SFPP Norwalk Pump Station
Norwalk, California

Work Plan for Offsite Soil Vapor Probe Installation

Final

July 29, 2021

Kinder Morgan, Inc.

SFPP Norwalk Pump Station

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Certification

The material and data presented in this report were prepared consistent with current and generally accepted consulting principles and practices. This work was supervised by the following Jacobs licensed professional.

Malcolm Thomas
California Professional Geologist, No. 9825

July 29, 2021
Date

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Acronyms and Abbreviations

bgs	below ground surface
CH2M	CH2M HILL, now part of Jacobs Engineering Group Inc.
EPA	U.S. Environmental Protection Agency
ft/ft	foot per foot
GWE	groundwater extraction
Jacobs	Jacobs Engineering Group Inc.
Kinder Morgan	Kinder Morgan, Inc.
LNAPL	light nonaqueous phase liquid
MRP	Monitoring and Reporting Program
No.	number
NSZD	natural source zone depletion
OEHHA	Office of Environmental Health Hazard Assessment
RAP	Remedial Action Plan
Regional Board	California Regional Water Quality Control Board, Los Angeles Region
SFPP	SFPP, L.P., an indirect subsidiary of Kinder Morgan, Inc.
SVE	soil vapor extraction
SVP	soil vapor probe
TFE	total fluids extraction
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
USA	Underground Service Alert
VOC	volatile organic compound

1. Introduction

This work plan was prepared by Jacobs Engineering Group Inc. (Jacobs), on behalf of Kinder Morgan, Inc. (Kinder Morgan), to install two additional soil vapor probes (SVPs) in the offsite/residential area along Cheshire Street, adjacent to the SFPP, L.P. (SFPP) Norwalk Pump Station (the site), located at 15306 Norwalk Boulevard, Norwalk, California (Figure 1). The purpose of the new SVPs is to fill an apparent data gap in the offsite portion of the SVP monitoring network identified by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board).

The regulatory history leading up to this work plan is complex. The process began in 2019, when Jacobs prepared a risk assessment entitled *Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the 36-Acre Parcel – Revision 1* (herein referred to as the HHRA) (Jacobs, 2019a). Following their review of the HHRA, the Regional Board issued comments in a letter dated April 23, 2020, in which they requested that Kinder Morgan prepare a technical memorandum reviewing the current offsite SVP monitoring network and evaluating the adequacy of the ongoing soil vapor monitoring program. In response, Jacobs prepared and submitted a technical memorandum entitled *Review of the Offsite Soil Vapor Monitoring Probe Network* (Jacobs, 2020), which concluded that the existing SVP network for the onsite and offsite areas is adequate for assessing risk and evaluating performance of the offsite/south-central horizontal biosparge and soil vapor extraction (SVE) treatment wells, which were installed in 2020.

Subsequently, the Regional Board, with input from the Office of Environmental Health Hazard Assessment (OEHHA), issued comments on the offsite SVP technical memorandum in a letter dated June 14, 2021, in which they presented a dissenting opinion on the adequacy of the SVP monitoring network and identified a perceived data gap in the offsite/residential area along Cheshire Street. In those comments, the Regional Board requested that Kinder Morgan submit a work plan for the installation of additional probes in the offsite/residential area by July 29, 2021.

To attain clarity from the Regional Board regarding comments on the offsite SVP technical memorandum, and to determine a path forward, Jacobs met with the Regional Board's Caseworker, Paul Cho, in a virtual meeting conducted on June 24, 2021, in which it was agreed that Kinder Morgan would proceed with submitting a work plan for the installation of two additional SVPs along Cheshire Street. As such, the following sections provide relevant site background information, describe the proposed scope of work and methods, and present a general schedule for implementation of this work plan.

2. Background Information

This section presents a summary of site background information including a site description, hydrogeologic conditions, and existing remediation systems. Additional details on the site background are available in the 2013 *Conceptual Site Model* (CH2M, 2013a) and the *Second Quarter 2021 Remediation Progress Report* (Jacobs, 2021b), accessible on GeoTracker, the State Water Resources Control Board's internet-accessible database system.

2.1 Site Description

The entire site on which Kinder Morgan operates pipelines and remediation systems is owned by DLA Energy (formerly Defense Energy Support Center). The site previously was occupied by 12 aboveground fuel storage tanks and associated piping and facilities. The tanks had a maximum capacity of 35 million gallons and were used to store and distribute refined petroleum products including jet-propellant numbers 5 and 8 (JP-5 and JP-8); the tanks reportedly also stored aviation gasoline and jet-propellant number 4 (JP-4). DLA Energy previously operated truck fill stands and various fuel transfer systems. The facility was decommissioned in 2001 and is no longer used to handle fuel. The aboveground tanks and the main infrastructure were demolished in 2010; demolition of the subsurface piping was completed in 2011.

Kinder Morgan currently operates remediation equipment within 2 acres of the site and has easements for its pipelines that traverse the southern and eastern boundaries of the facility (Figure 2). Beginning in 1956, Kinder Morgan operated a pump station near the south-central area of the site. The pump station was used to transfer fuel to and from the site, and as an in-line pumping station for portions of the Kinder Morgan pipeline network. The pump station was decommissioned in 2001, but three pipelines remain in service and continue to convey refined petroleum fuels consisting of gasoline, diesel, and jet fuel. The three pipelines are two 16-inch pipelines and one 24-inch pipeline heading eastward along the southern boundary of the site (one of the 16-inch pipelines bends at the southeastern corner of the facility and continues northward within the eastern easement). Originally, the pipelines were fitted with block valves and motor-operated valves within the site. The block valve located in the south-central area of the site was historically referred to as the “intermediate 24-inch block valve.” The intermediate 24-inch block valve and other motor-operated valves were removed between the third quarter of 2016 and second quarter of 2017. A block valve is located offsite near the southeastern area of the site. The block valve is still in use, and is referred to as the “southeastern 24-inch block valve” or “offsite 24-inch block valve.”

Subsurface assessments have been performed at the site since 1986. Groundwater monitoring, soil vapor monitoring, and remediation wells have been installed at the site for monitoring and as components of groundwater remediation systems. The investigations have evaluated and characterized the subsurface soil and groundwater within the uppermost groundwater zone that has been impacted by fuel-related hydrocarbons from historical releases from Kinder Morgan’s pipelines at the site. The primary impacts are to groundwater associated with fuel product that historically leaked from block valves and migrated vertically downward to the water table. Separate-phase floating product, or light nonaqueous phase liquid (LNAPL), as well as sorbed-phase and dissolved-phase fuel hydrocarbons, have been delineated in areas beneath the site and offsite in all cardinal directions.

Historically, site assessments indicated that the chemicals of potential concern are total petroleum hydrocarbons (TPH), including TPH quantified as gasoline (TPH-g), diesel (TPH-d), JP-4, JP-5, and JP-8; benzene, toluene, ethylbenzene, and total xylenes; 1,2-dichloroethane; methyl tertiary butyl ether; and tertiary butyl alcohol. A groundwater Monitoring and Reporting Program (MRP) has been in effect at the site since 1995. The current groundwater MRP is described in the *Revised Groundwater Sampling and Analysis Plan* (CH2M, 2013b).

2.2 Hydrogeologic Conditions

The site is underlain by the following hydrogeologic units (shallow to deep):

- The uppermost saturated zone, also referred to as the semiperched upper groundwater zone, is located between depths of approximately 28 and 50 feet below ground surface (bgs). Currently, the average water table depth across the site is 35 feet bgs. Groundwater flow within this uppermost zone is generally north to northwestward with a horizontal gradient of approximately 0.001 foot per foot (ft/ft). This zone primarily comprises sand, silty sand, and clayed silt. Historically, there is a slight downward vertical gradient in this aquifer.
- The Bellflower aquitard of the Lakewood Formation is located between depths of approximately 50 and 80 feet bgs beneath the site. The Bellflower aquitard consists of predominantly clay, silty clay, and sandy clay with some interbedded sand with silt.
- The Exposition aquifer is located between depths of approximately 80 and 220 feet bgs. The horizontal hydraulic gradient in the Exposition aquifer beneath the site is approximately 0.001 ft/ft and generally moves in a southeastward direction. The potentiometric surface in the Exposition aquifer is approximately 25 feet lower than that in the semiperched uppermost groundwater zone. Despite the downward vertical gradient in the uppermost saturated zone, historical analytical data from samples collected in the Exposition aquifer suggest that the Bellflower aquitard inhibits the vertical movement of groundwater between the two aquifers.

2.3 Overview of Existing Remediation Systems

Kinder Morgan operates remediation systems consisting of vertical and horizontal SVE and horizontal biosparge in the offsite/south-central and southeastern areas of the site. The hydraulic control systems, consisting of total fluids extraction (TFE) wells (that is, the extraction of free product, groundwater, or both, using a top-loading pump) and groundwater extraction (GWE) wells (that is, the extraction of groundwater using a bottom-loading pump) were temporarily suspended on February 23, 2021, pending development of an interim Remedial Action Plan (RAP), as approved by the Regional Board.

The remediation systems are designed to contain and control the migration of hydrocarbon constituents in groundwater and soil vapor, and to remove hydrocarbon mass from soil and groundwater. The remediation systems contain the following wells:

- South-central area (currently inactive)
  - 13 TFE wells
  - 24 onsite SVE wells
  - 1 horizontal biosparge well (BS-01)
- Offsite south-central area
  - 7 TFE wells (only GMW-O-12 and GMW-O-20 are active)
  - 6 offsite SVE wells (five are collocated with TFE wells, inactive)
  - 1 horizontal biosparge well (BS-03, startup and active)
  - 1 horizontal SVE well (HSVE-01, startup and active)

- Southeastern area
  - 4 TFE wells (GM W-O-15, GMW-O-18, GMW-36, and GMW-SF-9, inactive)
  - 1 GWE well (GMW-SF-10, inactive)
  - 9 SVE wells (3 collocated with TFE wells, active)
  - 1 horizontal biosparge well (BS-02, active)

The remediation system layout is shown on Figure 2.

In addition, as a transitional remedy, in May 2020, Kinder Morgan implemented a natural source zone depletion (NSZD) performance monitoring pilot study in the south-central and southeastern areas of the site, as described in the *Natural Source Zone Depletion Work Plan* (Jacobs, 2019b). NSZD is a term used to describe the collective, naturally occurring processes of dissolution, volatilization, and biodegradation that result in mass losses of LNAPL petroleum hydrocarbon constituents from the subsurface. Under favorable conditions, NSZD processes are often capable of contaminant reduction rates on par with active remedies.

To facilitate the pilot study, heretofore active remedies (i.e., SVE, TFE, and biosparge) in the south-central area were temporarily suspended in May 2020, to allow for data collection in that area under ambient conditions, while active remedies in the southeastern and offsite/south-central areas continued to operate. Since then, the hydraulic control system was deactivated in the remaining areas of the site on February 23, 2021, as discussed above.

The pilot study consists of three separate sampling and monitoring events over the course of 18 to 24 months, whereby complementary field methodologies are being used to collect carbon dioxide efflux measurements and soil gas samples for laboratory analysis. The new data, coupled with historical soil vapor monitoring data, will be used to calculate current NSZD rates, which will be evaluated in conjunction with other remediation performance monitoring data such as SVE influent and effluent concentrations, groundwater hydrocarbon concentrations, and TFE influent and effluent data. Ultimately, the pilot study will inform the approach for potentially transitioning to an NSZD remedy at the site, which will be detailed in the forthcoming interim RAP.

The first (baseline) NSZD sampling and monitoring event was conducted in May 2020, with the south-central remediation systems turned off and just prior to startup of the southeastern remediation systems. The second event was conducted in November 2020; the third event is scheduled to occur in the third quarter of 2021. Additionally, supplemental NSZD data are being collected intermittently from the SVE system to monitor the NSZD rates on an interim basis.

Additional details on the existing remediation systems are provided in the *First Quarter 2021 Remediation Progress Report* (Jacobs, 2021a).

2.4 Overview of Current Soil Vapor Probe Network

As presented in the *Review of the Offsite Soil Vapor Monitoring Probe Network* technical memorandum (Jacobs, 2020), the current SVP network consists of the following infrastructure:

- Onsite/South-Central Area:
  - SVM-11, SVM-12, SVM-13, and SVM-14R (replaced SVM-14 in 2017)
  - SVP-105, SVP-106, SVP-107, SVP-108, and SVP-109

- Offsite/South-Central Area:
  - SVM-01, SVM-02, SVM-03, SVM-05, SVM-06, SVM-07, SVM-08, SVM-10, SVM-15, and SVM-16
- Onsite/Southeastern Area:
  - SVM-09, SVM-17, SVM-18, SVM-19, SVM-20, SVM-21, SVM-22, and SVM-23
- Offsite/Southeastern Area:
  - SVM-24, SVM-25

In total, the SVP network contains 24 SVPs, as shown on Figure 2. The majority of probes are dual-nested and screened at approximately 5 feet and 10 feet bgs. Six probes (SVM-11, SVM-12, SVM-13, SVM-14, SVM-15, SVM-16) are triple-nested, with shallow, medium, and deep screen intervals, installed at various depths of up to approximately 22 feet bgs. Soil vapor probes are sampled on a quarterly basis, as part of ongoing, routine monitoring. Historical SVP data from 2012 to present are provided in Kinder Morgan's quarterly remediation progress reports, and submitted to the Regional Board on the 15th of January, April, July, and October every year.

To evaluate the adequacy of the soil vapor monitoring network and potential vapor intrusion risk to offsite receptors in the south-central area, the *Review of the Offsite Soil Vapor Monitoring Probe Network* technical memorandum (Jacobs, 2020) presented a detailed accounting of long-term SVP data trends and other supporting lines of evidence. Based on that review, Jacobs concluded that the existing SVP network is adequate in both detecting any vapors present and confirming the absence of vapors at monitoring locations located above areas most likely to produce vapors. Additionally, the observations presented in the technical memorandum appear to support the conclusion from prior risk assessments that there is no significant risk to potential offsite receptors from petroleum hydrocarbon impacts in the subsurface under current conditions. Moreover, continued quarterly monitoring and reporting of data facilitate the evaluation of current and future risk to potential offsite receptors.

3. Scope of Work

The proposed scope of work for the offsite SVP installation encompasses pre-mobilization, field, and post-field activities, summarized as follows:

- Pre-Mobilization Activities
  - Work planning and coordination
- Field Activities
  - SVP mark-out and survey
  - Utility clearance and location
  - SVP installation
  - Equipment decontamination
  - Waste management
- Post-Field Activities
  - Sampling and reporting

3.1 Pre-Mobilization Activities

Jacobs will perform the following field preparation tasks before beginning field activities:

- Update the existing, site-specific health and safety plan to incorporate the planned fieldwork.
- Notify the Regional Board and the City of Norwalk a minimum of 1 week in advance of the planned field activities.
- Notify Underground Service Alert (USA). As required by USA, the borings will be called in and marked out in white paint at least 2 business days prior to drilling.
- Obtain an encroachment permit from the City of Norwalk for authorization to install SVPs in the sidewalk.

3.2 Field Activities

3.2.1 SVP Mark-out/Survey, and Utility Clearance/Location

Prior to SVP installation, Jacobs will mark out the two proposed probe locations on the ground surface with white, water-based survey paint. The proposed SVP locations are shown on Figure 2. In addition, proposed boring locations will be properly delineated for utility clearance as required by USA.

Following SVP mark-out, an underground utility check will be performed using a private utility-locating subcontractor. Jacobs and the utility-locating subcontractor will clear each proposed boring of potential underground utilities and other infrastructure.

The proposed location of the two SVPs will be finalized in the field based on the results of the survey conducted by the private utility-locating subcontractor and USA mark-outs.

3.2.2 Soil Vapor Probe Installation

SVP installation will consist of the following activities:

- Precut the sidewalk concrete at both SVP locations using a circular concrete saw.
- Clear and advance the SVP boring locations using a hand auger. The probe location may be adjusted based on subsurface conditions.
- Collect undisturbed soil samples, from 4 to 5 feet bgs and 9 to 10 feet bgs, with a slide hammer and acetate sleeves. Analyze soil samples for volatile organic compounds (VOCs) and total petroleum hydrocarbons. Install the SVPs in the same borehole. Preserve soil samples on ice following collection and submit to a local laboratory for analytical testing.
- Install SVPs constructed of 6-inch-long, stainless-steel woven screens at target depths of approximately 4.5 and 9.5 feet bgs using a hand auger. Center the SVPs within a filter pack consisting of approximately 1 foot of No. 3 sand. Connect the SVPs to ¼-inch-diameter Teflon tubing that runs from each screen interval to the ground surface. Place 1 foot of dry granular bentonite above the deep filter pack and the shallow filter pack. Place hydrated granular bentonite above the dry bentonite. Complete each SVP with a flush-mounted, 6-inch-diameter, traffic-rated monitoring well box. A conceptual design of these new SVPs is illustrated on Figure 3.
- Restore the sidewalk surface around the monitoring well box to its original condition to match the adjacent surface material (concrete).

3.2.3 Equipment Decontamination

Drilling equipment will be steam-cleaned with potable water prior to use. Sampling equipment will be cleaned before each use by washing with an Alconox-water solution and double-rinsing with potable water.

3.2.4 Waste Management

Investigative-derived waste generated during field activities will include the following:

- Equipment wash and rinse water
- Soil cuttings
- General refuse (gloves, rags, paper towels)

Equipment wash and rinse water will be contained in one 55-gallon drum.

Soil cuttings generated from the installation of the SVPs will be contained in a 55-gallon drum. General refuse will be disposed of as municipal waste.

A grab sample will be collected from the drum containing equipment wash and rinse water and sent to a certified laboratory for waste disposal profiling purposes.

A composite sample of the soil cuttings will be collected and sent to a certified laboratory for waste disposal profiling purposes. Jacobs will coordinate with Kinder Morgan personnel and the waste hauler to verify the laboratory parameters that need to be analyzed to meet waste profiling requirements.

Jacobs will properly label each drum as waste is generated.

3.3 Post-Field Activities

3.3.1 Sampling

The two proposed SVPs will be sampled during the fourth quarter 2021 soil vapor monitoring event. Similar to the existing probes, the two new SVPs will be sampled quarterly using Suma canisters. Jacobs will submit the canisters to a certified laboratory for the following analyses:

- Gasoline-range organics using U.S. Environmental Protection Agency (EPA) method TO-3
- VOCs using EPA method TO-15
- Fixed gases

3.3.2 Reporting

Jacobs will submit a SVP installation completion report to the Regional Board following installation and sampling of the two proposed SVPs. A summary of soil sample analytical results will be included in the completion report. The new data will also be included in the next available remediation progress report.

4. Project Schedule

Jacobs anticipates installation of the new soil vapor probes in 2021, after this work plan is approved by the Regional Board. Following installation, Jacobs will sample the new soil vapor probes for laboratory analysis and report the results to the Regional Board.

For questions regarding this work plan, please contact Mr. Eric Davis, Jacobs' Project Manager, at (213) 228-8262, or Mr. Court Reece, Kinder Morgan's Remediation Project Manager, at (346) 237-1505.

5. References

CH2M HILL (CH2M). 2013a. *Conceptual Site Model and Proposed Alternate Interim Remedy for Soil, Groundwater, and LNAPL*. September 3.

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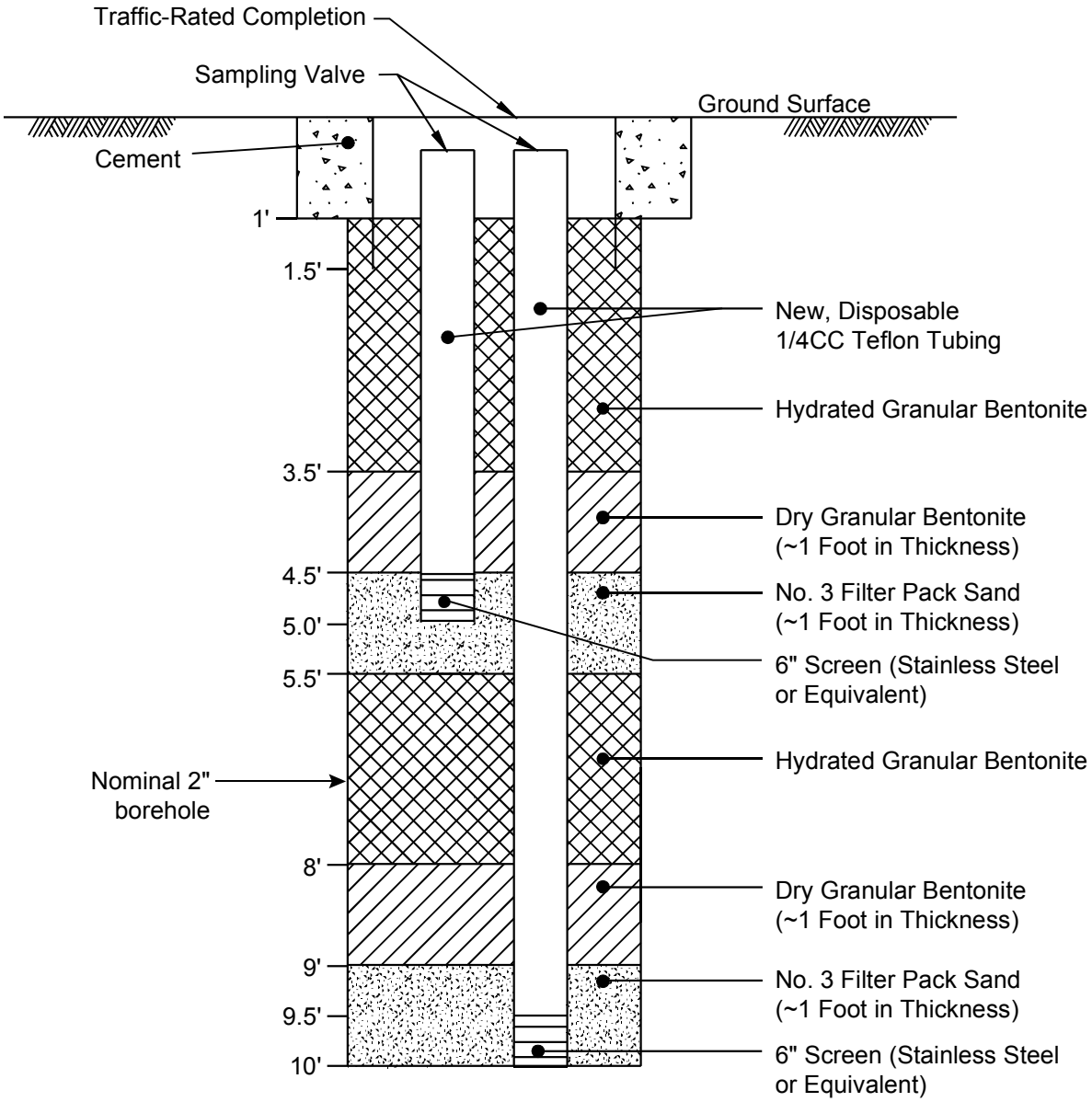
Figures



Not to Scale

Figure 3. SVM-26 and SVM-27 Conceptual Diagram
SFPP Norwalk Pump Station
Norwalk, California

Jacobs