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March 18, 2014 #4322932

Ms. Auralie Ashley-Marx
New Mexico Environment Department
Solid Waste Bureau
1190 St. Francis Drive
Santa Fe, NM 87502
auralie.ashley-marx@state.nm.us

RE: RESPONSE TO REVIEW OF THE WASTE EXCAVATION PLAN DATED FEBRUARY 7, 2014 FOR THE OLD ALAMOGORDO LANDFILL, ALAMOGORDO, NEW MEXICO

Dear Ms. Ashley-Marx:

Souder, Miller & Associates (SMA), on behalf of Operational Consultants, hereby submits the following response to the New Mexico Environment Department (NMED) Solid Waste Bureau (SWB) comments received in a letter dated February 27, 2014 concerning the review of the Waste Excavation Plan (WEP) for the Old Alamogordo Landfill. The following narrative includes those comments from NMED SWB and the SMA response.

NMED SWB GENERAL COMMENTS

NMED Comment: *The WEP appears to be generic, lacks site specific details, and portions of the plan are incomplete and need to have supplemental information included. The SWB cannot approve WEPs that have not been deemed sufficiently complete.*

SMA Response: WEP has been revised per NMED SWB comments and has been resubmitted to NMED SWB for approval. No excavation work will occur until final NMED SWB approval of the WEP.

NMED Comment: The WEP is self-described as a "dynamic document" in Section 1.1. While some modification of the plan in the field may be necessary based on unexpected conditions encountered during work, the WEP must provide adequate guidance for those persons completing the work and for them to understand potential risks and hazards, so as to ensure safety of any person on-site. The plan needs to include a discussion of possible contingency situations that may require operational modifications or work stoppage. Possible contingency situations need to be described, along with some recommendations regarding action steps.

SMA Response: WEP has been revised per the NMED SWB General Comment above.

NMED Comment: The WEP does not identify Volatile Organic Compounds (VOCs), which are known to be in areas adjacent to the excavation area, and that VOCs may potentially be encountered. The WEP doesn't identify what waste is to be expected. The consultant needs to refer to the 2004 Phase 2 Environmental Site Assessment (ESA), available from NMED GWQB.

SMA Response: Applicable portions (Figures and Tables) from the TetraTech EM, Inc. (TetraTech) Phase II Environmental Site Assessment (ESA) are included in Appendix C of the revised WEP. As discussed in the revised WEP, the Phase II report did not include the trench where the Atari items are thought to be buried. Therefore, SMA performed a landfill gas investigation of the actual trench containing the Atari items on March 11, 2014. In addition to low levels of methane, low level

concentrations of toluene, ethylbenzene and total xylenes were detected at various locations. Further details are provided in the revised WEP.

NMED Comment: How would workers be protected at the work site if those chemicals are found and if personnel are exposed? As identified in Figure 2 of the WEP, the excavation area appears to be Trench 1 of the 2004 Phase 2 ESA which identified VOCs (one soil vapor sample TWO1 with isooctane, cyclopentane, and TCA), vapor contamination, and landfill gases (methane 12.9 %, C02 28.4%). The Phase 2 ESA identifies Trench 1 as having a soil cap ranging from 0.5 to 3 feet and a waste depth of 9-13.5 feet. It appears that the 2004 Phase 2 ESA was not reviewed during the preparation of the WEP. The data from the Phase 2 ESA is 10 years old. Prior to any excavation activities, new soil vapor samples should be taken to identify current VOC and landfill gases expected to be encountered. The WEP should address contaminant specific safety concerns. In addition, there is no discussion of exploratory pit locations or findings in the WEP, which is a requirement as identified on the SWB WEP checklist.

SMA Response: The proposed 15 minute time weighted average (TWA) VOC action level of 50 parts per million by volume (ppmv) for evacuating the entire site is very conservative based on the permissible exposure limits (PELs) developed by OSHA for the VOC's identified during the March 11, 2014 landfill gas investigation. Air monitoring will be continuous during excavation activities thus any exposure to personnel will be temporary and well below the OSHA PELs before the site is evacuated. Various portions of the revised WEP address the NMED SWB General Comment above.

NMED Comment: The WEP does not provide assurance that the NMED/Air Quality Bureau approval/permitting for the excavation has been given or will be provided prior to site mobilization.

SMA Response: The excavation itself and limited number of haul trucks (2) will not exceed the NMED Air Quality Bureau (AQB) emissions threshold for a Notice of Intent (NOI) of 10 pounds per hour (lbs/hr) or 10 tons per year. The WEP has been revised accordingly.

NMED Comment: The WEP does not identify the commercial hauler to be utilized for removal of the excavated waste.

SMA Response: Greentree Solid Waste Authority is the certified hauler that will be used to haul all excavated waste (unless it is determined special/hazardous waste) to the active face of the Otero/Greentree Regional Landfill. The WEP has been revised accordingly.

NMED Comment: The WEP does not identify or otherwise verify the company or entity that will perform the excavation while adhering to the various WEP requirements.

SMA Response: Mesa Verde, Inc (Mesa Verde) will perform excavation activities and will adhere to the WEP and Health & Safety Plan (HASP) requirements. The WEP has been revised accordingly.

NMED Comment: The WEP does not provide any details regarding excavation procedures, excavation depth and progression, if a concrete "cap" will have to be removed and how this will be accomplished, what equipment will be utilized, the maximum volumes or dimensions for temporary on-site waste storage, the frequency that on-site stored waste (if any) would be removed, or if there is an adequate timeline supporting the assertion of a seven-day excavation event.

SMA Response: Please see Section 2.2 and Section 2.5 of the revised WEP for clarification on the items in the NMED SWB General Comment above.

NMED Comment: The WEP doesn't show protective measures to maintain slope stabilization. It states slopes will be at 3: 1 only. The WEP does not provide any narrative description regarding specific actions to maintain slope stabilization in compliance with OSHA trenching requirements, other than asserting a 3: 1 side slope, and avoiding the excavated area after heavy rains.

SMA Response: For clarification, there will be no other protective measures (trench box, shoring, etc.) for maintaining slope stability other than maintaining the correct angle of repose. However, the proposed maximum slope for the waste sidewalls of 3:1 and 1.5:1 for the native soil sidewalls is very conservative and equals or exceeds the OSHA requirements for Type C soil (worst soil for slope stability). Further details are provided in Section 2.1 of the revised WEP.

NMED Comment: The WEP doesn't provide triggers for cessation of the excavation except for air monitoring (Table 3 and section 9.4 of HASP). For instance, what if slopes are not 3:1 and there are no other protective measures.

SMA Response: Section 2.1 of the revised WEP has been updated to include a discussion regarding the responsibility for maintaining maximum slope requirements and cessation of excavation activities until slope requirements are met.

NMED Comment: The WEP does not list safety equipment and items, capabilities of such equipment, and the locations where such equipment will be maintained.

SMA Response: Please see Section 2.2.1 and Appendix F of the revised WEP.

NMED Comment: The WEP does not provide sufficient details regarding the segregation or storage of any potentially excavated hazardous or special wastes, such as the manner of containerization, labeling/signage, wetting of suspect regulated asbestos waste, how access will be restricted, a timeline for waste removal, and the identity of the hauler(s) contracted to collect, manifest, and transport such wastes.

SMA Response: While an exact timeline for removal of any suspected special/hazardous waste is unknown as it would be dependent on receipt of laboratory analytical reports, any waste confirmed as special/hazardous will be immediately removed from the site. Safety Kleen would be contracted for hazardous waste removal/disposal. Please see Section 2.2 of the revised WEP for further details.

NMED Comment: The WEP does not sufficiently address site control, and restricted access especially considering the publicity inherent in this proposed excavation, the reported making of a movie and the need for clear guidelines regarding observers and reporters (the press) arriving at the site. There is no mention of 24-hour, manned security, which in this case should be considered.

SMA Response: Alamo Security will provide 24-hour security while off-duty City of Alamogordo Police Department personnel (in uniform and with their police vehicles) will be on-site during waste excavation activities to provide security and restrict public access to designated areas only. Please see Section 2.3 of the revised WEP for further details.

NMED Comment: The WEP does not identify the film crew, type of equipment they will use, type of access, and what access restrictions will be applied during excavation.

SMA Response: Please see Section 2.4 of the revised WEP.

NMED Comment: The WEP does not include a map or drawing of the proposed excavation area that clearly identifies the proposed exclusion, CRZ, decon and perimeter zones, and identifies the distances between zones or the sizes of such zones relative to the proposed excavation area.

SMA Response: Please see Figure 4 of the revised WEP

NMED Comment: The WEP provides no specificity as to whom, how, where, or when the waste screening inspections of the excavated waste will be performed.

SMA Response: SMA and Operational Consultants personnel will be continuously observing all excavation activities looking for material unsuitable for re-disposal. Please see Section 2.2 of the revised WEP for further details.

NMED Comment: The WEP does not indicate where or how any discovered Atari games will be stored or how quickly they would be removed from the site. There is no mention of security for these items, if discovered. As the predication for this WEP, and as an excavated waste until removed from the excavation site, some additional detail should be provided.

SMA Response: Please see Section 2.5 for details pertaining to the NMED General Comment above.

NMED Comment: The WEP does not provide any information regarding safety and movement of persons during filming operations at or near the site.

SMA Response: Section 2.4 of the revised WEP includes details on filming operations.

NMED Comment: Given that a film crew will be on-site during excavation, they should be OSHA trained to a determined level, and supervised to assure safety and minimize potential exposure.

SMA Response: As discussed in the revised WEP, while not all film personnel will be 40 Hour HAZWOPER trained, they will all be instructed on the HASP and general site construction safety procedures and attendance for all film personnel will be mandatory at the daily safety briefings. All film personnel will also be supervised by the Site Supervisor & Safety Officer during excavation activities.

NMED SWB SPECIFIC COMMENTS

NMED Comment: Page 2, Section 1.2 - Background. This section is weak by not identifying what waste and hazards are expected to be found based on the Phase 2 ESA data.

SMA Response: Section has been revised per NMED SWB Specific Comment above.

NMED Comment: Page 2 Section 1.3 - Site Hydrology. This section is weak by not presenting what is the expected depth to water (except from a well search showing 25-210 feet), the ground water flow direction, and if ground water may be encountered during excavation. Provide supplemental data, if available.

SMA Response: Based on further research including NMED Petroleum Storage Tank Bureau (PSTB) site in the area it is anticipated depth to water in the immediate vicinity of the excavation area occurs approximately 45 to 50 feet below ground surface (bgs). Regardless of the exact depth to water, with a planned total depth of excavation of approximately 12 to 15 feet bgs, groundwater will not be encountered.

NMED Comment: Page 3, It is noted that the site is within a "designated flood zone." Provide the proper reference and or map for this designation.

SMA Response: Proper reference is now included in Section 1.3.

NMED Comment: Page 3, Section 1.4 indicates that it is "likely" there will be landfill gas, which implies that prior site characterization reports were not used or were otherwise unavailable to indicate whether, and/or to what extent, landfill gas has been generated at the site. The WEP states that landfill gases have not been an issue of late, but does not reference the data from the Phase 2 ESA. It doesn't identify the contaminants found in the Phase 2 ESA work or address how hazards from these contaminants will be addressed if encountered. The HASP doesn't identify these contaminants either or direct how to treat such exposure or how to prevent exposure. However, Table 3 is a good table if explanation of "excavation" in first sentence of the last column is defined or changed to "evacuation."

SMA Response: Section 1.4, Table 3 and other sections of the revised WEP have been updated/revised per the NMED SWB Specific Comment above.

NMED Comment: Page 3, Section 1.4, provides no information or discussion regarding nearby trenches used for previous waste disposal, or any information regarding a "Hazard Assessment" as indicated upon the SWB's WEP Checklist.

SMA Response: With data obtained from the landfill gas investigation performed by SMA on March 11, 2014, Section 1.4 has been updated/revised per the NMED SWB Specific Comment above.

NMED Comment: Page 4, Section 2.0, asserts that Fuel Entertainment has responsibility for the "implementation of the WEP," yet there is no other reference to this company in the WEP.

SMA Response: Mesa Verde will be responsible for implementation of the WEP and HASP. The revised WEP has been updated accordingly.

NMED Comment: Page 4, Section 2.0. The contact information for Marco Bañales should be removed, as he will not have oversight responsibilities for this proposed WEP. The NMED 24-hour emergency reporting number should be included as (505) 827-9329.

SMA Response: Both items have been addressed in applicable portions of the revised WEP.

NMED Comment: Page 4, Section 2.0, identifies the list of persons involved and receiving copies of the WEP. Please assure that either the WEP narrative or the attached listing of these persons or companies includes full contact information, to include the name, address, telephone, electronic mail and proper title information.

SMA Response: Section 2.0 has been updated per the NMED SWB Specific Comment above.

NMED Comment: Page 5, Section 2.1, Para. 3 should describe in relative detail the measures to be taken to assure OSHA compliance and sufficiently assure side slope stability (see General Comment No. 10, above); the correct slope ratio needs to be provided here. The last two sentences of this paragraph contradict each other as to whether or not work will be performed during rainfall events or will be at the discretion of the site safety officer.

SMA Response: Section 2.1 has been updated/revised in the revised WEP. As previously discussed under the NMED General Comments section of this letter, there will be no other protective measures (trench box, etc.) for maintaining slope stability. However, the proposed maximum slope for the waste sidewalls

of 3:1 and 1.5:1 for the native soil sidewalls is very conservative and equals or exceeds the OSHA requirements for Type C soil (worst soil for slope stability).

NMED Comment: Page 6, Section 2.2, identifies laboratory testing methods, but does not include test methods for PCBs (8082) and Polarized Light Microscopy (or more accurate asbestos test methods).

SMA Response: While the specific laboratory analytical testing to be used on suspected special/hazardous waste would be dependent on the characteristics of the waste, the further possible laboratory testing methods described in the NMED SWB Specific Comment above have been included in Section 2.2 of the revised WEP.

NMED Comment: Page 6, Section 2.2, states that "…backfilling of the excavation will take place immediately as the excavation will be filled with adequate on-site soils. The backfilling will be conducted in the same manner *as to allow for compaction." There is no description of the "manner" of backfilling indicated. Considering the regulatory concerns about site contamination identified during at least two prior site characterization events, and considering that the WEP does not discuss operation of a borrow pit area at the site, the WEP should provide more detail regarding the proposed backfill soil and approval for its use pursuant to the WEP. Also, as a reminder, any excavated waste is considered fresh waste and must be disposed in accordance with the current SWR – meaning that excavated solid waste must be removed from the site, transported by a properly-registered commercial hauler and disposed at a permitted solid waste facility, not simply reburied at the site.*

SMA Response: All excavated waste will be hauled by a properly register commercial waste hauler (Greentree Solid Waste Authority). Mounds of clean, native soils at the Old Alamogordo Landfill will be used as borrow material to backfill the excavation. The locations of the borrow areas are illustrated in Figure 2 of the revised WEP. Section 2.2, and other applicable sections of the revised WEP have been updated/revised per the NMED SEB Specific Comment above.

NMED Comment: Page 6, Section 2.2, Besides needing to address how to monitor for specific VOCs expected and high concentrations of landfill gases, the WEP doesn't address how to manage unusual waste encountered (ie. a barrel of fluids, compressed cylinders, unknown containers, etc.).This section needs a better description of how the waste will be segregated prior to receipt of analytical results. What's the lab turnaround time? Will personnel be exposed to waste until results are received? What are the "adequate on-site soils" for backfilling?

SMA Response: Section 2.2 has been revised/updated to better describe the management of suspected special/hazardous waste. The suspected special/hazardous waste will be segregated in the location indicated in Figure 3 until laboratory analytical results are received in order for the special/hazardous waste to be properly disposed of. The special/laboratory waste will be segregated and covered in the designated area with temporary fencing/warning tape and only authorized personnel will be allowed access to the special/hazardous waste. Laboratory turnaround time is dependent on costs thus Operational Consultants will be consulted at the time of sample collection (if any) to determine the exact turnaround time for laboratory analysis. Other applicable portions of the revised WEP have been revised/updated per the NMED SWB Specific Comment above.

NMED Comment: Page 7, Section 2.2.1, The WEP should explain how to check for air monitoring in the excavation area prior to re-initiating work following a break or overnight.

SMA Response: Section 2.2.1 has been updated/revised per the NMED SWB Specific Comment above.

NMED Comment: Page 7, Section 2.3 Given that VOCs and landfill gases are expected, 24 hour surveillance should be imposed to prevent entry of the public or unauthorized personnel when work is not being conducted.

SMA Response: Alamo Security will provide 24-hour security while off-duty City of Alamogordo Police Department personnel (in uniform and with their police vehicles) will be on-site during waste excavation activities to provide security and restrict public access to designated areas only. Please see Section 2.3 of the revised WEP for further details.

NMED Comment: Section 3.0 of the WEP addresses, but not with specificity, the submission of an after-action report or summary. The after-action report should include daily logs, laboratory analyses reports, photographs, hazardous or special waste manifests, etc., verifying proper disposition of all excavated waste and WEP compliance. The WEP should specify that a complete copy of all such documentation shall be provided to the SWB within ten (10) days following excavation completion.

SMA Response: Section 3.0 has been updated/revised per the NMED SWB Specific Comment above.

NMED SWB HASP COMMENTS

NMED Comment: The HASP indicates that it has been prepared, in part, for the NMED. Although the HASP will be reviewed for regulatory purposes by the NMED, it is not prepared for the NMED, as the NMED does not directly provide on-site workers and it is not responsible for the execution of site operations or the safety of on-site personnel.

SMA Response: This has been changed to Mesa Verde (contractor responsible for implementation of the WEP and HASP) and Operational Consultants (Project Manager)

NMED Comment: The HASP, Section 1.0, should be revised to correctly spell "Site Safety Officer" and change "SASP" to "HASP."

SMA Response: Section 1.0 has been updated/revised per the NMED SWB HASP Comment above.

NMED Comment: The HASP, Section 1 0 states a HASP is for procedures in the event of an accident. A HASP should also include prevention. Need to amend WEP and HASP to identify actual personnel and their qualifications that will perform the WEP.

SMA Response: Section 1.0 has been updated/revised and specific personnel have been identified per the NMED SWB HASP Comment above

NMED Comment: Section 2.0 and 3.1 should list the chemicals to be expected based on the Phase 2 ESA data, describe how to measure for such chemicals, how to prevent exposure, and how to treat if exposed for each chemical.

SMA Response: Section 2.0 and Section 3.1 have been updated/revised per the NMED HASP Comment above. Based on the March 11, 2014 landfill gas investigation of the trench containing the Atari items and nearest adjacent trench, the expected chemicals are now listed. As previously discussed in the NMED SWB General Comments section of this letter, the proposed 15 minute TWA VOC action level of 50 ppmv for evacuating the entire site is very conservative based on the PELs developed by OSHA for the VOC's identified during the March 11, 2014 landfill gas investigation. Air monitoring will be continuous during excavation activities thus any exposure to personnel will be temporary and well below the OSHA PELs before the site is evacuated.

NMED Comment: Section 3.2 discussing physical hazards should describe better prevention for slope stabilization, and what PPE level will be used when certain conditions are met.

SMA Response: Only Level D personal protective equipment (PPE) will be used for waste excavation. If air monitoring indicates upgrade to Level C might be necessary, then all excavation activities will simply cease and the project will be reevaluated (instead of trying to continue the work in Level C PPE). Work may continue after a period of time has elapsed, but only if air monitoring indicates safe working conditions. As discussed previously in this letter, no additional safety equipment (trench box, etc.) will be used for slope stabilization but the slopes will be maintained at a very conservative and safe slope of 3:1 for the waste material and 1.5:1 for the native soil. Applicable sections of the WEP and HASP have been updated/revised accordingly. See Table 3 of the WEP and Section 9.4 of the HASP for details on air monitoring action levels and the appropriate response.

NMED Comment: Section 4.0, accident prevention, needs to elaborate on site specific training for personnel (Fuel Entertainment), what are site specific expected hazards (chemicals to be encountered, flooding), what are the physical barriers expected, how to identify hazards in any decontamination zone that may be needed and management of that zone.

SMA Response: This Section refers to an accident prevention plan which will basically mean familiarization with Mesa Verde's own construction/excavation accident prevention plan but some portions of Section 4.0 have been updated/revised per the NMED SWB HASP Comment above.

NMED Comment: The HASP jumps to Section 5.5. Is part of the HASP missing or just a misprint?

SMA Response: The misprint has been corrected in the revised HASP

NMED Comment: Section 6.0 on Personnel Training should specify which personnel listed is trained appropriately. It appears to be a general boiler plate language and should be made site specific.

SMA Response: While the film crew will not be 40 Hour HAZWOPER trained, SMA and Mesa Verde will have 40 Hour HAZWOPER trained personnel on site during waste excavation activities and Mesa Verde will be responsible for supervising all site personnel. Additionally, all personnel (including the film crew) will be made aware of the potential hazards prior to working on the site, general site safety responsibilities, medical surveillance, PPE requirements, emergency procedures, etc.

NMED Comment: Section 7.0 on medical surveillance is general and states it shouldn't be necessary. Given the expected exposure to chemicals identified in the Phase 2 ESA, it should be necessary.

SMA Response: While medical surveillance for all site personnel through individual employers will not be necessary (background/yearly medical exams with blood work, etc.) all site personnel will be monitored for any signs of chemical exposure. Section 7.0 has been updated/revised per the NMED SWB HASP Comment above.

NMED Comment: Section 8.0 on PPE should be clearer on when to move to the next level and show who is respirator trained and certified.

SMA Response: As discussed previously in the NMED SWB HASP Comments section of this letter, only Level D PPE will be used for this project. Should air monitoring indicate that an upgrade to Level C PPE might be required, all work on the excavation will cease and the site will be evacuated. See Table 3 of the WEP and Section 9.4 of the HASP for details on air monitoring action levels and the appropriate response.

NMED Comment: Section 9.2 Screening of Hazardous Waste should be more descriptive and not just state hazardous waste will be set aside. No detailed steps of how to screen the waste to determine if hazardous or not in the field.

SMA Response: Section 9.2 has been updated/revised per the NMED SWB HASP Comment above.

NMED Comment: Section 9.3 Air monitoring says will use PID but the table indicate landfill gases. Please clarify.

SMA Response: Section 9.3 has been updated/revised per the NMED SWB HASP Comment above and both a PID and combustible/toxic gas meter will be used for continuous air monitoring. Air monitoring instrumentation details are provided in Appendix F of the revised WEP.

NMED Comment: The HASP, Section 9.3, refers to a frequency of air monitoring being based upon various factors. There is no minimum frequency of monitoring proposed.

SMA Response: With the exception of brief periods of downtime for instrument check, recalibration, change batteries, etc., air monitoring will be continuous during all waste excavation activities. Section 9.3 has been revised accordingly.

NMED Comment: Section 9.4 clarify "excavation" in last column.

SMA Response: Should have been “evacuation” in original submittal. Section 9.4 has been updated/revised per the NMED SWB HASP Comment above.

NMED Comment: Section 10 Site control states physical barriers but doesn't describe what those will be.

SMA Response: Please see Figure 3 of the revised WEP for an illustration of site control and physical barriers will consist of temporary fencing/warning tap.

NMED Comment: Section 10.1 is general and not site specific. For instance, it states to go up wind but doesn't define further, such as the use of wind socks.

SMA Response: Specific evacuation routes are not included in Section 10.1 as the exact routes will be established and communicated to all personnel during the daily safety meetings and the initial safety briefing to review the HASP. However, the route of excavation is anticipated to be the access road illustrated in Figure 3 of the revised WEP. Alternatively, and if possible, personnel will be evacuated up-wind of the site (if wind speeds are such that wind direction can be readily determined as wind socks will not be utilized).

SMA appreciates the review completed by NMED SWB and hopes that this submittal provides sufficient information for final approval of the WEP. If you have any further questions or comments, please contact me at (575) 647-0799 or by e-mail at the address provided below.

Sincerely,

MILLER ENGINEERS, INC. D/B/A
SOUDER, MILLER & ASSOCIATES

Clay F. Kiesling, P.G.
Senior Geoscientist
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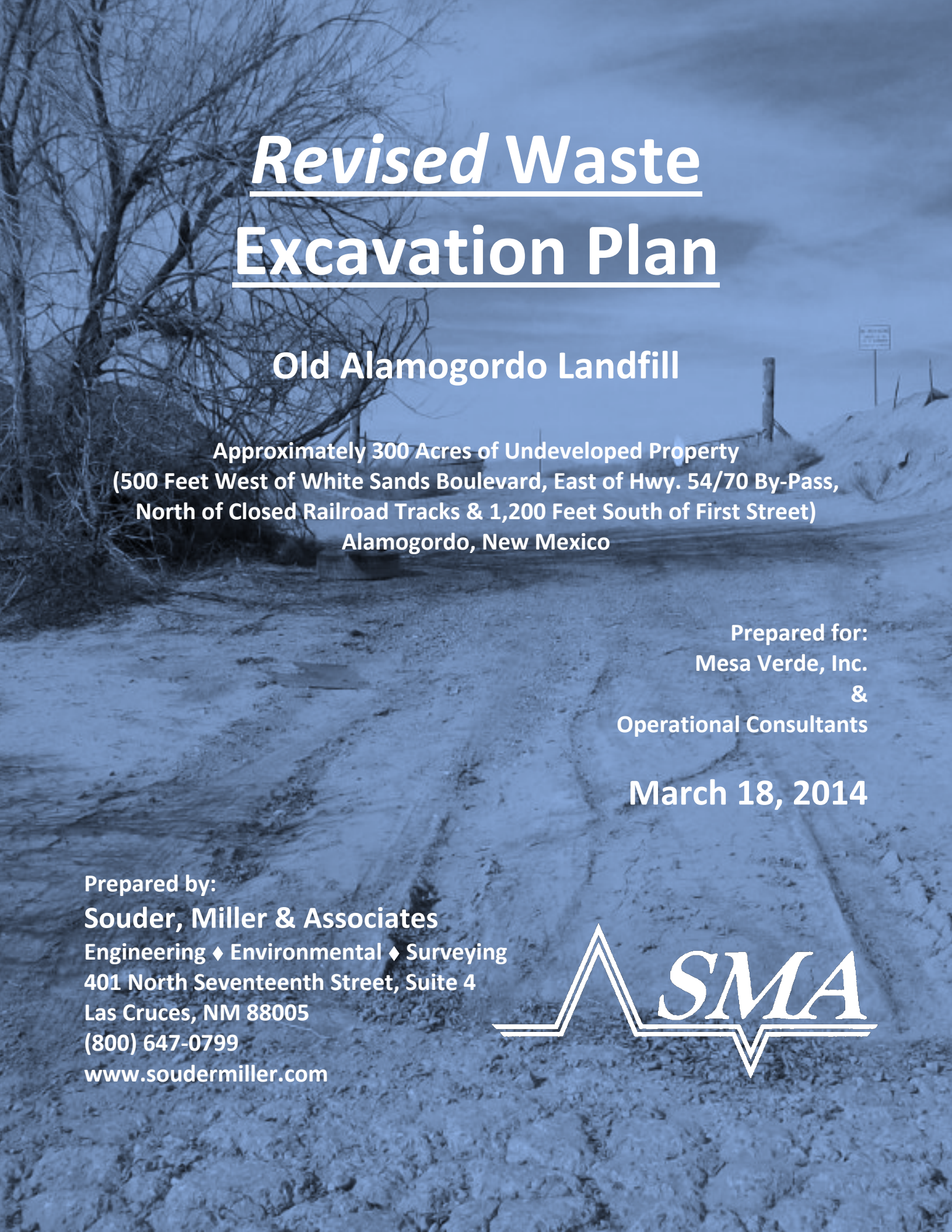
ext. 1304

Attachments: *Revised* Waste Excavation Plan

xc: Mr. Joe Lewandowski, Operational Consultants



Revised Waste Excavation Plan

Old Alamogordo Landfill

Approximately 300 Acres of Undeveloped Property
(500 Feet West of White Sands Boulevard, East of Hwy. 54/70 By-Pass,
North of Closed Railroad Tracks & 1,200 Feet South of First Street)
Alamogordo, New Mexico

Prepared for:
Mesa Verde, Inc.
&
Operational Consultants

March 18, 2014

Prepared by:
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SMA

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1.0 INTRODUCTION

The Old Alamogordo Landfill is on approximately 300 acres of undeveloped property located 500 feet west of White Sands Boulevard, 0.5 miles north of the Hwy. 54/70 by-pass, north of closed railroad tracks and approximately 600 feet south of First Street in Alamogordo, New Mexico (Figure 1).

In May 2013, Fuel Entertainment received an access agreement from the City of Alamogordo that allows the company to enter and excavate the property in the course of preparing a documentary on the following event. In September 1983, Atari entered into an agreement with the private contractor managing the Alamogordo Landfill to disposal of millions of games, stations and other debris from the warehouse in El Paso, Texas. The documentary film being produced is the telling of that story of when, where and how this occurred.

This Waste Excavation Plan (WEP) addresses the New Mexico Environment Department (NMED) Solid Waste Bureau (SWB) requirements for establishing a plan and procedure for removing, transporting and disposing of the excavated waste in a safe and efficient manner. The content and supporting attachments have been provided to satisfy the NMED SWB "Waste Excavation Checklist" requirements. A copy of the "Waste Excavation Checklist" is included as Appendix A.

1.1 Waste Excavation Plan (WEP) Summary

This document has been prepared to establish a plan and procedures to use for waste excavation in order to locate the Atari items disposed of at this landfill in September 1983. The type of work that qualifies for coverage of this WEP includes all waste excavation activities required to locate/uncover the Atari items and properly backfill the excavation area. This WEP is designed to provide guidance for personnel completing waste excavation activities and describe the potential hazards and contingency situations that may arise during waste excavation activities. The WEP shall be submitted to NMED SWB for review and approval prior to starting any waste excavation activities. Fugitive dust emission from the waste excavation and waste hauling operations will be below the New Mexico Air Quality Bureau threshold of 10 pounds per hour and 10 tons per year thus a Notice of Intent (NOI) will not be required.

Mesa Verde, Inc. (Mesa Verde) will perform the waste excavation in order to provide access for Fuel Entertainment to film the process and document the story. All excavated waste will be hauled by a certified waste hauler (Greentree Solid Waste Authority) and disposed of in the active cell at the Otero/Greentree Regional Landfill located approximately 23 miles south of Alamogordo, New Mexico. A site-specific Health & Safety Plan (HASP) for waste excavation activities is provided in Appendix B and Souder, Miller & Associates (SMA) will perform all landfill gas monitoring, waste screening and documentation of waste excavation activities. On March 11, 2014, SMA also performed an initial landfill gas investigation of the planned excavation area and details of the investigation are provided in this WEP. Operational

Consultants will also perform a limited soil boring investigation to identify trench edges and pinpoint the location of the Atari items prior to the start of excavation activities.

1.2 Site & Project Background

The Old Alamogordo Landfill is not an active landfill; it was closed in 1989 with no other activity at the location since that date. The landfill was utilized by the City of Alamogordo to dispose of municipal solid waste largely generated within the city limits during the 1960's and until its closing in 1989. The entire landfill covers an area of approximately 300 acres. The portion to be excavated for this project was most active in the 1980s and the planned excavation area is indicated in the attached Figures. The City has owned the landfill since it was in operation. The City has, over the life of this landfill, either operated the facility with City staff or private contractors.

In 2004 a Phase II Environmental Site Assessment (ESA) of a portion of the former landfill was completed by TetraTech EM, Inc. (TetraTech). The Phase II ESA included field screening and collection of multiple landfill gas samples for laboratory analysis. However, the sample locations in the Phase II ESA did not include the planned excavation area and the nearest sample location with laboratory analysis was labeled TW01 in the Phase II ESA and was located in a separate trench approximately 300 feet south of the planned excavation area (Figure 5). While TW01 was located in a separate trench, a variety of volatile organic compounds (VOCs) were detected. Additionally, the nearest field screening locations to the planned excavation area (TW05 and TW06) indicated methane concentrations of 0.2%, carbon dioxide (CO_2) concentrations of between 8.3 and 11.1% and oxygen (O_2) concentrations at 10.3 to 12.8%. The applicable figures and tables illustrating all sample locations and results from the Phase II ESA are included in Appendix C.

As the Phase II did not include investigation of the exact trench where the Atari items are thought to be buried, and as required by NMED SWB, on March 11, 2014 SMA conducted a landfill gas investigation of the trench where the items are thought to be buried, the specific area of the trench where the excavation will occur and the trench immediately south and nearest to the planned excavation area. The investigation consisted of landfill gas screening at the locations indicated in Figure 5 using a vapor probe at a depth of approximately 2 feet below ground surface. Laboratory analytical samples were also collected from select location for analysis of various VOCs using EPA Method 8260B.

The landfill cover thickness over the trench containing the Atari items was approximately 1 foot and field screening indicated that the highest methane concentration was 2% of the lower explosive limit (LEL) relative to methane (approximately 0.1% methane), the highest photoionization detector (PID) reading was 1.1 parts per million (ppm), the highest CO_2 reading was 3.2%, the highest CO reading was 6 ppm and the lowest O_2 reading was 16.9%. The results of the field screening and any VOC concentrations detected above the laboratory practical quantitation limit (PQL) are illustrated in Figure 5. The laboratory analytical report is provided in Appendix E.

1.3 Site Hydrogeology

Consideration of surface and subsurface drainage and geology are of interest since they provide an indication of the direction in which contamination, if present, could be transported. TetraTech (Phase I ESA, August 1, 2003) reviewed the following information regarding the hydrogeology of the subject site and the surrounding area:

- U.S. Geological Survey (USGS) 7.5-minute series topographic map
- Overview Map and Detail Map of the subject as prepared by Environmental Data Resources, Inc. (EDR), Inquiry Number 0974315.1s.

Alamogordo is located in central New Mexico in the Tularosa Basin, which is considered part of the Rio Grande Rift. The Rio Grande Rift, a series of grabens (down-dropped blocks), transects New Mexico from north to south. Quaternary and young Tertiary alluvial sediments fill the rift and are bordered by complex, uplifted ranges of Precambrian, Paleozoic and lower Tertiary rocks. The stratigraphic record of the area is dominated by Permian marine sedimentary rocks.

The soil type for the subject site was obtained from Environmental Data Resources, Inc. (EDR) and is described as follows:

Tome: *Soil surface texture is silt loam. The unified soil is classified as fine-grained soils, silts and clays. The hydrologic group is class B, moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately course textures. The soil texture classis reported as silt loam from 0-5 inches, stratified from 5-50 inches and sandy loam from 50-70 inches. Soil surface textures and surficial soil types 9from 0-20 inches) are gravelly-sandy loam, very gravelly-silt loam, very fine sandy loam and loam. Soil does not meet the requirements for a hydric soil.*

According to the USGS topographic map referenced above, the surface elevation of the property is approximately 4,302 feet above mean sea level (amsl). The overall topographic gradient is generally to the southwest. Based on site topography, groundwater flow is expected to be to the west. It should be noted, however, that surface topography does not always reflect the actual hydraulic gradient of the water table and that fluctuations are sometimes encountered. The depth to water and regional groundwater flow direction may be variable due to the influences of seasonal variations in water levels or local groundwater pumping patterns. Groundwater flow direction measurements would be necessary to determine the actual on-site direction and gradient. A topographic map for the area in which the subject site is located is presented as Figure 1.

The New Mexico Office of the State Engineer web page files were reviewed for water wells located within a mile of the site. An initial search indicated that approximately 200 water wells are located within one mile of the subject site. The depths of these wells range from 120 feet to 345 feet below ground surface (bgs), with depth to groundwater ranging from 25 to 210 feet bgs. While located some distance away, a petroleum storage tank release site approximately 1.5 miles

northeast of the Old Alamogordo Landfill indicates a depth to groundwater of approximately 75 feet bgs and a groundwater flow direction to the southwest. Based on available information, it is likely that groundwater at the Old Alamogordo Landfill occurs at a depth of approximately 45 to 50 feet bgs and with an excavation depth of 12 to 15 feet bgs, groundwater will not be encountered.

The Old Alamogordo Landfill is located in Flood Zone AH (FIRM Map #35035C0939D) which is a Special Flood Hazard Area designated by the Federal Emergency Management Agency (FEMA) as being subject to inundation by the 1% annual chance flood.

1.4 Site Hazards & Contaminants

The primary site hazards anticipated during waste excavation activities at the Old Alamogordo Landfill are exposure to landfill gas and slope stability. Landfill gas from municipal solid waste landfills can contain a variety of constituents. However, the primary constituents are methane, carbon dioxide and nitrogen. Methane and carbon dioxide are both simple asphyxiants and have the potential to displace oxygen in the waste excavation area. Methane is also a flammable and potentially explosive gas with a LEL of 5% (by volume) in air and an upper explosive limit (UEL) of 15%. Secondary constituents in landfill gas are typically a very small percentage of the landfill gas mixture and may include volatile organic compounds (VOCs) and hydrogen sulfide.

The Phase II ESA (TetraTech, 2004) identified the presence of methane, carbon dioxide and various VOCs at the Old Alamogordo Landfill (Appendix C). However, as discussed previously, the sample locations in the Phase II ESA did not include the trench/area of the planned excavation and a landfill gas investigation of the trench/area that will be excavated was performed by SMA on March 11, 2014. Only a portion of the trench containing the Atari games will be excavated and no excavation will occur within any nearby trenches. The results of the recent landfill gas investigation were previously presented in Section 1.2 and the results are illustrated in Figure 5. SMA will perform air quality monitoring during all excavation activities and details of the monitoring program are included in Section 2.2.1 of this WEP and in the attached HASP.

While part of the excavation will be performed in native soils, approximately half of the excavation will be conducted in waste comprised of various materials typical of municipal solid waste and it is difficult to determine what the exact properties of the waste/soil will be in order to ensure slope stability during excavation. Therefore, as discussed in Section 2.1 below, a very conservative slope of 3:1 will be used for all excavation activities occurring within the waste and a very conservative slope of 1.5:1 will be used for all excavation activities occurring in native soils. Slope requirements are also further discussed in the attached HASP.

Additional hazards specific to waste excavation include potentially hazardous substances disposed of at the Old Alamogordo Landfill. Section 2.2 of this WEP provides a protocol for handling and disposal of hazardous and/or special waste.

2.0 WASTE EXCAVATION PLAN

Implementation of the WEP will be the responsibility of Mesa Verde while technical and landfill questions will be addressed to Operational Consultants and/or SMA. SMA will perform all landfill gas monitoring, waste screening and documentation of waste excavation activities. The roles and responsible personnel are included in the attached Table 1.

Copies of the completed and approved WEP will be distributed to:

- City of Alamogordo, Mr. Brian Cesar, Public Works Director, (575) 439-4241, *bcesar@ci.alamogordo.nm.us*, 1376 East Ninth Street, Alamogordo, NM
- Fuel Entertainment, Mr. Francis Gasparini, *francisgasparini@gmail.com*, 8536 National Blvd, Suite A, Culver City, CA
- URS Environmental, Mr. David Raubvogel, Senior Geologist, (206) 438-2284, *david.raubvogel@urs.com*, 1501 4th Ave., Suite 1400, Seattle, WA
- Operational Consultants, Mr. Joe Lewandowski, Project Manager, (575) 430-8989, *opconsultants@yahoo.com*, 1102 24th St., Alamogordo, NM
- SMA, Mr. Craig Chase, Project Geologist, (575) 647-0799, *craig.chase@soudermiller.com*, 401 North Seventeenth St., Suite D, Las Cruces, NM
- Mesa Verde, Inc., Mr. Pat McGill, Site Supervisor & Safety Officer, (575) 437-2995, *mesaverde@mesaverdeinc.com*, 396 La Luz Gate Road, Alamogordo, NM
- Auralie Ashley-Marx, Bureau Chief, NMED SWB, (505) 827-0197, *auralie.ashley-marx@state.nm.us*, 1190 St. Francis Drive, Santa Fe, NM
- Chuck Akeley, Enforcement Manager, NMED SWB, (505) 827-2924, *chuck.akeley@state.nm.us*, 1190 St. Francis Drive, Santa Fe, NM
- Mr. Joey Vega, Environmental Specialist, NMED SWB, (575) 647-7968, *joey.vega@state.nm.us*, 1170 North Solano Drive, Suite M, Las Cruces, NM

2.1 Health & Safety

All personnel working in or near the waste excavation area shall read, understand, acknowledge and follow the HASP included in Appendix B. The attached HASP will be implemented by Mesa Verde and all on-site personnel will be briefed on the HASP prior to the start of excavation activities. All onsite personnel will also be required to attend daily safety briefings to be alerted of specific site activities planned for the day, any safety issues foreseen for that day and specific control measures planned to mitigate hazards (if any). SMA will be onsite during all excavation activities and will provided landfill gas monitoring and waste screening/observation services.

The attached HASP addresses the following elements:

- Site description and scope of work;
- Identification of roles and responsibilities;
- Identification of site hazards;
- A Hazard Communication Plan;
- Personal protective equipment (PPE) requirements;

- A respiratory protection plan;
- Landfill gas monitoring procedures;
- Excavation safety;
- Site control and
- Hot work; and
- Emergency contacts and procedures

All onsite personnel working in the exclusion zone established around the waste excavation area shall be versed in hazard communication and are required to wear level D PPE (minimum). This includes but is not limited to a hard hat, safety glasses, safety vest and steel toe boots. Additionally, any individuals who will directly be handling waste will need to wear chemical resistant gloves. Monitoring personnel provided by SMA will be 40 Hour Occupational Health and Safety Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) trained. While not all onsite personnel will be 40 Hour HAZWOPER trained, all personnel will be supervised by the Site Supervisor & Safety Officer.

An exclusion zone, contaminant reduction zone (CRZ) and support zone shall be established prior to commencement of waste excavation activities. The exclusion zone will be established based on work activities and will likely by dynamic based on site conditions and activities being performed. Typically, the exclusion zone will include any area where trash is exposed or where heavy equipment is being operated. The CRZ will include a buffer area between the exclusion zone and areas outside of the normal traffic pattern of trucks and equipment (support zone). While the zones will be dynamic as previously discussed, the attached Figure 4 illustrates the likely exclusion zone, CRZ and support zone. A first-aid station and decontamination equipment shall be set up outside of the CRZ in accordance with the site-specific HASP. The first aid and decontamination stations shall maintain (as needed) a first-aid kit, eyewash statin, drinking water, fire extinguisher, a spill response kit, brushed, buckets, alconox (or equal), deionized water, tap water, garbage bags and a tarp for decontamination activities (if required).

Excavation and trench safety will be monitored and sloping requirements promulgated by OSHA (29 CFR 1926 Subpart P) shall be enforced. For purposes of this WEP and as the most conservative option, it is assumed that the waste in the excavation area and the native soils will have soil properties consistent with a Type C soil (worst soil type for slope stability). OSHA requires that the maximum sloping of an excavation in Type C soil be 1.5:1. However, because of the anticipated difficulties and unknowns in working a surface comprised of exposed waste, the maximum slope of waste side walls will be maintained at an even more conservative 3:1 with the maximum slope of native soil side walls maintained at 1.5:1 (also very conservative as the 1983 photographs of the Atari items being disposed of (Appendix D) show vertical sidewalls of the trench). As saturation of the waste material could significantly reduce slop stability, postponement of work due to a rainfall event, or potential for a rainfall event, will be at the discretion of the Site Supervisor & Safety Officer. Following suspension of work due to a rainfall event, slope stability will be assessed by the Site Supervisor & Safety Officer prior to re-entry into the waste excavation area. Maintaining the correct slopes is the responsibility of Mesa Verde and the Site Supervisor & Safety Officer (a “competent person” as defined by OSHA

under 29 Code of Federal Regulations 1926.650 (b)-Excavation/Construction). Excavation activities will cease and the slopes will be immediately corrected should they begin to significantly deviate from the maximums previously listed.

The nearest hospital equipped with full services emergency room facilities is the Gerald Champion Regional Medical Center. The Gerald Champion Regional Medical Center is approximately 4.6 miles from the Old Alamogordo Landfill and is located at 2669 North Scenic Drive, Alamogordo, MM 88310. The hospital phone number is listed in the attached Table 2 along with a list of other pertinent emergency contact number. A map with directions to the hospital is included as part of the attached HASP (Appendix B).

2.2 Site Monitoring, Waste Manifesting & Certification

During all waste excavation activities, SMA will be on-site to monitor the types of waste being removed and monitor for landfill gasses. On-site SMA personnel will have the following qualifications and experience:

- 40 Hour HAZWOPER training (meeting OSHA requirements);
- Prior direct experience with excavation work;
- Knowledgeable in the operation, calibration and maintenance of the air/landfill gas monitoring equipment being used;
- Be a "competent person" as defined by OSHA under 29 Code of Federal Regulations 1926.650 (b)-Excavation/Construction;
- Be able to identify potentially hazardous waste or material that must be segregated for special disposal; and
- Be able to describe excavated material in terms of types of waste (with approximate percent of composition), organic content and degree of decomposition.

As it is not possible to screen every item of waste at the time of initial disposal, it is possible that some material disposed of at the Old Alamogordo Landfill may not be suitable for re-disposal in the Otero/Greentree Regional Landfill. Therefore, the excavated waste will be continuously monitored by SMA and Operational Consultants for materials unsuitable for re-disposal. Items unsuitable for re-disposal include, but are not limited to, hazardous substances, asbestos containing materials, liquids, medical waste and batteries. Freezers and refrigerators encountered shall be segregated and inspected to identify if Freon is still present. If Freon is present, it must be removed by a certified Freon recycler prior to re-deposit or removal from the site. Additionally, any other suspicious items such as pressure vessels, drums/barrels, unknown containers, etc. shall be set aside at the location indicated in Figure 3 for possible testing and determination of suitable disposal.

Representative samples of waste that may be suspected of containing regulated chemicals will be screened with a photo-ionization detector (PID) for the presence of VOC's (only VOC's with an ionization potential of <10.6 electron volts). If visual or field screening methods indicate evidence of possible hazardous waste, a representative sample may be collected and analyzed

using the appropriate laboratory methods(s) based on the type of suspected hazard present. Possible analysis includes EPA Method 8260B for VOC's, EPA Method 8081 for pesticides, EPA Method 8270 for semi-volatiles, EPA Method 8082 for polychlorinated biphenyls (PCBs), EPA Method 6010 for metals (mercury, arsenic, barium, cadmium, chromium, lead, selenium and silver), polarized light microscopy (PLM) as specified by EPA Method 600/R-93/116 for asbestos, or various other methods. Based on the results of the sample analyses, the material will be classified as standard waste or hazardous/special waste. If required, laboratory turnaround time/costs for the specified analyses will be negotiated with Operational Consultants prior to sampling and analysis.

Materials suspected of or classified as requiring special handling shall be separated and retained in a designated area (Figure 3) in labeled drums or other containers depending on the waste characteristics, quantity and final disposal requirements (dependent on laboratory analytical results). Any suspected asbestos containing material will be wetted prior to placement in the designated area. The designated area will have temporary fencing and warning tape to ensure unauthorized personnel do not enter the designated area. Staging of special and hazardous waste will be on double layer 6-mil visqueen sheeting bermed around the edges. Staged special/hazardous waste will be covered with 6-mil visqueen sheeting and labeled as such until Safety Kleen in El Paso, Texas can be notified and properly dispose of the special/hazardous waste.

All other typical municipal solid waste from the excavation area will be transported by the Greentree Solid Waste Authority to the Otero/Greentree Regional Landfill. A total of six (6) 30-cubic yard roll-on/roll-off containers will be available for storage/transport of the excavated waste. Two (2) roll-on/roll-off trucks will be dedicated to the waste hauling and, with an estimated one (1) hour turnaround for each load, there will be minimal lag time between excavation of the waste and transportation to the Otero/Greentree Regional Landfill. The total number of loads will be documented and all loads will be weighed at the Otero/Greentree Regional and the total amount of waste material excavated/hauled will be documented.

Types of waste encountered will also be documented by SMA in a designated field notebook and/or field data sheets (daily logs). As described in Section 3.0, copies of the field notes will be submitted to NMED SWB as part of the closeout documentation along with photo-documentation of excavated waste material. SMA will obtain photographs of typical waste material (household, construction/demolition, etc.) as well as any special or hazardous waste.

Once the Atari items have been uncovered/removed and documentary filming has been completed, backfilling of the excavation will take place immediately using various existing borrow locations at the Old Alamogordo Landfill as indicated in Figure 2. All backfill material will be obtained from existing mounds of clean, native soils at the locations indicated. Continuous landfill gas monitoring will not be performed by SMA during backfilling but periodic monitoring will be performed as discussed in Section 2.2.1 below.

2.2.1 Landfill Gas Monitoring

Landfill gas (%LEL of methane, hydrogen sulfide, carbon monoxide, carbon dioxide, oxygen and VOC concentrations) will be measured by SMA in the field at worker level using handheld equipment prior to commencement of waste excavation activities in order to obtain surficial background landfill gas levels (if any). As previously discussed, on March 11, 2014 SMA obtained subsurface landfill gas concentrations of both the excavation area and surrounding areas. During excavation activities a combustible/toxic gas meter and a PID will be located on SMA personnel and used to continuously monitor the work area for potential landfill gases and any oxygen deficiencies. Appendix F includes a description of the air monitoring equipment. The work/excavation area will also be monitored by a combustible/toxic gas meter and a PID prior to worker entry following a break in the work and prior to the beginning of each day of excavation activities. The data loggers on the instruments shall be in working order and the data can be downloaded on as needed basis. The combustible/toxic gas meter and PID will be calibrated daily and periodic snapshot readings will be recorded by SMA in a designated field notebook and/or field data sheet. Recommended action levels and appropriate responses for methane, hydrogen sulfide, oxygen (reduced conditions) and VOC's are included in the attached Table 3. Many components of landfill gas are simple asphyxiants and have vapor densities greater than air and will tend to settle in low lying areas such as an excavation. Therefore, monitoring of oxygen levels is critical in ensuring the safety of workers in the excavation area. In addition to landfill gas monitoring during excavation activities, monitoring will also be periodically performed by SMA personnel during the backfilling of the excavation area with clean, native soils obtained from the borrow locations at the Old Alamogordo Landfill.

2.3 Site Control & Security

The Old Alamogordo Landfill is currently fenced around the entire perimeter with only one entrance gate (Figure 3). This gate will remain locked at all times while personnel are not onsite and a private security company (Alamo Security) will be used for after-hours security to ensure no unauthorized personnel have access to the landfill. When personnel are on site and the gate is open and excavation/filming is occurring, a gate guard will be present to restrict access to unauthorized personnel. Additionally, off-duty City of Alamogordo Police Department personnel (in uniform and with their police vehicles) will be on-site during waste excavation activities to provide security and restrict public access to designated areas only (Figure 3)

Access to the waste excavation area itself will be restricted to authorized personnel only and will be at the discretion of the Site Supervisor & Safety Officer. As described in Section 2.4 below, no film crew will enter the excavation and all footage will be obtained at a safe distance. As an added safety feature, the waste excavation area will have orange safety fencing or warning tape placed around the perimeter of the excavation during non-working hours while a temporary fence will be constructed to ensure the viewing public is separated from the excavation area (Figure 3). The safety fence or warning tape shall

be set back approximately two feet from the edge of the waste excavation area and will remain in place until the excavated area is eventually backfilled with the appropriate amounts of soil cover material. With the help of the off-duty police officers previously mentioned, other traffic devices will also be put in place to insure public safety and to designate parking areas and no driving/access zones. Figure 3 illustrates the proposed site control and layout for the excavation and filming activities.

2.4 Film Personnel & Equipment

There will be approximately 25 crew members from Fuel Entertainment on site during excavation of the Atari items. Two (2) full camera crews with sound recorders will be utilized and the camera crews will use such equipment as dollies, tripods and a cherry picker to safely get the appropriate film shots. Additionally, a small drone will be used to get aerial shots and small remote cameras will be attached to some of the excavation equipment to safely get close-up shots of the excavation without actually entering the excavation. The camera crews will also use lights to facilitate low-level light filming; including standard work light-stands as well as special film lights. Fuel Entertainment will have a trailer set-up for use as an office and rest area. A large tent will also be set-up and there will be porta-potties available and an additional restroom in the office trailer.

While not all film personnel will be 40 Hour HAZWOPER trained, they will all be instructed on the HASP and general site construction safety procedures and attendance for all film personnel will be mandatory at the daily safety briefings. All film personnel will also be supervised by the Site Supervisor & Safety Officer during excavation activities and no film crew will enter into the excavation itself.

2.5 Waste Excavation

Mesa Verde will perform waste excavation and the excavated waste from this project site will be transported approximately 23 miles-to the active landfill face at the Otero/Greentree Landfill for proper disposal. The proposed waste transportation route in the immediate vicinity of the Old Alamogordo Landfill is illustrated in Figure 2. Excavation equipment will include an excavator, front-end loader, motor-grader, water truck and roller/compactor. The excavator will be used to remove the overburden and waste from the excavation and the front-end loader will be used to load the roll-on/roll-off containers. The water truck will be used to keep the soils in and around the excavation area and haul road damp so that excessive dust is not generated and good visibility is maintained. However, every attempt should be made not to saturate the solid waste and not apply water directly to waste remaining in place which would increase the potential for slope failure. The front-end loader and dump trucks will be used to backfill the excavation with clean, native soils and the motor-grader will be used for clearing and grubbing and final surface contouring.

The total depth of the excavation is anticipated to be approximately 12 to 15 feet below ground surface and based on the photographs provided in Appendix D, it appears that a thin concrete cap was placed over the Atari items at the time of disposal. The concrete cap was not reinforced and was simply placed over the items thus the cap will be easily broken up with the excavator and the concrete disposed of with the other waste being hauled to the Otero/Greentree Regional Landfill for final disposal. Atari items with any value will be immediately placed in a City of Alamogordo van/truck with security provided by the City of Alamogordo Police Department and transported to a City owned, secure warehouse for storage and future marketing.

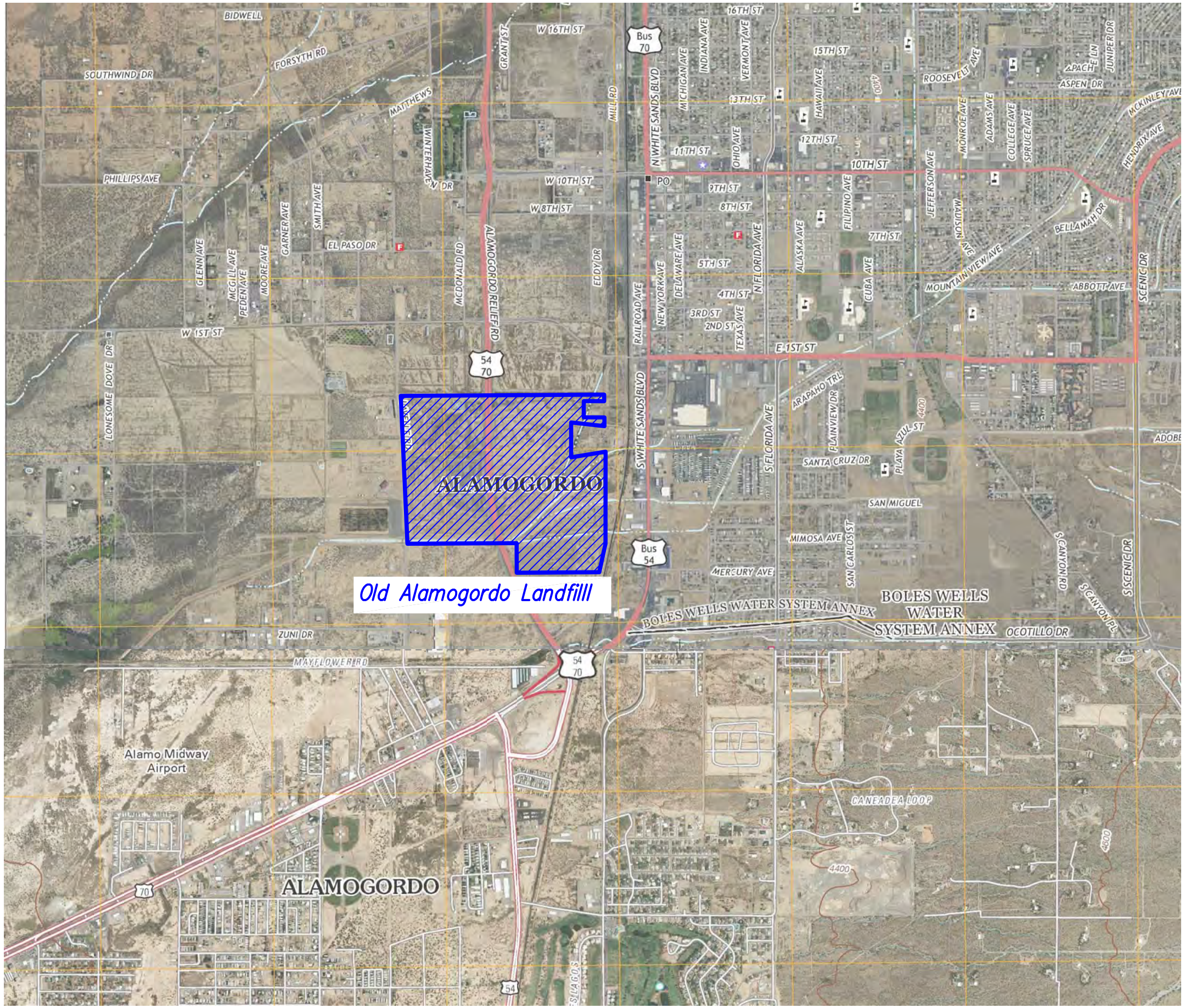
Depending on site-specific conditions, silt fencing may be used around the excavation area in order to keep waste form blowing off-site. Daily pick-up of wind-blown trash near the waste excavation area and from the old landfill property perimeter will be performed. More frequent trash pick-up may be warranted if operating under breezy to windy conditions. Excavation activities may need to be postponed if winds are excessive. Postponement of excavation activities for excessive wind will be at the discretion of the City of Alamogordo and/or Operational Consultants. Postponement due to rain (or potential for rain) will be at the discretion of the Site Supervisor & Safety Officer as discussed in Section 2.1.

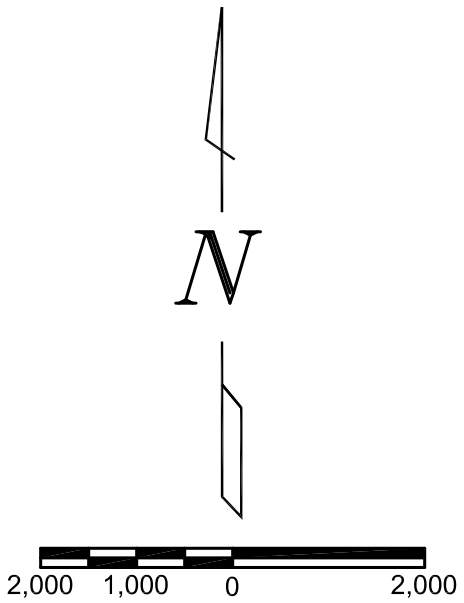
As discussed previously, clean, native soils from various existing mounds at the Old Alamogordo Landfill will be used to backfill the excavation immediately after the Atari items have been recovered. The final cover for the excavation area will be graded and compacted to insure surface water does not accumulate on the surface. While the exact timeline is unknown, it is anticipated that waste evacuation activities will take less than 7 days from start to finish.

3.0 CLOSEOUT DOCUMENTATION

After completion of the excavation, disposal of the excavated waste and backfill of the excavation, SMA will prepare a summary report for Operational Consultants for submittal to NMED SWB. The summary report will include a discussion of WEP compliance and verify proper disposition of all excavated waste. The summary report will also include the results of site monitoring during excavation, a description of the final excavation performed, final disposition of the excavated waste materials, volume of waste removed, description of the types and quantities of waste encountered, summary of hazardous and special waste encountered (if any), hazardous/special waste manifests (if any), laboratory analytical results (if any), daily logs and photographs of excavation activities and final backfill. A copy of the summary report with all supporting documentation will be submitted to NMED SWB within ten (10) calendar days following completion of waste excavation.

FIGURES





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Legend

Old Alamogordo Landfill

Note:

Base map is the Alamogordo North (2013) & Alamogordo South (2012) Quadrangles (1:24,000 : United States Geological Survey).

Figure 1

Site Vicinity Map
Old Alamogordo Landfill
Alamogordo, New Mexico

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Las Cruces, New Mexico 88005-8131
(575) 647-0799 / 647-0680 (Fax)
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Drawn CFK
Checked CCC
Approved KET

Revisions
By: Date: Descr.:
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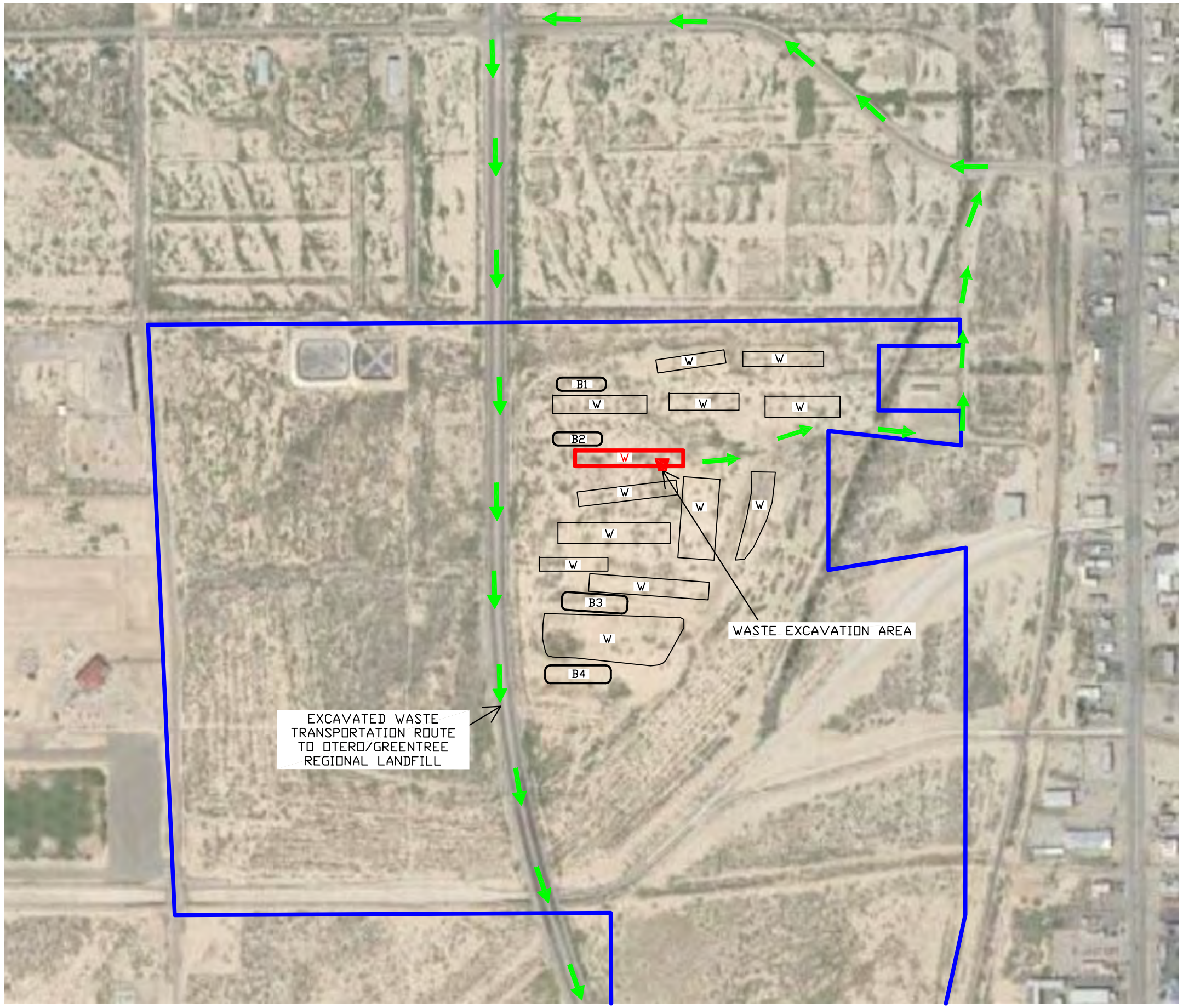

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Scale: 1"=500'

Legend

- Old Alamogordo Landfill Boundary
- W — Cell w/ Atari Games
- W — Nearby Waste Cells
- B2 — Borrow Areas

Note:

Aerial image from Google Earth (2013)

Figure 2

Site Map & Excavated Waste Route
Old Alamogordo Landfill
Alamogordo, New Mexico

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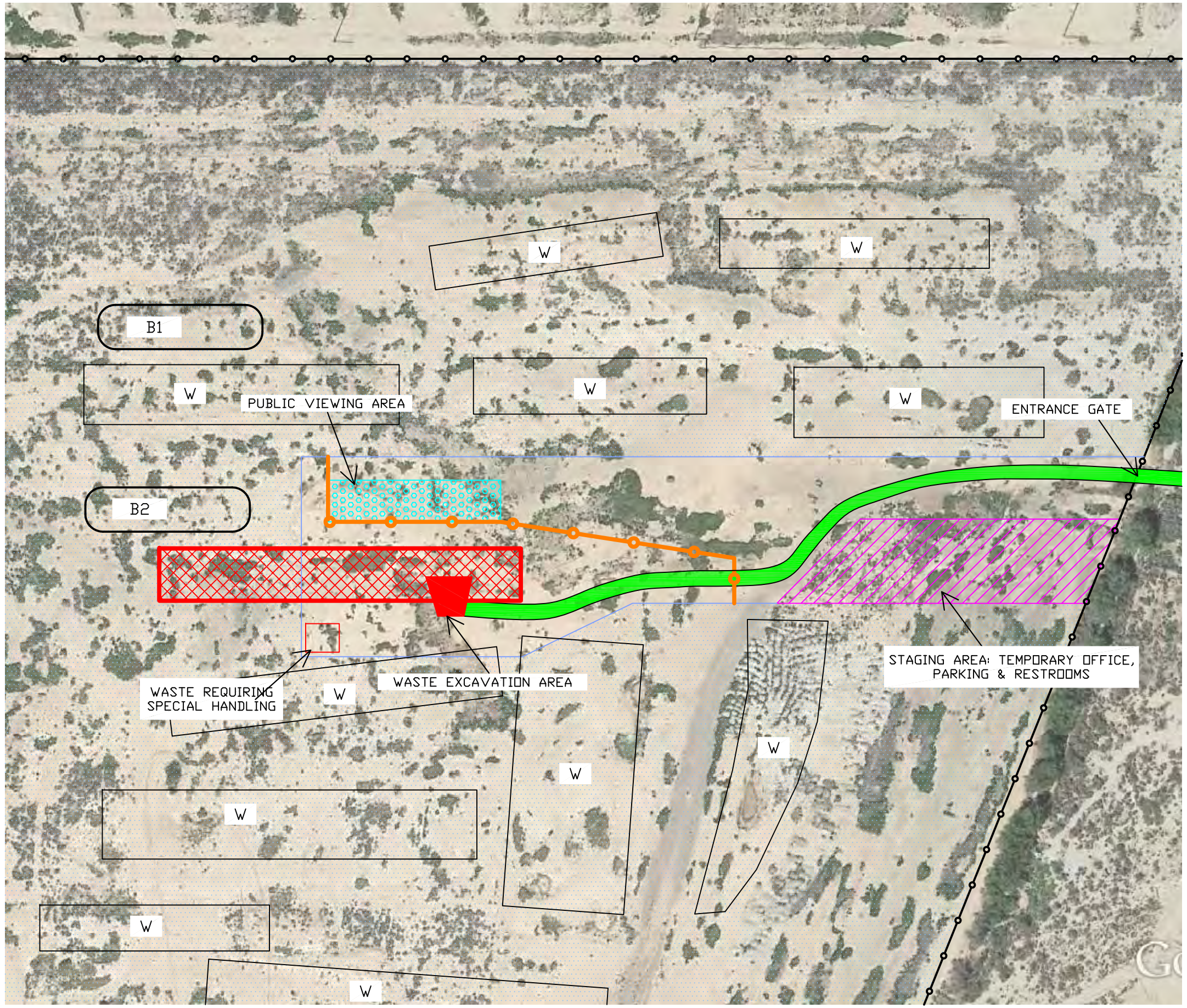

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Scale: 1"=150'

Legend

- Old Alamogordo Landfill/Restricted Area
- Waste Cell w/Atari Games
- W — Nearby Waste Cells
- B2 — Borrow Areas
- Two-Lane Access Road, Fire/EMS Use, Not to be Blocked
- Barrier Fence

Note:

Aerial image from Google Earth (2013)

Figure 3

Excavation Area & Site Control
Old Alamogordo Landfill
Alamogordo, New Mexico

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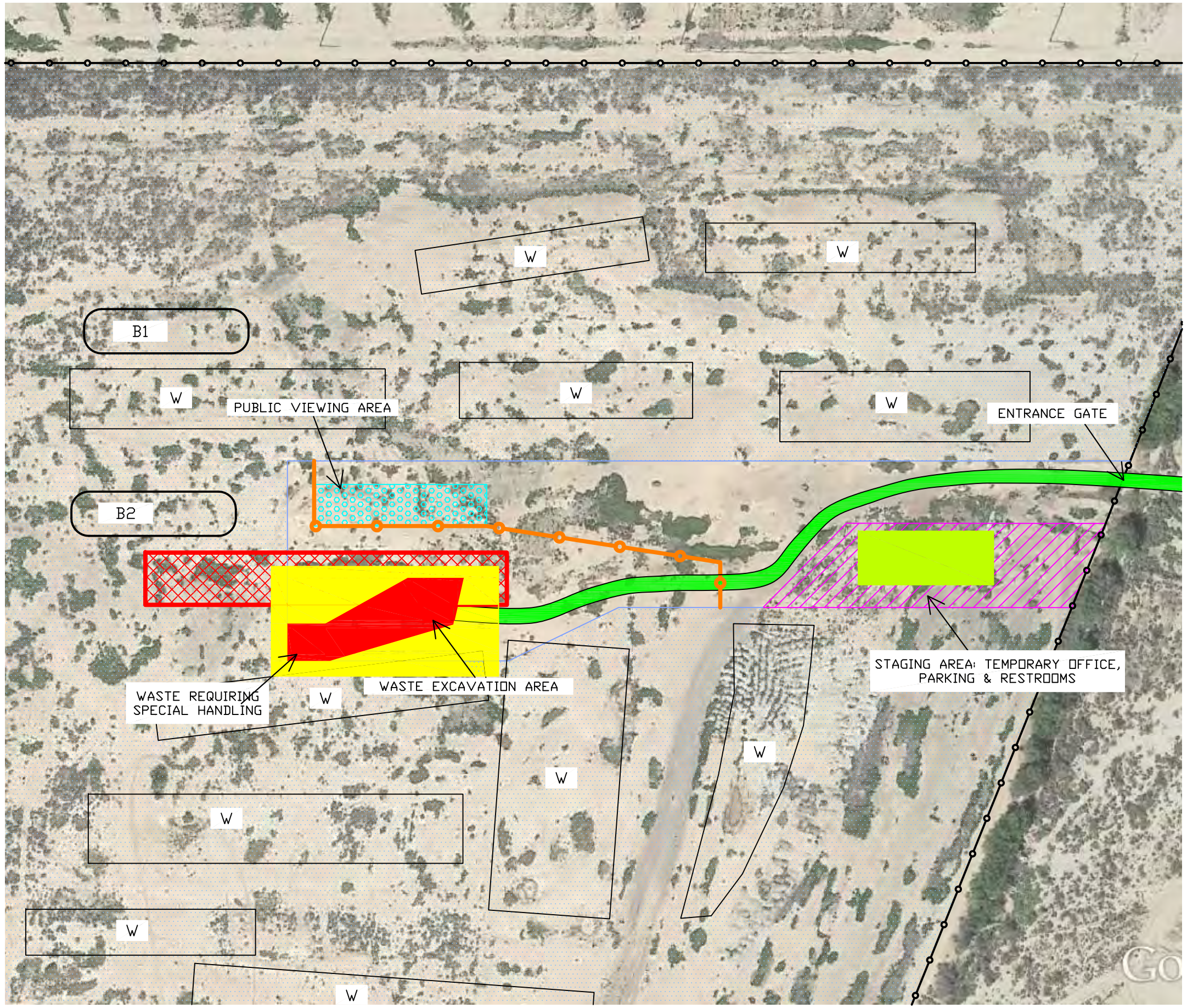

N

150 75 0 150

Scale: 1"=150'

Legend

- Old Alamogordo Landfill/Restricted Area
- Waste Cell w/Atari Games
- W — Nearby Waste Cells
- B2 — Borrow Areas
- Two-Lane Access Road, Fire/EMS Use, Not to be Blocked
- Barrier Fence
- Exclusion Zone
- CRZ
- Support Zone

Note:

Aerial image from Google Earth (2013)

Figure 4

Potential Exclusion, CRZ & Suppot Zones
Old Alamogordo Landfill
Alamogordo, New Mexico

401 North Seventeenth Street, Suite 4
Las Cruces, New Mexico 88005-8131
(575) 647-0799 / 647-0680 (Fax)
www.soudermiller.com
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Revisions
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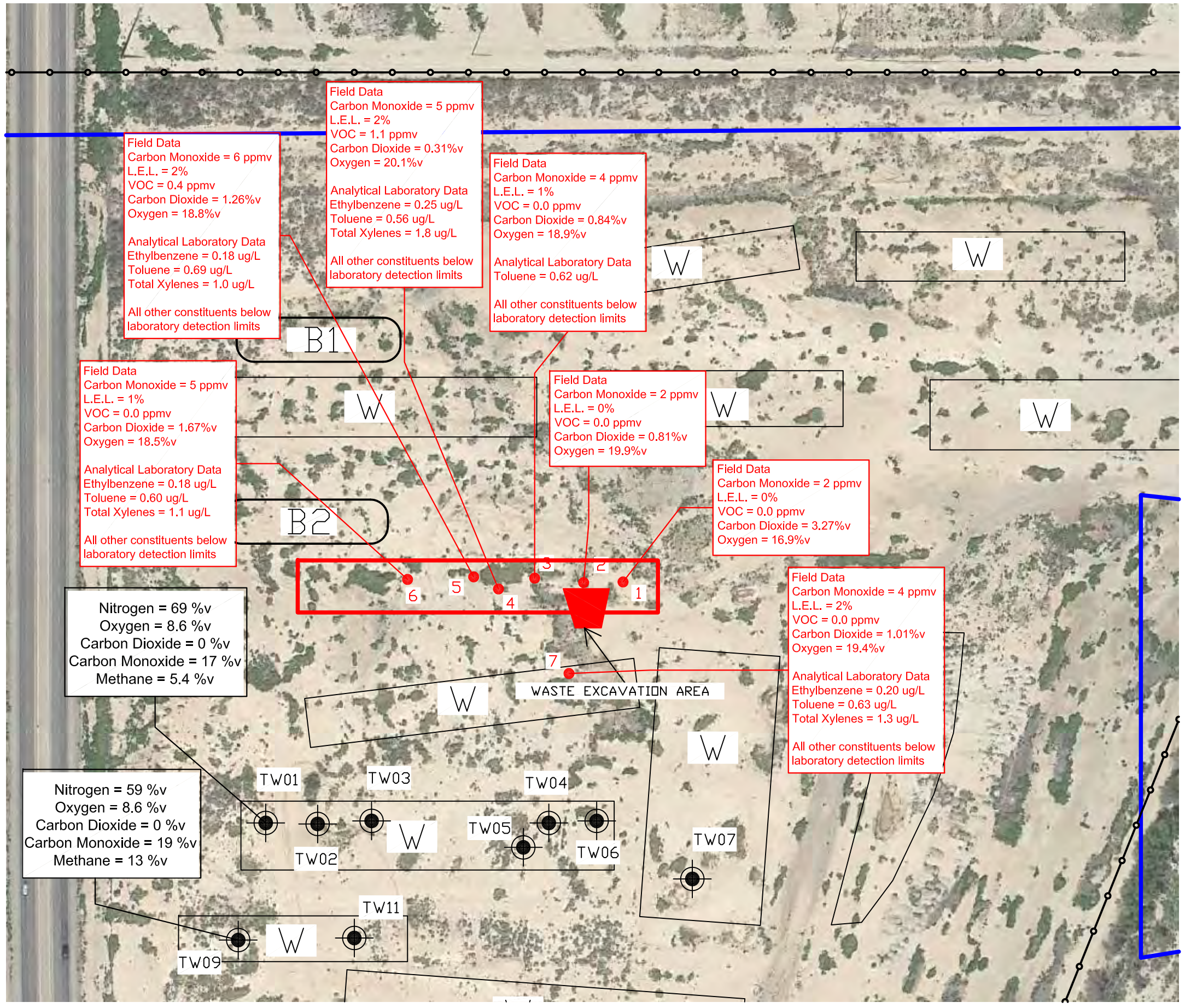
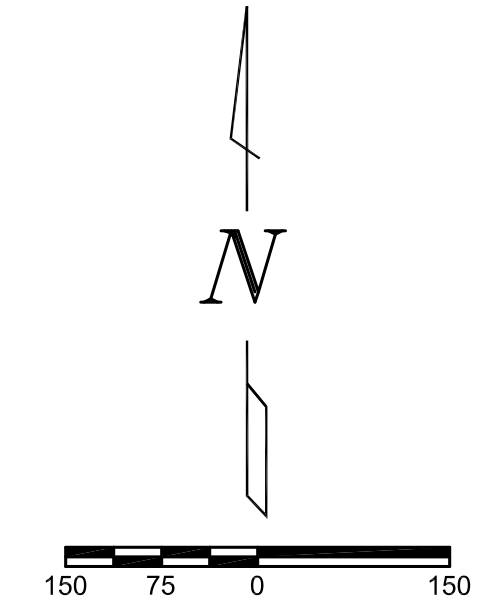
02-09-14





Scale: 1"=150'

Legend

- Old Alamogordo Landfill
- Waste Cell w/Atari Games
- W — Nearby Waste Cells
- B2 — Borrow Areas
- 1 — Soil Vapor Point (3/11/14)
- TW01 — Temporary Well (7/26/04, TetraTech Rpt)
- ppmv — Parts Per Million by Volume
- %v / %v — Percent by volume

Note:

Aerial image from Google Earth (2013)

Figure 5

Landfill Gas Data
Old Alamogordo Landfill
Alamogordo, New Mexico

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By:
Descr.:
Date:
By:

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02-09-14

TABLES

TABLE 1

Primary Waste Excavation Roles & Responsible Personnel

Project Role	Affiliation	Responsible Personnel & Contact Information
Owner	City of Alamogordo	Brian Cesar, Public Works Director (575)439-4241 bcesar@ci.alamogordo.nm.us
Contractor	Mesa Verde (earthwork) Greentree SWA (waste hauler)	Pat McGill 575-437-2995 Debra Ingle 575-937-2702
Engineer	Souder, Miller & Associates	Karl Tonander, P.G., P.E., C.P.G. 575-649-1438 karl.tonander@soudermiller.com
Project Manager	Operational Consultants	Joe Lewandowski 575-430-8989 opconsultants@yahoo.com
Waste Excavation On-Site Supervisor	Mesa Verde	Pat McGill 575-437-2995
Waste Excavation Plan (development)	Souder, Miller & Associates	Clay F. Kiesling, P.G. 575-647-0799 clay.kiesling@soudermiller.com
Site Safety Officer	Mesa Verde	Pat McGill 575-437-2995
Landfill Gas Monitoring & Waste Excavation Observation	Souder, Miller & Associates	Craig C. Chase, P.G. 575-647-0799 craig.chase@soudermiller.com
Regulatory Agency	New Mexico Environment Department (NMED) Solid Waste Bureau (SWB)	Mr. Joey Vega (575) 647-7968 jose.vega@state.nm.us

TABLE 2

Emergency Contact Phone Numbers

Entity	Phone Number
Gerald Champion Regional Medical Center	911 or (575) 439-6100
Alamogordo Fire Department	911 or (575) 439-4300
Alamogordo Police Department	911 or (575) 439-4300
New Mexico State Police	911 or (505) 829-9300
EPA Region VI Emergency Response (24 hr hotline)	(866) 372-7745
National Response Center	(800) 424-8862
Centers for Disease Control & Prevention	(800) 232-4636
Poison Information Center	(800) 222-1222
New Mexico Poison Center	(505) 272-2222
NMED Hazardous Waste Bureau	(505) 476-6000
NMED Solid Waste Bureau	(505) 827-0197
NMED Solid Waste Bureau 24-Hour Emergency #	(505) 827-9329

TABLE 3

Landfill Gas Action Levels & Response

Gas	Action Level	Response
Methane-Concentration	≥ 0.5% in air (≥ 5,000 ppmv)	Stop work and evacuate the exclusion zone until levels are below the action level. If the action level is exceeded in the CRZ, evacuate the site. Contact the City of Alamogordo authorities as well as the Alamogordo fire department if persistent exceedances are measured in the CRZ.
Methane-Lower Explosive Limit (LEL)	≥ 10% of the LEL	Stop work and evacuate the exclusion zone until levels are below the action level. If the action level is exceeded in the CRZ, evacuate the site. Contact the City of Alamogordo authorities as well as the Alamogordo fire department if persistent exceedances are measured in the CRZ.
Oxygen	< 19.5%	Stop work and evacuate the exclusion zone until levels are above the action level for a period of at least 15 minutes. Re-visit HASP and establish better engineering controls (slow down waste excavation to allow landfill gas to dissipate and oxygen to enter excavation area, etc.). As a last resort prepare to implement a respiratory protection plan (forced air) prior to re-entry.
Carbon Dioxide	≥ 1% (10,000ppmv)	Stop work and evacuate the exclusion zone until levels are above the action level for a period of at least 15 minutes. Re-visit HASP and establish better engineering controls (slow down waste excavation to allow landfill gas to dissipate and oxygen to enter excavation area, etc.). As a last resort prepare to implement a respiratory protection plan (forced air) prior to re-entry.
Hydrogen Sulfide	≥ 10 ppmv	Stop work and evacuate the exclusion zone until levels are below the action level. If the action level is exceeded in the CRZ, evacuate the site. Establish better engineering controls and/or (as a last resort) prepare to implement respiratory protection plan (forced air) prior to re-entry.
Volatile Organics	>10 ppmv >50 ppmv	Notify City of Alamogordo authorities. Inspect excavation and exposed waste for possible sources and evaluate whether samples for laboratory analysis are warranted. Proceed with work in Level D PPE while further assessing conditions. Stop work and evacuate the site, re-evaluate excavation project.

NOTE: A photo-ionization detector (PID) only detects volatile organic compounds (VOC's) with an ionization potential below the range of the lamp (typically 10.6 electron volts). Without knowing the specific VOC resulting in a PID reading, a conservative approach is necessary.

Appendix A – Waste Excavation Checklist

Waste Excavation Checklist

Background summary

- Facility or project description, location and reason for the excavation

NMED Notification Prior to Commencement of Scheduled Activities

Schedule of Proposed Activities

Exploratory Pit Locations

- Plan view map with landfill boundaries, observations, objects encountered, soil vapor PID results (plan view with concentrations)

Waste Removal (Describe in Detail)

- How waste will be removed
- How stockpiling of waste will be avoided
- How, if necessary, temporarily stockpiled waste will be restricted form public access and covered and what preventative measures will be taken to preclude soil or groundwater contamination
- Equipment to be used
- Screening equipment (if applicable)
- Type of trucks and owners(s)
- Protection mechanisms to prevent slope failure of the excavation (OSHA compliance)
- Dust control mechanizes (e.g., use of water, trapping, avoiding work at periods of high winds)
- Personnel that will be dedicated to monitoring excavation activities
- Type(s) of waste to be excavated or anomalies that will trigger cessation of excavation or monitoring

Air Monitoring

- Compliance with local laws/ordinances
- Types of air monitoring devices to be utilized, frequency of sampling
- Procedures to ensure worker safety during monitoring, sampling and excavation activities

Personal Protective Equipment

- Required PPE to be used during excavation activities and protection levels, as appropriate

Hazard Assessment

- Chemicals and contaminants that may be encountered, potential health hazards, associated symptoms and proposed response to such situations

Site Perimeter and Security

- Means of restricting or cordoning off excavated areas (during operations and at the end of each day)
- General site security procedures, to include description of exclusion zone(s) to be implemented

Letter from Landfill Acknowledging Acceptance of the Excavated Waste

Verification of Commercial Waste Hauler Registration for Hauler(s)

Work Limitations

- Anticipated days/hours of excavation activities, personnel shifts, weather conditions that would result in cessation of work

Emergency Contact Log ad Directions & Route Map to Nearest Hospital

Key Project Personnel and Emergency Telephone Numbers

- Identification of the Site Safety Officer and other supervisory personnel
- Telephone number for nearby fire and police departments/substations, hospital(s), poison information center, NMED's 24-hour emergency reporting and the local NMED Solid Waste Bureau's enforcement officer

*****NOTE: All Waste Excavation Plans must address, but shall not necessarily be limited to, all of the items listed above.**

Appendix B – Health & Safety Plan (HASP)

WASTE EXCAVATION

HEALTH & SAFETY PLAN (HASP)

LOCATION:
Old Alamogordo Landfill

Otero County, New Mexico

PREPARED FOR:
Mesa Verde, Inc.
&
Operational Consultants

PREPARED BY:

Souder, Miller & Associates
401 North Seventeenth Street, Suite 4
Las Cruces, NM 88005

DATE:
March 18, 2014

Table of Contents

ATTACHMENT

NEAREST HOSPITAL ROUTE & DIRECTIONS

1.0 INTRODUCTION

The Health and Safety Plan (HASP) is submitted by Souder, Miller & Associates (SMA) as part of the Waste Excavation Plan (WEP) and is intended to reduce the risk of worker injury or illness from exposure to potential risks at the landfill and establish emergency action procedures in the event of an accident while conducting waste removal operations at the Old Alamogordo Landfill. The landfill is located west of White Sands Boulevard and south of West First Street in Alamogordo, New Mexico. This HASP is designed to provide health and safety criteria for the protection of on-site personnel, the public and the environment from physical, biologic/pathologic and chemical hazards that may be associated with waste excavation activities. The specific activities to which this HASP applies includes the excavation, loading, hauling and disposal of waste material. The purpose of this HASP is to provide personnel protection standards and mandatory safety practices while performing waste excavation activities. This HASP addresses the following regulations and guidance:

- OSHA Safety and Health Standards, 29 CFR 1910/1926, U.S. Department of Labor, Occupational Safety and Health Administration, OSHA 2207,1985
- OSHA Interim Final Standards, 29 CFR 1910.120
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/EP NUSCG, DHHS, (NIOSH) Publication No 85-115, 1985

Mesa Verde, Inc. (Mesa Verde) will provide waste excavation services for this project and will be responsible for implementing the HASP. The Greentree Solid Waste Authority will provide waste transportation services of the waste to the Otero/Greentree Regional Landfill. Other, more stringent, guidelines may be implemented by the City of Alamogordo and/or Mesa Verde. Mr. Pat McGill (Mesa Verde) is the designated Site Supervisor & Safety Officer for this project and will implement the HASP for waste excavation activities. In addition to implementation of this HASP, all onsite personnel will also be required to attend daily safety briefings to be alerted of specific site activities planned for the day, any safety issues foreseen for that day and specific control measures planned to mitigate hazards (if any).

2.0 SITE DESCRIPTION & BACKGROUND

The Old Alamogordo Landfill is located southwest of White Sands Boulevard and West First Street in Alamogordo, Otero County, New Mexico (Section 36, Township 16 South, Range 9 East N.M.P.M.). The full landfill property area is approximately 300 acres. The landfill is owned by the City of Alamogordo. This landfill was closed in 1989 with no further activity after that date. Charlie Lee Memorial Relief Route is a four-lane highway running north-south located approximately 500 feet to the west of the excavation site.

In May 2013, Fuel Entertainment received an access agreement from the City of Alamogordo that allows the company to enter and excavate the property in the course of preparing a documentary on the following event. In September 1983, Atari entered into an agreement with the private contractor managing the Alamogordo Landfill to disposal of millions of games,

stations and other debris from the warehouse in El Paso, Texas. The documentary film being produced is the telling of that story of when, where and how this occurred.
In 2004 a Phase II Environmental Site Assessment (ESA) of a portion of the former landfill was completed by TetraTech EM, Inc. (TetraTech). The Phase II ESA included field screening and collection of multiple landfill gas samples for laboratory analysis. While the Phase II ESA did not include the planned excavation area, a variety of volatile organic compounds (VOCs) were detected including isooctane and cyclopentane. Additionally, field screening at two (2) locations nearest to the planned excavation area indicated methane concentrations of 0.2%, carbon dioxide (CO_2) concentrations of between 8.3 and 11.1% and oxygen (O_2) concentrations at 10.3 to 12.8%.

On March 11, 2014, SMA conducted a landfill gas investigation of the trench where the Atari items are thought to be buried, the specific area of the trench where the excavation will occur and the trench immediately south and nearest to the planned excavation area. The landfill cover thickness over the trench containing the Atari items was approximately 1 foot and field screening indicated that the highest methane concentration was 2% of the lower explosive limit (LEL) relative to methane (approximately 0.1% methane), the highest photoionization detector (PID) reading for volatile organic compounds (VOCs) was 1.1 parts per million (ppm), the highest CO_2 reading was 3.2%, the highest CO reading was 6 ppm and the lowest O_2 reading was 16.9%. Additionally, laboratory analytical results indicated toluene, ethylbenzene and/or total xylenes were detected in various sample location with the highest toluene concentration at 0.69 micrograms (µg/L), the highest ethylbenzene concentration at 0.25 µg/L and the highest total xylenes concentration at 1.8 µg/L. All other analyzed VOCs were below the laboratory practical quantitation limit (PQL).

3.0 SITE HAZARD SUMMARY

Based on an understanding of current site conditions, the following health and safety hazards may potentially be encountered during waste excavation activities:

- Exposure (inhalation or skin contact) to contaminated waste and/or soil,
- Presence of flammable/combustible vapors,
- Heat stress due to protective clothing and environmental conditions,
- Physical hazards inherent to excavation operations, heavy equipment and landfill debris,
- Hazardous wastes or petroleum products that may have been deposited at the landfill,
- Methane gas generation from within the landfill
- Hydrogen sulfide gas (H^2S)
- Volatile organic compounds (VOCs)
- Slope failure during waste excavation and
- Oxygen deficient atmosphere within excavation area.

3.1 Chemical Exposure

Based on the recent soil vapor investigation on March 11, 2014, the waste material and soils in the area to be excavated at the Old Alamogordo Landfill has the potential to contain methane gas and various VOCs including toluene, ethylbenzene and total xylenes. The methane gas (%LEL relative to methane) and VOCs will be continuously measured during excavation activities with the use of a combustible/toxic gas meter and a PID. The PID will have a 10.6 eV lamp which will be able to detect toluene, ethylbenzene and total xylenes which have an ionization potential of 8.82 eV, 8.76 eV and 8.44-8.56 eV, respectively.

The OSHA permissible exposure limits (PELs) are 200 ppm for toluene, 100 ppm for ethylbenzene and 100 ppm for total xylenes, all over an 8-hour time weighted average (TWA). LEL readings over 10% and PID readings over 50 ppmv (15 minute TWA) will result in work stoppage/site evacuation and the excavation project will be re-evaluated. Respirator protection is not included as part of this HASP as any concentrations in excess of those discussed above, and also provided in Section 9.4 of this HASP, will simply result in work stoppage instead of upgrading to respiratory protection to complete the work. Work may continue after a work stoppage, but only after sufficient time has elapsed and air monitoring indicates it is safe to proceed.

3.2 Physical Hazards

Physical hazards are inherently present during any excavation operation and slope stability is particularly an issue during the excavation of waste material. To reduce the potential for slope failure, excavation and trench safety will be monitored and sloping requirements promulgated by OSHA (29 CFR 1926 Subpart P) shall be enforced. For purposes of this HASP and as the most conservative option, it is assumed that the waste in the excavation area and the native soils will have soil properties consistent with a Type C soil (worst soil type for slope stability). OSHA requires that the maximum sloping of an excavation in Type C soil be 1.5:1. However, because of the anticipated difficulties and unknowns in working a surface comprised of exposed waste, the maximum slope of waste side walls will be maintained at an even more conservative 3:1 with the maximum slope of native soil side walls maintained at 1.5:1 (also very conservative). As saturation of the waste material could significantly reduce slop stability, postponement of work due to a rainfall event, or potential for a rainfall event, will be at the discretion of the Site Supervisor & Safety Officer. Following suspension of work due to a rainfall event, slope stability will be assessed by the Site Supervisor & Safety Officer prior to re-entry into the waste excavation area. Maintaining the correct slopes is the responsibility of Mesa Verde and the Site Supervisor & Safety Officer (a “competent person” as defined by OSHA under 29 Code of Federal Regulations 1926.650 (b)-Excavation/Construction). Excavation activities will cease and the slopes will be immediately corrected should they begin to significantly deviate from the maximums previously listed.

Additional physical hazards present at the landfill site may include debris (glass, metal, concrete, etc.), mechanical hazards, noise associated with the operation of heavy equipment,

slip-trip-fall hazards associated with field operations and skeletal-muscular injury hazards associated with field operations.

Site workers must be aware of heavy equipment at all times. Heavy equipment working on-site should always be given the right-of-way. Workers are to be conscious of swinging booms from track-hoes and other pieces of heavy equipment, designated traffic paths for heavy equipment and haul trucks will be established. Heavy equipment will be outfitted with backup alarms and all workers on site will be required to wear high-visibility safety vests.

3.3 Weather

Weather conditions play an important consideration in planning and conducting waste excavation activities. Rainfall events could potentially lead to saturation of the waste material which could significantly reduce slope stability. Very windy conditions could result in blowing trash and reduced visibility. At the discretion of the Site Supervisor & Safety Officer, work may cease in the event of a rainfall event (or if the potential for a rainfall event exists). The postponement of excavation activities for excessive wind will be at the discretion of the City of Alamogordo and/or Operational Consultants. Extremely hot or cold weather can also cause or contribute to physical discomfort, loss of efficiency and personal injury.

4.0 ACCIDENT PREVENTION

Mesa Verde will be responsible for implementation of an accident prevention plan. All on-site personnel will be accountable for reading, understanding and following the guidelines provided in the accident prevention plan. The accident prevention plan should be similar to those prepared for other excavation sites.

- While not all site personnel will be 40 Hour HAZWOPER trained, site-specific training/hazard communication will be provided by Mesa Verde to all site personnel, including film crew, prior to initiation of work at the Old Alamogordo Landfill (Section 6.0). This includes the communication of potential chemical and physical hazards and response should air monitoring indicate readings in excess of those described in Section 3.1.
- Mesa Verde will be responsible for maintaining a clean job site-free from hazards and providing safe ingress and egress from the site.
- Physical barriers delineating the work site (temporary fencing & caution tape) and off-duty City of Alamogordo Police Department personnel (in uniform and with their police vehicles) will be used for traffic control and to limit access to the restricted work area (excavation area).
- Emergency telephone numbers will be available on-site and the location of the emergency telephone numbers will be made available to all site personnel. A mobile/cellular telephone will be in use at the site in the event of an emergency. Emergency assistance can be obtained using the 911 telephone number. The closest

hospital to the work site is the Gerald Champion Regional Medical Center (telephone: (575) 439-6100). A map to the hospital is attached to this HASP
- At the beginning of each workday a tailgate health and safety meeting (daily safety briefings) will be held to discuss relevant site-specific information, control measures to mitigate hazards and changed conditions.

A portable eyewash station and a first aid kit will be maintained on-site by Mesa Verde and if a minor accident occurs, limited first aid will be provided on-site. If appropriate, 911 will be contacted for assistance in an emergency situation. All occupational injuries or illnesses will be reported.

5.0 ASSIGNMENT OF RESPONSIBILITIES

The assignment of health and safety responsibilities will be provided by Mesa Verde.

Project Manager (Operational Consultants)

- Ensuring that health and safety requirement are met and HASP is implemented;
- Briefing field teams on specific duties;
- Controlling site access;
- Serving as liaison with all associated parties;
- Implementing the HASP in compliance with OSHA standards and with general health and safety policies;
- Modifying and/or developing new health and safety procedures as necessary;
- Maintaining medical surveillance procedures as outlined;
- Selecting the proper level of PPE and clothing and ensuring proper use by all on-site employees;
- Regularly inspecting all personal protective equipment (PPE) and providing proper maintenance and storage of PPE;
- Monitoring all on-site workers for signs of stress;
- Preparing and submitting the required health and safety, monitoring, accident logs and reports; and
- Conducting as needed safety briefings and site-specific training for on-site medical care and services.

Monitoring Personnel (Souder, Miller & Associated)

- Development of the HASP;
- If observed, notify the Project Manager of any potentially unsafe conditions;
- Provide field screening and visual observation of debris that is excavated from the site; and
- Attend site safety meetings.

Site Supervisor & Safety Officer (Mesa Verde)

- Verify that health and safety requirements are met;
- Regularly inspect PPE and provide for proper maintenance and storage of PPE;
- Brief field teams on specific duties;
- Control site access;
- Implement the HASP in compliance with OSHA standards;
- Modify and/or develop new health and safety procedures as necessary;
- Ensure that all on-site personnel have been certified as physically fit to perform field work;
- Maintain medical surveillance procedures as outlined;
- Monitor all on-site workers for signs of stress; and
- Ensure on-site implementation of the HASP.

6.0 PERSONNEL TRAINING

SMA and Mesa Verde will have 40 Hour HAZWOPER trained personnel on site during waste excavation activities. Additionally, all personnel (including the film crew) will be made aware of the potential hazards prior to working on the site. Training/hazard communication will meet the requirements of OSHA 29 CFR 1910.120 (e) regarding:

- General site safety responsibilities;
- Medical surveillance program;
- Review of the HASP;
- Potential chemical/physical hazards;
- PPE;
- Personnel/equipment decontamination procedures (if needed); and
- Emergency assistance network.

7.0 MEDICAL SURVEILLANCE PROGRAM

Medical fitness testing for respirator protection is not applicable as respirator protection will not be used for this project. In accordance with OSHA 29 CFR 1910.120(f), medical surveillance programs are only required for employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year. As the film crew is not normally exposed to hazardous substances, a medical surveillance program with baseline testing is not necessary. However, any employees who are injured, become ill or develop signs or symptoms due to possible overexposure of potential chemicals during excavation will be tested. Additionally, SMA personnel at the site will be under a medical surveillance program.

As discussed previously, should air monitoring indicate %LEL (relative to methane) at or greater than 10% and PID readings at or greater than 50 ppm (15 minute TWA), then all work will simply stop and the project will be re-evaluated. However, in addition to continuous air monitoring, all site personnel will also be observed for any signs or symptoms related to the anticipated chemical hazards previously discussed in Section 3.1. These symptoms generally include irritation to the eyes, nose and throat followed by headaches and dizziness.

Prior to starting work, an emergency medical assistance network will be established. This involves identifying the fire department, ambulance service and hospitals near the landfill. Emergency assistance can be obtained using the 911 telephone number. Section 11.3 lists various emergency telephone numbers and a map with driving directions to the Gerald Champion Regional medical Center, which is the closest emergency care facility to the landfill, is attached to this HASP. Additionally, a vehicle shall be available on-site during all waste excavation activities to transport personnel with minor injuries to the identified emergency medical facility.

8.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Based on an evaluation of potential hazards, Level D PPE has been designated for this project. For this project, Level C PPE, Level A PPE and Level B PPE are not anticipated and if those levels of protection become necessary, work will be stopped and the project will be re-evaluated or work will continue only after air monitoring indicates it is safe to do so.

8.1 Level D Personal Protective Equipment

Personnel working at the project site shall wear at a minimum:

- Work uniforms;
- Steel-toe safety boots (leather or chemical resistant);
- Hard hat;
- Safety glasses;
- Safety vets for visibility; and
- Leather gloves, chemical-resistant gloves (i.e., nitrile or PVC) may be mandated when handling or sampling potentially hazardous or contaminated materials.

8.2 Level C, Level B & Level A Personal Protective Equipment

Level C, Level B and Level A environments are not anticipated for this project. If field-monitoring equipment indicates that a Level C, Level B or a Level A environment is present, work will be stopped and the situation will be reviewed.

9.0 HAZARD ASSESSMENT & CONTROLS

A hazard assessment shall be performed by the Project Manager and/or Site Supervisor & Safety Officer to evaluate what control measures are necessary during this project. This will involve characterization of chemical, biologic/pathologic, physical and other health and safety hazards at

the site. The hazard assessment is an on-going process and will be conducted throughout the project.

9.1 Area Survey

The Project Manager and/or Site Supervisor & Safety Officer shall conduct a physical survey of the work site to evaluate appropriate control measures.

9.2 Screening for Hazardous Waste

The excavated waste will be continuously monitored by SMA and Operational Consultants for materials unsuitable for re-disposal at the Otero/Greentree Regional Landfill. Items unsuitable for re-disposal include, but are not limited to, hazardous substances, asbestos containing materials, liquids, medical waste and batteries. Freezers and refrigerators encountered shall be segregated and inspected to identify if Freon is still present. If Freon is present, it must be removed by a certified Freon recycler prior to re-deposit or removal from the site. Additionally, any other suspicious items such as pressure vessels, drums/barrels, unknown containers, etc. shall be set aside at the location indicated in Figure 3 of the WEP for possible testing and determination of suitable disposal.

Representative samples of waste that may be suspected of containing regulated chemicals will be screened with a PID for the presence of VOC's (only VOC's with an ionization potential of <10.6 electron volts). If visual or field screening methods indicate evidence of possible hazardous waste, a representative sample may be collected and analyzed using the appropriate laboratory methods(s) based on the type of suspected hazard present. Possible analysis includes EPA Method 8260B for VOC's, EPA Method 8081 for pesticides, EPA Method 8270 for semi-volatiles, EPA Method 8082 for polychlorinated biphenyls (PCBs), EPA Method 6010 for metals (mercury, arsenic, barium, cadmium, chromium, lead, selenium and silver), polarized light microscopy (PLM) as specified by EPA Method 600/R-93/116 for asbestos, or various other methods. Based on the results of the sample analyses, the material will be classified as standard waste or hazardous/special waste.

Materials suspected of or classified as requiring special handling shall be separated and retained in a designated area in labeled drums or other containers depending on the waste characteristics, quantity and final disposal requirements (dependent on laboratory analytical results). Any suspected asbestos containing material will be wetted prior to placement in the designated area. The designated area will have temporary fencing and warning tape to ensure unauthorized personnel do not enter the designated area. Staging of special and hazardous waste will be on double layer 6-mil visqueen sheeting bermed around the edges. Staged special/hazardous waste will be covered with 6-mil visqueen sheeting and labeled as such until Safety Kleen in El Paso, Texas can be notified and properly dispose of the special/hazardous waste.

9.3 Air Monitoring

The main objective of air monitoring is to assess the potential inhalation hazard to site personnel and to determine safe working conditions. Landfill gas (%LEL of methane, hydrogen sulfide, carbon monoxide, carbon dioxide, oxygen and VOC concentrations) will be measured by SMA in the field at worker level using handheld equipment prior to commencement of waste excavation activities in order to obtain surficial background landfill gas levels (if any). As previously discussed, on March 11, 2014 SMA obtained subsurface landfill gas concentrations of both the excavation area and surrounding areas. During excavation activities a combustible/toxic gas meter and a PID will be used to continuously monitor the work area (with brief periods of downtime for instrument checks, recalibration, change batteries, etc.) for potential landfill gases and any oxygen deficiencies. The work/excavation area will also be monitored by a combustible/toxic gas meter and a PID prior to worker entry following a break in the work and prior to the beginning of each day of excavation activities.

9.4 Air Monitoring Action Levels

Gas	Action Level	Response
Methane-Concentration	≥ 0.5% in air (≥ 5,000 ppmv)	Stop work and evacuate the exclusion zone until levels are below the action level. If the action level is exceeded in the CRZ, evacuate the site. Contact the City of Alamogordo authorities as well as the Alamogordo fire department if persistent exceedances are measured in the CRZ.
Methane-Lower Explosive Limit (LEL)	≥ 10% of the LEL	Stop work and evacuate the exclusion zone until levels are below the action level. If the action level is exceeded in the CRZ, evacuate the site. Contact the City of Alamogordo authorities as well as the Alamogordo fire department if persistent exceedances are measured in the CRZ.
Oxygen	< 19.5%	Stop work and evacuate the exclusion zone until levels are above the action level for a period of at least 15 minutes. Re-visit HASP and establish better engineering controls (slow down waste excavation to allow landfill gas to dissipate and oxygen to enter excavation area, etc.). As a last resort prepare to implement a respiratory protection plan (forced air) prior to re-entry.
Carbon Dioxide	≥ 1% (10,000ppmv)	Stop work and evacuate the exclusion zone until levels are above the action level for a period of at least 15 minutes. Re-visit HASP and establish better engineering controls (slow down waste excavation to allow landfill gas to dissipate and oxygen to enter excavation area, etc.). As a last resort prepare to implement a respiratory protection plan (forced air) prior to re-entry.
Hydrogen Sulfide	≥ 10 ppmv	Stop work and evacuate the exclusion zone until levels are below the action level. If the action level is exceeded in the CRZ, evacuate the site. Establish better engineering controls and/or (as a last resort) prepare to implement respiratory protection plan (forced air) prior to re-entry.

Volatile Organics	>10 ppmv	Notify City of Alamogordo authorities. Inspect excavation and exposed waste for possible sources and evaluate whether samples for laboratory analysis are warranted. Proceed with work in Level D PPE while further assessing conditions.
	>50 ppmv	Stop work and evacuate the site, re-evaluate excavation project.

NOTE: A photo-ionization detector (PID) only detects volatile organic compounds (VOC's) with an ionization potential below the range of the lamp (typically 10.6 electron volts). Without knowing the specific VOC resulting in a PID reading, a conservative approach is necessary.

9.5 Heat Stress Monitoring

The stress of working in a hot environment can cause a variety of illnesses including heat exhaustion or heat stroke; the latter can be fatal. Hazards associated with heat stress include the following:

- *Hear Rash* – may result from continuous exposure to heat or to humid air.
- *Heat Cramps* – caused by heavy sweating with inadequate electrolyte replacement, Heat cramps can cause muscle spasms and pain in the hands, feet and abdomen.
- *Heat Exhaustion* – occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration, Heat exhaustion can cause pale, cook, moist skin; heavy sweating; dizziness; nausea; and fainting.
- *Heat Stroke* – the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cook the body before serious injury and death occur. Competent medical help must be obtained, Heat stroke can cause re, hot unusually dry skin. Symptoms include lack of (or reduced) perspiration, nausea, dizziness, confusion, strong rapid pulse and come.

Employees who experience these symptoms should take prompt action. Severe exposures to heat stress conditions can lead to heat stroke.

9.6 Control of Heat/Cold Stress Conditions

The Project Manager and/or Site Supervisor & Safety Officer will monitor worker activity and will stop employee work activity when signs of heat or cold stress conditions warrant. Employees shall report any signs and symptoms of heat or cold stress to the Project Manager and/or Site Supervisor & Safety Officer.

Control measures to prevent cold stress include:

- Proper clothing
- Appropriate work schedule

Control measures to prevent heat stress include:

- Adequate intake of fluids, preferably cool water
- Work/rest regiment with rest periods taken in a cool shaded area
- In extreme conditions, cooling vests can be worn

Any employees working in chemical-resistant protective clothing will be observed for the following signs and symptoms of heat stress: dizziness and nausea; profuse sweating; skin color change; vision problems; fainting; weakness; fatigue; cramping; and hot, red, dry skin. Any team member who exhibits these symptoms will be monitored for heat stress. Heat stress monitoring will consist of measuring heart rate and/or body temperature (alternative) to monitor for the onset of heat stress illness.

Heart rate (HR) will be measured by the radial pulse at the wrist for thirty seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats per minute. If the HR is excess of the above guideline, the x=next work period will be shortened by one-third, while the length of the rest period stays the same. If the pulse rate is in excess of 110 beats per minute at the beginning of the next rest period, the following work cycle will be further shortened by one-third.

Body temperature will be measured with a temperature sensitive strip placed on the worker's forehead as early as possible in the resting period. Strip temperature should not exceed 99.7°F the next work period will remain the same for one work interval. However, if the forehead temperature is in excess of 99.7°F at the beginning of the next rest period, the following work cycle will be further shortened by one-third. Forehead temperature will be measured again at the end of the rest period to assure that it has decreased below 99.7°F. Under no circumstance will a worker be allowed to wear impalpable or semi-permeable garments if his/her temperature exceeds 100.6°F.

Workers experiencing heat stress that is not relieved by rest period/work period modifications will be removed from field work and be required, if conscious, to consume two to four pints of electrolyte fluid or cool water every hour while resting in a shaded area. The individual should not return to work until heat stress symptoms are no longer recognizable, If the symptoms appear critical, persist, or get worse, medical attention will be sought.

9.7 Noise Monitoring

During site activities, the Project Manager and/or Site Supervisor & Safety Officer may conduct noise monitoring during various tasks throughout the project. An initial survey may be conducted using a sound level meter to determine compliance with the OSHA hearing conservation standard (29 CFR 1910.95). Disposable hearing protection devices shall be made available to site personnel upon request. If measured noise levels exceed 85 dB (A), hearing protective devices shall be worn by all site personnel within the

affected work zone. Use of portable "Walkman-type" radios is prohibited at any time. A copy of the OSHA Occupational Noise Standard, 29 CFR 1910.95 shall be made available to employees upon request.

9.8 Physical Hazard Control

Physical hazards are inherently present during construction operations. Physical hazards present at the project site will include mechanical and noise hazards associated with the operation of construction equipment, slip-trip-fall hazards associated with construction sites and skeletal-muscular injury hazards associated with physical labor.

- HEAVY EQUIPMENT OPERATION: Safety hazards associated with the operation of heavy equipment can be effectively reduced by the employee if a constant awareness of these hazards is maintained. Constant visual or verbal contact with the equipment operator will facilitate such awareness.
- SLIP-TRIP-FALL HAZARDS: While it is difficult to prevent slip-trip-fall hazards, risk of injury can be reduced by implementing proper site control measures such as daily safety meetings, proper footwear and by keeping the work area free of obstructions. Special care shall be taken around decontamination areas where water has accumulated on polyethylene sheeting, creating slippery conditions.
- LIFTING HAZARDS: field operations often require heavy physical labor tasks to be performed. All employees will be instructed in proper lifting techniques. Additionally, employees will be instructed to not attempt to lift large or heavy objects (in excess of 70 pounds) without assistance.
- TOOL AND EQUIPMENT HAZARDS: Safety hazards present during the use of tools and equipment are generally associated with improper tool handling and inadequate maintenance. Management of these hazards involves rigorous maintenance of tools and equipment and effective training of employees in the proper use of these tools.
- FIRE HAZARDS: Proper fire safety controls measures such as no smoking or hot work in the excavation area shall be strictly maintained. An ABC dry chemical fire extinguisher will be located at the project site, The Alamogordo Fire Department can be contacted by dialing "911".
- SLOPE STABILITY HAZARDS: Excavation and trench safety will be monitored and sloping requirements promulgated by OSHA shall be enforced. The maximum slope of waste side walls will be maintained at 3:1 with the maximum slope of native soil sidewalls maintained at a slope of 1.5:1. Saturation of the waste material could significantly reduce slop stability. Therefore, postponement of work due to rainfall events, or potential for a rainfall event, will be at the discretion of the Site Supervisor & Safety Officer.

10.0 SITE CONTROL

Site control requires the establishment of an exclusion zone, contaminant reduction zone (CRZ), support zone and an emergency evacuation protocol. To minimize the exposure of personnel and the public to the work site and potentially contaminated material, site control procedures are required. Safety procedures for preventing or reducing the potential of exposure of employees and the public to potentially contaminated excavations or materials are:

- Set up physical barriers (temporary fencing/warning tape) to exclude unnecessary personnel from the excavation area
- Set up physical barriers (temporaty fencing/warning tape) to exclude unnecessary personnel from the hazardous material holding area (if required).

Figures 3 of the WEP illustrate the site control and Figure 4 of the WEP illustrates the potential exclusion, CRZ and support zones (although the zones are dynamic and may change during the course of the excavation).

10.1 Emergency Protocol

The Project Manager of Site Safety Officer shall take the following action upon occurrence of an emergency:

- ACCOUNTING FOR PERSONNEL: The Project Manager and/or Site Supervisor & Safety Officer will designate a person to account for personnel and inform outside emergency response teams when personnel are believed missing

- FIRE:
  1. Maintain the safety of employees in the immediate vicinity of the fire.
  2. Call for assistance from the fire department (911). Additional emergency phone numbers are provided in Section 11.3. The following information should be provided to the 911 emergency operator upon calling:
     a. Name of person calling
     b. Phone number of phone calling from
     c. Location of incident
     d. Nature of incident (fire, explosion, cave-in, injury, vehicle accident)
     e. When the incident occurred
     f. Type of assistance needed (fire, rescue, law enforcement)
     g. Number of persons needing assistance
     h. Extent of injuries (if know)

  3. If it can be done safely, proceed to extinguish the blaze with portable fire-fighting equipment available at the site. Persons with a potential for using fire extinguishers shall receive proper training.

- ACCIDENT OR INJURY:
  1. Depending on the severity of the injury, treatment may either be given at the site by trained personnel (additional assistance from an emergency medical technician may be required) or the victim may have to be transported to a hospital.

  2. Call for medical assistance (911). Emergency telephone numbers are presented in section 11.3. The following information should be provided to the 911 emergency operator upon calling:
     a. Name of person calling
     b. Phone number of phone calling from
     c. Location of incident (address if available)
     d. Nature of incident (fire, explosion, cave-in, injury, vehicle accident)
     e. When the incident occurred
     f. Type of assistance needed (fire, rescue, law enforcement)
     g. Number of persons needing assistance
     h. Extent of injuries (if know)
  3. Report any incident, no matter how minor, to the Project Manager and/or Site Supervisor & Safety Officer.

- SITE EVACUATION: The Project Manager and/or Site Supervisor & Safety Officer are responsible for determining if circumstances exist which require evacuation and should always assume worst case conditions until proven otherwise. Evacuation routes from the site shall be established and communicated to all personnel during the daily safety meetings and the initial safety briefing to review the HASP. During an emergency, the Project Manager and/or Site Supervisor & Safety Officer shall ensure that all personnel are evacuated from the site and accounted for at a predetermined meeting location, In the event of a fire or other emergency; action shall be taken to address the emergency following the accounting of all personnel. If possible, personnel will be evacuated up-wind of the site (if wind speeds are such that wind direction can be readily determined as wind socks will not be utilized). Three stages of evacuation are as follows:
  1. Withdraw from the exclusion zone if:
     a. Landfill gas action levels are exceeded (see “Response” in Section 9.4)
     b. Occurrence of a minor accident – field operations will resume after first aid and/or decontamination procedures have been administered.
     c. Equipment malfunctions, including PPE.
  2. Withdraw from the CRZ if:
     a. Landfill gas action levels are exceeded (see “Response” in Section 9.4)
     b. A major accident or injury occurs.
     c. A fire and/or explosion occurs.
  3. Withdraw from support zone if:
     a. Landfill gas action levels are exceeded (see “Response” in Section 9.4)

b. A catastrophic event occurs. The Project Manager and/or Site Supervisor & Safety Officer are responsible for determining if circumstances exist for an area wide evacuation and should always assume worst-case conditions until proven otherwise.

10.2 Site Inspections

The inspection of the site must be performed initially by the Project Manager and/or Site Supervisor & Safety Officer and prior to the initiation of each workday. An evaluation must be conducted with regards to the activity that may generate a hazard within the workspace.

10.3 3rd Party Safety

Site access will be strictly controlled such that only authorized personnel and previously approved visitors will be allowed in work areas containing potentially hazardous materials or conditions. Only the Project Manager and/or Site Supervisor & Safety Officer will have the authority to escort third parties to work areas containing potentially hazardous materials or conditions

10.4 Emergency Communications

Emergency communications equipment will be provided at the site to notify field personnel and local authorities of an emergency. A telephone will be maintained at the site for emergency communications. The Project Manager and/or Site Supervisor & Safety Officer will use this telephone to report emergencies to local authorities such as medical, fire, police and to notify outside emergency response teams.

11.0 GENERAL SAFETY REQUIREMENTS

Field personnel will comply with all federal, state and local safety codes, ordinances and regulations in order to maintain safe working conditions at the job site. All personnel will be responsible for reporting unsafe working conditions to the Project Manager and/or Site Supervisor & Safety Officer.

All health and safety questions or enquiries, no matter how small, must be addressed to the Project Manager and/or Site Supervisor & Safety Officer immediately. Prompt reporting is critical so as to provide field personnel the proper information, first aid, or other medical treatment as required. Hazard assessment is a continual process and on-site personnel must be aware of their surroundings and constantly be aware of potential chemical and physical hazards that may be present.

11.1 General Safety Policies & Procedures

- There shall be no intoxicating substances of any kind permitted on or near the job site (i.e., alcohol, illegal/illicit drugs, etc.) Under no circumstances will anyone known to

be under the influence of intoxicating substances be allowed on the job site (violators are subject to dismissal).

- No firearms or other weapons shall be permitted on the job site violators are subject to dismissal).
- Fighting, scuffling, or horseplay is prohibited while on the job site (violators are subject to dismissal).
- No field personnel shall enter underground vaults, tanks, silos, manholes, excavation, or any confined space until it has been determined that the air contained no flammable or toxic gases or vapors and that oxygen is above 19.5%. This determination can only be made by the Project Manager and/or Site Supervisor & Safety Officer.
- All equipment, (i.e., electrical and gas fueled) water lines, steam lines and gas lines shall not be turned on or set in motion without carefully checking to assure that no person could by injured by such action and use of such equipment should only be by authorized personnel.
- All personnel are responsible for practicing personal hygiene and are expected to wash hands, face and forearms thoroughly prior to eating, drinking, smoking and use of rest room facilities.
- No smoking, eating, drinking, or chewing tobacco or gum shall be allowed on the work site. This measure is to decrease the probability of hand-to-mouth transfer and ingestion of hazardous materials.
- Good housekeeping is essential because of the work site conditions. Every effort will be made to ensure the site is maintained in a clean and safe condition at all times.
- No worker shall be allowed to work alone at any time in or immediately near an excavation and/or construction area. Another worker must be present outside the work area due to the possible effects of suspected health hazards.
- All motors used in the excavation area shall be explosion proof.
- No hot work shall be permitted within 50 feet of the excavation or work area.
- All refuse or other material excavated during field activities shall be properly disposed of at a legal point of disposal.
- Equipment shall be bonded and grounded, spark proof and explosion resistant, as appropriate.
- Contact with potentially contaminated substances, kneeling on the ground, or leaning, sitting, or placing equipment on potentially contaminated substances is not allowed.

11.2 Fire Safety

- Entrances to the job site must not be obstructed. In the event of an emergency, response vehicles must have a means of access to the work site.
- The use of gasoline as a cleaning solvent is strictly forbidden. If cleaning of tanks, machinery, or other equipment is necessary, a steam cleaner shall be brought on site.

- No burning, welding, or other source of ignition shall be applied to any enclosed tank or vessel, even if there are openings in it, until it has been determined by the Site Supervisor & Safety Officer that there is no possibility of explosion. Authorization for such work must be obtained from the Project Manager and/or Site Supervisor & Safety Officer.

11.3 Emergency Telephone Numbers & Signature/Acknowledgement Form

Agency	Telephone Number
EMERGENCY	911
GERALD CHAMPION REGIONAL MEDICAL CENTER	(575) 439-6100
ALAMOGORDO FIRE DEPARTMENT	(575) 439-4300
ALAMOGORDO POLICE DEPARTMENT	(575) 439-4300
NEW MEXICO STATE POLICE	(505) 829-9300
POISON INFORMATION CENTER	(800) 222-1222
EPA EMERGENCY RESPONSE TEAM (Region VI)	(866) 372-7745
NATIONAL RESPONSE CENTER	(800) 424-8862
CENTER FOR DESEASE CONTROL & PREVENTION	(800) 232-4636
NMED HAZARDOUS WASTE BUREAU	(505) 476-6000

BY SIGNING BELOW I SIGNIFY THAT I HAVE BEEN BRIEFED ON AND FULLY UNDERSTAND THE PRECEDING HEALTH AND SAFETY PLAN FOR ON-SITE ACTIVITIES.

NAME (PRINTED SIGNATURE RESPRESENTING DATE

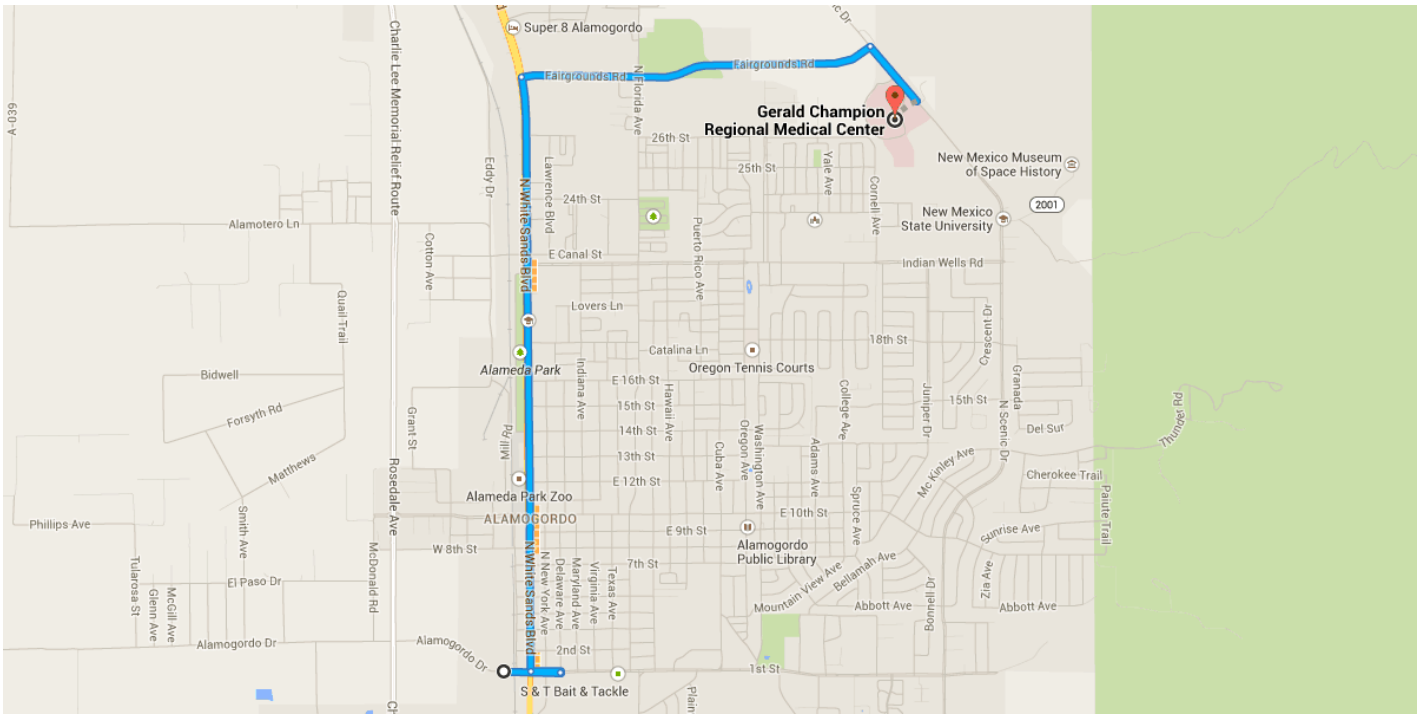
1._____
2._____
3._____
4._____
5._____
6._____

Hospital Map

Google

Drive 4.7 mi, 10 min

Directions from **32.8902471, -105.9621996** to **Gerald Champion Regional Medical Center**



32.8902471, -105.9621996

1. Head **east** on **W 1st St/Alamogordo Dr** toward **Railroad Ave**

   Continue to follow W 1st St

   0.2 mi

2. Make a **U-turn** at **Delaware Ave**

   0.1 mi

3. Take the 2nd **right** onto **N White Sands Blvd**

   2.5 mi

4. Turn **right** onto **Fairgrounds Rd**

   1.5 mi

5. Turn **right** onto **N Scenic Dr**

   Destination will be on the right

   0.3 mi

Gerald Champion Regional Medical Center

2669 N Scenic Dr, Alamogordo, NM 88310

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the

Appendix C – Portions of TetraTech Phase II Report (2004)

LEGEND:

- Alamogordo Landfill Site Boundary
- Phase II ESA Study Area
- Features of the Proposed Sports Complex
- Trench Indicated by Geophysical Survey

N

500 250 0 500

Scale in Feet

ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

FIGURE 2
SITE LAYOUT, RESULTS OF GEOPHYSICAL SURVEY, AND PROPOSED SPORTS COMPLEX LAYOUT

Tetra Tech EM Inc.

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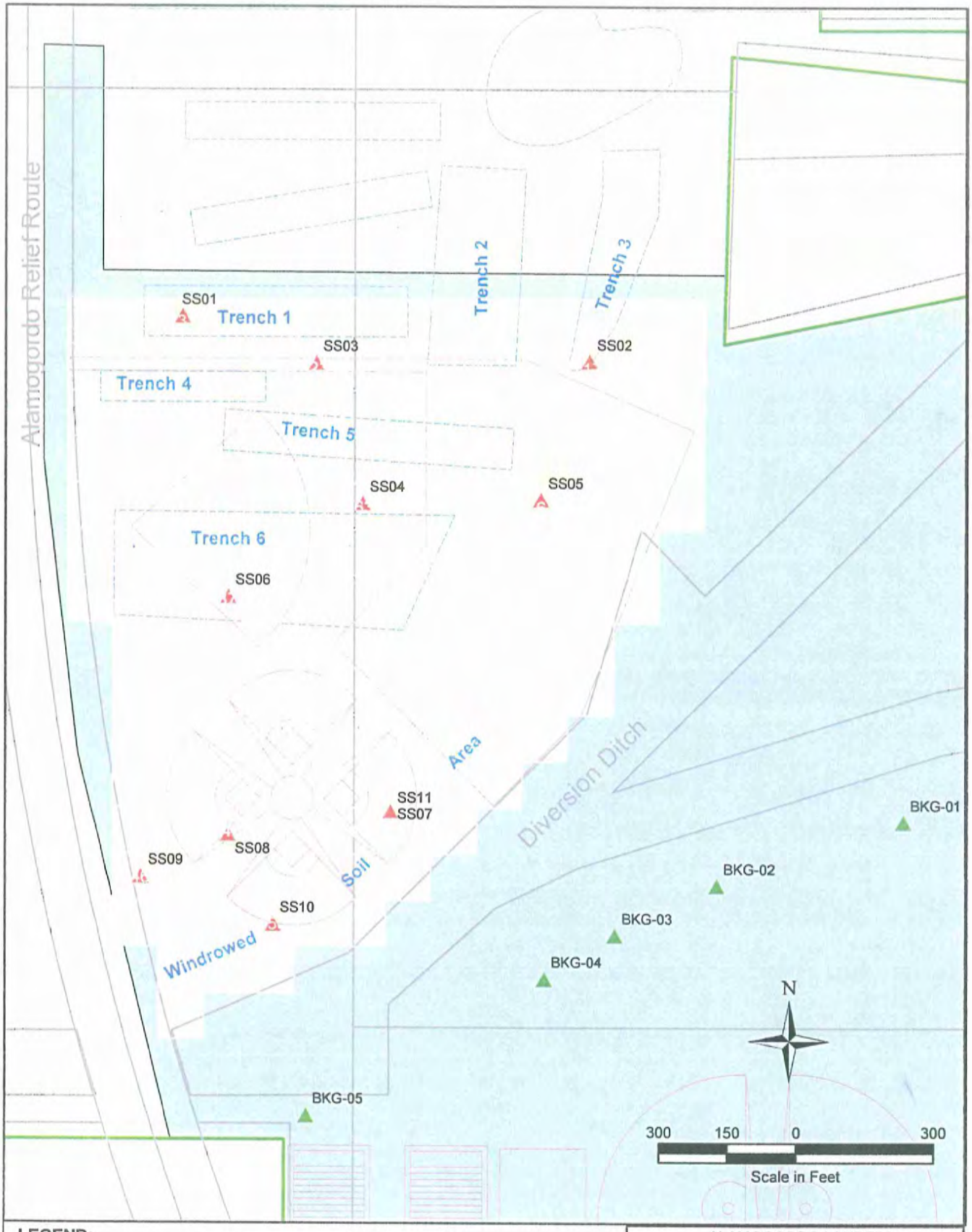

LEGEND:

- Alamogordo Landfill Site Boundary
- Phase II ESA Study Area
- Features of the Proposed Sports Complex
- Trench Indicated by Geophysical Survey
- Random Sampling Grid
- Background Surface Soil Sampling Location
- Environmental Surface Soil Sampling Location

ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

FIGURE 3
SURFACE SOIL SAMPLING LOCATIONS

Tetra Tech EM Inc.

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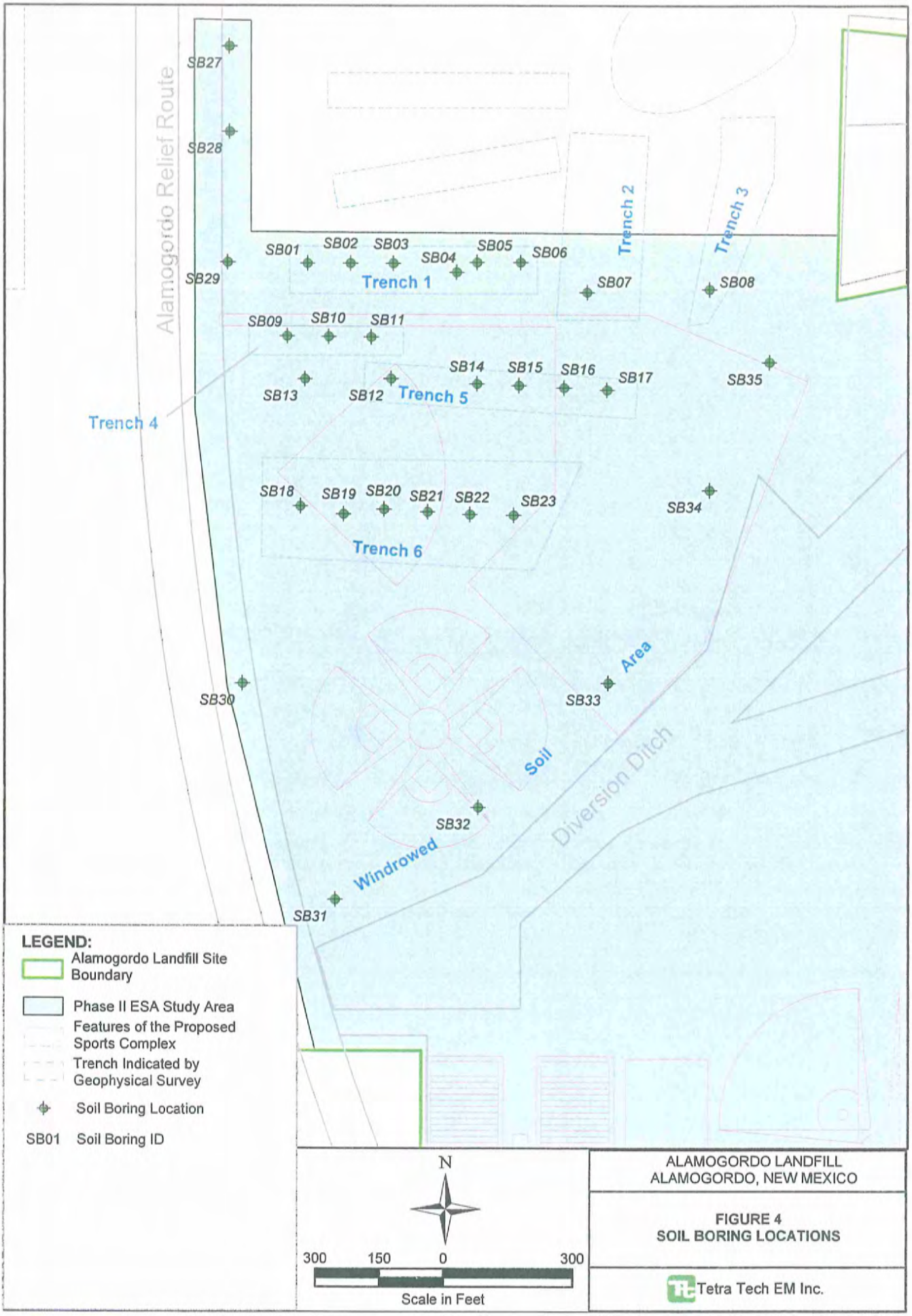
Alamogordo Relief Route
SB27
SB28
SB29
SB01
SB02
SB03
SB04
SB05
SB06
SB07
SB08
Trench 1
Trench 2
Trench 3
SB09
SB10
SB11
SB12
SB13
SB14
SB15
SB16
SB17
SB35
Trench 4
Trench 5
SB18
SB19
SB20
SB21
SB22
SB23
SB34
Trench 6
SB30
SB33
Area
Soil
Diversion Ditch
SB32
Windrowed
SB31
LEGEND:
Alamogordo Landfill Site Boundary
Phase II ESA Study Area
Features of the Proposed Sports Complex
Trench Indicated by Geophysical Survey
Soil Boring Location
SB01 Soil Boring ID
N
300
150
0
300
Scale in Feet
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO
FIGURE 4
SOIL BORING LOCATIONS
Tetra Tech EM Inc.
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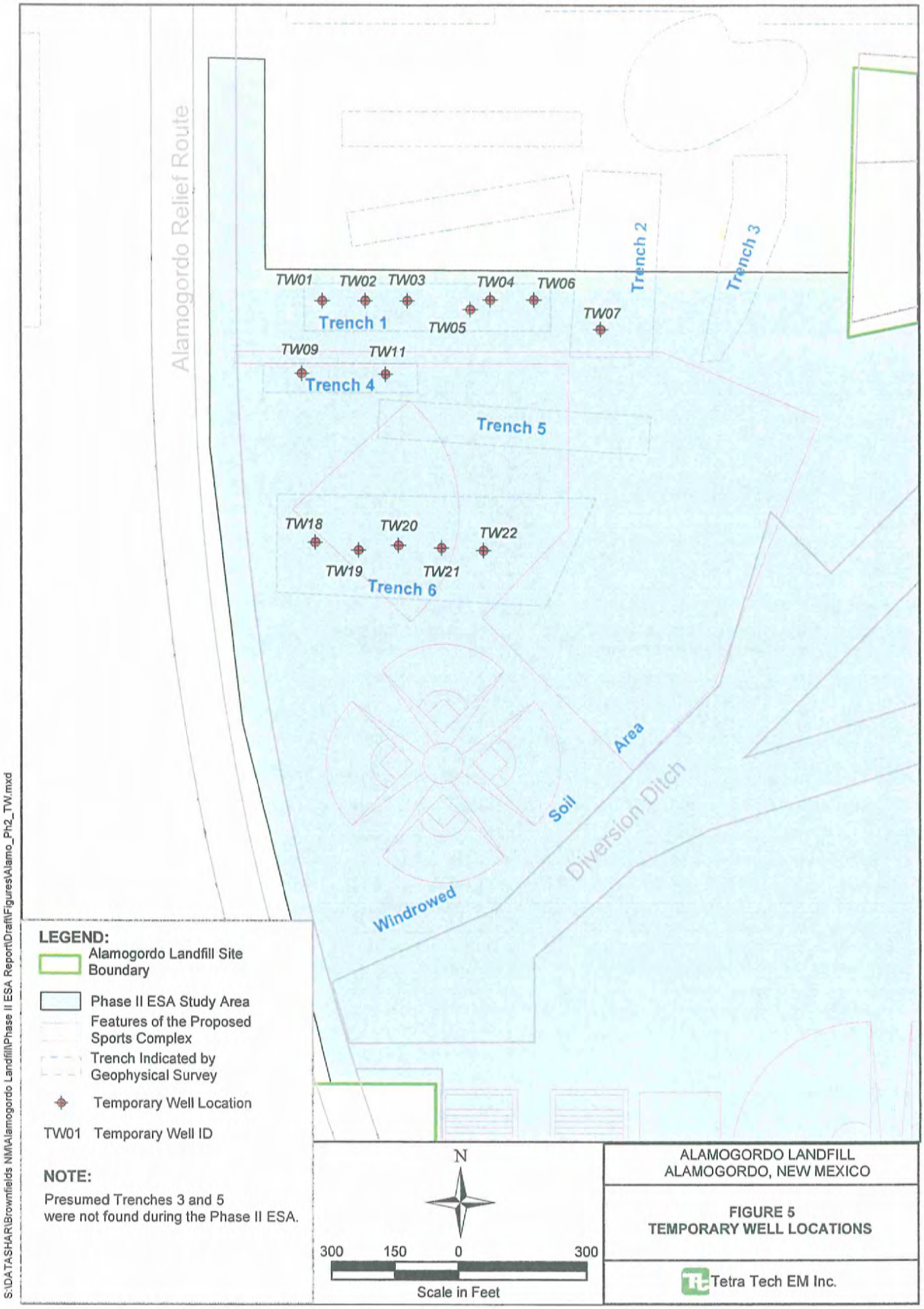
Alamogordo Relief Route
TW01
TW02
TW03
TW04
TW06
TW07
TW05
Trench 1
Trench 2
Trench 3
TW09
TW11
Trench 4
Trench 5
TW18
TW20
TW22
TW19
TW21
Trench 6
Soil
Area
Diversion Ditch
Windrowed
LEGEND:
Alamogordo Landfill Site Boundary
Phase II ESA Study Area
Features of the Proposed Sports Complex
Trench Indicated by Geophysical Survey
Temporary Well Location
TW01 Temporary Well ID
NOTE:
Presumed Trenches 3 and 5 were not found during the Phase II ESA.
N
300 150 0 300
Scale in Feet
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO
FIGURE 5
TEMPORARY WELL LOCATIONS
Tetra Tech EM Inc.
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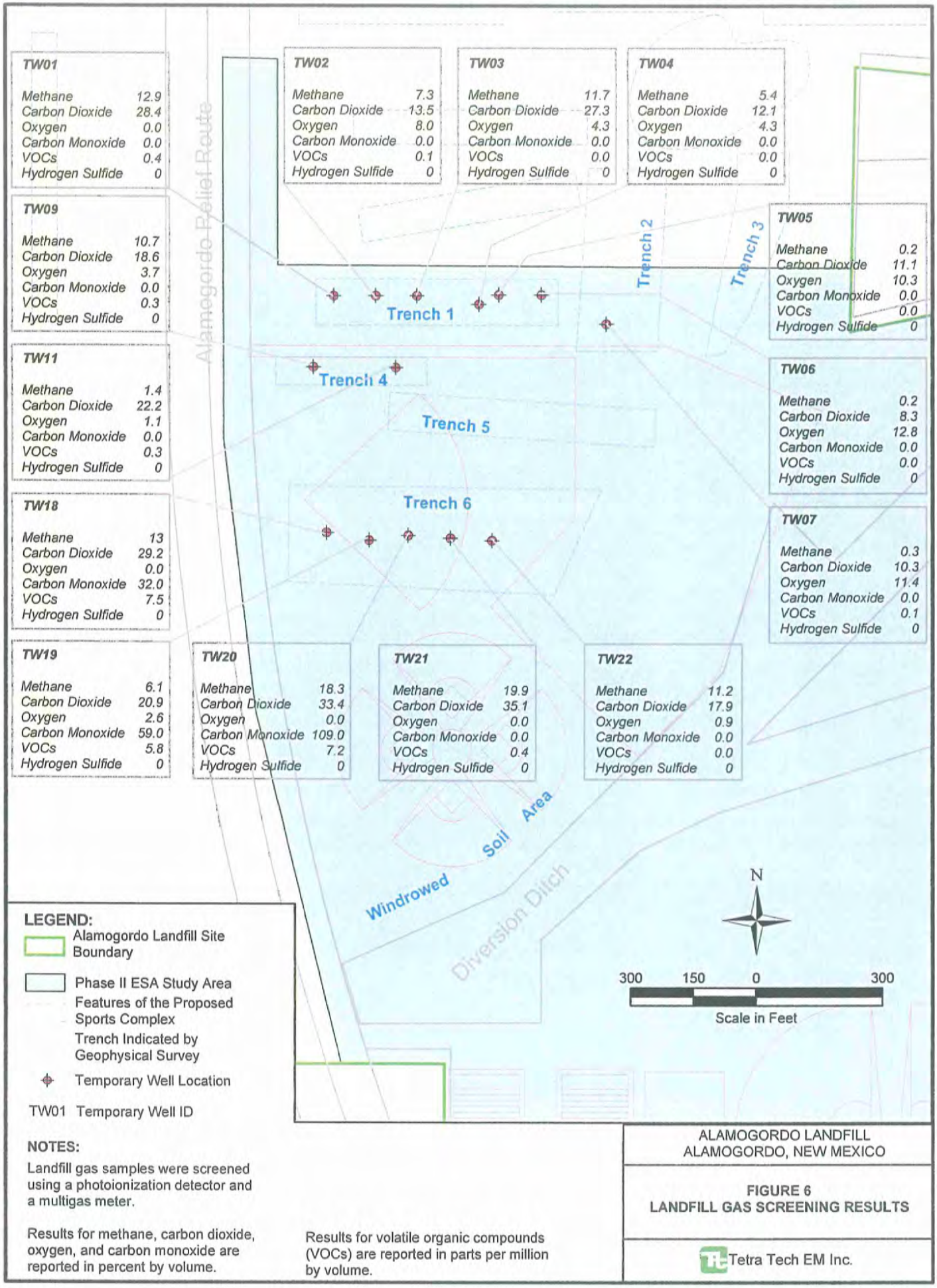
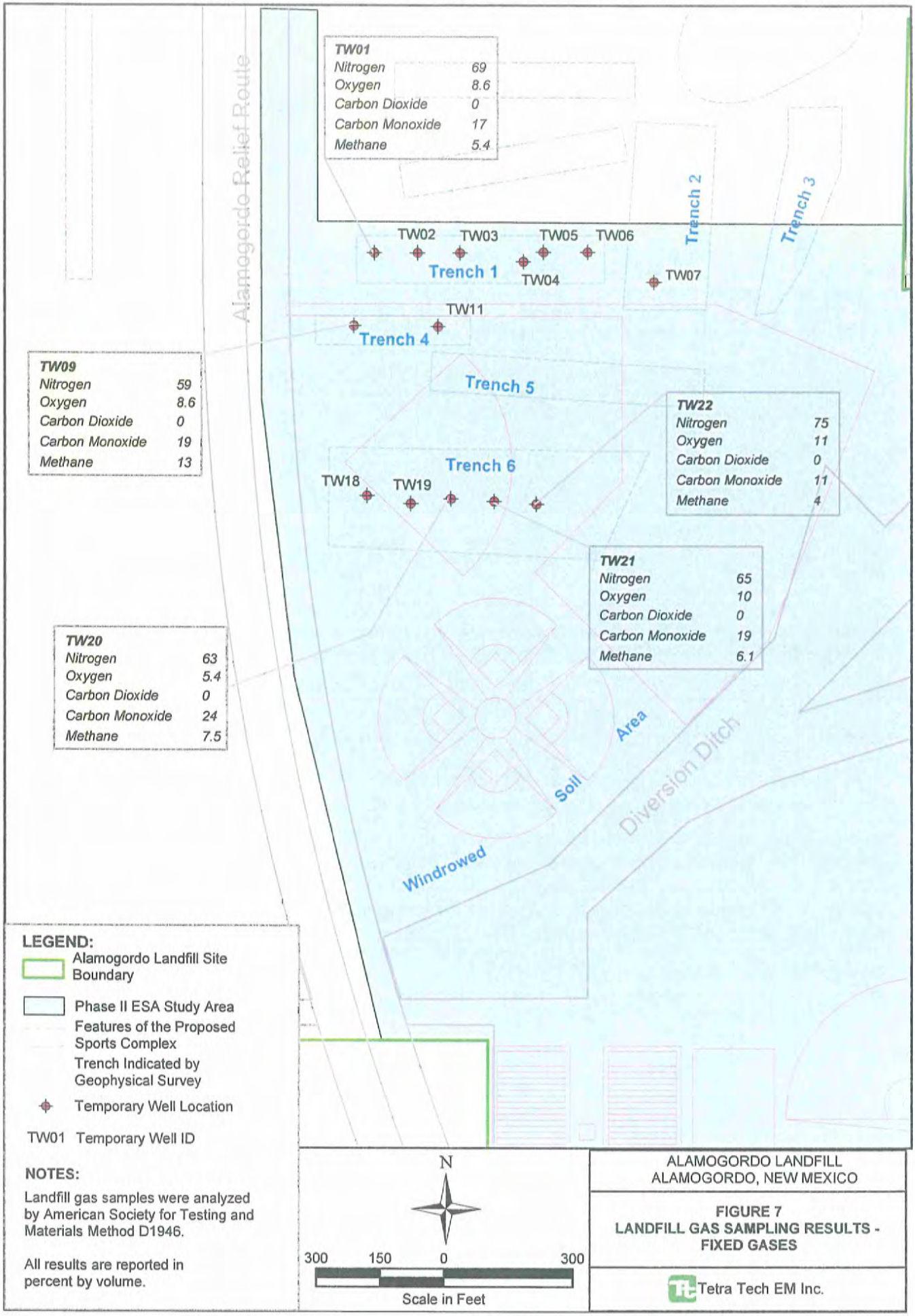

TW01
Methane 12.9
Carbon Dioxide 28.4
Oxygen 0.0
Carbon Monoxide 0.0
VOCs 0.4
Hydrogen Sulfide 0
TW02
Methane 7.3
Carbon Dioxide 13.5
Oxygen 8.0
Carbon Monoxide 0.0
VOCs 0.1
Hydrogen Sulfide 0
TW03
Methane 11.7
Carbon Dioxide 27.3
Oxygen 4.3
Carbon Monoxide 0.0
VOCs 0.0
Hydrogen Sulfide 0
TW04
Methane 5.4
Carbon Dioxide 12.1
Oxygen 4.3
Carbon Monoxide 0.0
VOCs 0.0
Hydrogen Sulfide 0
TW05
Methane 0.2
Carbon Dioxide 11.1
Oxygen 10.3
Carbon Monoxide 0.0
VOCs 0.0
Hydrogen Sulfide 0
TW06
Methane 0.2
Carbon Dioxide 8.3
Oxygen 12.8
Carbon Monoxide 0.0
VOCs 0.0
Hydrogen Sulfide 0
TW07
Methane 0.3
Carbon Dioxide 10.3
Oxygen 11.4
Carbon Monoxide 0.0
VOCs 0.1
Hydrogen Sulfide 0
TW09
Methane 10.7
Carbon Dioxide 18.6
Oxygen 3.7
Carbon Monoxide 0.0
VOCs 0.3
Hydrogen Sulfide 0
TW11
Methane 1.4
Carbon Dioxide 22.2
Oxygen 1.1
Carbon Monoxide 0.0
VOCs 0.3
Hydrogen Sulfide 0
TW18
Methane 13
Carbon Dioxide 29.2
Oxygen 0.0
Carbon Monoxide 32.0
VOCs 7.5
Hydrogen Sulfide 0
TW19
Methane 6.1
Carbon Dioxide 20.9
Oxygen 2.6
Carbon Monoxide 59.0
VOCs 5.8
Hydrogen Sulfide 0
TW20
Methane 18.3
Carbon Dioxide 33.4
Oxygen 0.0
Carbon Monoxide 109.0
VOCs 7.2
Hydrogen Sulfide 0
TW21
Methane 19.9
Carbon Dioxide 35.1
Oxygen 0.0
Carbon Monoxide 0.0
VOCs 0.4
Hydrogen Sulfide 0
TW22
Methane 11.2
Carbon Dioxide 17.9
Oxygen 0.9
Carbon Monoxide 0.0
VOCs 0.0
Hydrogen Sulfide 0
Alamogordo Relief Route
Trench 1
Trench 2
Trench 3
Trench 4
Trench 5
Trench 6
Windrowed Soil Area
Diversion Ditch
N
300 150 0 300
Scale in Feet
LEGEND:
Alamogordo Landfill Site Boundary
Phase II ESA Study Area
Features of the Proposed Sports Complex
Trench Indicated by Geophysical Survey
Temporary Well Location
TW01 Temporary Well ID
NOTES:
Landfill gas samples were screened using a photoionization detector and a multigas meter.
Results for methane, carbon dioxide, oxygen, and carbon monoxide are reported in percent by volume.
Results for volatile organic compounds (VOCs) are reported in parts per million by volume.
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO
FIGURE 6
LANDFILL GAS SCREENING RESULTS
Tetra Tech EM Inc.
S:\DATA\SHARI\L ields NM\Alamogordo Landfill\Phase II ESA Report\Draft\Figures\Alamo_Ph2_LG_Screen.mxd


TW01
Nitrogen 69
Oxygen 8.6
Carbon Dioxide 0
Carbon Monoxide 17
Methane 5.4
Alamogordo Relief Route
Trench 2
Trench 3
TW02
TW03
TW05
TW06
Trench 1
TW04
TW07
TW11
Trench 4
Trench 5
TW09
Nitrogen 59
Oxygen 8.6
Carbon Dioxide 0
Carbon Monoxide 19
Methane 13
TW22
Nitrogen 75
Oxygen 11
Carbon Dioxide 0
Carbon Monoxide 11
Methane 4
Trench 6
TW18
TW19
TW21
Nitrogen 65
Oxygen 10
Carbon Dioxide 0
Carbon Monoxide 19
Methane 6.1
TW20
Nitrogen 63
Oxygen 5.4
Carbon Dioxide 0
Carbon Monoxide 24
Methane 7.5
Area
Soil
Diversion Ditch
Windrowed
LEGEND:
Alamogordo Landfill Site Boundary
Phase II ESA Study Area
Features of the Proposed Sports Complex
Trench Indicated by Geophysical Survey
Temporary Well Location
TW01 Temporary Well ID
NOTES:
Landfill gas samples were analyzed by American Society for Testing and Materials Method D1946.
All results are reported in percent by volume.
N
300 150 0 300
Scale in Feet
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO
FIGURE 7
LANDFILL GAS SAMPLING RESULTS - FIXED GASES
Tetra Tech EM Inc.
S:\DATASHAR\Brownfields NM\Alamogordo Landfill\Phase II ESA Report\Draft\Figures\Alamo_Ph2_LG.mxd

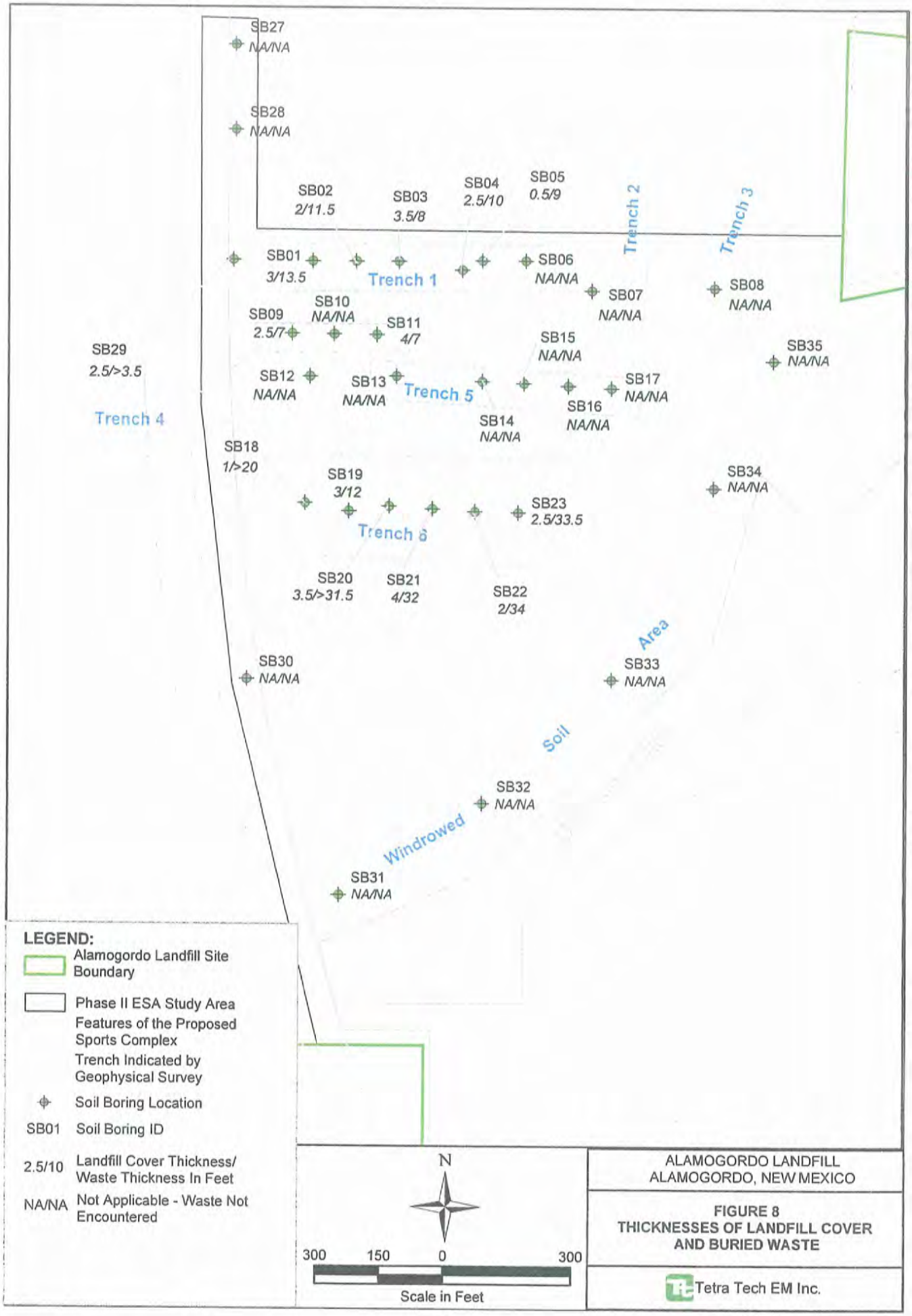

SB27
NA/NA
SB28
NA/NA
SB02
2/11.5
SB03
3.5/8
SB04
2.5/10
SB05
0.5/9
Trench 2
Trench 3
SB01
3/13.5
Trench 1
SB06
NA/NA
SB07
NA/NA
SB08
NA/NA
SB10
NA/NA
SB09
2.5/7
SB11
4/7
SB15
NA/NA
SB35
NA/NA
SB29
2.5/>3.5
SB12
NA/NA
SB13
NA/NA
Trench 5
SB17
NA/NA
SB16
NA/NA
Trench 4
SB14
NA/NA
SB18
1/>20
SB19
3/12
SB34
NA/NA
SB23
2.5/33.5
Trench 6
SB20
3.5/>31.5
SB21
4/32
SB22
2/34
Area
SB30
NA/NA
SB33
NA/NA
Soil
SB32
NA/NA
Windrowed
SB31
NA/NA
LEGEND:
Alamogordo Landfill Site Boundary
Phase II ESA Study Area
Features of the Proposed Sports Complex
Trench Indicated by Geophysical Survey
Soil Boring Location
SB01 Soil Boring ID
2.5/10 Landfill Cover Thickness/ Waste Thickness In Feet
NA/NA Not Applicable - Waste Not Encountered
N
300 150 0 300
Scale in Feet
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO
FIGURE 8
THICKNESSES OF LANDFILL COVER AND BURIED WASTE
Tetra Tech EM Inc.
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TABLE 1
SUMMARY OF SAMPLING PROGRAM AND LOCATIONS
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Sample ID	Grid Number or Soil Boring ID	Sample Depth (feet bgs)	Suite of Analyses	Easting[1] (feet)	Northing[1] (feet)	Elevation (feet msl)
Surface Soil Samples						
SS01	3	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	685844	1726634	4280
SS02	17	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	685748	1727527	4292
SS03	23	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	685744	1726927	4313
SS04	63	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	685441	1727030	4295
SS05	67	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	685449	1727421	4296
SS06	87	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	685239	1726734	4297
07	140	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	684776	1727092	4300
SS11[2]	140	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	684776	1727092	4300
SS08	143	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	684725	1726734	4300
SS09	146	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	684634	1726543	4298
SS10	155	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	684532	1726833	4298
Background Surface Soil Samples						
BKG-01[3]	NA	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOC (EPA Method 8270C) VOC (EPA Method 8260B)	684755	1728217	4286
BKG-02[3]	NA	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOC (EPA Method 8270C) VOC (EPA Method 8260B)	684617	1727809	4280
BKG-03[3]	NA	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOC (EPA Method 8270C) VOC (EPA Method 8260B)	684509	1727585	4281
BKG-04[3]	NA	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOC (EPA Method 8270C) VOC (EPA Method 8260B)	684415	1727430	4275
BKG-05[3]	NA	0-2	RCRA Metals (EPA Methods 7471 and 6010B) SVOC (EPA Method 8270C) VOC (EPA Method 8260B)	684120	1726906	4270

TABLE 1
SUMMARY OF SAMPLING PROGRAM AND LOCATIONS
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Sample ID	Grid Number or Soil Boring ID	Sample Depth (feet bgs)	Suite of Analyses	Easting[1] (feet)	Northing[1] (feet)	Elevation (feet msl)
Landfill Gas Samples						
TW01	SB01		Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	685870	1726592	4280
TW09	SB09		Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	685703	1726544	4300
TW20	SB20		Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	685307	1726771	4293
TW21	SB21		Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	685301	1726872	4294
TW22	SB22		Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	685295	1726971	4296
TW23[4]	SB23		Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	685293	1727073	4298
Field Quality Control Samples						
SWB-01	NA	NA	RCRA Metals (EPA Methods 7471 and 6010B) SVOCs (EPA Method 8270C) VOCs (EPA Method 8260B)	NA	NA	NA
ER-01	NA	NA	Fixed Gases (ASTM Method D1946) VOCs (EPA Method TO-15)	NA	NA	NA
TB-01	NA	NA	VOCs (EPA Method 8260B)	NA	NA	NA

Notes:

[1] Easting and northing are provided in feet using the New Mexico State Plane Coordinate System, North American Datum 1983.

[2] Sample SS11 is a field duplicate of SS07.

[3] Although five background surface soil samples were collected and submitted to the analytical laboratory, they were not analyzed because concentrations of chemicals of potential concern in the environmental samples were below the New Mexico soil screening levels.

[4] Sample TW23 is a field duplicate of TW21.

bgs Below ground surface
msl Above mean sea level
RCRA Resource Conservation and Recovery Act
VOC Volatile organic compound
SVOC Semivolatile organic compound
NA Not applicable

TABLE 2
SUMMARY OF SOIL BORING AND TEMPORARY WELL CONSTRUCTION DETAILS
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Soil Boring ID	Installation Date	Boring Depth (feet bgs)	Temporary Well ID	Screen Interval (feet bgs)	Easting[1] (feet)	Northing[1] (feet)	Ground Elevation (feet msl)
SB01	7/26/2004	19	TW01	12-17	685870	1726592	4280
SB02	7/26/2004	15	TW02	6-11	685870	1726693	4282
SB03	7/26/2004	13.5	TW03	5-10	685870	1726792	4285
SB04	7/26/2004	13.5	TW04	4-9	658550	1726940	4291
SB05	7/26/2004	10.5	TW05	4-9	685872	1726987	4293
SB06	7/27/2004	9	TW06	4-9	685872	1727089	4295
SB07	7/27/2004	9.5	TW07	4-9	685804	1727243	4295
SB08	7/27/2004	7.5	NA	NA	685811	1727529	4296
SB09	7/27/2004	10.5	TW09	4-9	685703	1726544	4300
SB10	7/27/2004	7.5	NA	NA	685702	1726642	4303
SB11	7/27/2004	12	TW11	5-10	685701	1726741	4305
SB12	7/27/2004	19.6	NA	NA	685606	1726586	4306
SB13	7/28/2004	16.5	NA	NA	685605	1726787	4303
SB14	7/28/2004	13.5	NA	NA	685594	1726987	4303
SB15	7/28/2004	15.0	NA	NA	685590	1727085	4300
SB16	7/28/2004	10.0	NA	NA	685585	1727189	4297
SB17	7/28/2004	9.0	NA	NA	685580	1727290	4297
SB18	7/28/2004	20	TW18	10-15	685314	1726575	4294
SB19	7/29/2004	16.5	TW19	8-13	685296	1726677	4296
SB20	7/29/2004	35	TW20	20-30	685307	1726771	4293
SB21	7/29/2004	37	TW21	20-30	685301	1726872	4294
SB22	7/29/2004	37	TW22	9-34	685295	1726971	4296
SB23	7/29/2004	37	NS	NA	685293	1727073	4298
SB27	7/30/2004	6	NS	NA	686368	1726410	4299
SB28	7/30/2004	6	NS	NA	686172	1726411	4297
SB29	7/30/2004	6	NS	NA	685872	1726406	4298
SB30	7/30/2004	4.5	NS	NA	684908	1726440	4292
SB31	7/30/2004	6	NS	NA	684413	1726658	4296
SB32	7/30/2004	6	NS	NA	684624	1726991	4230
SB33	7/30/2004	6	NS	NA	684909	1727293	4302
SB34	7/30/2004	6	NS	NA	685351	1727529	4306
SB35	7/30/2004	6	NS	NA	685644	1727668	4307

Notes:

Soil borings SB24 through SB26 were not drilled due to ongoing construction along the Alamogordo Relief Route.

[1] Easting and northing are provided in feet using the New Mexico State Coordinate System, North American Daturm 1983.

bgs Below ground surface

msl Above mean sea level

NA Not applicable - waste was not encountered

NS Temporary well installation was not scoped

TABLE 3
SUMMARY OF ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Sample ID	Method	NM Industrial/ Occupational SSL	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS11[1]	SS08	SS09	SS10
Sample Depth (feet bgs)			0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2
Sample Date			07/27/04	07/27/04	07/27/04	07/27/04	07/27/04	07/27/04	07/28/04	07/28/04	07/28/04	7/28/2004	7/28/2004
Sample Time			9:32	11:55	11:00	12:30	13:00	13:45	8:30	8:45	11:00	9:50	9:15
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals													
Total Solids	2540G	NS	94.7	94.9	93.7	92.2	94.2	94.8	87.5	93.7	92.9	93.8	96.0
Mercury	7471	341	0.14	<0.021	<0.021	<0.022	0.031	0.041	<0.023	<0.021	<0.022	<0.021	<0.021
Arsenic	6010B	17.7	<5.3	<5.3	<5.3	<5.4	<5.3	<5.3	<5.7	<5.3	<5.4	<5.3	<5.2
Barium	6010B	78,300	130	150	110	120	140	140	140	120	140	110	130
Cadmium	6010B	8,600	<2.6	<2.6	<2.7	<2.7	<2.6	<2.6	<2.8	<2.7	<2.7	<2.7	<2.6
Chromium	6010B	100,000	16	22	19	20	21	19	17	17	17	15	15
Lead	6010B	750	140	19	12	14	19	21	11	10	12	11	10
Selenium	6010B	5,680	5.3	<5.3	<5.3	<5.4	<5.3	<5.3	<5.7	<5.3	<5.4	<5.3	<5.2
Silver	6010B	5,680	2.6	<2.6	<2.7	<2.7	<2.6	<2.6	<2.8	<2.7	<2.7	<2.7	<2.6
Volatile Organic Compounds													
Benzene	8260B	73.6	0.0024	0.0014	<0.0011	<0.0011	<0.0011	<0.051	0.0071	0.0075	0.0035	0.0075	0.0073
Ethylbenzene	8260B	25,400	<0.0012	<0.0011	<0.0011	<0.0011	<0.0011	<0.051	0.0018	0.0017	<0.0011	0.0017	0.0017
Toluene	8260B	248	<0.0062	<0.0053	<0.0053	<0.0055	<0.0053	<0.26	0.0083	0.0087	<0.0054	0.0088	0.0086
1,2,4-Trimethylbenzene	8260B	191	<0.0012	<0.0011	<0.0011	<0.0011	<0.0011	<0.051	0.0020	0.0019	<0.0011	0.0020	0.0020
Xylenes, total	8260B	132	<0.0037	<0.0032	<0.0032	<0.0033	<0.0032	<0.15	0.0060	0.0062	<0.0032	0.0061	0.0060
Semivolatile Organic Compounds													
Benzo(a)anthracene	8270C	23.4	<0.35	<0.35	<0.35	<0.36	<0.35	0.57	<0.38	<0.35	<0.36	<0.35	<0.34
Benzo(b)fluoranthene	8270C	23.4	<0.35	<0.35	<0.35	<0.36	<0.35	0.63	<0.38	<0.35	<0.36	<0.35	<0.34
Benzo(a)pyrene	8270C	2.34	<0.35	<0.35	<0.35	<0.36	<0.35	0.39	<0.38	<0.35	<0.36	<0.35	<0.34
Chrysene	8270C	2,340	<0.35	<0.35	<0.35	<0.36	<0.35	0.50	<0.38	<0.35	<0.36	<0.35	<0.34
Fluoranthene	8270C	24,400	<0.35	<0.35	<0.35	<0.36	<0.35	1.5	<0.38	<0.35	<0.36	<0.35	<0.34
Phenanthrene	8270C	20,500	<0.35	<0.35	<0.35	<0.36	<0.35	0.84	<0.38	<0.35	<0.36	<0.35	<0.34
Pyrene	8270C	31,300	<0.35	<0.35	<0.35	<0.36	<0.35	1.0	<0.38	<0.35	<0.36	<0.35	<0.34

Notes:
For volatile and semivolatile organic compounds only detected constituents are presented in this table. Refer to Appendix D for all results.

[1] Sample SS11 if a field duplicate of SS07.
bgs Below ground surface
mg/kg Milligrams per kilogram
NM New Mexico
SSL Soil screening level (February 2004)
NS No standard

TABLE 4
SUMMARY OF LANDFILL GAS SCREENING RESULTS
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Well ID	Methane (percent)	Carbon Dioxide (percent)	Oxygen (percent)	Carbon Monoxide (percent)	VOCs (ppm)	Hydrogen Sulfide (ppm)
TW01	**12.9**	**28.4**	**0.0**	**0.0**	**0.4**	**0**
TW02	7.3	13.5	8.0	0.0	0.1	0
TW03	11.7	27.3	4.3	0.0	0.0	0
TW04	5.4	12.1	9.0	0.0	0.0	0
TW05	0.2	11.1	10.3	0.0	0.0	0
TW06	0.2	8.3	12.8	0.0	0.0	0
TW07	0.3	10.3	11.4	0.0	0.1	0
TW09	**10.7**	**18.6**	**3.7**	**0.0**	**0.3**	**0**
TW11	1.4	22.2	1.1	0.0	0.3	0
TW18	13	29.2	0.0	32.0	7.5	0
TW19	6.1	20.9	2.6	59.0	5.8	0
TW20	**18.3**	**33.4**	**0.0**	**109.0**	**7.2**	**0**
TW21	**19.9**	**35.1**	**0.0**	**0.0**	**0.4**	**0**
TW22	**11.2**	**17.9**	**0.9**	**0.0**	**0.0**	**0**

Notes:
Bold type indicates wells selected for sampling.
ppm Parts per million
VOC Volatile organic compound

TABLE 5
SUMMARY OF ANALYTICAL RESULTS FOR LANDFILL GAS SAMPLES
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Sample ID	Method	Units	TW-01	TW-09	TW-20	TW-21	TW-23[1]	TW-22
Sample Depth (feet bgs)			6-11	4-9	20-30	20-30	9-34	9-34
Sample Date			7/29/2004	7/29/2004	7/30/2004	7/30/2004	7/30/2004	7/30/2004
Sample Time			11:45	12:00	9:10	13:00	13:10	11:40
Fixed Gases								
Nitrogen	D1946	%	69	59	63	65	65	75
Oxygen	D1946	%	8.6	8.6	5.4	10	9.4	11
Carbon Monoxide	D1946	%	0	0	0	0	0	0
Carbon Dioxide	D1946	%	17	19	24	19	20	11
Methane	D1946	%	5.4	13	7.5	6.1	6.4	4
Volatile Organic Compounds								
Propene	TO-15	$\mu g/m^3$	17,000	30,000	48,000	30,000	31,000	68,000
Dichlorofluoromethane	TO-15	$\mu g/m^3$	2,400	2,700	44,000	34,000	35,000	15,000
HCFC-22	TO-15	$\mu g/m^3$	17,000	16,000	72,000	76,000	76,000	39,000
CFC-114	TO-15	$\mu g/m^3$	960	390	6,000	3,900	4,000	1,400
Chloromethane	TO-15	$\mu g/m^3$	<200	250	7,200	3,200	3,300	1,400
Isobutene	TO-15	$\mu g/m^3$	22,000	31,000	60,000	56,000	56,000	56,000
Vinyl Chloride	TO-15	$\mu g/m^3$	1,400	560	2,200	1,800	2,000	720
Acetaldehyde	TO-15	$\mu g/m^3$	560	760	52,000	84,000	88,000	64,000
Bromomethane	TO-15	$\mu g/m^3$	<200	<200	<200	<200	<200	<200
Chloroethane	TO-15	$\mu g/m^3$	840	1,400	19,000	25,000	26,000	4,800
Trichlorofluoromethane	TO-15	$\mu g/m^3$	<200	<200	480	800	840	<200
Pentane	TO-15	$\mu g/m^3$	9,200	3,300	18,000	44,000	48,000	30,000
Ethanol	TO-15	$\mu g/m^3$	230	2,400	210,000	28,000	28,000	19,000
Isoprene	TO-15	$\mu g/m^3$	<200	200	2,500	1,800	1,900	960
1,1-Dichloroethene	TO-15	$\mu g/m^3$	<200	<200	3,100	2,000	2,000	240
Acetone	TO-15	$\mu g/m^3$	<200	20,000	34,000	52,000	56,000	30,000
2-Propanol	TO-15	$\mu g/m^3$	<200	520	48,000	44,000	44,000	10,000
Carbon Disulfide	TO-15	$\mu g/m^3$	<200	2,300	1,600	1,300	1,300	4,000
Methylene Chloride	TO-15	$\mu g/m^3$	800	2,900	64,000	64,000	40,000	34,000
MTBE	TO-15	$\mu g/m^3$	<200	<200	560	560	600	360
Hexane	TO-15	$\mu g/m^3$	14,000	4,400	56,000	52,000	22,000	36,000
Methacrolein	TO-15	$\mu g/m^3$	<200	<200	1,000	3,200	3,600	1,700
Vinyl Acetate	TO-15	$\mu g/m^3$	<200	<200	480	1,300	1,400	370
1-Propanol	TO-15	$\mu g/m^3$	<200	600	100,000	40,000	44,000	27,000
Butanal	TO-15	$\mu g/m^3$	<200	<200	12,000	24,000	25,000	26,000
Methyl Vinyl Ketone	TO-15	$\mu g/m^3$	5,200	1,400	22,000	21,000	21,000	11,000
MEK	TO-15	$\mu g/m^3$	<200	6,800	40,000	48,000	48,000	28,000
cis-1,2-Dichloroethane	TO-15	$\mu g/m^3$	2,800	2,000	6,000	3,900	4,000	3,200
Chloroform	TO-15	$\mu g/m^3$	<200	<200	<200	<200	<200	<200
Cyclohexane	TO-15	$\mu g/m^3$	21,000	6,400	25,000	23,000	52,000	32,000
1,1,1-Trichloroethane	TO-15	$\mu g/m^3$	<200	<200	<200	1,900	1,900	<200
Tetrachloromethane	TO-15	$\mu g/m^3$	<200	<200	<200	<200	<200	<200
Benzene	TO-15	$\mu g/m^3$	1,000	1,400	7,200	7,600	7,200	6,000
1,2-Dichloroethane	TO-15	$\mu g/m^3$	<200	<200	380	640	640	<200
Isooctane	TO-15	$\mu g/m^3$	520,000	170,000	1,300,000	1,300,000	1,300,000	840,000
Cyclopentane	TO-15	$\mu g/m^3$	360,000	140,000	1,200,000	1,100,000	1,100,000	760,000

TABLE 5
SUMMARY OF ANALYTICAL RESULTS FOR LANDFILL GAS SAMPLES
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Sample ID	Method	Units	TW-01	TW-09	TW-20	TW-21	TW-23[1]	TW-22
Sample Depth (feet bgs)			6-11	4-9	20-30	20-30	9-34	9-34
Sample Date			7/29/2004	7/29/2004	7/30/2004	7/30/2004	7/30/2004	7/30/2004
Sample Time			11:45	12:00	9:10	13:00	13:10	11:40
Trichlorethene	TO-15	µg/m^3	480	1,500	56,000	4,800	5,200	1,000
2-Pentanone	TO-15	µg/m^3	<200	1,800	3,600	2,400	2,300	1,000
1,2-Dichloropropane	TO-15	µg/m^3	520	840	720	<200	<200	6,000
1-Butanol	TO-15	µg/m^3	2,300	600	96,000	72,000	68,000	38,000
Pentanal	TO-15	µg/m^3	<200	<200	7,200	8,000	8,000	1,300
3-Pentanone	TO-15	µg/m^3	400	440	2,000	2,100	<200	440
1,4-Dioxane	TO-15	µg/m^3	<200	<200	<200	220	<200	<200
Bromodichloromethane	TO-15	µg/m^3	260	<200	640	520	<200	340
cis-1,3-Dichloropropene	TO-15	µg/m^3	<200	<200	440	400	<200	<200
MIBK	TO-15	µg/m^3	800	2,500	1,900	39,000	39,000	2,500
Toluene	TO-15	µg/m^3	440	5,600	64,000	60,000	60,000	29,000
trans-1,3-Dichloropropene	TO-15	µg/m^3	<200	<200	<200	<200	<200	<200
1,1,2-Trichloroethane	TO-15	µg/m^3	<200	<200	280	<200	<200	<200
3-Hexanone	TO-15	µg/m^3	6,000	3,400	26,000	13,000	<200	13,000
Tetrachloroethylene	TO-15	µg/m^3	340	2,200	6,800	5,600	6,000	1,800
2-Hexanone	TO-15	µg/m^3	<200	350	1,100	1,100	<200	300
Hexanal	TO-15	µg/m^3	5,600	3,200	12,000	<200	<200	3,200
1,2-Dibromoethane	TO-15	µg/m^3	<200	<200	210	<200	<200	<200
Chlorobenzene	TO-15	µg/m^3	<200	<200	200	<200	<200	<200
Ethylbenzene	TO-15	µg/m^3	560	4,400	12,000	32,000	33,000	5,600
m,p-Xylene	TO-15	µg/m^3	<200	2,400	19,000	68,000	68,000	10,000
o-Xylene	TO-15	µg/m^3	<200	880	4,800	24,000	25,000	2,800
Styrene	TO-15	µg/m^3	<200	<200	1,400	1,600	1,600	480
Bromoform	TO-15	µg/m^3	<200	<200	<200	<200	<200	<200
1,1,2,2-Tetrachloroethane	TO-15	µg/m^3	1,700	760	880	1,000	1,000	680
1,2,3-Trimethylbenzene	TO-15	µg/m^3	<200	<200	<200	340	440	<200
1,3,5-Trimethylbenzene	TO-15	µg/m^3	<200	<200	390	2,400	2,800	390
1,2,4-Trimethylbenzene	TO-15	µg/m^3	640	<200	760	2,000	2,400	480
m-Dichlorobenzene	TO-15	µg/m^3	<200	<200	<200	<200	<200	<200
o-Dichlorobenzene	TO-15	µg/m^3	<200	<200	<200	<200	<200	<200
p-Dichlorobenzene	TO-15	µg/m^3	<200	<200	<200	<200	<200	<200
1,2,4-Trichlorobenzene	TO-15	µg/m^3	<200	<200	<200	<200	<200	<200

Notes:

1	Sample TW23 is a field duplicate of TW21.
bgs	Below ground surface
%	Percent
µg/m^3	Micrograms per cubic meter

TABLE 6
SUMMARY OF ANALYTICAL RESULTS FOR FIELD QUALITY CONTROL SAMPLES
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Sample ID	Method	SWB-1	ER-01	TB-01
Sample Date		7/28/2004	7/28/2004	7/28/2004
Sample Time		8:00	8:15	0:00
Units		mg/L	mg/L	mg/L
Metals				
Mercury	7470A	<0.00020	<0.00020	NA
Arsenic	6010B	<0.010	<0.010	NA
Barium	6010B	<0.0050	<0.0050	NA
Cadmium	6010B	<0.0050	<0.0050	NA
Chromium	6010B	<0.010	<0.010	NA
Lead	6010B	<0.0050	<0.0050	NA
Selenium	6010B	<0.010	<0.010	NA
Silver	6010B	<0.0050	<0.0050	NA
Volatile Organic Compounds[1]				
Bromodichloromethane	8260B	<0.0010	0.0026	<0.0010
Bromoform	8260B	0.0018	0.0022	<0.0010
Chlorodibromomethane	8260B	0.0041	0.0044	<0.0010
Methylene Chloride	8260B	<0.0050	<0.0050	0.022

Notes:

1	For volatile organic compounds, only results that exceeded the detection limt for any one sample are presented.
mg/L	Milligrams per liter
NA	Not analyzed
SWB	Source water blank
ER	Equipment rinsate
TB	Trip blank

TABLE 7
THICKNESSES AND COMPOSITION OF LANDFILL COVER AND BURIED WASTE
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Soil Boring ID	Cover Thickness (feet) and Soil Type	Waste Thickness (feet) and Composition	Bottom of the Trench (feet bgs) and Composition
SB01	3 Silty clay	13.5 Silt and clay with plastic, glass, wood; sewer-like smell	16.5 Brown clay with white crystals
SB02	2 Clayey silt	11.5 Silt and clay with plastic, wood, some glass, clothing; sewer-like smell	13.5 Brown clay/silt with caliche
SB03	3.5 Clayey silt	8 Blackish trash with wood, plastic, some glass	11.5 Brown clayey silt with caliche
SB04	2.5 Clayey silt	10 Wood, glass, clothes, copper wire; fresher garbage smell.	12.5
SB05	0.5 Clayey silt	9 Wood, paper, plastic, glass	9.5 Sandy silty clay
SB06	NA	NA No apparent trench observed; a few inclusions of trash found at 3-3.5 and 6-7 ft bgs - perhaps mixed during trench backfill	NA
SB07	NA	NA No apparent trench observed; a few inclusions of trash found at 4-4.5 ft bgs (paper and plastic) and at 7-7.5 ft bgs (asphalt, gravelly concrete-like material)	NA
SB08	NA	NA No waste trench encountered	NA
SB09	2.5 Clayey silt	7 Paper, plastic, wood, asphalt	9.5 Sandy silty clay
SB10	NA	NA No waste trench encountered	NA
SB11	4 Sandy slity clay	7 Paper, plastic	11 Sandy clay
SB12	NA	NA No waste trench encountered	NA
SB13	NA	NA No waste trench encountered	NA
SB14	NA	NA No waste trench encountered	NA
SB15	NA	NA No waste trench encountered	NA
SB16	NA	NA No waste trench encountered	NA
SB17	NA	NA No waste trench encountered.	NA

TABLE 7
THICKNESSES AND COMPOSITION OF LANDFILL COVER AND BURIED WASTE
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Soil Boring ID	Cover Thickness (feet) and Soil Type	Waste Thickness (feet) and Composition	Bottom of the Trench (feet bgs) and Composition
SB18	1 Silt	>19 Plastic, paper, clothing, carpet, wire, organic matter	>20 Unknown - could not reach the bottom of the trench - refusal
SB19	3 Silt	12 Plastic, paper, some wood, carpet, clothes fiber, organic matter	15 Clayey silt
SB20	3.5 Clayey silt	>31.5 Plastic, paper, clothing, organic matter, gravelly material and concrete on the bottom	>35 Unknown - could not reach the bottom of the trench - refusal
SB21	4 Silt	32 Plastic, paper, vegetation, Christmas tree, tires, metal cable casing, carpet	36 Lean clay
SB22	2 Silt	34 Plastic, paper, vegetation, wood, wire, carpeting, strapping metal, schrubs	36 Clayey silt
SB23	2.5 Silt	33.5 Plastic, paper, vegetation, wood, wire, strapping metal, schrubs	36 Silt
SB27	NA	NA No waste trench encountered	NA
SB28	NA	NA No waste trench encountered	NA
SB29	2.5 Clayey silt	>3.5 Paper, plastic, rags, clothes, metal cans	>6 Unknown - did not reach bottom of the waste pile - out of scope
SB30	NA	NA No waste trench encountered	NA
SB31	NA	NA No waste trench encountered	NA
SB32	NA	NA No waste trench encountered	NA
SB33	NA	NA No waste trench encountered	NA
SB34	NA	NA No waste trench encountered	NA
SB35	NA	NA No waste trench encountered	NA

Notes:

bgs Below ground surface

NA Not applicable - well installation was not scoped or trench was not encountered

TABLE 8
COMPARISON OF LANDFILL GAS CONCENTRATIONS TO ATSDR MINIMAL RISK LEVELS
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ALAMOGORDO LANDFILL
ALAMOGORDO, NEW MEXICO

Analyte/Sample ID	Units	MRL Acute	MRL Intermediate	MRL Chronic	TW01	TW09	TW20	TW21	TW23[1]	TW22
1,1,2,2-Tetrachloroethane	ppbv	NS	NS	40	**250**	**110**	**130**	**150**	**150**	**100**
1,2-Dichloropropane	ppbv	50	7	NS	**110**	**180**	**160**	<44	<44	**1,300**
Vinyl Acetate	ppbv	NS	100	NS	<57	<57	**140**	**380**	**400**	**100**
Vinyl Chloride	ppbv	500	30	NS	**550**	**220**	**870**	**730**	**770**	**280**

Notes:

Bold type indicates concentrations exceeding MRLs.

MRLs are based on non-cancerous health effects only and are not based on consideration of cancer effects.

Acute MRL was developed for exposure lasting between 1 to 14 days.

Intermediate MRL was developed for exposure lasting between 14 to 364 days.

Chronic MRL was developed for exposure lasting more than 365 days.

1	Sample TW23 is a field duplicate of TW21.
ATSDR	Agency for Toxic Substances and Disease Registry
MRL	Minimal risk level
NS	No standard developed
ppbv	Parts per billion by volume

Appendix D – Atari Items Disposal Photographs (1983)


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Appendix E – Laboratory Analytical Report (March 11, 2014)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 13, 2014

Clay Kiesling
Souder, Miller & Associates
401 17th St. Suite 4
Las Cruces, NM 88005
TEL: (575) 647-0799
FAX (575) 647-0680

RE: Alamogordo LF OrderNo.: 1403454

Dear Clay Kiesling:

Hall Environmental Analysis Laboratory received 5 sample(s) on 3/12/2014 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 3
Project: Alamogordo LF
Collection Date: 3/11/2014 12:20:00 PM
Lab ID: 1403454-001 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Chloromethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
cis-1,2-DCE	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Dichlorodifluoromethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Dibromochloromethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Dibromomethane	ND	0.20		µg/L	1	3/12/2014 12:39:08 PM	R17270
Ethylbenzene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Iodomethane	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
Methylene Chloride	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Styrene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Tetrachloroethene (PCE)	ND	0.050		µg/L	1	3/12/2014 12:39:08 PM	R17270
Toluene	0.62	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Carbon Tetrachloride	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Chloroethane	ND	0.20		µg/L	1	3/12/2014 12:39:08 PM	R17270
trans-1,2-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
2-Butanone	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
trans-1,4-Dichloro-2-butene	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
2-Hexanone	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
Trichloroethene (TCE)	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
4-Methyl-2-pentanone	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
Bromoform	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Trichlorofluoromethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Acetone	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,1-Dichloroethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,1-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Acrylonitrile	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
Bromodichloromethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Carbon disulfide	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,2,3-Trichloropropane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Vinyl acetate	ND	1.0		µg/L	1	3/12/2014 12:39:08 PM	R17270
Vinyl chloride	ND	0.040		µg/L	1	3/12/2014 12:39:08 PM	R17270
Xylenes, Total	ND	0.15		µg/L	1	3/12/2014 12:39:08 PM	R17270
Chloroform	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Bromomethane	ND	0.20		µg/L	1	3/12/2014 12:39:08 PM	R17270
Chlorobenzene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 3
Project: Alamogordo LF
Collection Date: 3/11/2014 12:20:00 PM
Lab ID: 1403454-001 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,2-Dichloropropane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,1,1-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,1,2-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
1,4-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Benzene	ND	0.10		µg/L	1	3/12/2014 12:39:08 PM	R17270
Surr: 1,2-Dichloroethane-d4	102	70-130		%REC	1	3/12/2014 12:39:08 PM	R17270
Surr: 4-Bromofluorobenzene	111	70-130		%REC	1	3/12/2014 12:39:08 PM	R17270
Surr: Dibromofluoromethane	116	70-130		%REC	1	3/12/2014 12:39:08 PM	R17270
Surr: Toluene-d8	93.7	70-130		%REC	1	3/12/2014 12:39:08 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 4
Project: Alamogordo LF
Collection Date: 3/11/2014 12:55:00 PM
Lab ID: 1403454-002 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Chloromethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
cis-1,2-DCE	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Dichlorodifluoromethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Dibromochloromethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Dibromomethane	ND	0.20		µg/L	1	3/12/2014 2:11:59 PM	R17270
Ethylbenzene	0.25	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Iodomethane	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
Methylene Chloride	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Styrene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Tetrachloroethene (PCE)	ND	0.050		µg/L	1	3/12/2014 2:11:59 PM	R17270
Toluene	0.56	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Carbon Tetrachloride	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Chloroethane	ND	0.20		µg/L	1	3/12/2014 2:11:59 PM	R17270
trans-1,2-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
2-Butanone	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
trans-1,4-Dichloro-2-butene	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
2-Hexanone	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
Trichloroethene (TCE)	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
4-Methyl-2-pentanone	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
Bromoform	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Trichlorofluoromethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Acetone	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,1-Dichloroethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,1-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Acrylonitrile	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
Bromodichloromethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Carbon disulfide	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,2,3-Trichloropropane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Vinyl acetate	ND	1.0		µg/L	1	3/12/2014 2:11:59 PM	R17270
Vinyl chloride	ND	0.040		µg/L	1	3/12/2014 2:11:59 PM	R17270
Xylenes, Total	1.8	0.15		µg/L	1	3/12/2014 2:11:59 PM	R17270
Chloroform	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Bromomethane	ND	0.20		µg/L	1	3/12/2014 2:11:59 PM	R17270
Chlorobenzene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 4
Project: Alamogordo LF
Collection Date: 3/11/2014 12:55:00 PM
Lab ID: 1403454-002 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,2-Dichloropropane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,1,1-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,1,2-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
1,4-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Benzene	ND	0.10		µg/L	1	3/12/2014 2:11:59 PM	R17270
Surr: 1,2-Dichloroethane-d4	104	70-130		%REC	1	3/12/2014 2:11:59 PM	R17270
Surr: 4-Bromofluorobenzene	113	70-130		%REC	1	3/12/2014 2:11:59 PM	R17270
Surr: Dibromofluoromethane	115	70-130		%REC	1	3/12/2014 2:11:59 PM	R17270
Surr: Toluene-d8	92.4	70-130		%REC	1	3/12/2014 2:11:59 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 5
Project: Alamogordo LF
Collection Date: 3/11/2014 1:30:00 PM
Lab ID: 1403454-003 **Matrix:** AIR **Received Date:** 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Chloromethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
cis-1,2-DCE	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Dichlorodifluoromethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Dibromochloromethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Dibromomethane	ND	0.20		µg/L	1	3/12/2014 3:42:50 PM	R17270
Ethylbenzene	0.18	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Iodomethane	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
Methylene Chloride	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Styrene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Tetrachloroethene (PCE)	ND	0.050		µg/L	1	3/12/2014 3:42:50 PM	R17270
Toluene	0.69	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Carbon Tetrachloride	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Chloroethane	ND	0.20		µg/L	1	3/12/2014 3:42:50 PM	R17270
trans-1,2-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
2-Butanone	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
trans-1,4-Dichloro-2-butene	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
2-Hexanone	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
Trichloroethene (TCE)	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
4-Methyl-2-pentanone	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
Bromoform	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Trichlorofluoromethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Acetone	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,1-Dichloroethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,1-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Acrylonitrile	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
Bromodichloromethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Carbon disulfide	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,2,3-Trichloropropane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Vinyl acetate	ND	1.0		µg/L	1	3/12/2014 3:42:50 PM	R17270
Vinyl chloride	ND	0.040		µg/L	1	3/12/2014 3:42:50 PM	R17270
Xylenes, Total	1.0	0.15		µg/L	1	3/12/2014 3:42:50 PM	R17270
Chloroform	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Bromomethane	ND	0.20		µg/L	1	3/12/2014 3:42:50 PM	R17270
Chlorobenzene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 5
Project: Alamogordo LF
Collection Date: 3/11/2014 1:30:00 PM
Lab ID: 1403454-003 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,2-Dichloropropane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,1,1-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,1,2-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
1,4-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Benzene	ND	0.10		µg/L	1	3/12/2014 3:42:50 PM	R17270
Surr: 1,2-Dichloroethane-d4	103	70-130		%REC	1	3/12/2014 3:42:50 PM	R17270
Surr: 4-Bromofluorobenzene	108	70-130		%REC	1	3/12/2014 3:42:50 PM	R17270
Surr: Dibromofluoromethane	117	70-130		%REC	1	3/12/2014 3:42:50 PM	R17270
Surr: Toluene-d8	94.0	70-130		%REC	1	3/12/2014 3:42:50 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 6
Project: Alamogordo LF
Collection Date: 3/11/2014 2:00:00 PM
Lab ID: 1403454-004 **Matrix:** AIR **Received Date:** 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Chloromethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
cis-1,2-DCE	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Dichlorodifluoromethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Dibromochloromethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Dibromomethane	ND	0.20		µg/L	1	3/12/2014 2:42:17 PM	R17270
Ethylbenzene	0.18	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Iodomethane	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
Methylene Chloride	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Styrene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Tetrachloroethene (PCE)	ND	0.050		µg/L	1	3/12/2014 2:42:17 PM	R17270
Toluene	0.60	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Carbon Tetrachloride	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Chloroethane	ND	0.20		µg/L	1	3/12/2014 2:42:17 PM	R17270
trans-1,2-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
2-Butanone	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
trans-1,4-Dichloro-2-butene	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
2-Hexanone	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
Trichloroethene (TCE)	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
4-Methyl-2-pentanone	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
Bromoform	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Trichlorofluoromethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Acetone	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,1-Dichloroethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,1-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Acrylonitrile	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
Bromodichloromethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Carbon disulfide	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,2,3-Trichloropropane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Vinyl acetate	ND	1.0		µg/L	1	3/12/2014 2:42:17 PM	R17270
Vinyl chloride	ND	0.040		µg/L	1	3/12/2014 2:42:17 PM	R17270
Xylenes, Total	1.1	0.15		µg/L	1	3/12/2014 2:42:17 PM	R17270
Chloroform	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Bromomethane	ND	0.20		µg/L	1	3/12/2014 2:42:17 PM	R17270
Chlorobenzene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 6
Project: Alamogordo LF
Collection Date: 3/11/2014 2:00:00 PM
Lab ID: 1403454-004 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,2-Dichloropropane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,1,1-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,1,2-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
1,4-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Benzene	ND	0.10		µg/L	1	3/12/2014 2:42:17 PM	R17270
Surr: 1,2-Dichloroethane-d4	99.4	70-130		%REC	1	3/12/2014 2:42:17 PM	R17270
Surr: 4-Bromofluorobenzene	114	70-130		%REC	1	3/12/2014 2:42:17 PM	R17270
Surr: Dibromofluoromethane	106	70-130		%REC	1	3/12/2014 2:42:17 PM	R17270
Surr: Toluene-d8	91.6	70-130		%REC	1	3/12/2014 2:42:17 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 7
Project: Alamogordo LF
Collection Date: 3/11/2014 2:40:00 PM
Lab ID: 1403454-005 **Matrix:** AIR **Received Date:** 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Chloromethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
cis-1,2-DCE	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Dichlorodifluoromethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Dibromochloromethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Dibromomethane	ND	0.20		µg/L	1	3/12/2014 3:12:28 PM	R17270
Ethylbenzene	0.20	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Iodomethane	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
Methylene Chloride	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Styrene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Tetrachloroethene (PCE)	ND	0.050		µg/L	1	3/12/2014 3:12:28 PM	R17270
Toluene	0.63	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Carbon Tetrachloride	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Chloroethane	ND	0.20		µg/L	1	3/12/2014 3:12:28 PM	R17270
trans-1,2-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
2-Butanone	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
trans-1,4-Dichloro-2-butene	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
2-Hexanone	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
Trichloroethene (TCE)	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
4-Methyl-2-pentanone	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
Bromoform	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Trichlorofluoromethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Acetone	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,1-Dichloroethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,1-Dichloroethene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Acrylonitrile	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
Bromodichloromethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Carbon disulfide	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,2,3-Trichloropropane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Vinyl acetate	ND	1.0		µg/L	1	3/12/2014 3:12:28 PM	R17270
Vinyl chloride	ND	0.040		µg/L	1	3/12/2014 3:12:28 PM	R17270
Xylenes, Total	1.3	0.15		µg/L	1	3/12/2014 3:12:28 PM	R17270
Chloroform	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Bromomethane	ND	0.20		µg/L	1	3/12/2014 3:12:28 PM	R17270
Chlorobenzene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Point 7
Project: Alamogordo LF
Collection Date: 3/11/2014 2:40:00 PM
Lab ID: 1403454-005 **Matrix:** AIR
Received Date: 3/12/2014 9:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,2-Dichloropropane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,1,1-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,1,2-Trichloroethane	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
1,4-Dichlorobenzene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Benzene	ND	0.10		µg/L	1	3/12/2014 3:12:28 PM	R17270
Surr: 1,2-Dichloroethane-d4	102	70-130		%REC	1	3/12/2014 3:12:28 PM	R17270
Surr: 4-Bromofluorobenzene	114	70-130		%REC	1	3/12/2014 3:12:28 PM	R17270
Surr: Dibromofluoromethane	116	70-130		%REC	1	3/12/2014 3:12:28 PM	R17270
Surr: Toluene-d8	93.1	70-130		%REC	1	3/12/2014 3:12:28 PM	R17270

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403454**

13-Mar-14

Client: Souder, Miller & Associates

Project: Alamogordo LF

Sample ID **1403454-001adup**	SampType: **DUP**	TestCode: **EPA Method 8260B: Volatiles, Table I**
Client ID: **Point 3**	Batch ID: **R17270**	RunNo: **17270**
Prep Date:	Analysis Date: **3/12/2014**	SeqNo: **497574** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.10						0	0	
Chloromethane	ND	0.10						0	20	
cis-1,2-DCE	ND	0.10						0	20	
cis-1,3-Dichloropropene	ND	0.10						0	20	
Dichlorodifluoromethane	ND	0.10						0	20	
Dibromochloromethane	ND	0.10						0	20	
Dibromomethane	ND	0.20						0	20	
Ethylbenzene	ND	0.10						0	20	
Iodomethane	ND	1.0						0	20	
Methylene Chloride	ND	0.10						0	20	
Styrene	ND	0.10						0	20	
Tetrachloroethene (PCE)	ND	0.050						0	20	
Toluene	0.55	0.10						10.7	20	
Carbon Tetrachloride	ND	0.10						0	20	
Chloroethane	ND	0.20						0	20	
trans-1,2-Dichloroethene	ND	0.10						0	20	
trans-1,3-Dichloropropene	ND	0.10						0	20	
2-Butanone	ND	1.0						0	20	
trans-1,4-Dichloro-2-butene	ND	1.0						0	20	
2-Hexanone	ND	1.0						0	20	
Trichloroethene (TCE)	ND	0.10						0	20	
4-Methyl-2-pentanone	ND	1.0						0	20	
Bromoform	ND	0.10						0	20	
Trichlorofluoromethane	ND	0.10						0	20	
Acetone	ND	1.0						0	20	
1,1-Dichloroethane	ND	0.10						0	20	
1,1-Dichloroethene	ND	0.10						0	20	
Acrylonitrile	ND	1.0						0	20	
Bromodichloromethane	ND	0.10						0	20	
Carbon disulfide	ND	1.0						0	20	
1,2,3-Trichloropropane	ND	0.10						0	20	
Vinyl acetate	ND	1.0						0	20	
Vinyl chloride	ND	0.040						0	20	
Xylenes, Total	ND	0.15						0	20	
Chloroform	ND	0.10						0	20	
Bromomethane	ND	0.20						0	20	
Chlorobenzene	ND	0.10						0	20	
1,1,1,2-Tetrachloroethane	ND	0.10						0	20	
1,1,2,2-Tetrachloroethane	ND	0.10						0	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1403454**

13-Mar-14

Client: Souder, Miller & Associates

Project: Alamogordo LF

Sample ID	**1403454-001adup**	SampType:	**DUP**	TestCode:	**EPA Method 8260B: Volatiles, Table I**
Client ID:	**Point 3**	Batch ID:	**R17270**	RunNo:	**17270**
Prep Date:		Analysis Date:	**3/12/2014**	SeqNo:	**497574**

Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2-Dichlorobenzene	ND	0.10						0	20	
1,2-Dichloropropane	ND	0.10						0	20	
1,1,1-Trichloroethane	ND	0.10						0	20	
1,1,2-Trichloroethane	ND	0.10						0	20	
1,2-Dichloroethane (EDC)	ND	0.10						0	20	
1,4-Dichlorobenzene	ND	0.10						0	20	
Benzene	ND	0.10						0	20	
Surr: 1,2-Dichloroethane-d4	1.0		1.000		103	70	130	0	0	
Surr: 4-Bromofluorobenzene	1.1		1.000		108	70	130	0	0	
Surr: Dibromofluoromethane	1.2		1.000		115	70	130	0	0	
Surr: Toluene-d8	0.89		1.000		89.3	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: SMA-LC Work Order Number: 1403454 RcptNo: 1

Received by/date: 03/12/14

Logged By: **Lindsay Mangin** 3/12/2014 9:45:00 AM

Completed By: **Lindsay Mangin** 3/12/2014 10:48:22 AM

Reviewed By: KMS 3/12/14

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	UPS		

Log In

4. Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☐	NA ☑
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	NA	Good	Yes			

Chain-of-Custody Record

Client: SMA

Mailing Address: 401 N 17th
LC, NM

Phone #: 575.647.0799

email or Fax#:

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☐ Rush 24hr

Project Name: Alamogordo LF

Project #: 43229321.1

Project Manager: Clay Kresley

Sampler: GN

On Ice: ☐ Yes ☑ No

Sample Temperature: N/A

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403154	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
3/11/14	1220	Air	Point 3	1 Tedlar	NP	-001										X		
	1255		Point 4			-002										X		
	1330		Point 5			-003										X		
	1400		Point 6			-004										X		
	1440		Point 7			-005										X		

Date: 3/11/14 Time: 1713 Relinquished by: GN

Received by: [signature] Date: 03/12/14 Time: 0945

Date: Time: Relinquished by:

Received by: Date: Time:

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Appendix F – Air Monitoring Equipment

MultiRAE IR

One-to-Five Gas Monitor

One-to-Five Gas Monitor with CO_2 & VOC Detection

The **MultiRAE IR** combines a PID (Photoionization Detector) and Carbon Dioxide (CO_2) sensor with O_2, LEL, and one specific toxic gas sensor in a compact monitor with sampling pump. The **MultiRAE IR**'s versatility allows it to replace a wide range of monitors, saving training and maintenance costs. The **MultiRAE IR** is quickly and easily changed from a sophisticated technician instrument to a simple text- or display-only monitor. The same monitor can be used as a personal monitor, a hand-held sniffer or as a continuous, operational area monitor for use in such applications as indoor air quality and industrial hygiene.

Key Features

- O_2, LEL, PID, CO_2 and one plug-in "smart" toxic sensor: CO, H_2S, SO_2, NO, NO_2, Cl_2, HCN, NH_3, PH_3
- 0-20,000 ppm measurement of CO_2 using our patented non-dispersive infrared (NDIR) sensor
- 0-2,000 ppm measurement of VOCs (volatile organic compounds) with 0.1 ppm resolution
- Measure more chemicals than with any other PID: With over 60 Correction Factors built into the **MultiRAE IR** memory and the largest printed list of Correction Factors in the world (300+), RAE Systems offers the ability to accurately measure more ionizable chemicals than any other PID!
- Drop-in Battery: when work schedules require putting in more than the 12 hours supplied by the advanced Lithium-ion (Li-ion) battery, the drop-in alkaline pack supplied with every **MultiRAE IR** allows you to finish the job.
- User friendly screens make it easy to use for simple applications and flexible enough for sophisticated options.
- Rugged Rubber Boot: the standard rubber boot helps assure that the **MultiRAE IR** survives the bumps and knocks of tough field use.
- Strong, built-in sample pump draws up to 100 feet (30 meters) horizontally or vertically. External filter and automatic low flow alarm protect the **MultiRAE IR** from damage.
- Large keys operable with 3 layers of gloves
- Easy-to-read display with backlight
- Store up to 80 hours of data at one minute interval for all 5 sensors for download to PC with built-in datalogging.
- Loud audible alarm that varies for different alarm conditions and an optional external vibration alarm for noisy areas

Applications

- Indoor Air Quality
- Beverage and Brewery
- Food Industry
- Hospitals
- Respirable Breathing-Air Testing

ISO 9001 CERTIFIED

RAE Systems Inc.
3775 North First Street, San Jose, CA • 95134 • USA
Tel: 877.723.2878 • Fax: 408.952.8480
Email: raesales@raesystems.com • www.raesystems.com

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RAE Systems (Hong Kong) Ltd.
Room 8, 6/F, Hong Leong Plaza, 33 Lok Yip Road, Fanling, N.T. • Hong Kong
Tel: 852.2669.0828

Specifications*

Sensor Specifications

Gas Monitor	Range	Resolution
Carbon Dioxide	0 - 20,000 ppm	10 ppm
Oxygen	0 - 30.0%	0.1%
Combustible gas	0 - 100% LEL	1%
VOCs	0 - 200.0 ppm	0.1 ppm
	200 - 2,000 ppm	1 ppm
Carbon Monoxide	0 - 500 ppm	1 ppm
Hydrogen Sulfide	0 - 100 ppm	1 ppm
Sulfur Dioxide	0 - 20.0 ppm	0.1 ppm
Nitric Oxide	0 - 250 ppm	1 ppm
Nitrogen Dioxide	0 - 20.0 ppm	0.1 ppm
Chlorine	0 - 10.0 ppm	0.1 ppm
Hydrogen Cyanide	0 - 100 ppm	1 ppm
Ammonia	0 - 50 ppm	1 ppm
Phosphine	0 - 5.0 ppm	0.1 ppm

Detector Specifications

Size	4.6"L x 3.0"W x 1.9"H (12 x 7.6 x 4.8 cm)
Weight	16 oz with battery (454g)
Sensors	• Up to 5 sensors including non-dispersive infrared sensor for CO_2 • Protected catalytic bead for combustible gas • Interchangeable electrochemical sensors for oxygen and toxic gases • Photoionization detector for VOCs (10.6 eV, 9.8 eV and 11.7 eV lamps)
Battery	Interchangeable Li-ion and alkaline battery packs; Rechargeable units include Lithium-ion battery pack with internal smart charging, 120V AC/DC wall adapter, and spare alkaline battery pack
Operating Hours	• 12 hours continuous operation • Unit will run and charge simultaneously
Display	2 line, 16 digit LCD with LED back light automatically in dim light or alarm condition
Keypads	1 operation and 2 programming keys
Direct Readout	Instantaneous (up to 5) values: • Oxygen as percentage by volume • Combustible gas as percentage of lower explosive limit (LEL) • Toxic gas, VOC and CO_2 as parts per million by volume • High and low values for all gases • STEL and TWA values of toxic gas, VOC and CO_2 • Battery and shut-down voltage • Date, time, elapsed time, temperature • LEL/VOC scale (using Correction Factors)
Alarm	90 dB buzzer and flashing red LED to indicate exceeded preset limits • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms automatically reset or latching with manual override • Additional diagnostic alarm and display message for low battery and pump stall
Datalogging	20,000 points (80 hours, 5 channels at one minute intervals) download to PC with serial number of unit, user ID, site number, calibration date
Calibration	Two-point field calibration for zero and span gas
Sampling Pump	Internal pump with user selectable flow rate: High: ~250 cc/min, Low: ~150 cc/min

Detector Specifications (continued)

Temperature	-4° to 113°F (-20° to 45°C)
Humidity	0% to 95% relative humidity (non-condensing)
Attachments	Wrist strap and high visibility rubber boot
Warranty	Lifetime on non-consuming components (per RAE Systems Standard Warranty), 2 years for CO_2, O_2, LEL, CO and H_2S sensors, 1 year all other sensors, 1 year pump, 1 year battery, 1 year for 10.6 eV PID lamp

*Ongoing projects to enhance our products mean that these specifications are subject to change

Monitor Only Includes:

- Sensors as specified
- Datalogging
  - ProRAE Suite for Windows 98, NT, 2000 and XP
  - Computer interface cable
- Calibration adapter
- Quick reference guide
- Operation and maintenance manual
- Rubber boot with belt clip
- Rechargeable Lithium-ion battery pack
- 120 / 230 V AC/DC wall adapter (if specified)
- Alkaline battery adapter
- External filters
- 3-inch inlet probe
- External filter adapter

Monitor with accessories kit also includes:

- Hard transport case with pre-cut foam
- 15 feet (5 meters) Teflon™ tubing
- Tool kit

Optional calibration kit also includes:

Four gas mix in a 34L cylinder (CH_4 50% LEL, 20.9% O_2, 50 ppm CO, 5000 ppm CO_2, balance N_2)

- Isobutylene gas in a 34L cylinder (for units with PID)
- Calibration Regulator (male) and tubing
- *Note: Must have zero air for non-PID units*

DISTRIBUTED BY:

MultiRAE IR

RAE Systems Inc.
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Tel: 852.2669.0828

MiniRAE 2000

Portable Handheld VOC Monitor

The rugged MiniRAE 2000 is the smallest pumped handheld volatile organic compound (VOC) monitor on the market. Its Photoionization Detector's (PID) extended range of 0 to 10,000 ppm makes it an ideal instrument for applications from environmental site surveying to HazMat/ Homeland Security.

AutoRAE Compatible

Wireless

Key Features

- **Proven PID technology** The patented sensor provides a 3-second response up to 10,000 ppm and sets a new standard for resistance to moisture and dirt.
- **Wireless communication enabled and certified**
- **Self-cleaning lamp and sensor** The patented self-cleaning lamp and sensor minimize the need for maintenance and calibration.
- **The MiniRAE 2000 lamp and sensor can be taken apart in seconds for easy maintenance without tools!**
- **Measure more chemicals than with any other PID.** With over 100 Correction Factors built into the MiniRAE 2000 memory and the largest printed list of Correction Factors in the world (300+), RAE Systems offers the ability to accurately measure more ionizable chemicals than any other PID. When a gas is selected from the MiniRAE 2000's library, the alarm points are automatically loaded into the meter.
- **User friendly** screens make it easy to use for simple applications and flexible enough for sophisticated operations.
- **Drop-in battery** When work schedules require putting in more than the 10 hours supplied by the standard NiMH battery, the drop-in alkaline pack supplied with every MiniRAE 2000 lets you finish the job.
- **Rugged Rubber Boot** The standard rubber boot helps assure that the MiniRAE 2000 survives the bumps and knocks of tough field use.
- **Strong, built-in sample pump** draws up to 100 feet (30 m) horizontally or vertically.
- **Tough, flexible inlet probe**
- **Large keys** operable with 3 layers of gloves.
- **Easy-to-read display** with backlight.
- **Stores up to 267 hours of data** at one-minute intervals for downloading to PC.
- **3-year 10.6 eV lamp warranty**

Applications

HazMat/Homeland Security

- Initial PPE (personal protective equipment) assessment
- Leak detection
- Safety perimeter establishment and maintenance
- Spill delineation
- Decontamination
- Remediation

Industrial Hygiene/Safety

- Confined Space Entry (CSE)
- Indoor Air Quality (IAQ)
- Worker exposure studies

Environmental

- Soil and water headspace analysis
- Leaking underground storage tanks
- Perimeter fenceline monitoring
- Fugitive emissions (EPA Method 21)
- Vapor recovery breakthrough
- Landfill monitoring

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Specifications*

Detector Specifications

Size	8.2" L x 3.0" W x 2.0" H (21.8 x 7.62 x 5.0 cm)
Weight	20 oz with battery pack (553 g) w/o rubber boot
Sensor	Photoionization sensor with standard 10.6 eV or optional 9.8 eV or 11.7 eV UV lamp
Battery	• Rechargeable, external, field-replaceable Nickel-Metal-Hydride (NiMH) battery pack • Alkaline battery holder (for 4 AA batteries)
Operating Period	10 hours continuous operation
Display	Large LCD, backlight activated manually, by alarms or by darkness
Keypad	1 operation and 2 programming keys
Direct Readout	• VOCs as ppm by volume • High and low values • STEL and TWA (in hygiene mode) • Battery and shut down voltage
Alarms	90 dB buzzer and flashing red LED to indicate exceeded preset limits: • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms automatic reset or latching with manual override • Optional plug-in pen size vibration alarm • User adjustable alarm limits
Calibration	Two-point field calibration of zero and standard reference gas. Calibration memory of 8 calibration gases, alarm limits, span values and calibration date
Datalogging	267 hours (at one-minute intervals) with date/time. Header information includes monitor serial number, user ID, site ID, date and time
Sampling Pump	• Internal, integrated flow rate of 400 cc/min • Sample from 100' (30 m) horizontally or vertically
Low Flow Alarm	Auto shut-off pump at low flow condition
Communication	Download data and upload instrument set-up from PC through RS-232 link to serial port. Wireless communication enabled and certified (requires RAELink2 and ProRAE Remote to use)
Temperature	14° F to 104° F (-10° C to 40° C)
Humidity	0% to 95% relative humidity (non-condensing)
EM/RFI	Highly resistant to EMI /RFI. Compliant with EMC Directive 89/336/EEC
IP-rating	IP-55: protected against dust, protected against low-pressure jets of water from all directions
Hazardous Area Approval	• **US and Canada:** UL and cUL, Classified for use in Class I, Division 1, Groups A, B, C and D hazardous locations • **Europe:** ATEX II IG EEx ia IIC T4
Attachment	Durable bright yellow rubber boot w/belt clip & wrist strap
Warranty	Lifetime on non-consumable components (per RAE Systems Standard Warranty), 3 years for 10.6.V PID lamp, 1 year for pump and battery

***** Specifications are subject to change

****** Performance based on isobutylene calibration

Default Sensor Settings**

Gas Monitor (ppm)	Range (ppm)	Resolution Time (T90)	Response
VOCs	0 to 99.9 ppm	0.1 ppm	< 3 sec
	100 to 10,000 ppm	1 ppm	< 3 sec

MiniRAE 2000 and Accessories

Monitor only includes:

- RAE Systems UV lamp: 10.6 eV, 9.8 eV or 11.7 eV as specified
- ProRAE Suite software package for Windows® 98, NT, 2000 and XP
- Computer interface cable
- 5-inch Flex-I-Probe
- External filter
- Rubber boot with belt clip
- Alkaline battery adapter
- Tool kit
- Lamp cleaning kit
- Nickel-Metal-Hydride (NiMH) battery
- 120/230 V AC/DC wall adapter (if specified)
- Operation and maintenance manual

Monitor with accessories kit adds:

- Hard transport case with pre-cut foam padding
- 5 porous metal filters and O-rings
- Organic vapor zeroing adapter
- Gas outlet port and tubing

Optional calibration kit adds:

- 10 ppm isobutylene calibration gas, 34L
- Calibration regulator and flow controller

Optional Guaranteed Cost of Ownership Program:

- 4-year repair and replacement guarantee
- Annual maintenance service

DISTRIBUTED BY:

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San Jose, CA 95134 USA
raesales@raesystems.com

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Middle East/Australia 971 50 429 1385
China 8610 58858788
Asia +852 2669 0828

www.raesystems.com

VRAE

Handheld Five-Gas Surveyer

The VRAE is a powerful, pumped, one- to five-gas monitor that protects workers from combustible gases and vapors, toxic gases and oxygen deficiency/enrichment. This versatile instrument can measure concentrations of combustibles either as percentage by volume or as percentage of lower explosive limit (LEL). The VRAE's rechargeable Nickel-Metal-Hydride battery, powerful internal pump and rugged frame make it ideal for confined space entry, leak detection, and site surveys.

- **Powerful and versatile**
- **Easy to use**
- **Durable and intrinsically safe**

KEY FEATURES

Convenient and Easy to Use

- Wide variety of interchangeable sensors, including combustible, CO, H_2S, SO_2, NO, NO_2, Cl_2, NH_3, HCN, and PH_3
- Familiar, intuitive user interface
- Large keys usable even with 3 layers of gloves
- Large backlit LCD display
- Internal pump for quick response and simple remote sampling
- Field-replaceable rechargeable battery with 10 hours of continuous operation

Durable

- Rugged weather-proof case

APPLICATIONS

- Refineries and petrochemical plants
- Pulp and paper mills
- Utility cable vaults, transformer stations
- Waste-water treatment plants
- Landfill operations
- Fire service

ISO 9001 CERTIFIED

VRAE

Handheld Five-Gas Surveyor

SPECIFICATIONS

Monitor Specifications

Size	7.75"L x 2.75"W x 1.5"H (19.6 cm x 7.0 cm x 3.8 cm)
Weight	19 oz (540 g) with battery
Sensors	• Catalytic sensor for combustible gas • Thermal conductivity sensor for percentage volume combustible gas • Electrochemical sensors for oxygen and toxic gases
Battery	Rechargeable, snap-in, field replaceable 4.8V/1250 mAh, Ni-MH battery pack, 4 AA battery adapter
Operating Hours	10 hours continuous operation
Display	2-line, 16-digit LCD with LED back light automatically turns on in dim light or alarm condition
Keypads	1 operation and 2 programming keys
Direct Readout	Instantaneous reading (up to 5 values) • Oxygen as percentage by volume • Combustible gas as percentage by volume or percentage of lower explosive limit (LEL)
Alarms	90 dB buzzer and flashing red LED to indicate exceeded preset alarms: • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms latching with manual override or automatic reset • Additional diagnostic alarm and display message for low battery and pump stall
Datalogging	Optional 16,000 points (53 hours, 5 channels at one minute intervals) download to PC with serial number of unit, user ID, site ID and calibration date
Calibration	Two-point field calibration of zero and span gas
Sampling Pump	• Internal pump, flow rate 400 cc/minute • Automatic shut off at low flow condition
Hazardous Area Approval	US: UL, cUL, classified as intrinsically safe for use in Class I, Division 1 Groups A, B, C, D, Hazardous Locations T3C rating
Temperature	-4° F to 113° F (-20° C to 45° C)
Humidity	0% to 95% relative humidity (non-condensing)
Attachment	Durable rubber boot and wrist strap
Warranty	Lifetime on non-consuming components (per RAE Systems standard warranty), 2 years for O_2, LEL, CO and H_2S sensors, 1 year for all other sensors, 1 year pump, 1 year battery

Specifications are subject to change

Sensor Specifications

Gas Monitor	Range	Resolution
Combustible	0 to 100% LEL	1%
	0 to 100% VOL	1%
Oxygen	0 to 30.0%	0.1%
Carbon Monoxide	0 to 500 ppm	1 ppm
Hydrogen Sulfide	0 to 100 ppm	1 ppm
Sulfur Dioxide	0 to 20.0 ppm	0.1 ppm
Nitric Oxide	0 to 250 ppm	1 ppm
Nitrogen Dioxide	0 to 20.0 ppm	0.1 ppm
Chlorine	0 to 10.0 ppm	0.1 ppm
Hydrogen Cyanide	0 to 100 ppm	1 ppm
Ammonia	0 to 50 ppm	1 ppm
Phosphine	0 to 5.0 ppm	0.1 ppm

Specifications are subject to change

MONITOR ONLY INCLUDES:

- Monitor as specified
- Sensors as specified
- Filter and O-ring pack
- 5" Inlet probe
- Gas outlet port adapter
- Operation and maintenance manual
- Rubber boot with belt clip
- Alkaline battery adapter
- Rechargeable units additionally include:
  – Nickel-Metal-Hydride (NiMH) battery
  – 120 or 230 V AC/DC wall adapter (if specified)

MONITOR WITH ACCESSORIES KIT ALSO INCLUDES:

- Hard transport case with pre-cut foam padding

OPTIONAL CALIBRATION KIT ALSO INCLUDES:

- Four-gas mix in a 34L cylinder (50% LEL, 20.9% O_2, 25 ppm H_2S, 50 ppm CO)
- Calibration regulator (male) and tubing
- 15' (5 m) Tygon® tubing
- Tool kit

DATALOGGING MONITORS ALSO INCLUDE:

- Software ProRAE Suite Package for Windows® 98, 2000, NT and XP
- Computer interface cable

CORPORATE HEADQUARTERS

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raesales@raesystems.com

DS-1042-03

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