AP - 111

SWMU-1

2019

Marathon Petroleum Company LP

September 23, 2019

Mr. John E. Kieling, Chief
New Mexico Environmental Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87SOS-6303

RE: Investigation Work Plan Solid Waste Management Unit 1
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is submitting this Investigation Work Plan for the Solid Waste Management Unit (SWMU) 1. The Investigation Work Plan has been enclosed for your review. If there are any questions, please call Brian Moore at 505-726-9745.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
B. Moore Marathon Gallup Refinery

MARATHON PETROLEUM CORPORATION

GALLUP REFINING DIVISION

SWMU-1 SOIL SAMPLING INVESTIGATION WORK PLAN

SEPTEMBER 23, 2019

Approval to Proceed

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Brian Moore

9-23-19
Date

Title: Senior HSE Professional

Executive Summary

The Marathon Petroleum Company, Gallup Refining Division is submitting this Investigation Work Plan for the sampling of sediments contained in the former aeration lagoons and evaporation pond known as Solid Waste Management Unit (SWMU) 1.

SWMU-1 was a part of a former aggressive biological treatment unit where refinery wastewater flowed through the aeration lagoons and then into the evaporation pond. Based on this usage the aeration lagoon sediments are most likely hazardous waste and the evaporation pond sediments may be classified as non-hazardous waste. This Work Plan was developed to sample the sediments and the underlying soils to further delineate the impacts to the subsurface from historical usage.

Historical sampling and sediment thickness measurements were completed in April 2008 by Trihydro Corporation to help determine the appropriate disposal of sediments within SWMU-1. Data from the 2008 sampling was used to characterize sediments. Sediment volumes were calculated based on the approximate dimensions of the lagoons and the evaporation pond. This Work Plan and additional sampling will help to further delineate the horizontal and vertical extent of the contamination within the lagoons and pond.

This Investigation Work Plan will collect samples within the lagoons and pond of both sediments (similar to the 2008 sampling) and soils beneath the lagoon and pond sediments. This sampling will close any data gaps from the historical sampling and will be utilized to develop an excavation plan so that MPC can apply for SWMU-1 closure.

Table of Contents

Introduction

The Marathon Petroleum Company (MPC), Gallup Refining Division (Refinery) is located approximately 17 miles east of Gallup, McKinley County, New Mexico along the north side of Interstate Highway I-40 (Figure 1). The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Refinery property covers approximately 810 acres.

Trihydro Corporation (Trihydro) has prepared this report proposing an Investigation Work Plan for sampling of sediments and soils contained in, and beneath, the former aeration lagoons and evaporation pond known as Solid Waste Management Unit (SWMU) 1 at the Refinery.

The Refinery is a crude oil refinery that processes crude oil transported by pipeline or tanker truck from the Four Corners region. Various process units operated at the Refinery include: crude distillation, reformer, fluidized catalytic cracker, alkylation, sulfur recovery, merox treater, and hydrotreater. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

Background

SWMU-1 consists of the former aeration lagoons (AL-1 and AL-2) and an evaporation pond (EP-1). These areas were part of the aggressive biological treatment unit (ABTU) formerly used at the Refinery. Refinery wastewater flowed from AL-1 to AL-2, followed by flow to EP-1 for evaporation. Based on this usage, AL-1 and AL-2 sediments can be reasonably classified as listed hazardous waste (F037/F038), whereas sediments in EP-1 by definition would not be classified as a listed hazardous waste.

AL-1, AL-2, and EP-1 were constructed in 1987 and were in operation until 2013. AL-1 and AL-2 are approximately 0.3 acres and 0.5 acres, respectively, and EP-1 is approximately 1.3 acres. The Refinery's process wastewater would flow to an American Petroleum Institute (API) separator with benzene air strippers and then flow into the two aeration lagoons in series; the lagoons were equipped with surface aerators to help achieve biological activity. The evaporation pond would be the final phase of the wastewater treatment before being discharged to the evaporation ponds at the Refinery. AL-1, AL-2 and EP-1 are earthen surface impoundments with natural clay functioning as a bottom liner (DiSorbo 2018, Section 2.1.1).

Prior sampling of the sediments and laboratory analysis were last conducted in 2008 of AL-1, AL-2, and EP-1 (Trihydro 2008, Section 7). Laboratory sampling analyses of the sediments consisted of total petroleum

hydrocarbons (TPH), diesel range organics (DRO), and gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) method 8015, semi-volatile organic compounds (SVOCs) by USEPA method 8270, volatile organic compounds (VOCs) by USEPA Method 8260, Resource Conservation and Recovery Act (RCRA) metals by USEPA Method 6010C, and mercury by USEPA Method 7471. The Toxicity Characteristics Leaching Procedure (TCLP) analysis was not performed.

In the 2008 report (Trihydro 2008, Section 6), standards for comparison consisted of NMED Industrial Soil Screening Levels (SSLs) and EPA's Maximum Concentrations of Contaminants for the Toxicity Characteristic (CFR Title 40 Part 261). In the absence of TCLP analyses, TCLP data were approximated using an EPA-approved RCRA calculation wherein soil analytical data were decreased by a factor of 20, which allowed a comparison against RCRA Toxicity Characteristic levels as a screening tool. Exceedances with respect to these comparison standards are discussed below.

Twenty-six samples from various sediment depths in the three areas exceeded the Toxicity Characteristic for mercury, and three samples from AL-1 exceeded the Toxicity Characteristic for lead. These results for TCLP are estimates based on the approximation described above and will be confirmed with actual TCLP analyses proposed in this plan.

During this sampling Trihydro also determined the approximate thickness and volume of the sediments in SWMU-1:

- AL-1: 3.5 feet (ft) to 6.0 ft, 1,700 cubic yards (cy)
- AL-2: 6.5 ft to 9.6 ft, 3,800 cy
- EP-1: 1.2 ft to 5.1 ft, 3,200 cy

At the time of the 2008 SWMU-1 sampling event, a boat was required for access and sediment volume estimates reflect fully saturated conditions. In order to collect sediment and soil samples the ponds must be drained prior to sampling. Per MPC's conversations with the New Mexico Environmental Department (NMED) on August 14th, 2019, MPC will install French Drains along the east and south sides of SWMU-1 and two sumps on the southern side of AL-1 and AL-2 in order to dewater the ponds and prevent further groundwater infiltration.

The purpose of the previous sediment investigations was to determine and evaluate the presence, nature, and extent of contaminant releases within SWMU-1. The purpose of this sediment investigation is to further delineate the existing soil impacts to finalize an excavation and closure plan for SWMU-1. This investigation will complete characterization of the soil and volume of sediment for removal within the lagoons and pond.

Site Conditions

Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the refinery property range from 7,040 ft to 6,860 ft. The area near the ponds is at an approximate elevation of 6,910 ft above mean sea level (amsl) (DiSorbo 2018).

Subsurface Conditions

The shallow subsurface soil (alluvium)is comprised of clay and silt with some inter-bedded sand layers. Cross sections through SWMU-1 (Figure 2A) are included as Figures 2B through 2D. Beneath the alluvium is the Petrified Forest Member of the Chinle Group, which primarily consists of interbedded mudstone, siltstone, and sandstone. The Alluvium/Chinle interface is as little as 15 ft below ground surface (bgs) to over 32 ft bgs beneath SWMU-1.

The groundwater within SWMU-1 is known to be shallow based on groundwater measurements taken in the area (Disorbo 2018, Table 2). The proposed French drains and sumps will remove the surface water and groundwater from the pond footprint to allow for sampling and, ultimately, excavation and closure. The surface water and shallow groundwater currently collects in the lagoons and pond. In addition, the installation of the French drain will prevent groundwater infiltration into SWMU-1 in the future to prevent re-impacting the area. The groundwater in the French drains will collect into sumps and will be transported and treated at the wastewater treatment facility.

Scope of Activities

The site sampling and investigative activities of SWMU-1 will be completed to supplement and confirm data that has previously been collected at the ponds. Pending NMED approval, MPC anticipates sampling to occur in October-November 2019.

The sediment sampling will be completed per the RCRA Post-Closure Permit Section IV.J.2.d.ii. Soil borings will be completed with a hand-auger and discrete samples will be collected in order to fill data gaps from historical sampling and to create a better understanding of underlying soil impacts.

Analytical results will be screened by comparison to NMED Industrial SSLs, Toxicity Characteristic Levels, and the chosen disposal facility's waste acceptance criteria (WAC). Soil recovered during sampling will be placed in roll-off boxes within the area of SWMU-1 and characterized prior to disposal.

Once characterization has been completed, MPC will prepare an investigation report with results from the sampling. A risk assessment will be included with the investigation report. Following the investigation report a closure plan will be submitted to NMED.

Investigation Methods

The proposed sampling locations are show on Figure 3. The proposed locations include three samples from each of the aeration lagoons and four from the evaporation pond. MPC also plans to collect 12 additional sidewall samples along the SWMU-1 berm (4 from each area).

Soil samples will be collected by hand-augering within SWMU-1 and along the perimeter sidewalls (Figure 3). Discrete sediment samples will be collected at 2.5-ft intervals from the surface until visual and/or instrumental contamination is no longer evident, or until a maximum depth of approximately 8 feet is reached. Sediments obtained will be visually inspected and classified in general accordance with ASTM D2487 (Unified Soil Classification System) and D2488 (Description and Identification of Soils). Detailed boring logs will be completed in the field by qualified field staff. Samples will be field screened for evidence of contaminants and will be recorded in the boring logs. Field screening will include taking discrete grab samples as described below and using a Flame Ionization Detector (FID) to measure hydrocarbon vapors.

Quality assurance/quality control (QA/QC) samples will be collected during sampling to monitor the validity of the sample collection procedures. Field duplicates will be collected at a rate of ten percent of all samples collected. Equipment blanks will be collected based on ten percent of the re-usable equipment; if disposable sampling equipment is used, the blanks shall be collected at a frequency of one per day. Field blank samples will also be collected once a day. The field duplicate and blank samples will be submitted to the laboratory along with the sediment samples.

Sample Collection Procedures

Samples will be collected in accordance with the confirmation sampling Standard Operating Procedure (SOP) (Appendix A). Details related to sample collection will be documented on the confirmation sampling field forms. General observations to be recorded on the field forms for each soil sample location will include sampling start and end times, weather, site conditions, sampling team members, and other affiliations present. Sample-specific information will include field sample identification, time of sample collection, sample start and end depth, collection method, sample type (i.e., composite or aliquot), soil classification and characteristics, any deviations or clarification of sampling procedures, and other observations. Field techniques will be applied consistently across SWMU-1 by a team of dedicated sampling personnel who may be assisted by site supervisors. A summary of the sampling activities is shown below:

1. Installation of 10 hand-augered borings in the pond sediments to determine depth of sediments and volume for disposal in the approximate locations shown in Figure 3. Both sediment and soil samples will be collected from the borings.

2. Collection of 10 sediment and 12 berm sludge/soil samples for laboratory analysis in the locations shown in Figure 3. Subject to WAC at the waste disposal facility, laboratory analyses will consist of:

    - pH
    - Metals, Method 6010
    - SVOCs, Method 8270
    - VOCs, Method 8260
    - TCLP (lead and mercury)
    - TPH GRO and DRO
    - Density
    - Paint Filter Test
    - Photoionization Detector (PID) – Headspace sampling

3. Analytical data will be screened by comparison with NMED Industrial SSLs, Toxicity Characteristic levels, and the proposed disposal facility WACs.

Equipment will be decontaminated before collecting each sample, and equipment decontamination will be noted on the field forms. Upon collection, samples will be placed into a clean, sealable plastic bag labeled with the field sample identification. Sample jars will be filled, labeled, and placed in a cooler. Before shipment, coolers will be packed with additional ice and one temperature blank per cooler. A chain of custody (CoC) form will accompany each sample shipment. Coolers will be sealed and shipped overnight to Hall Environmental Analytical Laboratory in Albuquerque, NM.

Sample Collection Frequency

Sediment sample collections will be taken in accordance with the RCRA Post-Closure Permit Section IV.J.2.d.ii (Soil and Rock Sampling) and will include the following applicable intervals and depths:

- at the surface of the proposed boring locations;
- at 2.5-ft intervals;
- at the maximum depth of each boring; and
- at intervals suspected of being source or contaminated zones.

Data Quality and Validation

QA/QC samples will be recorded on the field forms and CoCs. All data will be subjected to Tier II data validation to evaluate data validity.

Data Evaluation

Analytical results will be screened by comparison to NMED Industrial SSLs, Toxicity Characteristic Levels, and the chosen disposal facility's WAC. Soil recovered during sampling will be placed in roll-off boxes within the area of SWMU-1 and characterized prior to disposal.

Monitoring and Sampling Program

No groundwater, ambient air, subsurface vapor, remediation system, engineering controls, or other monitoring and sampling programs are currently being implemented at SWMU-1. A routine sampling program may be developed following excavation of the ponds if clean closure is not obtained.

Schedule

Pending NMED approval, MPC anticipates sampling to occur in October-November 2019 following the installation of the French drain and sumps in October 2019. Following the completion of sampling activities a Closure Plan will submitted to NMED for review and approval.

References

DiSorbo. 2018. Investigation Work Plan Solid Waste Management Unit (SWMU) No. 1 Aeration Basin and SWMU No. 14 Old API Separator. Gallup Refinery, Western Refining Southwest, Inc., Gallup, New Mexico, November.

Trihydro. 2008. Aeration Lagoons 1 and 2 and Evaporation Pond 1 Sediment Investigation Western Refining Company, Gallup Refinery, Gallup, New Mexico, June.

Figures

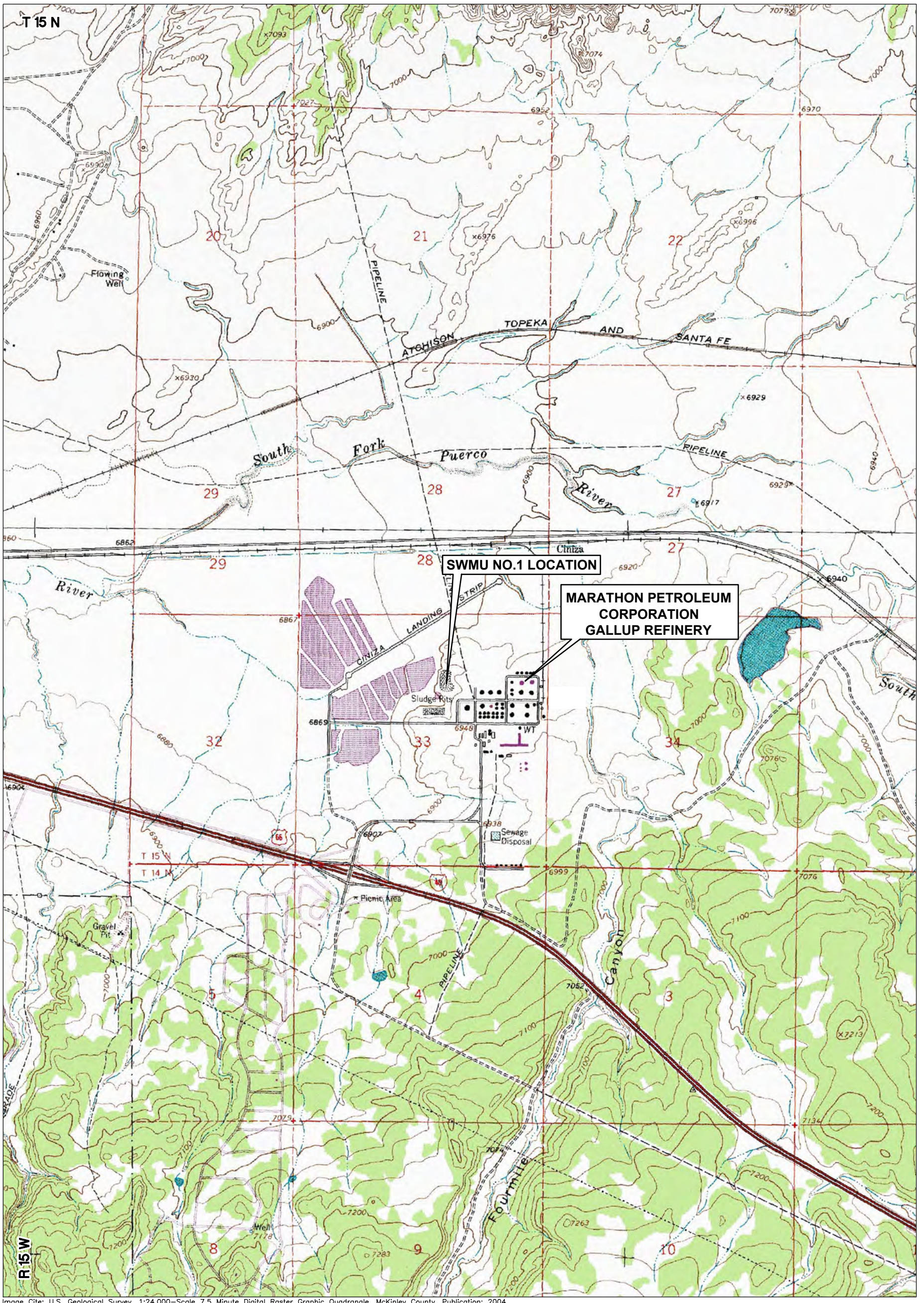

Image Cite: U.S. Geological Survey, 1:24,000–Scale 7.5 Minute Digital Raster Graphic Quadrangle, McKinley County, Publication: 2004

NEW MEXICO

QUADRANGLE LOCATION

NOTE:
SITE LEGAL DESCRIPTION -
TOWNSHIP 15 NORTH,
RANGE 15 WEST, SECTION 33

N

0 2,000'

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1252 Commerce Drive
Laramie, Wyoming 82070
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FIGURE 1

REFINERY AND SWMU NO.1 LOCATION

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: JP	Scale: 1" = 2,000'	Date: 3/12/2019	File: 697-SITELOC-201903

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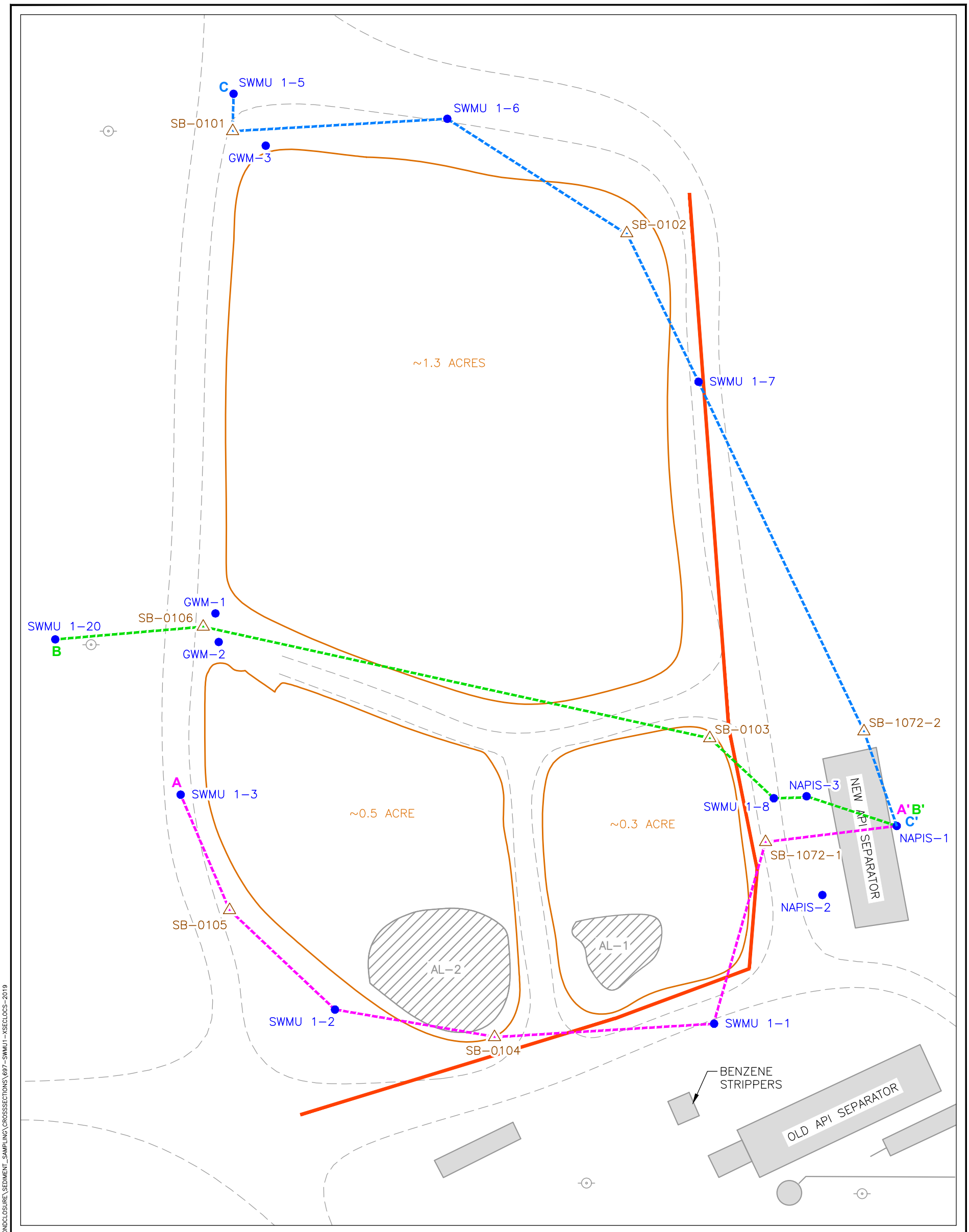

EXPLANATION

- NAPIS-2 — GROUNDWATER WELL AND DESIGNATION
- SB-0104 — SOIL SAMPLE AND DESIGNATION
- CROSS-SECTION A-A'
- CROSS-SECTION B-B'
- CROSS-SECTION C-C'
- ACCESS ROAD EDGE
- BANK/BERM EDGE
- PROPOSED 2019 GROUNDWATER INTERCEPTOR TRENCH
- EXTENT OF WATER/PSH (JULY 2019)
- BUILDING OR OTHER STRUCTURE
- UTILITY POLE

N

0 50'

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FIGURE 2A

CROSS-SECTION LOCATIONS MAP

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: 1" = 50'	Date: 8/19/19	File: 697-SWMU1-XSECLOCS-2019

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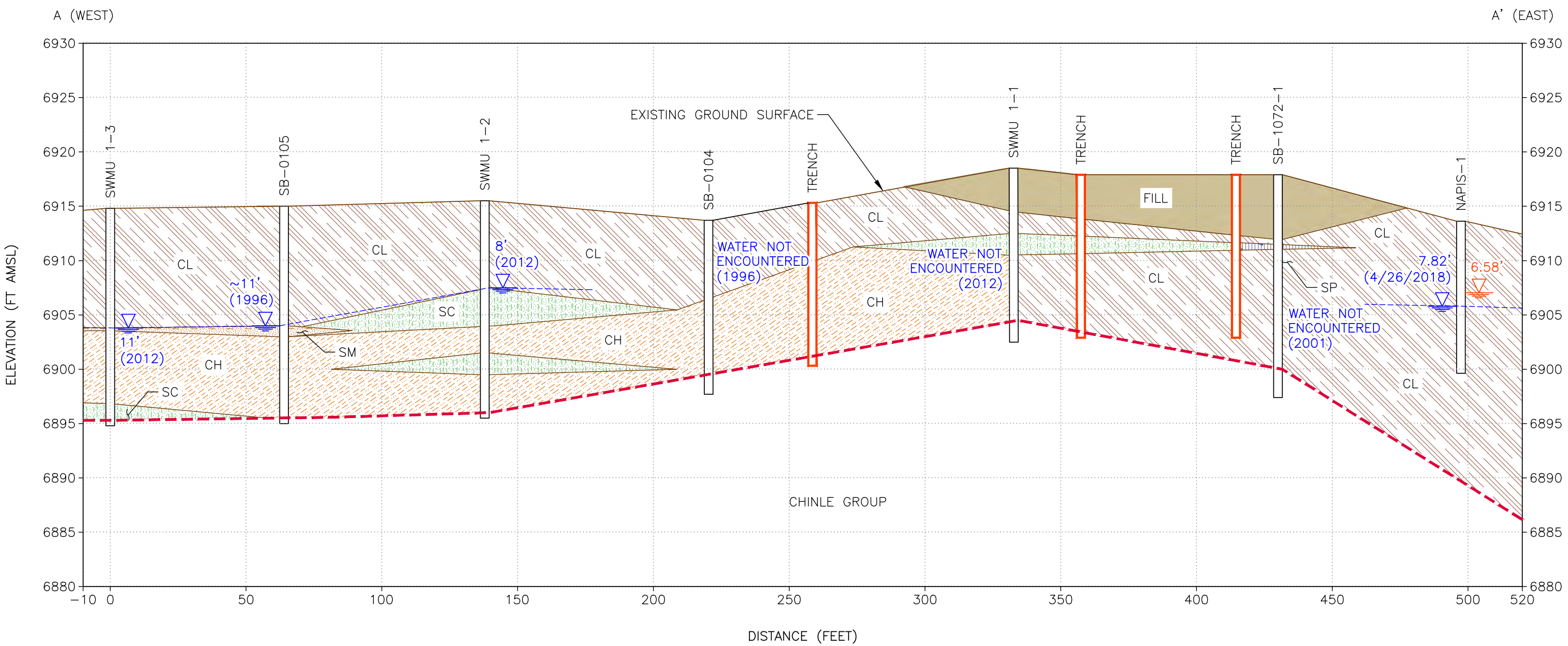
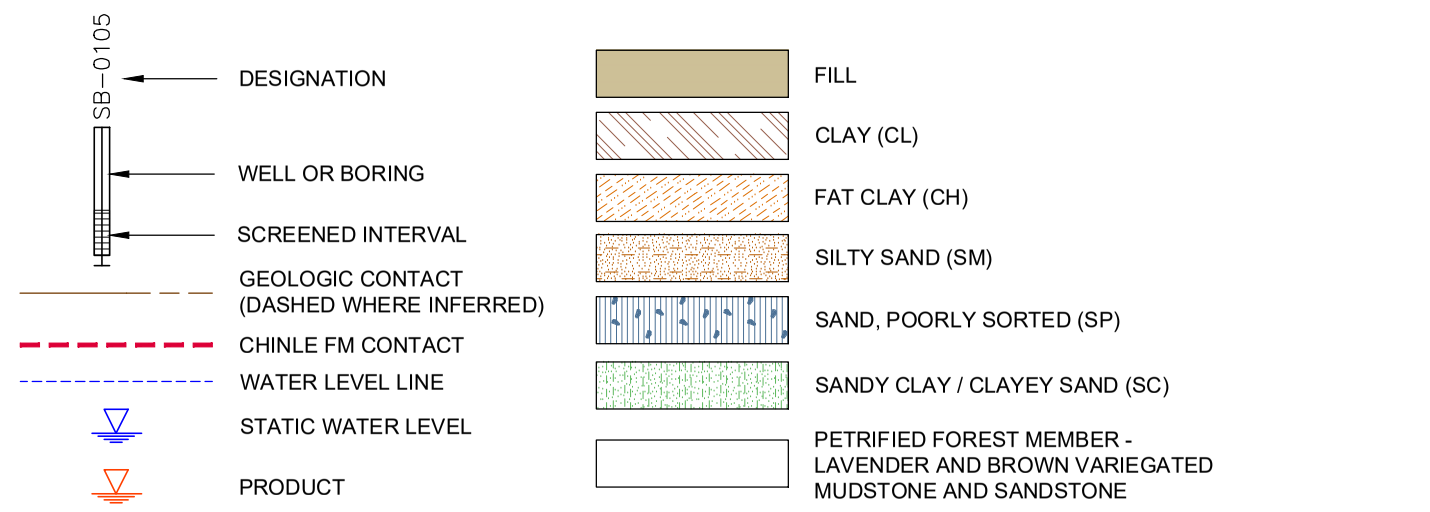


EXPLANATION



0 40' HORIZONTAL SCALE

0 10' VERTICAL SCALE

VERTICAL EXAGGERATION = 4X

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FIGURE 2B

GEOLOGICAL CROSS-SECTION A-A'

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: AS SHOWN	Date: 9/17/19	File: 697-SWMU1-XSECA_2019

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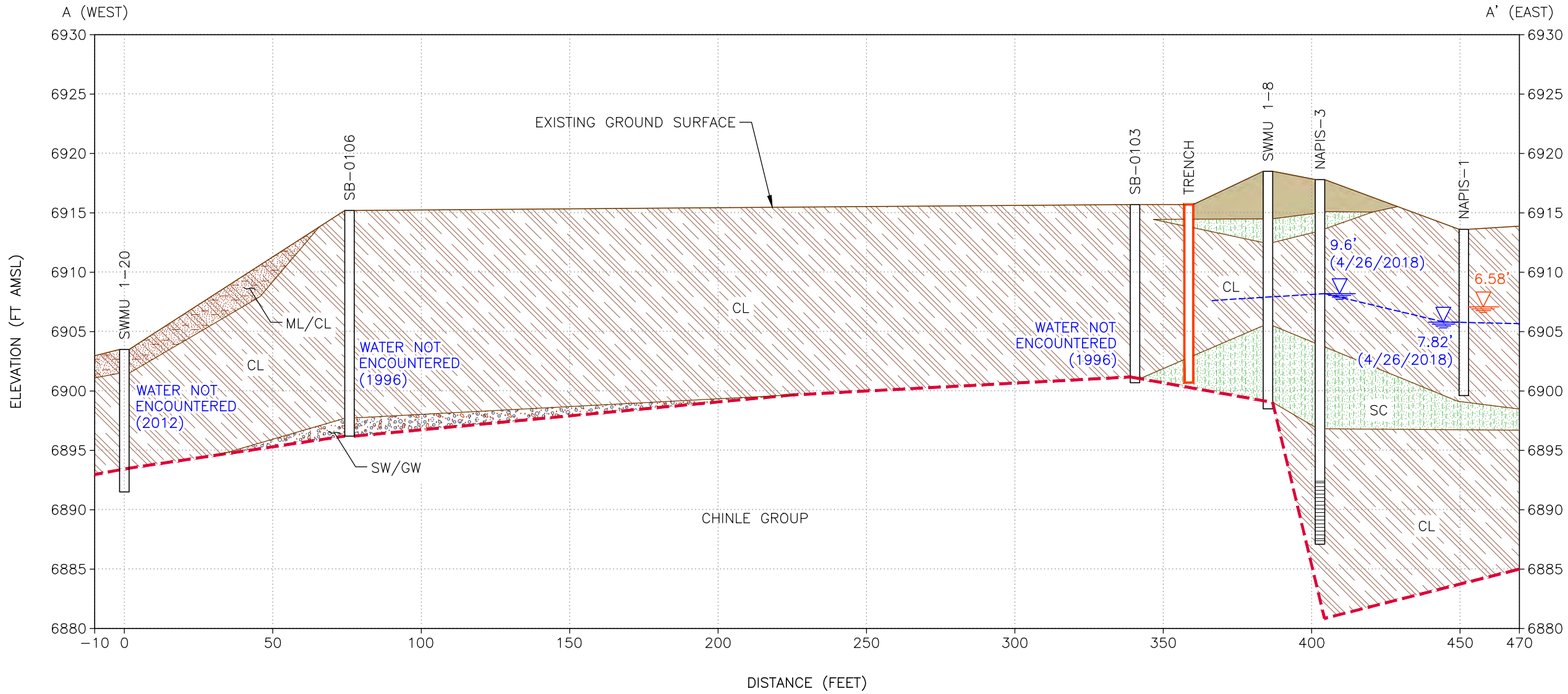

EXPLANATION

SB-0106 — DESIGNATION

WELL OR BORING

SCREENED INTERVAL

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

CHINLE FM CONTACT

WATER LEVEL LINE

STATIC WATER LEVEL

PRODUCT

FILL

CLAY (CL)

SAND, WELL SORTED (SW)

GRAVEL, WELL SORTED (GW)

SANDY CLAY / CLAYEY SAND (SC)

SILT (ML)

PETRIFIED FOREST MEMBER - LAVENDER AND BROWN VARIEGATED MUDSTONE AND SANDSTONE

PROPOSED 2019 GROUNDWATER INTERCEPTOR TRENCH

FT AMSL — FEET ABOVE MEAN SEA LEVEL

0 40' HORIZONTAL SCALE

0 10' VERTICAL SCALE

VERTICAL EXAGGERATION = 4X

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FIGURE 2C

GEOLOGICAL CROSS-SECTION B-B'

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: AS SHOWN	Date: 9/18/19	File: 697-SWMU1-XSECB_2019

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C (WEST)

C' (EAST)

EXISTING GROUND SURFACE

SWMU 1-5

SB-0101

SWMU 1-6

SB-0102

SWMU 1-7 TRENCH

SB-1072-2

NAPIS-1

CL

SC

GW

CH

SP/GW

WATER NOT ENCOUNTERED (1996)

25' (2012)

9' (2012)

14' (2012)

1.1 (2012)

8' (2011)

6.58'

7.82' (4/26/2018)

CHINLE GROUP

ELEVATION (FT AMSL)

6930
6925
6920
6915
6910
6905
6900
6895
6890
6885
6880
6875
6870

0 50 100 150 200 250 300 350 400 450 500 550 575

DISTANCE (FEET)

EXPLANATION

SB-0106 — DESIGNATION

WELL OR BORING

SCREENED INTERVAL

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

CHINLE FM CONTACT

WATER LEVEL LINE

STATIC WATER LEVEL

PRODUCT

FILL

CLAY (CL)

GRAVEL, WELL SORTED (GW)

SANDY CLAY / CLAYEY SAND (SC)

SAND, POORLY SORTED (SP)

FAT CLAY (CH)

PERCHED WATER ZONE

PETRIFIED FOREST MEMBER - LAVENDER AND BROWN VARIEGATED MUDSTONE AND SANDSTONE

PROPOSED 2019 GROUNDWATER INTERCEPTOR TRENCH

FT AMSL — FEET ABOVE MEAN SEA LEVEL

0 40' HORIZONTAL SCALE

0 10' VERTICAL SCALE

VERTICAL EXAGGERATION = 4X

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FIGURE 2D

GEOLOGICAL CROSS-SECTION C-C'

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: AS SHOWN	Date: 9/18/19	File: 697-SWMU1-XSECC_2019

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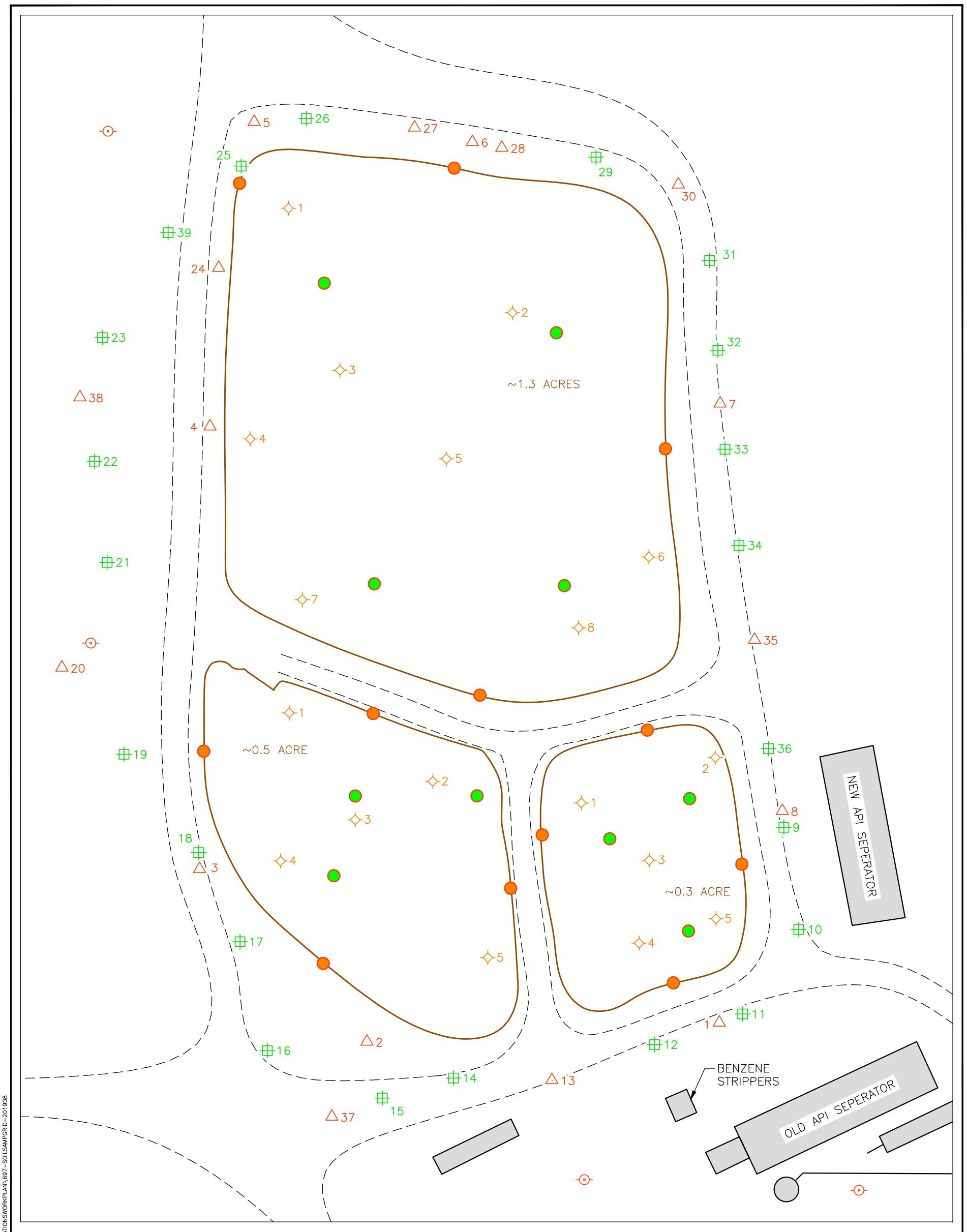

EXPLANATION

- ACCESS ROAD EDGE
- BANK/BERM EDGE
- 37 PREVIOUS PERIMETER SOIL BORING AND DESIGNATION
- 16 PREVIOUS HAND AUGER SAMPLE AND DESIGNATION
- PROPOSED 2019 POND SEDIMENT SAMPLING LOCATION
- PROPOSED 2019 BERM SAMPLING LOCATION
- 4 2008 SEDIMENT DEPTH MEASURING POINT AND DESIGNATION
- UTILITY POLE
- BUILDING OR OTHER STRUCTURE

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FIGURE 3

SOIL/SEDIMENT SAMPLING LOCATIONS
SWMU NO.1

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: CF	Scale: 1" = 50'	Date: 8/29/19	File: 697-SOILSAMPGRID-201908

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Attachment

memorandum

To: Sampling Team Members
From: Project Manager
Date: October 4, 2019
Re: Standard Operating Procedure – Sediment Sampling

1.0 INTRODUCTION

Sediment sampling related to site characterization and site clean-up is expected to involve source sampling of potentially contaminated sediments for characterization and profiling. Sediment sampling is expected to occur in and around the aeration lagoons and evaporation pond.

All personnel involved in sediment sampling projects are required to review this Standard Operating Procedure (SOP) before sampling to ensure the continued generation of reliable data. This SOP is based on experience gained from collecting sediment samples and the latest information available in guidance manuals. This SOP may be updated as additional experience and information are acquired.

2.0 PRE-FIELD ACTIVITIES

Several activities will be conducted prior to departure for the project site. A project team will be assigned and the members will begin coordinating the sample collection event with Marathon Petroleum Company. Field equipment will be checked and organized. Access to the areas to be sampled will be checked, and provisions made to pack the necessary equipment for delivery to the project site.

3.0 PREPARATION

The Project Manager will review the current sampling and analysis plans and work plans to determine if any documents need to be brought to the site during monitoring. The Project Manager will also evaluate whether any changes have been made in the sampling and analytical procedures, and notify the appropriate personnel.

The Sampling Team Members will review available surface water level data before leaving for the sampling site. This preparation ensures that the proper equipment and personnel are available at the site. All field screening equipment will be inspected prior to departure, ensuring that it is in proper working order. For sediment sampling, the only field monitoring equipment used will be the Photoionization detection (PID) meter and it should be calibrated and operated and according to manufacturer's recommendations.

4.0 EQUIPMENT

The following equipment is recommended for sediment sampling:

- ☐ Required personal protective equipment (PPE), listed in the site-specific health and safety plan (HASP) (generally nitrile gloves, waders, life preserver, rope and safety glasses)
- ☐ Sediment sampling devices (i.e., hand auger)
- ☐ Sampling beaker, bottles, labels, and preservatives
- ☐ Gloves
- ☐ Chain-of-custody/sample-analysis-request forms
- ☐ Flame Ionization detection meter (FID)
- ☐ Opaque Cooler(s) and bagged ice or frozen Blue Ice
- ☐ Detergent or solvent for cleaning monitoring equipment
- ☐ Brushes dedicated for decontamination
- ☐ Decontamination containers dedicated for wash, rinse 1, and rinse 2
- ☐ Paper towels
- ☐ Trash bags
- ☐ Field logbook
- ☐ Wrist watch (with digital display)

5.0 SAMPLE COLLECTION

A critical aspect of any sampling program is selection and implementation of an appropriate sampling technique. Selection of equipment and technique should be appropriate for the volume of material required and the type of analysis to be performed. In general, the sampling equipment and technique will be chosen to minimize, to the extent possible, the amount of handling a sample will undergo prior to analysis. In many cases, the material to be sampled will be easy to access, and simple "grab" samples collected using a shovel, trowel, or drive sampler are appropriate. In other cases, such as underwater or heavily saturated samples, the sediments may be difficult to access, and sampling will involve the use of specialized sediment sampling equipment. Specific analytical requirements and sampling frequencies are specified in the work plan.

Sediment samples located in dry areas will be collected from representative locations using a decontaminated drive sampler equipped with clean brass or stainless steel sampling rings, a thin-walled tube sampler or a shovel or hand trowel. The sampling device will be driven completely into the material

manually or using a manually operated auger, drive hammer, or mallet. The sampling device will then be extracted from the material using a shovel or trowel as needed. If used, filled sampling rings or the thin walled tube will then be removed from the sampling device and immediately sealed on both ends with teflon sheeting and plastic caps. Otherwise, the material will placed directly from the trowel or other appropriate sampling device into a clean glass jar. The jar will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with a teflon-lined lid.

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Field screening may involve the use of a FID probe; which will be inserted into the bag and the reading taken. All samples shall be screened at as close to the same temperature as possible to obtain consistent results.

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Field logbooks, Sediment Sampling Field Log, and photograph logs will provide a written record of field data gathered, field observations, field equipment calibrations, the samples collected for analysis, and sample custody. Color photographs will be used to substantiate and augment the field notes, if necessary.

Figures

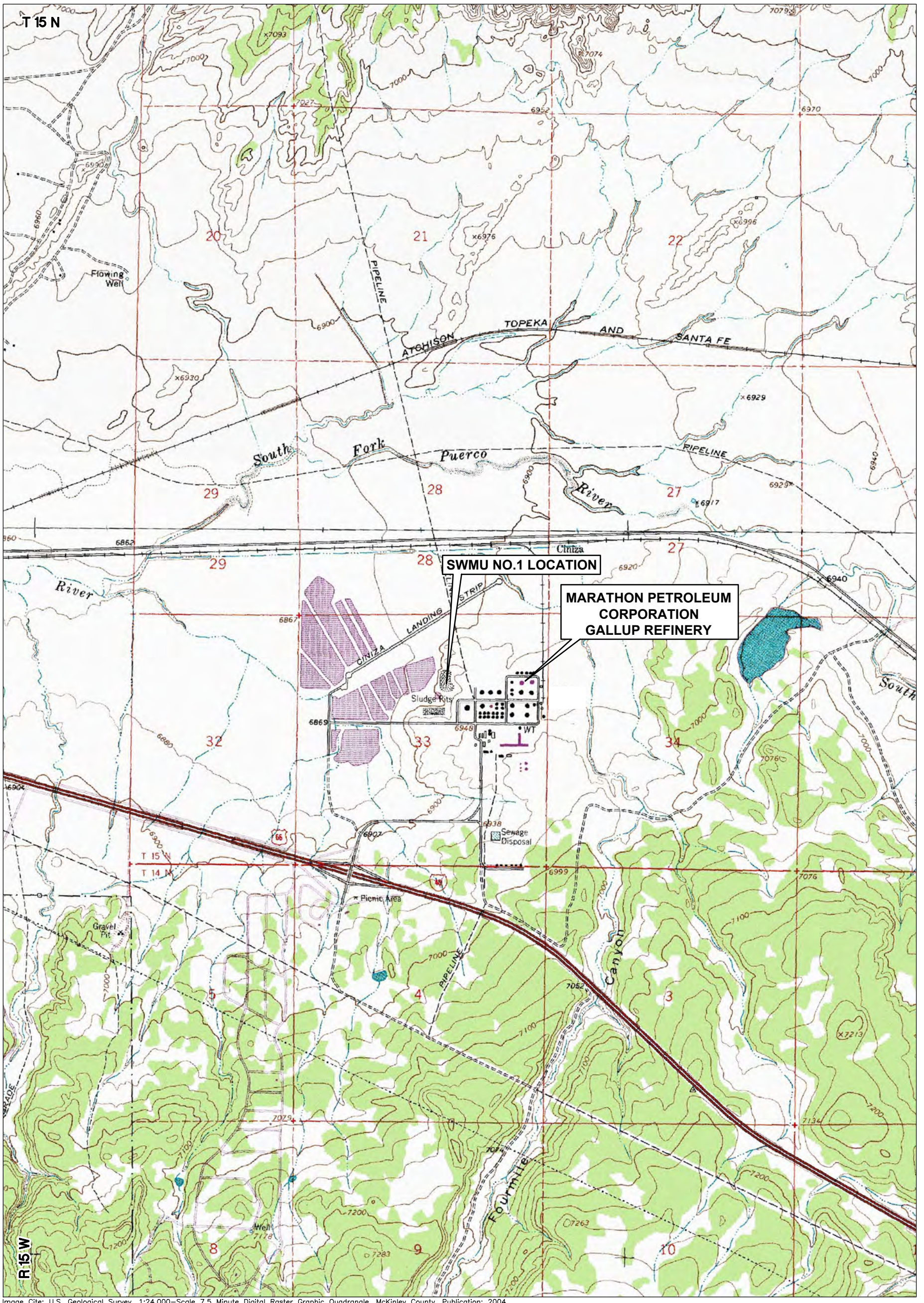

Image Cite: U.S. Geological Survey, 1:24,000–Scale 7.5 Minute Digital Raster Graphic Quadrangle, McKinley County, Publication: 2004

NEW MEXICO

QUADRANGLE LOCATION

NOTE:
SITE LEGAL DESCRIPTION -
TOWNSHIP 15 NORTH,
RANGE 15 WEST, SECTION 33

N

0 2,000'

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FIGURE 1

REFINERY AND SWMU NO.1 LOCATION

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: JP	Scale: 1" = 2,000'	Date: 3/12/2019	File: 697-SITELOC-201903

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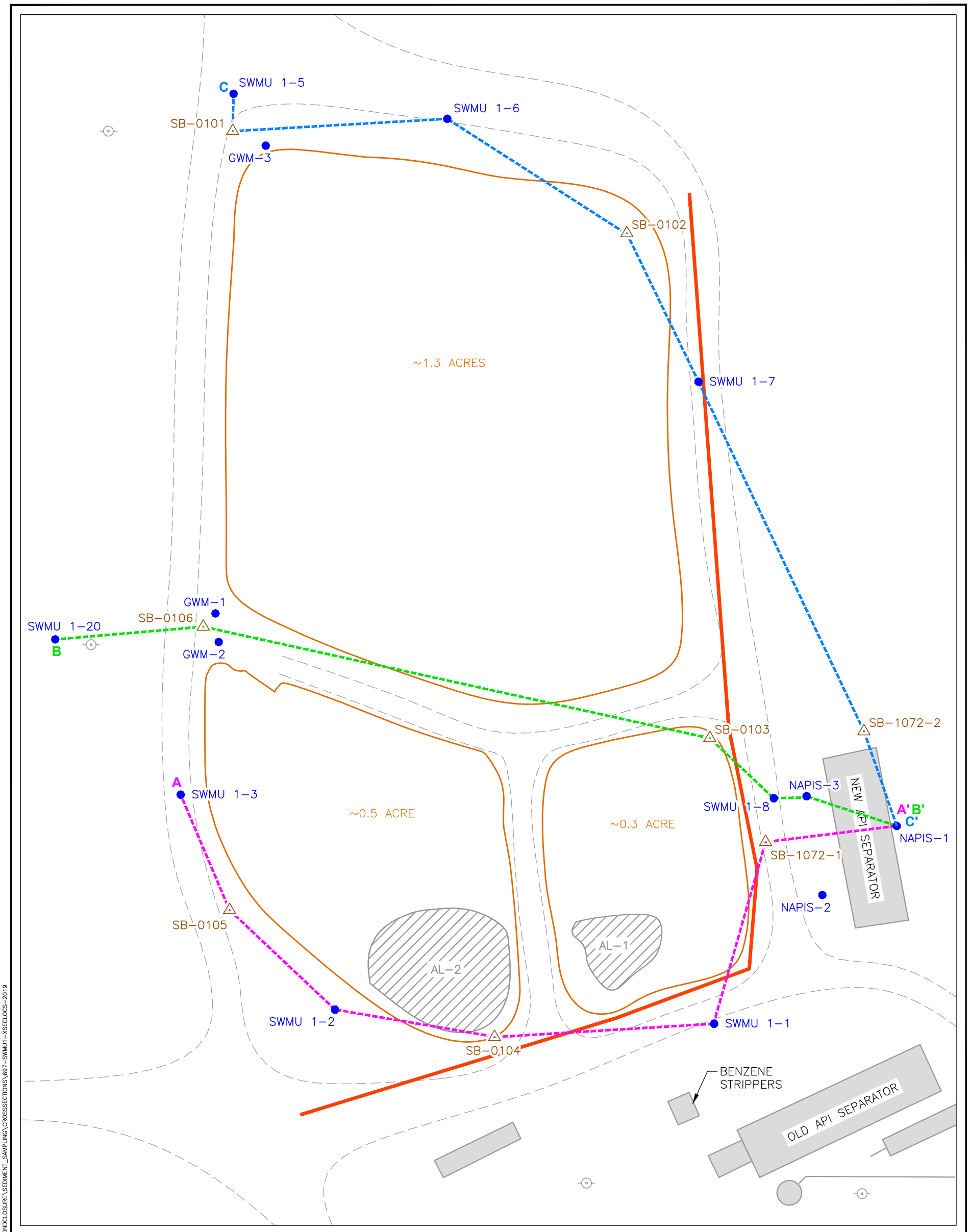

EXPLANATION

- NAPIS-2 — GROUNDWATER WELL AND DESIGNATION
- SB-0104 — SOIL SAMPLE AND DESIGNATION
- CROSS-SECTION A-A'
- CROSS-SECTION B-B'
- CROSS-SECTION C-C'
- ACCESS ROAD EDGE
- BANK/BERM EDGE
- PROPOSED 2019 GROUNDWATER INTERCEPTOR TRENCH
- EXTENT OF WATER/PSH (JULY 2019)
- BUILDING OR OTHER STRUCTURE
- UTILITY POLE

N

0 50'

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FIGURE 2A

CROSS-SECTION LOCATIONS MAP

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: 1" = 50'	Date: 8/19/19	File: 697-SWMU1-XSECLOCS-2019

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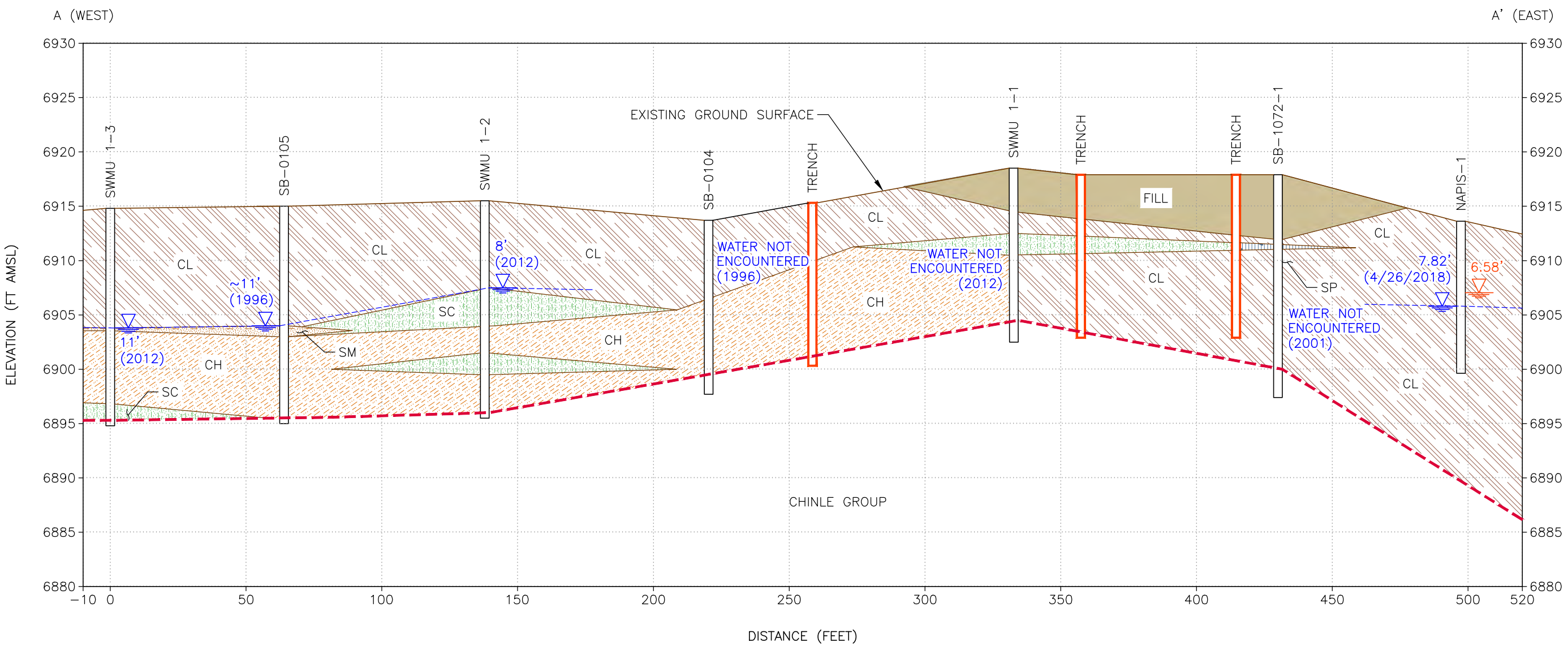
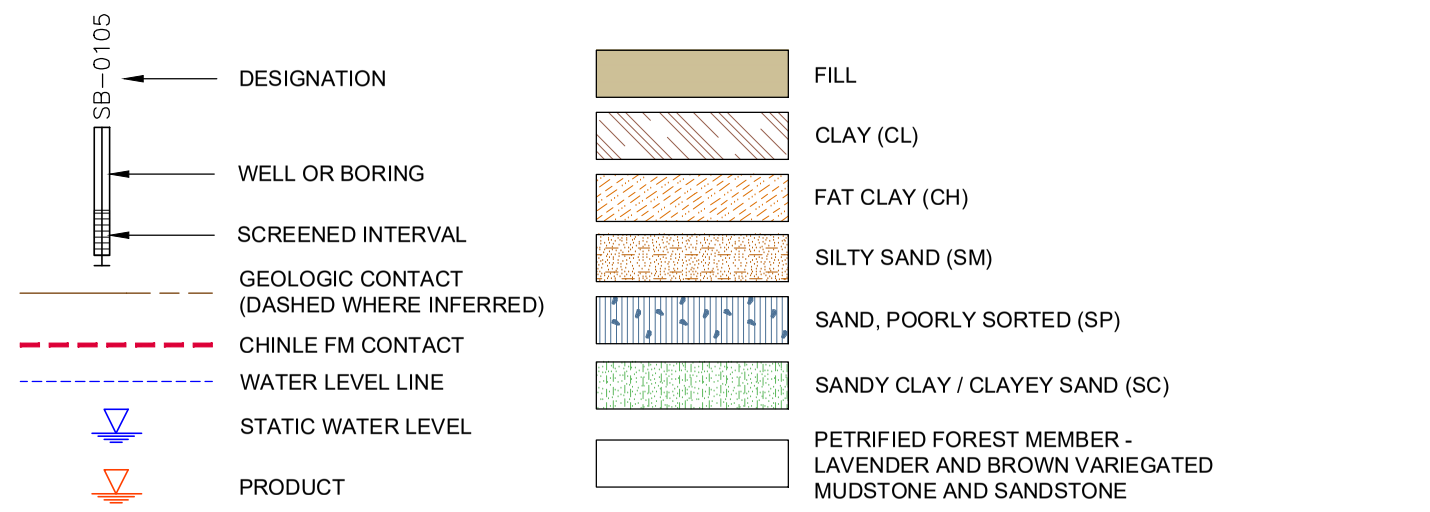


EXPLANATION



0 40' HORIZONTAL SCALE

0 10' VERTICAL SCALE

VERTICAL EXAGGERATION = 4X

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FIGURE 2B

GEOLOGICAL CROSS-SECTION A-A'

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: AS SHOWN	Date: 9/17/19	File: 697-SWMU1-XSECA_2019

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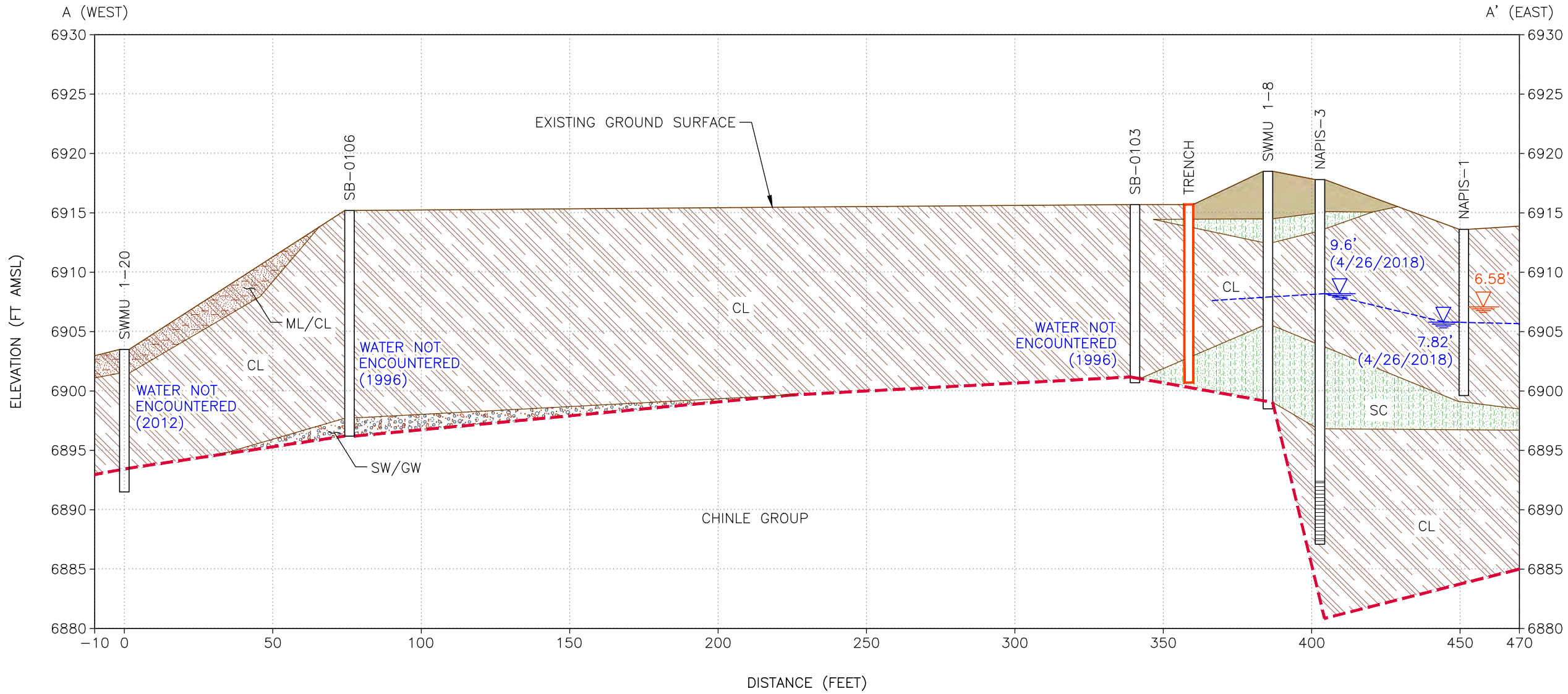

EXPLANATION

SB-0106 — DESIGNATION

WELL OR BORING

SCREENED INTERVAL

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

CHINLE FM CONTACT

WATER LEVEL LINE

STATIC WATER LEVEL

PRODUCT

FILL

CLAY (CL)

SAND, WELL SORTED (SW)

GRAVEL, WELL SORTED (GW)

SANDY CLAY / CLAYEY SAND (SC)

SILT (ML)

PETRIFIED FOREST MEMBER - LAVENDER AND BROWN VARIEGATED MUDSTONE AND SANDSTONE

PROPOSED 2019 GROUNDWATER INTERCEPTOR TRENCH

FT AMSL — FEET ABOVE MEAN SEA LEVEL

0 40' HORIZONTAL SCALE

0 10' VERTICAL SCALE

VERTICAL EXAGGERATION = 4X

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FIGURE 2C

GEOLOGICAL CROSS-SECTION B-B'

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: AS SHOWN	Date: 9/18/19	File: 697-SWMU1-XSECB_2019

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C (WEST)

C' (EAST)

EXISTING GROUND SURFACE

SWMU 1-5

SB-0101

SWMU 1-6

SB-0102

SWMU 1-7 TRENCH

SB-1072-2

NAPIS-1

CL

SC

GW

CH

SP/GW

WATER NOT ENCOUNTERED (1996)

25' (2012)

9' (2012)

14' (2012)

1.1 (2012)

8' (2011)

6.58'

7.82' (4/26/2018)

CHINLE GROUP

ELEVATION (FT AMSL)

6930
6925
6920
6915
6910
6905
6900
6895
6890
6885
6880
6875
6870

0 50 100 150 200 250 300 350 400 450 500 550 575

DISTANCE (FEET)

EXPLANATION

SB-0106 — DESIGNATION

WELL OR BORING

SCREENED INTERVAL

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

CHINLE FM CONTACT

WATER LEVEL LINE

STATIC WATER LEVEL

PRODUCT

FILL

CLAY (CL)

GRAVEL, WELL SORTED (GW)

SANDY CLAY / CLAYEY SAND (SC)

SAND, POORLY SORTED (SP)

FAT CLAY (CH)

PERCHED WATER ZONE

PETRIFIED FOREST MEMBER - LAVENDER AND BROWN VARIEGATED MUDSTONE AND SANDSTONE

PROPOSED 2019 GROUNDWATER INTERCEPTOR TRENCH

FT AMSL — FEET ABOVE MEAN SEA LEVEL

0 40' HORIZONTAL SCALE

0 10' VERTICAL SCALE

VERTICAL EXAGGERATION = 4X

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FIGURE 2D

GEOLOGICAL CROSS-SECTION C-C'

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: PH	Scale: AS SHOWN	Date: 9/18/19	File: 697-SWMU1-XSECC_2019

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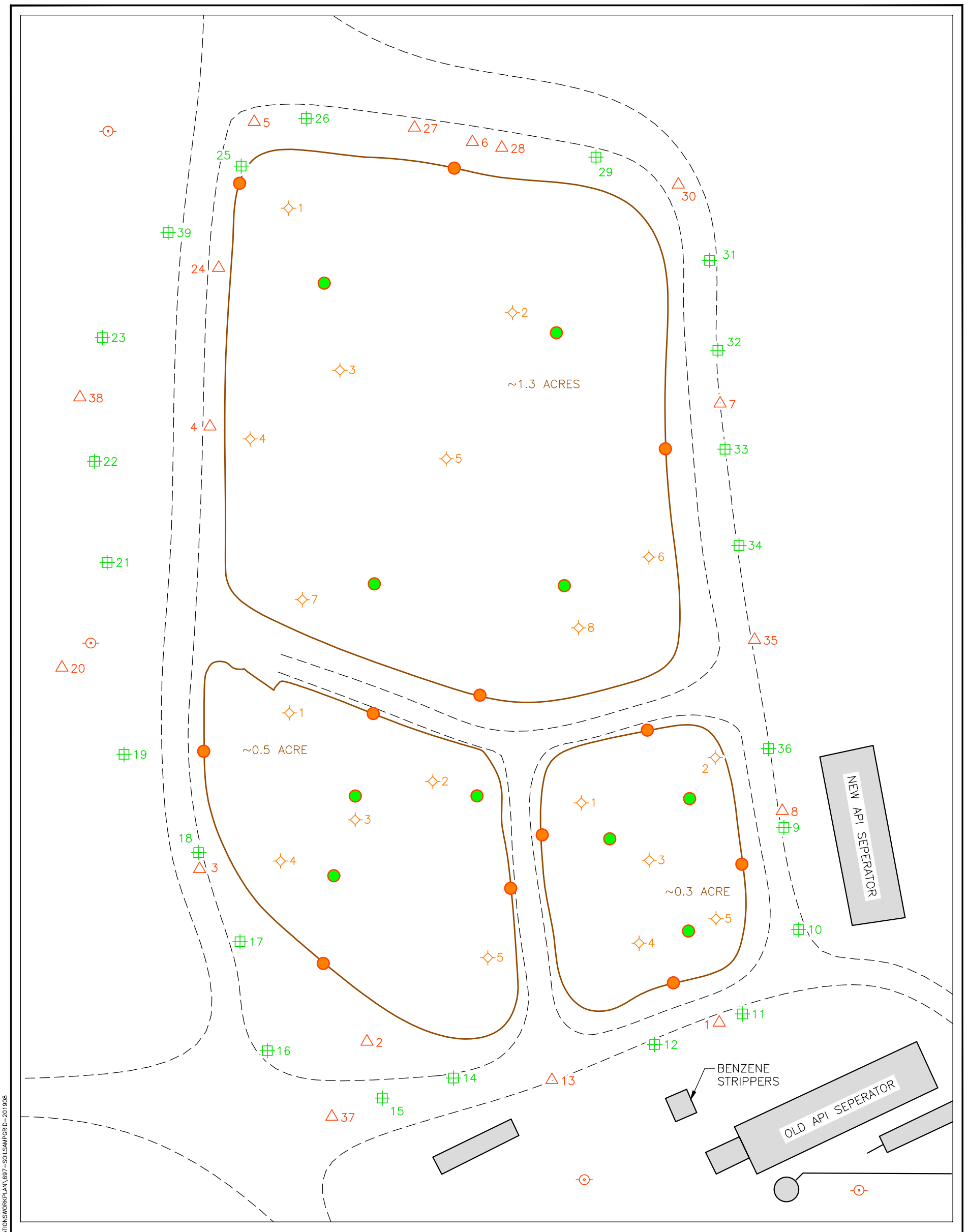

EXPLANATION

- ACCESS ROAD EDGE
- BANK/BERM EDGE
- 37 PREVIOUS PERIMETER SOIL BORING AND DESIGNATION
- 16 PREVIOUS HAND AUGER SAMPLE AND DESIGNATION
- PROPOSED 2019 POND SEDIMENT SAMPLING LOCATION
- PROPOSED 2019 BERM SAMPLING LOCATION
- 4 2008 SEDIMENT DEPTH MEASURING POINT AND DESIGNATION
- UTILITY POLE
- BUILDING OR OTHER STRUCTURE

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FIGURE 3

SOIL/SEDIMENT SAMPLING LOCATIONS
SWMU NO.1

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: CF	Scale: 1" = 50'	Date: 8/29/19	File: 697-SOILSAMPGRID-201908

M:_ITON_MARATHON_CADD_GALLUP_REPORTS_SWMU1_EVAPPONDCLOSURE_INVESTIGATIONSWORKPLAN_697--SOILSAMPGRID--201908

Attachment

memorandum

To: Sampling Team Members
From: Project Manager
Date: October 4, 2019
Re: Standard Operating Procedure – Sediment Sampling

1.0 INTRODUCTION

Sediment sampling related to site characterization and site clean-up is expected to involve source sampling of potentially contaminated sediments for characterization and profiling. Sediment sampling is expected to occur in and around the aeration lagoons and evaporation pond.

All personnel involved in sediment sampling projects are required to review this Standard Operating Procedure (SOP) before sampling to ensure the continued generation of reliable data. This SOP is based on experience gained from collecting sediment samples and the latest information available in guidance manuals. This SOP may be updated as additional experience and information are acquired.

2.0 PRE-FIELD ACTIVITIES

Several activities will be conducted prior to departure for the project site. A project team will be assigned and the members will begin coordinating the sample collection event with Marathon Petroleum Company. Field equipment will be checked and organized. Access to the areas to be sampled will be checked, and provisions made to pack the necessary equipment for delivery to the project site.

3.0 PREPARATION

The Project Manager will review the current sampling and analysis plans and work plans to determine if any documents need to be brought to the site during monitoring. The Project Manager will also evaluate whether any changes have been made in the sampling and analytical procedures, and notify the appropriate personnel.

The Sampling Team Members will review available surface water level data before leaving for the sampling site. This preparation ensures that the proper equipment and personnel are available at the site. All field screening equipment will be inspected prior to departure, ensuring that it is in proper working order. For sediment sampling, the only field monitoring equipment used will be the Photoionization detection (PID) meter and it should be calibrated and operated and according to manufacturer's recommendations.

4.0 EQUIPMENT

The following equipment is recommended for sediment sampling:

- ☐ Required personal protective equipment (PPE), listed in the site-specific health and safety plan (HASP) (generally nitrile gloves, waders, life preserver, rope and safety glasses)
- ☐ Sediment sampling devices (i.e., hand auger)
- ☐ Sampling beaker, bottles, labels, and preservatives
- ☐ Gloves
- ☐ Chain-of-custody/sample-analysis-request forms
- ☐ Flame Ionization detection meter (FID)
- ☐ Opaque Cooler(s) and bagged ice or frozen Blue Ice
- ☐ Detergent or solvent for cleaning monitoring equipment
- ☐ Brushes dedicated for decontamination
- ☐ Decontamination containers dedicated for wash, rinse 1, and rinse 2
- ☐ Paper towels
- ☐ Trash bags
- ☐ Field logbook
- ☐ Wrist watch (with digital display)

5.0 SAMPLE COLLECTION

A critical aspect of any sampling program is selection and implementation of an appropriate sampling technique. Selection of equipment and technique should be appropriate for the volume of material required and the type of analysis to be performed. In general, the sampling equipment and technique will be chosen to minimize, to the extent possible, the amount of handling a sample will undergo prior to analysis. In many cases, the material to be sampled will be easy to access, and simple "grab" samples collected using a shovel, trowel, or drive sampler are appropriate. In other cases, such as underwater or heavily saturated samples, the sediments may be difficult to access, and sampling will involve the use of specialized sediment sampling equipment. Specific analytical requirements and sampling frequencies are specified in the work plan.

Sediment samples located in dry areas will be collected from representative locations using a decontaminated drive sampler equipped with clean brass or stainless steel sampling rings, a thin-walled tube sampler or a shovel or hand trowel. The sampling device will be driven completely into the material

manually or using a manually operated auger, drive hammer, or mallet. The sampling device will then be extracted from the material using a shovel or trowel as needed. If used, filled sampling rings or the thin walled tube will then be removed from the sampling device and immediately sealed on both ends with teflon sheeting and plastic caps. Otherwise, the material will placed directly from the trowel or other appropriate sampling device into a clean glass jar. The jar will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with a teflon-lined lid.

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