Addison Natural Gas Project Phase 1

SOIL MANAGEMENT PLAN

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1.0 Introduction and Scope of Work

Vanasse Hangen Brustlin, Inc. ("VHB") has prepared this Soil Management Plan ("SMP") as a supplement to the approved "OHM Incident Response and Reporting Plan" that Vermont Gas Systems, Inc. ("VGS") prepared, which was submitted to the Vermont Agency of Natural Resources ("ANR") on May 19, 2014. The purpose of this SMP is to outline procedures that VGS and its contractors shall follow for the management of pre-existing soil or groundwater contamination that may be encountered during construction of the Addison Natural Gas Project ("ANGP" or "the Project"). This SMP applies only to the Project.

The Project generally consists of the installation of an approximately 41-mile long, 12-inch diameter natural gas transmission pipeline from Colchester to Middlebury, passing through the towns of Colchester, Essex, Williston, St. George, Hinesburg, Monkton, New Haven, and Middlebury. Additionally, the project involves installation of two 6-inch diameter distribution mainlines: one approximately 3.7 miles long through the towns of New Haven, Ferrisburgh, and Waltham, as well as another approximately 1.4 miles long in Middlebury. In total, the transmission pipeline and distribution mainlines total to approximately 46 miles. Generally, the Project will involve excavation of a trench approximately four to five feet deep, installing the pipeline in the trench, and backfilling the trench with native and imported soil materials. In some environmentally elevated risk areas, such as wetlands, the pipeline will be installed via a trenchless Horizontal Directional Drilling method.

The OHM Incident Response and Reporting Plan addresses the management of oil and hazardous materials ("OHM") used during construction, to prevent and respond to spills. In contrast, this SMP pertains to reporting and management of potentially existing contaminated soil that may be encountered during the progress of construction. Nothing in this SMP is intended to nor shall it be interpreted to cause VGS to assume liability under 10 V.S.A. § 6615.

VGS and its contractors shall follow the procedures outlined herein in order to comply with the Vermont Hazardous Waste Management Regulations and with Vermont ANR Procedures regarding environmental contamination. Regarding matters of worker safety and OSHA requirements, contractors are responsible for establishing and following their own site specific health and safety plans.

1.1 Guidance

This SMP is based in part on the Vermont Hazardous Waste Management Regulations and on the guidance provided in the Vermont ANR's March 2002 document "Guidance for Construction of Public Works Projects in Areas Where Contamination is Suspected or Known," ("Guidance") which is attached as Appendix 1. Because it is not uncommon for linear construction projects such as water or sewer pipelines to encounter existing soil or groundwater contamination in the course of excavation, this Guidance has been developed to provide procedures for identifying contaminated areas and planning for the management of contaminated materials.

It is not expected that the Project will encounter suspected or known contamination, nonetheless, this SMP has been developed in response to concerns about potential contamination associated with utility poles, and to provide a framework for addressing any unexpected contamination that may be encountered. As the Guidance document notes, it "*is written for sewer or water pipeline construction, but may be applicable to other construction projects effected by subsurface contaminants*," and therefore has been relied upon in the development of this SMP.

1.2 Potential Contaminants of Concern

Although the Project is not expected to encounter contamination, potential sources of existing contamination may exist in the vicinity of the VGS Project route. This SMP has been developed to identify potential elevated risk areas in advance of construction, and to investigate and manage contaminated soil and water in accordance with the applicable regulations. The potential contaminant sources, as described in more detail in section 2.1 below, include the following:

- Hazardous waste sites designated by the Vermont ANR
- Known or unknown underground petroleum storage tanks
- Pentachlorophenol originating from treated wood products including wooden utility pole structures
- Dumping of OHM, including farm dumps and illegal dumping

1.2.1 Pentachlorophenol

Considerable attention has been recently directed at the potential contamination of shallow ground water supplies by the wood treatment preservative pentachlorophenol ("PCP"). Recent reports of PCP in private water supplies have led to requests from the Vermont ANR; Health Department; Department of Public Service; and Agency of Agriculture, Food, and Markets, for further study of the potential for treated wooden utility poles to contaminate soil and groundwater. Three shallow groundwater supplies have reportedly been identified as contaminated with PCP throughout the State of Vermont since 2009. Two of these instances were attributed to improperly treated wooden utility poles. The third, although still being investigated, appears to have occurred due to a number of contributing factors, one of which is believed to be soil disturbance in the immediate vicinity of a pre-existing wood pole structure, along with other site conditions that are believed to have allowed anomalous migration of PCP to a nearby shallow water supply source. To address these concerns, this SMP also identifies PCP as a potential contaminant source.

PCP is an Environmental Protection Agency ("EPA") and VT Agency of Agriculture registered pesticide. As such, the Vermont Hazardous Waste Management Regulations provide that: ""*Hazardous material" does not include herbicides and pesticides when applied consistent with good practice conducted in conformity with federal, state and local laws and regulations and according to manufacturers' instructions*." PCP is a semi-volatile organic compound, registered for use as a wood preservative.

PCP has a very low water-solubility (14 mg/L in water at 20^0 C) and high partitioning coefficients ($\log k_{ow} = 5.12$, $\log k_{oc} = 3.10$ to 4.40). Due to these properties, PCP typically adsorbs to soil and organic matter and has low mobility in the environment. Normally, the vast majority of wood preservatives remain in the treated wood. If released into the environment, these chemicals tend to adsorb to soils and biodegrade over time; biodegradation may require several weeks for acclimation of the bacteria. PCP is readily biodegradeable in soil, surface water, and wetlands (US EPA, 2008, D'Angelo and Reddy, 2000, HSDB, 2014). Studies of PCP concentrations in soils at in-service utility poles have found that concentrations of PCP are highest in the immediate vicinity of the poles and rapidly decrease by several orders of magnitude within 3 to 12 inches from the poles. Concentrations of PCP found at distances of 30 to 40 inches away from the poles were reported to be non-detectable and typical of environmental background conditions (Arsenault, 1976, Murarka et al., 1996). Therefore, a goal of this SMP as it relates to PCP, is to avoid soils that may potentially

contain PCP and thus reduce the risk of PCP migration to water supplies and environmental receptors such as streams and wetlands.

On the Project, the limits of earth disturbance typically maintain a separation distance of 30 to 50 feet from utility poles on the VELCO right-of way, whereas the actual pipeline trench is at least 50 feet from all such poles. In consideration of the distances that PCP typically migrates in the environment compared to the setbacks provided by the Project design, the chances of encountering or mobilizing PCP contamination are considered extremely small.

1.2.2 Petroleum Compounds

Other potential contaminants include petroleum compounds that may be present in soil and groundwater as a result of leaking storage tanks, dumping, or other sources. Benzene, toluene, ethylbenzene, xylenes, trimethylbenzenes, and polycyclic aromatic hydrocarbons ("PAHs") such as naphthalenes, fluorene, phenanthrene, and anthracene, are among the more typically encountered petroleum related contaminants. In consideration of the distances between the Project and known petroleum-contaminated sites, it is not expected that such contamination will be encountered, however, the plan includes an assessment of DEC-listed sites in the vicinity of the project for a conservative assessment of potential areas of caution.

2.0 Background Information and Overview

A tiered approach will be used to screen for, identify, and manage contamination during Project construction. Refer to Section 3.0 below for Field Procedures to be followed by VGS and its contractors during Project construction.

During all portions of Project construction, earthwork will be monitored by on-site specialists in accordance with the Individual Construction-Phase Stormwater Permit ("INDC"), Permit # 6949-INDC. An On-Site Plan Coordinator ("OSPC") will be present for each mainline work crew, and shall perform inspections to assess conditions at the construction site that could impact stormwater quality, and shall assess the effectiveness of soil and sediment control measures. Also, a designated EPSC Specialist will be responsible for performing

environmental inspections during Project construction, confirming water resources protection throughout the Project route, and for related record keeping. These specialists will be trained in contamination awareness and will perform ongoing monitoring throughout the project to identify any potential soil contamination.

Additionally, section 2.1 of this SMP describes elevated risk areas that have been identified based on the presence of sensitive receptors and/or proximity to potential sources of contamination, where an enhanced level of inspection will be performed to screen for potential contaminants that may be encountered. Sections 2.2 through 2.6 explain the tiered sets of additional measures that would be employed in these Elevated risk areas.

2.1 Pre-Construction Assessment for Entire Project Route

As a pre-construction assessment, this SMP identifies elevated risk areas where existing contaminated soils or groundwater might potentially be encountered during Project construction, based on proximity to known and documented features such as active and closed hazardous sites designated by the Vermont DEC, and registered underground petroleum storage tanks. This SMP also identifies as elevated risk areas, locations along the Project corridor where Project construction will be in proximity to wood utility poles treated with wood preservatives (see Appendix 2 for a list of elevated risk areas). The attached maps[1] (pages 1 through 44 of Appendix 3) depict the Project, designated elevated risk areas, potential contaminant sources, the VELCO right-of-ways, as well as environmental receptors such as mapped private wells and springs along the VELCO corridor[2], public wells, wellhead protection areas, wetlands, streams, and surface waters. On these maps, the Project's limit of disturbance ("LOD") is shown in orange, and a 50-

1 The Project is depicted on a series of 44 maps, as attached, labeled non-consecutively as sheets #2 through #61. Sheets depicting areas of formerly-proposed pipeline routes have been retained in the numbering sequence, but have been omitted from the Appendix, in order to reduce confusion.

2 VHB utilized several available data sets for this mapping effort, including VHB-delineated data, data from ANR and VCGI, and VELCO field-collected data. Many of these data sets are dynamic, as the features can change over time. VELCO field-mapped private wells and springs using GPS, along the right-of-way corridor, therefore the mapped private water supplies represent the wells and springs that could be located in the field at the time of the survey. Any more recently installed water sources, or any water sources that could not be field-located would not have been mapped, therefore the mapping is not necessarily all-inclusive.

foot buffer on all sides of the LOD is shown in blue to indicate areas where the Project is in proximity to potential contaminant sources and sensitive receptors.

Of the Project's total of approximately 46 miles of pipeline, roughly 20 miles are located along the existing VELCO right-of-way corridor, where wooden utility pole structures are present. All the individual VELCO structures along the Project route have been accurately mapped, and areas where such structures are within 50 feet of the Project's LOD have been designated as elevated risk areas, as shown in Appendix 3. The LOD represents the pipeline trench plus an additional zone on either side of the trench where earth-disturbance may occur as a result of earthmoving, equipment travel, and stockpiling of excavated soils and construction equipment. Thus, the LOD represents the maximum area over which any existing potentially contaminated soils might be disturbed (note that no utility poles are located with 50 feet of the actual pipeline trench).

Table 1 below summarizes the Potential Contaminant Sources present within the vicinity of the Project LOD:

Table 1: Potential Contaminant Sources and Water Supply Features

Feature	Inventory Results
VT-Designated Hazardous Waste Sites	17 are present in the vicinity of the Project
Registered Underground Storage Tanks	4 are present in the vicinity of the Project
VELCO utility pole structures	153 are present within 50 feet of the Project LOD (none are within 50 feet of the actual pipeline trench)
Mapped Private Wells/Springs along VELCO Corridor	1 is present within 50 feet of the Project LOD
Public Wells	6 are present in the vicinity of the Project or where the Project passes through the associated Wellhead Protection Area
Public Wellhead Protection Areas	1 is present where the Project passes through it

2.2 Construction Look-Ahead Reconnaissance's for Entire Project Route

To identify other potential contaminant sources, contractors will perform a pre-construction "look-ahead" reconnaissance as the pipeline construction advances. The

"look-ahead" procedure is described in the OHM Incident Response and Reporting Plan, and consists of pre-construction assessment and evaluation of field conditions to determine applicable permit requirements and construction conditions prior to initiating ground disturbing activity. Accordingly, look-aheads will be used as a means to help identify un-documented potential contaminant sources, such as farm dumps, illegal dumping areas, and treated utility poles within 50 feet of the LOD, and to identify any areas within 50 feet of the Project LOD where gross staining (over 12 inches from the pole) is observed on soil at utility pole bases. Such areas that are identified in a look-ahead will be designated as elevated risk areas and will be subject to special procedures for elevated risk areas as described in section 2.3 below.

Refer to Section 3.0 for specific look-ahead procedures.

2.3 Additional Measures for Excavation Monitoring in Elevated Risk Areas

Additional measures will be implemented during Project construction within the identified elevated risk areas, including within areas where the LOD is in the vicinity of other potential contaminant sources that may be discovered during pre-construction "look-ahead" reconnaissance's.

Construction will proceed under heightened vigilance in the elevated risk areas as identified above. The potential sources of contamination within the elevated risk area, as identified above, will be assessed, and utility poles within the ROW and elevated risk area will be observed for evidence of gross soil staining. Generally, soil staining from treated wood poles beyond approximately 12 inches from the base of the pole would be considered excessive.

During excavation and earthmoving within the elevated risk areas, the OSPC shall observe the work closely to pay particular attention to any signs of contamination, such as stained soil, odors, or a sheen on groundwater (if groundwater or seepage is encountered). Should evidence of contamination be identified, the third tier of investigation, as described in section 2.4 below, would occur while Project construction proceeds.

Note that the Project LOD is not in proximity to any VT ANR-designated hazardous sites where a Corrective Action Plans ("CAP") or Soil Management Plan is in effect.

2.4 Screening if Evidence of Contamination is Observed

During excavations where evidence of contamination has been identified, the contractor will arrange for an OSHA-40-hour-HAZWOPER certified scientist to be present to screen soils and ambient air for Volatile Organic Compounds ("VOCs") with a PID. In general, work should stop if photoionization detector ("PID") values in the work area reach or exceed 1,000 ppm.

The OSHA-HAZWOPER certified scientist will monitor ambient airspace during excavation in these areas and will screen excavated soils with a PID. Screening will consist of creating a narrow linear depression in the soil contained within the excavator bucket with a clean implement or a clean nitrile-gloved hand. The PID probe will be inserted into and moved along the depression for a continuous headspace reading while a clean nitrile-gloved hand is cupped over the top of the depression and moved along with the PID probe. The most elevated reading will be recorded along with soil characteristics including depth, lateral location, time of screening, soil color, soil texture, soil moisture content, and olfactory observation. Soils with elevated PID screen readings (>10 ppm above the ambient background reading) or visual/olfactory evidence of contamination will be collected for headspace PID measurements, and further steps will be taken in accordance with section 2.5. Project construction may proceed while contaminated soils are being screened, segregated, and managed.

Detailed notes indicating the approximate volume of material removed and PID values will be recorded on daily observation logs.

2.4.1 Field Methods - Quality Control/Quality Assurance

Soil screening and observations will be conducted by an OSHA-40-hour-HAZWOPER certified scientist trained and experienced with contaminated soil and use of a PID. Each day before use, the PID will be calibrated on-site relative to a 100 ppm isobutylene standard, per manufacturing instructions, and calibrations will be recorded in the instrument's calibration log.

Refer to VHB's PID Field Screening Standard Operating Procedure ("SOP") in Appendix 4 for detailed procedures that will be followed.

2.5 Steps to be Taken if Contamination is Detected

Whether in a designated elevated risk area or elsewhere on the Project, if contamination is detected in soils being excavated by olfactory, visual, and/or PID headspace (>10 ppm above ambient background) indications, the following actions will be taken:

- Notify the Vermont DEC, Waste Management and Prevention Division, immediately about the discovery of an apparent release of contamination using the following telephone numbers:
    - (802) 241-3888 (business hours)
    - (800) 641-5005 (24-hour emergency)
- Segregate any contaminated soil from uncontaminated soils.
    - Roll-off containers may be used for the storage of contaminated soil, and shall be lined with 6-mil thick polyethylene plastic sheeting ("plastic"), and covered with polyethylene plastic at the end of each day. Roll-offs shall have a lid to prevent precipitation from entering the container.
    - Alternatively, contaminated soils may be temporarily stockpiled by encapsulation in plastic (plastic beneath the soils and a weighted plastic cover on top of the soils) within the LOD until contaminant testing is completed and a final destination for the soils has been approved.
    - In circumstances where soils will be backfilled on the same day, no precipitation is forecast, and PID readings are <100 ppm, soils may be temporarily stockpiled within the LOD without encapsulation in plastic.
- Assess the source of the contamination and the effect, if any, that the project may have on the migration and extent of the existing contamination:
    - Except at sites that are already designated as hazardous sites by the Vermont DEC (source already identified), identify the likely source of the detected contamination based on evaluation of potential contaminant sources in the area.
    - Collect samples of the contaminated soils that were encountered by Project construction, for laboratory analysis to identify types of contaminants present, and their concentrations. Specific laboratory analysis will be selected based on the suspected contaminant sources (e.g. TPH by EPA method 8015, VOCs by EPA method 8260, PCP by EPA method 8151, or other tests as appropriate).
    - Assess extent of existing contamination and flow directions, evaluate potential for preferential flow along the Project pipeline and for the Project to mobilize or alter the extent of existing contaminants.

- Conduct a sensitive receptor assessment to identify any environmental or human-health related sensitive receptors that are in the vicinity of the contamination, and that may be affected by the Project, including but not limited to the following:
    - Water supply wells and springs
    - Streams
    - Wetlands
    - Basements – vapor intrusion
    - Areas frequented by public
    - Gardens
    - Play areas
- Manage contamination in accordance with the Vermont Hazardous Waste Management Regulations ("HWMR") and the Vermont ANR Investigation and Remediation of Contaminated Properties Procedure ("IROCP"), as discussed further in the following section.

2.6 Management of Contaminated Soils

Once any temporarily-stockpiled soil suspected of containing contaminants has been evaluated, it should be placed in a permanent location for treatment. Options for permanent soil treatment are as follows, beginning with the most preferred option:

- Consistent with the ANR Guidance (2002), contaminated soil should be preferentially backfilled as close to the source area as possible.
    - Circumstances in which contaminated soil may not be backfilled could include the presence of debris or soil types that are unsuitable for Project geotechnical needs, excess volume of excavated soil relative to the amount of fill that can be accommodated, or levels of contaminants that exceed DEC guidelines for backfilling (to be determined on a case-by case basis through discussion with the DEC following discovery of soils with PID readings over 400 ppm and/or of soils saturated with free product petroleum).
    - As stated in the ANR guidance (2002), "*every effort should be made to backfill contaminated soils during construction. Contaminated soils to be backfilled, should be placed at the bottom of the trench with at least 18" of uncontaminated soil used for closing the trench. Soils, which cannot be backfilled either because*

they are geotechnically unsuitable or because they do not fit in the excavation will need appropriate disposal."

- As a second option, soils may be shipped off-site for disposal at a landfill or at a thermal treatment facility (e.g. ESMI), if acceptable to the receiving facility based on confirmatory sampling.
    - For off-site disposal, representative soil samples will be collected and analyzed for constituents as instructed by the accepting disposal facility. Soil sampling will occur in accordance with VHB's Soil Sample Collection SOP included in Appendix 4. Soil screening, sampling, and disposal will be coordinated with the appropriate DEC manager. Contaminated soil shipped off-site will be manifested in accordance with the Vermont Hazardous Waste Management Regulations.
    - Disposal facility contact information is as follows:
        - Casella Waste Systems Inc. (Coventry VT Landfill)
            - Scott Sampson
            - 4 Chennell Drive Suite 200, Concord, NH 03301
            - (603) 235-3597
            - Scott.Sampson@CASELLA.COM
        - Environmental Soil Management Companies (Loudon NH thermal treatment facility)
            - Mike Phelps
            - 67 International Drive, Loudon, New Hampshire 03307
            - (800) 950-7645
            - mphelps@esmiofnh.com

3.0 Contractor Field Procedures

A tiered approach will be used to screen for and manage contamination during Project construction.

3.1 Step 1: Contaminant Awareness Training

VGS will provide each OSPC with awareness training that will cover the following topics:

1. General awareness of this plan, and the guidelines stated herein
2. Recognition of soil contamination through olfactory and visual techniques
3. Identification of groundwater, seasonal high water table indicators (e.g. soil mottling), and recognition of groundwater contamination indicators such as stained soil within the seasonal water table zone, or sheens on groundwater
4. Familiarity with elevated risk areas specific to locations where OSPC's may be working
5. Reporting and communication protocols

3.2 Step 2: Look-Ahead Reconnaissance

Contractors will perform a pre-construction "look-ahead" reconnaissance as the pipeline construction advances. The "look-ahead" procedure is described in the OHM Incident Response and Reporting Plan, and consists of pre-construction assessment and evaluation of field conditions to determine applicable permit requirements and construction conditions prior to ground disturbing activity.

During look-aheads, contractors shall look for indicators of un-documented potential contaminant sources, such as farm dumps, illegal dumping areas, and treated utility poles within 50 feet of the LOD. Such areas that are identified in a look-ahead will be designated as elevated risk areas and will be subject to special procedures for elevated risk areas as described in section 3.3 below.

Also during look-aheads, the contractors shall identify any areas within 50 feet of the Project LOD where gross staining (over 12 inches from the pole) is observed on soil at utility pole bases, and shall notify the utility that owns any such poles. Barrier tape or other appropriate markings shall be placed so that no Project earth disturbance occurs within 25 feet of any poles with gross staining at the base.

3.3 Step 3: Monitoring in Elevated Risk Areas

During excavation and earthmoving within the elevated risk areas, the OSPC shall observe the work closely to pay particular attention to the potential sources of contamination within the elevated risk area (see list in Appendix 2 and maps in Appendix 3) and shall be

alert for any indicators of contamination, such as stained soil, odors, or a sheen on groundwater (if groundwater or seepage is encountered).

If a sign of contamination is identified, Step 4 procedures would be implemented.

3.4 Step 4: Procedures if Evidence of Contamination is Observed

The contractor will arrange for an OSHA-40-hour-HAZWOPER certified environmental scientist to be present to screen soils and ambient air for Volatile Organic Compounds ("VOCs") while Project construction may proceed. Contractor shall use OSHA-HAZWOPER certified personnel to handle and manage any contaminated soils. In general, work should stop if photoionization detector ("PID") values in the work area reach or exceed 1,000 ppm.

Section 2.4 above explains procedures to be followed by the environmental scientist performing the screening.

If presence of contamination is confirmed by the environmental scientist performing the soil screening, Step 5 procedures would be implemented.

3.5 Step 5: Procedures if Contamination is Detected

The contractor will follow the directions of the environmental scientist to segregate contaminated soil from uncontaminated soils and to proceed with Project construction. The environmental scientist will follow the reporting and contaminant assessment steps specified in sections 2.5 and 2.6 above.

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