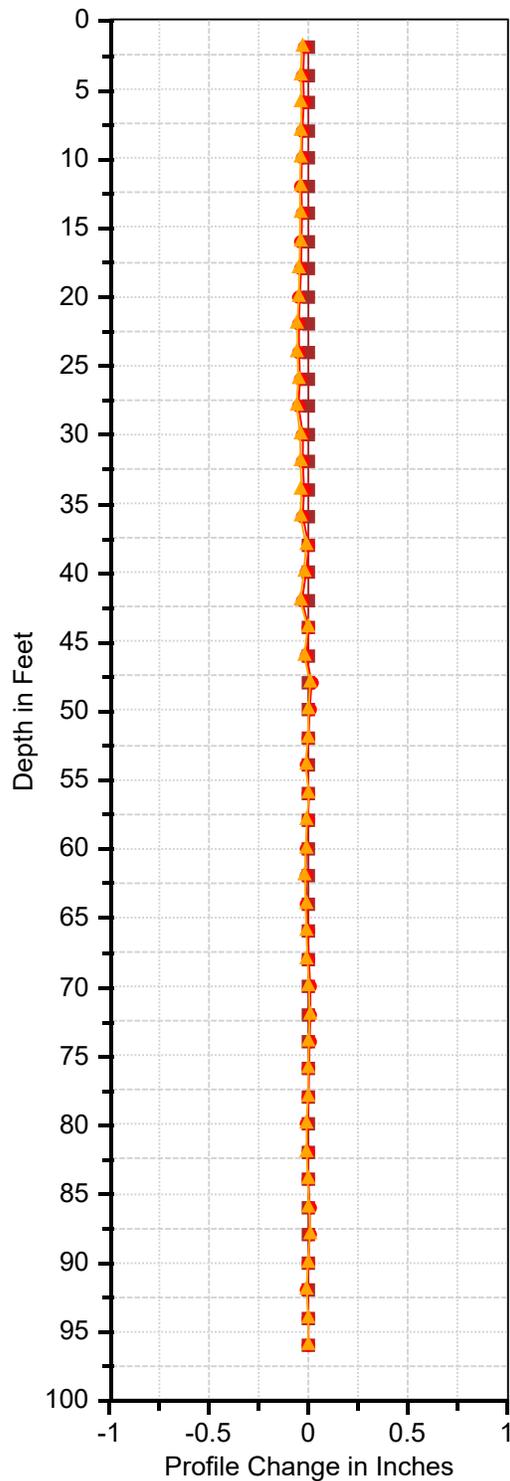
CDB SI-9 A

8/7/2020 5/3/2021 8/4/2021



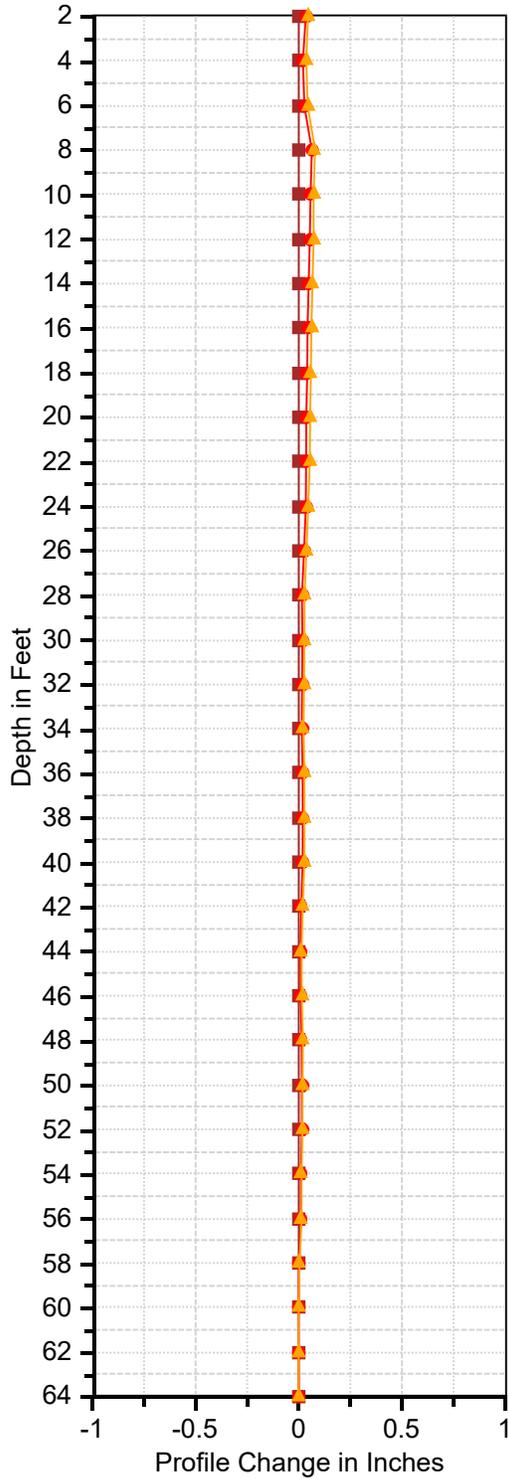
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8/7/2020 5/3/2021 8/4/2021



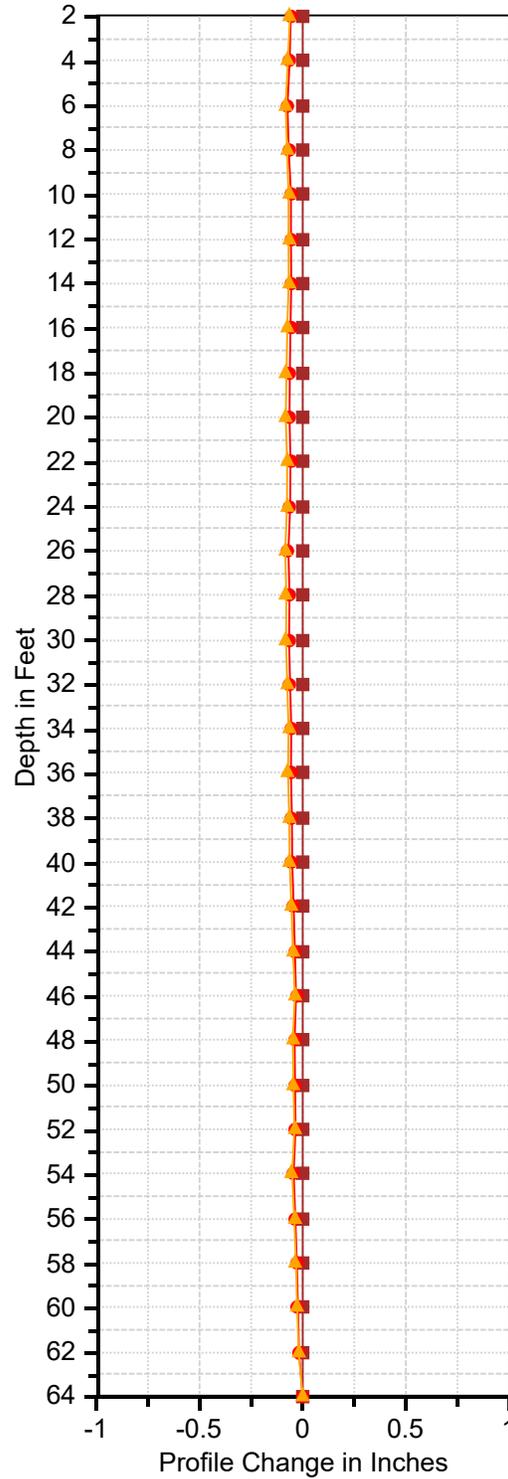
CDB SI-10 A

8/7/2020 5/4/2021 8/4/2021



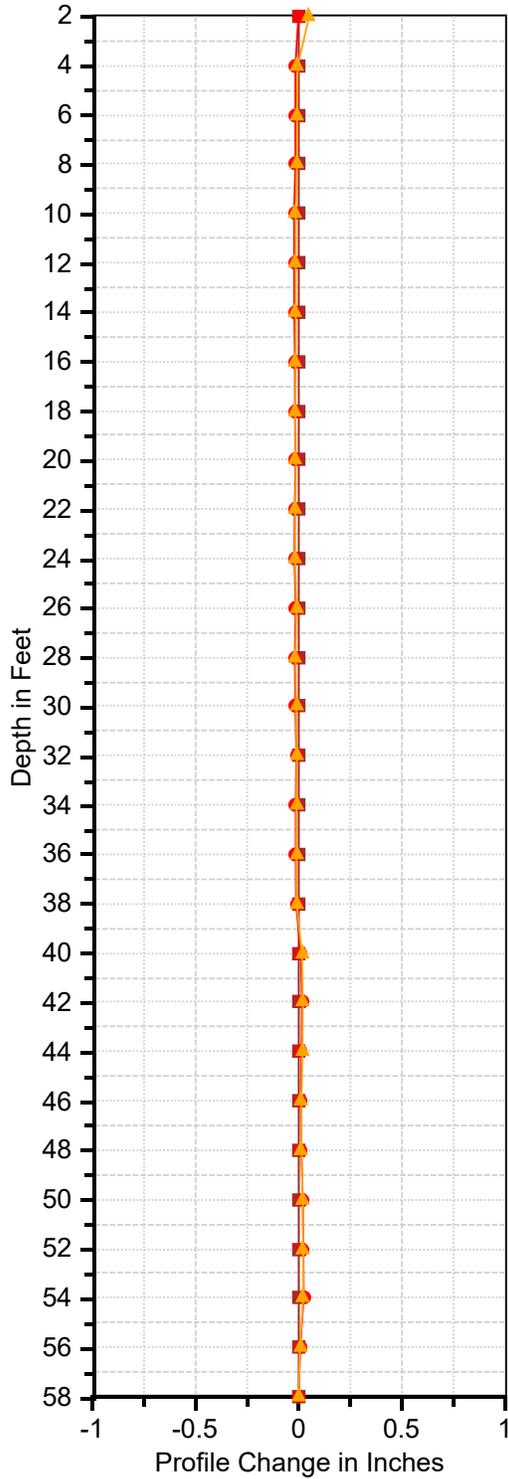
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8/7/2020 5/4/2021 8/4/2021



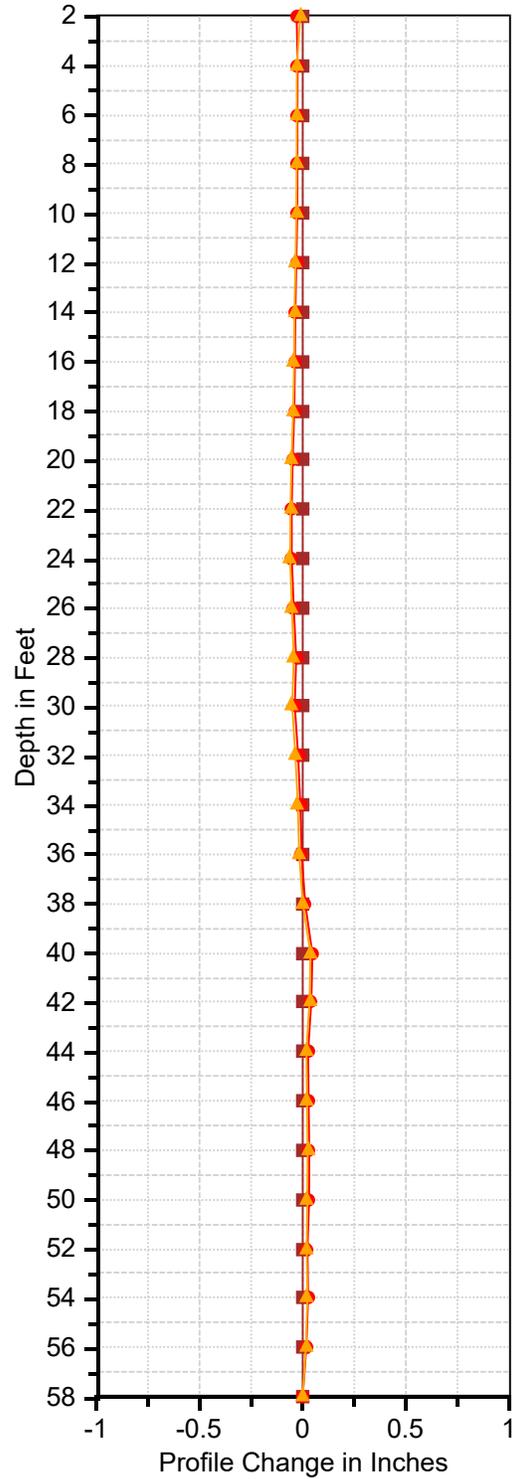
CDB SI-11 A

8/7/2020 5/4/2021 8/4/2021



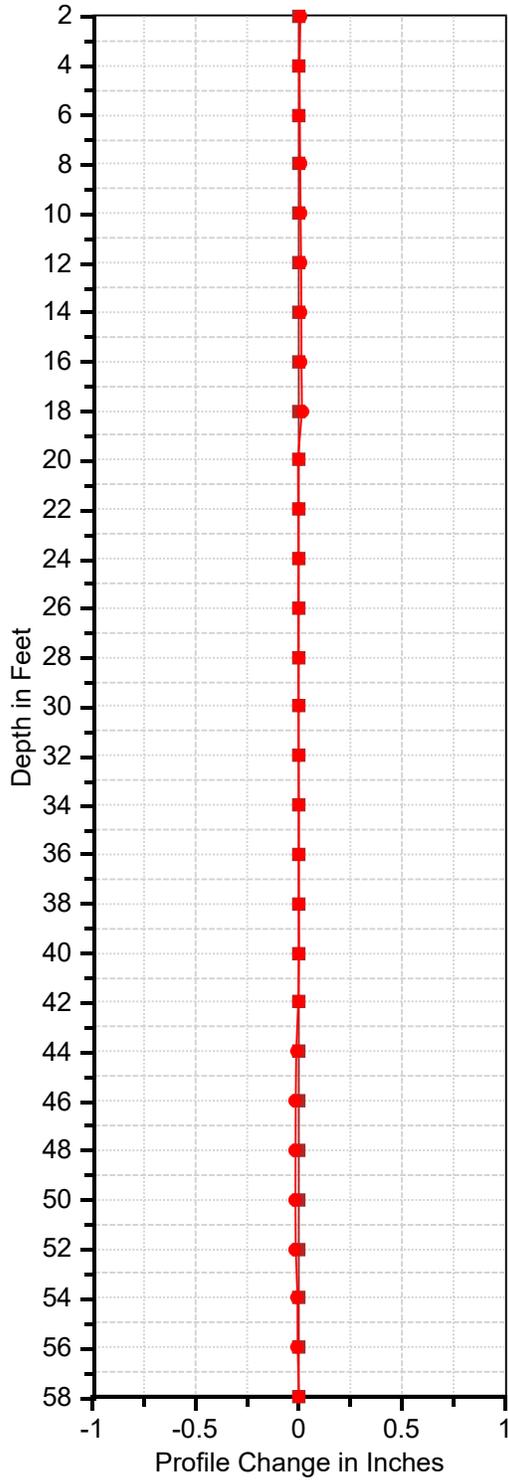
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8/7/2020 5/4/2021 8/4/2021



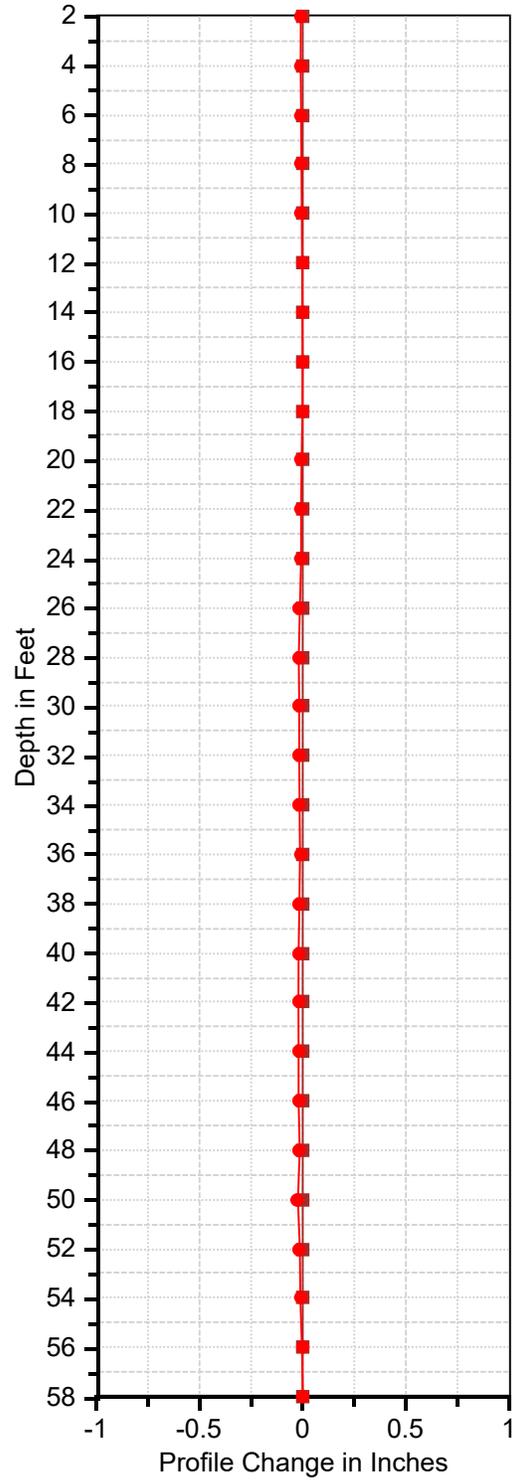
CDB SI-12 A

8/7/2020 5/3/2021



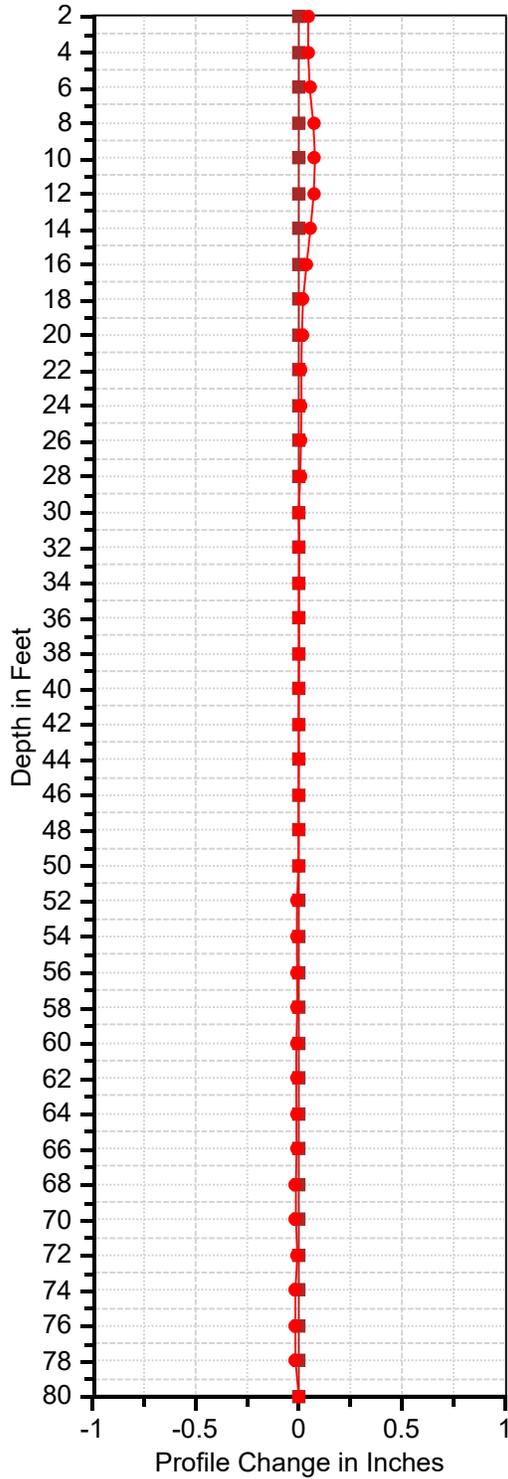
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8/7/2020 5/3/2021



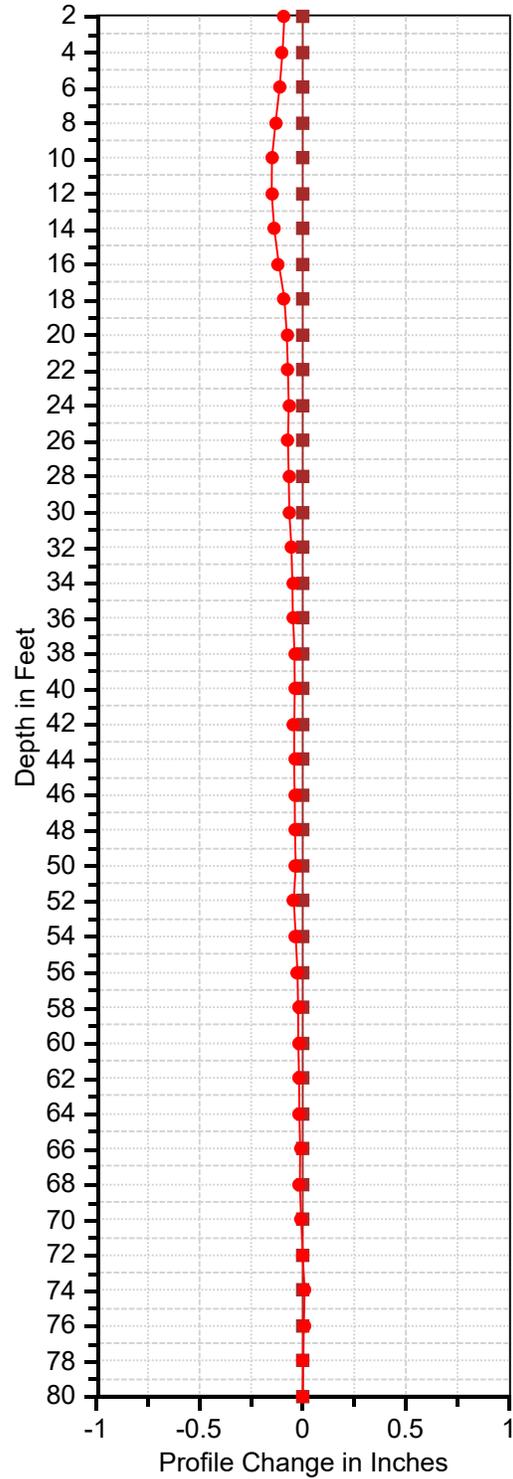
CDB SI-13 A

8/7/2020 8/9/2021



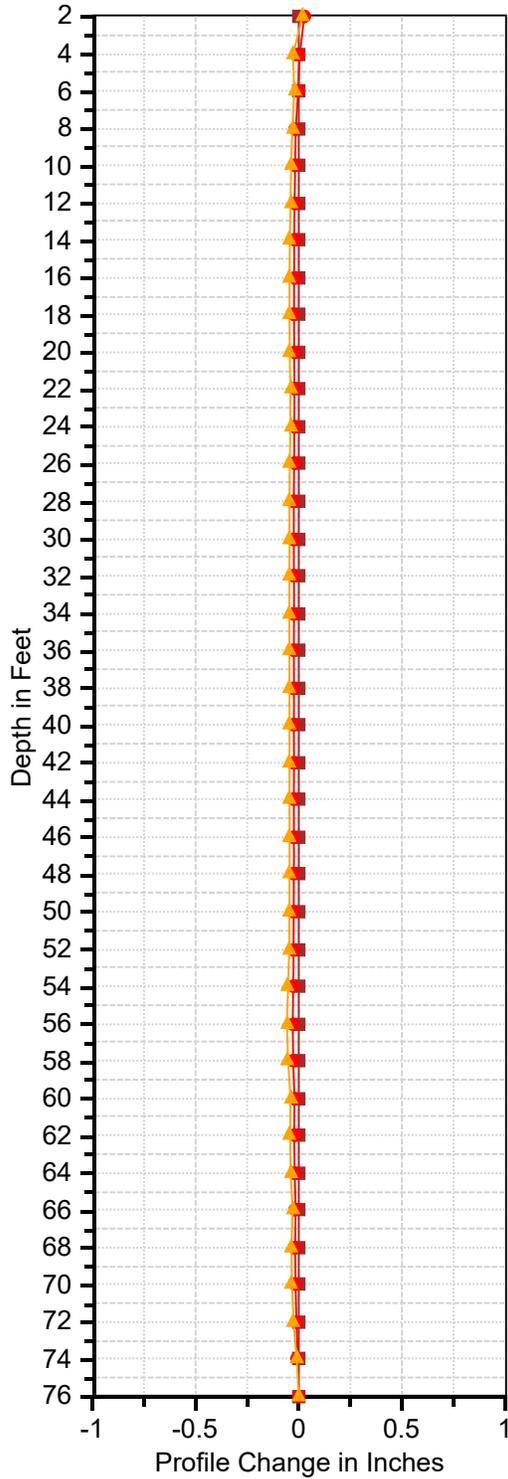
CDB SI-13 B

8/7/2020 8/9/2021



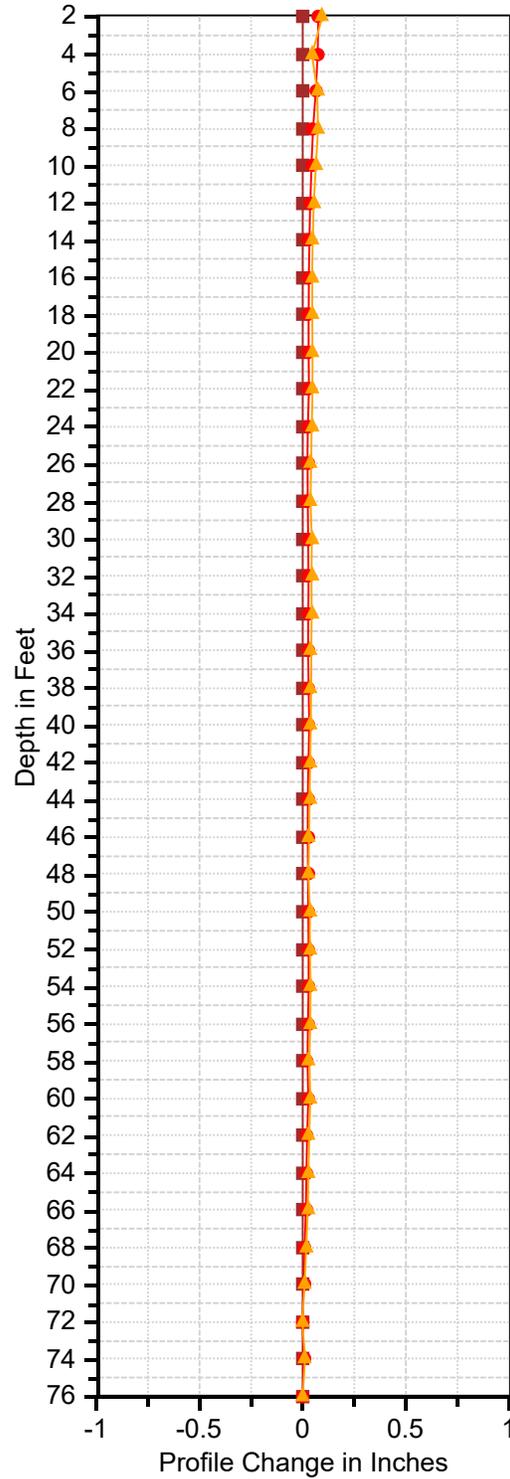
CDB SI-14 A

8/7/2020 4/19/2021 8/9/2021



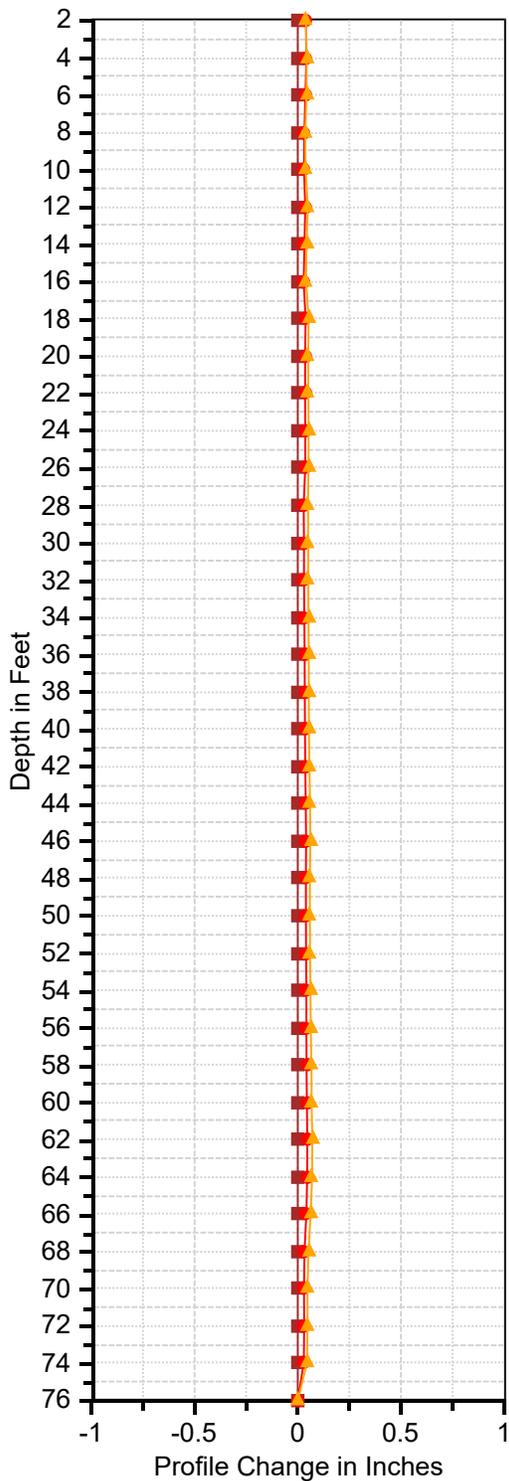
CDB SI-14 B

8/7/2020 4/19/2021 8/9/2021



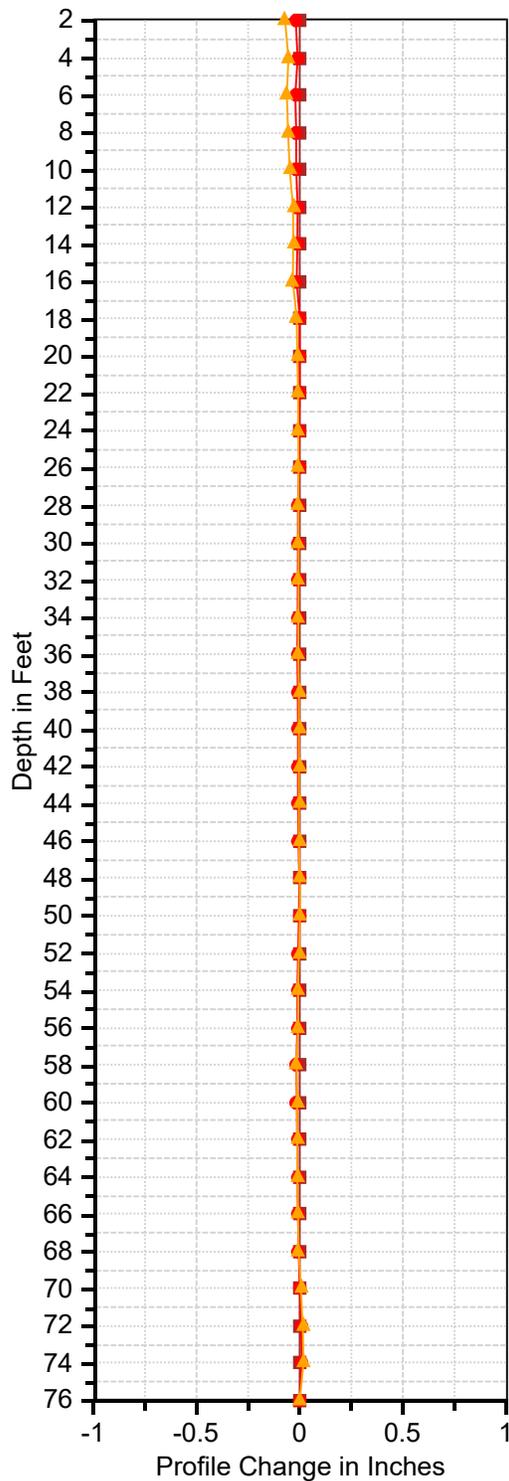
CDB SI-15 A

8/7/2020 5/3/2021 8/3/2021



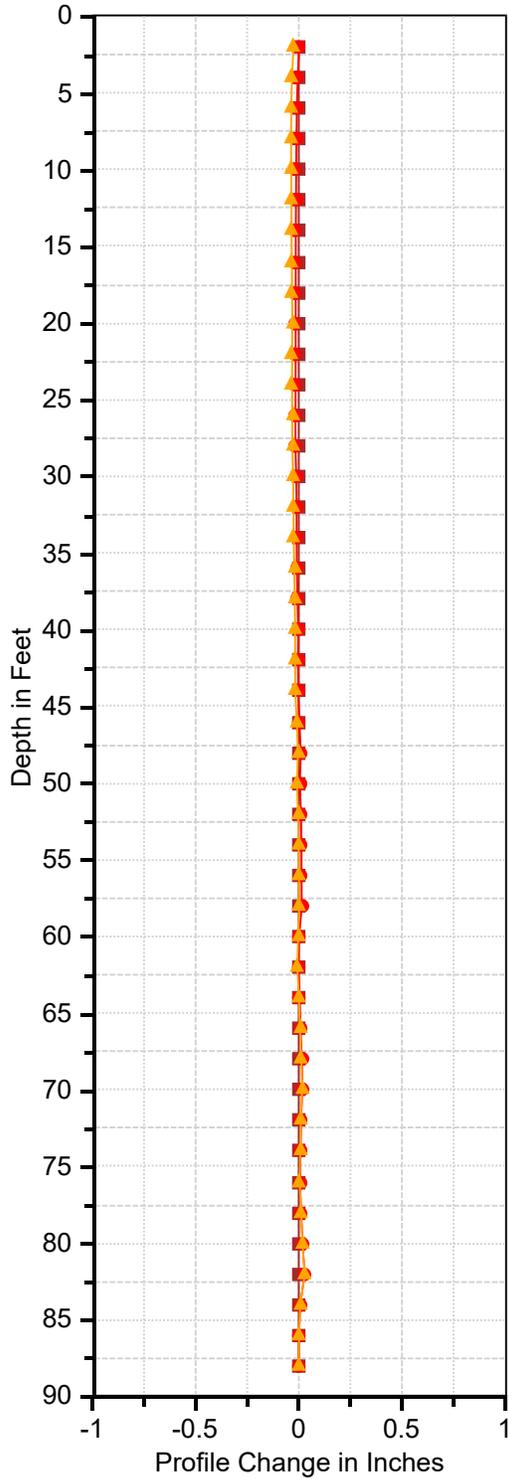
CDB SI-15 B

8/7/2020 5/3/2021 8/3/2021



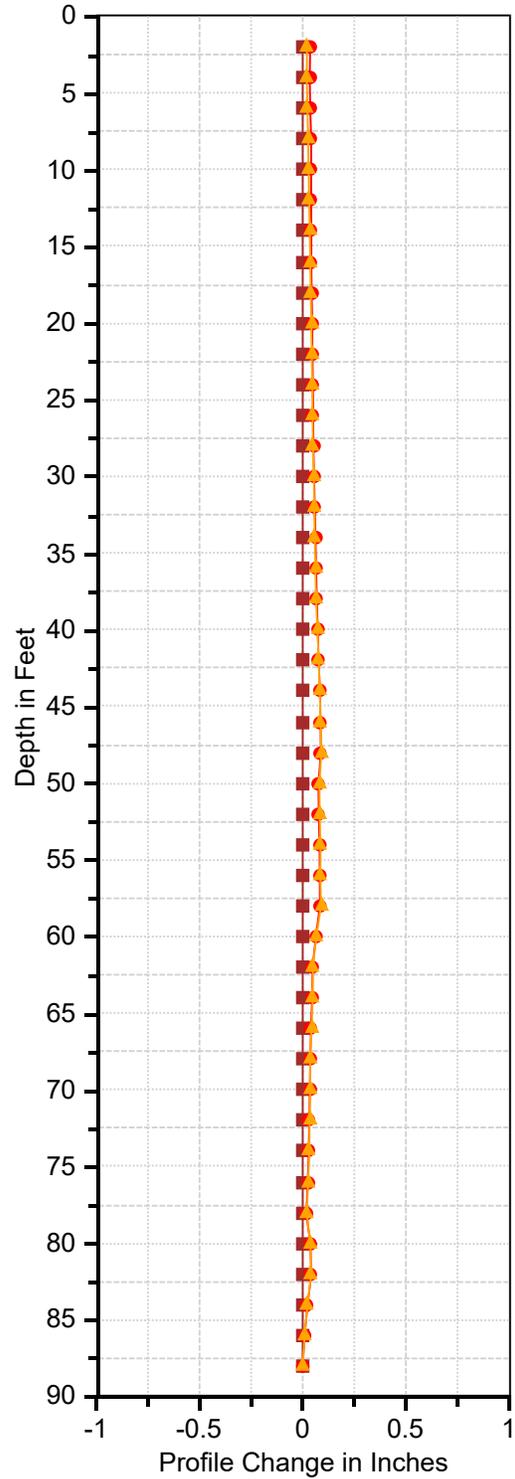
CDB SI-16 A

8/7/2020 5/3/2021 8/4/2021



CDB SI-16 B

8/7/2020 5/3/2021 8/4/2021



APPENDIX C - DEWATERING

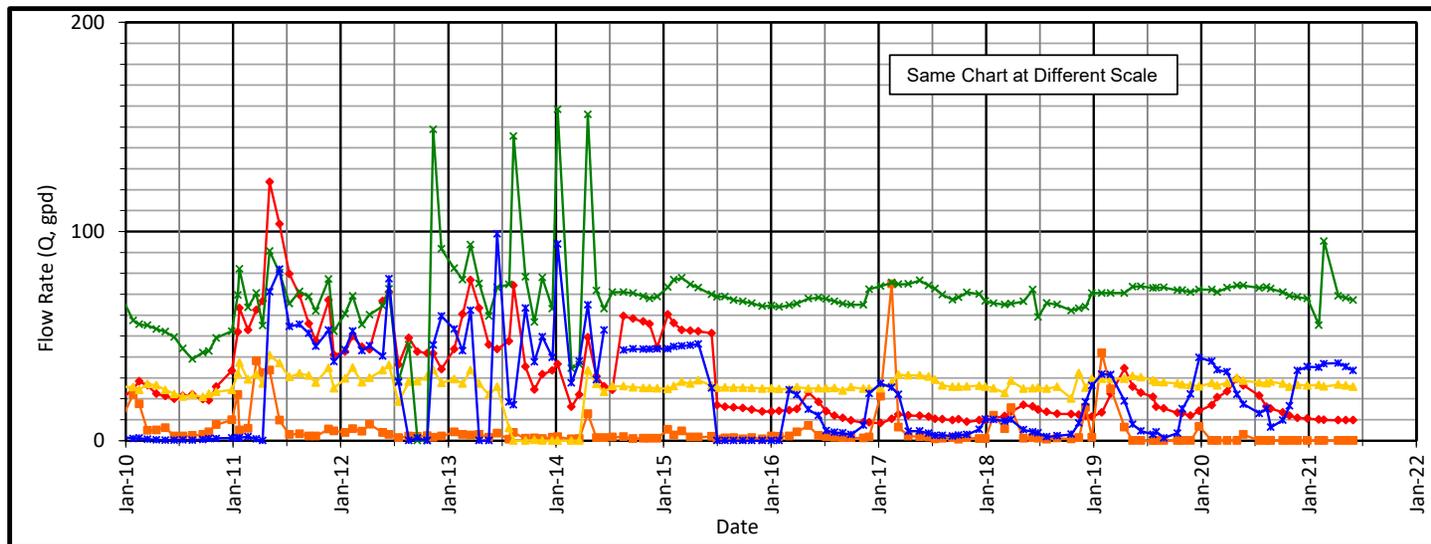
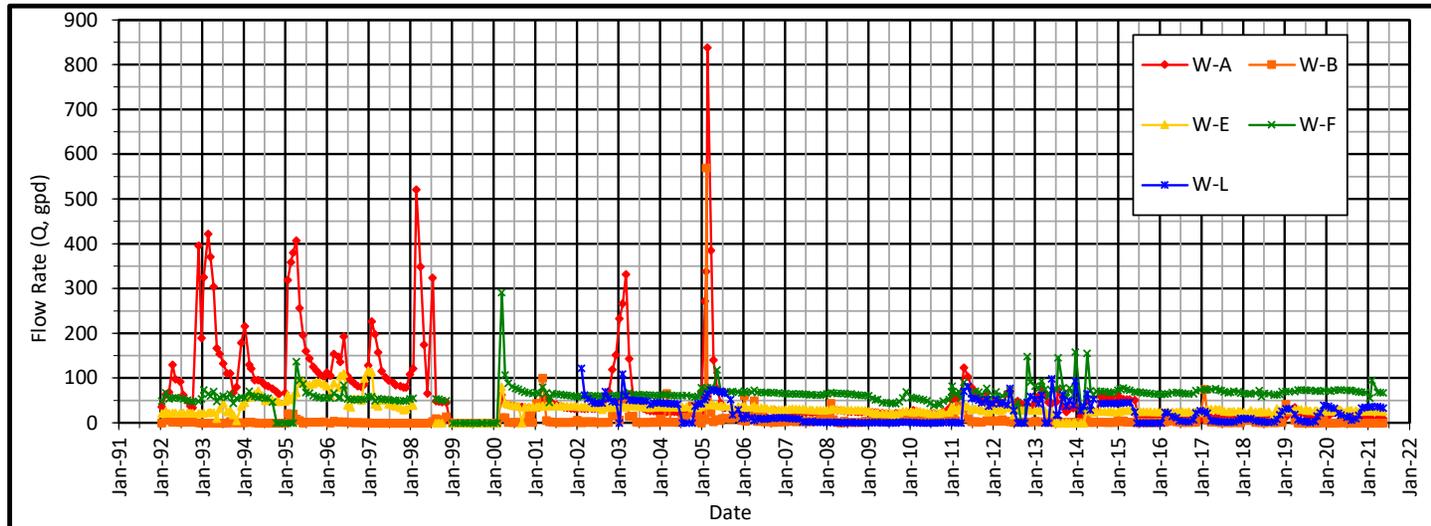
| Dewatering Well Information | | | | | | | |
|-----------------------------|-----------------------|------------------------|----------------------|----------------|------------------------------|----------------------------|---------------|
| Well ID | Vault Elevation (ft.) | Bottom Elevation (ft.) | Pump Elevation (ft.) | Pump Size (hp) | 2020-2021 Pumping Rate (gpd) | % of Total Well Production | Comment |
| W-A | 196.0 | Unknown | 45.0 | 1/2 | 12.4 | 5% | |
| W-B | 204.0 | 169.7 | 173.7 | 1/2 | 0.0 | 0% | |
| W-C | 295.0 | 233.5 | 237.5 | 1/2 | 42.1 | 17% | |
| W-D* | 297.0 | Unknown | Unknown | none | 0.0 | 0% | Destroyed '98 |
| W-E | 215.0 | Unknown | 116.5 | 1/2 | 26.8 | 11% | |
| W-F | 210.0 | 109.0 | 112.0 | 1/2 | 70.9 | 29% | |
| W-G* | 292.0 | 222.0 | none | none | 0.0 | 0% | No Pump, Dry |
| W-H | 299.5 | 234.5 | 242.5 | 1/3 | 2.7 | 1% | |
| W-I | 298.0 | 238.0 | 248.0 | 1/3 | 7.0 | 3% | |
| W-J | 304.0 | 244.0 | 250.0 | 1/3 | 17.6 | 7% | |
| W-K | 430.0 | 370.0 | 380.0 | 1/3 | 0.0 | 0% | Dry |
| W-L | 258.0 | 189.0 | 192.5 | 1/2 | 25.7 | 11% | |
| W-M | 302.0 | 242.4 | 245.0 | 1/2 | 37.3 | 15% | |

Note: * Non-functioning Dewatering Wells

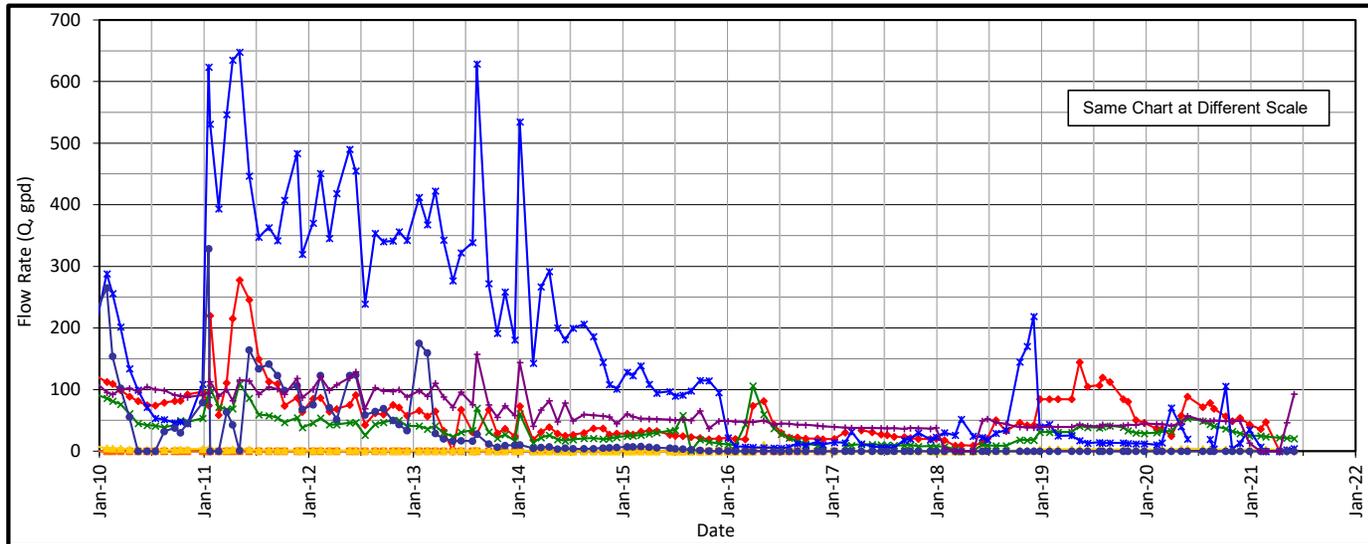
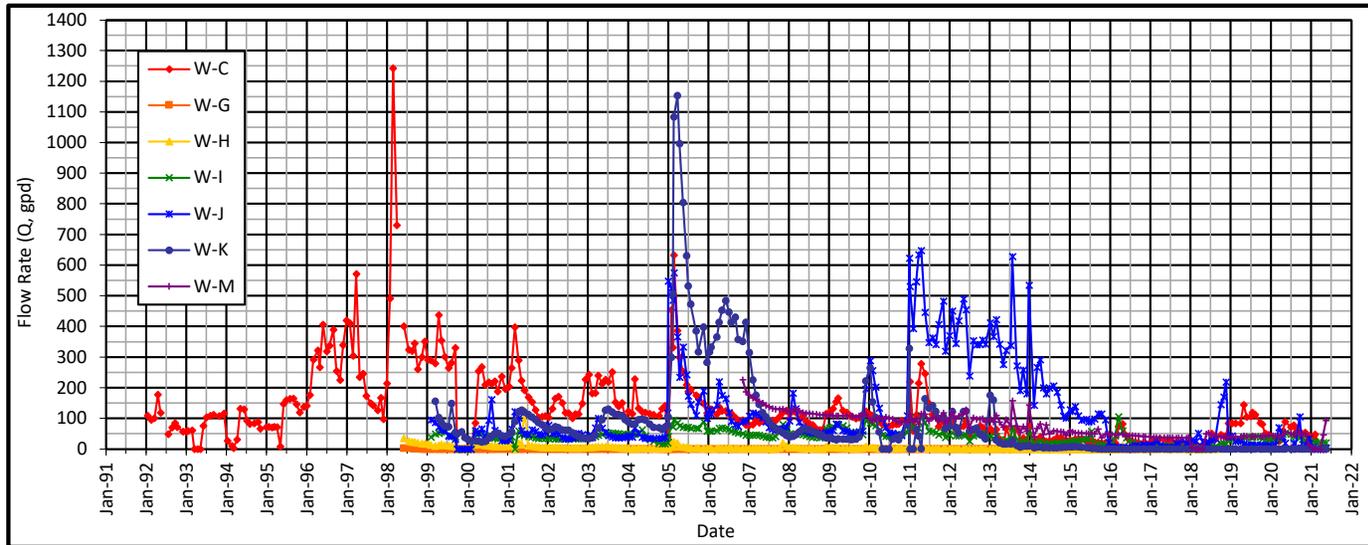
| Hydrauger Information | | | | | | |
|-----------------------|-----------------------|------------------------|---------------------------|-----------------------|--------------|-----------------------------|
| Hydrauger ID | Installed Length (ft) | Functional Length (ft) | 2020-2021 Flow Rate (gpd) | % of Total Production | Installed By | Comment |
| HD-12 | 93 | unknown | 0.0 | 0% | BYA | Destroyed per BYA (2000) |
| HD-2 | 127 | unknown | 0.0 | 0% | BYA | Destroyed per BYA (2000) |
| HD-3 | 155 | unknown | 0.0 | 0% | BYA | Destroyed per BYA (2000) |
| HD-4 | 80 | unknown | 0.0 | 0% | BYA | Destroyed per BYA (2000) |
| HD-5 | 65 | unknown | 0.0 | 0% | BYA | Destroyed per BYA (2000) |
| HD-6 | 97 | unknown | 0.0 | 0% | BYA | Destroyed per BYA (2000) |
| HD-7 | 227 | unknown | 0.0 | 0% | BYA | no production '20-'21 |
| HD-8 | 290 | unknown | 5.5 | 6% | BYA | |
| HD-9 | 230 | unknown | 0.4 | 0% | BYA | |
| HD-10 | 330 | unknown | 0.0 | 0% | BYA | no production '20-'21 |
| HD-11 | 230 | unknown | 0.0 | 0% | BYA | no production '20-'21 |
| HD-12 | 330 | unknown | 0.0 | 0% | BYA | no production '20-'21 |
| HD-13 | 210 | unknown | 37.4 | 39% | BYA | |
| H-1 | 240 | unknown | 52.0 | 54% | LA County | |
| H-2 | 180 | unknown | 0.0 | 0% | LA County | No outlet to monitor |
| ROWH-1 | -- | unknown | 0.0 | 0% | BYA | discharge diverted from H-2 |
| H-3 | 235 | unknown | 0.0 | 0% | LA County | Destroyed 1998 |
| H-4 | 140 | unknown | 0.0 | 0% | LA County | Destroyed 1998 |
| H-5 | 260 | unknown | 0.0 | 0% | LA County | Destroyed 1998 |
| H-6 | 140 | unknown | 0.0 | 0% | LA County | Destroyed 1998 |
| H-7 | 205 | unknown | 0.0 | 0% | LA County | Destroyed 1998 |
| H-1A | 100 | 92 | 0.0 | 0% | Fugro | no production '20-'21 |
| H-2A | 130 | 125 | 1.8 | 2% | Fugro | |

DEWATERING WELL / HYDRAUGER INFORMATION

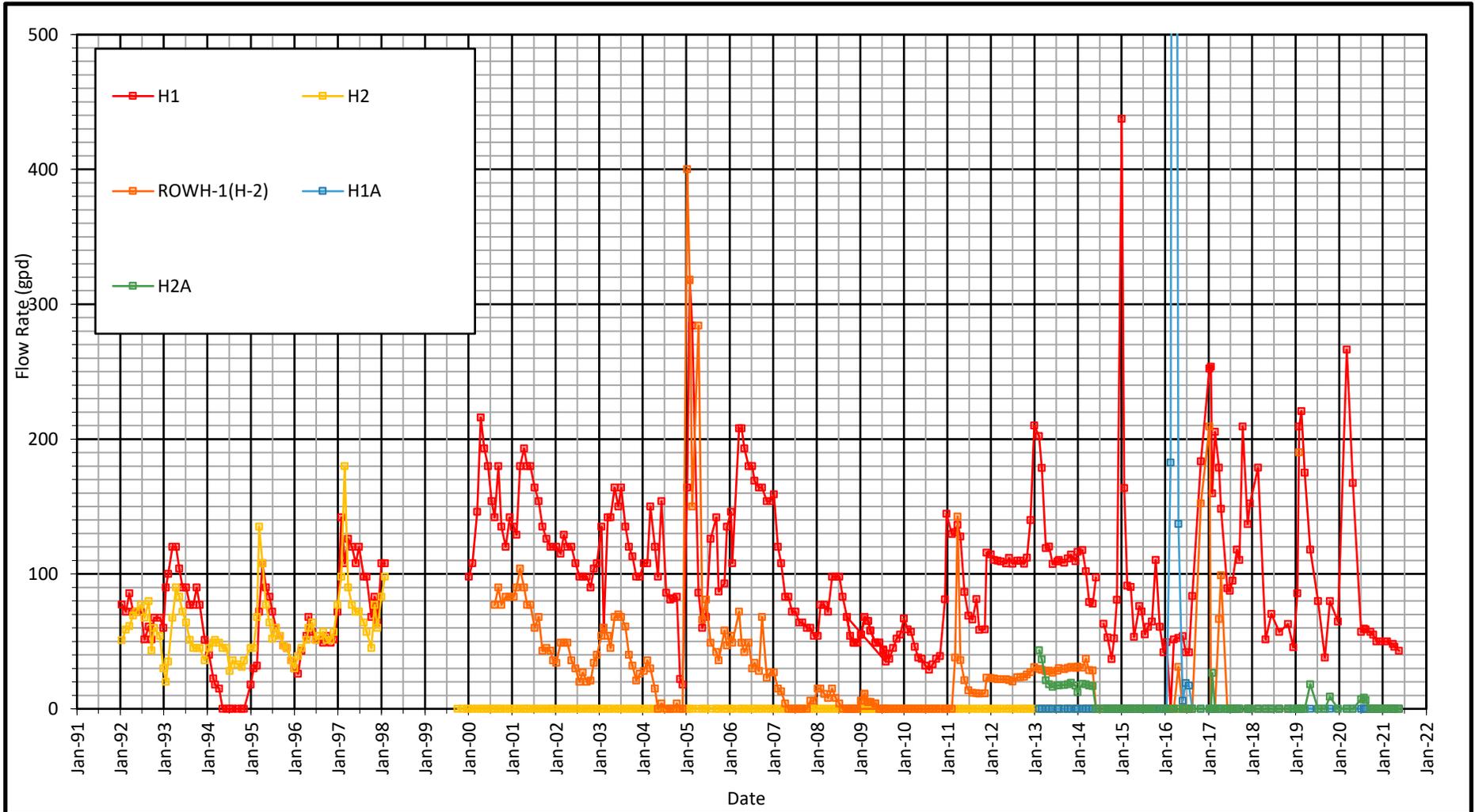
Calle del Barco Landslide Assessment District
 Malibu, California



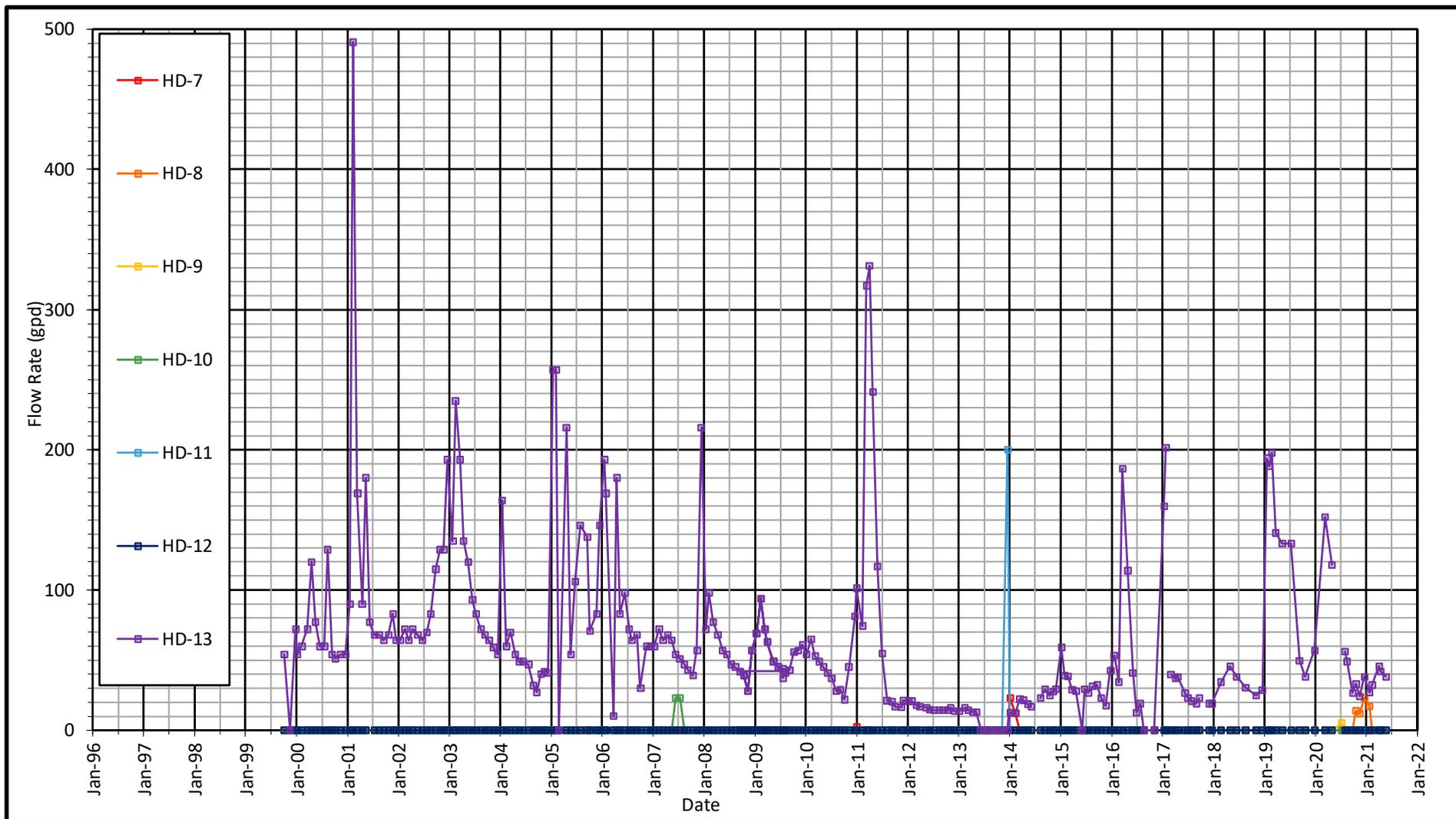
DEWATERING WELL DISCHARGE RATE GRAPH
Rambla Orienta and Slope
Calle del Barco Landslide Assessment District
Malibu, California



DEWATERING WELL DISCHARGE RATE GRAPH
Calle del Barco and Rambla Pacifico
 Calle del Barco Landslide Assessment District
 Malibu, California



HYDRAUGER DISCHARGE RATE GRAPH
Rambla Orienta
Calle del Barco Landslide Assessment District
Malibu, California



HYDRAUGER DISCHARGE RATE GRAPH
Landslide Toe
 Calle del Barco Landslide Assessment District
 Malibu, California