



## Tetra Tech EM Inc.

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November 17, 2000

Ms. Michelle Gallice- Sondrup  
Department of the Navy  
Southwest Division  
Naval Facilities Engineering Command  
1230 Columbia Street, Suite 1100  
San Diego, California 92101

**Subject: Final Field Activity Summary and Quality Assurance Review for Quarterly Soil Gas Methane Monitoring at Site 1, Waste Disposal Area, Naval Fuel Depot Point Molate, Richmond, California  
CLEAN Contract Number N62474-94-D-7609, Contract Task Order 0280**

Dear Ms. Gallice- Sondrup,

This letter was prepared by Tetra Tech EM Inc. (TtEMI) to provide project background, a summary of field activities, and a quality assurance review for quarterly soil gas sampling that will occur at Site 1, the Waste Disposal Area, at Naval Fuel Depot (NFD) Point Molate in Richmond, California. The results of the quarterly soil gas sampling will be used to evaluate whether soil gas vents will be necessary as part of the removal action, a final soil cover for Site 1.

### PROJECT BACKGROUND

Site 1 encompasses a disposal area of approximately 1 acre. Waste disposal occurred at Site 1 from approximately 1957 to 1979. Wastes include primarily construction debris and soil and some oily waste. In addition, fuel releases from the installation's fuel distribution system have flowed into Site 1. Wastes may be up to 30 feet thick at some locations, but are generally less than 15 feet thick.

TtEMI is currently designing the final soil cover for Site 1 at NFD Point Molate. The soil cover is part of the selected final removal action for Site 1. As part of this design, TtEMI conducted an initial methane survey in January 2000 to evaluate whether methane venting would be necessary in the design of the final soil cover. Methane was not detected in any samples analyzed by the laboratory. However, field screening with a Landtec GA-90 resulted in a detection of methane above 5 percent by volume in well MW02-06. This detection exceeded the survey action level of 5 percent. The survey action level of 5 percent was established using California Code of Regulations (CCR) Title 27, which permits 5 percent methane in air at the boundary of Site 1. This action level is conservative when applied to well MW02-06 because the well is located within the waste. Based on these results, the Regional Water Quality Control Board (RWQCB), Contra Costa County Health Services (CCHS), and the California Integrated Waste Management Board (CIWMB) suggested additional soil gas sampling to support the evaluation of soil gas venting in the design of the final soil cover at Site 1.

### FIELD ACTIVITIES SUMMARY

There will be three quarterly sampling events, in November 2000, February 2001, and May 2001. TtEMI will measure methane concentrations at 13 locations. The attached figure shows these locations. These locations include 11 existing monitoring wells and two soil gas probes that will be installed.

The two soil gas probes will be installed within the boundary of Site 1. The probes will be placed to detect potential concentrations of methane. They will be located based on previous detections of methane and on the thickness of the waste. One probe will be installed near well MW02-06, where the level of methane detected in January 2000 exceeded 5 percent by volume. The other probe will be installed near the center of Site 1 where the waste should be the thickest. Before construction of the gas probes occurs, the water levels will be measured in the surrounding area to indicate the approximate water level at the locations of the probes. The probes will be driven to approximately 2 feet above the water table, approximately 16 feet below ground surface, and will have a minimum of a 6-inch screened opening at the bottom. Teflon tubing will be threaded to the screened opening. This tubing isolates the screened opening and provides a clean, inert pathway for sampling the soil gases.

Sampling will begin with measuring methane in percent by volume directly with a field-calibrated screening instrument (a Landtec GA-90 or similar) in the 11 existing wells and the two probes. A charcoal filter will be used on the screening instrument to prevent interference by petroleum hydrocarbons. The wells and probes will then be purged one casing volume with a small air pump so that the sample is representative of soil gas in the vadose zone. After the wells and probes are purged, another screening for methane will be conducted. The basis for the field screening is two fold. First, field screening is conducted at the soil gas probes to compare the results with laboratory-reported data for quality assurance. Second, field screening is conducted at the existing wells located around the site as an inexpensive way to investigate potential anomalies in migration of methane that may warrant collecting samples for laboratory analysis. The decision to collect soil gas samples for laboratory analysis from the existing wells will be made in the field. As a general guideline, a sample will be collected for laboratory analysis if the reading from the screening instrument exceeds 5 percent methane by volume in the well.

After screening measurements have been collected, samples will be collected at the soil gas probes and at well MW02-06 for laboratory analysis of methane by American Society for Testing and Materials (ASTM) Method 1945. One sample will be collected at each newly installed soil gas probe and at existing well MW02-06. The sample from well MW02-06 will be collected only for the first sampling event in November 2000. Future sampling at this well for laboratory analysis will depend on the initial laboratory results. The samples will be collected by connecting the tubing to a Summa canister (under vacuum) and opening the canister's valve. The samples will be recorded in the appropriate chain-of-custody and sent to the laboratory with a field blank.

The data will be reported to the Navy, RWQCB, CIWMB, CCHS, and U.S. Environmental Protection Agency (EPA) Region 9 in a report to be submitted in May 2001. If laboratory results for samples from the two soil gas probes exceed 5 percent by volume of methane, venting will be included in the final soil cover design for Site 1. Gas venting will not be planned if methane concentrations are consistently below 5 percent. All sampling and data analysis will follow the quality assurance review described below.

## **QUALITY ASSURANCE REVIEW**

This Quality Assurance Review was prepared to support the design of the final soil cover for Site 1 at NFD Point Molate. This review is to be used in conjunction with the data quality objectives (DQO) summarized in Table 1 to provide guidance and general quality assurance and quality control (QA/QC) criteria for collecting, evaluating, and submitting data for this investigation. The DQOs clarify the study objective, define the most appropriate data to collect and the conditions from which to collect the data, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support decision-making.

### **Sample Collection and Sample Handling**

Eleven existing wells and two soil gas probes will be screened in the field for methane as described in the field activities summary. In addition, three samples will be collected for laboratory analysis of methane at the soil gas probes and at well MW02-06 at Site 1. Well MW02-06 will be sampled only during the November 2000 sampling event. Future sampling of this well depends on the laboratory results. These samples will be collected using Summa canisters. Holding times are not specified in ASTM Method 1945; however, the standard industry holding time is usually 14 days for summa canisters. A field blank will also be analyzed in this investigation for quality control.

Documentation during sampling activities is essential. The chain-of-custody record will be used to provide an accurate written record that can trace the possession of individual samples from the time of collection in the field until they are accepted at the laboratory. It will also be used as documentation of the samples collected and the analysis required. Standard sample custody procedures will be used to maintain and document sample integrity during collection, transportation, storage, and analysis. Field logbooks will be maintained by the TtEMI field team leader and will include documentation of sampling, logging, and field measurements.

### **Analytical Methods Requirements**

ASTM Method 1945 was selected as the analytical method for this investigation to provide data on methane of the quality necessary to meet the DQOs for this project and to maintain comparability with existing site data. The reference for this method is ASTM-D-1945. Samples will be analyzed by a subcontract laboratory using methodologies recognized by EPA. Laboratory calibration procedures and frequencies are listed in the laboratory's quality assurance (QA) plan and standard operating procedures (SOP) and the ASTM-D-1945 analytical method. Laboratory Quality Control (QC) samples will be analyzed in accordance with referenced analytical method protocols to ensure that laboratory procedures and analyses are conducted properly. A method blank will be prepared daily to evaluate whether contamination of the field sample is occurring in the laboratory during sample preparation or analysis. A laboratory sample duplicate will be analyzed for 5 percent of the samples to demonstrate accuracy and precision.

The laboratory selected must demonstrate method detection limit and instrument detection limit studies, which must meet the project-required quantitation limits. The project-required quantitation limit for this investigation is 1 percent methane. The laboratory also must follow a maintenance schedule for each instrument used to analyze samples.

### **Data Management**

The laboratory will be responsible for sending a hard copy of the data package and the electronic data deliverable (EDD) on computer diskette to the TtEMI analytical coordinator within 28 days after receiving the last sample in the standard delivery group (SDG). A copy of the EDD and hard-copy data will be sent to an independent third-party subcontractor for data validation (100 percent cursory validation and 10 percent full validation). After they have been validated, these data will be entered into the TtEMI database for NFD Point Molate. The field measurements and analytical results obtained during this investigation will be reported in a letter report submitted to the Navy.

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### Reconciliation with Data Quality Objectives

A data quality assessment will be conducted after the results are received. The first step of the data quality assessment process is to evaluate whether project DQOs have been met. The goal of methane sampling at Site 1 is to evaluate whether Site 1 wastes are generating methane at levels that will require soil gas venting as part of closure. Data compiled for this project must be of sufficient quantity and known quality to be used in the assessment of Site 1.

If you have any questions, please call me at (303) 382-8784.

Sincerely,



Ellen Miller  
Project Engineer

ELM/rkr

Attachment

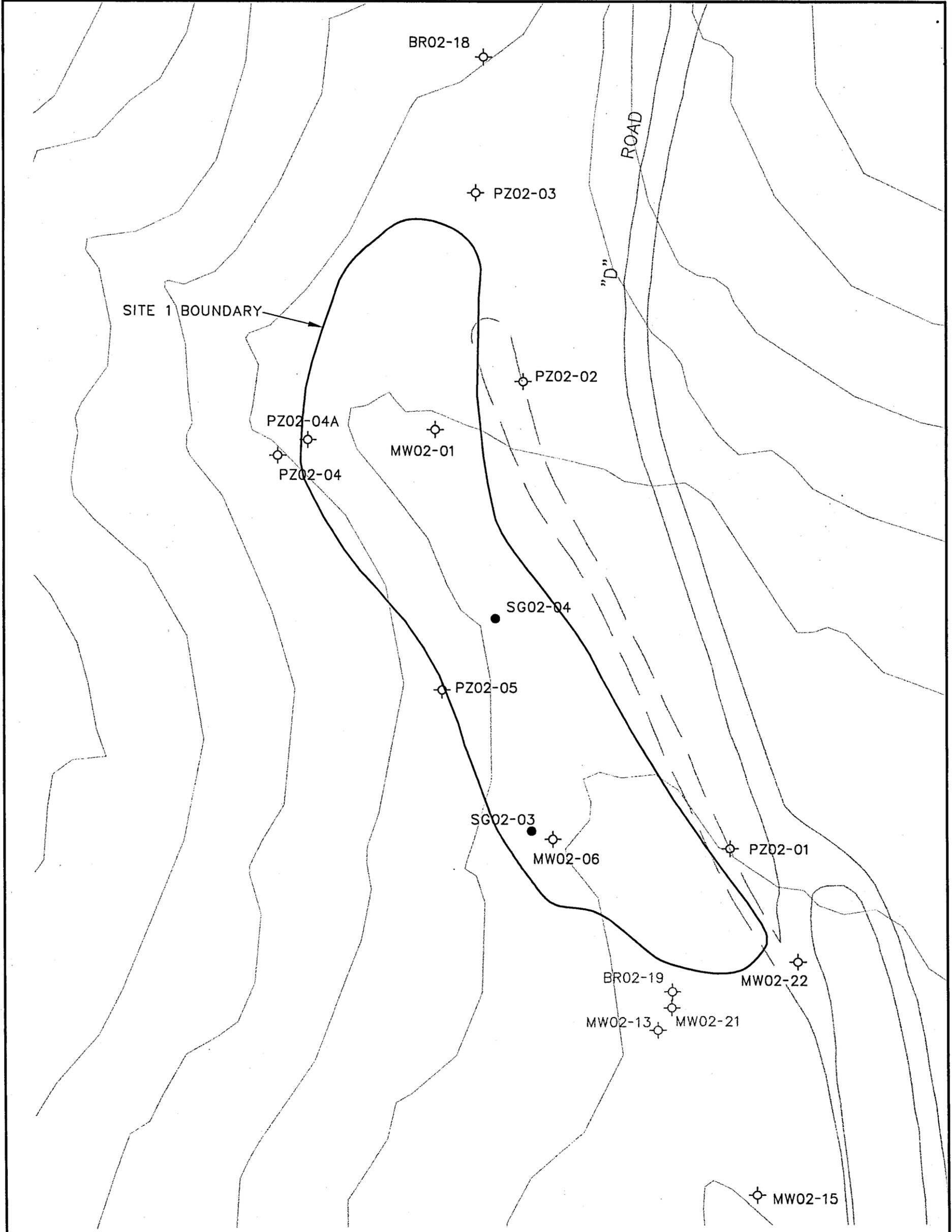
cc: Transmittal Distribution List

**TABLE 1  
NFD POINT MOLATE  
QUALITY ASSURANCE REVIEW PLAN  
PROPOSED METHANE SURVEY**

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
State the Problem	Identify the Decisions	Identify the Inputs to the Decisions	Define Study Boundaries	Develop Decision Rules	Specify Tolerable Limits on Errors	Optimize Sampling Design
<ul style="list-style-type: none"> <li>A soil cover is being designed as part of the final action at Site 1. As part of this design, it must be determined if wastes at Site 1 are generating methane at levels that will require soil gas venting as part of closure.</li> </ul>	<ul style="list-style-type: none"> <li>Are Site 1 wastes generating methane at concentrations that will require soil gas venting as part of closure?</li> </ul>	<ul style="list-style-type: none"> <li>Field screening measurements for methane for 11 existing well locations and two soil gas probes at the site to evaluate where methane is generated at the site.</li> <li>Validated chemical data for methane for three soil gas samples collected at the site during the initial sampling event in November 2000. Two soil gas samples will be collected in February 2001 and May 2001 for laboratory analysis and data validation.</li> </ul>	<ul style="list-style-type: none"> <li>Thirteen locations will be screened in the field for methane from Site 1. The locations include 11 existing monitoring wells and two soil gas probes. The soil gas probes samples will also be analyzed in the laboratory for methane only. During the November 2000 sampling event a sample will be collected from well MW02-06 for laboratory analysis. All wells that will be screened for methane are shown in Figure 1. Basis for soil gas probe locations is explained in the Field Activities Summary.</li> <li>To meet the project schedule, fieldwork for this investigation should begin in November 2000. Adequate time will be necessary for receipt of chemical analytical results and data validation and analysis. This project will last for three quarters.</li> </ul>	<ul style="list-style-type: none"> <li>If samples analyzed in the laboratory from the two soil gas probes exceed 5 percent by volume of methane, venting will be included in the final soil cover design for Site 1.</li> <li>If samples analyzed in the laboratory from the two soil gas probes are consistently below 5 percent by volume of methane, venting will not be included in the final soil cover design for Site 1.</li> </ul>	<ul style="list-style-type: none"> <li>Two soil gas samples taken from the soil gas probe locations and one sample taken from well MW02-06 during the November 2000 sampling event will be analyzed by ASTM Method D-1945.</li> <li>Eleven existing wells and the two soil gas probes will be measured for methane by a screening instrument.</li> <li>All wells included are shown in Figure 1.</li> <li>Data quality will be evaluated using QA/QC procedures and evaluations described in the quality assurance review.</li> </ul>	<ul style="list-style-type: none"> <li>Data collected from this investigation will be used to evaluate whether methane releases must be managed at Site 1.</li> </ul>

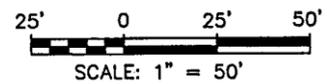
Note:

ASTM      American Society for Testing and Materials  
DQO        Data quality objective  
QA/QC     Quality assurance and quality control



**LEGEND**

- GP02-03 ● PROPOSED SOIL GAS SAMPLE LOCATION
- MW02-06 ⊕ GROUNDWATER MONITORING WELL
- BR02-19 ⊕ WELLS WILL NOT BE SAMPLED FOR SOIL GAS DUE TO ARTESIAN CONDITIONS



**FIGURE 1**  
**NFD POINT MOLATE**  
**PROPOSED SOIL GAS SAMPLE LOCATIONS**



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