

FY20/21 Maintenance and Monitoring

AD98-1, Big Rock Mesa

City of Malibu, California

Yeh Project No.: 220-276

June 14, 2022



Prepared for:

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

Prepared by:

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June 14, 2022

Project No. 220-276

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 98-1, Big Rock Mesa, 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-1, Big Rock Mesa 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, NPDES compliance 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

Table of Contents

1. INTRODUCTION	1
1.1 PHYSIOGRAPHIC SUB-REGIONS	2
2. MONITORING	4
2.1 GROUNDWATER LEVELS	4
2.1.1 HEADSCARP REGION	4
2.1.2 EASTERN REGION	4
2.1.3 CENTRAL REGION	5
2.1.4 BLUFF REGION	5
2.1.5 PCH REGION	6
2.1.6 WESTERN EXTENSION REGION	6
2.2 SLOPE INCLINOMETERS	6
2.2.1 INCLINOMETER MONITORING EVENTS	6
2.2.2 HEADSCARP REGION	7
2.2.3 EASTERN REGION	7
2.2.4 CENTRAL REGION	7
2.2.5 BLUFF REGION	7
2.2.6 PCH REGION	7
2.2.7 WESTERN EXTENSION REGION	8
3. WATER BUDGET TRACKING	8
3.1 RAINFALL DATA	8
3.2 IMPORTED WATER USAGE	8
3.3 DEWATERING	8
3.3.1 DEWATERING WELL PRODUCTION	9
3.3.2 HYDRAUGER PRODUCTION	9
4. MAINTENANCE AND CAPITAL IMPROVEMENTS	10
5. GROUNDWATER QUALITY MONITORING	10
6. ADDITIONAL OBSERVATIONS AND MONITORING	11
7. MAINTENANCE AND CAPITAL IMPROVEMENT RECOMMENDATIONS	11
8. REFERENCES	12



List of Figures

FIGURE 1: PROJECT LOCATION MAP 1
 FIGURE 2: APPROXIMATE BOUNDARIES OF PHYSIOGRAPHIC SUBREGIONS 3
 FIGURE 3: HYDROGRAPH OF STANDPIPE, PC-1 WITH 1-HOUR RECORDED INTERVALS, MARCH 26 TO JUNE 9, 2021 5
 FIGURE 4: BYA-1 TRANSDUCER DATA; 1- MINUTE READINGS; WATER LEVEL RESPONSE TO PUMP CONTROL ADJUSTMENTS MARCH 11 TO MAY 19, 2021 9

List of Tables

TABLE 1. SUMMARY OF ANNUAL MONITORING AND MAINTENANCE 2
 TABLE 2: SUMMARY OF AVERAGE GROUNDWATER ELEVATIONS 4

List of Plates

	Plate No.
Maintenance and Monitoring Facilities	1
Summary of Maintenance Activities (2 pages)	2
Rainfall Graph.....	3
Summary of Groundwater Levels, Dewatering, and Rainfall	4
Total Dewatering Production and Total Water Consumption	5

List of Appendices

	Page No.
Appendix A – Groundwater Levels	
Standpipe Piezometer Information.....	A-1
Pneumatic Piezometer Information.....	A-2
Groundwater Elevation Data Analysis	A-3 to 4
Groundwater Elevation Data – Headscarp.....	A-5
Groundwater Elevation Data – Eastern	A-6
Groundwater Elevation Data – Central.....	A-7 to 8
Groundwater Elevation Data – Bluff	A-9
Groundwater Elevation Data – Pacific Coast Highway.....	A-10 to 11
Groundwater Elevation Data – Western Extension	A-12
Appendix B – Slope Inclinerometers	
Slope Inclinerometer Information	B-1
A/B Direction Plots for SP-26	B-2
A/B Direction Plots for PC-1	B-3
A/B Direction Plots for SP-3A	B-4
A/B Direction Plots for SP-16A.....	B-5
A/B Direction Plots for SP-17B	B-6
A/B Direction Plots for SP-34	B-7



A/B Direction Plots for SP-35	B-8
A/B Direction Plots for SP-36	B-9
A/B Direction Plots for SP-32	B-10
A/B Direction Plots for SP-11	B-11
A/B Direction Plots for SP-14	B-12
A/B Direction Plots for SP-29	B-13
A/B Direction Plots for SP-30	B-14
A/B Direction Plots for SP-21	B-15
A/B Direction Plots for SP-22	B-16
A/B Direction Plots for SP-23	B-17
Appendix C – Dewatering Data	
Dewatering Well Information	C-1
Discharge Rate for Dewatering Wells - Eastern	C-2 to 3
Discharge Rate for Dewatering Wells - Central.....	C-4 to 6
Discharge Rate for Dewatering Wells – Western Extension	C-7
Summary of Hydrauger Information.....	C-8
Discharge Rate for Hydraulgers - Eastern	C-9 to 10
Discharge Rate for Hydraulgers - Central.....	C-11 to 12
Discharge Rate for Hydraulgers – Western Extension	C-13
Appendix D – Groundwater Quality Monitoring	
2020 Q3 Effluent Testing Summary	D-1
2020 Q4 Effluent Testing Summary	D-2
2021 Q1 Effluent Testing Summary	D-3
2021 Q2 Effluent Testing Summary	D-4



1. INTRODUCTION

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 Big Rock Mesa Landslide Assessment District, 98-1. 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 and crack gauges, 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.

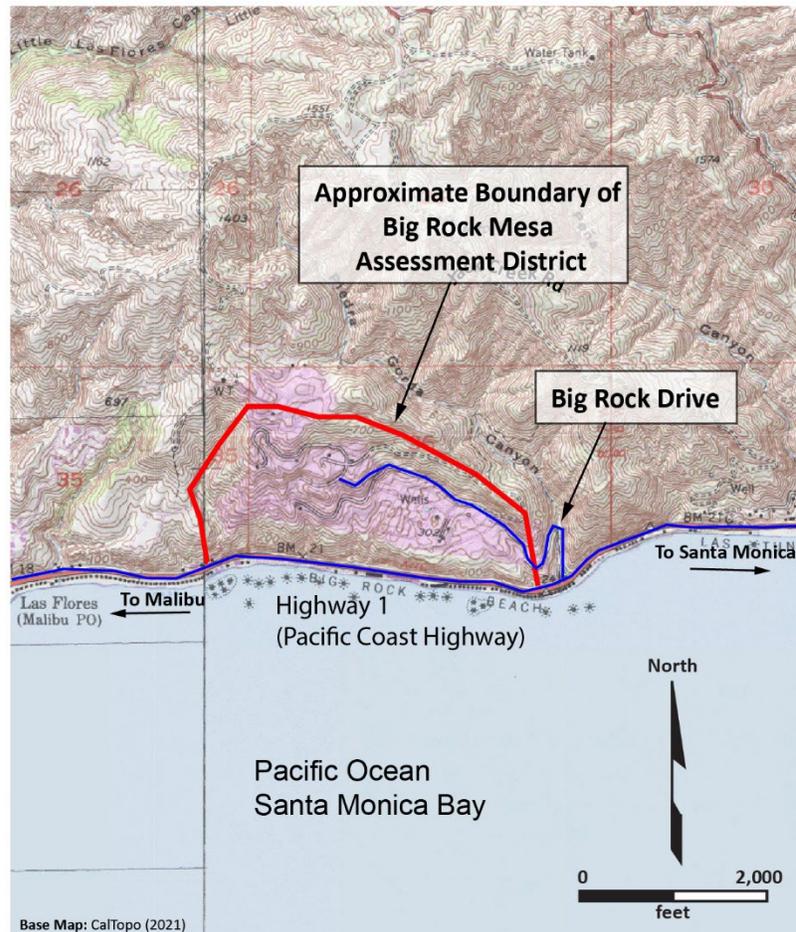


Figure 1: Project Location Map

Table 1. Summary of Annual Monitoring and Maintenance

Type of Monitoring Instrument or Dewatering Device	Number of Locations	Brief Description	Monitoring Frequency	Maintenance Effort ²
Standpipe piezometer	29 ¹	1.5-inch to 3.25-inch diameter perforated PVC, aluminum, or 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	26 ¹	1.5-inch to 3.25-inch diameter grooved casings made of PVC, or aluminum used to survey for shear displacement by an inclinometer probe	quarterly to annually	low
Dewatering wells	24	6-inch diameter steel or PVC casings equipped with 0.5 to 3HP submersible pump and connected to electrical controls, pumped water flows through meter and into conveyance piping to discharge	monthly	high
Horizontal Drains (hydraugers)	36	1-inch to 1.5-inch perforated PVC casings drilled slightly higher than horizontal into the face of the bluff and into the slope for hundreds to thousands of feet and used to drain groundwater that intercepts the casing. Flow can be measured along PCH before it flows to discharge	monthly	medium
Big Rock Master Water Meter #0138193	1	Meters imported water to Big Rock Mesa, data obtained from Los Angeles County Public Works	monthly	N/A
Big Rock Mesa Rain Gauge #1239	1	Documented Rainfall, Data obtained from Los Angeles County Public Works	monthly	N/A
PK Nail Crack Gauges	5	PK survey nails set in the pavement to straddle existing cracks within areas of previously documented landslide related distress cracking	quarterly	low
Ocean outfall ports	10	Water quality sampling and testing in accordance with active LARWQB NPDES Compliance File CI-6893	monthly	low
Notes:				
¹ - standpipe and inclinometer casings are same device. Some casings are no longer “usable” to survey with an inclinometer probe but are used to collect groundwater level measurements.				
² - maintenance effort (generalized): “high” – services monthly, “medium” – services quarterly, “low” – services annually				

1.1 PHYSIOGRAPHIC SUB-REGIONS

Monitoring results are discussed with respect to the six physiographic sub-regions within the overall 1983 landslide boundary and are described by BYA (1992) and similarly by D.A. Evans (1986) as: Headscarp, Eastern, PCH, Central, Bluff and Western Extension. Figure 2 presents the approximate areas associated with the six physiographic sub-regions and they are described below. Each are composed of landslide blocks or complexes of landslide blocks that possess common structural and hydrologic characteristics (BYA, 1992).

- **Headscarp Region:** delineated on the north by the 1983 re-activated landslide boundary west of the Inland Lane fault which runs north-south just west of the Inland Lane and Piedra Chica cul-de-sacs and borders the Eastern Region to the east, the Central Region to the south, and the Western Extension Region to the west.



- **Eastern Region:** delineated on the north and east by the 1983 re-activated landslide boundaries, it is separated from the Central Region on the west by the Inland Lane fault which trends approximately north-south just west of the Piedra Chica and Inland Lane cul-de-sacs and borders the PCH region on the south at the base of the bluffs along PCH.
- **Central Region:** extends west from the Inland Lane fault which runs north-south just west of the Inland Lane and Piedra Chica cul-de-sacs to the eastern edge of the 1983 re-activated slide boundary. It extends north-south from the head scarp area to the bluffs along PCH.
- **Bluff Region:** southern portion of the 1983 re-activated slide in the area of Roca Chica Drive and includes the complex shallow landslides within in the bluff face to PCH.
- **PCH Region:** delineated from the base of the bluffs along PCH and south across PCH to the mapped 1983 landslide toe location.
- **Western Extension Region:** extends west from the eastern boundary of the 1983 re-activated slide to Rockpoint Canyon and from above the upper terminus of Big Rock Drive in the north to PCH in the south. The Western Extension Region was not part of the active slide during 1983 and is not known to have undergone any movement.

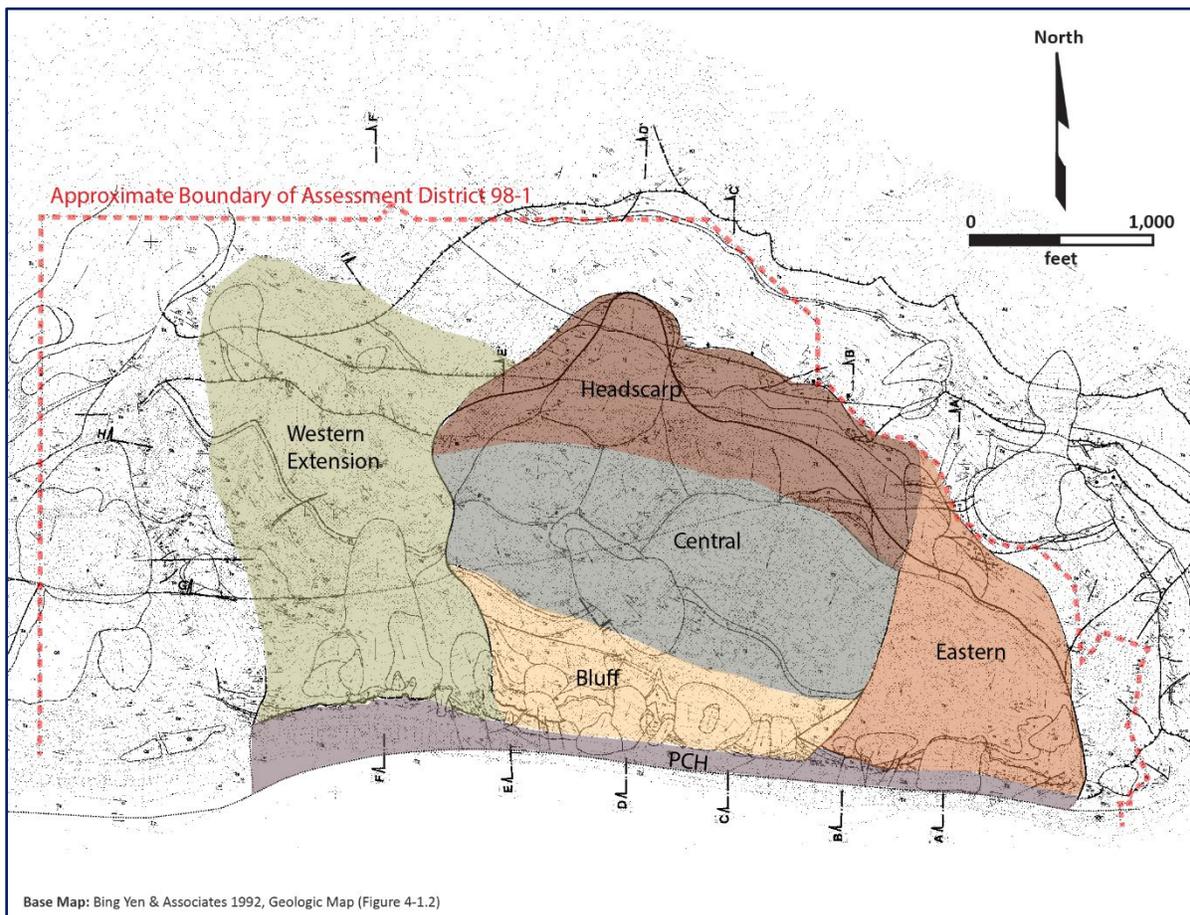


Figure 2: Approximate Boundaries of Physiographic Subregions

2. MONITORING

The following provides the result of monitoring the water level in standpipe piezometers and the results of inclinometer surveys performed.

2.1 GROUNDWATER LEVELS

Groundwater levels were measured approximately monthly in 29 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. Standpipes PC-1 and SP-20 were fitted with pressure transducers programmed to read water levels at one-hour intervals for 1 month or longer. Table 1 summarizes the average groundwater levels over the monitoring year for each of the six physiographic regions. Average and average peak water levels for each standpipe within each region were calculated over the monitoring year. Of the six regions, only the Bluff Region showed an increase in average or average peak water levels over the monitor in year, all other physiographic regions recorded an average decrease in groundwater levels. Summaries for groundwater levels for each of the physiographic regions are described below.

Table 2: Summary of Average Groundwater Elevations

Assessment District Sub-Region	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)
Headscarp Region	1	553.1	-1.0	554.6	-4.8
Eastern Region	4	38.9	-5.1	42.1	-14.7
Central Region	8	225.4	-1.7	233.6	-0.3
Bluff Region	4	36.8	+3.6	39.9	+3.6
PCH Region	8	8.9	-0.6	9.8	-0.9
Western Extension	4	371.7	-5.8	379.7	-5.6

2.1.1 HEADSCARP REGION

Water levels in the Headscarp Region are monitored using SP-26 only. The average water level in SP-26 decreased by 1.0 foot since the prior monitoring year. Water levels in SP-26 have remained consistent since approximately 2006. The maximum variability of measured groundwater between any month over the monitoring year was 2.5 feet.

2.1.2 EASTERN REGION

Average groundwater levels within the Eastern Region decreased by 5.1 feet since the prior monitoring year. Groundwater levels within individual standpipes located in the Eastern Region remained essentially unchanged with some temporal responses to isolated rainfall events. Water levels were recorded at PC-1 between March 26, 2021 and June 9, 2021 by a pressure transducer



programmed to record data every hour. Figure 3 is the resulting groundwater hydrograph from PC-1. Monthly water level data from the remaining standpipes that are within the Eastern Region are presented in Appendix A.

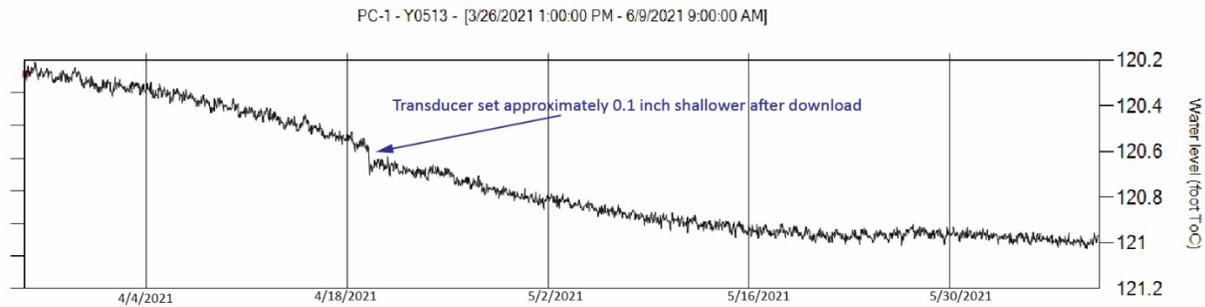


Figure 3: Hydrograph of standpipe, PC-1 with 1-hour recorded intervals, March 26 to June 9, 2021

2.1.3 CENTRAL REGION

Average groundwater levels within the Central Region decreased by 1.7 feet since the prior monitoring year. The average decrease may be larger; however, measurements from standpipe SP-9A appear to be occasionally skewed higher by the presence of falling water within the casing. The wet casing above the stable groundwater level is sometimes erroneously measured when taking a manual reading with the electric probe. Future recommendations include installing a pressure transducer in SP-9A to remove the interfering effects of falling water on the groundwater level measurements. Water levels in the remaining standpipes part of the Central Region decreased or remained approximately the same since the prior monitoring year.

2.1.4 BLUFF REGION

Average water levels within the Bluff Region increased by 3.6 feet since the prior monitoring year. This increase is entirely due to an approximately 22-foot water level rise in one standpipe, SP-32 between March 2020 and August 2020. Water levels in SP-32 have been declining since the annual peak measurement in August 2020 and have declined approximately 12 feet since then. Groundwater levels in SP-32 remain approximately 40 feet below the 1988 levels. Water levels in the other standpipes in the Bluff Region remained essentially unchanged or static since the prior monitoring year.

2.1.5 PCH REGION

Average groundwater levels within the PCH region decreased by 0.6 feet since the prior monitoring year. Groundwater levels within individual standpipes located in the PCH region remained essentially unchanged with some response to tidal influences and isolated rainfall events.

2.1.6 WESTERN EXTENSION REGION

Average water levels in the western extension region decreased by 5.8 feet since the prior monitoring year. The decrease is primarily due to SP-23 recovering from a water level rise that occurred during the prior monitoring year. In August and September 2020, SP-23 was found to be dry. Water levels in the other standpipes in the Western Extension were essentially unchanged from the prior year.

2.2 SLOPE INCLINOMETERS

2.2.1 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.

During the 2020-2021 monitoring year, Yeh surveyed a total of 22 out of 26 remaining inclinometer casings from the prior year. Yeh removed an additional four inclinometers from the survey that are considered unusable¹ inclinometer casings: SP-3, SP-33, SP-10 and SP-24. Plots in Appendix B are provided for 16 survey locations throughout the project. Twenty-two (22) survey locations are being monitored per plan. Plots for 6 of the 22 surveyed inclinometers are not presented in Appendix B due to a lack of sufficient survey data collected with the new equipment over the monitoring year. Those casings are continuing to be monitored and results will be presented in subsequent reports.

Profile change plots for 16 inclinometers over the monitoring period are attached in appendix B. Plate B-1 presents a tabular summary of historic through present slope inclinometer conditions and results. Inclinometers were reviewed and compared to previous surveys for an indication of distinct shear-

¹ SP-3, SP-33, SP-10 and SP-24 casings were removed as reliable sources to the current monitoring program over this monitoring period. Each of the pre-1988 casings consist of a series of aluminum casings connected at the joints with rivets. DGSI discontinued production of this type of inclinometer casing over 30 years ago due to data collection issues associated with casing "bumps" and spiral deformation that commonly occurred along the joints of this type of casing. Over time, rivets displace to protrude the casing diameter. The protruding rivets restrict the advancement and retraction of the modern inclinometer probe geometry and wiring. A video log of SP-10 from 12/3/2020 confirmed the described condition.



type movement. Inclinometer survey results for the current monitoring year are summarized below by subregion:

2.2.2 HEADSCARP REGION

The Headscarp Region consists of the steep slopes at the northern boundary of the mapped landslide. SP-26 is the only usable inclinometer in the Headscarp Region. During the monitoring year, SP-26 continues to display inconsistent readings in the upper 40 feet that is interpreted to be associated with casing deformity and probe stabilization errors. BYA (1996) reported that SP-26 was sheared off in 1983-1984 slope movement and the upper approximately 40 feet of casing was replaced and possibly backfilled with a foam product.

2.2.3 EASTERN REGION

Two inclinometers are monitored within the Eastern Mesa Region; PC-1 and SP-3A. Neither SP-3A or PC-1 displayed quantifiable shear-type movement during the monitoring year. Additionally, inclinometer SP-11 is located in the PCH Region directly south of the Eastern Region and near the toe of the 1983 landslide. SP-11 is considered relevant to the Eastern Region and is included in this section. Inclinometer SP-11 did not display quantifiable shear-type displacement during the monitoring year.

2.2.4 CENTRAL REGION

There are currently five inclinometers able to be surveyed in the Central Region; SP-9A, SP-16A, SP-17B, SP-35 and SP-36. Each of those were surveyed during the monitoring year. SP-9A was surveyed for baseline only and displacement results are not included in this monitoring report. Baseline and survey results for SP-36 over this monitoring period did not begin until after March 2021. Inclinometers surveyed during this monitoring year did not display quantifiable shear-type displacement.

2.2.5 BLUFF REGION

One inclinometer was surveyed within the Bluff Region; SP-32. SP-32 did not display quantifiable shear-type displacement during the monitoring year.

2.2.6 PCH REGION

There are eight inclinometers located in the PCH Region: SP-19, SP-11, SP-12, SP-27A, SP-14, SP-15, SP-29 and SP-30. During the monitoring year, Yeh surveyed each of the eight inclinometers but was only able to obtain a single baseline survey for SP-12, SP-19, SP-27A and SP-15 and displacement plots for those locations are not provided in this report. Results will be provided in subsequent annual reports. The inclinometer casings surveyed during this monitoring year did not display quantifiable shear-type displacement.



2.2.7 WESTERN EXTENSION REGION

There are four inclinometers being surveyed within the western extension region; SP-20, SP-21, SP-22 and SP-23. Yeh surveyed each of the inclinometers during the monitoring year. SP-20 was surveyed for a baseline only. Additional survey results for SP-20 will be presented in the next monitoring report. Surveyed inclinometers in the Western Extension Region did not display shear type movement during the monitoring year.

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 4 – 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 increased despite well below average rainfall.

3.2 IMPORTED WATER USAGE

Yeh collected monthly water usage readings for Big Rock Mesa from the Los Angeles County Department of Public Works master water meter #138193 located at the corner of Rockport Way and Big Rock Drive and acquired meter data directly from the LA Country Waterworks District 29. The monthly average water imported to the site as calculated between July 24, 2020 and June 17, 2021 was 163.1 thousand gallons, which is 15.6% more than the 2019-2021 monitoring year. A plot of monthly usage and water usage trendline is included on Plate 5 – Total Dewatering Production and Total Water Consumption.

3.3 DEWATERING

Yeh tracks dewatering production for active pumping dewatering wells installed throughout the regions and passive horizontal drains (hydraugers) installed at the base of the bluffs. During the 2020-2021 monitoring year dewatering production averaged 65,882 gpd, which is an increase of 14.8% from the previous monitoring years average production of 57,386 gpd.



3.3.1 DEWATERING WELL PRODUCTION

Yeh performed monthly monitoring of production for the 24 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 Plates B-1 through B-4. A graph showing total well production since 1993 is included on Plate 5.

During the 2020-2021 monitoring year, the average total well production was 50,519 gpd which is 19.8 % higher than last year’s average production of 42,155 gpd and 2.1% less than the historical production average of 51,611 gpd calculated from 1993 to present and 27.5% less than the maximum production of 69,741 gpd recorded during the 2004-2005 monitoring year.

Well production typically varies in response to rainfall totals. The production increase over this monitoring year despite historically low rainfall totals is due to maintenance efforts as well as changes to well pump controls. Yeh introduced the use of pressure transducers within producing wells to observe the well pump cycle and the reaction of water level to changes throughout the pump cycle and as a result of outside events. Figure 4 is an example of how pressure transducer data was observed, tracked, and used to adjust pump controls to maximize the dewatering capacity of BYA-1.

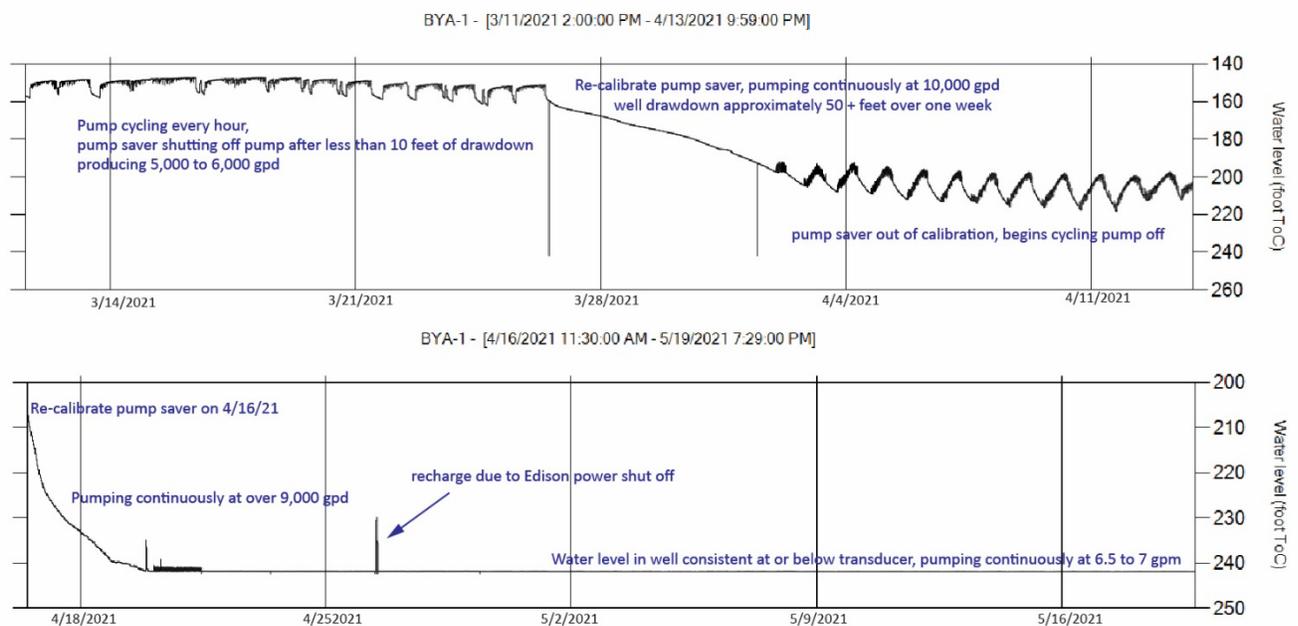


Figure 4: BYA-1 transducer data; 1- minute readings; water level response to pump control adjustments March 11 to May 19, 2021

3.3.2 HYDRAUGER PRODUCTION

Yeh performed monthly monitoring for 36 hydraugers. Hydrauger production is measured directly from a sampling port installed on each hydrauger. A graph showing total hydrauger production since



1993 is presented on Plate 5. Production data and status for individual hydrauger locations are included in Appendix C.

During the 2020-2021 monitoring year, the average monthly hydrauger production was 15,363 gpd which is approximately 0.8 % more than last year's average monthly production of 15,231 gpd. Over the monitoring year, hydrauger production was highest in August and generally declined throughout the rest of the year, the decline is likely due primarily to a lack of rainfall but maintenance on several dewatering wells may have also impacted hydrauger production.

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, repairs to well equipment vaults, and repairs to well discharge lines. Typical maintenance to hydrauvers included PVC repairs at the bluff face along Highway 1 or 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. Yeh performed numerous maintenance and repairs to dewatering facilities and improvements to the project assets throughout the monitoring year.

5. GROUNDWATER QUALITY MONITORING

The City of Malibu has permitted the dewatering discharge with the Los Angeles Regional Water Quality Control Board (Water Board) under the National Pollutant Discharge Elimination System (NPDES) under permit CAG994004 order number R4-2013-0095. Order number R4-2013-0095 expired on July 6, 2018 and the Water Board is currently in the process of creating a new permit and new order R4-2018-0125 based on information submitted to the water Board in the Notice of Intent filed by the City in December 2018 and subsequent discussions between the Waterboard, Yeh, and the City.

Yeh and Associates, Inc., as a consultant for the City, performed the NPDES monitoring and reporting for this monitoring year in general accordance with the City's NOI and Sampling Plan, dated December 2018. Analyses were conducted at certified laboratories, in accordance with current U.S. EPA procedures. Analytic results of the water quality sampling for each quarter are attached in Appendix D - Quarterly Results. Quarterly Discharge Monitoring Reports were submitted the Waterboard for Q3 and Q4 of 2020 and Q1 and Q2 of 2021 for this monitoring year.

6. ADDITIONAL OBSERVATIONS AND MONITORING

- Yeh performed a visual reconnaissance and reviewed seven locations where ground cracks had been historically documented in a 1993 Major Ground Crack Check Location map (BYA, 1993). Yeh did not observe change or extension of existing cracks. Yeh will continue to visit and observe for changes in areas where historic cracks are visible. Yeh also performed research and review of historical aerial photography and available report documents that discuss or show historic cracking in the vicinity of Rockport Way, the intersections of Roca Chica Drive and Piedra Chica Drive, Big Rock Drive and Cool Oak Way, and Rockcroft Way and at Big Rock Drive.
- Yeh installed five PK-nail crack gauges across selected, existing visible cracks in roadways. Two gauges are located on Pinnacle way, one at the intersection of Big Rock Drive and Cool Oak Way, one at the hairpin turn on Big Rock Drive south of Rockport Way and one in the Seamoor Drive cul-de-sac. The crack gauges were measured periodically from January to September 2021 and no discernible pattern of movement was detected. Yeh will continue to periodically measure the crack gauges.
- Yeh performed a visual reconnaissance and reviewed two areas of historical ground deformation along Highway 1 near the interpreted toe of the 1983 landslide. Historic reports document that a pressure ripple had developed in the vicinity of 20010 PCH between February and June 1995 and a bulge had formed adjacent to SP-11 during 1998 to 1999. Highway 1 through this area was re-paved in August 2019. No evidence of the historic landslide features are visible.
- In July 2020, Yeh first noted a water seep along the base of the bluff between hydraugers HD-4 and BYA-H10. Yeh personnel excavated into the bluff face to expose the seep and noted its apparent source above a layer of dark gray clay, approximately 5 feet above the road. This location coincides with the mapped trace of the “Bluff Fault” as presented in BYA (1992).
- Yeh noted the presence of two intermittent seeps behind the existing soldier pile wall between hydraugers HD-12 and HD-10.
- In July 2020, Yeh first noted that an abandoned and damaged hydrauger had reactivated and was seeping at a rate of approximately 4 GPD. Based on maps within D.A. Evans (1986), the re-activated hydrauger is likely H-3a or H-3b. Growing vegetation was observed around the outfall. The seep was observed to slow over the next few months and by February 2021 the hydrauger was dry. Yeh will continue to monitor this location during the monthly monitoring program.
- Rainfall totals for the 2020-2021 monitoring year were the driest on record for the area and imported water usage increased approximately 16%.

7. MAINTENANCE AND CAPITAL IMPROVEMENT RECOMMENDATIONS

- Re-develop and treat wells BYA-1, W-2 and BYA-9 for iron forming bacteria in the filter pack and attempt to recover depth by removing existing sludge at well bottom.
- Re-develop and treat wells BYA-5 and FW-1 to improve water quality results for NPDES compliance.
- Replace inclinometers that cannot be surveyed or have uncorrectable error due to significant past deformity, high levels of curvature, are significantly out of plumb, or limit survey ability



(SP-3, SP-33, SP-24, SP-10). Replacement inclinometer casings are recommended to replace past survey coverage within the central and eastern regions.

- 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. Global Positional Systems (GPS) survey had been performed for the project area on an approximately annual basis between 1993 and 1999 as reported by BYA (1994, 1995, 1996, 1997, 1998, 1999).
- Install 1 or more new hydraugers at the observed seep between HD-4 and BYA-H10 and at seepage locations behind the soldier-pile wall between HD-12 and HD-10.
- Dewatering wells BYA-1 and W-3 should be replaced to original depth as part of long-term capital improvement planning.

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Maintenance and Monitoring Facilities
 Assessment District 98-1, Big Rock Mesa
 City of Malibu, California



- Dewatering Well
- Hydrauger Outfall
- Hydrauger Installation Length
- Conveyance Point
- Ocean Discharge Point
- Approximate Limits of Primary Land Movement
- Western Extension Boundary
- Big Rock Mesa Landslide Assessment
- Slope Incliner/Standpipe Piezometer
- Slope Incliner/Standpipe Piezometer (standpipe only, not usable for inclinometer)
- Catch Basin
- Master Water Meter
- Storm Drain



SCALE 1:2,100
 200 100 0 200 Feet

DATE:	PROJECT NUMBER:	PLATE:
December 2021	220-276	1
DRAWN BY:	APPROVED BY:	
M. Boyd	L. Berry	



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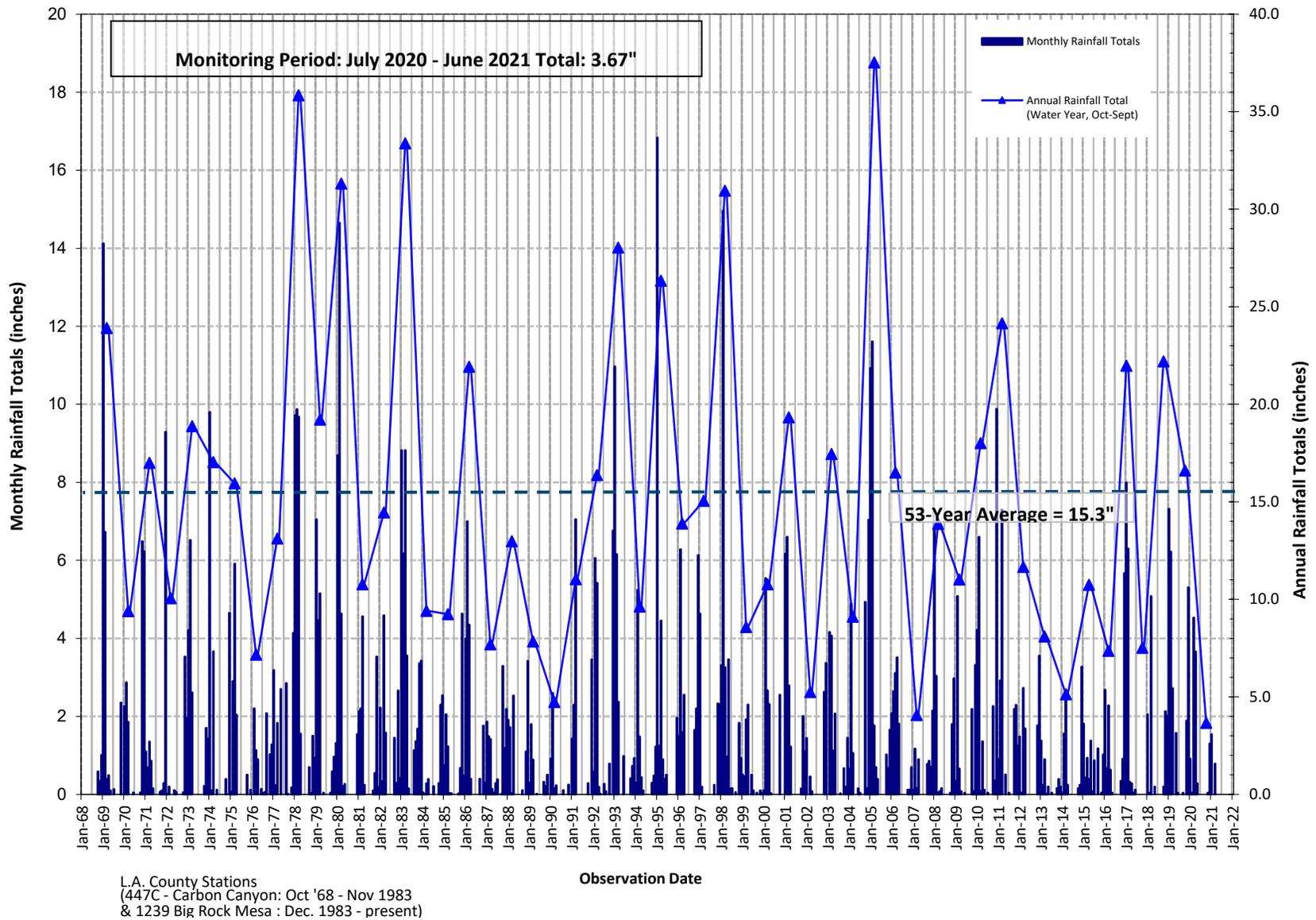
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FY20/21 MAINTENANCE SUMMARY

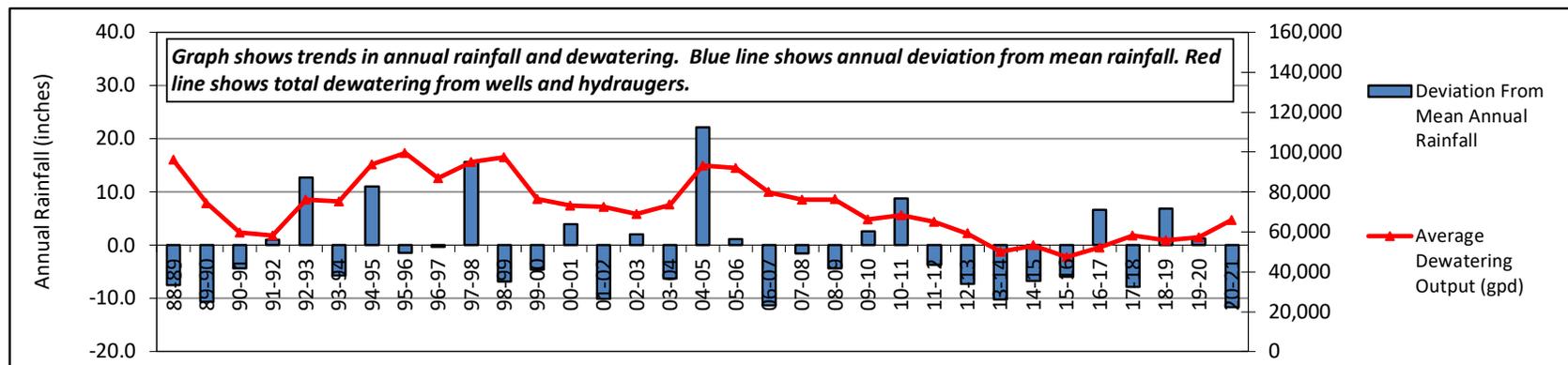
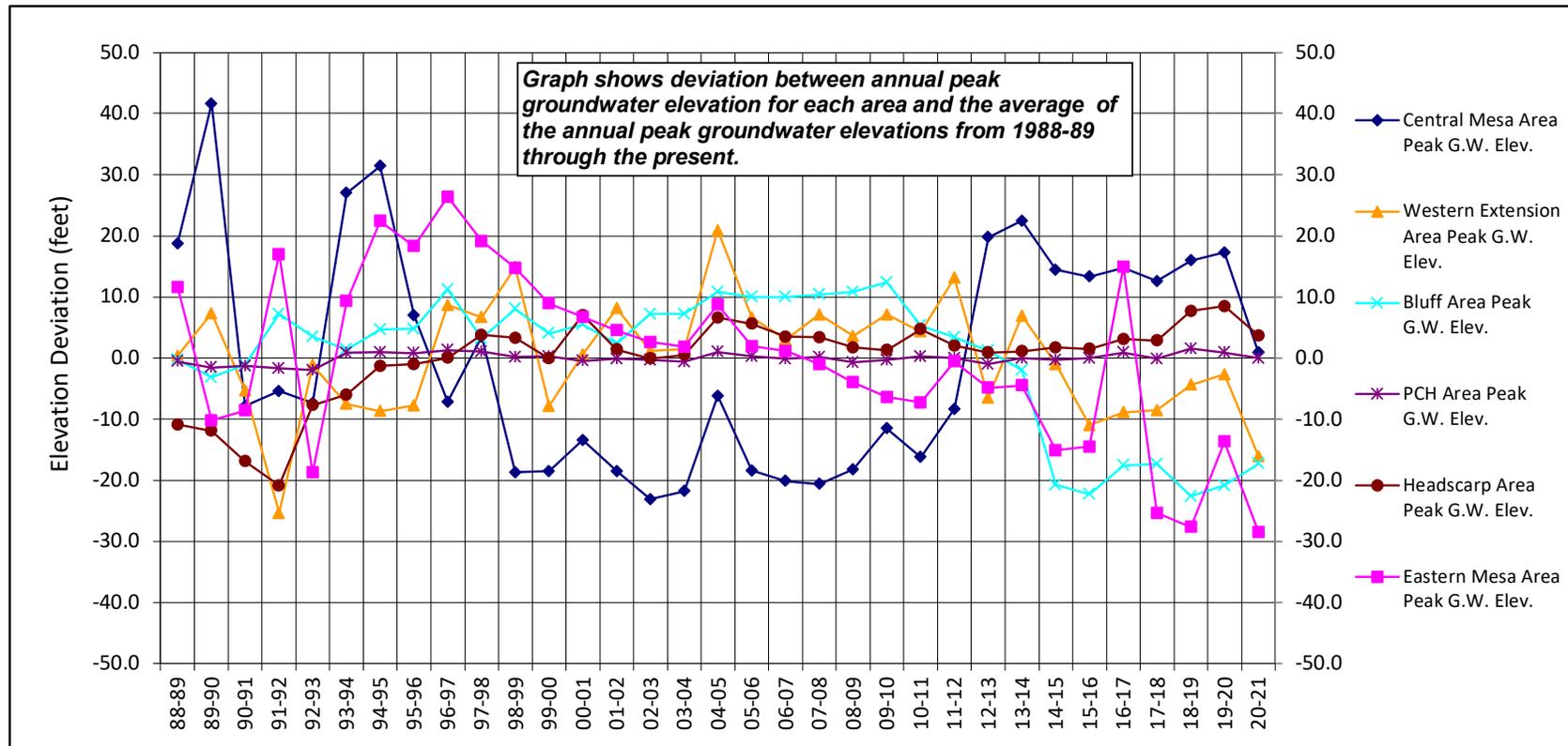
Date Entered	Facility	Description/Observations	Status or Resolution
Jul-20	FW-1	well vault cracked prior to July 2020, on 10/13/20 vault was observed to be crushed.	Vault removed and replaced by Burns pacific 12/2/20
Jul-20	W-2	no/low production. Assesed by Yeh and Coast Pump and found pump immediately switching off at pump saver, determined that pump requires replacement. Trees growing over location will need to be trimmed to access boom truck.	Trees trimmed by Burns Pacific on 8/26/202. Pump removed from well 8/27/2020. Video log performed 8/31/2020. New pump, drop pipe and sounding tube installed, pump back in service 9/11/2020
Jul-20	W-3	decreased production noted subsequent to pump replacement on November 2019, pump, controller and pump saver assessed 8/25/202 by Coast Pump, pump saver bypassed temporarily to assess true production. Scheduling to remove and test pump and video log well	pump was removed on 8/27/20, well video logged 8/31/2020 pump was tested by Coast Pump and found in good working order and was reinstalled in well on 9/15/2020 with existing drop pipe and addition of 1" sounding tube.
Jul-20	W-8	low production, sudden drop in production April 2020. Assessed by Coast Pump and determined to be a wiring issue in the control box	pump wiring repaired 8/25/202, pump now producing and running at normal amps
Jul-20	W-17	stopped production January 2020, assesed by Yeh and Coast pump	pump and motor removed 8/27/20, well video logged 8/31/2020, installed new pump, motor, drop pipe and 1" sounding tube, pump 9/9/20, back in service 9/15/2020
Jul-20	BYA-1	sudden drop to no production since December 2019, assesed by Layne in July 2020 and again 8/5/2020, needs new pump, controller and pump saver	New electronics, pump and 1" soundming tube installed 10/1/2020
Jul-20	BYA-1	casing collapse at 250' depth, assesed by layne to determine options to try and recover lost well depth	pending
Jul-20	BYA-1	damage/corrosion to well control box, well controll box requires replacement	pending, will complete at same time that BYA-1 is deepened or replaced
Jul-20	BYA-4	well shows no production since 12/2019. Assessed by Yeh as bad flow meter.	Flow totalizer replaced with new 3/4" flow meter 9/8/2020
Jul-20	BYA-6	Leaking discharge line at distal end of vault, vault filling with water. Requires excavation of discharge line and repairs	8/25/20 excavated discharge line with backhoe and repaired discharge line, backfilled and patched. Well operating normally
Jul-20	W-18	W-18 investigated by Yeh on 7/16/20 for low production since February 2020. Pump was found to be running over 30 amps and was placed out of service to protect pump. Pump was assesed by Coast Pump and pump controller was found to be faulty.	Pump controller was replaced on 8/25/20, pump returned to service operating normally.
8/20/2022	W-1	decreasing prodction noted in August 2020 assesed 9/4/20 and 9/14/20 and 1/5/21 reveals decreasing gpm with pump running in normal range amps. Pump found to be failed on 1/26/21, will need to replace pump.	Pump and well electronics replaced 1/27/2021 with 1" sounding tube added.
10/15/2020	BYA-3	flow meter indicates 1 gpm but outflow at discharge is visually observed to be higher than 1gpm, meter is making clicking sound, meter needs to be replaced	meter replaced 10/21/2020, operating normally
12/4/2020	BYA-14	meter vault is full of water and running down street, turn off pump and reassess	12/9/20 observed vault to be dry, turned on pump and there was no leaking into vault observed. Vault was full again January 26 2021. Rechecked vault several times since and problem has not been repeated. Leave pump running. pump appears to be discharging normally. Will continue to monitor.
12/8/2020	W-18	no production when attempting NPDES monthly, note pump controller was replaced, 8/25/2020. Assessed by Coast Pump who noted the pump controller components appeared burned, possibly by a power surge.	well controller replaced 12/10/2020, it was then noted pump saver also needs to be replaced, pump controller was replaced 12/16/2020
12/15/2020	W-2	low/no production while attempting NPDES sample, assesed by Yeh, pump being shut off by pump saver with 40' of water above pump intake, pump was recently replaced 9/2020, assesed by Coast Pump 12/16/2020	pump saver re-calibrated, well now operating normally

FY20/21 MAINTENANCE SUMMARY cont.

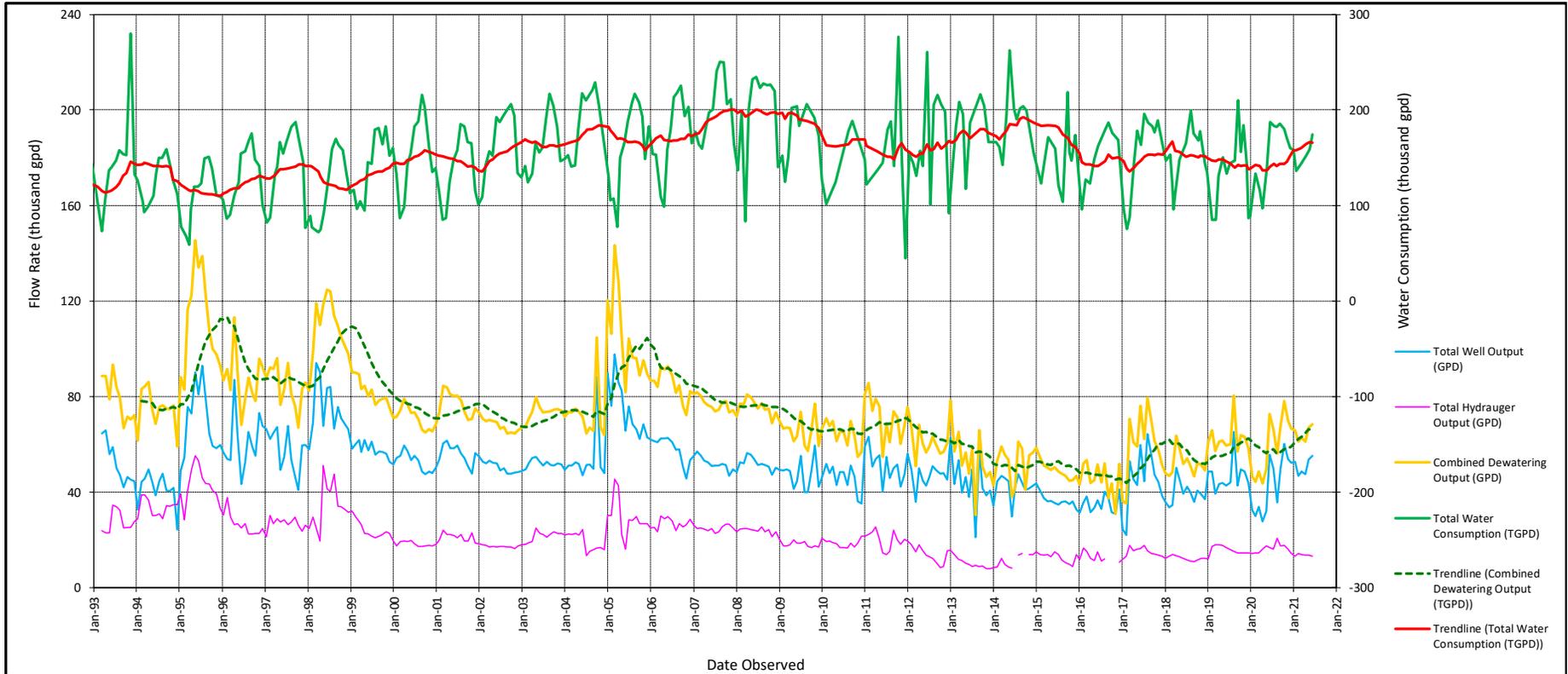
Date Entered	Facility	Description/Observations	Status or Resolution
DEWATERING WELLS			
12/3/2020	BYA-1	no production noted at beginning of January, pump was new in October, assessed by Coast PUMP 1/5/2021, flow meter is down	flow meter replaced 1/6/2021, well operating normally
12/11/2020	W-1	flow meter failing, making clicking noises, dial jerking	replaced flow meter 1/5/2021
12/15/2020	W-2	during NPDES, pump shut off by pump saver after <1 gallon	adjust pump controls 12/15/2020, well now operating normally
9/10/2020	BYA-9	9/10/20 during NPDES pump was not producing, instantly shut off by pump saver, assessed by Coast Pump 9/15/202 and CP adjusted pump controls and well resumed normal operations. 2/5/21 repeated the problem, reassessed by CP 2/6/2021 and adjusted pump controls and well resumed normal operation. Pump failed in Late April or May.	5/13/21 pump, motor and drop pipe removed by CP. 5/20/21 Well Rehab Services video logged well, will coordinate quote to treat and rehab well via airlifting due to about 30' of sludge on bottom of well. On 6/7/21 new pump, motor drop pipe, and sounding tube installed pump running continuously at 11 gpm.
6/17/2021	BYA-1	Transducer check on 6/2/2021 noted water level rise. Yeh assessed well on 6/2/21, pumping down from 6 gpm to 4gpm, subsequent transducer check on 6/23/21 shows second sudden WL level rise on 6/20/21 well production now at 2 gpm. On 7/8/21 meter was not moving, well was turned off. Will replace pump and motor assess possible rehab for bacterial growth or corrosive well condition.	pump was removed and replaced with new pump on 7/12/2021, pump intake was noted to be clogged by bacterial sludge.
HYDRAUGERS			
20-Jul	HD-43, HD-5, HD-6	Buried conveyance line from western hydrauger cluster is clogged, broken and leaking causing standing water behind K-Rail	Line was unclogged and temporary repair performed March 12, 2020 and April 29, 2021. Conveyance is discharging to port. Completion pending replacement of final 4 feet of 4" PVC.
20-Jul	HD-11	Conveyance Line from HD-10 and HD-11 to Port 6 is broken below ground and clogged backing up into hydraugers.	Opened caps to hydraugers to allow drainage to flow overland to Port 6. Work will require excavation, obtain quote from Burns Pacific, pending start of work.
20-Jul	HD-34	Discharge line hydrauger HD-34 to Port 3 is broken above ground	Yeh repaired July 10, 2020. Additional repairs completed March 12, 2020
9/24/2020	HD-26	buried conveyance line broken and leaking at HD-26 to Port 4	September 24, 2020 Temporary, above ground discharge line is routing discharge to Port
INCLINOMETERS			
20-Jul	uneven tops	uneven tops affects placement of cable control device reduces repeatability of readings	cut risers flat on select inclinometers that were uneven



RAINFALL GRAPH
 Landslide Assessment Districts
 Malibu, California



SUMMARY OF GROUNDWATER LEVELS, DEWATERING, AND RAINFALL
 Big Rock Mesa Landslide Assessment District
 Malibu, California



TOTAL DEWATERING PRODUCTION AND TOTAL WATER CONSUMPTION
Wells and Hydraulers(Combined)/Total Water Consumption
 Big Rock Mesa Landslide Assessment District
 Malibu, California

APPENDIX A - GROUNDWATER LEVELS

Big Rock Mesa: Standpipe Piezometer Information				
Piezometer ID	Surface Elev. (ft)	Depth (ft)	Perforation Interval Elevation (ft)	Installer
PCH Standpipe Piezometers				
SP-11	27	58	Unknown	Evans
SP-12	26	40	Unknown	Evans
SP-14	25	30	Unknown	Evans
SP-15	20	82	Unknown	Evans
SP-19	25	82	Unknown	Evans
SP-27A	29	94	Unknown	Evans
SP-29	27	138	Unknown	Evans
SP-30	29	128	Unknown	Evans
Bluff Standpipe Piezometers				
SP-10	295	332	Unknown	Evans
SP-28	270	358	Unknown	Evans
SP-32	233	354	Unknown	Evans
SP-34	270	382	-112 to -107	BYA
Headscarp Piezometers				
SP-26	745	346	Unknown	Conv
Central Standpipe Piezometers				
SP-9A	365	300	Unknown	Evans
SP-16	285	240	Unknown	Evans
SP-16A	285	392	Unknown	Evans
SP-17	540	192	Unknown	Evans
SP-17A	540	238	Unknown	BYA
SP-24	370	382	Unknown	Conv
SP-35	345	396	-51 to -46	BYA
SP-36	380	254	120 to 125	BYA
Western Standpipe Piezometers				
SP-20	430	326	Unknown	Conv
SP-21	660	280	Unknown	Evans
SP-22	780	332	Unknown	Conv
SP-23	860	398	Unknown	Conv
Eastern Standpipe Piezometers				
PC-1	250	160	87.5 to 90	BYA
SP-3	212	132	Unknown	Evans
SP-3A	203	246	Unknown	Evans
SP-33	208	374	Unknown	Evans

Evans - D.A. Evans

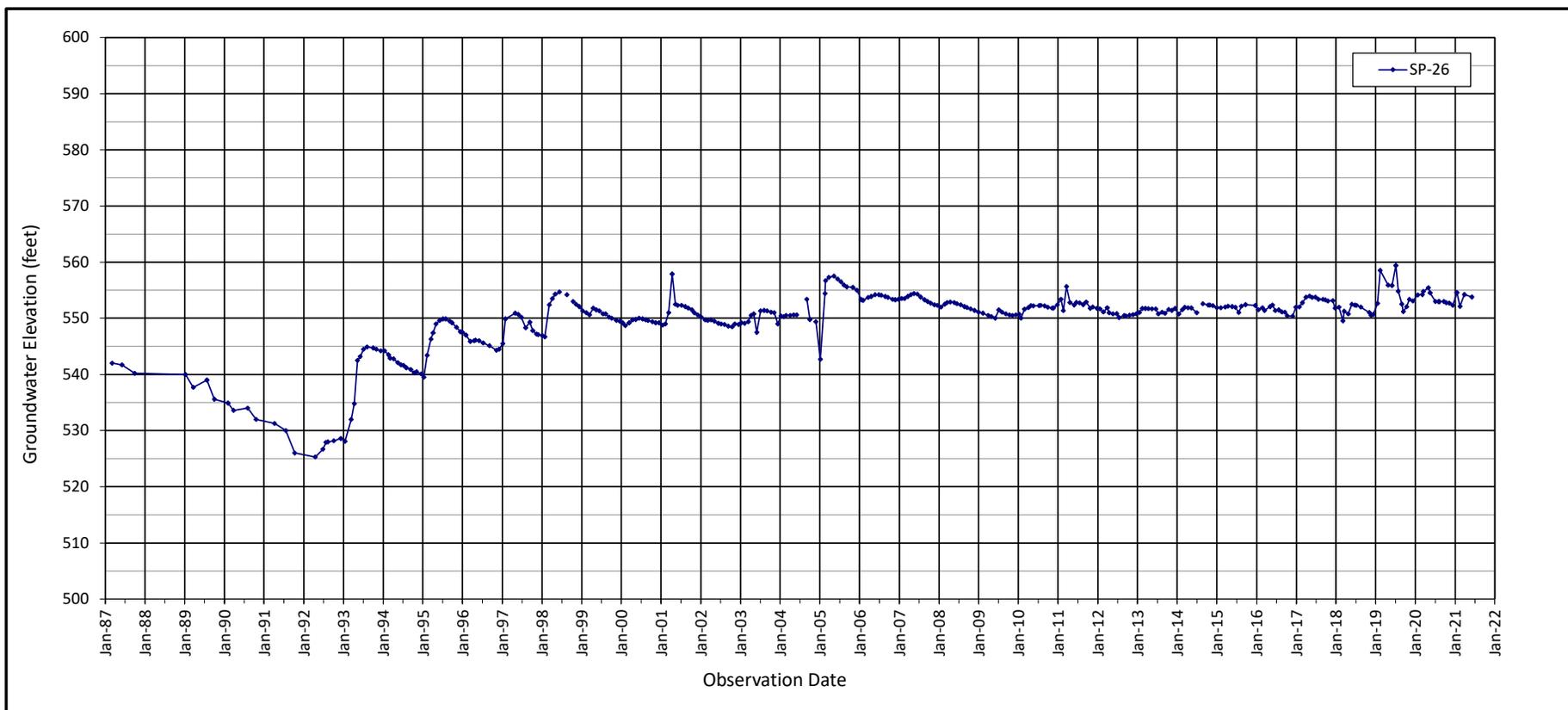
Converse - Converse Consultants

BYA - Bing Yen and Associates

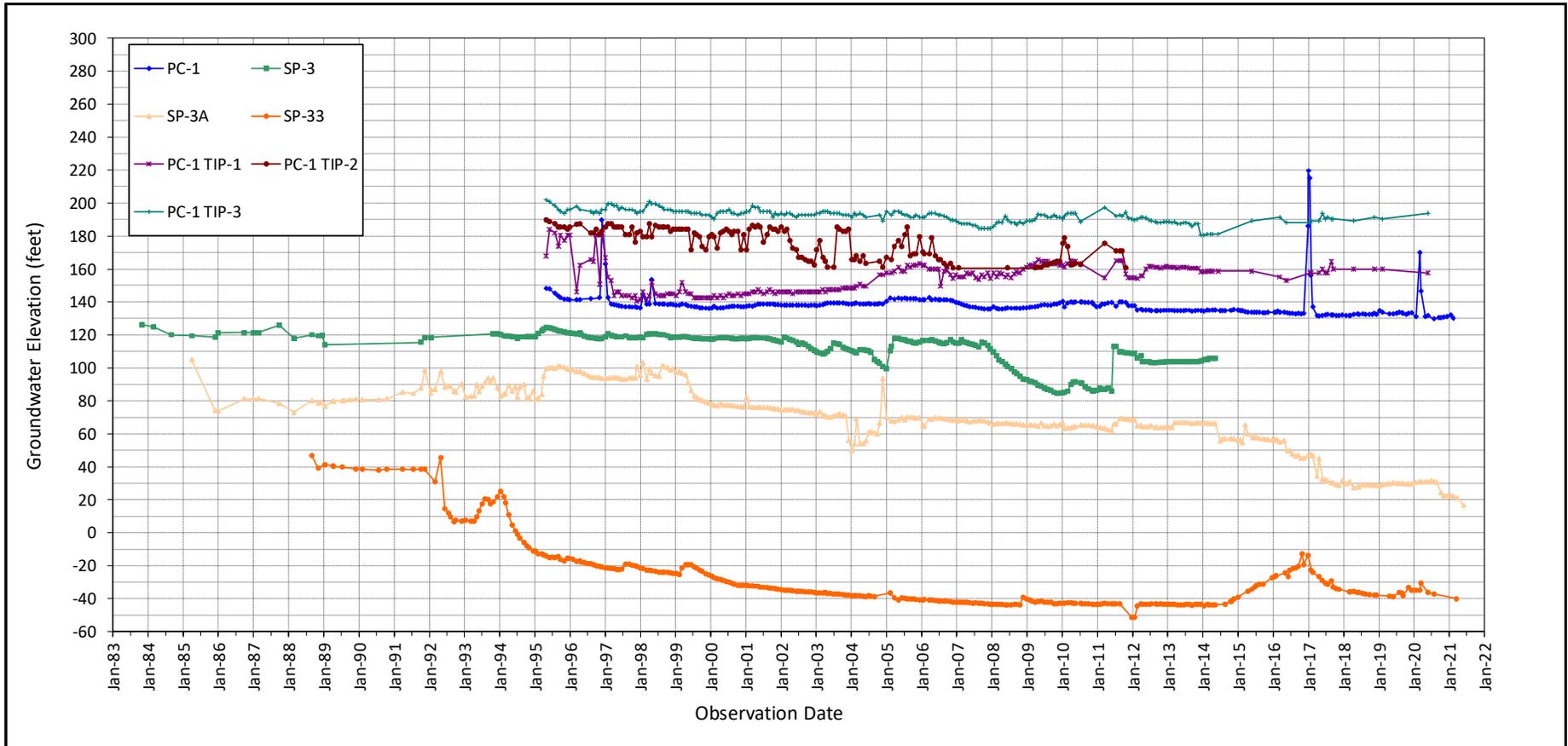
PNEUMATIC PIEZOMETER INFORMATION					
Piezometer ID	Surface Elev. (ft)	Tip No.	TIP DEPTH (ft.)	INSTALL BY	STATUS
W-10**	432	230	230	BYA	No air-line, has sounder access, no data reported
W-11**	507	214	214	BYA	Air-line present, no sounder access, no data reported
W-15**	295	164	164	BYA	Air-line present, no sounder access, no data reported
PC-1	250	TIP-1	120	BYA	Functioning, reported
		TIP-2	90		0 PSI since November 2011
		TIP-3	70		Functioning, reported
		TIP-4	40		Non-Functioning, no return air flow, not reported
		TIP-5	20		Non-Functioning, no return air flow, not reported
SP-5A*	NA	TIP-1		BYA	Non-functioning - Covered by asphalt pavement
		TIP-2	NA		
		TIP-3			
SP-8A*	NA	TIP-1		BYA	Non-functioning - Covered by landslide
		TIP-2	NA		
		TIP-3			
SP-17A*	540	TIP-1	Unknown	BYA	Non-functioning, no return air flow
		TIP-2	Unknown		
		TIP-3	Unknown		
		TIP-4	Unknown		
		TIP-5	Unknown		
SP-34	270	TIP-1	381	BYA	Functioning, reported
		TIP-2	282		Functioning, reported
		TIP-3	182		Low PSI since installation, not reported
		TIP-4	82		Non-Functioning, no return air flow, not reported
SP-35	345	TIP-1	393	BYA	Functioning, reported
		TIP-2	293		Functioning, reported
		TIP-3	193		Functioning, reported
		TIP-4	98		Non-Functioning, no return air flow, not reported
SP-36	380	TIP-1	255	BYA	Functioning, reported
		TIP-2	195		Functioning, reported
		TIP-3	95		0 PSI since installation, not reported
BYA-2*	665	TIP-1	Unknown	BYA	Non-functioning, no return air flow
		TIP-2	Unknown		
		TIP-3	Unknown		
BYA-3A*	NA	TIP-1		BYA	Non-Functioning
		TIP-2			
		TIP-3	NA		
		TIP-4			
BYA-4A*	NA	TIP-1		BYA	Non-functioning, no return air flow
		TIP-2			
		TIP-3	NA		
		TIP-4			
		TIP-5			
		TIP-6			
BYA-5A*	NA	TIP-1		BYA	Non-Functioning, Paved over
		TIP-2	NA		
		TIP-3			
		TIP-4			
GEO-2 (OB-2)*	305	TIP-1		GS	Non-Functioning
		TIP-2	NA		
		TIP-3			
GEO-1*	NA	TIP-1		GS	Restricted Access (possibly malfunctioning)
		TIP-2	NA		
		TIP-3			

NOTE: * Not functioning or no longer monitored pneumatic peizometer
** Inactive dewatering well air-line

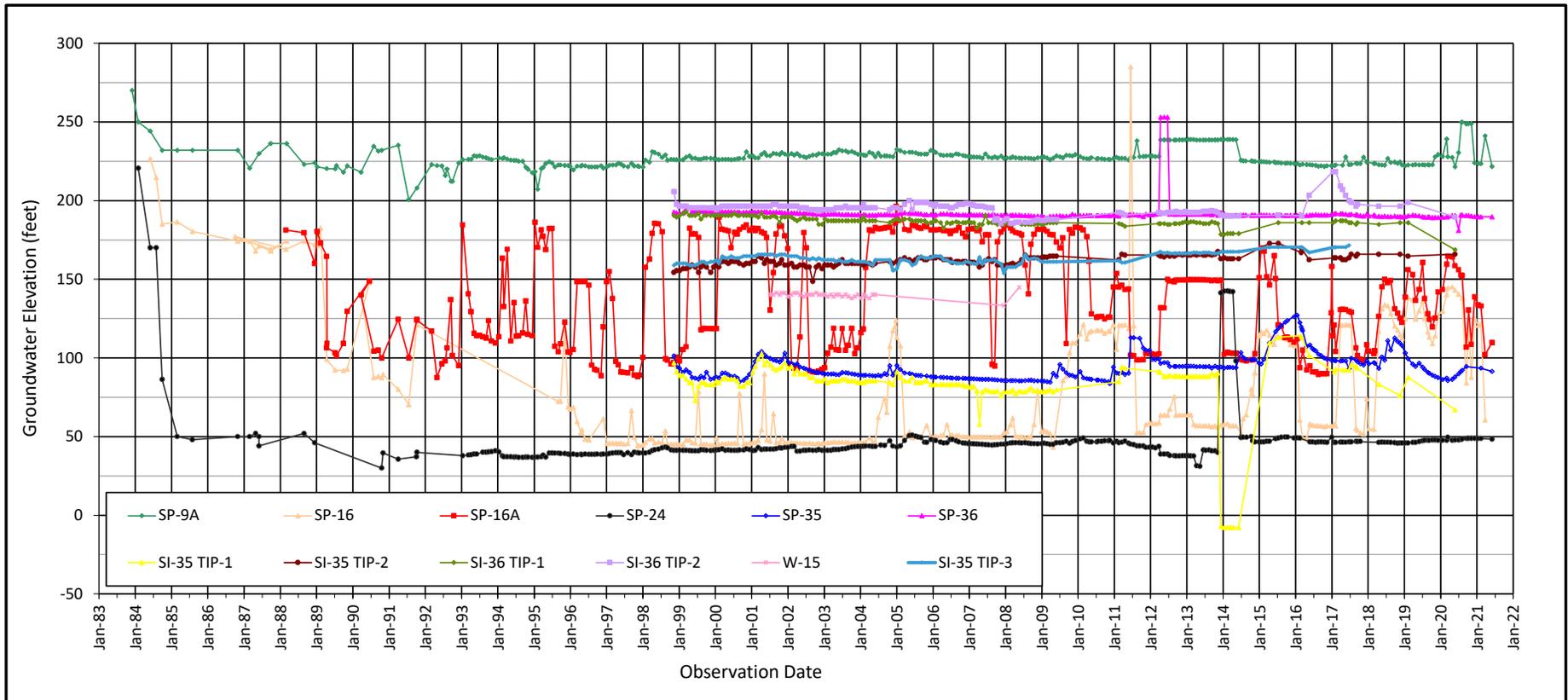
Piezometer I.D.	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	Highest Recorded	Mean '91 - '21	Stand Dev.	'20-'21 vs '97-'98	'20-'21 vs '19-'20	'20-'21 vs mean		
PCH REGION																																														
SP-11	Mean El.					5.7	5.3	4.7	4.5	5.7	5.7	5.5	5.8	5.5	5.8	6.3	5.5	4.8	5.4	5.4	5.2	5.3	5.1	5.4	4.9	4.6	5.1	8.4	7.8	4.7	4.8	5.0	5.3	5.7	5.9	4.8	5.0	5.2	Jul-16	5.5	0.8	-0.6	0.2	-0.3		
	Highest El.					6.4	5.8	5.5	5.0	6.0	7.4	6.9	7.5	6.7	7.3	8.1	6.5	5.5	8.3	7.0	5.7	5.8	5.9	7.6	5.9	5.2	5.6	11.8	8.8	5.0	5.1	5.9	6.1	7.2	7.2	5.2	6.0	5.5	11.8	6.6	1.4	-1.8	-0.5	-1.1		
SP-12	Mean El.					4.6	5.4	5.5	5.4	5.2	4.8	4.9	5.1	4.8	5.0	5.3	5.3	4.7	4.5	4.8	4.6	5.5	5.2	4.9	4.8	4.7	4.0	4.7	4.2	5.2	5.2	6.0	6.4	5.9	5.0	5.5	4.4	Feb-17	5.0	0.5	-0.6	-1.1	-0.6			
	Highest El.					4.6	5.4	6.0	6.0	6.0	7.2	6.1	6.3	7.4	7.0	6.4	6.5	7.4	6.4	6.4	6.4	8.3	7.2	6.4	5.8	5.7	5.1	5.3	5.2	5.5	5.8	6.2	8.8	8.8	7.8	6.9	6.5	5.9	8.8	6.6	1.0	-1.1	-0.6	-0.7		
SP-14	Mean El.					4.5	4.7	4.4	4.8	4.3	4.8	4.9	4.9	5.0	5.9	5.8	5.6	4.7	4.5	4.6	4.6	4.7	4.8	4.7	4.3	4.3	4.3	4.1	5.2	5.6	4.5	5.1	4.9	4.9	4.7	4.5	4.5	Feb-98	4.8	0.4	-1.4	0.0	-0.3			
	Highest El.					4.5	4.7	4.4	5.2	5.4	7.1	6.1	5.3	5.9	5.7	8.7	6.9	7.4	5.4	5.7	5.1	5.4	5.4	5.7	5.5	6.0	5.1	5.0	4.6	4.9	5.5	5.5	5.7	6.0	6.2	5.8	5.9	5.1	5.2	8.7	5.8	0.8	-3.5	0.1	-0.6	
SP-15	Mean El.					11.3	8.8	10.5	9.1	7.5	10.7	13.4	12.6	15.1	14.5	12.2	12.0	11.7	11.6	11.5	11.7	10.0	11.9	11.6	11.6	11.4	8.9	8.4	7.2	7.6	5.5	5.7	8.6	10.6	10.6	8.8	11.4	12.1	10.6	Jan-97	10.6	2.3	-1.5	-1.4	0.1	
	Highest El.					11.3	12.2	10.5	11.4	9.1	12.4	19.4	19.5	19.9	20.0	16.3	13.5	12.7	12.4	12.5	12.4	12.2	12.8	12.4	12.2	12.2	11.1	12.2	10.1	10.2	5.9	6.2	12.0	12.2	12.4	10.6	12.5	12.4	12.2	20.0	12.7	3.4	-4.1	-0.2	-0.5	
SP-19	Mean El.						3.6	3.6	3.1	4.5	4.4	4.7	4.6	4.3	4.4	4.5	3.8	3.4	3.7	3.5	3.4	3.9	3.6	3.6	3.5	3.1	3.6	3.7	3.6	3.0	3.6	3.4	3.4	3.5	3.7	3.8	4.3	3.4	Mar-95	3.8	0.5	-0.9	-0.9	-0.3		
	Highest El.						4.1	4.0	3.4	5.0	5.0	5.9	5.4	4.9	5.2	5.0	4.5	3.9	4.3	4.1	4.0	4.2	4.5	4.4	4.1	3.6	4.6	4.0	4.3	3.3	4.2	4.1	3.6	4.1	4.2	5.5	5.5	4.2	5.9	4.4	0.6	-1.0	-1.3	-0.3		
SP-27A	Mean El.					7.1	9.1	8.8	8.7	9.3	9.4	9.7	9.5	9.5	9.7	9.6	10.1	9.2	9.0	9.5	9.3	10.2	9.7	9.5	10.0	9.5	10.0	10.0	9.7	10.5	17.1	9.7	9.1	10.0	9.9	10.4	9.7	9.2	Jun-15	9.9	1.4	-0.5	-0.5	-0.7		
	Highest El.					7.1	10.1	9.2	10.2	10.0	10.2	10.8	10.3	10.4	10.7	10.4	13.7	9.6	9.7	9.9	9.8	13.5	12.5	10.2	13.7	10.1	10.6	10.5	10.5	10.8	17.8	10.0	10.1	12.8	10.3	15.5	11.0	9.8	17.8	11.2	1.9	-0.9	-1.2	-1.4		
SP-29	Mean El.					19.7	20.4	19.4	18.7	18.0		19.7	20.0	19.2	19.2	19.7	18.8	18.0	18.1	17.0	16.2	16.0	18.0	17.7	16.7	16.3	15.8	15.9	16.2	15.8	16.7	15.7	14.4	13.9	14.5	14.3	14.3	14.6	13.8	Feb-05	16.7	1.9	-6.0	-0.9	-2.9	
	Highest El.					19.7	21.7	19.4	18.7	18.0		20.9	22.1	20.2	20.5	21.3	19.9	19.1	19.6	18.1	16.7	16.4	22.2	18.7	17.4	16.9	16.1	16.6	16.9	17.1	16.9	16.8	14.7	14.3	16.7	14.8	18.0	18.2	14.3	22.2	17.9	2.2	-7.0	-3.9	-3.6	
SP-30	Mean El.					7.4	7.1	6.4	7.2	6.9	7.7	7.3	7.9	8.1	9.6	8.0	8.5	9.0	9.7	11.3	12.6	12.9	13.0	13.4	13.4	14.4	15.1	15.7	16.2	15.8	16.5	16.8	13.6	13.8	16.0	16.5	18.1	20.0	20.1	Feb-21	12.9	3.9	12.1	0.1	7.1	
	Highest El.					7.4	8.0	6.4	8.0	8.0	8.0	9.3	9.6	9.4	13.3	10.2	9.6	10.1	10.8	12.6	14.3	13.4	14.3	14.1	14.2	15.3	15.5	16.4	17.2	17.2	17.2	17.2	17.2	17.2	20.9	20.8	21.4	21.4	14.3	3.9	11.2	0.7	7.1			
Area Average	Mean El.					10.7	8.3	8.0	7.8	7.3	6.8	8.7	8.8	9.1	9.1	8.8	8.6	8.3	8.4	8.5	8.2	9.1	8.9	8.7	8.7	8.2	8.4	8.8	8.6	8.4	9.3	8.1	8.4	9.0	8.7	9.1	9.5	8.9		8.6	0.5	0.1	-0.6	0.3		
	Highest El.					10.7	9.2	8.3	8.5	8.1	7.8	10.7	10.8	10.6	11.1	10.8	10.0	10.1	9.3	9.7	9.5	9.2	10.8	10.1	9.7	10.0	9.1	9.5	10.1	9.8	8.8	9.8	9.5	9.8	10.7	9.7	11.3	10.7	9.8		9.9	0.8	-1.0	-0.9	-0.1	
Change vs Prior	Mean El.					-2.4	-0.3	-0.2	-0.5	-0.4	1.8	0.1	0.3	0.0	-0.2	0.0	-0.2	-0.3	0.1	0.2	-0.3	0.8	-0.2	-0.2	0.0	-0.5	0.2	0.4	-0.3	-0.1	0.9	-1.3	0.3	0.6	-0.2	0.3	0.4	-0.6								
	Highest El.					-1.5	-1.0	0.2	-0.4	-0.4	2.9	0.1	-0.2	0.5	-0.3	-0.9	0.1	-0.7	0.4	-0.2	-0.3	1.7	-0.7	-0.4	0.3	-0.9	0.5	0.5	-0.3	-1.0	1.1	-0.3	0.3	0.9	-0.9	1.6	-0.6	-0.9								
BLUFF REGION																																														
SP-10	Mean El.	144.7	76.0	50.0	50.5	49.2	47.4	45.9	48.8	55.3	44.6	42.9	41.6	42.0	41.6	41.3	42.4	42.8	42.9	43.3	43.6	44.1	44.4	47.2	45.4	45.4	45.2	44.9	44.6	46.0	44.7	44.1	44.0	44.3	48.7	47.3	55.4	47.3	47.4	45.1	Dec-83	44.2	2.4	3.7	0.2	0.8
	Highest El.	174.2	130.0	50.0	50.5	50.0	52.0	46.0	55.5	74.0	45.9	44.4	42.2	42.6	41.9	41.6	44.8	43.4	43.3	43.6	44.1	44.4	47.2	45.4	45.4	45.2	44.9	44.6	46.0	44.7	44.1	44.0	44.3	48.7	47.3	55.4	47.3	47.4	45.1	174.2	46.1	5.9	3.5	-2.4	-1.0	
SP-28	Mean El.						36.4	33.7	37.5	33.7	33.6	33.7	33.0	32.7	32.2	31.9	32.6	33.2	33.1	33.0	32.9	32.9	34.9	34.7	33.3	33.1	32.8	33.1	32.8	32.8	33.4	33.4	33.3	33.4	33.4	33.3	33.4	33.4	33.3	34.3	Jan-12	33.3	0.7	2.4	0.9	1.0
	Highest El.						40.5	33.8	40.0	36.0	35.2	35.2	33.1	33.1	32.4	32.2	34.9	33.6	33.2	33.3	33.0	32.9	36.1	36.0	33.6	33.1	33.1	33.4	33.8	42.0	33.7	33.6	33.4	33.5	33.6	33.6	33.6	33.6	33.7	39.1	42.0	34.2	2.0	6.9	5.3	4.8
SP-32	Mean El.						75.3	79.1	72.6	76.1	90.1	85.9	92.5	92.5	94.9	76.5	84.2	79.7	88.2	70.1	89.9	91.1	99.9	100.2	102.3	102.4	104.4	105.1	102.3	104.8	106.4	105.6	35.0	24.0	34.3	34.8	25.5	29.8	41.7	Apr-96	79.0	28.0	-34.8	12.0	-37.3	
	Highest El.						78.2	82.3	72.8	83.2	101.0	96.2	110.2	110.2	130.9	107.4	95.3	88.4	97.0	83.6	106.0	105.8	106.7	105.9	105.9	105.8	105.8	105.9	106.9	106.9	107.1	41.3	30.3	55.0	47.1	33.7	38.5	49.1	130.9	89.1	28.0	-58.3	10.6	-40.0		
SP-34	Mean El.																																													
	Highest El.																																													
Area Average	Mean El.	144.7	76.0	50.0	50.5	49.2	53.0	52.9	53.0	55.0	56.1	54.2	55.7	55.7	56.2	49.9	58.4	58.3	60.1	55.7	60.0	60.5	65.1	64.9	65.9	66.2	66.7	67.7	58.0	56.8	55.0	54.5	34.2	31.9	33.2	34.2	31.5	33.2	36.8		53.1	11.8	-13.1	3.6	-16.3	
	Highest El.	174.2	130.0	50.0	50.5	50.0	56.9	54.0	56.1	64.4	60.7	58.6	61.8	62.0	68.4	60.4	65.2	61.2	62.7	59.6	64.4	64.4	68.0	67.2	67.2	67.6	68.0	69.6	62.5	60.6	58.4	55.2	36.4	34.9	39.6	39.8	34.5	36.3	39.9		57.3	11.7	-20.5	3.6	-17.4	
Change vs Prior	Mean El.		-68.7	-26.0	0.5	-1.3	3.8	-0.2	0.1	2.0	1.1	-1.9	1.5	0.1	0.5	-6.3	8.5	-0.1	1.8	-4.4	4.3	0.5	4.6	-0.1	0.9	0.3	0.5	0.9	-9.6	-1.2	-1.8	-0.5	-20.2	-2.4	1.4	0.9	-2.7	1.7	3.6							
	Highest El.		-44.2	-80.0	0.5	-0.5	6.9	-2.9	2.1	8.3	-3.7	-2.1	3.2	0.1	6.4	-8.0	4.8	-4.0	1.5	-3.2	4.8	0.0	3.6	-0.8	0.0	0.4	0.4	1.6	-7.0	-2.0	-2.2	-3.1	-18.8	-1.5	4.8	0.2										



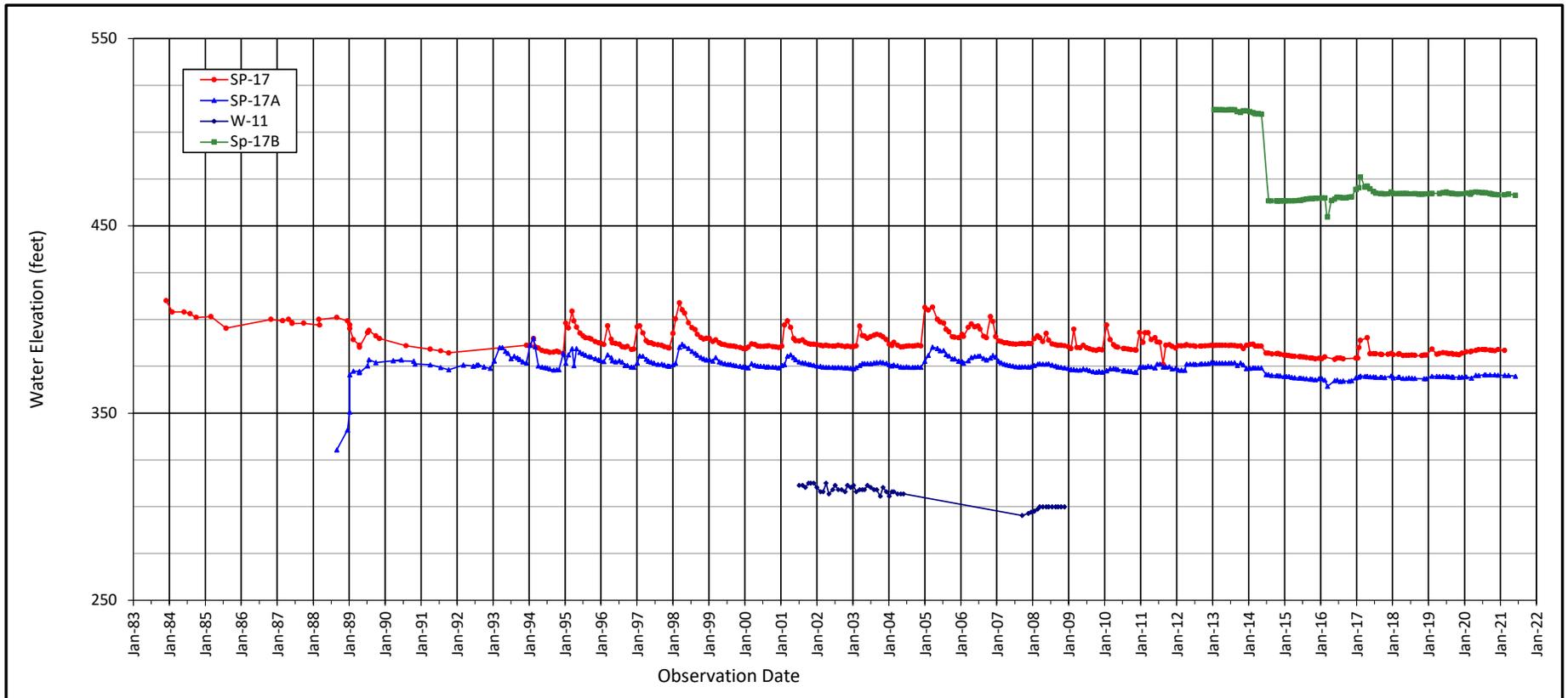
GROUNDWATER ELEVATION DATA
Headscarp Area
Big Rock Mesa Landslide Assessment District
Malibu, California



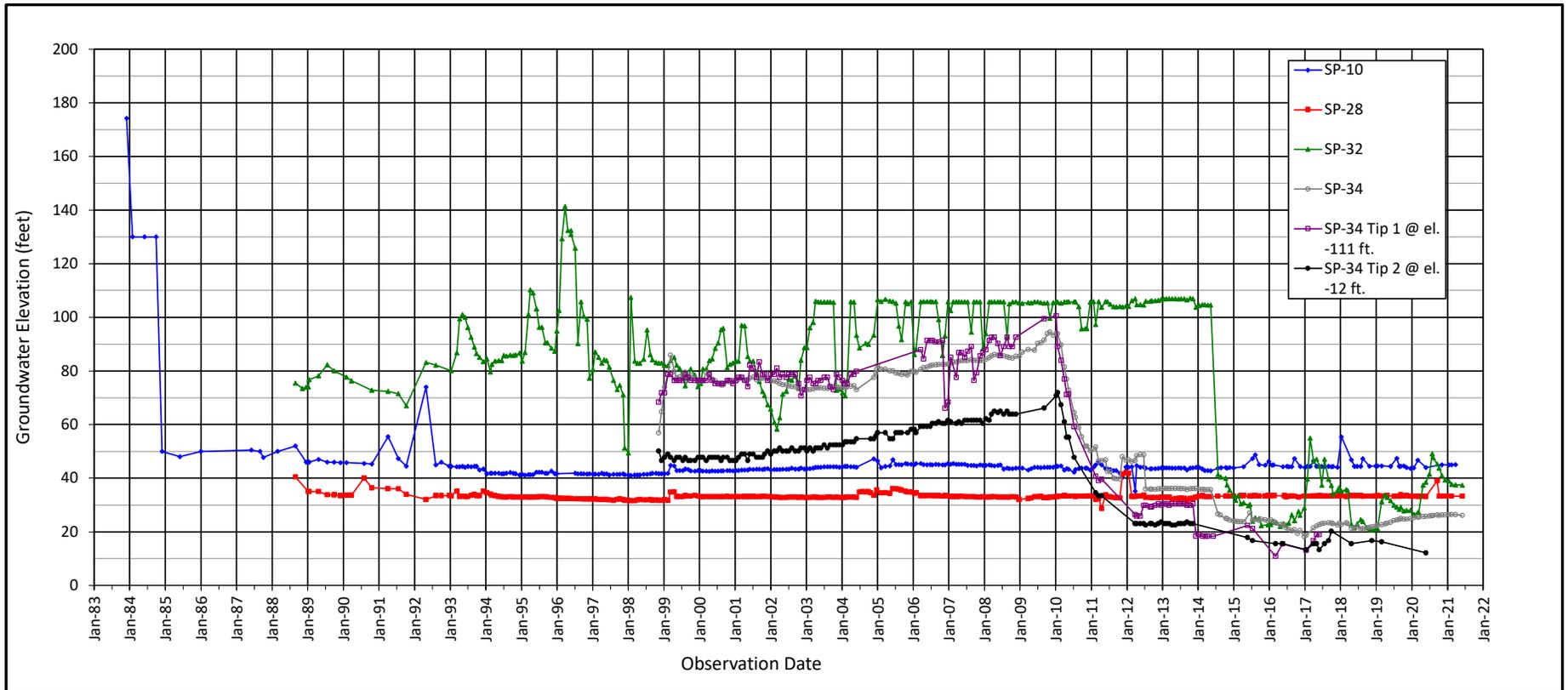
GROUNDWATER ELEVATION DATA
Eastern Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



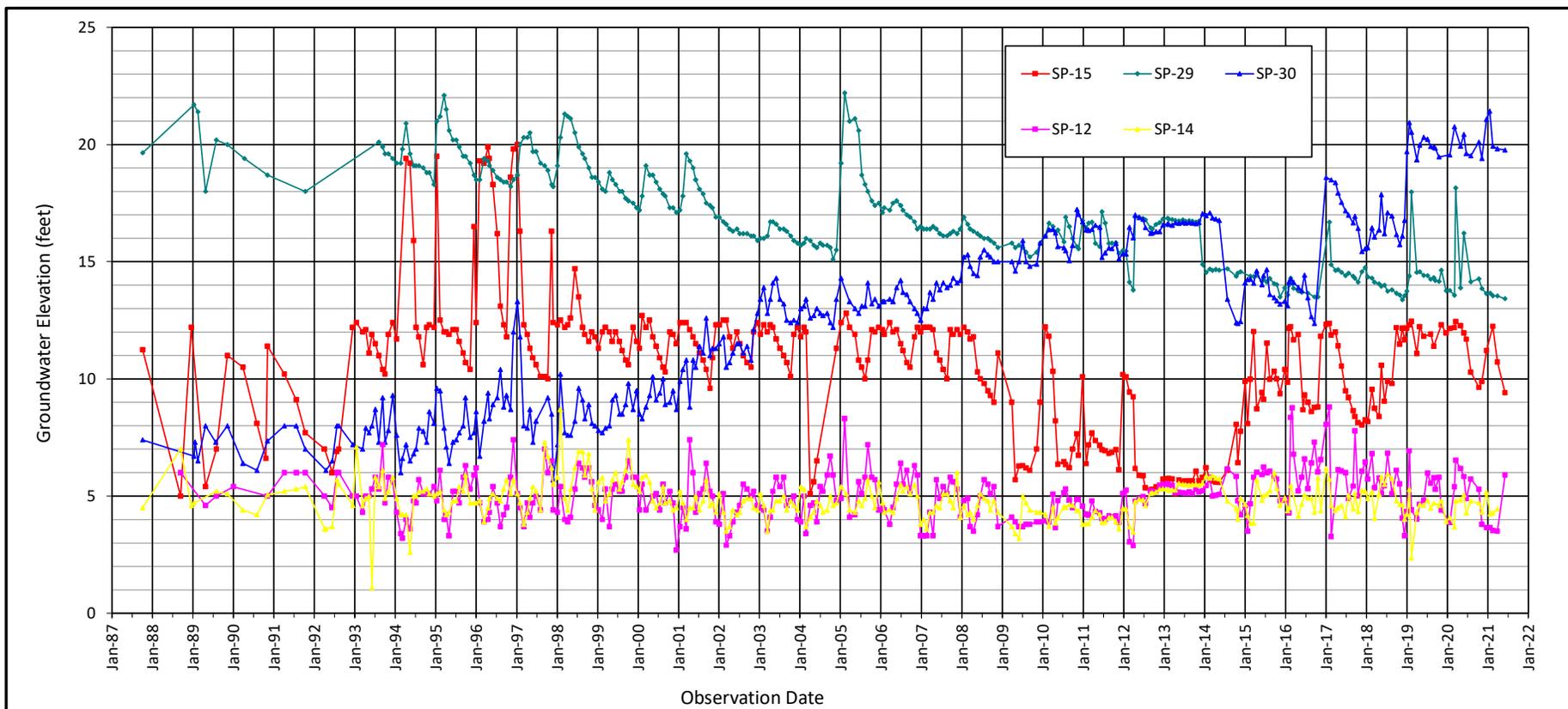
GROUNDWATER ELEVATION DATA
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



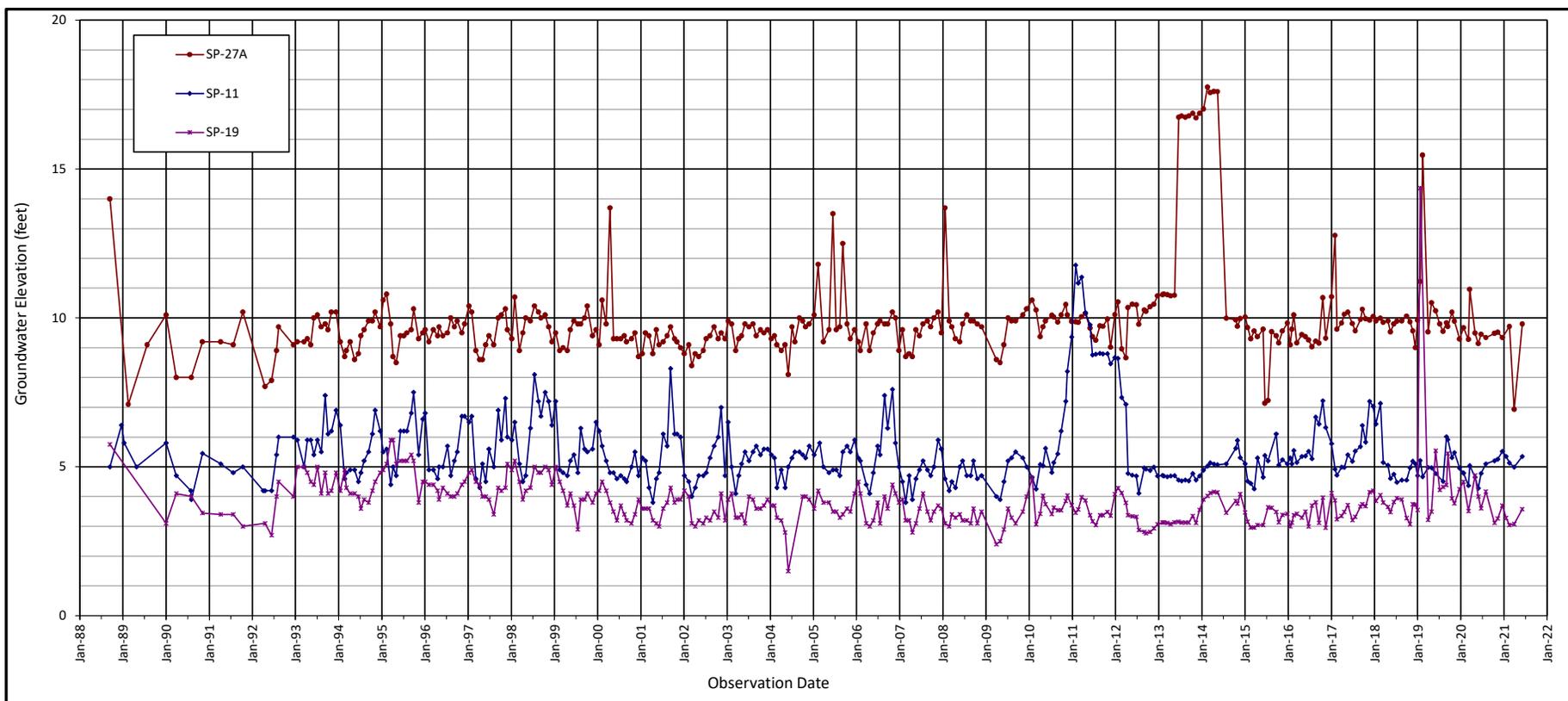
GROUNDWATER ELEVATION DATA
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



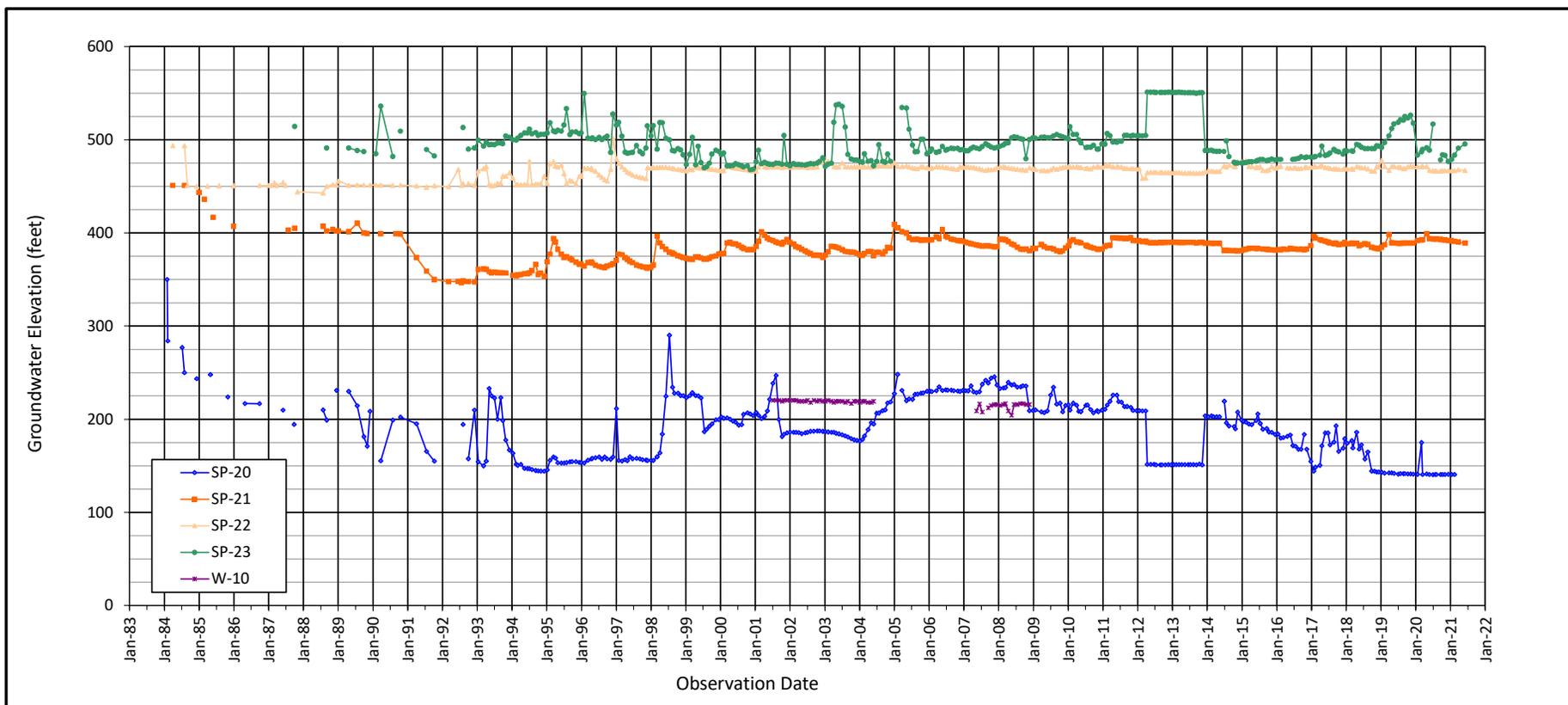
GROUNDWATER ELEVATION DATA
Bluff Region
Big Rock Mesa Landslide Assessment District
Malibu, California



GROUNDWATER ELEVATION DATA
Pacific Coast Highway (Western Half)
Big Rock Mesa Landslide Assessment District
Malibu, California



GROUNDWATER ELEVATION DATA
Pacific Coast Highway (Eastern Half)
Big Rock Mesa Landslide Assessment District
Malibu, California

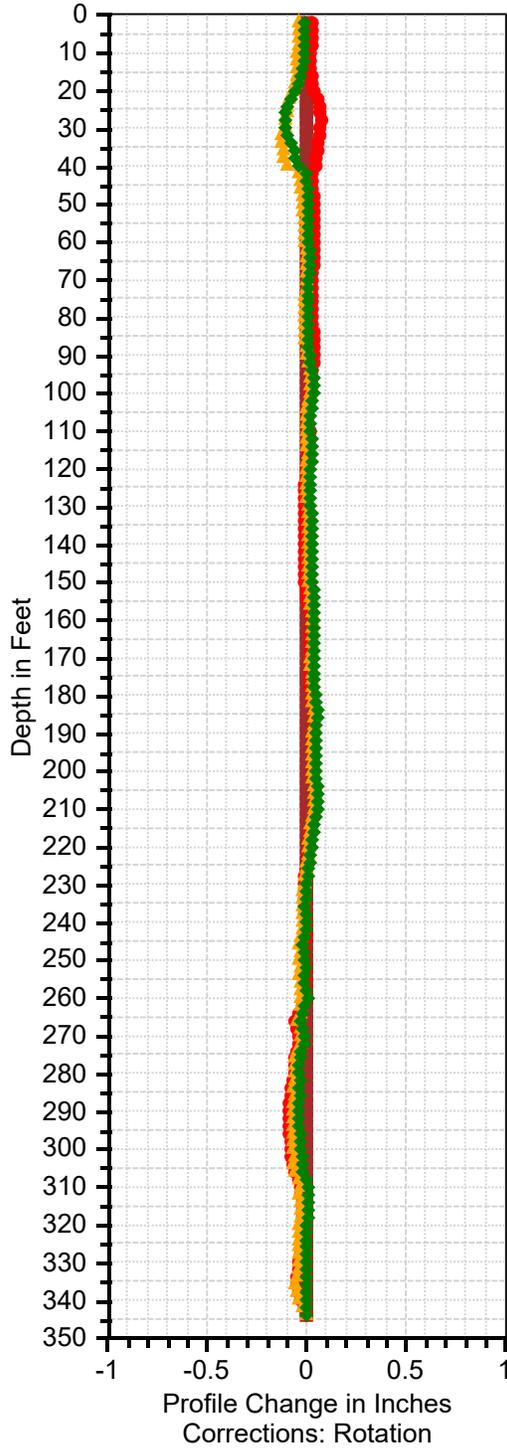


GROUNDWATER ELEVATION DATA
Western Extension
 Big Rock Mesa Landslide Assessment District
 Malibu, California

APPENDIX B - SLOPE INCLINOMETERS

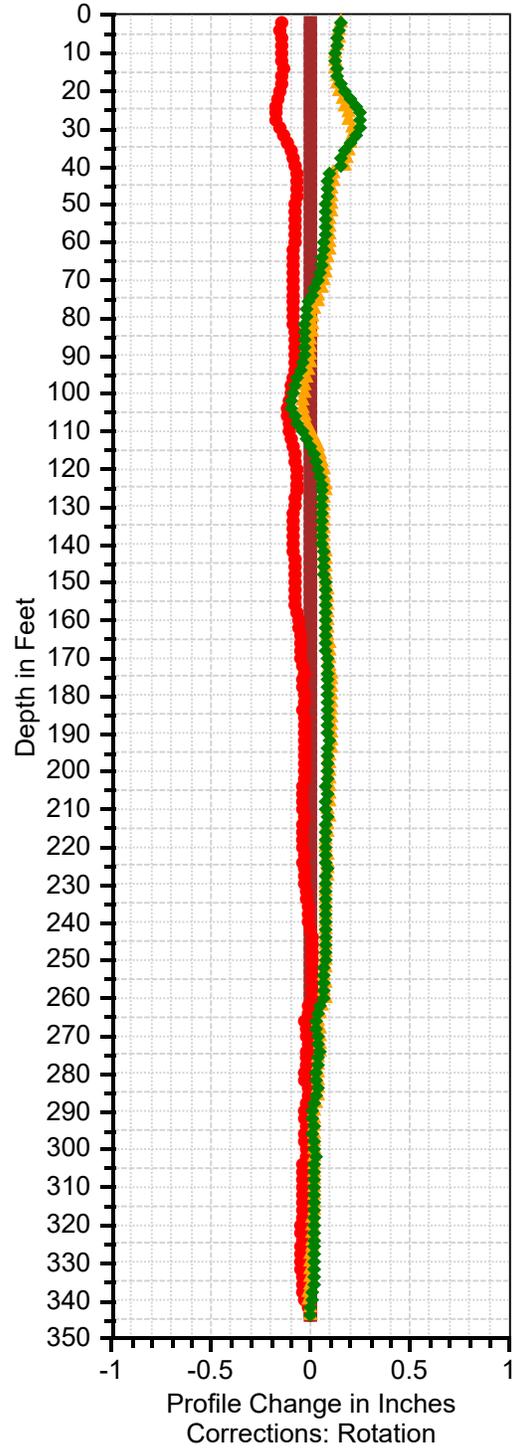
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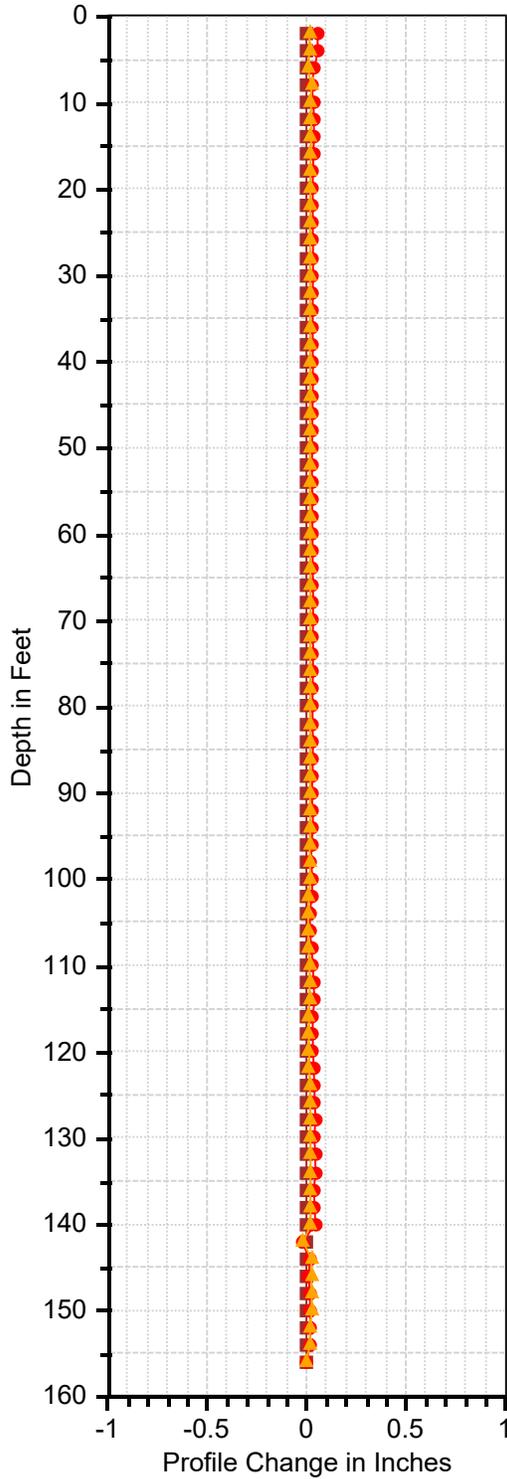
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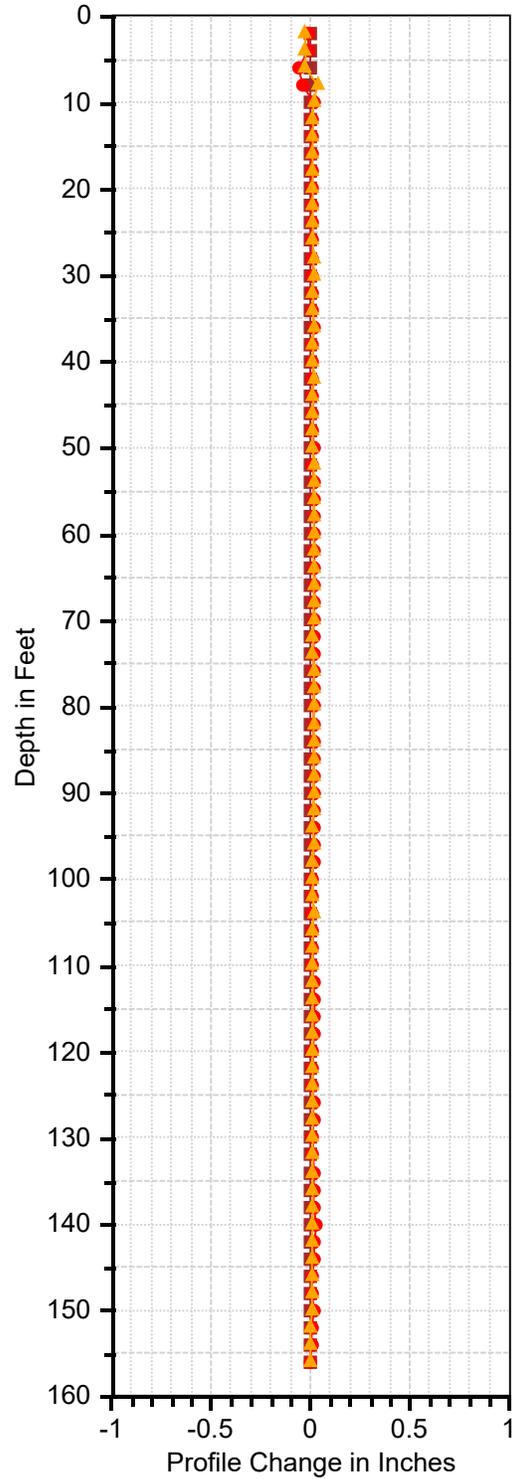
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10/30/2020 3/30/2021 7/23/2021



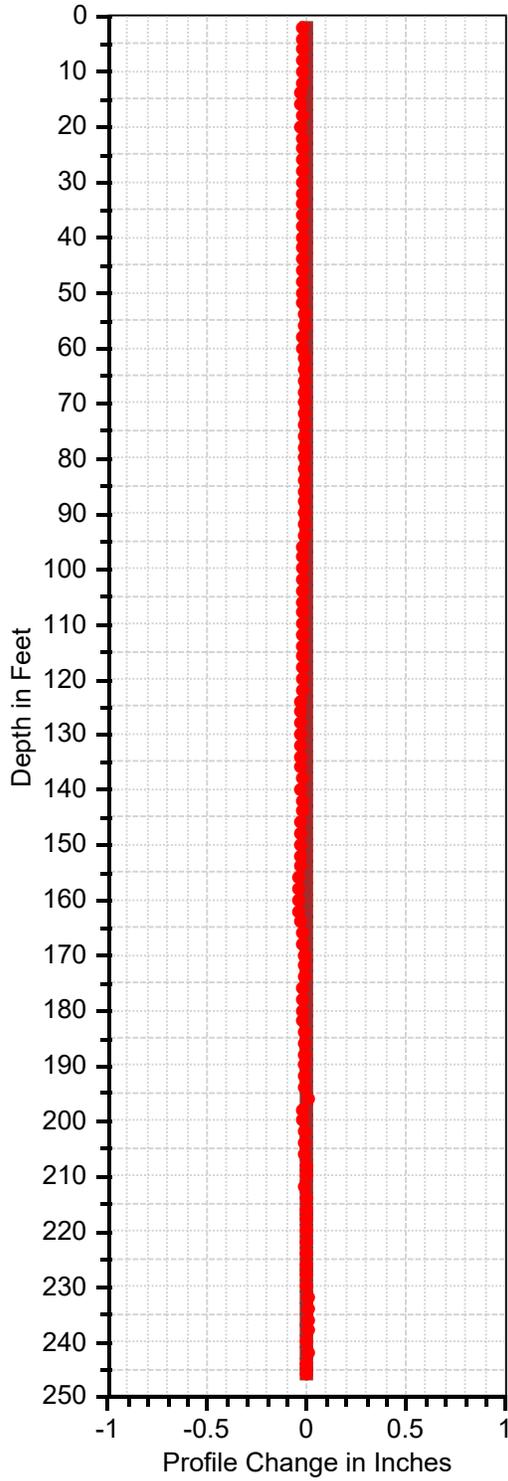
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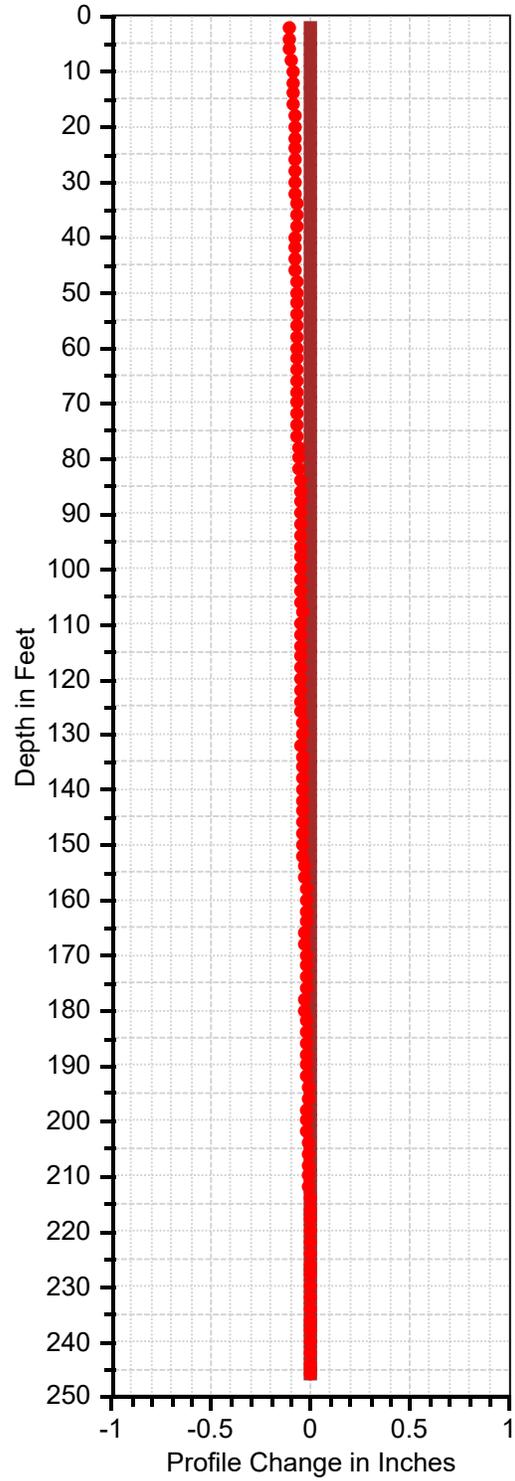
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3/30/2021 7/23/2021



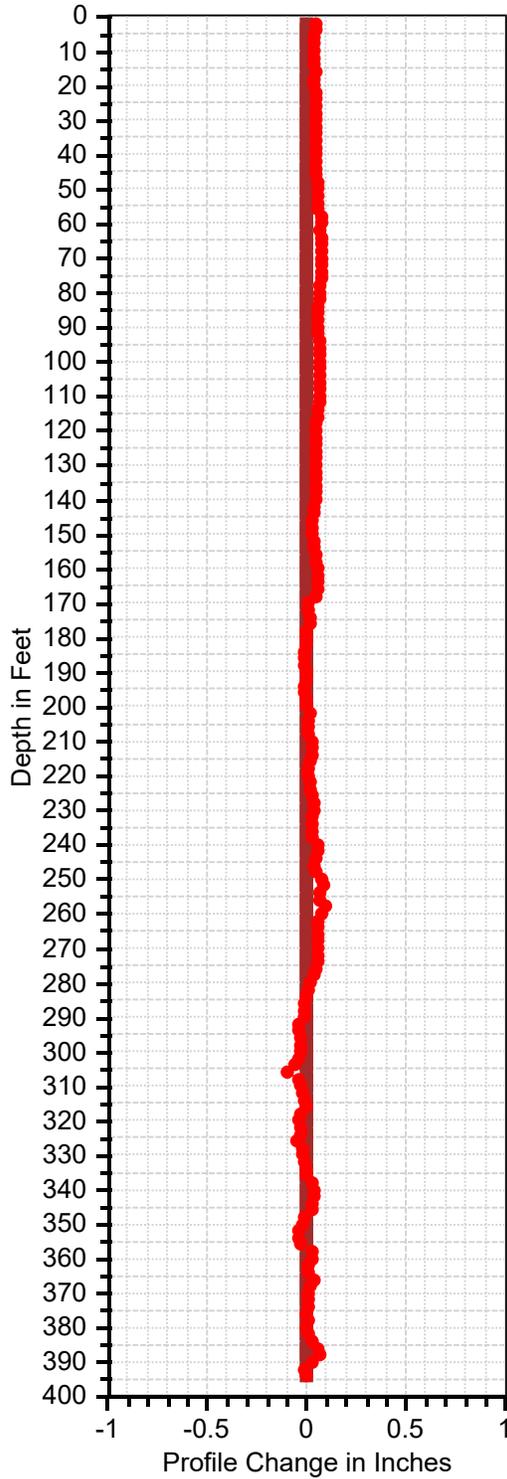
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3/30/2021 7/23/2021



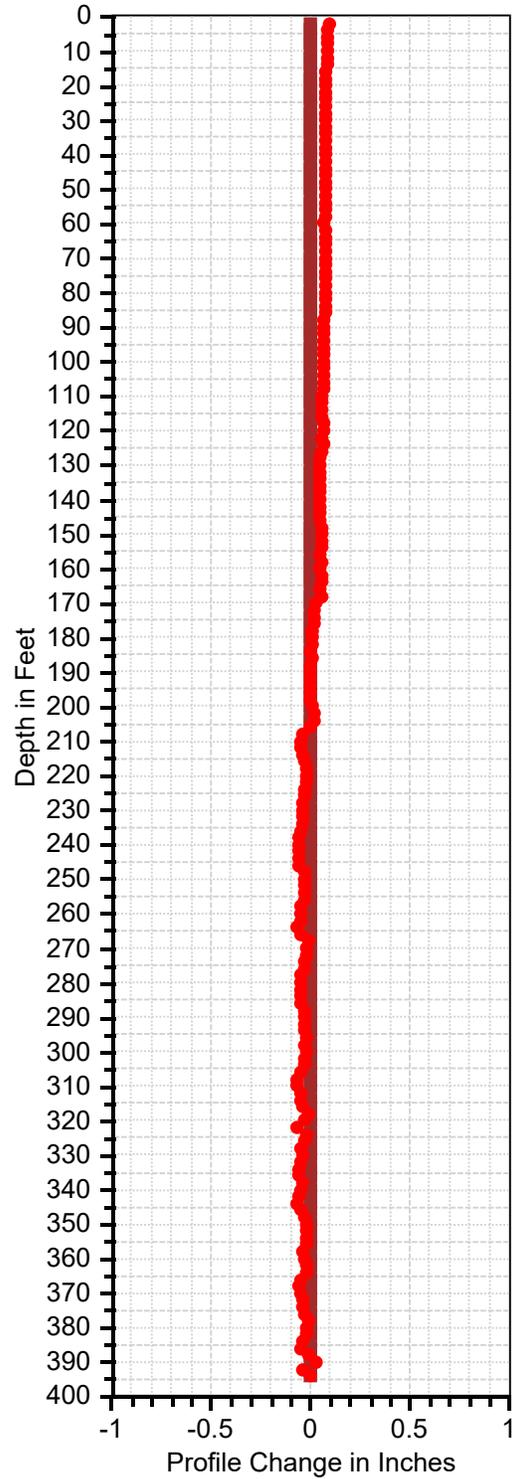
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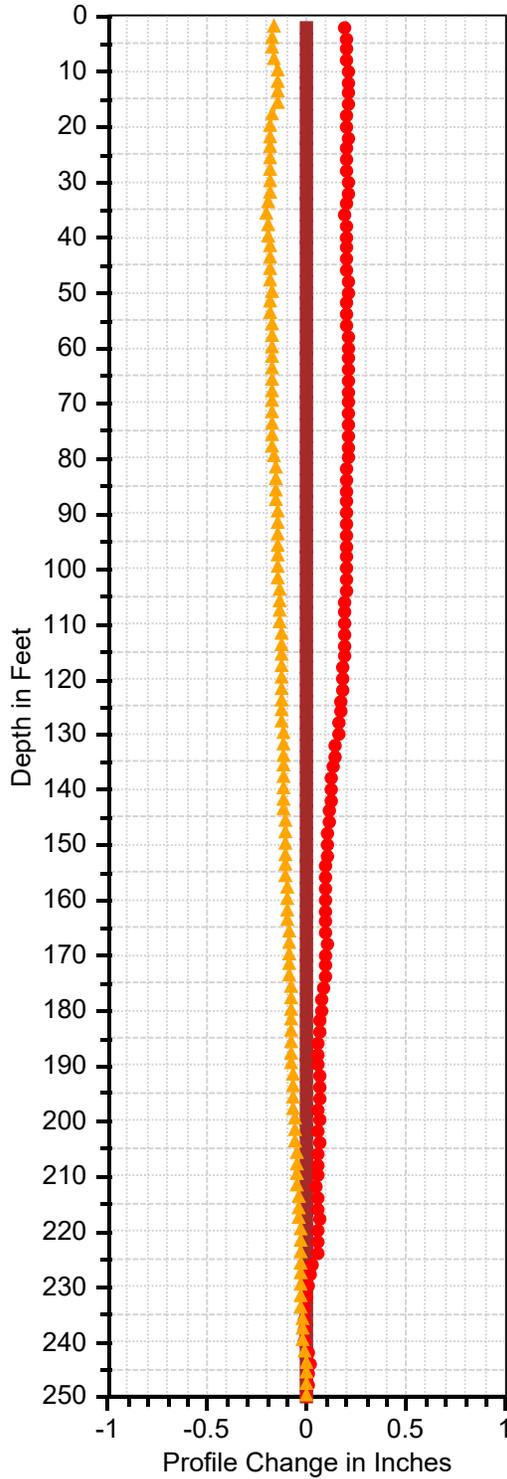
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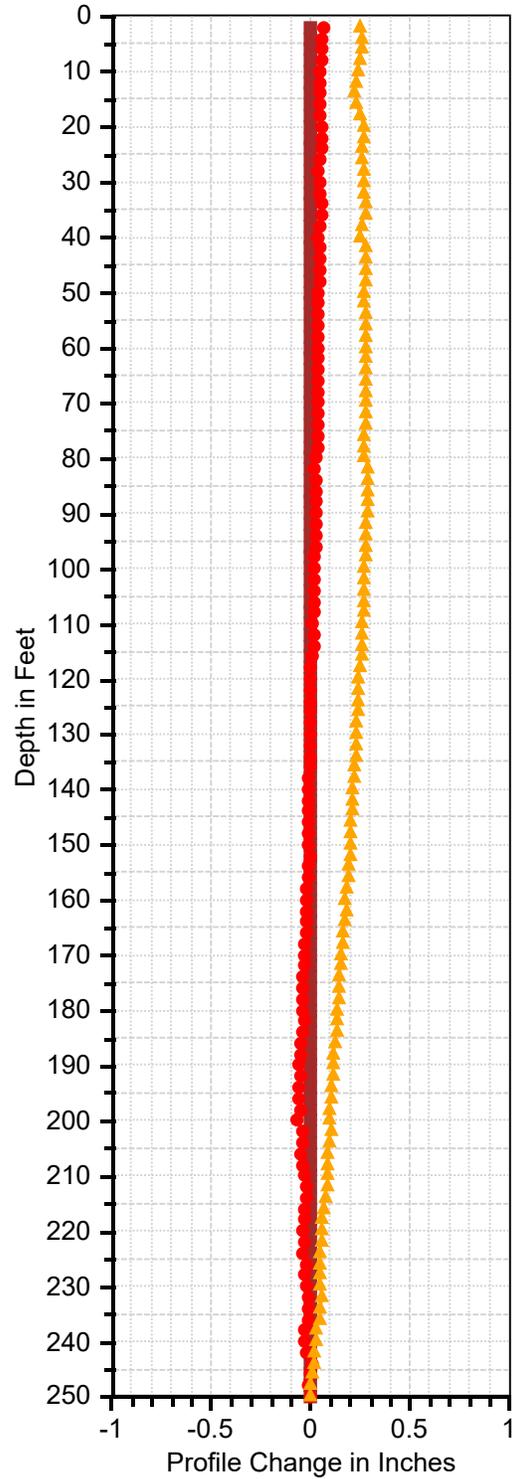
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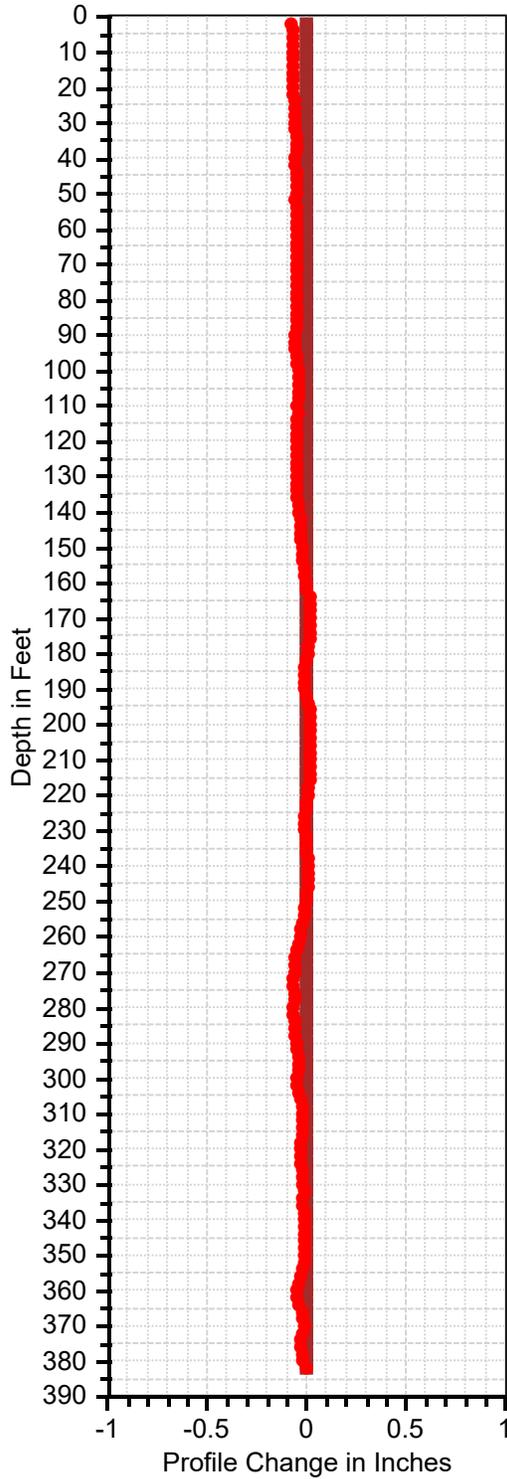
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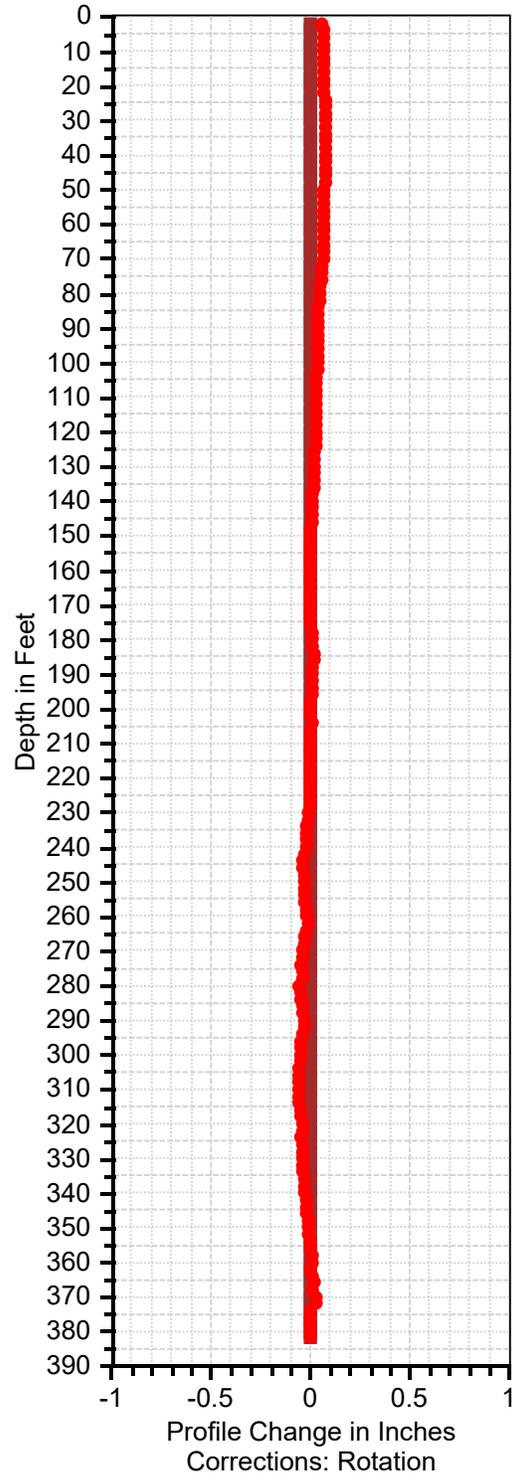
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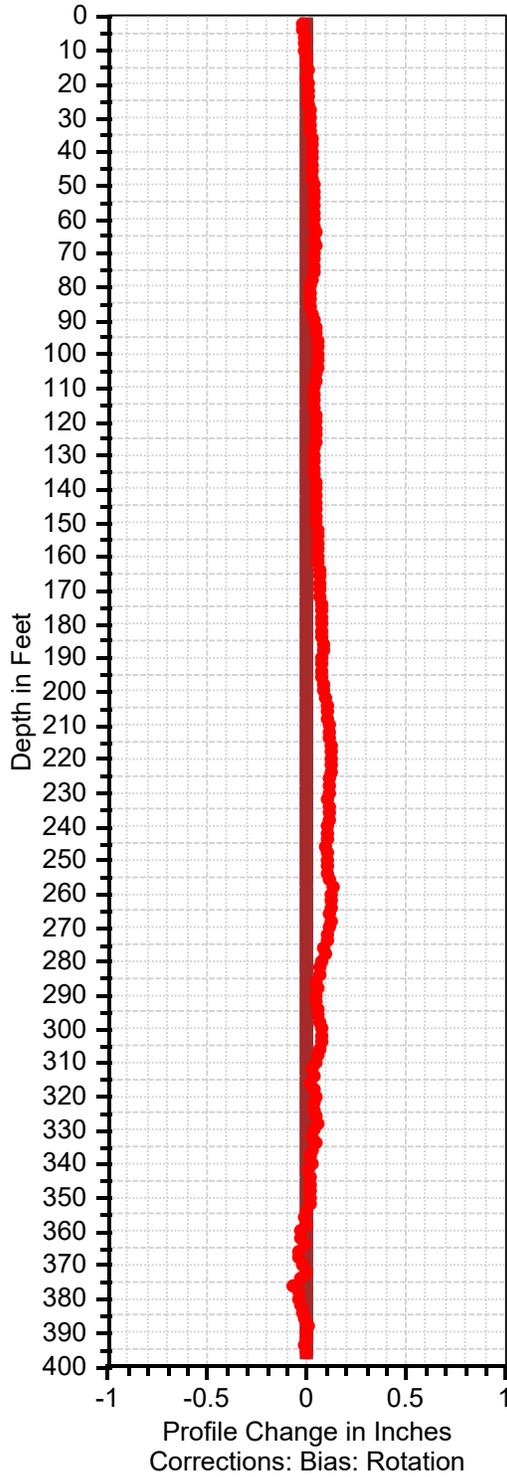
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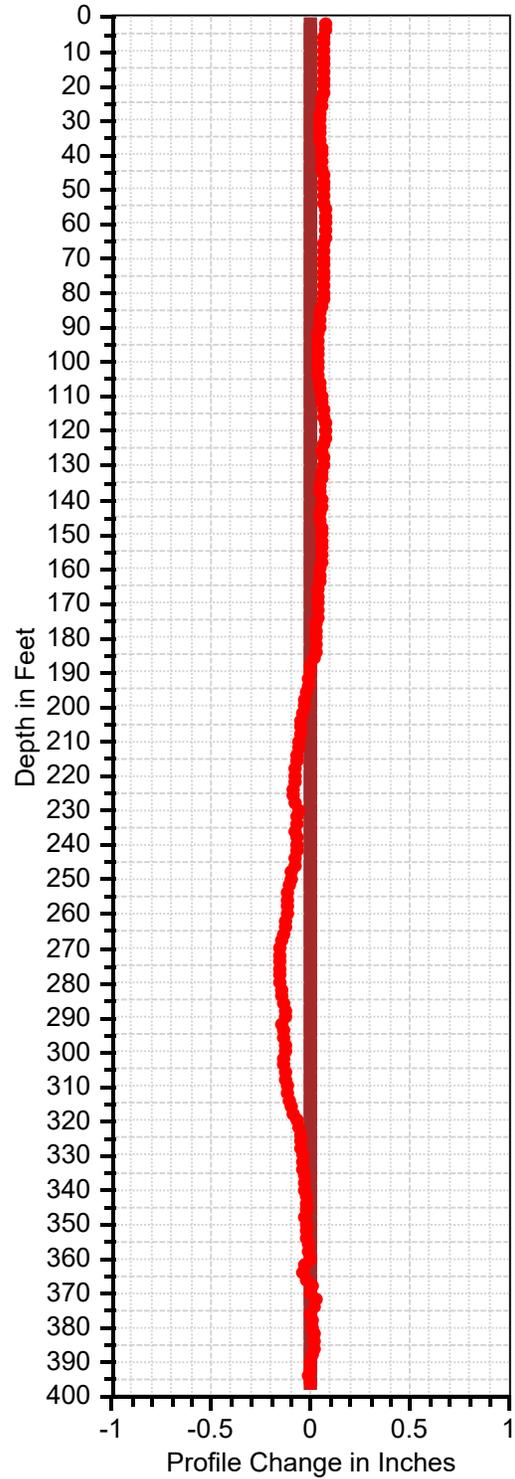
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9/29/2020 8/6/2021



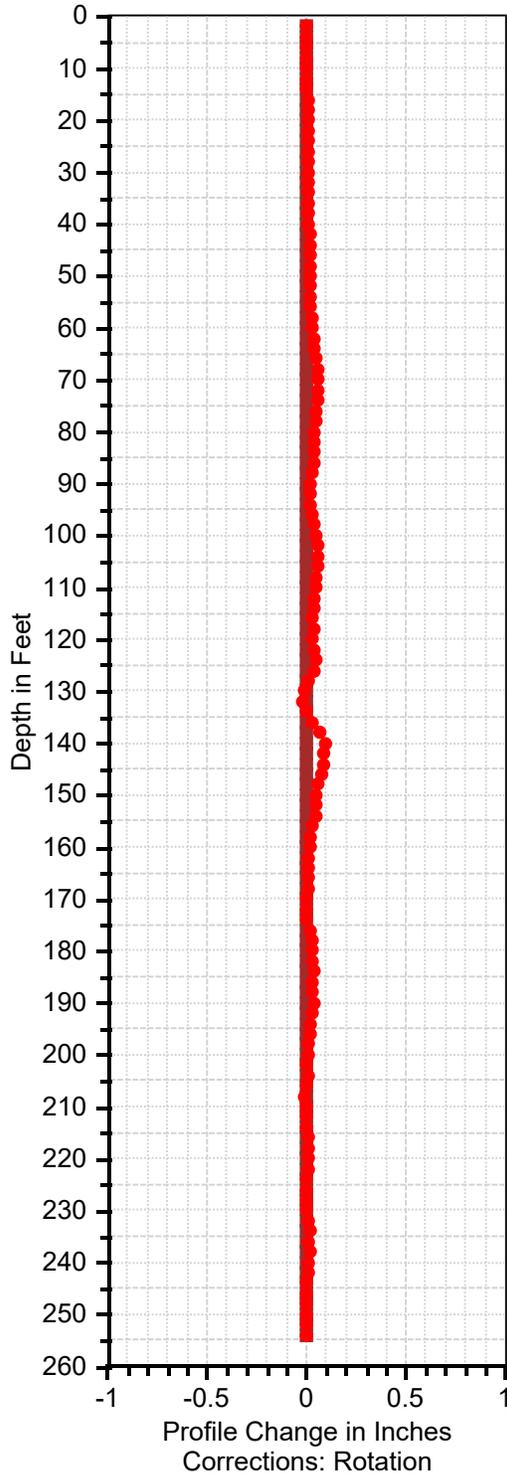
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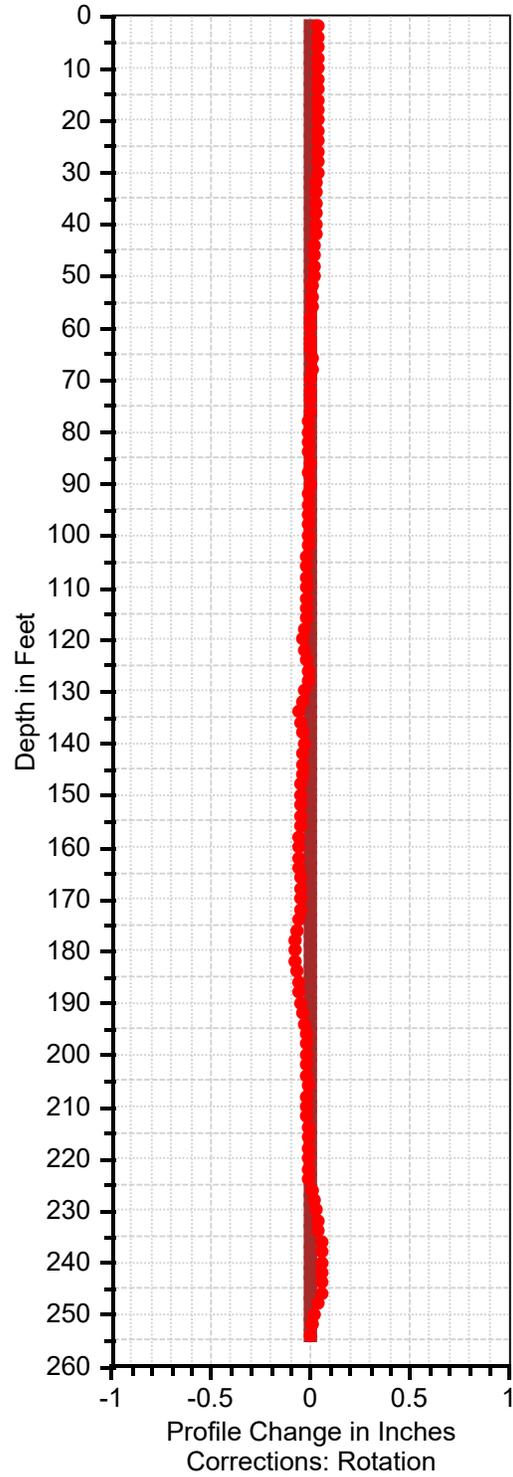
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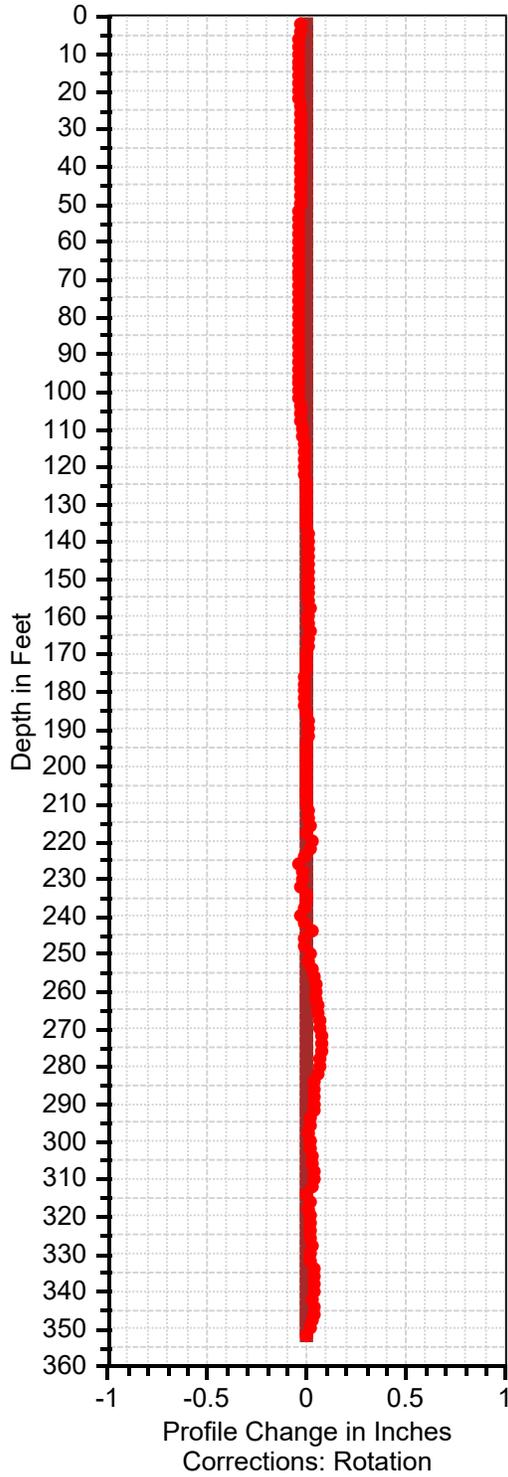
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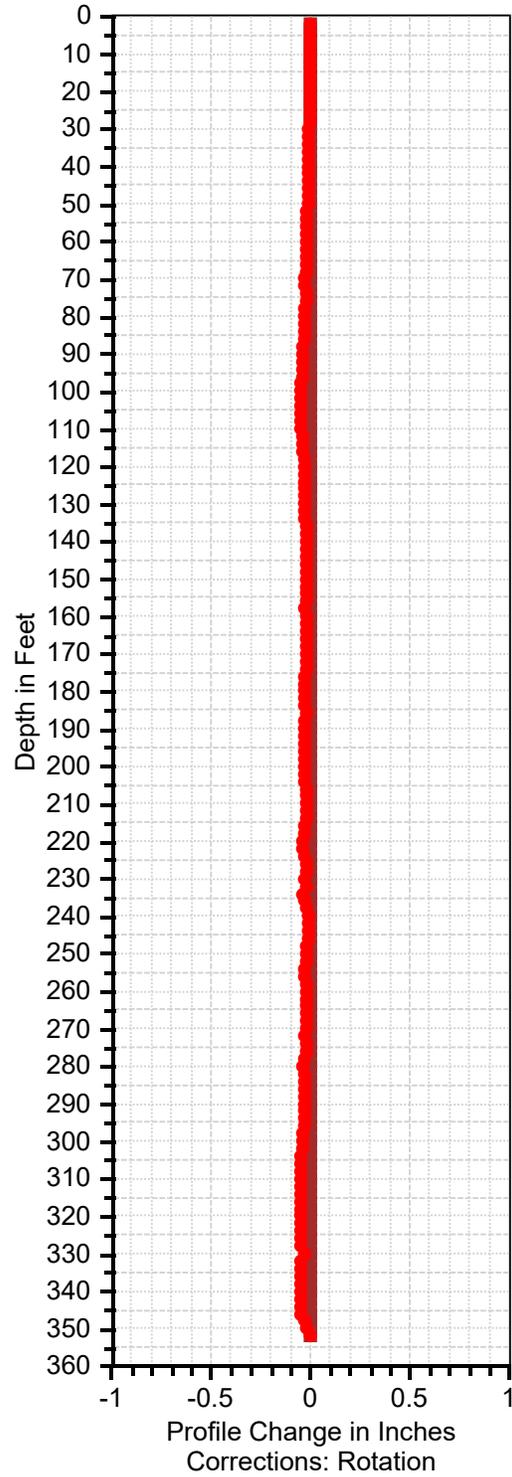
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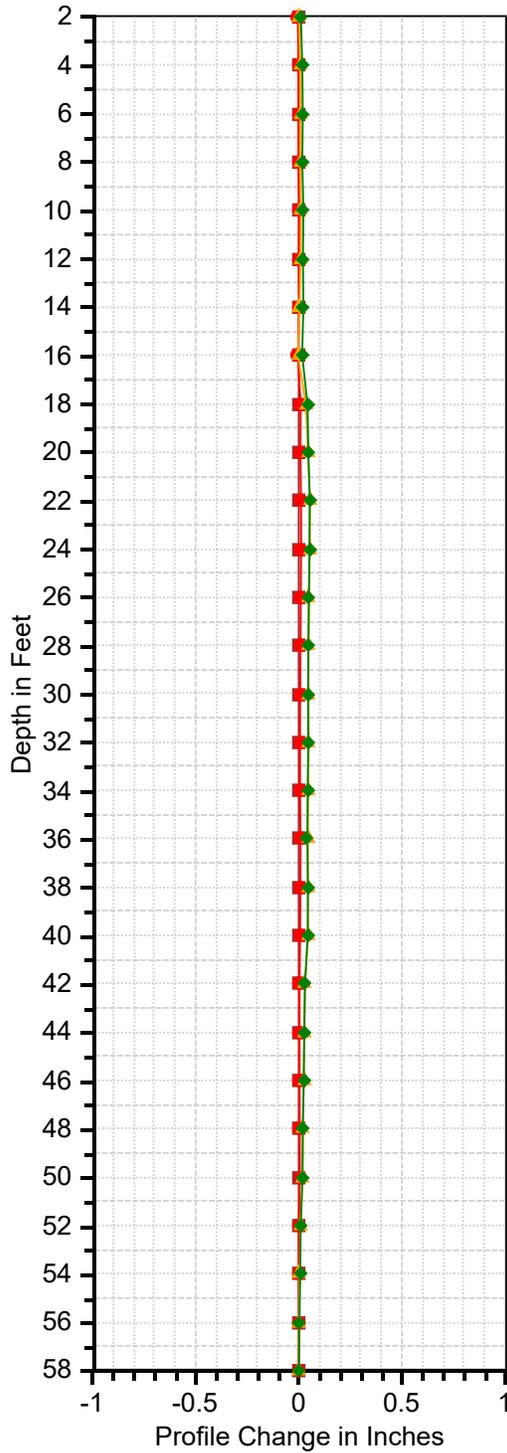
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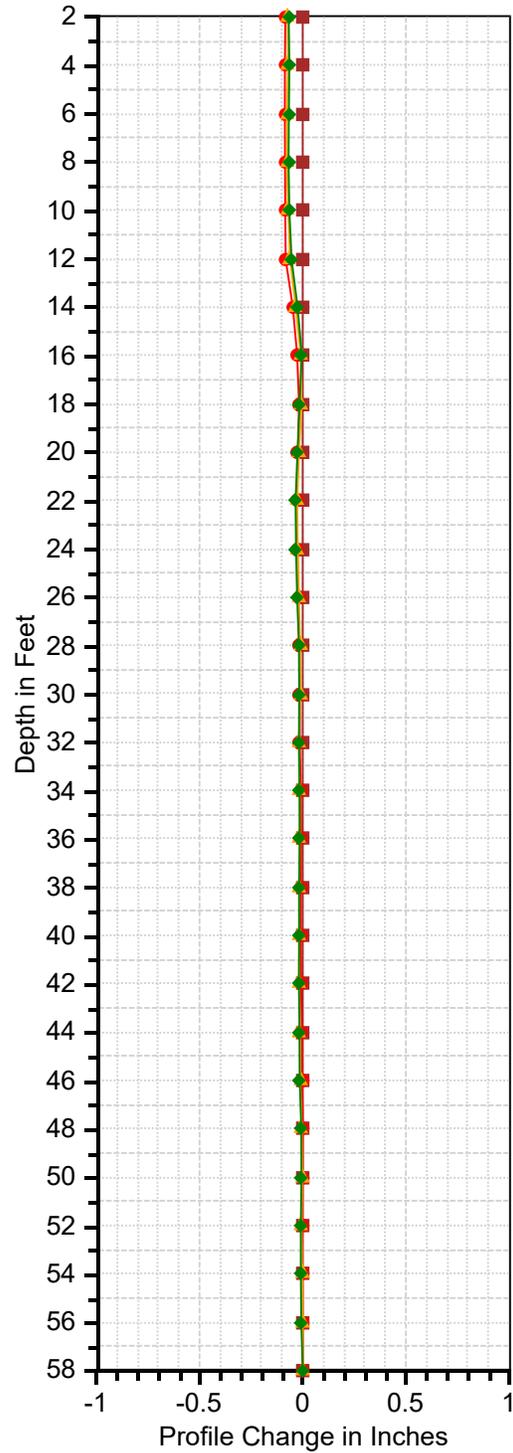
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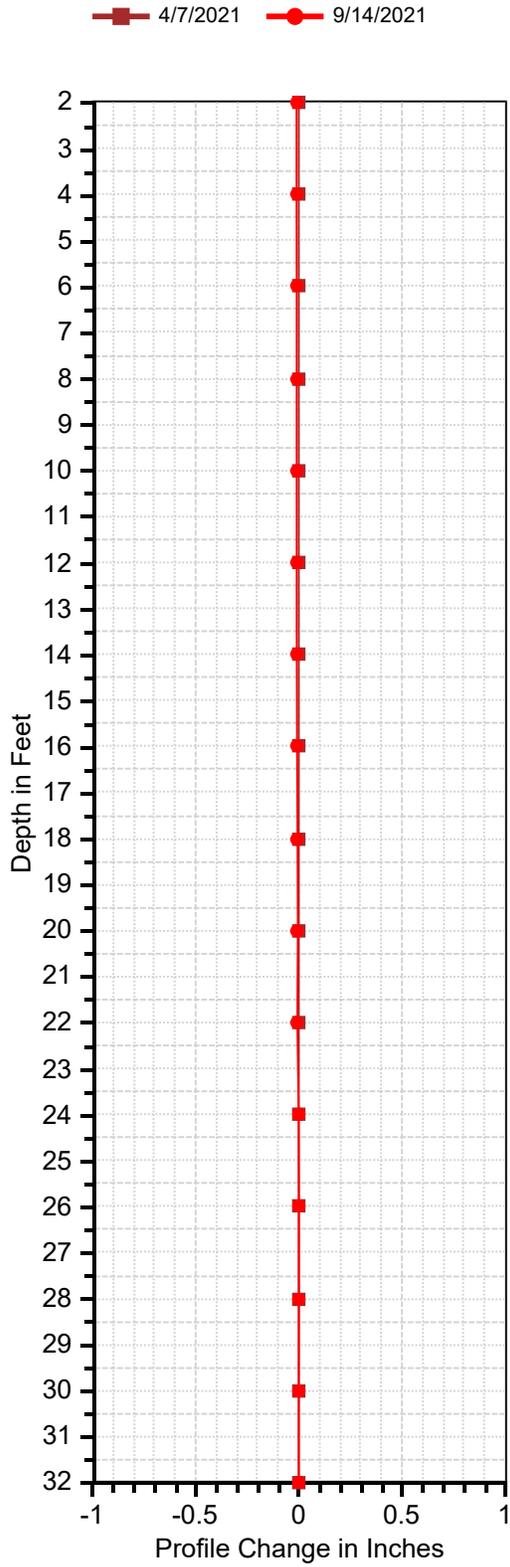


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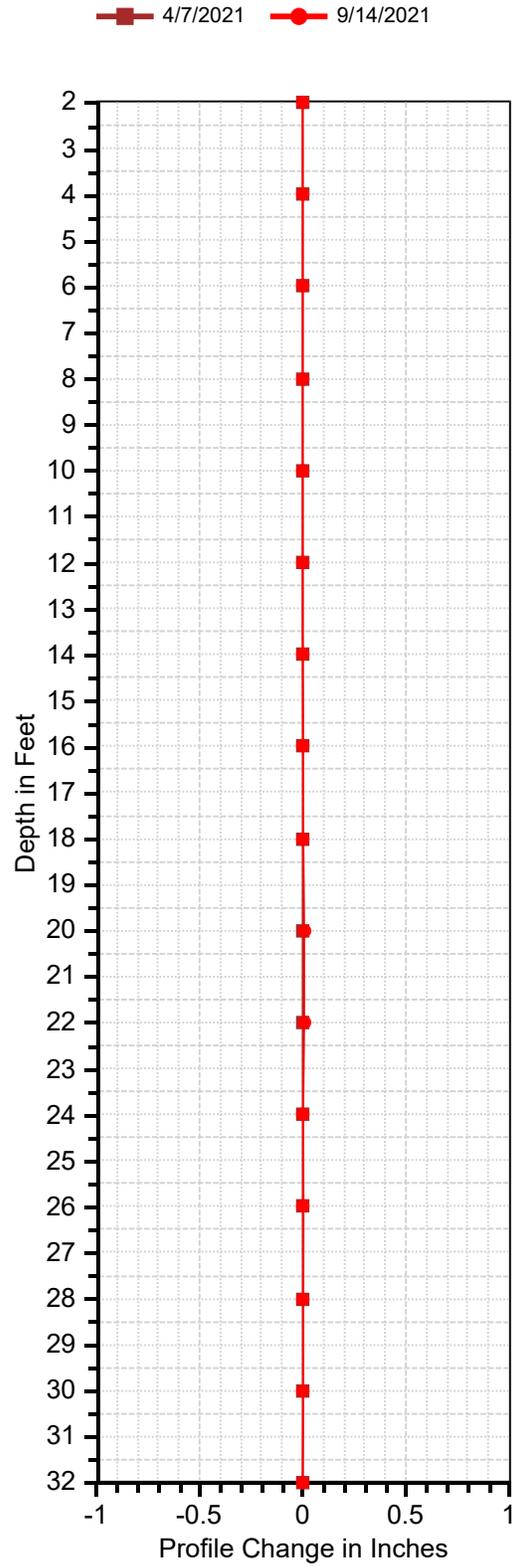
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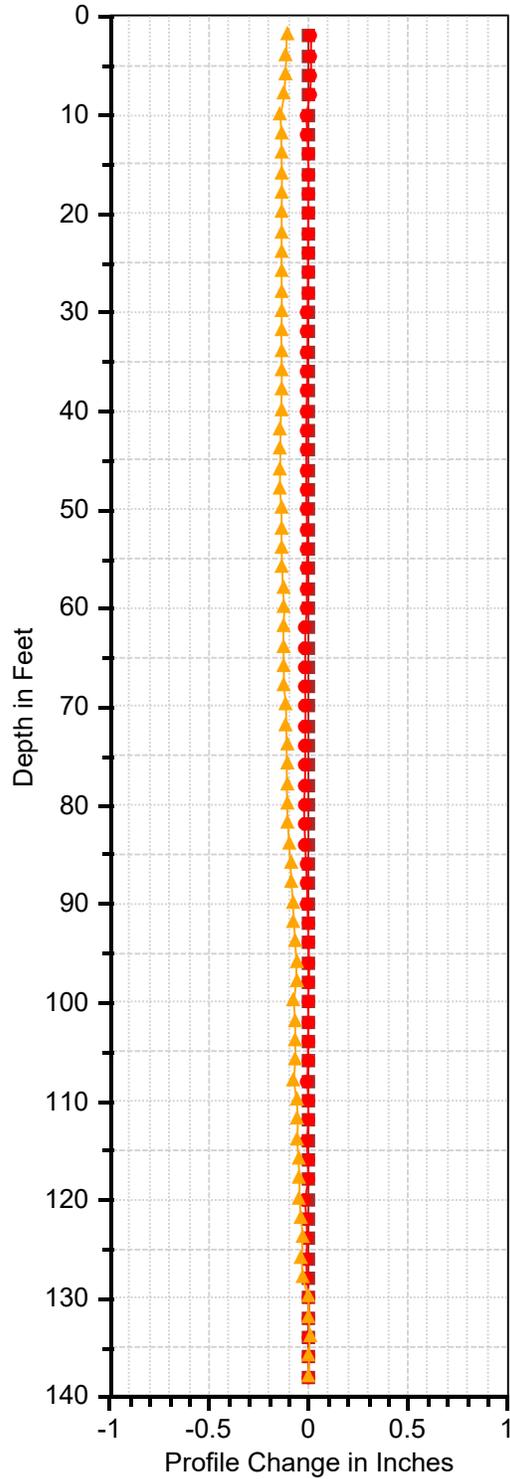


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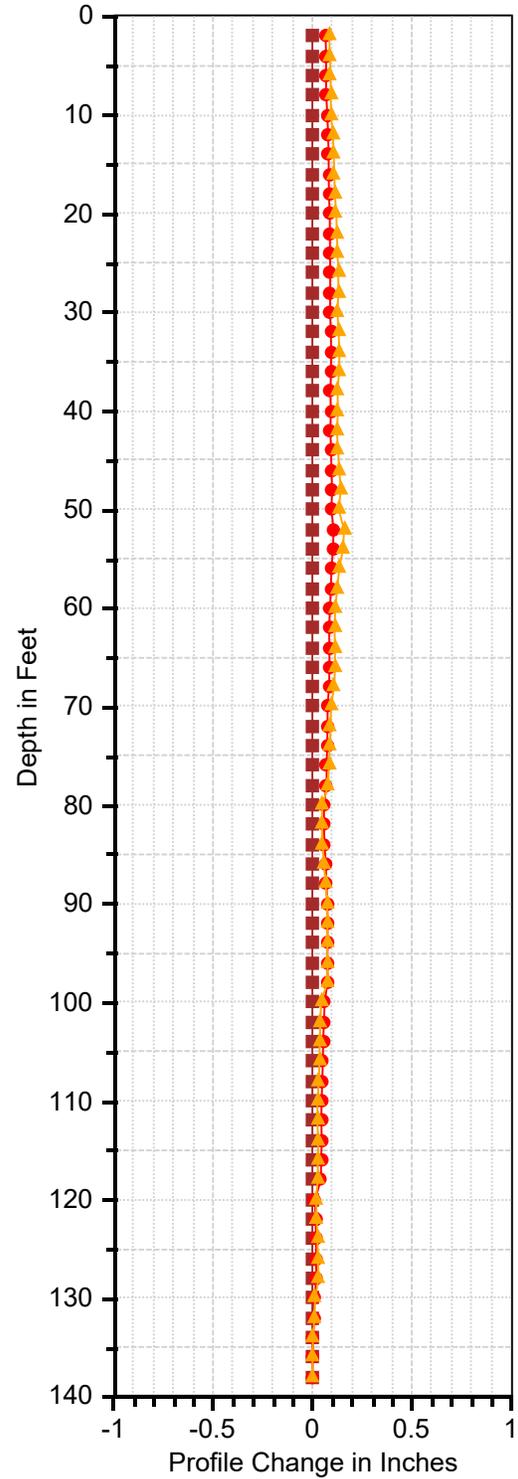
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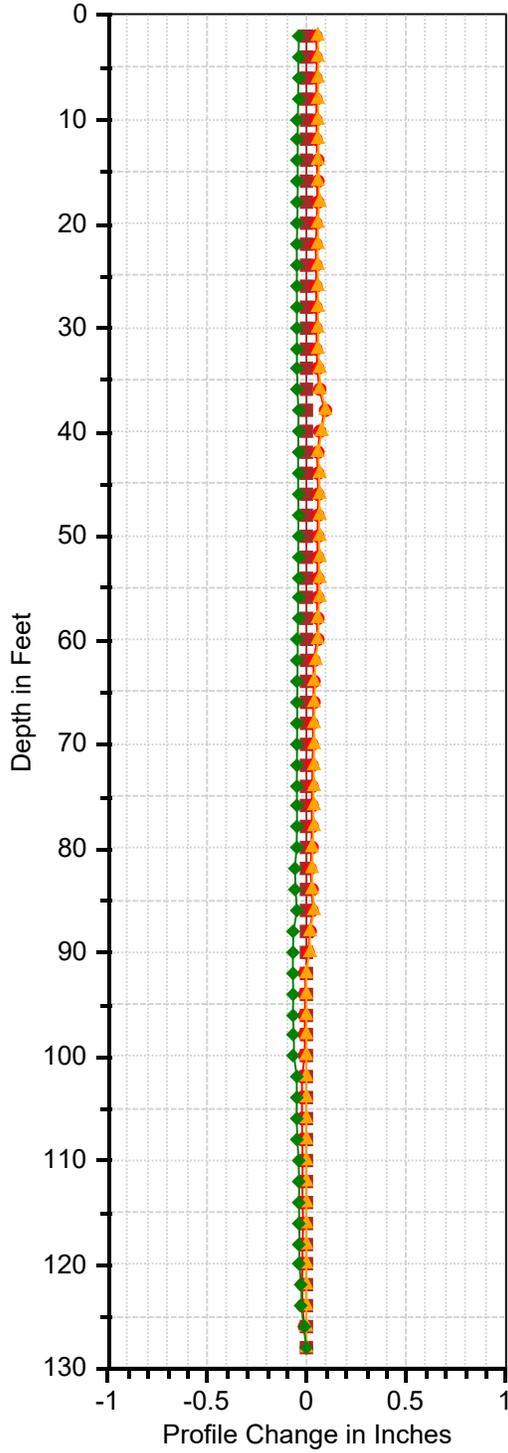
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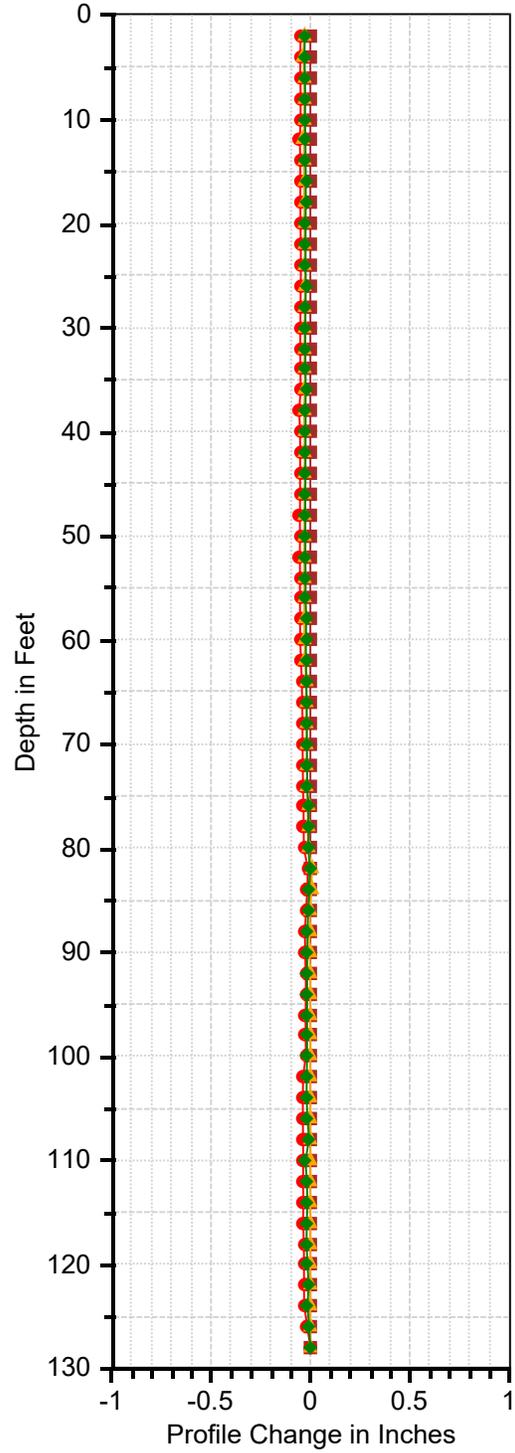
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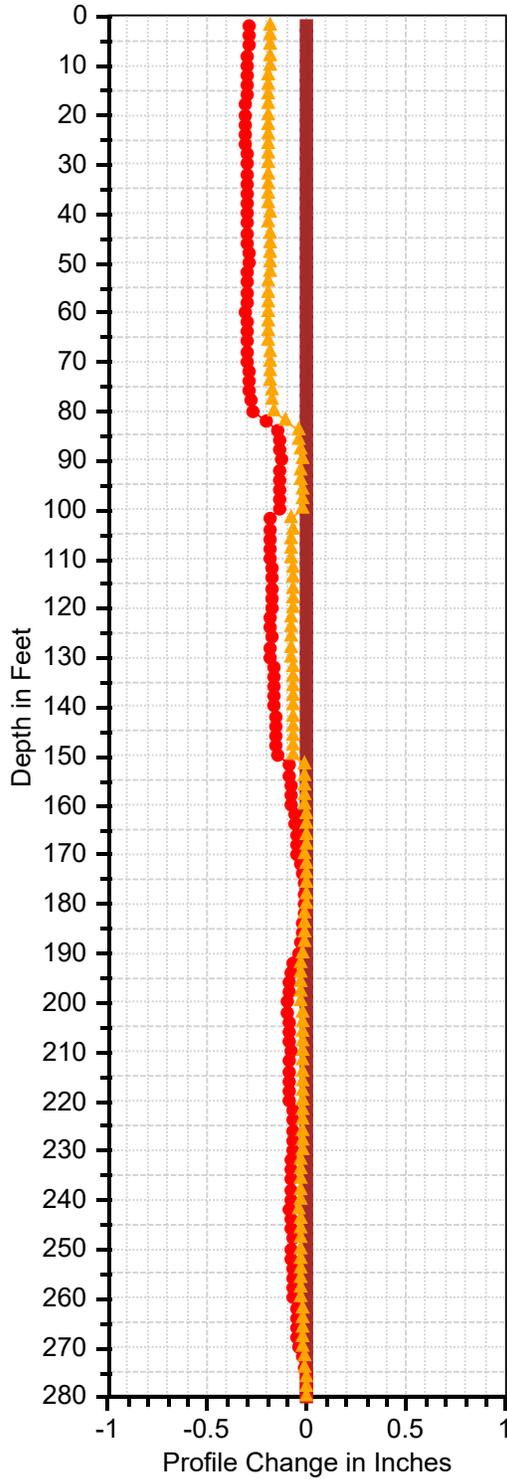
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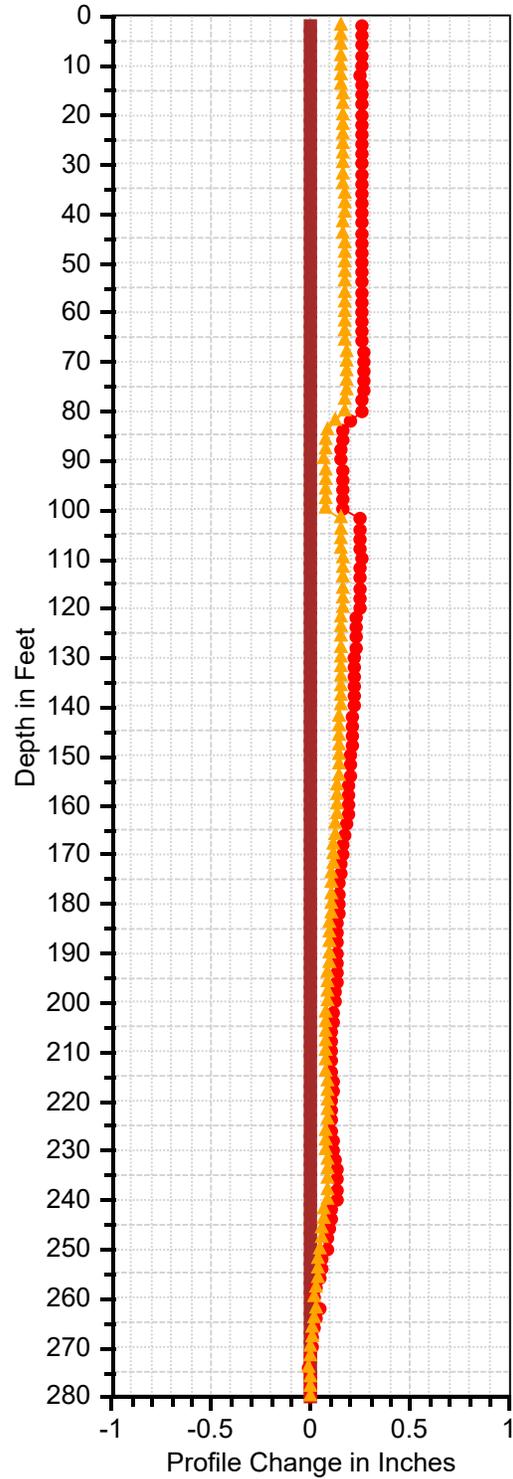
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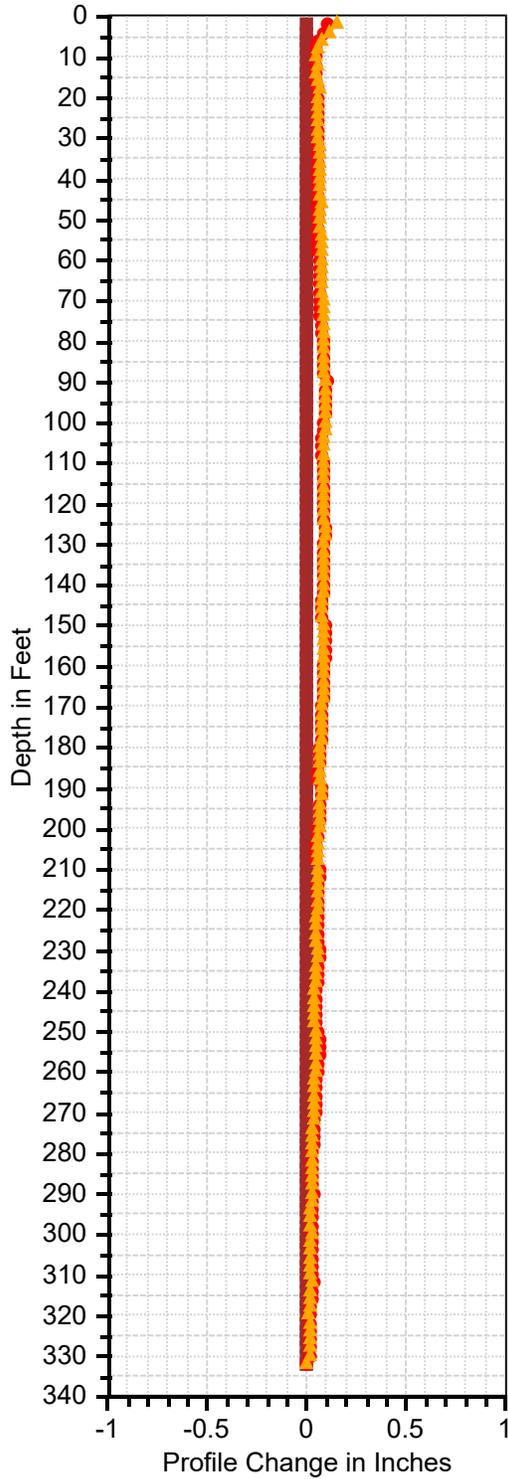
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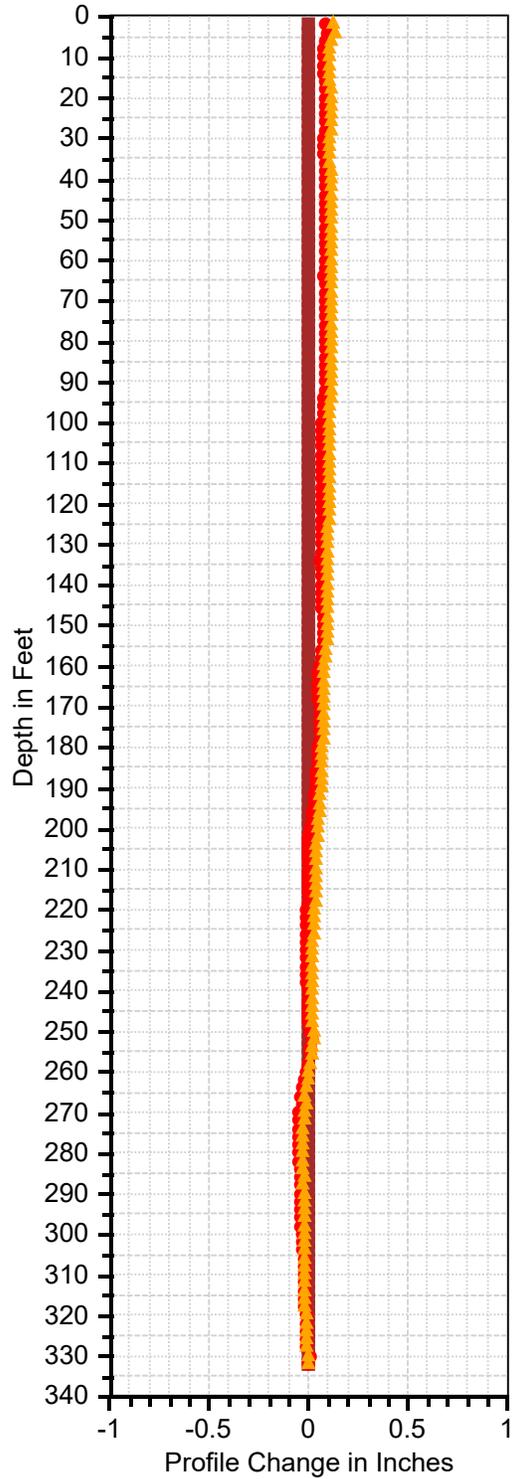
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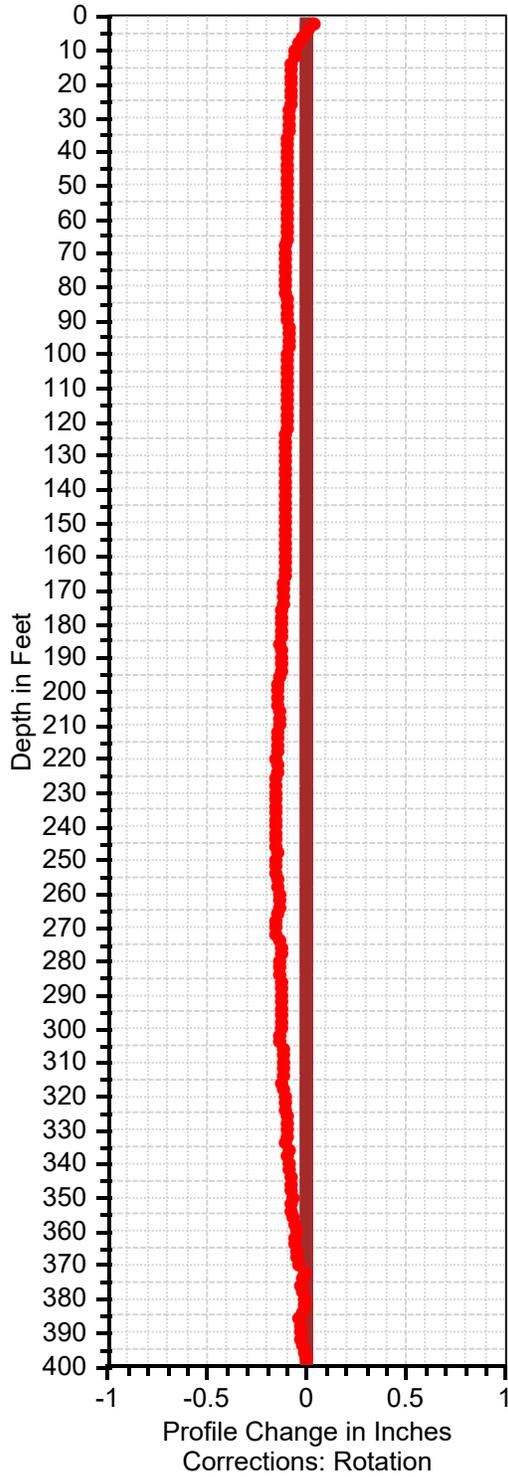
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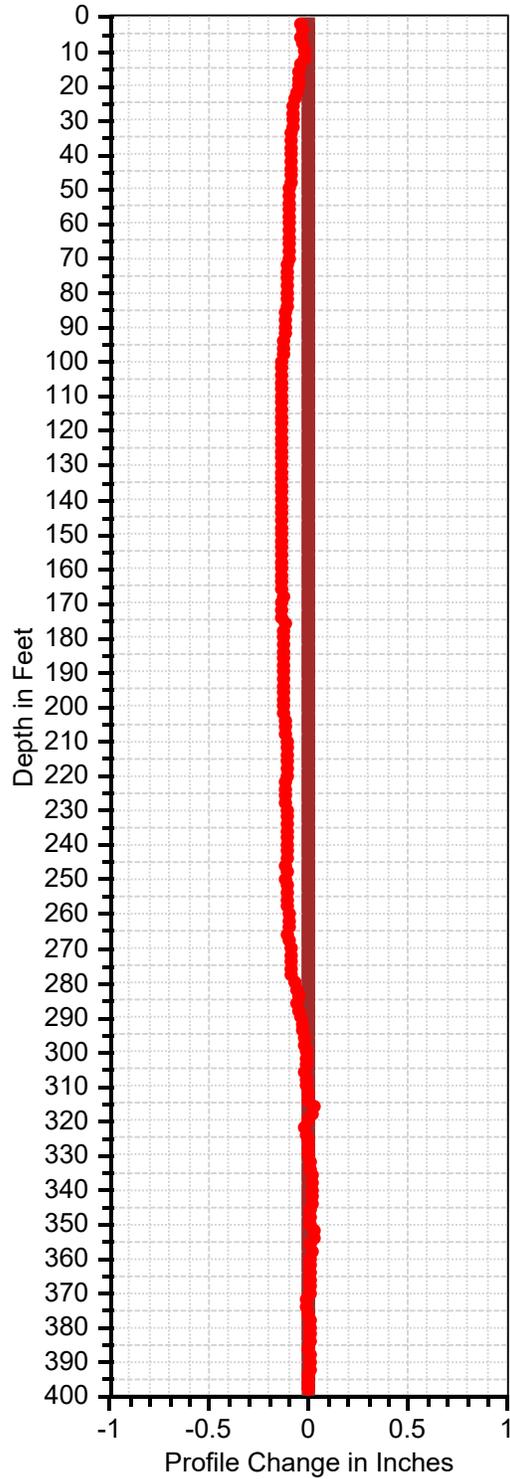
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10/27/2020 7/30/2021



BRM SP-23 B

10/27/2020 7/30/2021



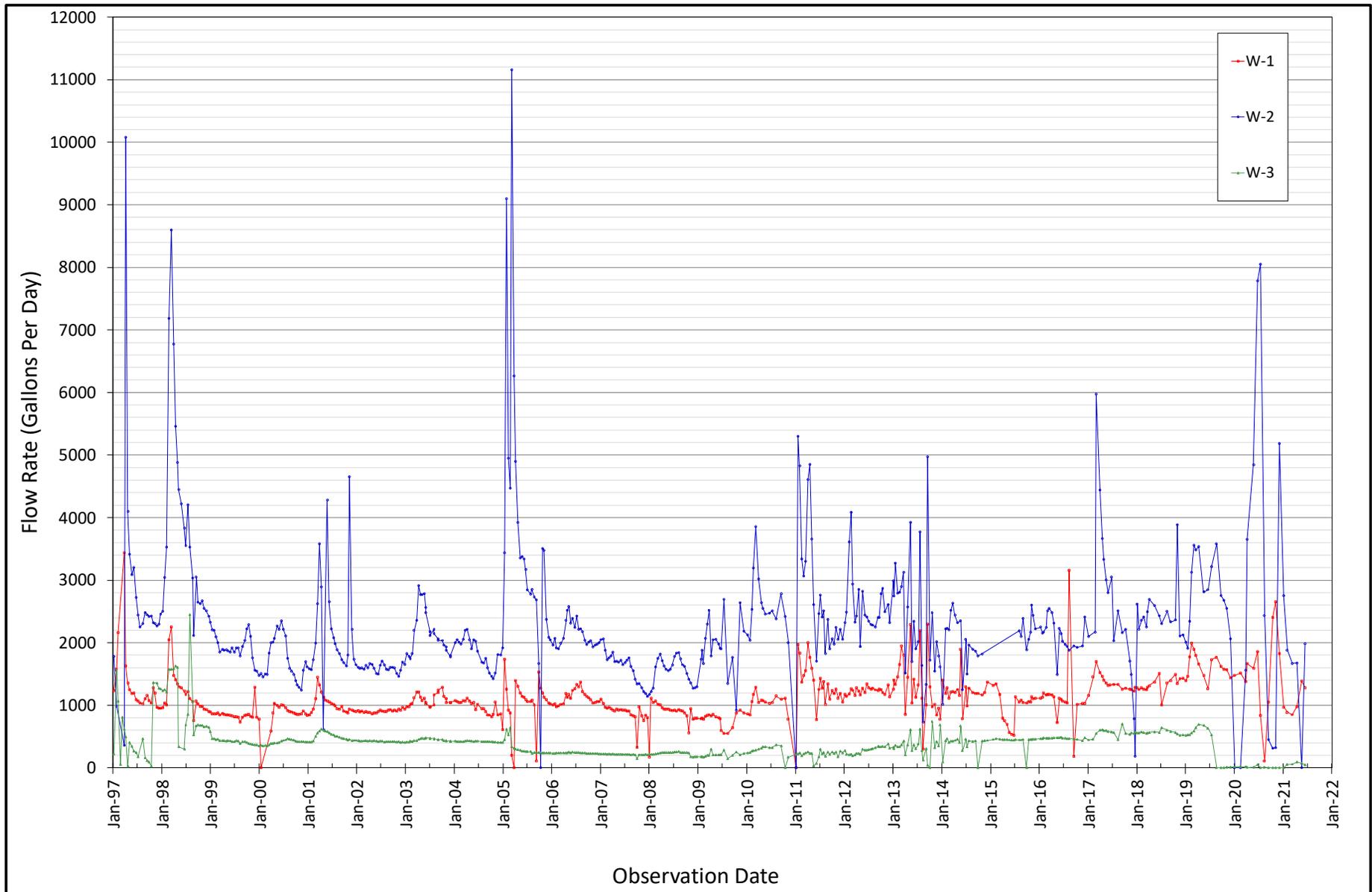
APPENDIX C - DEWATERING

SUMMARY OF DEWATERING WELL INFORMATION

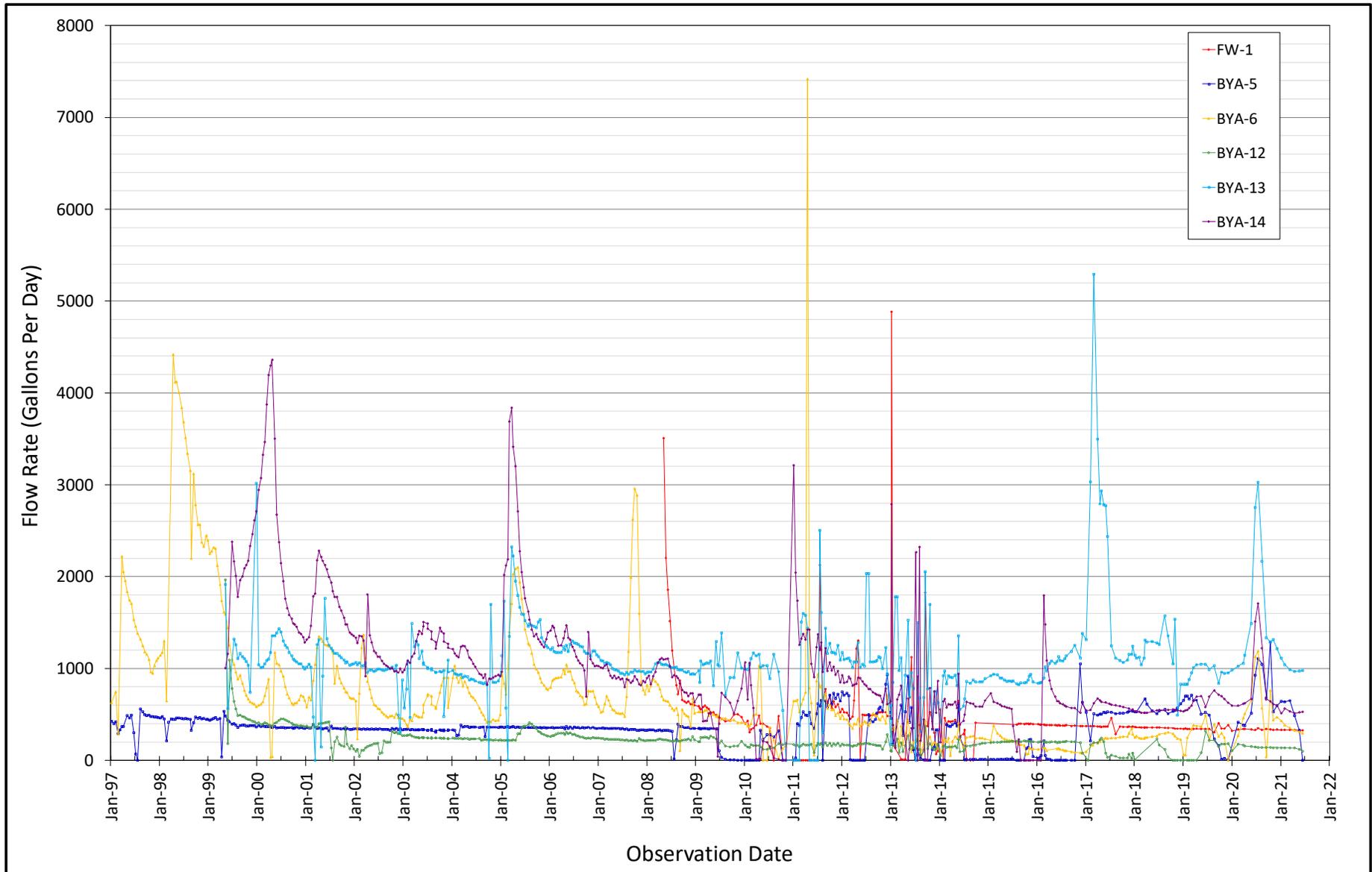
Well I.D.	DATE COMPLETED (DA Evans 1986)	TOP ELEV. (ft.)	BOTTOM ELEV. (ft.)	PUMP ELEV. (ft.)	PUMP SIZE (HP)	2020-2021 PUMPING RATE (GPD)	% of TOTAL PRODUCTION	Rank	Drainage Port	COMMENT
W-1	1977	210.5	-30	14.5	1.5	1,272	3%	11	3	Producing
W-2	1955	219	41	44	1.5	2,226	4%	8	3	Producing
W-3	1973	243.5	65.5	70.5	3/4	29	0%	23	3	Producing
W-4	1973	248	-10	N/A	N/A	0	0%	25	N/A	Non-producing, casing perforations closed due to siltation (BYA 1991)
W-5	1984	280	252	N/A	N/A	0	0%	25	N/A	Capped 4/4/84 (DA Evans 1986)
W-6	1983	174	80	N/A	N/A	0	0%	25	N/A	Non-producing, static water level at bottom of casing (BYA 1991)
W-7	1983	257	171	N/A	N/A	0	0%	25	N/A	Non-producing, static water level at bottom of casing (BYA 1991)
W-8	1983	287	93	98	1	5,203	10%	5	4	Producing
W-9	1983	282	87	N/A	N/A	0	0%	25	N/A	Non-producing, static water level at bottom of casing (BYA 1991), replaced with BYA-11
W-10	1983	432	192	194	3/4	0	0%	25	N/A	Inactive, no pump
W-11	1983	507	285	292	3/4	0	0%	25	N/A	Inactive, disconnected from electrical, replaced with BYA-10
W-12	1983	375	195	N/A	N/A	0	0%	25	N/A	Non-producing, casing sheared at 185 ft.elevation (BYA 1991)
W-13	1983	361	184	193	1	1,269	3%	12	5	Producing
W-14	1984	283	131	N/A	N/A	0	0%	25	N/A	Non-producing, static water level at bottom of casing (BYA 1991)
W-15	1984	295	121	130	3/4	0	0%	25	N/A	Inactive, replaced with BYA-9
W-16	1984	325	107	113	3/4	6,539	13%	1	5	Producing
W-17	1984	270	41	50	3/4	1,204	2%	13	4	Producing
W-18	1984	750	179	225	3	5,633	11%	4	6	Producing
BYA-1	1990	281	-162	-128	3	6,039	12%	2	4	Producing
BYA-2	1990	665	215	242	1.5	379	1%	20	6	Producing
BYA-3	1990	510	-40	29	3	1,691	3%	9	6	Producing
BYA-4	1990	372	-68	-28	1.5	4,587	9%	6	5	Producing
BYA-5	1990	189	-231	-211	1.5	666	1%	18	1	Producing
BYA-6	1996	220	-280	-275	0.75	464	1%	19	1	Producing
BYA-7	1996	240	-120	-115	0.75	994	2%	15	2	Producing
BYA-9	1996	295	-105	-100	7.5(5)	5,638	11%	3	5	Producing
BYA-10	1996	510	210	215	1	754	1%	16	5A	Producing
BYA-11	1996	275	-125	-120	0.75	2,345	5%	7	5	Producing
BYA-12	1998	207	-140	-137	0.5	134	0%	22	1	Producing
BYA-13	1998	329	-14	-18	0.5	1,368	3%	10	3	Producing
BYA-14	1998	265	38	40	0.5	718	1%	17	1A	Producing
BYA-15	2002	429	340	300	1	1	0%	24	6	Producing <10 GPD
FW-1	2008	170			1	334	1%	21	1A	Producing
FW-2	2009	270	-130	-115	1.5	1,031	2%	14	4	Producing

Note:

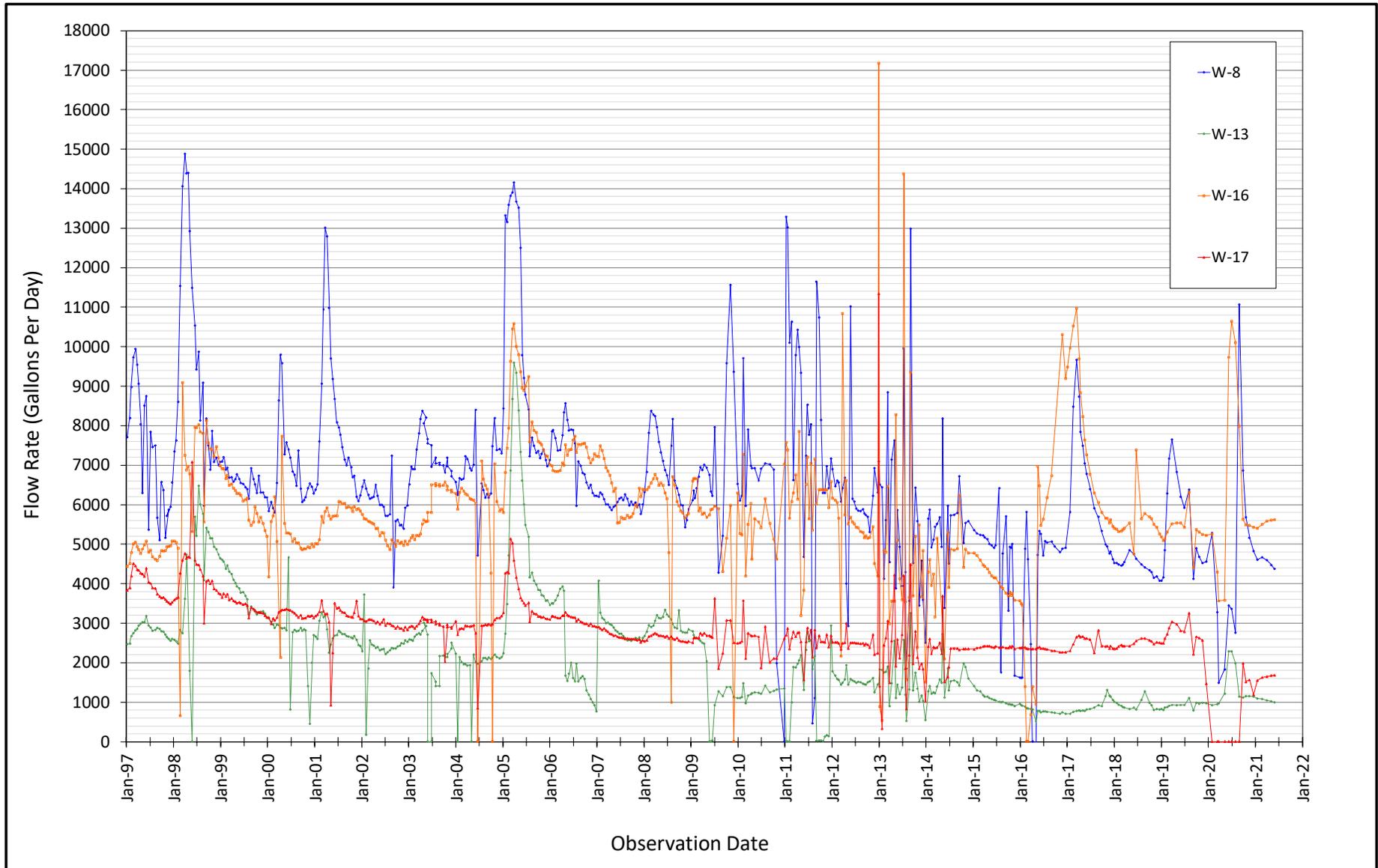
- Not functioning or no longer monitored dewatering well



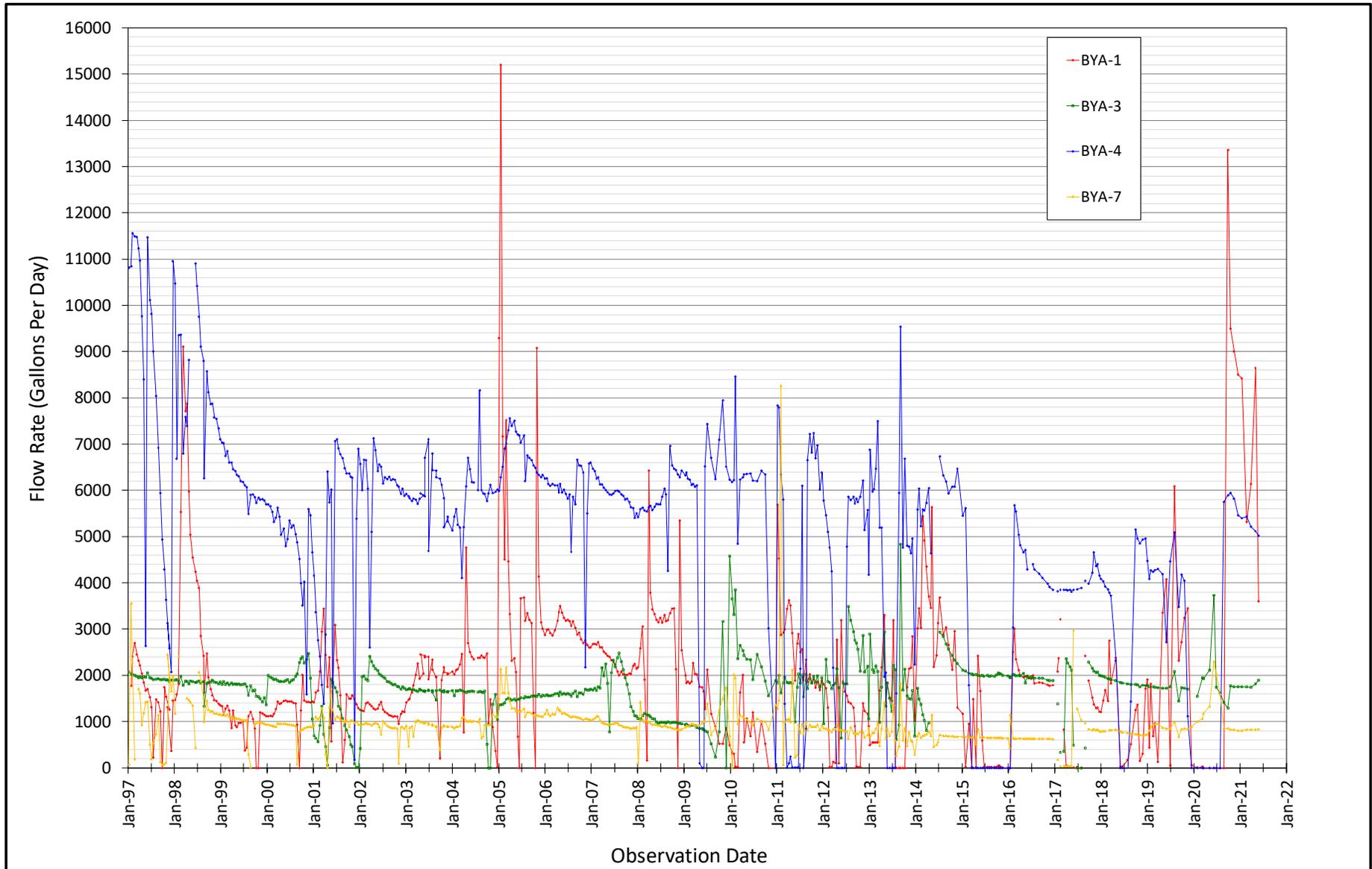
**DISCHARGE RATE FOR DEWATERING WELLS
Eastern Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California**



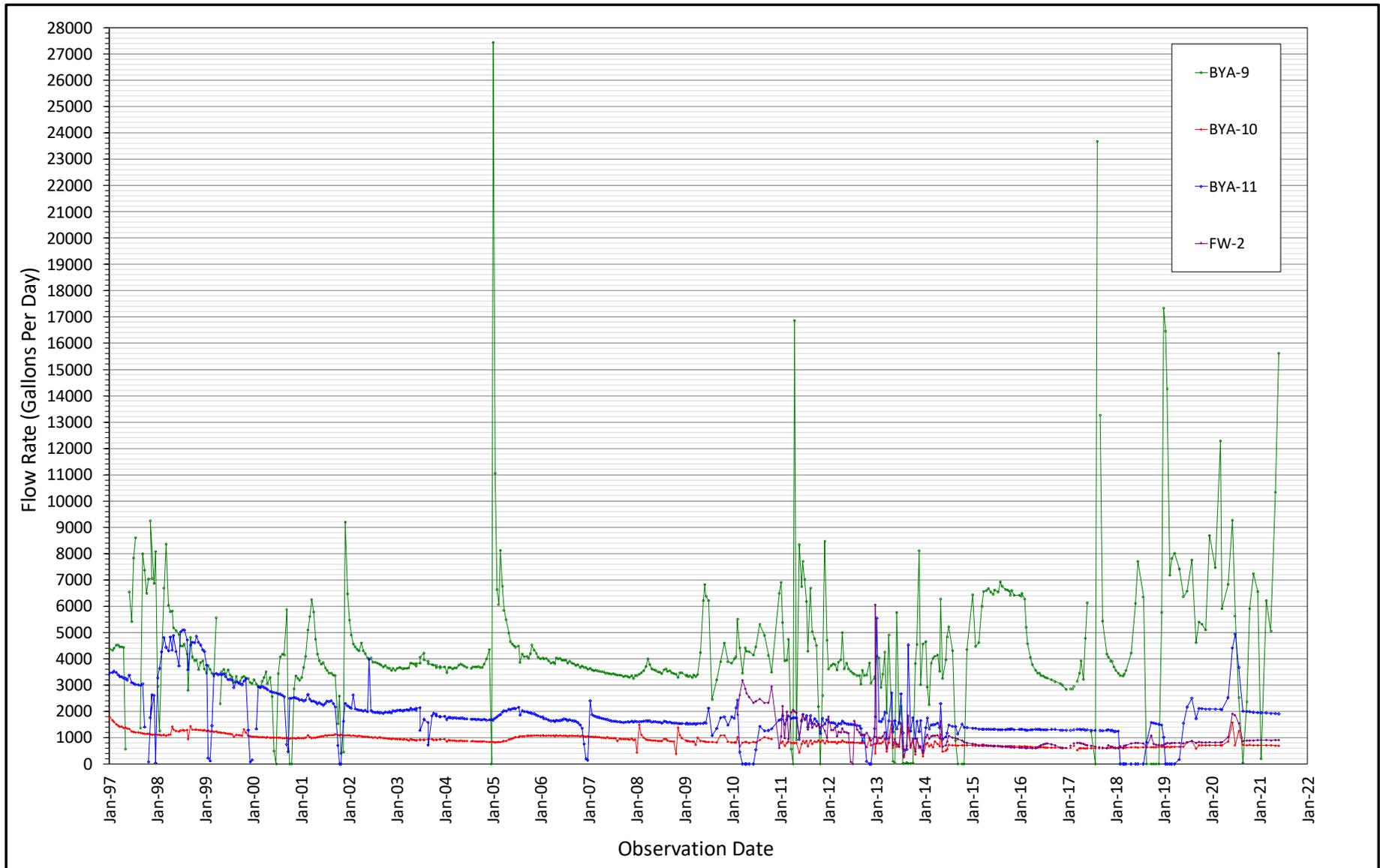
DISCHARGE RATE FOR DEWATERING WELLS
Eastern Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



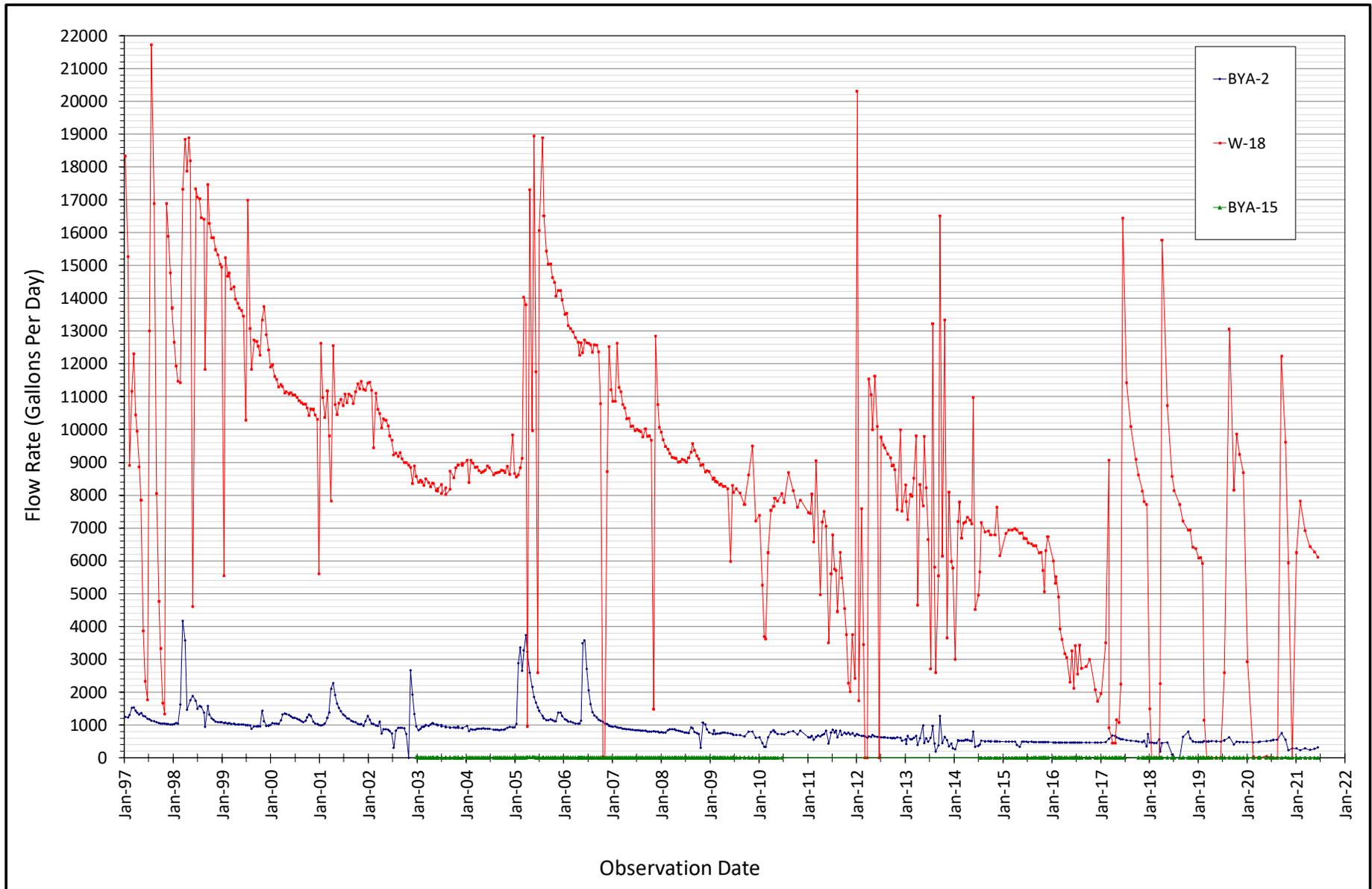
DISCHARGE RATE FOR DEWATERING WELLS
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



DISCHARGE RATE FOR DEWATERING WELLS
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



DISCHARGE RATE FOR DEWATERING WELLS
Central Mesa Region
Big Rock Mesa Landslide Assessment District
Malibu, California



DISCHARGE RATES FOR DEWATERING WELLS
Western Extension
Big Rock Mesa Landslide Assessment District
Malibu, California

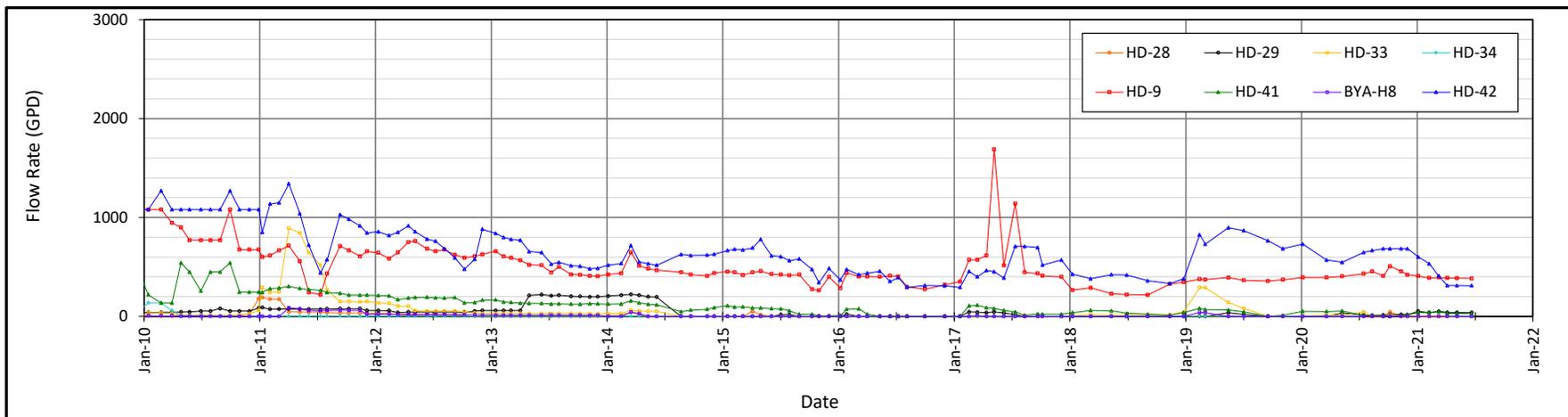
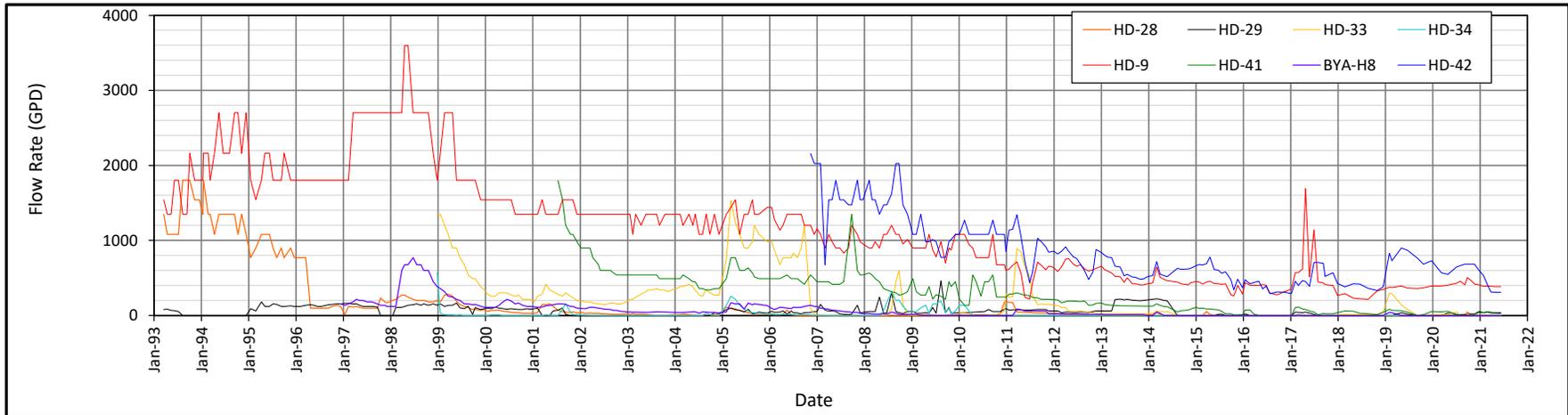
SUMMARY OF HYDRAUGER INFORMATION							
HYDRAUGER ID	INSTALLED LENGTH (ft.)	OPEN LENGTH (ft.)**	Orientation/ Slope	2017-2018 Average Flow (GPD)	% OF TOTAL PRODUCTION	Rank	INSTALLED BY
H-1	700	210**	S115W / 3	16	0.1%	20	MT
HD-4	760	10	-	446	3.1%	9	D.E.
HD-5	890	530**	-	856	6.0%	6	D.E.
HD-6	980	490**	-	166	1.2%	13	D.E.
HD-7	1160	420**	-	68	0.5%	16	D.E.
HD-9	205	205**	-	452	3.2%	8	D.E.
HD-10	990	170**	-	339	2.4%	11	D.E.
HD-11	540	540**	-	77	0.5%	15	D.E.
HD-12	690	385**	-	2426	17.1%	2	D.E.
HD-15	200	200**	-	144	1.0%	14	D.E.
HD-22	568	540**	-	1022	7.2%	5	D.E.
HD-23	1280	260**	-	1499	10.6%	4	D.E.
HD-24	1030	580**	-	58	0.4%	17	D.E.
HD-25	1005	360**	-	42	0.3%	18	D.E.
HD-26	1200	410**	S37W / 1	1866	13.2%	3	D.E.
HD-28	1420	595**	-	0	--	--	D.E.
HD-29	1150	450**	-	2	0.0%	24	D.E.
HD-30	1040	10**	S13W / 7	3480	24.5%	1	D.E.
HD-33	340	340	S23W / 5	5	0.0%	23	BYA
HD-41	500	500	S18E / 3	35	0.2%	19	BYA
BYA-H8	500	345**	-	0	--	--	BYA
BYA-H10	500	10**	-	237	1.7%	12	BYA
HD-42	700	700	-	554	3.9%	7	Fugro
HD-43	700	700	-	394	2.8%	10	Fugro
H-2*	Unknown	0	-	0	--	--	MT
H-3a*	Unknown	0	-	0	--	--	MT
H-3b*	Unknown	0	-	0	--	--	MT
H-3c*	Unknown	0	-	0	--	--	MT
H-4	680	115**	-	0	--	--	MT
H-5a*	Unknown	0	-	0	--	--	MT
H-5b*	Unknown	0	-	0	--	--	MT
H-6a*	100	96	-	0	--	--	CT
H-6b*	100	96	-	0	--	--	CT
H-7a*	100	100	-	0	--	--	CT
H-7b*	100	96	-	0	--	--	CT
H-7c*	50	0	-	0	--	--	CT
H-8*	Unknown	0	-	0	--	--	CT
HD-1*	350	340**	-	0	--	--	D.E.
HD-2a*	70	33	-	0	--	--	D.E.
HD-2b*	Unknown	0	-	0	--	--	D.E.
HD-2c*	460	0	-	0	--	--	D.E.
HD-3	560	90**	-	0	--	--	D.E.
HD-8*	530	170**	-	0	--	--	D.E.
HD-13*	650	14	-	0	--	--	D.E.
HD-14*	130	130**	-	0	--	--	D.E.
HD-16	575	575**	-	0	--	--	D.E.
HD-17*	750	176	-	0	--	--	D.E.
HD-18*	870	285	-	0	--	--	D.E.
HD-19*	1000	182	-	0	--	--	D.E.
HD-20*	1000	446	-	0	--	--	D.E.
HD-21*	1560	147	-	0	--	--	D.E.
HD-27*	700	327	-	0	--	--	D.E.
HD-31*	140	113	-	0	--	--	D.E.
HD-32*	835	700**	-	0	--	--	D.E.
HD-34	150	150	S40W / 10	0	--	--	BYA
HD-35*	40	40	-	0	--	--	BYA
HD-36*	150	150	-	0	--	--	BYA
HD-37*	430	50	-	0	--	--	BYA
HD-38A*	140	140	S23W / 5	0	--	--	BYA
HD-38B*	140	140	S18W / 6	0	--	--	BYA
HD-39	400	400	S15E / 5	0	--	--	BYA
HD-40*	595	595	S25W / 6	0	--	--	BYA
BYA-6a	350	20**	-	8	0.1%	22	BYA
BYA-6b	60	60	-	9	0.1%	21	BYA
BYA-7	400	375**	-	0	--	--	BYA
BYA-H9*	550	550**	-	0	--	--	BYA
BYA-H11*	450	400**	S7E / 3	0	--	--	BYA

* Not functioning or no longer monitored hydrauger

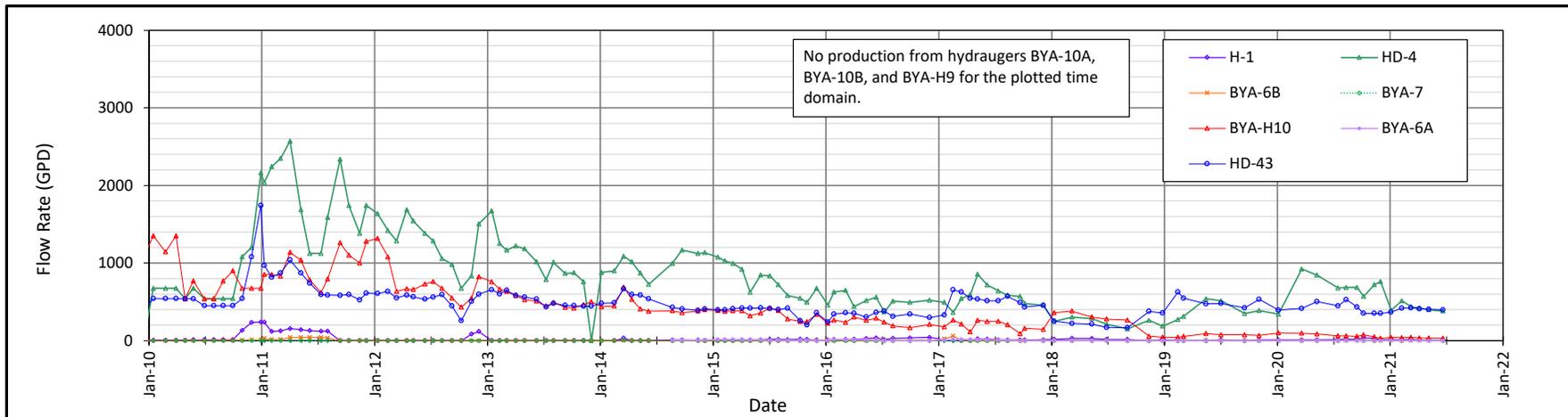
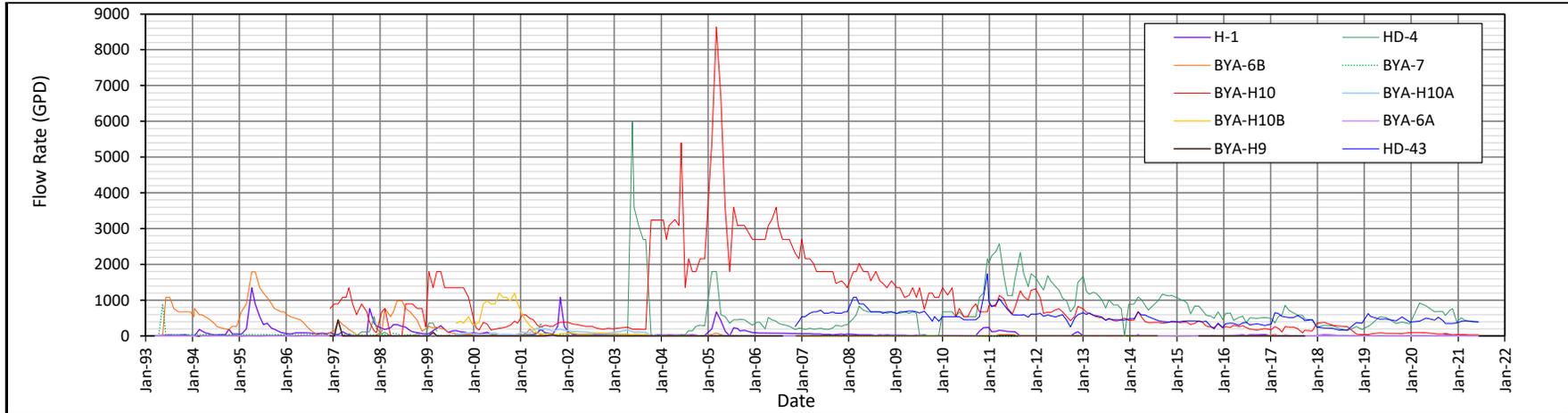
** Open Length is Measured on 10-1997 by BYA

Installed by: MT = Moore & Taber; CT = Caltrans; D.E. = D.A. Evans; BYA = Bing Yen & Associates

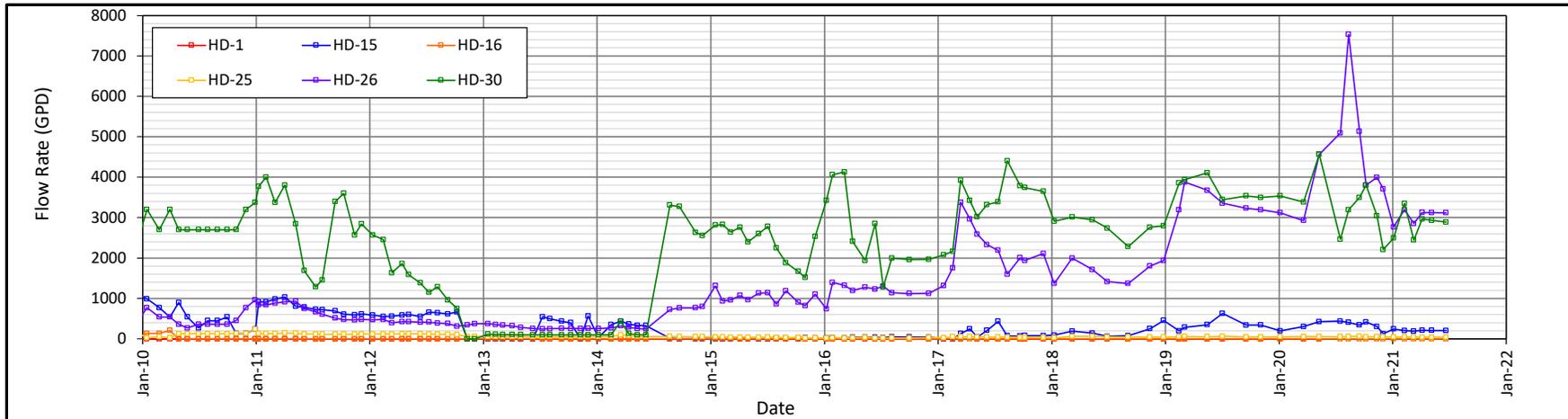
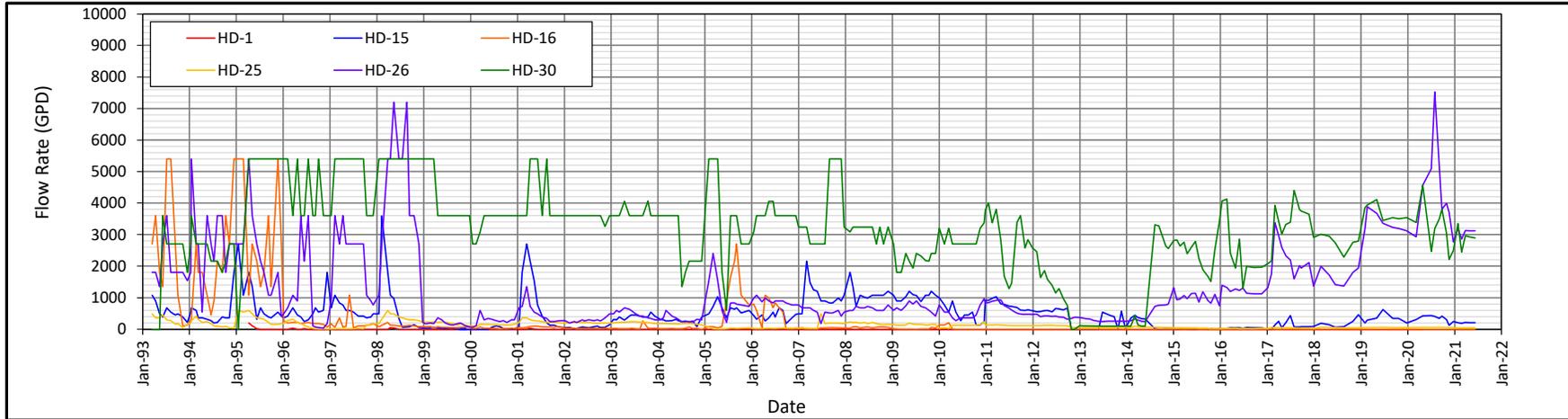
SUMMARY OF HYDRAUGER INFORMATION
 Big Rock Mesa Landslide Assessment District
 Malibu, California



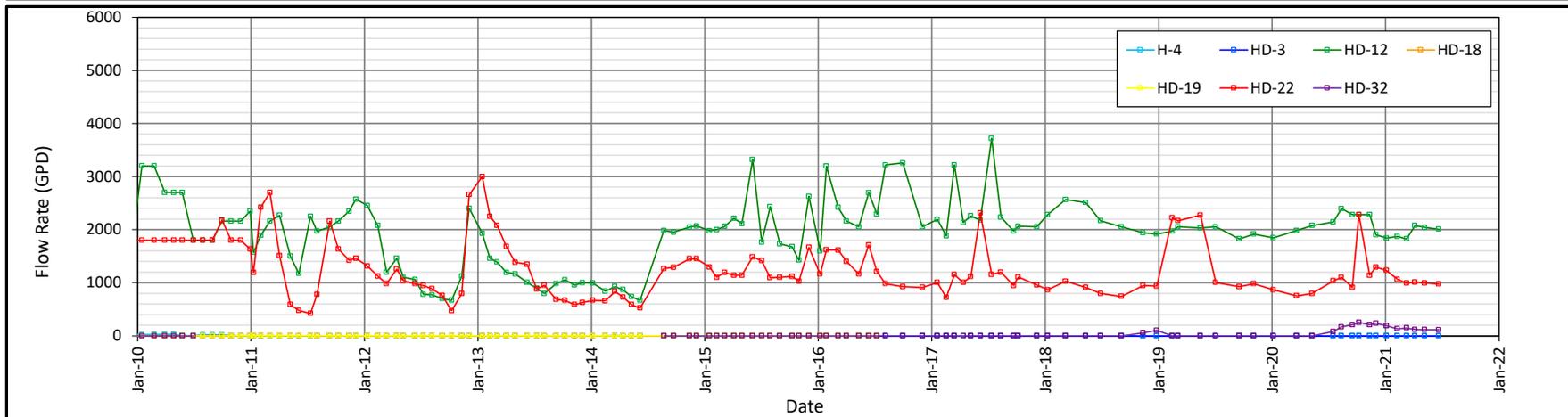
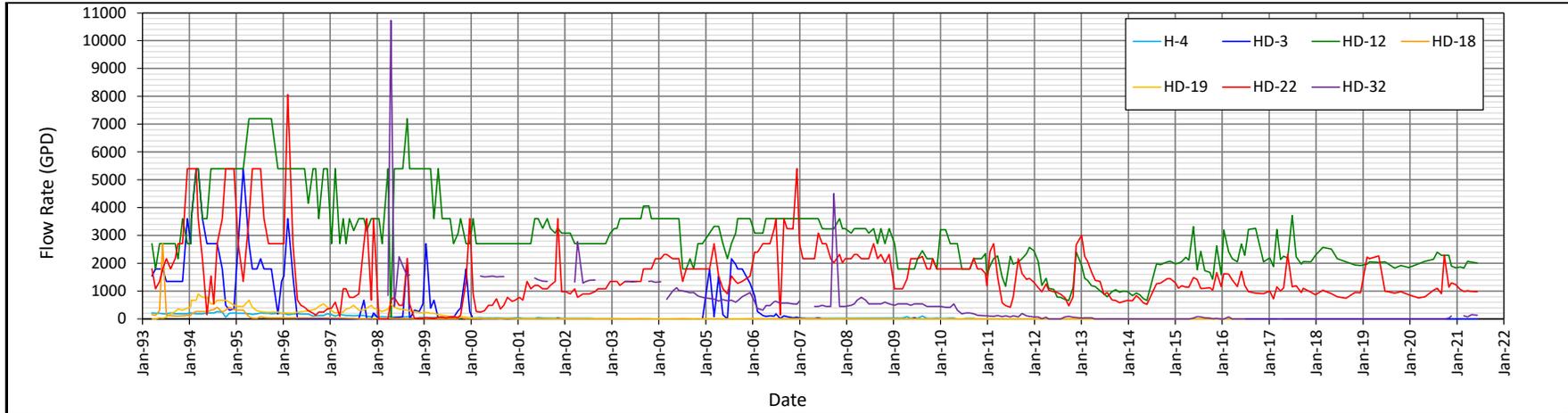
DISCHARGE RATE FOR HYDRAUGERS
Eastern Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



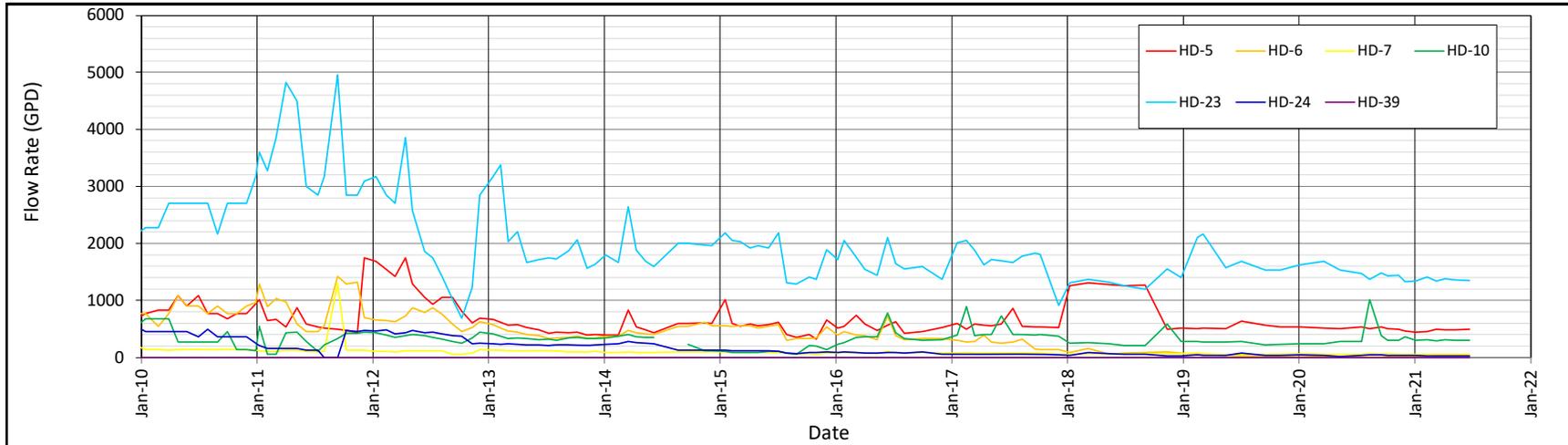
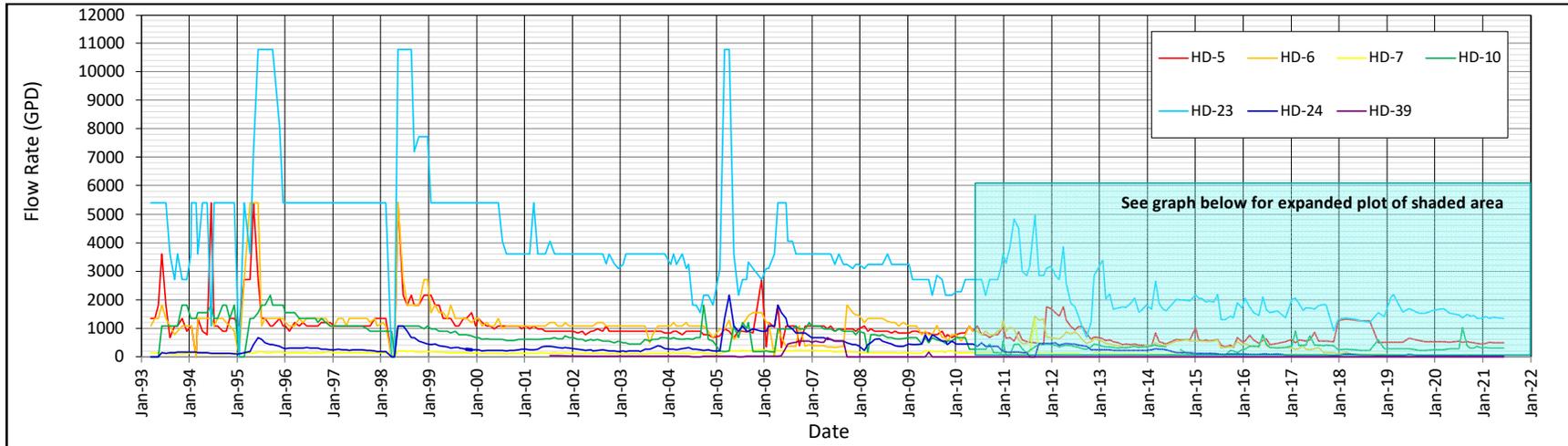
DISCHARGE RATE FOR HYDRAUGERS
Eastern Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



DISCHARGE RATE FOR HYDRAUGERS
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



DISCHARGE RATE FOR HYDRAUGERS
Central Mesa Region
 Big Rock Mesa Landslide Assessment District
 Malibu, California



DISCHARGE RATE FOR HYDRAUGERS
Western Extension
 Big Rock Mesa Landslide Assessment District
 Malibu, California

APPENDIX D - GROUNDWATER QUALITY

2020 Q3 INORGANIC NON-METALS (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature	Biochemical Oxygen Demand	Surfactants (MBAS)	Oil & Grease	Settleable Solids	Sulfides	Phenols	Residual Chlorine (Field Measured)	Total Suspended Solids	Turbidity	TPH Diesel	TPH Motor Oil	Bis(2-Ethylhexyl) Phthalate	Zinc	Total Coliform	Fecal Coliform	Fecal/Total Coliform >0.1?	Enterococcus	Acute Toxicity**
				°F	mg/L	mg/L	mg/L	mL/L	mg/L	mg/L	mg/L	mg/L	NTU	µg/L	µg/L	µg/L	µg/L	MPN/100ml	MPN/100ml		MPN/100ml	% Survival
Discharges to M-001 (Outfall/Port #1a)																						
7/21/2020	BYA-14	100%	7.22	72.1	3.2	ND	ND	ND	ND	0.043 J	0.00	ND A07	0.13	ND	ND	ND A10	28 J	<1.8	<1.8	N/A	3.0	--
8/13/2020	FW-1	100%	7.64	73.0	24	ND	ND	ND	35 A07	ND	0.02	0.80 A07	110 A07	ND	ND	ND	ND	<1.8	1.80	N/A	<1	--
9/8/2020	BYA-14	100%	7.21	71.1	ND	ND	ND	ND	ND	0.026 J	--	ND	0.29	ND	ND	ND	18 J	<1.8	1.80	N/A	<1	--
9/10/2020	FW-1	100%	7.60	73.2	26	--	--	--	38 A07	ND	--	0.80 A07	44 A07	--	--	--	--	--	--	--	--	--
9/18/2020	FW-1	100%	7.62	73.0	17	--	--	--	23 A07	ND	--	0.80 A07	130 A07	--	--	--	--	--	--	--	--	--
9/24/2020	FW-1	100%	7.59	73.4	16	--	--	--	20 A07	ND	--	0.80 A07	130	--	--	--	--	--	--	--	--	--
Discharges to M-002 (Outfall/Port #1)																						
7/21/2020	HD-42	45%	6.73	74.7	2.4	0.074 J	ND	ND	ND	ND	0.00	4.1 A07	0.27	ND	ND	ND	130	<1.8	<1.8	N/A	1.0	-
	HD-9	55%																				
8/7/2020	HD-42	45%	6.70	74.3	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--
	HD-9	55%																				
8/12/2020	BYA-5	58%	7.46	74.3	ND	ND	ND	ND	ND	ND	0.00	3.1 A07	1.10	ND	ND	ND	1000	350	22	No	3.0	--
	BYA-6	42%																				
8/20/2020	HD-42	45%	6.99	73.9	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--
	HD-9	55%																				
9/8/2020	HD-42	45%	7.06	74.3	ND	ND	ND	ND	ND	ND	0.00	ND A07	0.30	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-9	55%																				
Discharges to M-003 (Outfall/Port #2)																						
7/21/2020	HD-41	100%	7.48	72.7	--	--	ND	--	--	ND	0.00	--	--	ND	ND	--	--	--	--	--	--	--
7/21/2020	BYA-6A	0%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharges to M-004 (Outfall/Port #3)																						
7/21/2020	BYA-13	100%	7.08	72.7	ND	ND	ND	ND	ND	ND	0.00	ND A07	0.27	ND	ND	ND	34 J	<1.8	<1.8	N/A	3.0	--
	W-2	Down																				
8/12/2020	HD-30	88%	7.20	70.0	ND	ND	ND	ND	ND	ND	0.00	ND	0.12	ND	ND	ND	ND	<1.8	<1.8	N/A	>2400	--
	HD-43	12%																				
9/8/2020	W-1	100%	7.46	71.6	ND	ND	ND	ND	ND	ND	0.01	1.8	1.4	ND	ND	ND	96	<1.8	<1.8	N/A	<1	--
	W-2	Down																				
Discharges to M-005 (Outfall/Port #4)																						
7/22/2020	FW-2	100%	7.02	72.0	ND	ND	ND	ND	ND	ND	0.00	2.5 A07	3.50	ND	ND	ND	19 J	<1.8	<1.8	N/A	1.0	-
8/12/2020	HD-26	100%	7.20	71.6	ND	ND A07	ND	ND	ND	ND	0.00	ND A07	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	1.0	--
9/10/2020	W-8	100%	7.28	74.5	ND	ND	ND	ND	ND	ND	0.00	ND A07	14	ND	ND	ND	23 J	<1.8	<1.8	N/A	<1	--
	W-17	Down																				
Discharges to M-006 (Outfall/Port #5)																						
7/22/2020	HD-22	100%	7.63	71.8	ND	0.027 J	0.75 J	ND	ND	ND	0.00	0.82 A07	2.4	ND	ND	ND	15 J	<1.8	<1.8	N/A	<1	-
	Duplicate	100%																				
8/12/2020	W-16	30%	7.42	74.3	ND	ND	ND	ND	ND	ND	0.00	ND A07	2.2	ND	ND	ND	4.5 J	<1.8	<1.8	N/A	<1	-
	BYA-4	23%																				
	BYA-9	42%																				
	BYA-11	5%																				
9/10/2020	W-16	30%	7.40	74.8	ND	ND	ND	ND	ND	ND	0	ND A07	0.52	ND	ND	ND	41 J	<1.8	<1.8	N/A	<1	--
	BYA-4	23%																				
	BYA-9	42%																				
	W-13	5%																				
Discharges to M-007 (Outfall/Port #5a)																						
7/22/2020	BYA-10	100%	7.60	73.9	1.5	0.031 J	ND	ND	ND	ND	0.00	0.6 A07	0.45	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
8/13/2020	BYA-10	100%	7.54	74.5	1.5	ND	ND	ND	ND	ND	0.02	1.4 A07	0.52	ND	ND	ND	ND	4.5	<1.8	<1.8	N/A	<1
	Duplicate	100%	7.54	74.5	1.6	ND	ND	ND	ND	ND	0.02	0.58 A07	0.32	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
9/8/2020	BYA-10	100%	7.56	74.5	ND	ND	ND	ND	ND	ND	0.00	ND	0.39	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-008 (Outfall/Port #6)																						
7/22/2020	HD-10	16%	7.60	70.9	2.7	ND	ND	ND	ND	ND	0.00	0.94 A07	1.3	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	-
	HD-12	84%																				
	W-18	70%																				
8/12/2020	BYA-2	7%	7.38	73.0	2.0	ND	ND	ND	ND	ND	0.00	0.80 A07	1.6	ND	ND	ND	110	<1.8	<1.8	N/A	<1	--
	BYA-3	23%																				
	HD-12	100%																				
9/10/2020	HD-12	100%	7.30	73.8	5.4	ND	ND	ND	ND	ND	0.00	9.4 A07	0.19	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	Duplicate	100%																				
	Duplicate	100%	7.30	73.8	5.3	ND S05	ND	ND	ND S05	ND	0.00	1.1A07,S05	0.27	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-009 (Outfall/Port #7)																						
7/21/2020	HD-7	100%	8.15	75.2	ND	0.03 J	ND	ND	ND	ND	0.00	0.67 A07	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	-
8/12/2020	HD-7	100%	8.08	74.7	ND	ND	ND	ND	ND	ND	0.00	ND A07	0.16	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	-
9/8/2020	HD-7	100%	8.31	75.6	ND	ND	ND	ND	ND	ND	0.00	1.0 A07	0.34	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	-
Discharges to M-010 (Outfall/Port #9)																						
7/21/2020	HD-5	23%	7.61	73.8	ND	0.04 J	ND	ND	ND	ND	0.00	ND A07	0.13	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	-
	HD-6	10%																				
	HD-23	67%																				
8/12/2020	HD-5	23%	7.54	74.1	ND	ND	ND	ND	ND	ND	0.00	0.56 A07	0.12	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	-
	HD-6	10%																				
	HD-23	67%																				
9/8/2020	HD-5	23%	7.62	73.9	ND	ND	7.0	ND	ND	ND	0.00	0.56 A07	0.17	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-6	10%																				
	HD-23	67%																				
Effluent Limit (Daily Max.)																						
				---	30	0.5	15	0.3	1.0	1.0	0.1	75	150	100	100	11	95	10000	400		104	90
Effluent Limit (Daily Max. if Fecal/Total Coliform > 0.1)																						
				---	20	---	10	0.1	---	---	---	50	50	---	---	5.9	47	1000	200		35	---
Effluent Limit (Monthly Avg.)																						

-- Not tested for
 --- No established limit.
 ** Acute Toxicity samples were collected on 1/21/15
 ND = none detected above laboratory
 NR = No reading taken
 J = Laboratory estimated value, below PQL and above the MDL.
 A = Laboratory PQLs were raised due to sample dilution caused by high analyte concentration or matrix interference.
 B = Indicates laboratory measurement.
 A01 = Detection and quantitation limits were raised due to sample dilution
 A52 = Chromatogram not typical of diesel
 A57 = Chromatogram not typical of motor oil
 A07 = Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
 D = Chromatogram not typical of motor oil
 1 = Chlorine test repeated after flow appeared to increase
 2 = Area of coalescence that discharges through M-007
 S05 = Sample holding time was exceeded

0.12 Exceedance of effluent limit.
 Waiting for data
 Exceedance Sampling Needed

2020 Q4 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature	Biochemical Oxygen Demand	Surfactants (MBAS)	Oil & Grease	Settleable Solids	Sulfides	Phenols	Residual Chlorine (Field Measured)	Total Suspended Solids	Turbidity	TPH Diesel	TPH Motor Oil	Bis(2-Ethylhexyl) Phthalate	Zinc	Total Coliform	Fecal Coliform	Fecal/Total Coliform >0.1?	Enterococcus	Acute Toxicity**
				°F	mg/L	mg/L	mg/L	mL/L	mg/L	mg/L	mg/L	mg/L	NTU	µg/L	µg/L	µg/L	µg/L	MPN/100ml	MPN/100ml		MPN/100ml	% Survival
Discharges to M-001 (Outfall/Port #1a)																						
10/13/2020	BYA-14	100%	7.45	64.9	ND	ND	ND	ND A07	ND	ND	0.01	ND A07	0.20	ND	ND	ND	31 J	<1.8	<1.8	N/A	1.0	--
11/12/2020	FW-1	100%	7.80	71.8	2.1	ND	ND	ND	ND	ND	0.00	0.78 A07	9.4	ND	ND	ND	16 J	<1.8	<1.8	N/A	3.1	100
11/12/2020	Duplicate	100%	7.80	71.8	3.1	0.028 J	ND	ND A07	6.8 A07	ND	0.00	ND A07	17	ND	ND	ND	17 J	<1.8	<1.8	N/A	2.0	100
12/8/2020	BYA-14	100%	7.32	74.7	ND	ND	ND	ND	ND	ND	0.01	1.3 A07	0.78	ND	ND	0.42 J	84 J	<1.8	<1.8	N/A	7.2	--
12/11/2020	FW-1	100%	7.76	66.6	--	--	--	--	--	--	--	--	38	--	--	--	--	--	--	--	--	--
12/15/2020	FW-1	100%	7.71	72.1	--	--	--	--	--	--	--	--	38	--	--	--	--	--	--	--	--	--
12/22/2020	FW-1	100%	7.73	68.4	--	--	--	--	--	--	--	--	100 A07	--	--	--	--	--	--	--	--	--
12/31/2020	FW-1	100%	7.74	72.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/31/2020	BYA-14	100%	7.36	68.0	--	--	--	--	--	--	--	--	--	--	--	--	46 J	--	--	--	--	--
Discharges to M-002 (Outfall/Port #1)																						
10/13/2020	BYA-5	52%	7.68	72.0	ND	0.034 J	ND	ND A07	ND	ND	0.02	ND A07	0.17	ND	ND	ND	150 J	<1.8	<1.8	N/A	<1	--
	BYA-6	48%																				
11/10/2020	HD-42	45%	7.69	71.6	ND	ND	ND	ND	ND	ND	0.00	0.81 A07	37	ND	ND	ND	17 J	<1.8	<1.8	N/A	<1	100
	HD-9	55%																				
12/8/2020	BYA-5	52%	7.70	75.2	1.6	ND	ND	ND	ND	ND	0.05	6.0 A07	0.62	ND	ND	0.77 J	300	<1.8	<1.8	N/A	310	--
	BYA-6	48%																				
12/8/2020	Duplicate	100%	7.70	75.2	2.3	ND	ND	0.1	ND	ND	0.05	5.4 A07	0.53	ND	ND	ND	360	<1.8	<1.8	N/A	310	--
12/11/2020	BYA-5	100%	7.95	72.1	--	--	--	--	--	--	--	--	--	--	--	--	180	--	--	--	--	--
12/11/2020	BYA-6	100%	7.16	72.0	--	--	--	--	--	--	--	--	--	--	--	--	240	--	--	--	--	--
12/15/2020	BYA-5	100%	7.97	71.8	--	--	--	--	--	--	--	--	--	--	--	--	160	--	--	--	--	--
12/15/2020	BYA-6	100%	7.14	71.8	--	--	--	--	--	--	--	--	--	--	--	--	250	--	--	--	--	--
12/22/2020	BYA-5	100%	7.90	72.0	--	--	--	--	--	--	--	--	--	--	--	--	120	--	--	--	--	--
12/22/2020	BYA-6	100%	7.12	71.8	--	--	--	--	--	--	--	--	--	--	--	--	210	--	--	--	--	--
12/31/2020	BYA-5	100%	7.92	72.0	--	--	--	--	--	--	--	--	--	--	--	--	200	--	--	--	--	--
12/31/2020	BYA-6	100%	7.13	71.8	--	--	--	--	--	--	--	--	--	--	--	--	260	--	--	--	--	--
Discharges to M-003 (Outfall/Port #2)																						
10/13/2020	HD-41	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/10/2020	HD-41	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/11/2020	HD-41	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharges to M-004 (Outfall/Port #3)																						
10/13/2020	HD-30	83%	7.32	72.50%	ND	0.025 J	ND	ND A07	ND	ND	0.00	ND A07	0.16	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-4	17%																				
11/12/2020	W-2	Down	7.09	71.6	ND	ND	ND	ND	ND	ND	0.03	0.56 A07	0.12	ND	ND	ND	1600	4.5	<1.8	N/A	<1	100
	BYA-13	100%																				
12/8/2020	HD-30	89%	7.75	71.6	ND	ND	ND	ND	ND	ND	0.00	ND A07	0.27	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-43	11%																				
12/11/2020	BYA-13	100%	7.22	70.7	--	--	--	--	--	--	--	--	--	--	--	--	200	--	--	--	--	--
12/11/2020	W-1	100%	7.28	73.4	--	--	--	--	--	--	--	--	--	--	--	--	780	--	--	--	--	--
12/11/2020	W-2	100%	7.12	70.3	--	--	--	--	--	--	--	--	--	--	--	--	46 J	--	--	--	--	--
12/15/2020	BYA-13	100%	7.16	70.5	--	--	--	--	--	--	--	--	--	--	--	--	66	--	--	--	--	--
12/15/2020	W-1	100%	7.27	73.6	--	--	--	--	--	--	--	--	--	--	--	--	320	--	--	--	--	--
12/15/2020	W-2	100%	7.14	70.2	--	--	--	--	--	--	--	--	--	--	--	--	37 J	--	--	--	--	--
12/22/2020	BYA-13	100%	7.18	71.1	--	--	--	--	--	--	--	--	--	--	--	--	84 J	--	--	--	--	--
12/22/2020	W-1	100%	7.28	73.9	--	--	--	--	--	--	--	--	--	--	--	--	370 J	--	--	--	--	--
12/22/2020	W-2	100%	7.10	71.2	--	--	--	--	--	--	--	--	--	--	--	--	28	--	--	--	--	--
12/31/2020	BYA-13	100%	7.20	73.4	--	--	--	--	--	--	--	--	--	--	--	--	1400	--	--	--	--	--
12/31/2020	W-1	100%	7.26	73.0	--	--	--	--	--	--	--	--	--	--	--	--	1500	--	--	--	--	--
12/31/2020	W-2	100%	7.12	70.9	--	--	--	--	--	--	--	--	--	--	--	--	85	--	--	--	--	--
Discharges to M-005 (Outfall/Port #4)																						
10/13/2020	HD-26	100%	7.46	71.4	ND	ND	ND	ND A07	ND	ND	0.00	ND A07	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
11/12/2020	W-8	82%	7.27	71.78	ND	ND	ND	ND	ND	ND	0.00	3.3 A07	11	ND	ND	ND	26 J	23	<1.8	No	<1	100
	BYA-1	18%																				
12/8/2020	HD-26	100%	7.48	71.8	ND	ND	ND	ND	ND	ND	0.02 J	0.02	ND A07	0.11	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-006 (Outfall/Port #5)																						
10/13/2020	HD-22	100%	7.58	71.6	ND	ND	ND	ND A07	ND	ND	0.00	2.2 A07	3.80	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
11/12/2020	W-16	30%	7.30	70.0	ND	ND	0.85 J	ND	ND	ND	0.00	ND A07	2.0	ND	ND	ND	32 J	49	<1.8	No	<1	100
	BYA-4	23%																				
	BYA-9	42%																				
	BYA-11	5%																				
12/8/2020	W-16	40%	7.43	73.6	ND	ND	ND	ND	ND	ND	0.00	4.2 A07	3.9	140 J, A52	ND	ND	84	<1.8	<1.8	N/A	<1	--
	BYA-4	22%																				
	BYA-9	31%																				
	W-13	7%																				
12/31/2020	W-16	40%	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	--	--	--	--
	BYA-4	22%																				
	BYA-9	31%																				
	W-13	7%																				
12/31/2020	W-13	100%	7.12	70.2	--	--	--	--	--	--	--	--	--	--	--	--	28 J	--	--	--	--	--
12/31/2020	BYA-4	100%	7.44	71.24	--	--	--	--	--	--	--	--	--	--	--	--	60	--	--	--	--	--
12/31/2020	W-16	100%	7.14	71.42	--	--	--	--	--	--	--	--	--	--	--	--	32	--	--	--	--	--
12/31/2020	BYA-9	100%	7.14	69.98	--	--	--	--	--	--	--	--	--	--	--	--	45 J	--	--	--	--	--
Discharges to M-007 (Outfall/Port #5a)																						
10/13/2020	BYA-10	100%	7.54	73.0	ND	ND	ND	ND A07	ND	ND	0.00	ND A07	0.38	ND								

2021 Q1 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature	Biochemical Oxygen Demand	Surfactants (MBAS)	Oil & Grease	Settleable Solids	Sulfides	Phenols	Residual Chlorine (Field Measured)	Total Suspended Solids	Turbidity	TPH Diesel	TPH Motor Oil	Bis(2-Ethylhexyl) Phthalate	Zinc*	Total Coliform	Fecal Coliform	Fecal/Total Coliform >0.1?	Enterococcus	Acute Toxicity**	
				°F	mg/L	mg/L	mg/L	mL/L	mg/L	mg/L	mg/L	mg/L	NTU	µg/L	µg/L	µg/L	µg/L	MPN/100ml	MPN/100ml		MPN/100ml	% Survival	
Discharges to M-001 (Outfall/Port #1a)																							
1/15/2021	BYA-14	100%	7.30	23.5	1.8	ND	ND	ND	ND	0.08	ND A07	0.23	ND	ND	ND	ND	16 J	170	<1.8	N/A	1.0	--	
	FW-1	100%	--	--	--	--	--	--	--	--	--	170 A07	--	--	--	--	--	--	--	--	--	--	
1/22/2021	FW-1	100%	7.67	20.0	--	--	--	--	--	--	--	--	1.1	--	--	--	--	--	--	--	--	--	
	BYA-14	100%	7.18	20.0	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	
1/26/2021	FW-1	100%	7.88	18.9	--	--	--	--	--	--	--	--	91 A07	--	--	--	--	--	--	--	--	--	
	BYA-14	100%	7.44	16.3	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	
2/5/2021	FW-1	100%	7.80	19.3	--	--	--	--	--	--	--	--	84 A07	--	--	--	--	--	--	--	--	--	
	BYA-14	100%	7.23	17.8	--	--	--	--	--	--	--	--	--	--	--	--	9.6 J	--	--	--	--	--	
2/11/2021	FW-1	100%	7.68	20.3	--	--	--	--	--	--	--	--	160 A07	--	--	--	--	--	--	--	--	--	
	BYA-14	100%	7.21	19.1	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	
2/18/2021	FW-1	100%	7.66	22.4	--	--	--	--	--	--	--	--	110 A07	--	--	--	--	--	--	--	--	--	
	BYA-14	100%	7.20	20.1	--	--	--	--	--	--	--	--	--	--	--	--	17 J	--	--	--	--	--	
2/19/2021	FW-1	100%	7.75	22.9	4.6	ND	ND	ND	ND	0.02	0.89 A07	23	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	BYA-14	100%	7.36	21.2	--	--	--	--	--	--	--	--	21	--	--	--	--	--	--	--	--	--	
3/22/2021	BYA-14	100%	7.16	22.7	ND	ND	ND	ND	ND	0.05	0.56 A07	0	ND	ND	ND	ND	16 J	<1.8	<1.8	N/A	<1	--	
Discharges to M-002 (Outfall/Port #1)																							
1/15/2021	HD-42	45%	7.50	23.3	ND	ND A07	ND	ND	ND	0.01	ND A07	0.22	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	HD-9	55%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2/19/2021	BYA-5	52%	7.44	22.4	2	ND	ND	ND	ND	0.02	0.78 A07	0.44	ND	ND	ND	ND	60	<1.8	<1.8	N/A	<1	--	
	BYA-6	48%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
3/22/2021	HD-42	45%	7.37	23.2	1.8	ND	ND	ND	ND	0.02	0.67 A07	0.46	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	HD-9	55%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Discharges to M-003 (Outfall/Port #2)																							
1/15/2021	HD-41	low flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2/19/2021	HD-41	low flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
3/22/2021	HD-41	low flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Discharges to M-004 (Outfall/Port #3)																							
1/15/2021	W-1	41%	7.65	23.4	ND	ND	ND	ND	ND	0.08	1.8 A07	2.3	ND	ND	ND	ND	30 J	280	<1.8	No	<1	--	
	W-2	59%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	Duplicate	--	7.65	23.4	1.7	ND	ND	ND	ND	ND	0.08	1.4 A07	3.70	ND	ND	ND	32 J	280	<1.8	No	<1	--	
	W-1	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	480	--	--	--	--	--	
	W-2	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	630	--	--	--	--	--	
	BYA-13	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	69	--	--	--	--	--	--	
2/19/2021	HD-30	83%	7.61	22.0	ND	ND	ND	ND	ND	0.03	ND A07	0.14	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	HD-4	17%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
3/22/2021	W-2	59%	7.15	21.7	ND	ND	ND	ND	ND	0.04	ND A07	0.24	ND	ND	ND	ND	14 J	<1.8	<1.8	N/A	<1	--	
	BYA-13	41%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Discharges to M-005 (Outfall/Port #4)																							
1/15/2021	W-8	86%	7.50	23.2	1.80	ND	ND	ND	ND	0.02	1.3 A07	0.44	ND	ND	ND	ND	12 J	<1.8	<1.8	N/A	<1	--	
	W-17	14%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2/19/2021	HD-26	100%	7.50	22.0	ND	ND	ND	ND	ND	0.05	ND A07	0.12	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	Duplicate	--	7.50	22.0	ND	ND	ND	ND	ND	0.05	ND A07	0.13	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
3/22/2021	W-8	82%	7.20	22.1	ND	0.027	ND	ND	ND	0.00	1.0 A07	6.80	ND	ND	ND	ND	ND	1.8	<1.8	N/A	<1	--	
	BYA-1	18%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Discharges to M-006 (Outfall/Port #5)																							
1/15/2021	HD-22	100%	7.75	22	ND	ND	ND	ND	ND	0.00	1.0 A07	17	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	BYA-4	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25 J	--	--	--	--	--	
	W-13	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	76	--	--	--	--	--	
	W-16	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34 J	--	--	--	--	--	
	BYA-9	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2600	--	--	--	--	--	
	W-16	40%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	BYA-4	22%	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	--	--	--	--	--	
	BYA-9	31%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	W-13	7%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	BYA-4	20%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/19/2021	BYA-9	28%	7.30	21.7	ND	ND	ND	ND	ND	0.00	ND A07	0.69	ND	ND	ND	ND	13 J	49	<1.8	N/A	<1	--	
	BYA-11	14%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	W-16	38%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
3/22/2021	W-16	40%	7.28	22.1	1.5	ND	ND	ND	ND	0.01	ND A07	0.83	ND	ND	ND	ND	7.8	<1.8	<1.8	N/A	<1	--	
	BYA-4	22%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	BYA-9	31%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	W-13	7%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	Duplicate	--	7.28	22.1	1.6	ND	ND	ND	ND	0.01	1.6 A07	0.92	ND	ND	ND	ND	23	<1.8	<1.8	N/A	<1	--	
Discharges to M-007 (Outfall/Port #5a)																							
1/15/2021	BYA-10	100%	7.60	22.6	2.4	ND	ND	ND	ND	0.03	ND A07	1.0	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
2/19/2021	BYA-10	100%	7.50	23.0	1.7	ND	ND	ND	ND	0.04	0.89 A07	0.50	ND	ND	ND	ND	ND	4.5	<1.8	<1.8	N/A	<1	
3/22/2021	BYA-10	100%	7.45	22.6	1.8	ND	ND	ND	ND	0.00	ND A07	0.65	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
Discharges to M-008 (Outfall/Port #6)																							
1/15/2021	HD-12	100%	7.40	22.3	3.70	ND	ND	ND	ND	0.05	ND A07	0.10	ND	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--	
	BYA-2	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	
	BYA-3	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	57	--	--	--	--	--	
	W-18	100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38 J	--	--	--	--	--	
2/19/2021	W-18	45%	7.49	23.3	3.1	ND	ND	ND	ND	0.02	3.4 A07	8.2	ND	ND	ND	ND	15 J	<1.8	<1.8	N/A	5.1	--	
	BYA-3	55%	--	--	--	--	--																

2021 Q2 EFFLUENT TESTING SUMMARY (Aqueous Matrix)

Date Sampled	Sample Point	Percentage of Composite Sample	pH (Field Measured)	Temperature	Biochemical Oxygen Demand	Surfactants (MBAS)	Oil & Grease	Settleable Solids	Sulfides	Phenols	Residual Chlorine (Field Measured)	Total Suspended Solids	Turbidity	TPH Diesel	TPH Motor Oil	Bis(2-Ethylhexyl) Phthalate	Zinc	Total Coliform	Fecal Coliform	Fecal/Total Coliform >0.1?	Enterococcus	Acute Toxicity**
				° F	mg/L	mg/L	mg/L	mL/L	mg/L	mg/L	mg/L	mg/L	NTU	µg/L	µg/L	µg/L	µg/L	MPN/100ml	MPN/100ml		MPN/100ml	% Survival
Discharges to M-001 (Outfall/Port #1a)																						
4/12/2021	BYA-14	100%	7.54	71.4	1.7	ND	ND	ND	ND	ND	0.01	ND	0.25	ND	ND	ND	13 J	<1.8	<1.8	N/A	<1	--
5/26/2021	FW-1	100%	7.81	75.2	13.0	ND	ND	ND	18 A07	ND	0.00	2.7 A07	57 A07	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
7/7/2021	BYA-14	100%	7.65	69.1	ND	0.044 J	ND	ND	ND	ND	0.02	ND	0.6	ND	ND	ND	11 J	<1.8	<1.8	N/A	<1	--
Discharges to M-002 (Outfall/Port #1)																						
4/12/2021	BYA-5	52%	7.28	70.7	1.7	ND	ND	ND	ND	ND	0.00	0.74	0.45	ND	ND	ND	190	<1.8	<1.8	N/A	7.3	--
	BYA-6	48%																				
5/26/2021	HD-42	45%	7.33	69.6	ND	0.075 J,A07	ND	ND	ND	ND	0.00	ND A07	0.23	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-9	55%																				
6/17/2021	BYA-5	no production	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	BYA-6	100%															170	--	--	--	--	--
6/23/2021	BYA-5	no production	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	BYA-6	100%															120	--	--	--	--	--
7/7/2021	HD-42	45%	7.15	72.5	ND	0.025 J	ND	ND	ND	ND	0.00	ND A07	0.17	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-9	55%																				
Discharges to M-003 (Outfall/Port #2)																						
4/12/2021	HD-41	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5/26/2021	HD-41	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/7/2021	HD-41	no flow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharges to M-004 (Outfall/Port #3)																						
4/12/2021	HD-30	89%	7.50	69.6	ND	ND	ND	ND	ND	0.050	0.00	ND	0.12	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-43	11%																				
5/26/2021	W-1	41%	7.21	74.8	ND	ND	ND	ND	ND	ND	0.01	0.78 A07	1.4	ND	ND	ND	18 J	<1.8	<1.8	N/A	<1	--
	W-2	59%																				
5/26/2021	Duplicate	100%	7.21	74.8	ND	ND	ND	ND	ND	ND	0.01	ND A07	0.62	ND	ND	ND	17 J	<1.8	<1.8	N/A	<1	--
7/7/2021	W-2	59%	7.44	74.1	ND	0.031 J	ND	ND	ND	ND	0.01	ND A07	0.3	ND	ND	ND	21 J	<1.8	<1.8	N/A	<1	--
	BYA-13	41%																				
Discharges to M-005 (Outfall/Port #4)																						
4/12/2021	HD-26	100%	7.38	68.9	1.6	ND	ND	ND	ND	ND	0.00	ND A07	0.18	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	W-8	86%																				
5/26/2021	W-17	14%	6.98	73.0	ND	ND	ND	ND	ND	ND	0.01	ND	0.14	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	W-8	100%																				
7/7/2021	BYA-1	down	7.42	72.7	ND	ND	ND	ND	ND	ND	0.01	ND A07	0.17	ND	ND	ND	14 J	<1.8	<1.8	N/A	1.0	--
Discharges to M-006 (Outfall/Port #5)																						
4/12/2021	HD-22	100%	7.49	68.7	1.5	ND	ND	0.10	ND	ND	0.00	2.7	4.0	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	W-16	no access																				
5/26/2021	BYA-4	60%	7.48	72.5	ND	ND	ND	ND	ND	ND	0.00	ND	0.4	ND	ND	ND	41 J	<1.8	<1.8	N/A	<1	--
	BYA-9	down																				
	BYA-11	40%																				
7/7/2021	HD-22	100%	7.35	74.8	ND	ND	ND	ND	ND	ND	0	0.67 A07	7.8	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-007 (Outfall/Port #5a)																						
4/12/2021	BYA-10	100%	7.48	71.1	1.7	ND	ND	ND	ND	ND	0.00	ND	0.40	ND	ND	ND	ND	<1.8	<1.8	N/A	1.0	--
4/12/2021	Duplicate	100%	7.48	71.1	1.6	ND	ND	ND	ND	ND	0.00	ND	0.48	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
5/26/2021	BYA-10	100%	7.39	71.6	ND	0.031 J	ND	ND	ND	ND	0.00	ND	0.51	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
7/7/2021	BYA-10	100%	7.66	74.1	ND	0.028 J	ND	ND	ND	ND	0.00	ND A07	0.46	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-008 (Outfall/Port #6)																						
4/12/2021	BYA-2	10%	7.52	70.5	1.90	ND	ND	ND	ND	ND	0.00	1.0	6.90	ND	ND	ND	26 J	<1.8	<1.8	N/A	<1	--
	BYA-3	49%																				
	W-18	41%																				
5/26/2021	HD-12	100%	7.28	70.2	4.60	0.028 J	ND	ND	ND	ND	0.00	ND	0.27	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-10	16%																				
7/7/2021	HD-12	84%	7.30	73.8	1.50	0.038 J	ND	ND	ND	ND	0.00	ND	0.24	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-009 (Outfall/Port #7)																						
4/12/2021	HD-7	100%	7.96	68.9	ND	ND	ND	ND	ND	ND	0.00	0.60	0.17	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
5/26/2021	HD-7	100%	--	--	ND	ND	ND	ND	ND	ND	0.00	ND	0.34	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
7/7/2021	HD-7	100%	8.02	77.4	ND	ND	ND	ND	ND	ND	0.00	2.0 A07	0.15	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Discharges to M-010 (Outfall/Port #9)																						
4/12/2021	HD-5	23%	7.54	68.9	1.5	ND	ND	ND	ND	0.047 J	0.00	ND	0.11	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-6	10%																				
	HD-23	67%																				
5/26/2021	HD-5	23%	7.23	71.6	9.2	ND	ND	ND	ND	ND	0.00	ND	11	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-6	10%																				
	HD-23	67%																				
7/7/2021	HD-5	23%	7.65	74.3	2.4	ND	ND	ND	ND	ND	0.00	ND A07	0.14	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
	HD-6	10%																				
	HD-23	67%																				
7/7/2021	Duplicate	100%	7.65	74.3	2.7	0.025 J	ND	ND	ND	ND	0.00	ND A07	0.31	ND	ND	ND	ND	<1.8	<1.8	N/A	<1	--
Effluent Limit (Daily Max.)																						
				--	30	0.5	15	0.3	1.0	1.0	0.1	75	150	100	100	11	95	10000	400		104	90
Effluent Limit (Daily Max. if Fecal/Total Coliform > 0.1)																						
				--	20	--	10	0.1	--	--	--	50	50	--	--	5.9	47	1000	200		35	--
Effluent Limit (Monthly Avg.)																						

- = Not tested for
- = No established limit.
- ** = Acute Toxicity samples were collected on 1/21/15
- ND = none detected above laboratory
- NR = No reading taken
- J = Laboratory estimated value, below PQL and above the MDL.
- A = Laboratory PQLs were raised due to sample dilution caused by high analyte concentration or matrix interference.
- B = Indicates laboratory measurement.
- A01= Detection and quantitation limits were raised due to sample dilution
- A52 = Chromatogram not typical of diesel
- A57= Chromatogram not typical of motor oil
- A07= Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
- D = Chromatogram not typical of motor oil
- 1 = Chlorine test repeated after flow appeared to increase
- 2= Area of coalescence that discharges through M-007
- S05= Sample holding time was exceeded

0.12	Exceedance of effluent limit.
	Waiting for data
	Exceedance Sampling Needed