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Date: APR 2 1 2015
Symbol: ENV-DO-15-0099
LA-UR: 15-20472
Locates Action No.: Not Applicable

Mr. John E. Kieling
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Dear Mr. Kieling:

Subject: Transmittal of Los Alamos National Laboratory Nitrate Salt-Bearing Waste Container Isolation Plan, Revision 3 for Review

The purpose of this letter is to transmit a Los Alamos National Laboratory (LANL) document for review and approval by the New Mexico Environment Department (NMED). The *LANL Nitrate Salt–Bearing Waste Container Isolation Plan, Revision 3* (Isolation Plan) is being submitted as discussed on April 3, 2015 by NMED personnel and personnel from the Los Alamos National Security, LLC (LANS) and the U.S. Department of Energy (DOE), collectively the Permittees. The original draft of the Isolation Plan was required by the May 19, 2014, *Administrative Order,* which was modified on July 10, 2014 by a letter from NMED, *Modification to May 19, 2014, Administrative Order*.

The enclosures to this letter represent changes to the LANL Isolation Plan that are necessary to update the plan, incorporate new containers into isolation, and create flexibility in the management of some nitrate salt-bearing waste containers located at LANL. There are two major modifications proposed by this revision. The first proposed modification incorporates newly identified suspect nitrate salt-bearing waste containers into isolation with the originally identified remediated nitrate salt-bearing waste containers. The four newly identified containers are Pipe Overpack Containers (POCs) and are referenced as such throughout the proposed revision. The second major proposed modification allows for the 29 unremediated nitrate salt-bearing waste containers currently stored within isolation to be placed into other compliant permitted storage at the facility.

Other updates to the plan include:

- Removal of specific descriptions of fire protection equipment and emergency operations planning for unremediated nitrate salt waste containers because they are no longer applicable.
- Revisions to the description of temperature monitoring data because the data was only included with the Isolation Plan, Revision 2.
- Revisions to text that was indirectly affected by the major modifications proposed to the document.
- Correction of typographical errors.
- Correction of inconsistencies within the document.

Enclosure 1 contains a copy of the plan that contains editing marks. Enclosure 2 includes a clean copy of the *LANL Nitrate Salt–Bearing Waste Container Isolation Plan, Revision 3* that includes all attachments to the plan. If you have comments or questions regarding this submittal, please contact Mark P. Haagenstad at (505) 665-2014 or David Nickless at (505) 665-6448.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Christine M. Gelles
Acting Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

AMD:CMG:MPH:LVH/lm

Enclosures: (1) Revision Isolation Plan, Revision 3 with Editing Marks
(2) LANL Nitrate Salt–Bearing Waste Container Isolation Plan, Revision 3

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Kathryn Roberts, NMED, Santa Fe, NM, (E-File)
Steve Pullen, NMED/HWB, Santa Fe, NM, (E-File)
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NMED
Hazardous Waste Bureau

Mr. John E. Kieling
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New Mexico Environment Department
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Santa Fe, NM 87505

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The enclosures to this letter represent changes to the LANL Isolation Plan that are necessary to update the plan, incorporate new containers into isolation, and create flexibility in the management of some nitrate salt-bearing waste containers located at LANL. There are two major modifications proposed by this revision. The first proposed modification incorporates newly identified suspect nitrate salt-bearing waste containers into isolation with the originally identified remediated nitrate salt-bearing waste containers. The four newly identified containers are Pipe Overpack Containers (POCs) and are referenced as such throughout the proposed revision. The second major proposed modification allows for the 29 unremediated nitrate salt-bearing waste containers currently stored within isolation to be placed into other compliant permitted storage at the facility.

ENCLOSURE 1

Revision Isolation Plan, Revision 3 with Editing Marks

ENV-DO-15-0099

LA-UR-15-20472

Date: APR 2 1 2015

LANL Nitrate Salt-Bearing Waste Container Isolation Plan
Revision ~~2~~3

~~September 19, 2014~~April 2015

LA-UR-15-20472~~14-27322~~

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I. Introduction

On May 19, 2014, the Department of Energy (DOE) and the Los Alamos National Security, LLC (LANS) ("Permittees") received Administrative Order No. 5-19001 ("Order") issued by the New Mexico Environment Department (NMED). The Order, at paragraph 18, required the Permittees to submit a *LANL Nitrate Salt--Bearing Waste Container Isolation Plan* ("Isolation Plan"). The Isolation Plan was submitted by 2:00 PM on May 21, 2014.

On May 23, 2014, NMED approved the Isolation Plan contingent on the submittal of a revised Isolation Plan that incorporated additional requirements ("Revised Isolation Plan"). NMED required the Permittees to address all of the items enumerated in their May 23, 2014 letter, incorporate those changes and resubmit the Revised Isolation Plan by May 29, 2014. The Revised Isolation Plan was submitted on May 29, 2014.

On August 29, 2014, NMED approved the Revised Isolation Plan with modifications. NMED required the Permittees to address all of the items enumerated in their August 29, 2014 letter, incorporate changes and resubmit the Plan ("Isolation Plan, Revision 2") to NMED no later than September 19, 2014 for final review and approval.

~~As described below, this~~The ~~-~~Isolation Plan, Revision 2 incorporate~~d~~s the modifications enumerated by NMED and was submitted to the NMED on September 19, 2014. It included description of ~~describes~~ how the Permittees ~~will~~ isolate~~d~~, and secure~~d~~ ~~and/or treat~~ all nitrate salt-bearing waste containers currently stored at Los Alamos National Laboratory (LANL) and information on characterization assessments conducted by the Permittees.

This revision of the Isolation Plan, Isolation Plan, Revision 3, describes the activities and assessments that have been conducted to date associated with all nitrate salt-bearing waste containers and includes the addition of 4 suspect remediated nitrate salt-bearing waste containers into isolation in the Permacon within Technical Area 54, Dome 375 (TA-54-375). It describes how the Permittees continue to secure and isolate remediated and newly suspect nitrate salt-bearing waste containers, so that a potential release from ~~any nitrate salt-bearing container~~ them at LANL does not pose a threat to human health or the environment. ~~-~~This~~e~~ plan also includes information on remediation planning and a schedule of immediate actions undertaken to implement isolating, securing and/or treating nitrate salt-bearing waste containers currently stored at LANL.

Additional measures above those described in this Isolation Plan, Revision ~~2~~3 may also be taken and will be identified to NMED during the technical calls established in Section IX below.

II. Background and General Implementation Updates

1) On May 1, 2014, the Waste Isolation Pilot Plant (WIPP) declared a potentially inadequate safety analysis (PISA) on the possibility of unremediated nitrate salt-bearing waste contained in waste packages at WIPP. On May 2, 2014, LANS convened a critique to perform an extent of condition on the PISA issued by WIPP. As a result of the critique, the Permittees implemented several corrective and precautionary actions immediately to ensure protection of human health and the environment. The Permittees identified the current storage locations of all remediated and unremediated nitrate salt-bearing waste containers. The Permittees moved all remediated nitrate salt-bearing waste containers into TA-54, Area G, Dome 230 (because Dome 230 has an active fire suppression system) and daily temperature measurements of each container commenced. Additionally, continuous radiological air monitoring was initiated in Dome 230. Finally, any further processing of nitrated salt waste streams was suspended and all transuranic (TRU) waste shipments from LANL were paused.

2) On May 15, 2014, WIPP released photographs showing a LANL drum containing remediated nitrate salt-bearing waste that appeared to be breached in Panel 7, Room 7. The initiator of this breach and other potentially impacted drums is currently unknown, but is being actively investigated by multiple parties.

3) On May 16, 2014, the Permittees convened a critique to review the new information. A PISA was declared (ORPS NA-LASO-LANL-WASTEMGT-2014-0004) on the possibility of inadequate safety basis controls specified for the remediated nitrate salt-bearing waste. As a result of the critique, the Permittees implemented several corrective and precautionary actions immediately to ensure protection of human health and the environment.

4) On May 18, 2014, the Permittees completed the overpacking of all originally identified remediated nitrate salt-bearing waste containers at LANL into Standard Waste Boxes (SWBs). There are 57 remediated nitrate salt-bearing waste containers at LANL, and these were overpacked into 55 SWBs. (As part of the original packing configuration, 2 SWBs each have 2 remediated nitrate salt-bearing waste containers.)

5) On May 20, 2014, the Permittees held the initial meeting of their Remediation Team. (See Section VI below for additional information.)

6) On June 3, 2014, the Permittees completed the move of all unremediated nitrate salt-bearing waste containers to the Permacon in Dome 231 located at TA-54, Area G, and all

remediated nitrate salt-bearing waste containers were moved to the Permacon in Dome 375 located at TA-54, Area G.

7) On June 5, 2014, the Permittees conservatively applied Environmental Protection Agency (EPA) Hazardous Waste Number D002 to 26 unremediated nitrate salt-bearing waste containers. The following describes the Permittees' regulatory basis, reasoning and analysis for assigning this EPA Hazardous Waste Number. (See also, Permittees' letter to NMED dated September 5, 2014, ADESH-14-088.)

   During a review of operating records associated with the remediation of nitrate salt-bearing TRU wastes, the Permittees determined that a few of the parent containers were noted as having liquids with a pH of 2 or less. (*see* ES Nitrate Salt Waste Containers at WCS, WIPP Panel 7, and LANL Data Summary, May 17, 2014, http://www.nmenv.state.nm.us/NMED/Issues/documents/ESNSWasteContatWCS-WIPP-LANL5.17.14.pdf). Based on this information, LANL evaluated the remaining unremediated nitrate salt-bearing waste containers to identify those with free liquids using real-time radiography (RTR) and high-energy RTR (HERTR) analysis. The testing identified that 26 of the 29 containers contained free liquids. As a conservative measure, based on this information, LANL applied the D002 EPA Hazardous Waste Number to these remaining unremediated nitrate salt-bearing waste containers identified with free liquids.

   Videos of 27 RTR fast scans were provided to NMED on September 5, 2014. (ADESH-14-088). As explained in the Permittees' September 5, 2014 letter, RTR video recordings are not available for 2 of the 29 unremediated nitrate salt-bearing waste containers as historically RTR video recordings were not created.

8) On June 18, 2014, the Permittees began headspace gas (HSG) sampling on additional SWBs containing remediated nitrate salt-bearing waste containers. The Permittees' intent was to conduct HSG sampling on each of the 55 SWBs. This HSG monitoring was an additional measure above those described in the original May 19, 2014 Isolation Plan and the May 29, 2014 Revised Isolation Plan. When all 55 SWBs were sampled the Permittees transitioned to sampling a subset of the 55 SWBs on a regular basis.

9) On July 25, 2014, the Permittees conservatively applied EPA Hazardous Waste Number D001 to the remediated and unremediated nitrate-salt bearing wastes stored at LANL. The following describes the Permittees' regulatory basis, reasoning and analysis for assigning this EPA Hazardous Waste Number. (See also, Permittees' letter to NMED dated September 5, 2014, ADESH-14-088.)

Unremediated Nitrate-Salt Bearing Waste. On May 22, 2014, LANL received analytical results from two samples taken from an unremediated nitrate salt-bearing waste drum stored at Area G, Dome 231. (These results were provided as Attachment A to the Permittees' letter to NMED dated September 5, 2014, ADESH-14-088). The results showed the presence of nitrate compounds listed on the US Department of Transportation (DOT) Division 5.1 Oxidizers table under the DOT rules at 49 CFR §173.127. EPA/NMED require hazardous wastes that qualify as a 5.1 DOT oxidizer to be managed as a RCRA waste (D001) under 40 CFR §261.21(a)(4). Although the analytical results apply to one (1) unremediated drum, the Permittees determined to conservatively label the remaining drums with the D001 Hazardous Waste Number.

Remediated Nitrate-Salt Bearing Waste. As described in CCP's *Acceptable Knowledge Summary Report for Los Alamos National Laboratory TA-55 Mixed Transuranic Waste* (CCP–AK-LANL-006, Rev. 13, which includes waste stream LA-MIN02-V-001), on page 142, LANL previously determined that these nitrate salts did not meet the definition of a DOT oxidizer. However, to further support managing these specific nitrate salt wastes as non-ignitable, LANL determined to remediate and repackage this waste with an inert material (e.g., zeolite/kitty litter) with a minimum absorbent material to nitrate salts mixture ratio of 1.5 to 1. This ratio was based on results of oxidizing solids testing performed by the Energetic Materials Research and Testing Center (EMRTC) and a white paper authored by the LANL-Carlsbad Office Difficult Waste Team (DWT), *Amount of Zeolite Required to Meet the Constraints Established by the EMRTC Report RF 10-13: Application to LANL Evaporator Nitrate Salts* (See, Attachment B to Permittees' letter to NMED dated September 5, 2014, ADESH-14-088). The EMRTC testing established the concentration at which the most reactive mixture of sodium and potassium nitrate becomes a non-oxidizer when mixed with either zeolite or grout. Based on the EMRTC testing, the LANL DWT concluded that the results can apply to LANL's non-cemented nitrate salts.

As previously reported, LANL remediated and repackaged certain nitrate-salt bearing waste containers using an organic kitty litter, and not a zeolite-based kitty litter (see Letter from Permittees to NMED Secretary Flynn dated July 1, 2014, *Addendum to the Los Alamos National Laboratory Hazardous Waste Facility Permit Reporting on Instances of Noncompliance and Releases for Fiscal Years 2012 and 2013*). This type of absorbent did not comport with the EMRTC testing or the LANL DWT recommendation.

To date, the Permittees have not sampled a remediated nitrate salt-bearing waste drum. Between July 22 and 29, 2014, LANL had surrogate samples of the waste tested by Southwest Research Institute of San Antonio, Texas. The surrogates were formulated using materials to approximate the remediated nitrate salt waste including *Swheat*™ kitty litter and a mixture of nitrate salts in both wet and dry samples. The samples were

analyzed using US Environmental Protection Agency's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) Method 1040 (which is based on a test method adapted from the United Nations regulations and classification procedures for the international transportation of dangerous goods) to determine whether the D001 designation code could apply.

On July 25, 2014, the Permittees received preliminary, un-validated results from this testing that indicated that the surrogates sampled could be classified as oxidizers. Based on these results, LANL determined that it could not exclude the application of D001 to the remediated nitrate salt-bearing wastes. Based on this information and consultation with the Carlsbad Field Office, LANL determined to conservatively apply D001 to the remaining remediated nitrate salt-waste containers stored at LANL.

The final analytical reports for this test and all of the other testing that has been conducted is included as Attachment 1.

10) On September 3-5, 2014, the Permittees had additional surrogate samples representative of the remediated waste tested by Southwest Research Institute of San Antonio, Texas to determine if the surrogate samples meet the DOT oxidizer criteria when tested in accordance with the UN Manual of Tests and Criteria under DOT rules at 49 CFR §173.127 (a) in addition to SW-846, Method 1040. The surrogates for the remediated nitrate salt waste were comprised of a mixture of *Swheat*™ kitty litter and sodium nitrate in a ratio of 3:1. This mixture represents the main components of interest in the remediated waste, i.e., the organic kitty litter and the principal nitrate salt as indicated by the May 22, 2014 analysis. The additional testing determined that the surrogate mixture was a DOT Oxidizer, Packing Group II by the DOT test and a Category II oxidizer by Method 1040. Additional analytical tests for ignitability have also been conducted on various surrogates related the investigation of nitrate-salt bearing wastes.

11) Attachment 2 contains correspondence between the Permittees, Waste Control Specialists (WCS), the Waste Isolation Pilot Plant (WIPP), and any other agencies related to the assignment of EPA Hazardous Waste Number D001 that were shipped to WCS and/or WIPP. The Permittees have not yet received copies of corrected manifests. However, upon receipt of the corrected manifests, the Permittees will provide them to NMED within 15 business days. Additionally, the Permittees are working to resolve manifest discrepancies with WIPP and WCS. The Permittees will provide NMED with any of the Permittees' additional correspondence on this issue.

12) In late February 2015, the Permittees identified an additional 3 parent containers designated as within waste stream LA-MIN04 to be suspect nitrate salt-bearing waste

containers. The 3 parent containers produced 10 daughter waste containers: 3 daughters are designated as LA-MDH01 (i.e., debris) and 7 daughters are designated as LA-MIN04. The 10 daughter waste containers are located at Waste Control Specialists (WCS) (2 containers), WIPP (4 containers), and LANL (4 containers). All 4 containers located at LANL are Pipe Overpack Containers (POCs). As a result of this reevaluation, the Permittees determined that the 10 daughter waste containers are suspected to hold nitrate salt-bearing waste.

On March 12, 2015, the Permittees identified an additional 2 parent waste containers designated as LA-MDH01 (i.e., debris) to be suspect nitrate salt-bearing waste containers. The parent waste containers produced 3 daughter waste containers also designated as LA-MDH01. The Permittees and CCP reviewed generator AK documentation, RTR videos, and conducted interviews with SMEs to determine if these 3 daughter waste containers held any nitrate-salt bearing wastes. As a result of this reevaluation, the Permittees determined that the 3 daughter waste containers, located at WIPP, were suspected to hold nitrate salt-bearing waste

~~11)~~13) ~~All 4 containers located at LANL are Pipe Overpack Containers (POCs)~~.

III. Waste Container Categories

The current inventory of nitrate salt-bearing waste containers stored at LANL can be divided into two categories: 1) remediated nitrate salt-bearing wastes; and 2) unremediated nitrate salt-bearing wastes. Additionally, there is a third category of containers that are cemented legacy and newly generated wastes that originated from the nitrate evaporator and cementation operations within TA-55.

To identify all of the nitrate salts-bearing waste containers generated, a focused review of the generator records was conducted. Unconsolidated nitrate salts were only generated at TA-55 in a specific room and glove box from 1979 through 1991. It is important to note that after 1991, all nitrate wastes were cemented.

Following review of generator records, it was determined that all of the nitrate salt parents exist as subsets in both a debris (LA-MHD01.001) and cemented (LA-CIN01.001-Cans) waste stream. The LA-MHD01.001 waste stream includes over a thousand containers, but only 164 original parent drums contained nitrate salts. LA-CIN01.001-Cans waste stream also includes over a thousand containers, but only 103 original parent drums contained nitrate salts.

In total, there were 267 original nitrate salt parent containers identified. A large portion of these 267 parent containers have been remediated into nitrate salt daughter containers. As a result, there are currently 707 nitrate salt-bearing waste containers. After remediation, all of the remediated nitrate daughters were assigned to two homogeneous absorption waste streams; LA-MIN02-V.001 and LA-MIN04-S.001. However, after RTR, daughter containers may have been re-assigned to a final waste stream based on the volume percentages of the final waste content.

Of the 707 identified nitrate salt-bearing containers, a total of 86 remain at LANL, 57 are remediated daughter containers and 29 are unremediated parent containers.

The above-referenced waste streams, LA-MHD01.001, LA-CIN01.001, LA-MIN02-V.001 and LA-MIN04-S.001 are not solely dedicated to nitrate salts. All other containers in waste streams LA-MHD01.001, LA-CIN01.001, LA-MIN02-V.001 and LA-MIN04-S.001 do not contain nitrate salts and do not require isolation or management as nitrate salts.

The Permittees' approach to the focused reviewed discussed above was conservative. The original list of 707 includes containers that contain nitrate salt-bearing waste or are suspected of containing nitrate salt-bearing waste.

Additional information on the Permittees' evaluation and identification of LANL nitrate salt drums is provided in the *Summary of Evaluation and Identification of LANL Nitrate Salt Containers*. (Attachment 3)

Ongoing internal reviews have produced new information as described in II.12 and II.13. If any additional nitrate salt-bearing waste containers are identified based on new information, these will be managed in the same manner as the currently identified nitrate salt-bearing waste containers. The Permittees will notify NMED during the technical calls established in Section IX below.

This plan addresses isolation, securing and/or treatment of the remediated ~~and unremediated,~~ nitrate salt-bearing wastes. In this plan, "remediated" containers are defined as LANL unconsolidated nitrate salts that were remediated with kitty litter absorbent and were repackaged into new drums. "Unremediated" containers are defined as LANL unconsolidated nitrate salts drums to which absorbent material has not been added. Isolation Plan, Revision 3, removes unremediated nitrate salt-bearing waste containers from secured isolation and allows for the storage of these waste containers in other compliant permitted storage at Technical Area (TA)-54, Area G.

The third category, cemented legacy and newly generated cemented wastes from the nitrate processing line at TA-55, is not addressed in this Isolation Plan, Revision 3~~2~~ because, as discussed in Section VII, per the definitions of ignitable and reactive in 40 CFR §264.21 and §264.23, legacy cemented nitrate waste generated since 1991, as well as newly generated cemented nitrate waste generated at ~~Technical Area (~~TA~~)~~-55, is not ignitable or reactive.

IV. Immediate Actions for Remediated Nitrate Salt-Bearing Waste Containers

There are currently ~~57~~61 remediated and suspect nitrate salt-bearing waste containers at LANL. The Permittees validated this number through review of data from the Waste Characterization and Action Tracking System (WCATS) database and a field walk-down verification. Below is a description of the activities the Permittees have already taken ~~and/or are currently underway~~ to address isolating, securing, and/or treating the remediated nitrate salt-bearing waste containers.

1) On May 16, 2014, LANS applied five LANL tamper indicating devices (TIDs) to drum number 68685 as shown in the attached photo (Attachment 4, photo 1). This TRU waste drum is the sister drum related to the suspect drum at WIPP (drum 68660 was confirmed as the damaged drum during the May 22, 2014 WIPP entry, and drum 68685 is its sibling). Additionally, a member of the DOE Los Alamos Field Office observed the application of the TIDs.

   On May 16, 2014, drum number 68685 was placed inside an SWB along with three empty dunnage drums (Attachment 4, photo 2) and was sealed. LANS applied two additional TIDs to either end of the SWB as shown in the attached photo (Attachment 4, photo 3).

On May 16, 2014, the empty parent containers for the two drums of initial interest (68660 and 68533) in the WIPP underground repository were identified onsite at LANL. As a result, LANS applied TIDs to both empty parent containers (69120 and 68359) during the early afternoon of May 16, 2014. This evolution was observed by DOE Los Alamos Field Office. Since that time S855793 was determined to be the parent container of drums 68685 and 68660.

These TIDs, and all subsequent TIDs, were installed in accordance with the LANL TID User Manual, NMCA-TID-FWI-002 R.1 (Attachment 5) by trained and qualified LANL TID users.

No additional TIDs have been applied to date, nor do the Permittees intend to install any additional TIDs at this time. However, additional TIDs will be applied as necessary to ensure that valuable information is not lost or as otherwise needed.

If directed to open the containers, the TIDs must be removed by qualified TID personnel in accordance with the TID User Manual (Section 3.21). In this instance, a two-person rule must be followed to verify chain of custody has been maintained and to verify that the TID has been properly destroyed once removed. Additionally, to ensure the TIDs are not removed without approval from the Facility Operations Director (FOD), they also have postings that clearly address that the TIDs cannot be removed without FOD approval.

2) On May 18, 2014, the Permittees completed overpacking the 57 remediated nitrate salt-bearing waste containers at LANL into SWBs. These containers were first placed into isolated storage in Dome 230 at TA-54, Area G, which has an active fire protection system. This dry-pipe fire protection system is not included within the LANL Hazardous Waste Facility Permit ("Permit"), Attachment D ("Contingency Plan") as it was inoperable during the re-application process for the Permit. This system became operable in November 2011, and currently the Permittees have chosen not to credit this system as fire control equipment in the Contingency Plan.

   Additionally, as described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Dome 230. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

3) The Permittees moved all remediated nitrate salt-bearing waste SWBs originally identified at LANL to the Permacon in Dome 375 located at TA-54, Area G. This move was completed on June 3, 2014. In the future, for operational efficiency, the Permittees may also utilize the Permacon in Dome 231 for storage of these containers.

4) The 4 newly identified suspect remediated nitrate salt-bearing waste containers located at LANL were moved from Domes 232 and 153 into the Permacon in Dome 375 on March 27, 2015.

~~4)~~5) As described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Domes 231 and 375. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

The Los Alamos Fire Department (LAFD) is manned and available 24-hours a day. They are able to utilize fire hydrants in the event of a fire or reaction. Additionally, the LANL emergency management organization is also on call 24-hours a day, and will respond promptly.

The Permacon in Dome 375 and the Permacon in Dome 231, as part of permitted units, are authorized under the LANL Permit for storage of mixed TRU wastes. The dry-pipe fire protection systems within the Permacons in the Domes are not included within the Permit Contingency Plan as the Permacons have been generally used for processing waste containers, a process that requires added safety / emergency controls more prescriptive than those of normal waste storage. Therefore, currently the Permittees have chosen not to credit these systems as fire control equipment in the Contingency Plan.

Pre-action fire suppression systems (FSSs) were installed in the Permacon within Dome 231 in November 2012, and in the Permacon within Dome 375 in February 2013. The FSSs are designed as an ordinary group 2 pre-action sprinkler system to protect the moderate hazard operations in the Permacon. Drawings of these FSSs are found in *TA-54 Area G Nitrate Salt Waste Container Response Instructions,* EWMO-AREAG-PLAN-1248, R.1 ~~EP-AREAG-PLAN-1248, R.0~~ (Attachment 6). This system uses water for fire suppression, which is compatible with the nitrate salt waste. Should the fire suppression system activate, Pad 9 has a fire water collection system that would contain water from the 231 Permacon FSS. Dome 375 has curbing that provides approximately 49,000 gallons of retention capacity.

The sprinkler system pre-action valve is automatically activated by a combination of any 2 of 3 types of electronic initiating devices located in the Dome or the Permacon: smoke detection, heat detection, or fire alarm pull stations. During an event, fire alarm pull stations can be accessed and manually activated by staff. Pull stations are located in accordance with National Fire Protection Association (NFPA) standards, and are in both Domes and both Permacons. Also, access is facilitated by maintaining emergency egress aisles with a minimum aisle space of two feet in the Domes and the Permacons. Further,

in compliance with Permit Section 3.5.1(1), the Permittees will maintain adequate aisle space to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the 231 and 375 Domes and Permacons. Finally, in the event of an abnormal condition, staff will evacuate quickly and will promptly report to 911, the operations center or the shift manager. Should an abnormal condition be observed, the Permittees will implement their emergency response plan and provide notice to NMED within 24 hours.

The Permacons are constructed of stainless steel frame and sheeting. They are contamination-control structures that are temperature-controlled and equipped with a High Efficiency Particulate Air (HEPA) filtration and fire suppression systems. The Permacons are also maintained at negative pressure. Additionally, the remediated drums werehave been overpacked into new SWBs and suspect nitrate salt-bearing waste are packaged in POCs. Since SWBs and POCs are considered robust enough to prevent lid loss due to deflagration or fire based on information in, according to DOE-STD-5506-2007, they would act as a barrier to provide a significant measure of worker protection. While the energy of the WIPP event in Panel 7, Room 7 has not been determined at this time, should an event occur, the 231 and 375 Permacons are designed to contain a radiological release.

5)6) The Permittees are monitoring, on a daily basis, the temperature of the SWBs and POCs that contain remediated or suspect nitrate salt-bearing waste drums. As discussed above, all remediated nitrate salt-bearing containers are overpacked in SWBs or are within POCs. Daily temperature measurements are taken of the external surface of the SWB using a calibrated infrared thermometer. The target temperature at which the nitrate salt-bearing waste containers are maintained in both the 375 and 231 Permacons is less than 90°F.

The Permittees will maintain records of all such temperature monitoring. These activities will be performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, EPWMO-AREAG-FO-DOP-1246, R.64 (Attachment 7). These records will be updated on a daily basis. The temperature data (both daily, and if conducted as an additional measure under Section I, hourly) that the Permittees have collected since the Isolation Plan was implemented was included with the Isolation Plan, Revision 2 as two attachments. The attachments were discs containing documentation of daily and hourly temperature measurements obtained by the Permittees up to the time the is attached to this Isolation Plan, Revision 2 at Attachment 8 (daily) and Attachment 9 (hourly). The Permittees began includingwill also include this temperature data in the daily written submissions provided to NMED, as established in Section IX below. Between the data included with the Isolation Plan, Revision 2 in Attachments 8 and 9 of that document and the data that the Permittees have already begun to provide in the daily

submissions, the Permittees have provided a current set of information to NMED. Additionally, these records and all temperature data (both daily, and if conducted as an additional measure under Section I, hourly) will be available to NMED for inspection.

The Permittees are also performing visual inspections of these containers on an hourly basis, 24 hours per day, to identify abnormal conditions (e.g., signs of smoking and fire, evidence of deterioration, bulging). These activities will be performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, ~~EP~~EWMO-AREAG-FO-DOP-1246, R.6~~4~~. The Permittees will maintain records of all such visual monitoring. (See, Attachment 7) These records will be updated on a daily basis and be available to NMED for inspection.

Additionally, the Permittees are using continuous air monitors (CAMs) with alarm capability, and will continue their use until further notice. There are CAMs in place in the 375 Permacon, two of which have remote alarm notification capability. These two remotely monitored CAMs provide remote notification if there is a significant airborne release (the 375 Permacon currently contains the LANL remediated nitrate salt-bearing waste). Additionally, there are CAMs in place in the 231 Permacon. Lastly, the Emergency Response/Hazardous Materials organization has been briefed on the storage configuration.

Action levels have been established and response instructions prepared. These are contained in LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, E~~P~~WMO-AREAG-FO-DOP-1246, R.6~~4~~ (Attachment 7). Should an abnormal condition be observed, the Permittees will implement their emergency response plan and provide notice to NMED within 24 hours. Area G's building emergency plan is found at Attachment 8~~10~~, and associated procedures are found at Attachments 9~~11~~, ~~12~~10 and ~~13~~11.

~~6)~~7) Remediated and suspect nitrate salt-bearing ~~SWBs~~ waste containers are spaced an adequate distance apart to limit any potential interactions between SWBs and POCs. This distance has been determined to be a minimum of 2 feet between containers. This distance is based on the Permittees' review of evidence from the event at WIPP, a calculation on the heat transfer from an SWB or POC undergoing a similar reaction, and a review of fire protection and Permit requirements.

The Permittees have reviewed photographs of the impacted drum in WIPP Room 7, Panel 7 and the adjacent containers. From the photographs, the adjacent drum and the adjacent SWB appear to have minimal damage and no release. The adjacent drums are in contact with the impacted drum and the adjacent SWBs are within inches of the impacted drum.

The Permittees have performed a preliminary calculation on the minimum separation distance between SWBs and POCs to ensure that an incident in one ~~SWB~~ container will not impact an adjacent ~~SWB~~container. Assuming the offending ~~SWB~~ container reaches a maximum temperature of approximately 1100°F and that the adjacent ~~SWB~~ container does not to exceed 200°F, the heat generated from the offending ~~SWB~~container drops off to below 200°F within 1 inch. The 2 foot spacing in use provides additional assurance that the adjacent ~~SWBs~~containers will not be impacted by the heat generated during an exothermic event in a single ~~SWB~~container. Drawings that include the locations of the containers are included in TA-54 Area G Nitrate Salt Waste Container Response Instructions, EWMO-AREAG-PLAN-1248, R.1 ~~EP-AREAG-PLAN-1248, R.0~~ (Attachment 6). The use of fire curtains in between ~~SWBs~~containers will not provide a measurable reduction in the thermal conductivity across the 24 inches but does provide protection from flame impingement.

SWBs and POCs are~~will be~~ placed in rows that allow for emergency egress and that have Permit compliant spacing between each row. ~~When~~ If used, the fire curtains will be placed within a row (that is, between the adjacent ~~SWBs~~ containers in that row) to mitigate the potential for interaction between adjacent ~~SWBs~~containers. While the temperatures of the event in Panel 7 have not been determined at this time, the Permittees have procured fire curtains that are rated to a continuous temperature of 1800°F and intermittent temperatures of 2500°F.

The NFPA consensus standards were also reviewed and NFPA 211 provided the most similar type of control. NFPA 211 covers the installation of chimney pipes and stoves and the distance recommended between the pipe and unprotected combustibles is 18 inches. There are no unprotected combustibles in the Permacons in Domes 231 and 375.

This 2 foot distance also meets the requirements in Permit Section 3.5.1(1). This section requires the Permittees to maintain adequate aisle space to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the 231 and 375 Domes and Permacons.

The Permittees may also use fire resistant curtains in lieu of spacing. ~~SWBs~~ Containers will be placed in rows that allow for safe egress and that have Permit compliant spacing between each row. ~~When~~ If used, the curtains will be placed within a row (that is, between the adjacent ~~SWBs~~ containers in that row) to mitigate the potential for interaction between adjacent ~~SWBs~~containers. While the temperatures of the event in Panel 7, Room 7 have not been determined at this time, the Permittees have procured fire curtains that are rated to a continuous temperature of 1800°F and intermittent

temperatures of 2500°F. Prior to using fire resistant curtains, the Permittees will discuss the details of their use with NMED during the technical calls established in Section IX below.

The Permittees will protect workers by restricting access to the remediated nitrate salt-bearing waste containers. Only those personnel performing the ongoing container monitoring activities (e.g., daily temperature monitoring), other sampling–/-data collection work (e.g., periodic head space gas sampling), and other required inspections (e.g., Permit required inspections) will be allowed into the storage areas. –This is documented in Standing Order EP-AREAG-SO-1247, R.2 1(Attachment 1412). Also, there will be warning signs posted at the entrance to the Permacons in Domes 231 and 375 that will inform personnel of access restrictions.

Additionally, all originally identified remediated nitrate salt-bearing waste has been recently were packed in new drums and overpacked into new SWBs, and suspect nitrate salt-bearing waste is located in POCs. Since SWBs and POCs are considered robust enough to prevent lid loss due to deflagration or fire, according to based on information in DOE-STD-5506-2007, they would act as a barrier to provide a significant measure of worker protection. No other protective shields or barriers are deemed necessary for the protection of workers at this time.

Furthermore, the ongoing data collection activities provide continuing information on the physical condition of the waste so that appropriate additional worker safety measures can be taken, if required.

7)8) Prior to moving nitrate salt-bearing containers, the Permittees will notify the LANL Emergency Operations Center (EOC). The EOC will notify the Los Alamos Fire Department and other responders, if needed. The Permittees will notify the EOC at the completion of the move. The Permittees do not anticipate that responders will be present during the movement of these containers, or that responders will be present / alerted during other actions.

8)9) The Permittees have updated all procedures and safety basis documents to convert the processing facilities into storage facilities.

9)10) SWBs will display the required labels for all inner containers or will be reclassified as a new container in WCATS. The 5761 subject containers (including the sister drum to the suspect drum in WIPP) have been clearly labeled with the appropriate warning labels and any other required labeling. –Specifically, the containers have the hazardous waste labels required by Permit Section 3.6(1). Additionally, the remediated nitrate salt-bearing waste containers are also marked as “Radioactive”, as required by Permit Section 3.6(1). In addition, the 4 POCs have been labeled as containing “Free

Liquids" and have been placed on adequate secondary containment within the Permacon in Dome 375

~~10)~~11) The Permittees have conducted headspace gas (HSG) sampling on all 55 SWBs that contain nitrate salt-bearing waste containers. Each SWB has been sampled for at least 7 days.

Gas chromatography with thermal conductivity detection is used for the analysis of He_2, H_2, O_2, N_2, CH_4, CO, CO_2, and NO_4 in HSG samples. The HSG sample data (H_2, CO_2, CO, and N_2O) that the Permittees have collected from the time ~~since~~ the Isolation Plan was implemented through September 11, 2014 is attached to this Isolation Plan, Revision ~~2~~3 at Attachment ~~15~~13. Between the data in Attachment ~~15~~13 and the data that the Permittees have already begun to provide in the daily submissions, the Permittees have provided a current set of information to NMED. Attachment ~~15~~13 also graphically presents the H_2, CO_2, CO, and N_2O data collected for each SWB, and the range of H_2 and CO_2 concentrations from the HSG for each.

Additionally, He_2 and CH_4 have not been detected in these samples, and O_2 and N_2 are observed at atmospheric concentrations. More detailed information on these compounds is available to the NMED at their request. If there is any change to this status, the Permittees will inform the NMED during the technical calls established in Section IX below.

The Permittees began this HSG sampling on May 19, 2014, when they began daily HSG sampling of SWB 68685. This SWB contains TRU waste drum 68685 which is the sister drum related to the suspect drum at WIPP.

On June 18, 2014, the Permittees began HSG sampling on the additional SWBs containing nitrate salt-bearing waste containers, in order to better be able to compare and evaluate results against SWB 68685. On July 24, 2014, the Permittees began daily HSG sampling of SWB SB50522. On August 13, 2014, LANL had conducted HSG sampling of all 55 SWBs that contain remediated nitrate salt-bearing waste. The Permittees transitioned to sampling a subset of the 55 SWBs on a regular basis (this subset may change over time). All of this headspace gas monitoring was an additional measure above those described in the original May 19, 2014 Isolation Plan and the May 29, 2014 Revised Isolation Plan.

On September 3, 2014, upon receipt (email) of the NMED's letter dated August 29, 2014, the Permittees immediately resumed daily HSG sampling of SWBs 68685 and SB50522. (The Permittees had been sampling both of these containers on a daily basis until August 28, 2014, when they shifted sampling to twice per week. The Permittees had also conducted HSG sampling of both SWBs on September 2, 2014.)

The Permittees will continue to conduct HSG sampling. This HSG sampling will measure concentrations of H_2, CO_2, CO and N_2O. The Permittees will:

1. Conduct daily HSG sampling of SWB SB50522 and the SWB that contains 68685.

2. Periodically sample HSG of all other SWBs that contain nitrate salt-bearing waste containers. This HSG sampling ~~will be~~ occurs on a schedule that ~~provides~~ ensures that each of these SWBs and POCs ~~will be~~ are sampled for HSG at least once per calendar month. The Permittees ~~will begin~~ began implementation of this monthly HSG sampling in ~~October~~September, 2014 ~~upon NMED approval of this plan~~. The~~is~~ monthly schedule is supported by the graphical presentations of the H_2, CO_2, CO and N_2O data in Attachment ~~15~~13 which indicate stability in the analyzed gas constituents ~~. This monthly schedule~~ and is protective of human health and the environment.

HSG sampling was conducted for at least 7 days on the 4 newly identified POCs. After the 7 day sampling was completed, the POCs were added to the monthly schedule described above. The Permittees will include this HSG data (H_2, CO_2, CO and N_2O) in the daily written submissions provided to NMED, as established in Section IX below.

Additionally, as part of initial investigations, the Permittees have performed solid phase micro-extraction (SPME) analyses. This work is being performed as part of the Permittees additional measures under Section I. SPME monitors for trace levels of organic compounds (< 1ppm). The detection limits for organic compounds without SPME is sufficient to establish that concentrations of organic vapors do not approach flammability limits. SPME was performed for the purpose of detecting organic molecules which could be an ignition initiator at very low concentrations. No noteworthy detections of compounds have been observed. A summary of this data is available as Attachment 14~~16~~.

~~11)~~12) The Permittees ~~have~~ evaluated the HSG data (H_2, CO_2, CO, and N_2O) collected from SWB SB50522 collected from July 24, 2014 through September 11, 2014. SB50522 contains 4 drums, with the following container identification numbers and waste stream identification numbers:

- Container 69490 (LA-MIN02-V.001)
- Container 69271 (LA-MIN03-NC.001)
- Container 68799 (LA-MIN03-NC.001)
- Container 57653 (LA-CIN01.001)

The range (high to low) of H_2 levels the Permittees ~~have~~ observed ~~during~~ in HSG ~~sampling~~ data during that time frame was ~~is~~ 28,020 parts per million (ppm) to 6,986 ppm. On July 30, 2014, the Permittees installed additional filters in the SWB to decrease concentrations. This approach was successful and concentrations of H_2 ~~have since been maintained~~ are present at a lower level. ~~–~~ ~~Since~~ Form August 18, 2014 through September 11, 2014,~~,~~ H_2 levels ~~have~~ remained below 10,000 ppm. The range (high to low) of CO_2 levels the Permittees ~~have~~ observed ~~during~~ in HSG ~~sampling is~~ data was 76,858 ppm to 39,338 ppm during that time frame.

The range of temperature measurements the Permittees ~~have~~ observed during hourly temperature measurements through September 11, 2014 ~~is~~ were~~as follows~~:

SB50522 Temperature	Degrees Fahrenheit
High	83.7
Low	55.5

For comparison the ambient temperature range in Dome 375 Cell 1 where SB50522 is located during the same time period is:

Dome 375 Cell 1 Temperature	Degrees Fahrenheit
High	85.1
Low	54.9

Prior to packaging the four containers into SB50522, the Permittees conducted flammable gas analysis on three of the containers (57653, 69271 and 69490) ~~prior to packaging them into the SWB~~. (Note: although flammable gas analysis is not required for the LA-MIN03-NC.001 waste stream it was conducted for 69271.) The Quantitation Reports for flammable gas analysis for these three containers are provided at Attachment 15~~17~~.

The HSG data for SB50522 is presented in Attachment 13~~15~~. This Attachment also graphically presents the H_2, CO_2, CO and N_2O data collected.

~~12)~~13) The Permittees ~~have~~ also evaluated the HSG data (H_2, CO_2, CO, and N_2O) collected from all of the SWBs with remediated nitrate salt-bearing waste.

As background information, radiolytic processes produce simple gas molecules from the interaction of radiation with organic and inorganic material in TRU waste. Hydrogen is

typically the principal gas produced from the interaction of radiation with organic material. During headspace analysis for hydrogen, levels of other gases including CO, CO_2, and N_2O are also measured. Gaseous CO_2 can also be formed from radiolysis, and its concentration depends on the specific composition of the waste. From studying the radiolysis of selected simulated TRU waste, the relative amount of CO_2 and H_2 that is produced has been established under a range of conditions. From these investigations, the ratio of the amount of CO_2 to H_2 produced was greatest for poly vinyl chloride, with a maximum ratio for this material to be 6.5 CO_2/H_2. Other waste types did not produce as much CO_2 and therefore this ratio would be less than 6.5.

The conducted HSG analysis initially selected revealed that some drums had CO_2 to H_2 ratios of >100. This suggests that gas generation in some cases cannot be attributed solely to radiolysis of the waste. This supposition is reinforced by the observation of nitrous oxide > 1,000 ppm, which would likely be indicative of nitrate salt chemistry. Atmospheric concentrations for these gases are approximately 450 ppm and 350 parts per billion (ppb) respectively.

LANL began characterizing the headspace gas of 55 SWBs containing remediated nitrate salt-bearing waste for Volatile Organic Compounds (VOCs) by Gas Chromatography/ Mass Spectrometry (GC-MS) and for permanent gases using GC with a Thermal Conductivity Detector (GC-TCD). Permanent gases are those that remain gaseous at standard temperature and pressure. Daily monitoring of a subset of these 55 SWBs was initiated on May 19, 2014. All 55 SWBs have now been characterized. Elevated concentrations of HSG compounds have been observed at concentrations well above normal atmospheric concentrations in some of these 55 SWBs (Attachment 13~~15~~). These concentrations cannot be explained based on radiolysis of waste drum content and suggest that the gases are being produced from other processes. Specifically, N_2O is believed to result from the oxidation of material contained within the nitrate salt containing waste. The N_2O concentrations observed, ranging from (100 – 9000 ppm), are above the normal atmospheric concentration of ~ 350 ppb. The Permittees have ongoing work that may provide insight into this chemistry.

While high CO_2 concentrations (and potentially the ratio of CO_2 and H_2) are expected to be proportional to the magnitude of potential changes taking place in any given drum, they are not, on their own an indicator of significant changes to the waste within the container. To date, LANL has collected over 700 HSG samples. The graphical representation of this HSG data indicates stability in the analyzed gas constituents and supports the monthly sampling schedule set out in Section IV.10 above.

The Permittees initially suspected the CO_2- to H_2 ratio might be an indicator of radiolytic decomposition, and tracked that ratio. However, analysis of the HSG data (H_2, CO_2, CO,

and N_2O) gathered to date indicates there are potentially other gas generating mechanisms occurring within some containers. The concentrations of oxidation products (e.g.: CO_2 and N_2O) is ancillary to the H_2 concentration measurement. While it provides additional insight into the nitrate salt-bearing waste, the Permittees no longer consider tracking the CO_2 to H_2 ratio to be a useful indicator. The Permittees have focused ongoing analyses on the monitoring of H_2 concentrations and temperature measurements rather than ratio of CO_2 and H_2 because: the lower flammability limit (LFL) for H_2 is established; both H_2 gas concentrations and temperature are readily measured; and actionable levels can be established. The H_2 and temperature measurements are a more direct way to monitor potential changes in the waste.

~~13)~~14) The Permittees conclude that the concentration of H_2 is an appropriate indicator to track and to use as a basis for action levels to trigger specific actions.

If the Permittees observe an H_2 concentration at or above 20,000 ppm (~50% of the lower explosive limit [LEL]), they will conduct daily HSG (H_2, CO_2, CO, and N_2O) for that SWB.

If the Permittees observe an H_2 concentration at or above 30,000 ppm (~75% of the LEL), they will install additional filters in the SWB, if the SWB is configured to accept additional filters. (This approach was successfully implemented by the Permittees with SB50522. Concentrations of H_2 were reduced after the installation of additional filters in that SWB, and have since been maintained at a lower level.)

If additional filters cannot be added to the SWB or if concentrations are not reduced to below 30,000 ppm at the next daily HSG sample, then the Permittees will apply a 15 foot stand-off exclusion zone. (The stand-off exclusion zone is a 15 foot area that is used at LANL to surround a container that is or has become unvented, thereby unable to vent contents adequately. This area is segregated from normal operations except those operations specific to disposition or inspection of the container of concern. Surrounding containers may exist in the exclusion zone. Entry into the exclusion zone is controlled by the FOD who will determine what actions can be taken – including entry for sampling, temperature measurements or visual monitoring.) This approach is consistent with the hazard analysis that has been performed for an unvented drum discovery. The Permittees will notify LANL Emergency Management to assume responsibility for the container if the container poses a threat, e.g. bulging.

The Permittees will include this HSG data (H_2, CO_2, CO, and N_2O) in the daily written submissions provided to NMED, as established in Section IX below.

~~15)~~The isolation configuration described in this Section IV continues to be protective of human health and the environment in light of the observed concentrations of H_2 and CO_2

in SWBs, and in light of the conservative assignment of EPA Hazardous Waste Number D001. The facility being used for isolation is compliant with the LANL Hazardous Waste Facility Permit. The fire suppression systems, climate control and filtration systems, and other mechanisms described above are designed to protect human health and the environment in the event of a reaction within a container, a release, a fire, or an explosion. The Permittees continue to evaluate the effectiveness of the isolation configuration and will make changes to this configuration as appropriate.

~~14)~~15)

V. ~~–~~Immediate Actions for Unremediated Nitrate Salt–Bearing Waste Containers

There are currently 29 unremediated nitrate salt-bearing waste containers at LANL. The Permittees validated this number through review of data from the WCATS database and a field walk-down verification. Below is a description of the activities DOE/LANS ~~have~~ implemented ~~and intend to implement to address~~ isolating, securing, and then removing from isolation ~~/or treating~~ the unremediated nitrate salt-bearing waste containers.

1) The 29 unremediated containers were first placed into isolated storage in Dome 230 at TA-54, Area G, which has an active fire protection system. ~~-~~This dry-pipe fire protection system is not included within the Permit Contingency Plan as it was inoperable during the re-application process for the Permit. ~~-~~This system became operable in November 2011, and currently the Permittees have chosen not to credit this system as fire control equipment in the Contingency Plan.

   Additionally, as described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Dome 230. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

~~2)~~ The Permittees moved all unremediated nitrate salt-bearing waste SWBs at LANL to the Permacon in Dome 231 located at TA-54, Area G. This move was completed on June 3, 2014. ~~In the future, for operational efficiency, the Permittees may also utilize the Permacon in Dome 375 for storage of these containers.~~

~~The Permit provides additional precautions for the storage of waste with the EPA Hazardous Waste Number D001. These precautions are found at Part 2.8.1 of the Permit.~~

~~As described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Domes 231 and 375. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants.~~

These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

- The LAFD is manned and available 24-hours a day. They are able to utilize fire hydrants in the event of a fire or reaction. Additionally, the LANL emergency management organization is also on call 24-hours a day, and will respond promptly.

- The Permacon in Dome 375 and the Permacon in Dome 231, as part of permitted units, are authorized under the LANL Permit for storage of mixed TRU wastes. These dry-pipe fire protection systems are not included within the Permit Contingency Plan as the Permacons have been generally used of processing waste containers. A process that requires added safety / emergency controls above and beyond those of normal waste storage. Therefore, currently the Permittees have chosen not to credit these systems as fire control equipment in the Contingency Plan.

- Pre-action FSSs were installed in the Permacon within Dome 231 in November 2012, and in the Permacon within Dome 375 in February 2013. The FSSs are designed as an ordinary group 2 pre-action sprinkler system to protect the moderate hazard operations in the Permacon. Drawings of these FSSs are found in *TA-54 Area G Nitrate Salt Waste Container Response Instructions*, EP-AREAG-PLAN-1248, R.0 (Attachment 6). This system uses water for fire suppression, which is compatible with the nitrate salt waste. Should the fire suppression system activate, Pad 9 has a fire water collection system that would contain water from the 231 Permacon FSS. Dome 375 has curbing that provides approximately 49,000 gallons of retention capacity.

- The sprinkler system pre-action valve is automatically activated by a combination of any 2 of 3 types of electronic initiating devices located in the Dome or the Permacon: smoke detection, heat detection, or fire alarm pull stations. During an event, fire alarm pull stations can be accessed and manually activated by staff. Pull stations are located in accordance with National Fire Protection Association standards, and are in both Domes and both Permacons. Also, access is facilitated by maintaining emergency egress aisles with a minimum aisle space of two feet in the Domes and the Permacons. Further, in compliance with Permit Section 3.5.1(1), the Permittees maintain adequate aisle space to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the 231 and Domes and Permacons. Finally, in the event of an abnormal condition, staff will evacuate quickly and will promptly report to 911, the operations center or the shift manager. Should an abnormal condition be observed, the Permittees will implement their emergency response plan and provide notice to NMED within 24 hours.

2) ~~The Permacons are constructed of stainless steel frame and sheeting. They are contamination control structures that are temperature controlled and equipped with a HEPA filtration and fire suppression systems. The Permacons are also maintained at negative pressure. Additionally, the unremediated drums have been overpacked into 85-gallon drums of good integrity. While the energy of the WIPP event in Panel 7, Room 7 has not been determined at this time, should an event occur, the 231 and 375 Permacons are designed to contain a radiological release~~.

3) The Permittees ~~are~~ monitor~~ed~~ing, on a daily basis, the temperature daily of the 85-gallon overpacks that contain unremediated nitrate salt-bearing waste drums from the time the Isolation Plan was implemented until the approval of the Isolation Plan, Revision 3. Daily temperature measurements ~~are~~ were taken of the external surface of the 85-gallon overpack using a calibrated infrared thermometer. The target temperature at which the nitrate salt-bearing waste containers ~~are~~ were maintained while in isolation ~~in both the 375 and 231 Permacons is~~ was less than 90°F.

   The Permittees will maintain records of all such temperature monitoring. These activities ~~will be~~ were performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, E~~P~~WMO-AREAG-FO-DOP-1246, R.6~~4~~ (Attachment 7). These records will be updated on a daily basis. The temperature data (both daily, and if conducted as an additional measure under Section I, hourly) that the Permittees ~~have~~ collected since the Isolation Plan was implemented was included with the Isolation Plan, Revision 2 as two attachments. The attachments were discs containing documentation of daily and hourly temperature measurements obtained by the Permittees up to the time the ~~is attached to this Isolation Plan, Revision 2 at Attachment 8 (daily) and Attachment 9 (hourly). The~~ Permittees began including ~~will also include this~~ temperature data to NMED in the daily written submissions provided to NMED, as established in Section IX below. Between the data included with the Isolation Plan, Revision 2 in Attachments 8 and 9 of that plan and the data that the Permittees have ~~already begun to~~ provided in the daily submissions, the Permittees have provided a current set of information to NMED. Additionally, these records and all temperature data (both daily, and if conducted as an additional measure under Section I, hourly) will be available to NMED for inspection.

   The Permittees ~~are~~ also perform~~ed~~ing visual inspections of these containers on an hourly basis, 24 hours per day, to identify abnormal conditions (e.g., signs of smoking and fire, evidence of deterioration, bulging) from the time the Isolation Plan was implemented until the approval of the Isolation Plan, Revision 3. These activities ~~will be~~ were performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, EWMO~~P~~-AREAG-FO-DOP-1246, R.6~~4~~. The Permittees will maintain records of all such visual monitoring~~.~~ (see Attachment 7). These records will be updated on a daily basis and be available to NMED for inspection.

Additionally, the Permittees ~~are using~~ used continuous air monitors (CAMs) with alarm capability~~, and will continue their use until further notice~~. ~~There are CAMs in place in the 375 Permacon, two of which have remote alarm notification capability. These two remotely monitored CAMs provide remote notification if there is a significant airborne release (the 375 Permacon currently contains the LANL remediated nitrate salt-bearing waste). Additionally, t~~There ~~are~~ were CAMs in place in the 231 Permacon for the entire time unremediated nitrate salt-bearing waste containers were stored within the Permacon. Lastly, the Emergency Response/Hazardous Materials organization ~~has been~~ were briefed on the storage configuration while the containers~~y~~ were isolated~~.~~

~~Action levels have been established and response instructions prepared. These are contained in LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, EWMOP-AREAG-FO-DOP-1246, R.4 (Attachment 7). Should an abnormal condition be observed, the Permittees will implement its emergency response plan and provide notice to NMED within 24 hours. Area G's building emergency plan is found at Attachment 10, and associated procedures are found at Attachments 11, 12 and 13~~.

~~4)~~ During isolation, ~~U~~unremediated nitrate salt-bearing containers ~~will be~~ were spaced an adequate distance apart to limit any potential interactions with other containers. This distance has been determined to be 2 feet between containers. This distance was~~is~~ based on the Permittees' review of evidence from the event at WIPP, a calculation on the heat transfer from an SWB undergoing a similar reaction, and a review of fire protection and Permit requirements~~.~~

~~The Permittees have reviewed photographs of the impacted drum in WIPP Room 7, Panel 7 and the adjacent containers. From the photographs, the adjacent drum and the adjacent SWB appear to have minimal damage and no release. The adjacent drums are in contact with the impacted drum and the adjacent SWBs are within inches of the impacted drum.~~

~~The Permittees have performed a preliminary calculation on the minimum separation distance between SWBs to ensure that an incident in one SWB will not impact an adjacent SWB. Assuming the offending SWB reaches a maximum temperature of approximately 1100°F and that the adjacent SWB does not to exceed 200°F, the heat generated from the offending SWB drops off to below 200°F within 1 inch. The 2 foot spacing in use provides additional assurance that the adjacent SWBs will not be impacted by the heat generated during an exothermic event in a single SWB. Drawings that include the locations of the containers are included in TA-54 Area G Nitrate Salt Waste Container Response Instructions, EP-AREAG-PLAN-1248, R.0 (Attachment 6). The use of fire curtains in between SWBs will not provide a measurable reduction in the thermal conductivity across the 24 inches but does provide protection from flame impingement.~~

~~SWBs will be placed in rows that allow for emergency egress and that have Permit compliant spacing between each row. When used, the fire curtains will be placed within a row (that is, between the adjacent SWBs in that row) to mitigate the potential for interaction between adjacent SWBs. While the temperatures of the event in Panel 7 have not been determined at this time, the Permittees have procured fire curtains that are rated to a continuous temperature of 1800°F and intermittent temperatures of 2500°F.~~

~~The NFPA consensus standards were also reviewed and NFPA 211 provided the most similar type of control. NFPA 211 covers the installation of chimney pipes and stoves and the distance recommended between the pipe and unprotected combustibles is 18 inches. There are no unprotected combustibles in the Permacons is Domes 231 and 375.~~

~~This 2 foot distance also meets the requirements in Permit Section 3.5.1(1). This section requires the Permittees to maintain adequate aisle space to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the 231 and 375 Domes and Permacons.~~

4) ~~The Permittees may also use fire resistant curtains may be used in lieu of spacing. Containers will be placed in rows that allow for safe egress and that have Permit compliant spacing between each row. When used, the curtains will be placed within a row (that is, between the adjacent containers in that row) to mitigate the potential for interaction between adjacent containers. While the temperatures of the event in Panel 7, Room 7 have not been determined at this time, the Permittees have procured fire curtains that are rated to a continuous temperature of 1800°F and intermittent temperatures of 2500°F. Prior to using fire resistant curtains, the Permittees will discuss the details of their use with NMED during the technical calls established in Section IX below~~.

5) During isolation, t~~T~~he Permittees ~~will protect~~ protected workers by restricting access to the unremediated nitrate salt-bearing waste containers. ~~-~~Only those personnel performing the ongoing container monitoring activities (e.g., daily temperature monitoring), other sampling~~–~~/-data collection work (e.g., periodic head space gas sampling), and other required inspections (e.g., Permit required inspections) ~~will be~~ were allowed into the storage areas. ~~–~~This is documented in Standing Order EP-AREAG-SO-1247, R.~~1~~2 (Attachment 12~~14~~). Also, there ~~will be~~ were warning signs posted at the entrance to the Permacon~~s~~ in Dome~~s~~ 231 informing ~~and 375 that will inform~~ personnel of access restrictions.

   Additionally, all unremediated nitrate salt-bearing waste is in 55-gallon drums that have been overpacked into 85-gallon containers of good integrity.

This waste has been stored above-ground for many years and the Permittees. No other protective shields or barriers are deemed necessary for the protection of workers at this time.

6) Furthermore, the ongoing continued data collection activities to provide continuing information on the physical condition of the waste so that appropriate additional worker safety measures couldcan be taken, if required.

7) Further evaluation of unremediated nitrate salt waste has led to the conclusion that the 29 unremediated nitrate salt-bearing waste containers do not require specific isolation from other waste containers stored at permitted units at TA-54 Area G. Unremediated salts are determined to not present the potential hazard of spontaneous combustion or enhanced combustion in their current configuration; therefore, they can be stored in any area in which combustible material is minimized and separated from the nitrate salt waste containers, without fear of a release. Attachment 16 for this Isolation Plan details the assessment conducted to reach this conclusion.

6) As a result of this evaluation, the Permittees will remove the 29 unremediated nitrate salt-bearing waste containers located within the Dome 231 Permacon from isolation and into a compliant permitted storage unit at TA-54, Area G, Pad 9 within Dome 230. Storage of the waste containers within Dome 230 will Prior to moving nitrate salt-bearing waste containers, the Permittees will notify the LANL EOC. The EOC will notify the LAFD and other responders, if needed. The Permittees will notify the EOC at the completion of the move. The Permittees do not anticipate that responders will be present during the movement of these containers, or that responders will be present / alerted during other actions.

7) The Permittees have updated all procedures and safety basis documents to convert the processing facilities into storage facilities.

The isolation configuration described in this Section V continues to be protective of human health and the environment. iIn light of the conservative assignment of EPA Hazardous Waste Number D001 and D002 (D002 conservatively assigned to some containers as described above), storage of the containers will meet all applicable conditions in Permit Section 2.8 and all other applicable sections of . The facility being used for isolation is compliant with the LANL Hazardous Waste Facility Permit. The fire suppression systems, climate control and filtration systems, and other mechanisms described above are designed to protect human health and the environment in the event of a reaction within a container, a release, a fire, or an explosion. The Permittees continue to

~~evaluate the effectiveness of the isolation configuration and will make changes to this configuration as appropriate~~.

8)

Dome 230 at TA-54, Area G, is equipped with an active dry-pipe fire protection system. Additionally, as described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Dome 230. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

Additional precautions that will be maintained for these containers of ignitable waste include:

- Waste will be stored with adequate aisle space (at least 2 feet) and separate from other wastes within the permitted unit.
- The waste will be protected from sources of ignition by facility procedure.
- Sources of open flames will not be allowed in, on, or around the containers and smoking is not permitted within the boundaries of TA-54, Area G.
- Dome 230 has appropriate lightning protection for storage of ignitable waste.
- Non-sparking tools will be used when managing ignitable waste containers (e.g. opening waste container or sampling waste).
- Movement of the containers will be achieved using a drum grappler or a forklift with the container strapped to the mast.
- Although Dome 230 is designed for secondary containment, the 26 unremediated nitrate salt-bearing waste containers that have free liquids will be stored on secondary containment pallets. The remaining 3 containers will be stored elevated.
- Waste containers will not be stacked.

VI. ~~VI.~~ Remediation Planning

1) The Permittees have established a "Remediation Team" to identify a path forward for remediation of these containers as necessary and appropriate. The Remediation Team has met regularly. The Permittees have met with NMED on ~~two~~ multiple occasions to discuss the Team's progress, and will continue these communications.

~~2)~~ As discussed in Paragraphs IV.2 and IV.3 above, the Permittees have overpacked the 57 remediated nitrate salt-bearing waste containers at LANL into 55 SWBs. These 55

SWBs are currently located in the Permacon in Dome 375. As discussed in IV.4 above, an additional 4 POCs are also located in the Permacon in Dome 375.

~~In order to take the first steps toward remediation and to further isolate the remediated nitrate salt-bearing waste containers, the Permittees will meet with NMED to have detailed discussions on the progress of remediation plans and schedules, including but not limited to, the processes, location and regulatory pathways to treat and stabilize the nitrate salt-bearing waste and remove the characteristics of ignitability (D001) and/or corrosivity (D002). The initial meeting is anticipated to discuss the potentially 'de-nesting' the 55 SWBs containing remediated nitrate salt-bearing waste containers. By the term de-nesting, the Permittees mean physically segregating (1) the non-nitrate salt-bearing waste containers out of these SWBs, and (2) move co-located nitrate salt bearing waste containers into separate SWBs. The result would be that the 57 remediated nitrate salt-bearing containers will be separately overpacked in 57 SWBs.~~

~~The Permittees would also like to discuss the collection of additional data during any de-nesting activities, including potentially opening all the SWBs to perform a visual inspection of the internal remediated nitrate salt-bearing waste drum(s), attaching thermocouples to the outside of each remediated nitrate salt-bearing waste container, measuring the gas evolution (flow rate) from each drum and collecting head space gas samples from the waste containing drums, including the remediated nitrate salt-bearing waste drums.~~

NMED and the Permittees have had initial discussions on these potential remediation actions and ~~. T~~the Permittees will continue their contact with NMED to set meeting(s) to discuss these potential actions in more detail. The Permittees will use these meetings to help develop a proposal for submission to NMED.

~~3)~~2) Any treatment plans or proposals that are developed by the Remediation Team shall be discussed with NMED. These plans or proposals shall include, but not be limited to, the neutralization steps, the reagents used, the location of the process for treating wastes, and any other key specific information related to all potential treatment ~~and neutralization~~options. Any treatment plans that are developed shall detail which characteristic (toxicity, reactivity, ignitability, corrosivity) mixed TRU wastes the Permacons (or other locations) are authorized to treat – including, as appropriate, the removal of the characteristics of ignitability (D001) and/or corrosivity (D002). Permittees shall discuss with NMED any permit modifications or authorizations that may be necessary for treatment of the nitrate salt-bearing wastes.

~~4)~~ The key events, actions and activities to be documented as specified in the treatment plan. The Permittees will maintain records of all key events, actions and activities

related to the disposition of the unremediated nitrate salt-bearing waste as documented in the treatment plan (e.g. safe storage configuration, the neutralization steps, the reagents used, the location of the process for treating drums). These records will be updated on a daily basis and be available to NMED for inspection.

3)

VII. ~~VII.~~ Cemented Legacy and Newly Generated Cemented Nitrate Salt-Bearing Waste

Since 1991, the nitrate salt waste stream generated from the evaporator process at TA-55 has been sent to cement fixation immediately upon generation. Remediated and unremediated nitrate salt-bearing waste containers generated at TA-55 prior to 1991 are discussed above. Additional information about the review that the Permittees conducted to identify containers with nitrate salt-bearing waste is included in Enclosure ~~3~~ 2 of the Permittees' letter to NMED dated September 19, 2014 (DIR-14-149). This enclosure also includes a discussion on how the evaluation was conducted for a specific subset of waste containers (all of which were pre-1991 containers).

There are approximately 378 containers of post-1991 cemented nitrate salt containers within the LANL Area G inventory.

The cementation process removes characteristics of ignitability and reactivity from the nitrate salt waste stream. Nitrate salt waste containers generated at TA-55 after 1991 have been cemented and are therefore not ignitable per the definition in 40 CFR §264.21 (Characteristic of Ignitability) or reactive per the definition in §264.23 (Characteristic of Reactivity).

The waste characterization by Acceptable Knowledge used at TA-55 to demonstrate that the cement from the stabilization process meets the waste acceptance criteria at WIPP was centered around two primary elements (1) no free liquids were present in the cemented waste and 2) the Portland cement created an inert solid monolith. These elements support the determination that the waste does not exhibit the characteristics of ignitability and reactivity.

The ignitability characteristic is not a concern for the following reasons: (1) the cement from the stabilization process is a solid and does not meet the definition of a liquid per 40 CFR 261.21(a)(1); (2) the cement has never exhibited the characteristic of an ignitable solid that is capable "under standard temperature and pressure of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard" per 40 CFR 261.21(a)(2); and (3) the cement has never exhibited oxidizing behavior per 40 CFR 261.21(a)(4).

The reactivity characteristic has never been observed regarding cement. The cement has never exhibited the following properties per 40 CFR 261.23: (1) it is normally unstable and readily undergoes violent change without detonating; (2) it reacts violently with water; (3) it forms potentially explosive mixtures with water; (4) when mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment; (5) it is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement; and (6) it is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

The basis for this determination has been established by direct personnel observations, the facility operating record, and the chemical nature of the Portland cement used in the LANL stabilization process. LANL staff has never observed any ignitable or reactive behavior associated with the cemented waste from the stabilization process. Facility records also confirm that no ignitable or reactive behavior was ever observed from the cemented waste. Lastly, Portland cement by its chemical nature will not react with oxidizers and has no available hydrogen, oxygen, and carbon molecules to help sustain a reaction. In addition, the stabilization process produces a solid monolith, which is an absorber of heat, further reducing any potential for reactive behavior within the cement matrix.

Characterization and stabilization (cementation) treatment of newly generated evaporator bottom waste at TA-55 is conducted in accordance with the Permit as approved. The waste treated at the TA-55 Mixed Waste Stabilization Unit is characterized using the procedure outlined in Permit Attachment C (Waste Analysis Plan), Section C.3.2.4.

Based on the above facts, the Permittees recommend that no further controls be implemented for the cemented legacy and newly generated cemented nitrate salt-bearing waste generated since 1991.

VIII. Immediate Action Implementation Schedule

Activity	**Due Date**
Remediated Nitrate Salt-Bearing Waste Containers	
Overpacking (into SWBs) of all nitrate salt-bearing wastes at LANL	Completed 5/18/14
Movement of SWBs to designated areas (e.g., Domes 230, 231 and 375) – (Remediated nitrate salt-bearing drums were in Dome 230, but have – been moved to the 375 Permacon)	Move to Dome 230 completed on 5/1/14. All remaining moves completed on 6/3/14

Activity	**Due Date**
Daily/Hourly monitoring of containers	Daily monitoring began on 5/1/14. Hourly monitoring began on 5/17/14
Appropriate spacing of SWBs	Completed in Dome 230 on 5/1/14. Completed in Dome 375 & 231 Permacons on 6/3/14
Updating procedures/safety basis documents as appropriate	Completed on 5/30/14
Labels for SWBs (display inner container label)	Completed 5/18/14
Remediation Team kick off	Completed 5/20/14
Unremediated Nitrate Salt-Bearing Containers	
Movement of 85-gallon drums to designated areas (e.g., Domes 230, 231 ~~—~~and 375)	Began in Dome 230 on 5/1/14. All remaining moves completed on 6/3/14
Daily/Hourly monitoring of containers	Daily/Hourly; began on 5/20/14
Appropriate spacing of containers	Completed in Dome 230 on 5/1/14. Completed in Domes 375 and 231 Permacons on 6/3/14
Updating procedures/safety basis documents as appropriate	5/30/14
Remediation Team kick off	Completed 5/20/14

IX. Updates/Submissions

The Permittees shall provide updates to NMED during the twice weekly pre-scheduled technical calls. The Permittees shall also provide updates to NMED in the form of daily written submissions that will be sent to NMED via electronic mail (email) by close of business (COB) on a daily basis until NMED indicates otherwise. For purposes of this Plan, daily refers to business days, and excludes state and federal holidays.

All submissions related to this Order shall be placed in both the electronic and hard-copy Information Repositories within five (5) working days of submission to NMED.

All procedures and plans attached to this Revised Isolation Plan may be revised by the Permittees as required. Revisions will be submitted to NMED and placed in Information Repositories as required in this Section IX.

All submissions required by NMED's Order will be sent to the following addresses:

Bureau Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87508-6303

Division Director
Environmental Health Division
Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
Santa Fe, New Mexico 87502-5469

ENCLOSURE 2

LANL Nitrate Salt-Bearing Waste Container Isolation Plan
Revision 3

ENV-DO-15-0099

LA-UR-15-20472

Date: APR 2 1 2015

LANL Nitrate Salt-Bearing Waste Container Isolation Plan
Revision 3

April 2015

LA-UR-15-20472

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LIST OF ATTACHMENTS

Attachment 1 Final Analytical Reports for EPA Hazardous Waste Number D001 Analyses

Attachment 2 Correspondence with Other Agencies Related to Assignment of EPA Hazardous Waste Number D001

Attachment 3 Summary of Evaluation and Identification of LANL Nitrate Salt Containers

Attachment 4 Photographs

Attachment 5 TID User Manual

Attachment 6 EWMO-AREAG-PLAN-1248, R.1: TA-54 Area G Nitrate Salt Waste Container Response Instructions

Attachment 7 EWMO-AREAG-FO-DOP-1246, R.6: Nitrate Salt-Bearing TRU Waste Container Monitoring

Attachment 8 EP-DIV-BEP-20048, R.1, EWMO Division Building Emergency Plan (BEP)

Attachment 9 EP-DIV-RM-ERP-20200, R.0, EWMO Area Emergency Response

Attachment 10 EP-DIV-RM-AOP-20201, R.0, Discovery of an Airborne, Liquid, and/or Solid Material Release or Spill

Attachment 11 EP-DIV-RM-AOP-20204, R.0, Waste Container Questionable Integrity

Attachment 12 EWMO-AREAG-S0-1247, R.2: TA-54 Area G Domes TA-54-231 and TA-54-375 PermaCon Access Restrictions

Attachment 13 Headspace Gas Data

Attachment 14 Solid Phase Micro-Extraction Data

Attachment 15 Flammable Gas Data

Attachment 16 Memorandum: Hazards Associated with Legacy Nitrate Salt Waste Drums Managed under the Container Isolation Plan

I. Introduction

On May 19, 2014, the Department of Energy (DOE) and the Los Alamos National Security, LLC (LANS) ("Permittees") received Administrative Order No. 5-19001 ("Order") issued by the New Mexico Environment Department (NMED). The Order, at paragraph 18, required the Permittees to submit a *LANL Nitrate Salt-Bearing Waste Container Isolation Plan* ("Isolation Plan"). The Isolation Plan was submitted by 2:00 PM on May 21, 2014.

On May 23, 2014, NMED approved the Isolation Plan contingent on the submittal of a revised Isolation Plan that incorporated additional requirements ("Revised Isolation Plan"). NMED required the Permittees to address all of the items enumerated in their May 23, 2014 letter, incorporate those changes and resubmit the Revised Isolation Plan by May 29, 2014. The Revised Isolation Plan was submitted on May 29, 2014.

On August 29, 2014, NMED approved the Revised Isolation Plan with modifications. NMED required the Permittees to address all of the items enumerated in their August 29, 2014 letter, incorporate changes and resubmit the Plan ("Isolation Plan, Revision 2") to NMED no later than September 19, 2014 for final review and approval.

The Isolation Plan, Revision 2 incorporated the modifications enumerated by NMED and was submitted to the NMED on September 19, 2014. It included description of how the Permittees isolated and secured all nitrate salt-bearing waste containers currently stored at Los Alamos National Laboratory (LANL) and information on characterization assessments conducted by the Permittees.

This revision of the Isolation Plan, Isolation Plan, Revision 3, describes the activities and assessments that have been conducted to date associated with all nitrate salt-bearing waste containers and includes the addition of 4 suspect remediated nitrate salt-bearing waste containers into isolation in the Permacon within Technical Area 54, Dome 375 (TA-54-375). It describes how the Permittees continue to secure and isolate remediated and newly suspect nitrate salt-bearing waste containers, so that a potential release from them at LANL does not pose a threat to human health or the environment. This plan also includes information on remediation planning and a schedule of immediate actions undertaken to implement isolating, securing and/or treating nitrate salt-bearing waste containers currently stored at LANL.

Additional measures above those described in this Isolation Plan, Revision 3 may also be taken and will be identified to NMED during the technical calls established in Section IX below.

II. Background and General Implementation Updates

1) On May 1, 2014, the Waste Isolation Pilot Plant (WIPP) declared a potentially inadequate safety analysis (PISA) on the possibility of unremediated nitrate salt-bearing waste contained in waste packages at WIPP. On May 2, 2014, LANS convened a critique to perform an extent of condition on the PISA issued by WIPP. As a result of the critique, the Permittees implemented several corrective and precautionary actions immediately to ensure protection of human health and the environment. The Permittees identified the current storage locations of all remediated and unremediated nitrate salt-bearing waste containers. The Permittees moved all remediated nitrate salt-bearing waste containers into TA-54, Area G, Dome 230 (because Dome 230 has an active fire suppression system) and daily temperature measurements of each container commenced. Additionally, continuous radiological air monitoring was initiated in Dome 230. Finally, any further processing of nitrated salt waste streams was suspended and all transuranic (TRU) waste shipments from LANL were paused.

2) On May 15, 2014, WIPP released photographs showing a LANL drum containing remediated nitrate salt-bearing waste that appeared to be breached in Panel 7, Room 7. The initiator of this breach and other potentially impacted drums is currently unknown, but is being actively investigated by multiple parties.

3) On May 16, 2014, the Permittees convened a critique to review the new information. A PISA was declared (ORPS NA-LASO-LANL-WASTEMGT-2014-0004) on the possibility of inadequate safety basis controls specified for the remediated nitrate salt-bearing waste. As a result of the critique, the Permittees implemented several corrective and precautionary actions immediately to ensure protection of human health and the environment.

4) On May 18, 2014, the Permittees completed the overpacking of all originally identified remediated nitrate salt-bearing waste containers at LANL into Standard Waste Boxes (SWBs). There are 57 remediated nitrate salt-bearing waste containers at LANL, and these were overpacked into 55 SWBs. (As part of the original packing configuration, 2 SWBs each have 2 remediated nitrate salt-bearing waste containers.)

5) On May 20, 2014, the Permittees held the initial meeting of their Remediation Team. (See Section VI below for additional information.)

6) On June 3, 2014, the Permittees completed the move of all unremediated nitrate salt-bearing waste containers to the Permacon in Dome 231 located at TA-54, Area G, and all

remediated nitrate salt-bearing waste containers were moved to the Permacon in Dome 375 located at TA-54, Area G.

7) On June 5, 2014, the Permittees conservatively applied Environmental Protection Agency (EPA) Hazardous Waste Number D002 to 26 unremediated nitrate salt-bearing waste containers. The following describes the Permittees' regulatory basis, reasoning and analysis for assigning this EPA Hazardous Waste Number. (See also, Permittees' letter to NMED dated September 5, 2014, ADESH-14-088.)

   During a review of operating records associated with the remediation of nitrate salt-bearing TRU wastes, the Permittees determined that a few of the parent containers were noted as having liquids with a pH of 2 or less. (*see* ES Nitrate Salt Waste Containers at WCS, WIPP Panel 7, and LANL Data Summary, May 17, 2014, http://www.nmenv.state.nm.us/NMED/Issues/documents/ESNSWasteContatWCS-WIPP-LANL5.17.14.pdf). Based on this information, LANL evaluated the remaining unremediated nitrate salt-bearing waste containers to identify those with free liquids using real-time radiography (RTR) and high-energy RTR (HERTR) analysis. The testing identified that 26 of the 29 containers contained free liquids. As a conservative measure, based on this information, LANL applied the D002 EPA Hazardous Waste Number to these remaining unremediated nitrate salt-bearing waste containers identified with free liquids.

   Videos of 27 RTR fast scans were provided to NMED on September 5, 2014. (ADESH-14-088). As explained in the Permittees' September 5, 2014 letter, RTR video recordings are not available for 2 of the 29 unremediated nitrate salt-bearing waste containers as historically RTR video recordings were not created.

8) On June 18, 2014, the Permittees began headspace gas (HSG) sampling on additional SWBs containing remediated nitrate salt-bearing waste containers. The Permittees' intent was to conduct HSG sampling on each of the 55 SWBs. This HSG monitoring was an additional measure above those described in the original May 19, 2014 Isolation Plan and the May 29, 2014 Revised Isolation Plan. When all 55 SWBs were sampled the Permittees transitioned to sampling a subset of the 55 SWBs on a regular basis.

9) On July 25, 2014, the Permittees conservatively applied EPA Hazardous Waste Number D001 to the remediated and unremediated nitrate-salt bearing wastes stored at LANL. The following describes the Permittees' regulatory basis, reasoning and analysis for assigning this EPA Hazardous Waste Number. (See also, Permittees' letter to NMED dated September 5, 2014, ADESH-14-088.)

Unremediated Nitrate-Salt Bearing Waste. On May 22, 2014, LANL received analytical results from two samples taken from an unremediated nitrate salt-bearing waste drum stored at Area G, Dome 231. (These results were provided as Attachment A to the Permittees' letter to NMED dated September 5, 2014, ADESH-14-088). The results showed the presence of nitrate compounds listed on the US Department of Transportation (DOT) Division 5.1 Oxidizers table under the DOT rules at 49 CFR §173.127. EPA/NMED require hazardous wastes that qualify as a 5.1 DOT oxidizer to be managed as a RCRA waste (D001) under 40 CFR §261.21(a)(4). Although the analytical results apply to one (1) unremediated drum, the Permittees determined to conservatively label the remaining drums with the D001 Hazardous Waste Number.

Remediated Nitrate-Salt Bearing Waste. As described in CCP's *Acceptable Knowledge Summary Report for Los Alamos National Laboratory TA-55 Mixed Transuranic Waste* (CCP–AK-LANL-006, Rev. 13, which includes waste stream LA-MIN02-V-001), on page 142, LANL previously determined that these nitrate salts did not meet the definition of a DOT oxidizer. However, to further support managing these specific nitrate salt wastes as non-ignitable, LANL determined to remediate and repackage this waste with an inert material (e.g., zeolite/kitty litter) with a minimum absorbent material to nitrate salts mixture ratio of 1.5 to 1. This ratio was based on results of oxidizing solids testing performed by the Energetic Materials Research and Testing Center (EMRTC) and a white paper authored by the LANL-Carlsbad Office Difficult Waste Team (DWT), *Amount of Zeolite Required to Meet the Constraints Established by the EMRTC Report RF 10-13: Application to LANL Evaporator Nitrate Salts* (See, Attachment B to Permittees' letter to NMED dated September 5, 2014, ADESH-14-088). The EMRTC testing established the concentration at which the most reactive mixture of sodium and potassium nitrate becomes a non-oxidizer when mixed with either zeolite or grout. Based on the EMRTC testing, the LANL DWT concluded that the results can apply to LANL's non-cemented nitrate salts.

As previously reported, LANL remediated and repackaged certain nitrate-salt bearing waste containers using an organic kitty litter, and not a zeolite-based kitty litter (see Letter from Permittees to NMED Secretary Flynn dated July 1, 2014, *Addendum to the Los Alamos National Laboratory Hazardous Waste Facility Permit Reporting on Instances of Noncompliance and Releases for Fiscal Years 2012 and 2013*). This type of absorbent did not comport with the EMRTC testing or the LANL DWT recommendation.

To date, the Permittees have not sampled a remediated nitrate salt-bearing waste drum. Between July 22 and 29, 2014, LANL had surrogate samples of the waste tested by Southwest Research Institute of San Antonio, Texas. The surrogates were formulated using materials to approximate the remediated nitrate salt waste including *Swheat*™ kitty litter and a mixture of nitrate salts in both wet and dry samples. The samples were

analyzed using US Environmental Protection Agency's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) Method 1040 (which is based on a test method adapted from the United Nations regulations and classification procedures for the international transportation of dangerous goods) to determine whether the D001 designation code could apply.

On July 25, 2014, the Permittees received preliminary, un-validated results from this testing that indicated that the surrogates sampled could be classified as oxidizers. Based on these results, LANL determined that it could not exclude the application of D001 to the remediated nitrate salt-bearing wastes. Based on this information and consultation with the Carlsbad Field Office, LANL determined to conservatively apply D001 to the remaining remediated nitrate salt-waste containers stored at LANL.

The final analytical reports for this test and all of the other testing that has been conducted is included as Attachment 1.

10) On September 3-5, 2014, the Permittees had additional surrogate samples representative of the remediated waste tested by Southwest Research Institute of San Antonio, Texas to determine if the surrogate samples meet the DOT oxidizer criteria when tested in accordance with the UN Manual of Tests and Criteria under DOT rules at 49 CFR §173.127 (a) in addition to SW-846, Method 1040. The surrogates for the remediated nitrate salt waste were comprised of a mixture of *Swheat*™ kitty litter and sodium nitrate in a ratio of 3:1. This mixture represents the main components of interest in the remediated waste, i.e., the organic kitty litter and the principal nitrate salt as indicated by the May 22, 2014 analysis. The additional testing determined that the surrogate mixture was a DOT Oxidizer, Packing Group II by the DOT test and a Category II oxidizer by Method 1040. Additional analytical tests for ignitability have also been conducted on various surrogates related the investigation of nitrate-salt bearing wastes.

11) Attachment 2 contains correspondence between the Permittees, Waste Control Specialists (WCS), the Waste Isolation Pilot Plant (WIPP), and any other agencies related to the assignment of EPA Hazardous Waste Number D001 that were shipped to WCS and/or WIPP. The Permittees have not yet received copies of corrected manifests. However, upon receipt of the corrected manifests, the Permittees will provide them to NMED within 15 business days. Additionally, the Permittees are working to resolve manifest discrepancies with WIPP and WCS. The Permittees will provide NMED with any of the Permittees' additional correspondence on this issue.

12) In late February 2015, the Permittees identified an additional 3 parent containers designated as within waste stream LA-MIN04 to be suspect nitrate salt-bearing waste containers. The 3 parent containers produced 10 daughter waste containers: 3 daughters

are designated as LA-MDH01 (i.e., debris) and 7 daughters are designated as LA-MIN04. The 10 daughter waste containers are located at Waste Control Specialists (WCS) (2 containers), WIPP (4 containers), and LANL (4 containers). All 4 containers located at LANL are Pipe Overpack Containers (POCs). As a result of this reevaluation, the Permittees determined that the 10 daughter waste containers are suspected to hold nitrate salt-bearing waste.

13) On March 12, 2015, the Permittees identified an additional 2 parent waste containers designated as LA-MDH01 (i.e., debris) to be suspect nitrate salt-bearing waste containers. The parent waste containers produced 3 daughter waste containers also designated as LA-MDH01. The Permittees and CCP reviewed generator AK documentation, RTR videos, and conducted interviews with SMEs to determine if these 3 daughter waste containers held any nitrate-salt bearing wastes. As a result of this reevaluation, the Permittees determined that the 3 daughter waste containers, located at WIPP, were suspected to hold nitrate salt-bearing waste.

III. Waste Container Categories

The current inventory of nitrate salt-bearing waste containers stored at LANL can be divided into two categories: 1) remediated nitrate salt-bearing wastes; and 2) unremediated nitrate salt-bearing wastes. Additionally, there is a third category of containers that are cemented legacy and newly generated wastes that originated from the nitrate evaporator and cementation operations within TA-55.

To identify all of the nitrate salts-bearing waste containers generated, a focused review of the generator records was conducted. Unconsolidated nitrate salts were only generated at TA-55 in a specific room and glove box from 1979 through 1991. It is important to note that after 1991, all nitrate wastes were cemented.

Following review of generator records, it was determined that all of the nitrate salt parents exist as subsets in both a debris (LA-MHD01.001) and cemented (LA-CIN01.001-Cans) waste stream. The LA-MHD01.001 waste stream includes over a thousand containers, but only 164 original parent drums contained nitrate salts. LA-CIN01.001-Cans waste stream also includes over a thousand containers, but only 103 original parent drums contained nitrate salts.

In total, there were 267 original nitrate salt parent containers identified. A large portion of these 267 parent containers have been remediated into nitrate salt daughter containers. As a result, there are currently 707 nitrate salt-bearing waste containers. After remediation, all of the remediated nitrate daughters were assigned to two homogeneous absorption waste streams; LA-MIN02-V.001 and LA-MIN04-S.001. However, after RTR, daughter containers may have been re-assigned to a final waste stream based on the volume percentages of the final waste content.

Of the 707 identified nitrate salt-bearing containers, a total of 86 remain at LANL, 57 are remediated daughter containers and 29 are unremediated parent containers.

The above-referenced waste streams, LA-MHD01.001, LA-CIN01.001, LA-MIN02-V.001 and LA-MIN04-S.001 are not solely dedicated to nitrate salts. All other containers in waste streams LA-MHD01.001, LA-CIN01.001, LA-MIN02-V.001 and LA-MIN04-S.001 do not contain nitrate salts and do not require isolation or management as nitrate salts.

The Permittees' approach to the focused reviewed discussed above was conservative. The original list of 707 includes containers that contain nitrate salt-bearing waste or are suspected of containing nitrate salt-bearing waste.

Additional information on the Permittees' evaluation and identification of LANL nitrate salt drums is provided in the *Summary of Evaluation and Identification of LANL Nitrate Salt Containers*. (Attachment 3)

Ongoing internal reviews have produced new information as described in II.12 and II.13. If any additional nitrate salt-bearing waste containers are identified based on new information, these will be managed in the same manner as the currently identified nitrate salt-bearing waste containers. The Permittees will notify NMED during the technical calls established in Section IX below.

This plan addresses isolation, securing and/or treatment of the remediated nitrate salt-bearing wastes. In this plan, "remediated" containers are defined as LANL unconsolidated nitrate salts that were remediated with kitty litter absorbent and were repackaged into new drums. "Unremediated" containers are defined as LANL unconsolidated nitrate salts drums to which absorbent material has not been added. Isolation Plan, Revision 3, removes unremediated nitrate salt-bearing waste containers from secured isolation and allows for the storage of these waste containers in other compliant permitted storage at Technical Area (TA)-54, Area G.

The third category, cemented legacy and newly generated cemented wastes from the nitrate processing line at TA-55, is not addressed in this Isolation Plan, Revision 3 because, as discussed in Section VII, per the definitions of ignitable and reactive in 40 CFR §264.21 and §264.23, legacy cemented nitrate waste generated since 1991, as well as newly generated cemented nitrate waste generated at TA-55, is not ignitable or reactive.

IV. Immediate Actions for Remediated Nitrate Salt-Bearing Waste Containers

There are currently 61 remediated and suspect nitrate salt-bearing waste containers at LANL. The Permittees validated this number through review of data from the Waste Characterization and Action Tracking System (WCATS) database and a field walk-down verification. Below is a description of the activities the Permittees have already taken to address isolating, securing, and/or treating the remediated nitrate salt-bearing waste containers.

1) On May 16, 2014, LANS applied five LANL tamper indicating devices (TIDs) to drum number 68685 as shown in the attached photo (Attachment 4, photo 1). This TRU waste drum is the sister drum related to the suspect drum at WIPP (drum 68660 was confirmed as the damaged drum during the May 22, 2014 WIPP entry, and drum 68685 is its sibling). Additionally, a member of the DOE Los Alamos Field Office observed the application of the TIDs.

   On May 16, 2014, drum number 68685 was placed inside an SWB along with three empty dunnage drums (Attachment 4, photo 2) and was sealed. LANS applied two additional TIDs to either end of the SWB as shown in the attached photo (Attachment 4, photo 3).

On May 16, 2014, the empty parent containers for the two drums of initial interest (68660 and 68533) in the WIPP underground repository were identified onsite at LANL. As a result, LANS applied TIDs to both empty parent containers (69120 and 68359) during the early afternoon of May 16, 2014. This evolution was observed by DOE Los Alamos Field Office. Since that time S855793 was determined to be the parent container of drums 68685 and 68660.

These TIDs, and all subsequent TIDs, were installed in accordance with the LANL TID User Manual, NMCA-TID-FWI-002 R.1 (Attachment 5) by trained and qualified LANL TID users.

No additional TIDs have been applied to date, nor do the Permittees intend to install any additional TIDs at this time. However, additional TIDs will be applied as necessary to ensure that valuable information is not lost or as otherwise needed.

If directed to open the containers, the TIDs must be removed by qualified TID personnel in accordance with the TID User Manual (Section 3.21). In this instance, a two-person rule must be followed to verify chain of custody has been maintained and to verify that the TID has been properly destroyed once removed. Additionally, to ensure the TIDs are not removed without approval from the Facility Operations Director (FOD), they also have postings that clearly address that the TIDs cannot be removed without FOD approval.

2) On May 18, 2014, the Permittees completed overpacking the 57 remediated nitrate salt-bearing waste containers at LANL into SWBs. These containers were first placed into isolated storage in Dome 230 at TA-54, Area G, which has an active fire protection system. This dry-pipe fire protection system is not included within the LANL Hazardous Waste Facility Permit ("Permit"), Attachment D ("Contingency Plan") as it was inoperable during the re-application process for the Permit. This system became operable in November 2011, and currently the Permittees have chosen not to credit this system as fire control equipment in the Contingency Plan.

   Additionally, as described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Dome 230. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

3) The Permittees moved all remediated nitrate salt-bearing waste SWBs originally identified at LANL to the Permacon in Dome 375 located at TA-54, Area G. This move was completed on June 3, 2014. In the future, for operational efficiency, the Permittees may also utilize the Permacon in Dome 231 for storage of these containers.

4) The 4 newly identified suspect remediated nitrate salt-bearing waste containers located at LANL were moved from Domes 232 and 153 into the Permacon in Dome 375 on March 27, 2015.

5) As described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Domes 231 and 375. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

   The Los Alamos Fire Department (LAFD) is manned and available 24-hours a day. They are able to utilize fire hydrants in the event of a fire or reaction. Additionally, the LANL emergency management organization is also on call 24-hours a day, and will respond promptly.

   The Permacon in Dome 375 and the Permacon in Dome 231, as part of permitted units, are authorized under the LANL Permit for storage of mixed TRU wastes. The dry-pipe fire protection systems within the Permacons in the Domes are not included within the Permit Contingency Plan as the Permacons have been generally used for processing waste containers, a process that requires added safety / emergency controls more prescriptive than those of normal waste storage. Therefore, currently the Permittees have chosen not to credit these systems as fire control equipment in the Contingency Plan.

   Pre-action fire suppression systems (FSSs) were installed in the Permacon within Dome 231 in November 2012, and in the Permacon within Dome 375 in February 2013. The FSSs are designed as an ordinary group 2 pre-action sprinkler system to protect the moderate hazard operations in the Permacon. Drawings of these FSSs are found in *TA-54 Area G Nitrate Salt Waste Container Response Instructions,* EWMO-AREAG-PLAN-1248, R.1 (Attachment 6). This system uses water for fire suppression, which is compatible with the nitrate salt waste. Should the fire suppression system activate, Pad 9 has a fire water collection system that would contain water from the 231 Permacon FSS. Dome 375 has curbing that provides approximately 49,000 gallons of retention capacity.

   The sprinkler system pre-action valve is automatically activated by a combination of any 2 of 3 types of electronic initiating devices located in the Dome or the Permacon: smoke detection, heat detection, or fire alarm pull stations. During an event, fire alarm pull stations can be accessed and manually activated by staff. Pull stations are located in accordance with National Fire Protection Association (NFPA) standards, and are in both Domes and both Permacons. Also, access is facilitated by maintaining emergency egress aisles with a minimum aisle space of two feet in the Domes and the Permacons. Further, in compliance with Permit Section 3.5.1(1), the Permittees will maintain adequate aisle

space to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the 231 and 375 Domes and Permacons. Finally, in the event of an abnormal condition, staff will evacuate quickly and will promptly report to 911, the operations center or the shift manager. Should an abnormal condition be observed, the Permittees will implement their emergency response plan and provide notice to NMED within 24 hours.

The Permacons are constructed of stainless steel frame and sheeting. They are contamination-control structures that are temperature-controlled and equipped with a High Efficiency Particulate Air (HEPA) filtration and fire suppression systems. The Permacons are also maintained at negative pressure. Additionally, the remediated drums were overpacked into new SWBs and suspect nitrate salt-bearing waste are packaged in POCs. Since SWBs and POCs are considered robust enough to prevent lid loss due to deflagration or fire based on information in DOE-STD-5506-2007, they would act as a barrier to provide a significant measure of worker protection. While the energy of the WIPP event in Panel 7, Room 7 has not been determined at this time, should an event occur, the 231 and 375 Permacons are designed to contain a radiological release.

6) The Permittees are monitoring, on a daily basis, the temperature of the SWBs and POCs that contain remediated or suspect nitrate salt-bearing waste drums. As discussed above, all remediated nitrate salt-bearing containers are overpacked in SWBs or are within POCs. Daily temperature measurements are taken of the external surface of the SWB using a calibrated infrared thermometer. The target temperature at which the nitrate salt-bearing waste containers are maintained in both the 375 and 231 Permacons is less than 90°F.

   The Permittees will maintain records of all such temperature monitoring. These activities will be performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring,* EWMO-AREAG-FO-DOP-1246, R.6 (Attachment 7). These records will be updated on a daily basis. The temperature data (both daily, and if conducted as an additional measure under Section I, hourly) that the Permittees have collected since the Isolation Plan was implemented was included with the Isolation Plan, Revision 2 as two attachments. The attachments were discs containing documentation of daily and hourly temperature measurements obtained by the Permittees up to the time the Permittees began including temperature data in the daily written submissions provided to NMED, as established in Section IX below. Between the data included with the Isolation Plan, Revision 2 in Attachments 8 and 9 of that document and the data that the Permittees provide in the daily submissions, the Permittees have provided a current set of information to NMED. Additionally, these records and all temperature data (both daily, and if conducted as an additional measure under Section I, hourly) will be available to NMED for inspection.

The Permittees are also performing visual inspections of these containers on an hourly basis, 24 hours per day, to identify abnormal conditions (e.g., signs of smoking and fire, evidence of deterioration, bulging). These activities will be performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, EWMO-AREAG-FO-DOP-1246, R.6. The Permittees will maintain records of all such visual monitoring. (See, Attachment 7) These records will be updated on a daily basis and be available to NMED for inspection.

Additionally, the Permittees are using continuous air monitors (CAMs) with alarm capability, and will continue their use until further notice. There are CAMs in place in the 375 Permacon, two of which have remote alarm notification capability. These two remotely monitored CAMs provide remote notification if there is a significant airborne release (the 375 Permacon currently contains the LANL remediated nitrate salt-bearing waste). Additionally, there are CAMs in place in the 231 Permacon. Lastly, the Emergency Response/Hazardous Materials organization has been briefed on the storage configuration.

Action levels have been established and response instructions prepared. These are contained in LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring*, EWMO-AREAG-FO-DOP-1246, R.6 (Attachment 7). Should an abnormal condition be observed, the Permittees will implement their emergency response plan and provide notice to NMED within 24 hours. Area G's building emergency plan is found at Attachment 8, and associated procedures are found at Attachments 9, 10 and 11.

7) Remediated and suspect nitrate salt-bearing waste containers are spaced an adequate distance apart to limit any potential interactions between SWBs and POCs. This distance has been determined to be a minimum of 2 feet between containers. This distance is based on the Permittees' review of evidence from the event at WIPP, a calculation on the heat transfer from an SWB or POC undergoing a similar reaction, and a review of fire protection and Permit requirements.

   The Permittees have reviewed photographs of the impacted drum in WIPP Room 7, Panel 7 and the adjacent containers. From the photographs, the adjacent drum and the adjacent SWB appear to have minimal damage and no release. The adjacent drums are in contact with the impacted drum and the adjacent SWBs are within inches of the impacted drum.

   The Permittees have performed a preliminary calculation on the minimum separation distance between SWBs and POCs to ensure that an incident in one container will not impact an adjacent container. Assuming the offending container reaches a maximum temperature of approximately 1100°F and that the adjacent container does not to exceed 200°F, the heat generated from the offending container drops off to below 200°F within 1

inch. The 2 foot spacing in use provides additional assurance that the adjacent containers will not be impacted by the heat generated during an exothermic event in a single container. Drawings that include the locations of the containers are included in TA-54 Area G Nitrate Salt Waste Container Response Instructions, EWMO-AREAG-PLAN-1248, R.1 (Attachment 6). The use of fire curtains in between containers will not provide a measurable reduction in the thermal conductivity across the 24 inches but does provide protection from flame impingement.

SWBs and POCs are placed in rows that allow for emergency egress and that have Permit compliant spacing between each row. If used, the fire curtains will be placed within a row (that is, between the adjacent containers in that row) to mitigate the potential for interaction between adjacent containers. While the temperatures of the event in Panel 7 have not been determined at this time, the Permittees have procured fire curtains that are rated to a continuous temperature of 1800°F and intermittent temperatures of 2500°F.

The NFPA consensus standards were also reviewed and NFPA 211 provided the most similar type of control. NFPA 211 covers the installation of chimney pipes and stoves and the distance recommended between the pipe and unprotected combustibles is 18 inches. There are no unprotected combustibles in the Permacons in Domes 231 and 375.

This 2 foot distance also meets the requirements in Permit Section 3.5.1(1). This section requires the Permittees to maintain adequate aisle space to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the 231 and 375 Domes and Permacons.

The Permittees may also use fire resistant curtains in lieu of spacing. Containers will be placed in rows that allow for safe egress and that have Permit compliant spacing between each row. If used, the curtains will be placed within a row (that is, between the adjacent containers in that row) to mitigate the potential for interaction between adjacent containers. While the temperatures of the event in Panel 7, Room 7 have not been determined at this time, the Permittees have procured fire curtains that are rated to a continuous temperature of 1800°F and intermittent temperatures of 2500°F. Prior to using fire resistant curtains, the Permittees will discuss the details of their use with NMED during the technical calls established in Section IX below.

The Permittees will protect workers by restricting access to the remediated nitrate salt-bearing waste containers. Only those personnel performing the ongoing container monitoring activities (e.g., daily temperature monitoring), other sampling/data collection work (e.g., periodic head space gas sampling), and other required inspections (e.g., Permit required inspections) will be allowed into the storage areas. This is documented in Standing Order EP-AREAG-SO-1247, R.2 (Attachment 12). Also, there will be warning

signs posted at the entrance to the Permacon in Dome 375 that will inform personnel of access restrictions.

Additionally, all originally identified remediated nitrate salt-bearing waste were packed in new drums and overpacked into new SWBs, and suspect nitrate salt-bearing waste is located in POCs. Since SWBs and POCs are considered robust enough to prevent lid loss due to deflagration or fire, based on information in DOE-STD-5506-2007, they would act as a barrier to provide a significant measure of worker protection. No other protective shields or barriers are deemed necessary for the protection of workers at this time.

Furthermore, the ongoing data collection activities provide continuing information on the physical condition of the waste so that appropriate additional worker safety measures can be taken, if required.

8) Prior to moving nitrate salt-bearing containers, the Permittees will notify the LANL Emergency Operations Center (EOC). The EOC will notify the Los Alamos Fire Department and other responders, if needed. The Permittees will notify the EOC at the completion of the move. The Permittees do not anticipate that responders will be present during the movement of these containers, or that responders will be present / alerted during other actions.

9) The Permittees have updated all procedures and safety basis documents to convert the processing facilities into storage facilities.

10) SWBs will display the required labels for all inner containers or will be reclassified as a new container in WCATS. The 61 subject containers (including the sister drum to the suspect drum in WIPP) have been clearly labeled with the appropriate warning labels and any other required labeling. Specifically, the containers have the hazardous waste labels required by Permit Section 3.6(1). Additionally, the remediated nitrate salt-bearing waste containers are also marked as "Radioactive", as required by Permit Section 3.6(1). In addition, the 4 POCs have been labeled as containing "Free Liquids" and have been placed on adequate secondary containment within the Permacon in Dome 375

11) The Permittees have conducted headspace gas (HSG) sampling on all 55 SWBs that contain nitrate salt-bearing waste containers. Each SWB has been sampled for at least 7 days.

Gas chromatography with thermal conductivity detection is used for the analysis of He_2, H_2, O_2, N_2, CH_4, CO, CO_2, and NO_4 in HSG samples. The HSG sample data (H_2, CO_2, CO, and N_2O) that the Permittees have collected from the time the Isolation Plan was implemented through September 11, 2014 is attached to this Isolation Plan, Revision 3 at Attachment 13. Between the data in Attachment 13 and the data that the Permittees have

already begun to provide in the daily submissions, the Permittees have provided a current set of information to NMED. Attachment 13 also graphically presents the H_2, CO_2, CO, and N_2O data collected for each SWB, and the range of H_2 and CO_2 concentrations from the HSG for each.

Additionally, He_2 and CH_4 have not been detected in these samples, and O_2 and N_2 are observed at atmospheric concentrations. More detailed information on these compounds is available to the NMED at their request. If there is any change to this status, the Permittees will inform the NMED during the technical calls established in Section IX below.

The Permittees began this HSG sampling on May 19, 2014, when they began daily HSG sampling of SWB 68685. This SWB contains TRU waste drum 68685 which is the sister drum related to the suspect drum at WIPP.

On June 18, 2014, the Permittees began HSG sampling on the additional SWBs containing nitrate salt-bearing waste containers, in order to better be able to compare and evaluate results against SWB 68685. On July 24, 2014, the Permittees began daily HSG sampling of SWB SB50522. On August 13, 2014, LANL had conducted HSG sampling of all 55 SWBs that contain remediated nitrate salt-bearing waste. The Permittees transitioned to sampling a subset of the 55 SWBs on a regular basis (this subset may change over time). All of this headspace gas monitoring was an additional measure above those described in the original May 19, 2014 Isolation Plan and the May 29, 2014 Revised Isolation Plan.

On September 3, 2014, upon receipt (email) of the NMED's letter dated August 29, 2014, the Permittees immediately resumed daily HSG sampling of SWBs 68685 and SB50522. (The Permittees had been sampling both of these containers on a daily basis until August 28, 2014, when they shifted sampling to twice per week. The Permittees had also conducted HSG sampling of both SWBs on September 2, 2014.)

The Permittees will continue to conduct HSG sampling. This HSG sampling will measure concentrations of H_2, CO_2, CO and N_2O. The Permittees will:

1. Conduct daily HSG sampling of SWB SB50522 and the SWB that contains 68685.

2. Periodically sample HSG of all other SWBs that contain nitrate salt-bearing waste containers. This HSG sampling occurs on a schedule that ensures that each of these SWBs and POCs are sampled for HSG at least once per calendar month. The Permittees began implementation of this monthly HSG sampling in September, 2014. The monthly schedule is supported by the graphical

presentations of the H_2, CO_2, CO and N_2O data in Attachment 13 which indicate stability in the analyzed gas constituents and is protective of human health and the environment.

HSG sampling was conducted for at least 7 days on the 4 newly identified POCs. After the 7 day sampling was completed, the POCs were added to the monthly schedule described above. The Permittees will include this HSG data (H_2, CO_2, CO and N_2O) in the daily written submissions provided to NMED, as established in Section IX below.

Additionally, as part of initial investigations, the Permittees have performed solid phase micro-extraction (SPME) analyses. This work is being performed as part of the Permittees additional measures under Section I. SPME monitors for trace levels of organic compounds (< 1ppm). The detection limits for organic compounds without SPME is sufficient to establish that concentrations of organic vapors do not approach flammability limits. SPME was performed for the purpose of detecting organic molecules which could be an ignition initiator at very low concentrations. No noteworthy detections of compounds have been observed. A summary of this data is available as Attachment 14.

12) The Permittees evaluated the HSG data (H_2, CO_2, CO, and N_2O) collected from SWB SB50522 collected from July 24, 2014 through September 11, 2014. SB50522 contains 4 drums, with the following container identification numbers and waste stream identification numbers:
    - Container 69490 (LA-MIN02-V.001)
    - Container 69271 (LA-MIN03-NC.001)
    - Container 68799 (LA-MIN03-NC.001)
    - Container 57653 (LA-CIN01.001)

    The range (high to low) of H_2 levels the Permittees observed in HSG data during that time frame was 28,020 parts per million (ppm) to 6,986 ppm. On July 30, 2014, the Permittees installed additional filters in the SWB to decrease concentrations. This approach was successful and concentrations of H_2 are present at a lower level. Form August 18, 2014 through September 11, 2014, H_2 levels remained below 10,000 ppm. The range (high to low) of CO_2 levels the Permittees observed in HSG data was 76,858 ppm to 39,338 ppm during that time frame.

The range of temperature measurements the Permittees observed during hourly temperature measurements through September 11, 2014 were:

SB50522 Temperature	Degrees Fahrenheit
High	83.7
Low	55.5

For comparison the ambient temperature range in Dome 375 Cell 1 where SB50522 is located during the same time period is:

Dome 375 Cell 1 Temperature	Degrees Fahrenheit
High	85.1
Low	54.9

Prior to packaging the four containers into SB50522, the Permittees conducted flammable gas analysis on three of the containers (57653, 69271 and 69490). (Note: although flammable gas analysis is not required for the LA-MIN03-NC.001 waste stream it was conducted for 69271.) The Quantitation Reports for flammable gas analysis for these three containers are provided at Attachment 15.

The HSG data for SB50522 is presented in Attachment 13. This Attachment also graphically presents the H_2, CO_2, CO and N_2O data collected.

13) The Permittees also evaluated the HSG data (H_2, CO_2, CO, and N_2O) collected from all of the SWBs with remediated nitrate salt-bearing waste.

As background information, radiolytic processes produce simple gas molecules from the interaction of radiation with organic and inorganic material in TRU waste. Hydrogen is typically the principal gas produced from the interaction of radiation with organic material. During headspace analysis for hydrogen, levels of other gases including CO, CO_2, and N_2O are also measured. Gaseous CO_2 can also be formed from radiolysis, and its concentration depends on the specific composition of the waste. From studying the radiolysis of selected simulated TRU waste, the relative amount of CO_2 and H_2 that is produced has been established under a range of conditions. From these investigations, the ratio of the amount of CO_2 to H_2 produced was greatest for poly vinyl chloride, with a maximum ratio for this material to be 6.5 CO_2/H_2. Other waste types did not produce as much CO_2 and therefore this ratio would be less than 6.5.

The conducted HSG analysis initially selected revealed that some drums had CO_2 to H_2 ratios of >100. This suggests that gas generation in some cases cannot be attributed solely to radiolysis of the waste. This supposition is reinforced by the observation of nitrous oxide > 1,000 ppm, which would likely be indicative of nitrate salt chemistry.

Atmospheric concentrations for these gases are approximately 450 ppm and 350 parts per billion (ppb) respectively.

LANL began characterizing the headspace gas of 55 SWBs containing remediated nitrate salt-bearing waste for Volatile Organic Compounds (VOCs) by Gas Chromatography/ Mass Spectrometry (GC-MS) and for permanent gases using GC with a Thermal Conductivity Detector (GC-TCD). Permanent gases are those that remain gaseous at standard temperature and pressure. Daily monitoring of a subset of these 55 SWBs was initiated on May 19, 2014. All 55 SWBs have now been characterized. Elevated concentrations of HSG compounds have been observed at concentrations well above normal atmospheric concentrations in some of these 55 SWBs (Attachment 13). These concentrations cannot be explained based on radiolysis of waste drum content and suggest that the gases are being produced from other processes. Specifically, N_2O is believed to result from the oxidation of material contained within the nitrate salt containing waste. The N_2O concentrations observed, ranging from (100 – 9000 ppm), are above the normal atmospheric concentration of ~ 350 ppb. The Permittees have ongoing work that may provide insight into this chemistry.

While high CO_2 concentrations (and potentially the ratio of CO_2 and H_2) are expected to be proportional to the magnitude of potential changes taking place in any given drum, they are not, on their own an indicator of significant changes to the waste within the container. To date, LANL has collected over 700 HSG samples. The graphical representation of this HSG data indicates stability in the analyzed gas constituents and supports the monthly sampling schedule set out in Section IV.10 above.

The Permittees initially suspected the CO_2 to H_2 ratio might be an indicator of radiolytic decomposition, and tracked that ratio. However, analysis of the HSG data (H_2, CO_2, CO, and N_2O) gathered to date indicates there are potentially other gas generating mechanisms occurring within some containers. The concentrations of oxidation products (e.g.: CO_2 and N_2O) is ancillary to the H_2 concentration measurement. While it provides additional insight into the nitrate salt-bearing waste, the Permittees no longer consider tracking the CO_2 to H_2 ratio to be a useful indicator. The Permittees have focused ongoing analyses on the monitoring of H_2 concentrations and temperature measurements rather than ratio of CO_2 and H_2 because: the lower flammability limit (LFL) for H_2 is established; both H_2 gas concentrations and temperature are readily measured; and actionable levels can be established. The H_2 and temperature measurements are a more direct way to monitor potential changes in the waste.

14) The Permittees conclude that the concentration of H_2 is an appropriate indicator to track and to use as a basis for action levels to trigger specific actions.

If the Permittees observe an H_2 concentration at or above 20,000 ppm (~50% of the lower explosive limit [LEL]), they will conduct daily HSG (H_2, CO_2, CO, and N_2O) for that SWB.

If the Permittees observe an H_2 concentration at or above 30,000 ppm (~75% of the LEL), they will install additional filters in the SWB, if the SWB is configured to accept additional filters. (This approach was successfully implemented by the Permittees with SB50522. Concentrations of H_2 were reduced after the installation of additional filters in that SWB, and have since been maintained at a lower level.)

If additional filters cannot be added to the SWB or if concentrations are not reduced to below 30,000 ppm at the next daily HSG sample, then the Permittees will apply a 15 foot stand-off exclusion zone. (The stand-off exclusion zone is a 15 foot area that is used at LANL to surround a container that is or has become unvented, thereby unable to vent contents adequately. This area is segregated from normal operations except those operations specific to disposition or inspection of the container of concern. Surrounding containers may exist in the exclusion zone. Entry into the exclusion zone is controlled by the FOD who will determine what actions can be taken – including entry for sampling, temperature measurements or visual monitoring.) This approach is consistent with the hazard analysis that has been performed for an unvented drum discovery. The Permittees will notify LANL Emergency Management to assume responsibility for the container if the container poses a threat, e.g. bulging.

The Permittees will include this HSG data (H_2, CO_2, CO, and N_2O) in the daily written submissions provided to NMED, as established in Section IX below.

15) The isolation configuration described in this Section IV continues to be protective of human health and the environment in light of the observed concentrations of H_2 and CO_2 in SWBs, and in light of the conservative assignment of EPA Hazardous Waste Number D001. The facility being used for isolation is compliant with the LANL Hazardous Waste Facility Permit. The fire suppression systems, climate control and filtration systems, and other mechanisms described above are designed to protect human health and the environment in the event of a reaction within a container, a release, a fire, or an explosion. The Permittees continue to evaluate the effectiveness of the isolation configuration and will make changes to this configuration as appropriate.

V. Immediate Actions for Unremediated Nitrate Salt–Bearing Waste Containers

There are currently 29 unremediated nitrate salt-bearing waste containers at LANL. The Permittees validated this number through review of data from the WCATS database and a field walk-down verification. Below is a description of the activities DOE/LANS implemented

isolating, securing, and then removing from isolation the unremediated nitrate salt-bearing waste containers.

1) The 29 unremediated containers were first placed into isolated storage in Dome 230 at TA-54, Area G, which has an active fire protection system. This dry-pipe fire protection system is not included within the Permit Contingency Plan as it was inoperable during the re-application process for the Permit. This system became operable in November 2011, and currently the Permittees have chosen not to credit this system as fire control equipment in the Contingency Plan.

   Additionally, as described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Dome 230. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

2) The Permittees moved all unremediated nitrate salt-bearing waste SWBs at LANL to the Permacon in Dome 231 located at TA-54, Area G. This move was completed on June 3, 2014 .

3) The Permittees monitored the temperature daily of the 85-gallon overpacks that contain unremediated nitrate salt-bearing waste drums from the time the Isolation Plan was implemented until the approval of the Isolation Plan, Revision 3. Daily temperature measurements were taken of the external surface of the 85-gallon overpack using a calibrated infrared thermometer. The target temperature at which the nitrate salt-bearing waste containers were maintained while in isolation was less than 90°F.

   The Permittees will maintain records of all such temperature monitoring. These activities were performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring,* EWMO-AREAG-FO-DOP-1246, R.6 (Attachment 7). These records will be updated on a daily basis. The temperature data (both daily, and if conducted as an additional measure under Section I, hourly) that the Permittees collected since the Isolation Plan was implemented was included with the Isolation Plan, Revision 2 as two attachments. The attachments were discs containing documentation of daily and hourly temperature measurements obtained by the Permittees up to the time the Permittees began including temperature data to NMED in the daily written submissions provided to NMED, as established in Section IX below. Between the data included with the Isolation Plan, Revision 2 in Attachments 8 and 9 of that plan and the data that the Permittees have provided in the daily submissions, the Permittees have provided a current set of information to NMED. Additionally, these records and all temperature data (both

daily, and if conducted as an additional measure under Section I, hourly) will be available to NMED for inspection.

The Permittees also performed visual inspections of these containers on an hourly basis, 24 hours per day, to identify abnormal conditions (e.g., signs of smoking and fire, evidence of deterioration, bulging) from the time the Isolation Plan was implemented until the approval of the Isolation Plan, Revision 3. These activities were performed in accordance with LANL's Procedure on *Nitrate Salt-bearing TRU Waste Container Monitoring,* EWMO-AREAG-FO-DOP-1246, R.6. The Permittees will maintain records of all such visual monitoring (see Attachment 7). These records will be updated on a daily basis and be available to NMED for inspection.

Additionally, the Permittees used continuous air monitors (CAMs) with alarm capability. There were CAMs in place in the 231 Permacon for the entire time unremediated nitrate salt-bearing waste containers were stored within the Permacon. Lastly, the Emergency Response/Hazardous Materials organization were briefed on the storage configuration while the containers were isolated.

4) During isolation, unremediated nitrate salt-bearing containers were spaced an adequate distance apart to limit any potential interactions with other containers. This distance has been determined to be 2 feet between containers. This distance was based on the Permittees' review of evidence from the event at WIPP, a calculation on the heat transfer from an SWB undergoing a similar reaction, and a review of fire protection and Permit requirements.

5) During isolation, the Permittees protected workers by restricting access to the unremediated nitrate salt-bearing waste containers. Only those personnel performing the ongoing container monitoring activities (e.g., daily temperature monitoring), other sampling/data collection work (e.g., periodic head space gas sampling), and other required inspections (e.g., Permit required inspections) were allowed into the storage areas. This is documented in Standing Order EP-AREAG-SO-1247, R.2 (Attachment 12). Also, there were warning signs posted at the entrance to the Permacon in Dome 231 informing personnel of access restrictions.

   Additionally, all unremediated nitrate salt-bearing waste is in 55-gallon drums that have been overpacked into 85-gallon containers of good integrity.

6) This waste has been stored above-ground for many years and the Permittees continued data collection activities to provide information on the physical condition of the waste so that appropriate additional worker safety measures could be taken, if required.

7) Further evaluation of unremediated nitrate salt waste has led to the conclusion that the 29 unremediated nitrate salt-bearing waste containers do not require specific isolation from other waste containers stored at permitted units at TA-54 Area G. Unremediated salts are determined to not present the potential hazard of spontaneous combustion or enhanced combustion in their current configuration; therefore, they can be stored in any area in which combustible material is minimized and separated from the nitrate salt waste containers, without fear of a release. Attachment 16 for this Isolation Plan details the assessment conducted to reach this conclusion.

8) As a result of this evaluation, the Permittees will remove the 29 unremediated nitrate salt-bearing waste containers located within the Dome 231 Permacon from isolation and into a compliant permitted storage unit at TA-54, Area G, Pad 9 within Dome 230. Storage of the waste containers within Dome 230 will continue to be protective of human health and the environment. In light of the conservative assignment of EPA Hazardous Waste Number D001 and D002 (D002 conservatively assigned to some containers as described above), storage of the containers will meet all applicable conditions in Permit Section 2.8 and all other applicable sections of the LANL Hazardous Waste Facility Permit.

   Dome 230 at TA-54, Area G, is equipped with an active dry-pipe fire protection system. Additionally, as described in Permit Attachment A.4.5 and Attachment D, TA-54 Area G, Table D-2, fire control equipment is located throughout Area G, including Dome 230. This equipment includes ABC-rated or BC-rated fire extinguishers and several fire hydrants. These fire hydrants will supply water at an adequate volume and pressure to satisfy the requirements of 40 CFR 264.32(d).

   Additional precautions that will be maintained for these containers of ignitable waste include:

   - Waste will be stored with adequate aisle space (at least 2 feet) and separate from other wastes within the permitted unit.
   - The waste will be protected from sources of ignition by facility procedure.
   - Sources of open flames will not be allowed in, on, or around the containers and smoking is not permitted within the boundaries of TA-54, Area G.
   - Dome 230 has appropriate lightning protection for storage of ignitable waste.
   - Non-sparking tools will be used when managing ignitable waste containers (e.g. opening waste container or sampling waste).
   - Movement of the containers will be achieved using a drum grappler or a forklift with the container strapped to the mast.
   - Although Dome 230 is designed for secondary containment, the 26 unremediated nitrate salt-bearing waste containers that have free liquids will be stored on

secondary containment pallets. The remaining 3 containers will be stored elevated.

- Waste containers will not be stacked.

VI. Remediation Planning

1) The Permittees have established a "Remediation Team" to identify a path forward for remediation of these containers as necessary and appropriate. The Remediation Team has met regularly. The Permittees have met with NMED on multiple occasions to discuss the Team's progress, and will continue these communications.

   As discussed in Paragraphs IV.2 and IV.3 above, the Permittees have overpacked the 57 remediated nitrate salt-bearing waste containers at LANL into 55 SWBs. These 55 SWBs are currently located in the Permacon in Dome 375. As discussed in IV.4 above, an additional 4 POCs are also located in the Permacon in Dome 375.

   NMED and the Permittees have had initial discussions on these potential remediation actions and the Permittees will continue their contact with NMED to set meeting(s) to discuss these potential actions in more detail. The Permittees will use these meetings to help develop a proposal for submission to NMED.

2) Any treatment plans or proposals that are developed by the Remediation Team shall be discussed with NMED. These plans or proposals shall include, but not be limited to, the neutralization steps, the reagents used, the location of the process for treating wastes, and any other key specific information related to all potential treatment options. Any treatment plans that are developed shall detail which characteristic (toxicity, reactivity, ignitability, corrosivity) mixed TRU wastes the Permacons (or other locations) are authorized to treat – including, as appropriate, the removal of the characteristics of ignitability (D001) and/or corrosivity (D002). Permittees shall discuss with NMED any permit modifications or authorizations that may be necessary for treatment of the nitrate salt-bearing wastes.

3) The key events, actions and activities to be documented as specified in the treatment plan. The Permittees will maintain records of all key events, actions and activities related to the disposition of the unremediated nitrate salt-bearing waste as documented in the treatment plan (e.g. safe storage configuration, the neutralization steps, the reagents used, the location of the process for treating drums). These records will be updated on a daily basis and be available to NMED for inspection.

VII. Cemented Legacy and Newly Generated Cemented Nitrate Salt-Bearing Waste

Since 1991, the nitrate salt waste stream generated from the evaporator process at TA-55 has been sent to cement fixation immediately upon generation. Remediated and unremediated nitrate salt-bearing waste containers generated at TA-55 prior to 1991 are discussed above. Additional information about the review that the Permittees conducted to identify containers with nitrate salt-bearing waste is included in Enclosure 2 of the Permittees' letter to NMED dated September 19, 2014 (DIR-14-149). This enclosure also includes a discussion on how the evaluation was conducted for a specific subset of waste containers (all of which were pre-1991 containers).

There are approximately 378 containers of post-1991 cemented nitrate salt containers within the LANL Area G inventory.

The cementation process removes characteristics of ignitability and reactivity from the nitrate salt waste stream. Nitrate salt waste containers generated at TA-55 after 1991 have been cemented and are therefore not ignitable per the definition in 40 CFR §264.21 (Characteristic of Ignitability) or reactive per the definition in §264.23 (Characteristic of Reactivity).

The waste characterization by Acceptable Knowledge used at TA-55 to demonstrate that the cement from the stabilization process meets the waste acceptance criteria at WIPP was centered around two primary elements (1) no free liquids were present in the cemented waste and 2) the Portland cement created an inert solid monolith. These elements support the determination that the waste does not exhibit the characteristics of ignitability and reactivity.

The ignitability characteristic is not a concern for the following reasons: (1) the cement from the stabilization process is a solid and does not meet the definition of a liquid per 40 CFR 261.21(a)(1); (2) the cement has never exhibited the characteristic of an ignitable solid that is capable "under standard temperature and pressure of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard" per 40 CFR 261.21(a)(2); and (3) the cement has never exhibited oxidizing behavior per 40 CFR 261.21(a)(4).

The reactivity characteristic has never been observed regarding cement. The cement has never exhibited the following properties per 40 CFR 261.23: (1) it is normally unstable and readily undergoes violent change without detonating; (2) it reacts violently with water; (3) it forms potentially explosive mixtures with water; (4) when mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment; (5) it is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement; and (6) it is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

The basis for this determination has been established by direct personnel observations, the facility operating record, and the chemical nature of the Portland cement used in the LANL stabilization process. LANL staff has never observed any ignitable or reactive behavior associated with the cemented waste from the stabilization process. Facility records also confirm that no ignitable or reactive behavior was ever observed from the cemented waste. Lastly, Portland cement by its chemical nature will not react with oxidizers and has no available hydrogen, oxygen, and carbon molecules to help sustain a reaction. In addition, the stabilization process produces a solid monolith, which is an absorber of heat, further reducing any potential for reactive behavior within the cement matrix.

Characterization and stabilization (cementation) treatment of newly generated evaporator bottom waste at TA-55 is conducted in accordance with the Permit as approved. The waste treated at the TA-55 Mixed Waste Stabilization Unit is characterized using the procedure outlined in Permit Attachment C (Waste Analysis Plan), Section C.3.2.4.

Based on the above facts, the Permittees recommend that no further controls be implemented for the cemented legacy and newly generated cemented nitrate salt-bearing waste generated since 1991.

VIII. Immediate Action Implementation Schedule

Activity	**Due Date**
Remediated Nitrate Salt-Bearing Waste Containers	
Overpacking (into SWBs) of all nitrate salt-bearing wastes at LANL	Completed 5/18/14
Movement of SWBs to designated areas (e.g., Domes 230, 231 and 375) – (Remediated nitrate salt-bearing drums were in Dome 230, but have been moved to the 375 Permacon)	Move to Dome 230 completed on 5/1/14. All remaining moves completed on 6/3/14
Daily/Hourly monitoring of containers	Daily monitoring began on 5/1/14. Hourly monitoring began on 5/17/14
Appropriate spacing of SWBs	Completed in Dome 230 on 5/1/14. Completed in Dome 375 & 231 Permacons on 6/3/14
Updating procedures/safety basis documents as appropriate	Completed on 5/30/14
Labels for SWBs (display inner container label)	Completed 5/18/14
Remediation Team kick off	Completed 5/20/14

Activity	**Due Date**
Unremediated Nitrate Salt-Bearing Containers	
Movement of 85-gallon drums to designated areas (e.g., Domes 230, 231 and 375)	Began in Dome 230 on 5/1/14. All remaining moves completed on 6/3/14
Daily/Hourly monitoring of containers	Daily/Hourly; began on 5/20/14
Appropriate spacing of containers	Completed in Dome 230 on 5/1/14. Completed in Domes 375 and 231 Permacons on 6/3/14
Updating procedures/safety basis documents as appropriate	5/30/14
Remediation Team kick off	Completed 5/20/14

IX. Updates/Submissions

The Permittees shall provide updates to NMED during the twice weekly pre-scheduled technical calls. The Permittees shall also provide updates to NMED in the form of daily written submissions that will be sent to NMED via electronic mail (email) by close of business (COB) on a daily basis until NMED indicates otherwise. For purposes of this Plan, daily refers to business days, and excludes state and federal holidays.

All submissions related to this Order shall be placed in both the electronic and hard-copy Information Repositories within five (5) working days of submission to NMED.

All procedures and plans attached to this Revised Isolation Plan may be revised by the Permittees as required. Revisions will be submitted to NMED and placed in Information Repositories as required in this Section IX.

All submissions required by NMED's Order will be sent to the following addresses:

Bureau Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87508-6303

Division Director
Environmental Health Division
Harold Runnels Building

1190 Saint Francis Drive, PO Box 5469
Santa Fe, New Mexico 87502-5469

Attachment 1

Attachment 1
LANL D001 (Ignitability) Testing To Date

RCRA D001 definition	TEST METHOD	TESTING OF REMEDIATED WASTE SURROGATES					
		TEST 1	RESULT	TEST 2	RESULT	TEST 3	RESULT
40 CFR 261.21(a)(2) - • Is the waste capable...of causing fire through friction, absorption of moisture or spontaneous chemical changes? and	**EPA SW-846 Method 1050** *(not required)*	SWRI July 7 *("simple" surrogate, sample no. WST54-14-MIX)*	**PASS** (not pyrophoric or self-heating)	--	--	--	--
• When ignited, does it burn so vigorously and persistently that it creates a hazard?	**EPA SW-846 Method 1030** *(not required)*	SWRI June 26 *("simple" surrogate, sample ID WST54-14-MIX)*	**PASS** (not ignitable)	--	--	--	--
40 CFR 261.21(a)(4) - Is the waste an oxidizer *[according to DOT]?* • *(does it yield oxygen readily to stimulate the combustion of organic matter?)*	**EPA SW-846 Method 1040** *(not required)*	SWRI July 29 *("revised" dry surrogate, sample ID CYA-D)*	1.**PASS** (Non-oxidizer); 2.**FAIL** (Category III oxidizer) *(duplicate)*	SWRI July 29 *("revised" surrogate w/ 70% acid, sample ID CYA-N)*	**FAIL** (Category III oxidizer)	SWRI September 9 *("simple" surrogate, sample ID 560542-1LY)*	**FAIL** (Category II oxidizer)
49 CFR 173.127(a)(1) - Is the waste a "DOT oxidizing solid"?	**UN** *Manual of Tests and Criteria*, Section 34, **Method O.1** *(required)*	SWRI August 5 *("revised" dry surrogate, sample ID CYA-D)*	**1. PASS** (Not Division 5.1 oxidizer); **2. FAIL** (Packing Group III oxidizer) *(duplicate)*	SWRI August 5 *("revised" surrogate w/ 70% acid, sample ID CYA-N)*	**FAIL** (DOT Packing Group III oxidizer)	SWRI September 9 *("simple" surrogate, sample ID 560542-2MX)*	**FAIL** (DOT Packing Group II oxidizer)

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

June 26, 2014

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, New Mexico 87545

Attn: Keith R. Greene

Subject:		
	COC ID:	ADEP
	SwRI Project Number:	19869.01.00X
	SDG:	553447
	SwRI Task Order Number:	140609-9
	SwRI Sample Receipt Number:	53282
	Samples received:	06/06/14
	Analysis:	Method 1030

Dear Mr. Greene,

Please find the enclosed results for the solid sample received on the above referenced date. Should you have any questions, please feel free contact me directly at 210-522-3051, or by email at hschattenberg@swri.org.

Sincerely,

Herbert J. Schattenberg III
Program Manager

APPROVED:

Michael J. Dammann
Director

HJS: dr
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140609-9
SRR#: 53282
SDG: 553447
VTSR: 06/06/14

NARRATIVE

Total Page Count: 010001-
Fraction: Method 1030 Pages: 010027

Client: Los Alamos National Laboratory
SDG: 553447
SwRI Project Number: 19869.01.006
SwRI Task Order Number: 140609-9

010002

INORGANICS ANALYSIS

NFPA / Method 1030

Sample WST54-14-MIX was tested according to NFPA 484 *Standard for Combustible Metals*, Section 4.2 Determination of Combustibility. This procedure is equivalent to SW 846 Method 1030 Ignitability *of Solids*, Section 7.1 Preliminary Screening. The sample was formed into a 250-mm long by 20 mm wide and 10 mm high powder train on a low thermal conductive plate. The flame from a propane torch, verified to be > 1000 °C, was applied to the powder train for 2 minutes. Glowing was observed at the heated zone but did not propagate along the powder train. Therefore, according to NFPA standard, the material shall be considered a nonbombustible form. Also, by Method 1030 standards, the material is not considered flammable. Magnesium was tested for a positive control.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI."

RSpies

Group Leader

06/26/14
Date

010003

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140609-9
SRR#: 53282
SDG: 553447
VTSR: 06/06/14

METHOD 1030

010004

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140609-9
SRR#: 53282
SDG: 553447
VTSR: 06/06/14

SAMPLE RESULTS

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET 010005

Sample ID
WST54-14-MIX

Lab Name: Southwest Research Institute

Client: Los Alamos National Lab.

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 06/06/14

SRR #: 53282

Date Analyzed: 06/09/14

Task Order #: 140609-9

Lab System ID: 553447

Method Reference	Results
NFPA 484 *Standard for Combustible Metals* Section 4.2 Determination of Combustibility	The material shall be considered a nonbombustible form
SW 846 Method 1030 *Ignitability of Solids* Section 7.1 Preliminary Screening	The material is not considered flammable.

* Note: Magnesium metal was used as laboratory control sample and gave positive results.

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010006

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140609-9
SRR#: 53282
SDG: 553447
VTSR: 06/06/14

Method 1030
Logbook Data

Book I.D. 12-0406-038 Book/ Page : 11 00194

Southwest Research Institute®
Logbook: Physical Testing

010007

Analysis / Method: SW 846 1030 (NFPA 484) Project# 1968.01.006 TE DAM 6/9/14

Client: LANL TO# 140609-9

LCS Info: TV= Balance#: N/A

Notes: magnesium powder was used as a positive control

Sample ID	glowing	propagated past heat zone	flame		
LCS	Yes	Yes	Yes		
553447	Yes	No	No		
553447D	Yes	No	No		

Sample 553447 was heated with then end of a train for two minutes. The heated area glowed, became molten, and would shoot a spark off every so often. However, the burning did not propagate past the burn zone. After heating, the burn zone was chared and a bit hardened while the rest of the train was untouched loose sample.

According to NFPA 484 section 4.2 sample 553447 is considered noncombustable.

6/9/14 DAM

Calculation:

Analyst Signature: Date: 6/9/14

Reviewed by: M. Mendoza Date: 10/23/14

010008

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140609-9
SRR#: 53282
SDG: 553447
VTSR: 06/06/14

SAMPLE RECEIPT, TASK ORDER
&
CHAIN OF CUSTODY

010009

Sample Receipt

Southwest Research Institute | Sample Receipt Number: 53282 | VTSR: 06/06/14 | Time: 09:15:00

Project: 19869.01.00X | Revision: 1 | **Manager: DAMMANN, MIKE**
Case #: ADEP | *This Receipt was Revised Jun 9 2014 8:19AM* | **Logged in by: SRAMIREZ**
Client: Los Alamos National Laboratory | **Creation Date:**

Notes

Sample was delivered intact at 0.5 °C (blue/wet ice).

Fed Ex #(s): 5908 1777 1295

See Task Order for full requirements.

See chain of custody as part of the SRR system for more information.

Phases:
001 - admin
002 - extraction
005 - 8082
006 - metals/radchem
007 - drg

Rev. 1 changed case name and moved system ID 553446 to new SRR 53291.

Background CPM: <100 cpm
Container Wipe CPM: <100 cpm
Total CPM: <100

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
553447	WST54-14-MIX	06/04/14	Solid	1	
Containers: 1				**Samples: 1**	

These documents are associated with this receipt: 159435[COC for SRR 53282], 159436[SRR Paperwork for SRR 53282]

Thermometer: 18439
Temperature: 0.5

Client: Los Alamos Nat[illegible] SR#: 53282

Page Printed: 26 Jun 2014 11:24:06
ver (10/16/2013)

FRM-002

Southwest Research Institute

Laboratory Task Order

010010

TO #: 140609-9 Revision: 1

SDG: 553447
VTSR: 06/06/14
CASE: ADEP

SRR #'s: 53282
Client(s): Los Alamos National Laboratory

Project(s): 19869.01.00X
Manager(s): DAMMANN, MIKE
To PM:
To QA:
To Client: 06/09/14

Instructions

Los Alamos National Laboratory _ Subcontract No. 250954
Lab Request # ADEP
SDG is 553447.

RUSH TAT. 3-business days
ALL DATA IS DUE TO THE CLIENT ON 06/11/2014.

1 overall SOLID sample (1 container) was received on 06/06/2014.

50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio

Requires:
sw-846:1030 (NFPA 484)

PRELIMS _ Email prelims to: Keith Greene kgreene@lanl.gov

EDD REQUIRED. Please note, All results have to be merged under 1 EDD "file."
See Exhibit "D" Scope of Work and Technical Specifications for Off-Site Analytical Laboratory Services

---

Main point-of-contact is Keith R. Greene, kgreene@lanl.gov; Additional contact Nita Patel npatel@lanl.gov
Send Hardcopy & CD TO:
Los Alamos National Laboratory
ATTN: Keith R. Greene
TA-3 SM-271 Drop point 02U
Los Alamos, NM 87545
REVISION 1, DRmz 06/26/14: Task Order revised to remove test Method 1050. Due to limited volume only Method 1030 was able to be completed. Method 1050 moved to Task Order # 140626-2, since additional volume to complete the test might be forthcoming.

Documents Related to this task order: 159435[COC for SRR 53282], 159436[SRR Paperwork for SRR 53282]

Deliverables --> Hard Copy: -YES- EDD: no PDF: -YES-

Test: COMB_1050 Holding: 180 days from CED
Section: WETCHEM — SW846 1050 Test A & C Spontaneous Combustion — Cnt: 1

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
553447		1	Solid	WST54-14-MIX	04 Jun 14	01 Dec 14

Test: IGNIT_1030 Holding: 180 days from CED
Section: WETCHEM — SW 846 Method 1030 Ignitability of solids — Cnt: 1

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
553447		1	Solid	WST54-14-MIX	04 Jun 14	01 Dec 14

ADEP

FIELD CHAIN- OF CUSTODY

010011

NAME: Keith Greene

Z#: _____

PHONE: 665-9966

TA: _____

OU: _____

CHAGE CODE: _____

SAMPLE #	ORDER CODE	CONTAINER	PREV. COLLECTED: Time /date	SPECIAL instructions
WST54-14-mix		125 poly	6/4/14 1:30	Flamability + Ignitability

Client:Los Alamos National Laboratory
SwRI Project #18889.01.04X
VTSR: 06/06/14 0915
Battery Check: Y
Cooler/Container Wipe: <100 cpm
Total cpm-mR/h (samples): <100 cpm / <0.5mR/hr
(see Radioactive Material Receiving Form for more information

SwRI SRR #53282
Case:ADEP
Sample(s) Received: Intact
Background Check: <100 cpm (Lab 103)
Temp.: 0.5°C (blue/wet ice) / #18439
Wipe Frisk Description: Cooler(s) - 1

Send results to Keith Greene/Nita Patel

RELINQUISHED BY:	Date/Time	RECEIVED BY;	Date/Time
Keith Greene	6/4/14 3:00	STEVEN RAMIREZ	06/06/14 0915

Southwest Research Institute

Traffic Report

010012

Sample Custodian Signature: _____

1. Custody Seal	Present
2. Chain of Custody	Present
3. Sample Tags	Not Present
Sample Tag Numbers	Not on COC
4. SMO Forms	Not Present

Client: Los Alamos National Laboratory

Project: 19869.01.00X

Case: ADEP / SDG: _____

Sample Receipt: 53282

Airbill: 5908 1777 1295

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
06/06/14	09:15:00	ADEP	WST54-14-MIX	N/A	553447	YES	Intact

SAMPLE LOG-IN SHEET

010013

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): STEVEN RAMIREZ	Log-in Date: 06/06/2014
Received By (Signature): Steven Ramirez	
Case Number: ADEP	Sample Delivery Group No.: N/A
Remarks: 19869.01.00X	SAS Number: N/A

			Corresponding		Remarks: Condition of Sample Shipment, etc
		EPA Sample #	Sample Tag #	Assigned Lab #	
1.	Custody Seal(s)	Present/Absent* Intact/Broken	WST54-14-MIX	N/A	553447 Intact
2.	Custody Seal Nos.	N/A			
3.	Chain-of Custody Records	Present/Absent*			
4.	Traffic Reports or Packing Lists	Present/Absent			
5.	Airbill	Airbill/Sticker Present/Absent*			
6.	Airbill No.	5908 1777 1295			
7.	Sample Tags	Present/Absent			
	Sample Tag Numbers	Listed/Not listed on Chain of Custody			
8.	Sample Condition	Intact/Broken*/ Leaking			
9.	Cooler Temperature	0.5C			
10.	Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*			
11.	Date Received at Lab	06/06/2014			
12.	Time Received	09:15:00			

Sample Transfer					
Fraction: ORG	Fraction				
Area #: COOLER 13	Area #				
By: STEVEN RAMIREZ	By				
On: 06/06/2014	On				

* Contact SMO and attach record of resolution

Reviewed By: 6.9.14	Logbook No.: Sample Receipt (53282)
Date	Logbook Page No.: 8747 SEC 2, 3 of 6

010014

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140609-9
SRR#: 53282
SDG: 553447
VTSR: 06/06/14

Client Communication

Ramirez, Daniel

From: Spies, Radonna S.
Sent: Wednesday, June 11, 2014 9:27 AM
To: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

Spoke with Nita –

She said that they will likely send us the kitty litter and we can mix it and retest the 100mm cube

---

From: Spies, Radonna S.
Sent: Wednesday, June 11, 2014 7:54 AM
To: 'Patel, Nita'; 'Greene, Keith R'
Cc: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

WST54-14-MIX

Method 1030
Glowing was observed at the heated zone but did not propagate along the powder train. Therefore, according to NFPA standard, the material shall be considered a non-combustible form. Also, by Method 1030 standards, the material is not considered flammable

Method 1050
The temperature of the material in a 25x25mm cube exceed 200C (max temp = 141C). According to the method, if 25-mm cube test cube test is negative, then the waste must be evaluated by the 100-mm cube test.

Therefore, we need more material to perform the 100-mm test for the results to be conclusive.

Please let us know how to proceed.

Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

-----Original Message-----
From: Spies, Radonna S.
Sent: Monday, June 09, 2014 10:57 AM
To: 'Patel, Nita'; Greene, Keith R
Cc: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

Nita -

With 50g of samples, we will have to use the 25 x 25 mm cube for METHOD 1050 TEST METHODS TO DETERMINE SUBSTANCES LIKELY TO SPONTANEOUSLY COMBUST - but according to the method, Section 11.4.9 states, " If the waste is suspected to have strong self-heating properties, the 25-mm cube test may be performed in lieu of the 100-mm cube test. If the results of this test are positive, then the test using the 100-mm cage need not be performed because the waste has self-heating properties. If the results of the 25-mm cube test are negative, then the waste must be evaluated by the 100-mm cube test in order to make a proper self-heating determination.". Therefore, if no self heating is indicated, then we will not have enough to perform the 100x100mm cube test.

We are begin the test today and should know by tomorrow morning if the material appears to be self heating. If it is not, then we will need to repeat with the 100x100mm cube. I know that a limited amount of sample was probably sent due to the oxidizer.

If you'd like, let us know the brand of kitty liter and we can purchase here, if available, and do the mixing of the concoction in the lab.

Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

-----Original Message-----
From: Patel, Nita [mailto:npatel@lanl.gov]
Sent: Wednesday, June 04, 2014 9:09 PM
To: Ramirez, Daniel; Greene, Keith R
Cc: Spies, Radonna S.
Subject: Re: FYI

Hi Daniel. The sample is on a rush tat. Thank you, Nita

----- Original Message -----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

Keith,
Will it require a rush TAT?

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

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From: Spies, Radonna S.
Sent: Wednesday, June 11, 2014 7:54 AM
To: Patel, Nita; Greene, Keith R
Cc: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

WST54-14-MIX

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Glowing was observed at the heated zone but did not propagate along the powder train. Therefore, according to NFPA standard, the material shall be considered a non-combustible form. Also, by Method 1030 standards, the material is not considered flammable

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Radonna Spies
Group Leader
Analytical and Environmental Chemistry
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fax: 210-522-3649
email: rspies@swri.org

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From: Spies, Radonna S.
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If you'd like, let us know the brand of kitty liter and we can purchase here, if available, and do the mixing of the concoction in the lab.

Thanks

Radonna Spies
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ph: 210-522-3242
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From: Patel, Nita [mailto:npatel@lanl.gov]
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To: Ramirez, Daniel; Greene, Keith R
Cc: Spies, Radonna S.
Subject: Re: FYI

Hi Daniel. The sample is on a rush tat. Thank you, Nita

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From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

Keith,
Will it require a rush TAT?

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

010020

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

Ramirez, Daniel

From: Spies, Radonna S.
Sent: Monday, June 09, 2014 10:57 AM
To: Patel, Nita; Greene, Keith R
Cc: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

Nita -

With 50g of samples, we will have to use the 25 x 25 mm cube for METHOD 1050 TEST METHODS TO DETERMINE SUBSTANCES LIKELY TO SPONTANEOUSLY COMBUST - but according to the method, Section 11.4.9 states, " If the waste is suspected to have strong self-heating properties, the 25-mm cube test may be performed in lieu of the 100-mm cube test. If the results of this test are positive, then the test using the 100-mm cage need not be performed because the waste has self-heating properties. If the results of the 25-mm cube test are negative, then the waste must be evaluated by the 100-mm cube test in order to make a proper self-heating determination.". Therefore, if no self heating is indicated, then we will not have enough to perform the 100x100mm cube test.

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If you'd like, let us know the brand of kitty liter and we can purchase here, if available, and do the mixing of the concoction in the lab.

Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
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email: rspies@swri.org

-----Original Message-----
From: Patel, Nita [mailto:npatel@lanl.gov]
Sent: Wednesday, June 04, 2014 9:09 PM
To: Ramirez, Daniel; Greene, Keith R
Cc: Spies, Radonna S.
Subject: Re: FYI

Hi Daniel. The sample is on a rush tat. Thank you, Nita

----- Original Message -----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

Keith,

Will it require a rush TAT?

010022

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

Ramirez, Daniel

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Thursday, June 05, 2014 11:42 AM
To: Ramirez, Daniel
Subject: RE: FYI

590817771295 says has departed local fed-ex location

-----Original Message-----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Thursday, June 05, 2014 10:38 AM
To: Greene, Keith R
Subject: RE: FYI

Keith,
Could you provide me with a tracking number for the below shipment, we have yet to receive it. FED EX has been experiencing lots of delays this week.

thanks

-----Original Message-----
From: Greene, Keith R [mailto:kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 6:35 PM
To: Ramirez, Daniel
Subject: Re: FYI

Yes if we could have something by early next week that would be great!

----- Original Message -----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

Keith,
Will it require a rush TAT?

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

010024

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

Ramirez, Daniel 010025

From: Patel, Nita [npatel@lanl.gov]
Sent: Thursday, June 05, 2014 9:21 AM
To: Dammann, Michael J.
Cc: Ramirez, Daniel
Subject: Mike.. FW: FYI

HI Mike, this sample has a mass ratio of 1:5 to 1. Kitty litter to sodium nitrate.

And the volume is 3:1.

Please email the preliminary results like last time. Also, send edd and data package to SMO.

-----Original Message-----
From: Patel, Nita
Sent: Wednesday, June 04, 2014 8:09 PM
To: 'daniel.ramirez@swri.org'; Greene, Keith R
Cc: 'radonna.spies@swri.org'
Subject: Re: FYI

Hi Daniel. The sample is on a rush tat. Thank you, Nita

----- Original Message -----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

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Will it require a rush TAT?

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
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-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

010027

Ramirez, Daniel

From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

SOUTHWEST RESEARCH INSTITUTE®

6220 CULEBRA ROAD 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

July 7, 2014

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, New Mexico 87545

Attn: Keith R. Greene

Subject:		
	COC ID:	ADEP
	SwRI Project Number:	19869.01.00X
	SDG:	553447
	SwRI Task Order Number:	140626-2
	SwRI Sample Receipt Number:	53282
	Samples received:	06/06/14, 07/01/14
	Analysis:	Method 1050

Dear Mr. Greene,

Please find the enclosed results for the sample received on the above referenced dates. Should you have any questions, please feel free contact me directly at 210-522-3051, or by email at hschattenberg@swri.org.

Sincerely,

Herbert J. Schattenberg III
Program Manager

APPROVED:

Michael J. Dammann
Director

HJS: dr
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140626-2
SRR#: 53282
SDG: 553447
VTSR: 06/06/14, 07/01/14
CASE: ADEP

METHOD 1050 ANALYSIS

Total Page Count:
Fraction: Data Report Pages: 6

Client: Los Alamos National Laboratory
SDG: 553447
SwRI Project Number: 19869.01.006
SwRI Task Order Number: 140626-2

INORGANICS ANALYSIS

Method 1050 25-mm analysis

Sample WST54-14-MIX was tested according to SW 846 Method 1050, *Test Methods to Determine Substances Likely to Spontaneously Combust*, Method C - Self-heating wastes. The sample was received on 06/06/14 and due to the limited volume the self-heating test was performed using two 25-mm cubes. Once the sample was placed into the 25-mm cube it was loaded into an outer cage and suspended in an oven. A thermocouple was positioned near the center of the sample and its duplicate, with an additional thermocouple monitoring the oven temperature. The oven temperature was ramped to 140°C, with a 2°C range. Temperatures were continuously monitored. After 24-hours, the temperatures were graphed and evaluated. Figure 1 illustrates the graph for the 25-mm cube analysis. Since the temperature of the sample did not exceed 200°C and did not exhibit self heating tendencies, a 100-mm cube test was further needed in order to determine if the sample was considered self-heating.

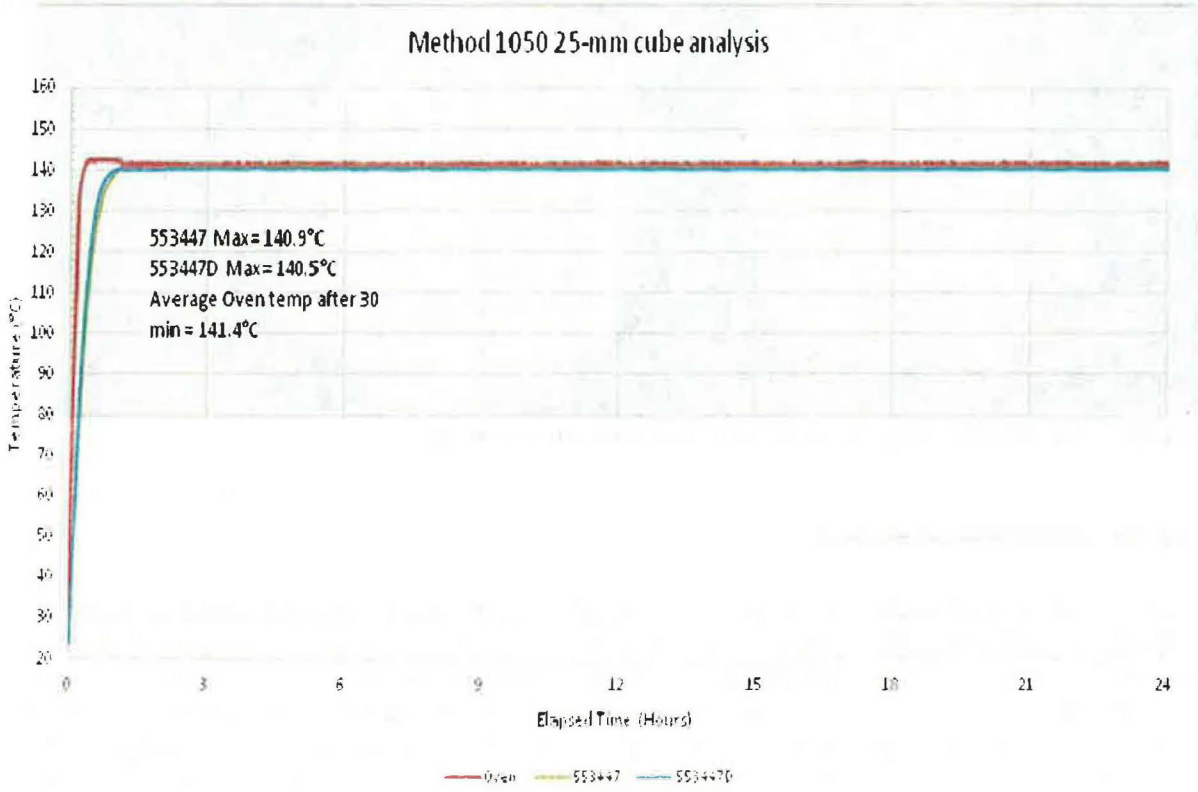


Figure 1. 25-mm cube analysis
After 24-hours:
Air Temp at Samples Average after 30 minute warm up period 141.4 C
Maximum Temp for sample LANL # WST54-14-MIX = 140.9 C @ Time= 3 Hrs 22 Min
Maximum Temp for sample LANL # WST54-14-MIX DUP = 140.5 C @ Time= 4 Hrs 7 Min

Client: Los Alamos National Laboratory
SDG: 553447
SwRI Project Number: 19869.01.006
SwRI Task Order Number: 140626-2

When the samples were removed from the oven, it was noted that they appeared slightly darker than they were at the beginning of test, reference Image 1.

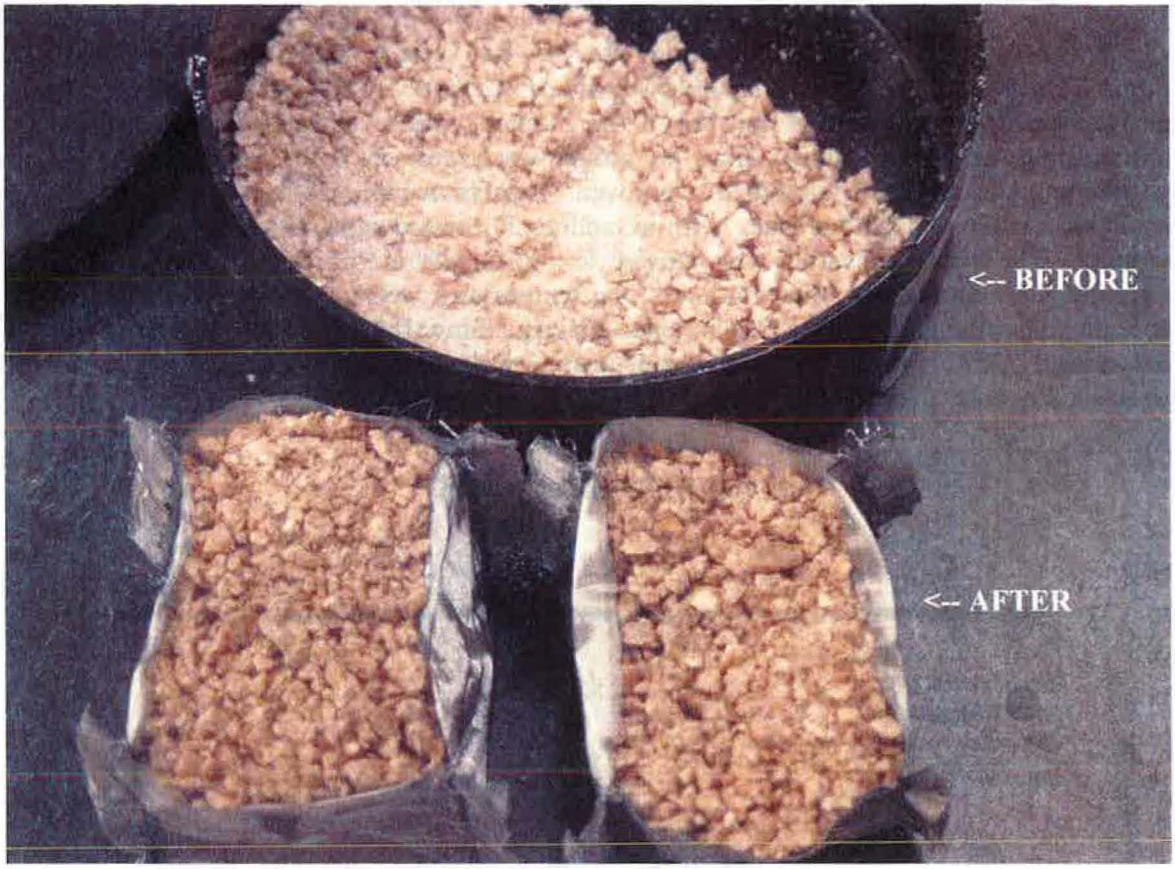


Image 1. Sample for 25-mm analysis before and after testing

Method 1050 100-mm analysis

On 07/01/14, an additional 1L container of sample was obtained from the client in order to perform the 100-mm cube analysis, to determine if the sample was self-heating according to Method C. Upon receipt a visual inspection was performed and it was noticed that the bottle had compressed in on itself. Pictures were taken to document the incident and can be viewed in Image 2, which show the unadulterated bottle as received by the lab before analysis was performed. Pictures were sent to LANL and permission was granted to the lab to proceed with the 100-mm test. The sample was placed into the 100-mm cube, loaded into an outer cage, and suspended in an oven. A thermocouple was positioned near the center of the sample and its duplicate, with an additional thermocouple monitoring the oven temperature. The oven temperature was ramped to 140°C, with a 2°C range. Temperatures were continuously monitored. After 24-hours, the temperatures were graphed and evaluated. Figure 2 illustrates the graph for the 100-mm cube analysis.

Client: Los Alamos National Laboratory
SDG: 553447
SwRI Project Number: 19869.01.006
SwRI Task Order Number: 140626-2

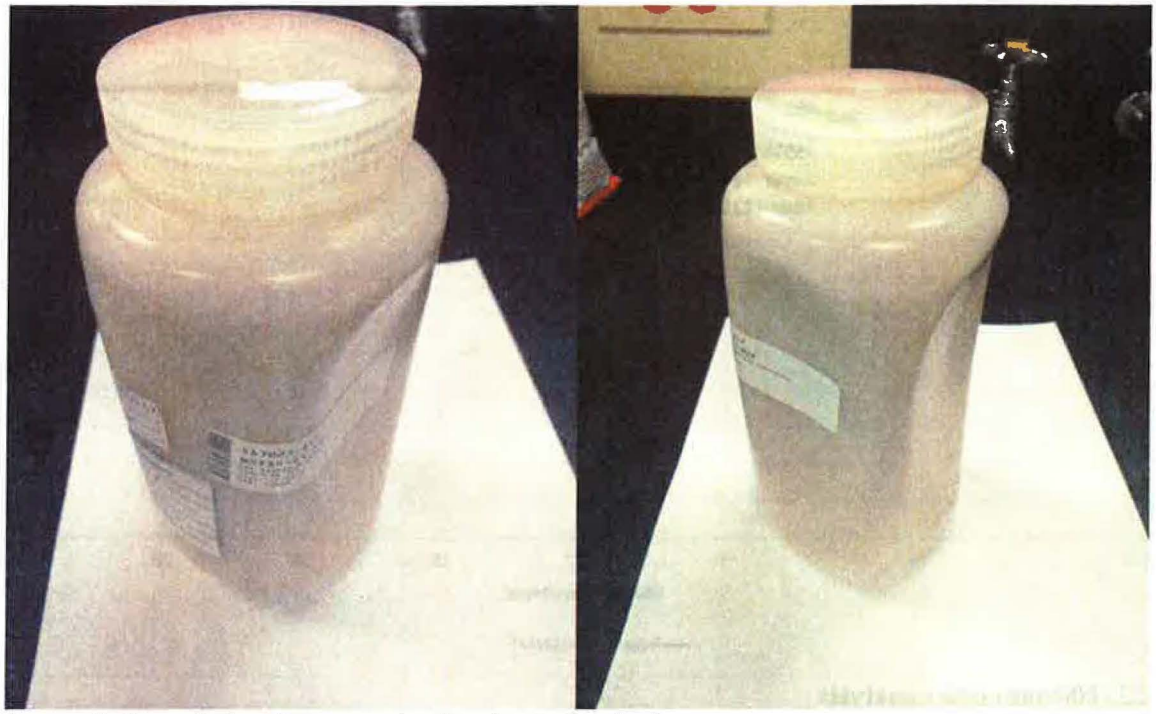


Image 2. Sample bottle as received prior to analysis.

Client: Los Alamos National Laboratory
SDG: 553447
SwRI Project Number: 19869.01.006
SwRI Task Order Number: 140626-2

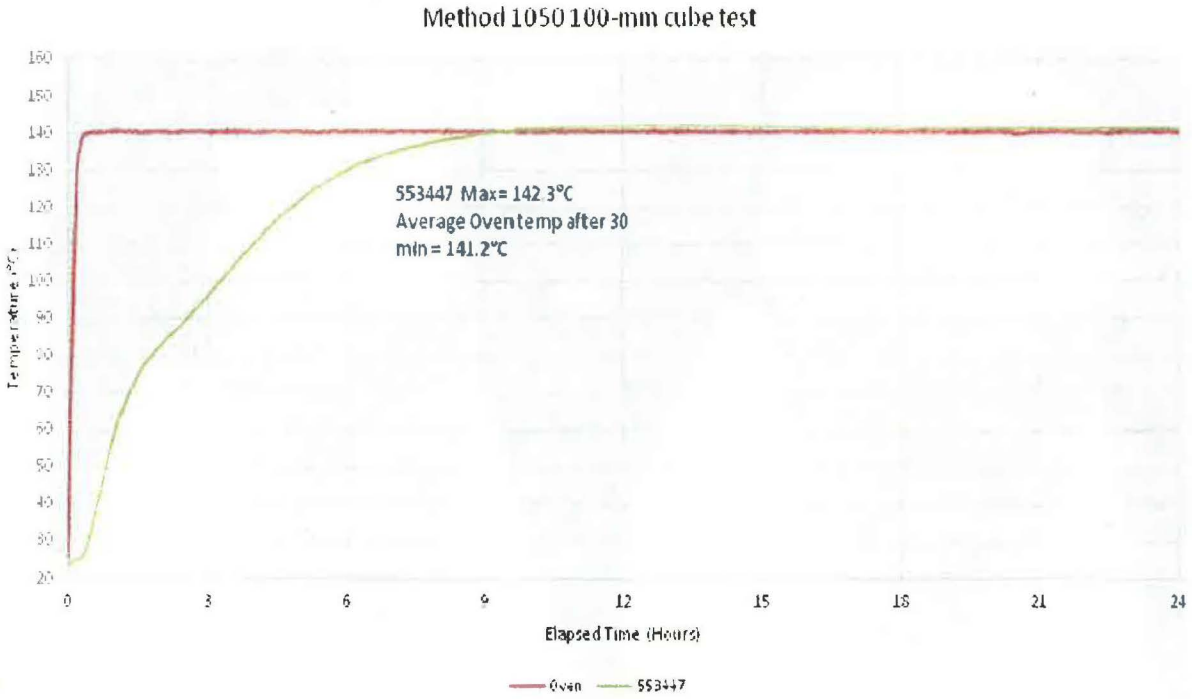


Figure 2. 100-mm cube analysis

After24-hours:
Air Temp at Samples Average after 30 minute warm up period 141.2 C
Maximum Temp for sample LANL # WST54-14-MIX = 142.3 C @ Time= 13 Hrs 24 Min

After the 24-hr time period the temperature of the sample did not exceed 200°C; therefore the material is considered not to be self-heating. The material is also not considered pyrophoric according to Method A- Pyrophoric Solids. When the samples were removed from the oven, an observation was noted that they appeared slightly darker than they were at the beginning of test. Also, upon emptying out the cages, it was noticed that approximately ¼ of the sample mass formed two clumps, which were buried in the central region of the cage. These clumps can be seen in Image 3.

Client: Los Alamos National Laboratory
SDG: 553447
SwRI Project Number: 19869.01.006
SwRI Task Order Number: 140626-2



Image 3. Clumps formed during 100-mm cube analysis.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI."

RSpies

Group Leader

07/07/14
Date

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140626-2
SRR#: 53282
SDG: 553447
VTSR: 06/06/14, 07/01/14
CASE: ADEP

METHOD 1050
Form I

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET 010002

Sample ID
WST54-14-MIX

Lab Name: Southwest Research Institute

Client: Los Alamos National Lab.

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 06/06/14, 07/01/14

SRR #:53282

Date Analyzed: 06/09/14, 07/01/14

Task Order #: 140626-2

Lab System ID: 553447

Method Reference	Results
SW 846 Method 1050 *Test Method to Determine Substances Likey to Spontaneously Combust* Method C	The material is not considered pyrophoric or self heating.

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010003

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140626-2
SRR#: 53282
SDG: 553447
VTSR: 06/06/14, 07/01/14
CASE: ADEP

METHOD 1050
Logbook Data

Southwest Research Institute®
Logbook: Miscellaneous

010004

Logbook #/ Page #_15 0069_ Book I.D. #__13-0406-035

Analysis / Method: comb 1050 Project# 19869.01.006

TAP# (if applicable): N/A N/A

Client: LANL TO# 140609-9

Balance # N/A

LCS Info: N/A TV: N/A

Notes: Time start 15:28 6/9/14

Sample ID					

Sample 553447 was placed into 25mm cups due to limited sample volume. 553447 was placed in cup 1 and the duplicate in cup 2. Testing began at 15:28 on 6/9/14 with two thermocouples monitoring the oven, sample, and duplicate. The oven was set to 140±2°C. After 24 hours the oven was turned off. Neither the sample or duplicate exceeded 200°C they both remained at the oven temperature of 140±2°C. According to the method the 100mm cups will now be needed in order to determine if the sample is combustible or self heating. Due to limited sample more will need to be obtained to perform the heating in the 100mm cups. When pulled from the oven after cooling, the sample was darker brown than when it began. In the sample cups a small amount of sand/sample together.

JAM 6/9/14

Calculation:

Analyst Signature: James Moore Date: 6/9/14

Reviewed by: Jacqueline Herrera Date: 07/07/14

Southwest Research Institute®
Logbook: Miscellaneous

010005

Logbook #/ Page #_15 0071_ Book I.D. #__13-0406-035

Analysis / Method: Comb 1050 Project# 19864.01.006

TAP# (if applicable): N/A N/A

Client: LANL TO# 140626-2

Balance # N/A

LCS Info: N/A TV: N/A

Notes: 140°C ± 2

Sample ID					
553447					

Sample ~~557023~~ test# 71114 was placed into a 100mm stainless steel cage which was inserted into a secondary steel cage #1. all sample was placed into the 100mm cage for analysis. Testing began at 11:46am 7/11/14. After 24hr temperature of the sample did not exceed 143°C. Upon emptying the cage it was noticed that the central portion of sample had clamped together forming two firm pieces of sample. Since temperature of sample did not exceed 200°C sample is not self heating.

7/7/14

Calculation:

Analyst Signature: James Mahe Date: 7/11/14

Reviewed by: Judy Herrera Date: 07/07/14

010006

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140626-2
SRR#: 53282
SDG: 553447
VTSR: 06/06/14, 07/01/14
CASE: ADEP

SAMPLE RECEIPT, TASK ORDER
&
CHAIN OF CUSTODY

010007

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 53282

VTSR: 06/06/14

Time: 09:15:00

Project: 19869.01.00X
Case #: ADEP
Client: Los Alamos National Laboratory

Revision: 4

This Receipt was Revised Jul 1 2014 10:02AM

Manager: DAMMANN, MIKE
Logged in by: SRAMIREZ
Creation Date:

Notes

Sample was delivered intact at 0.5 °C (blue/wet ice).

Fed Ex #(s): 5908 1777 1295- sample #1 0.5 °C (blue/wet ice).

Fed Ex #(s): 5908 1777 2410- sample #2 22.0 °C (no ice).
recieved sample at 07/01/14 at 08:38am

See Task Order for full requirements.

See chain of custody as part of the SRR system for more information.

Phases:
001 - admin
002 - extraction
005 - 8082
006 - metals/radchem
007 - drg

Rev. 1 changed case name and moved system ID 553446 to new SRR 53291.

Rev. 2 Moved Sample 557023 to SRR 53282 as ADDITIONAL volume.

Rev. 3 added notes (shipping info, temperature, date and time recived) for new sample.

Rev. 4 deleted sample 557023 and added second container for sample 553447. see attatched email

Background CPM: <100 cpm
Container Wipe CPM: <100 cpm
Total CPM: <100

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
553447	WST54-14-MIX	06/04/14	Solid	2	
Containers: 2				**Samples: 1**	

These documents are associated with this receipt: 159435[COC for SRR 53282], 159436[SRR Paperwork for SRR 53282], 160598[]

Thermometer: 18439
Temperature: 0.5

Page Printed: 7 Jul 2014 16:22:04
ver (10/16/2013)

Client: Los Alamos Nat SR#: 53282 FRM-002

Southwest Research Institute

Laboratory Task Order

TO #: 140626-2 Revision: 1

010008

SDG: 553447
VTSR: 06/06/14, 07/01/14
CASE: ADEP

SRR #'s: 53282
Client(s): Los Alamos National Laboratory

Project(s): 19869.01.00X
Manager(s): DAMMANN, MIKE
To PM:
To QA:
To Client: 07/07/14

Instructions

Los Alamos National Laboratory _ Subcontract No. 250954
Lab Request # ADEP
SDG is 553447.

RUSH TAT. 3-business days
ALL DATA IS DUE TO THE CLIENT ON 06/11/2014.

1 overall SOLID sample (1 container) was received on 06/06/2014. See also Task Order # 140609-9.
PLEASE NOTE _ Tests originally listed in Task Order # 140609-9. Method 1030 was able to be completed and submitted to client.

ADDITIONAL volume was received on 07/01/14, which was added to SRR 53282, listed as Container No. 2 under Lab System ID 553447.

Requires:
sw-846:1050
50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio

PRELIMS _ Email prelims to: Keith Greene kgreene@lanl.gov

EDD REQUIRED. Please note, All results have to be merged under 1 EDD "file."
See Exhibit "D" Scope of Work and Technical Specifications for Off-Site Analytical Laboratory Services

---

Main point-of-contact is Keith R. Greene, kgreene@lanl.gov; Additional contact Nita Patel npatel@lanl.gov
Send Hardcopy & CD TO:
Los Alamos National Laboratory
ATTN: Keith R. Greene
TA-3 SM-271 Drop point 02U
Los Alamos, NM 87545
REVISION 1, DRmz 07/01/14: Task Order revised to indicate additional volume was received. See SRR notes and TO instructions.

Documents Related to this task order: 159435[COC for SRR 53282], 159436[SRR Paperwork for SRR 53282], 161598[]

Deliverables --> Hard Copy: -YES- EDD: no PDF: -YES-

Test: COMB_1050 Holding: 180 days from CED
Section: WETCHEM **SW846 1050 Test A & C Spontaneous Combustion** Cnt: 1

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
553447		1	Solid	WST54-14-MIX	04 Jun 14	01 Dec 14
553447		2	Solid	WST54-14-MIX	04 Jun 14	01 Dec 14

ADEP

010009

FIELD CHAIN- OF CUSTODY

NAME: Keith Greene

Z#: _____

PHONE: 665-9966

TA: _____

OU: _____

CHAGE CODE: _____

SAMPLE #	ORDER CODE	CONTAINER	PREV. COLLECTED: Time /date	SPECIAL instructions
WST54-14-MIX		125 poly	6/4/14 1:30	Flamability + Ignitability
Additional Sample Received			6/30/14 1:35	
Send to SWRI			6/30/14 15:00	

Client: Los Alamos National Laboratory
BwRI Project #18868.01.08X
VTBR: 06/06/14 0815
Battery Check: Y
Cooler/Container Wipe: <100 cpm
Total cpm-mR/h (samples): <100 cpm / <0.5mR/hr
(see Radioactive Material Receiving Form for more information

BwRI BRR #53282
Case:ADEP
Sample(s) Received: Intact
Background Check: <100 cpm (Lab 103)
Temp.: 0.5°C (wet/blue ice) / #18439
Wipe Frisk Description: Cooler(s) - 1

Send results to Keith Greene/Alita Patel

RELINQUISHED BY:	Date/Time	RECEIVED BY;	Date/Time
Keith Greene	6/4/14 3:00	STEVEN RAMIREZ	07/01/14 0838

ADEP

010010

FIELD CHAIN- OF CUSTODY

NAME: Keith Greene

Z#: _____

PHONE: 665-9966

TA: _____

OU: _____

CHAGE CODE: _____

SAMPLE #	ORDER CODE	CONTAINER	PREV. COLLECTED: Time /date	SPECIAL instructions
WST54-14-mix		125 poly	6/4/14 1:30	Flamability + Ignitability

Client:Los Alamos National Laboratory
Cont:ADEP
Sample(s) Received: Intact
Background Check: <100 cpm (Lab 163)
Temp.: 8.5°C (Blue wet ice) / 0136.39
Wipe Pack Description: Cooler(s) - 1
(see Radioactive Material Receiving Form for more information)

Send results to Keith Greene/Nita Patel

RELINQUISHED BY:	Date/Time	RECEIVED BY;	Date/Time
Keith Greene	6/4/14 3:00	STEVEN RAMIREZ	06/06/14 0915

Southwest Research Institute

Traffic Report

Sample Custodian Signature: _____

010011

1. Custody Seal — Present
2. Chain of Custody — Present
3. Sample Tags — Not Present
   Sample Tag Numbers — Not on COC
4. SMO Forms — Not Present

Client: Los Alamos National Laboratory

Project: 19869.01.00X

Case: ADESH / SDG: _____

Sample Receipt: 53282

Airbill: 5908 1777 1295

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
06/06/14	09:15:00	ADESH	NP048-14-80011	N/A	553446	YES	Intact
06/06/14	09:15:00	ADEP	WST54-14-MIX	N/A	553447	YES	Intact

SAMPLE LOG-IN SHEET

010012

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): STEVEN RAMIREZ	Log-in Date: 06/06/2014
Received By (Signature): [signature]	
Case Number: ADESH	Sample Delivery Group No.: N/A
	SAS Number: N/A

Remarks: 19869.01.00X

			Corresponding		Remarks: Condition of Sample Shipment, etc
		EPA Sample #	Sample Tag #	Assigned Lab #	
1.	Custody Seal(s)	Present/Absent* Intact/Broken	NP048-14-80011	553446	Intact
2.	Custody Seal Nos.	N/A	WST54-14-MIX	553447	Intact
3.	Chain-of Custody Records	Present/Absent*			
4.	Traffic Reports or Packing Lists	Present Absent*			
5.	Airbill	Airbill/Sticker Present/Absent*			
6.	Airbill No.	5908 1777 1295			
7.	Sample Tags	Present/Absent*			
	Sample Tag Numbers	Listed/Not listed on Chain of Custody			
8.	Sample Condition	Intact/Broken*/ Leaking			
9.	Cooler Temperature	0.5C			
10.	Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*			
11.	Date Received at Lab	06/06/2014			
12.	Time Received	09:15:00			

Sample Transfer					
Fraction: ORG	Fraction				
Area #: Cooler 13	Area #				
By: STEVEN RAMIREZ	By				
On: 06/06/2014	On				

* Contact SMO and attach record of resolution

Reviewed By: [signature]	Logbook No.: Sample Receipt (53282)
Date: 06.14	Logbook Page No.: 8747

FORM DC-1

OLMO4.2

010013

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER#: 140626-2
SRR#: 53282
SDG: 553447
VTSR: 06/06/14, 07/01/14
CASE: ADEP

CLIENT COMMUNICATION

Ramirez, Daniel

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Tuesday, July 01, 2014 9:39 AM
To: Ramirez, Daniel
Subject: FW: sample

010014

From: Greene, Keith R
Sent: Tuesday, July 01, 2014 8:26 AM
To: MDammann@swri.org
Cc: Patel, Nita
Subject: sample

Mike, you should receive today the extra sample needed to complete the 1050 test on the kitty litter, txs

Ramirez, Daniel

From: Spies, Radonna S.
Sent: Wednesday, June 11, 2014 7:54 AM
To: Patel, Nita; Greene, Keith R
Cc: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

010015

WST54-14-MIX

Method 1030
Glowing was observed at the heated zone but did not propagate along the powder train. Therefore, according to NFPA standard, the material shall be considered a non-combustible form. Also, by Method 1030 standards, the material is not considered flammable

Method 1050
The temperature of the material in a 25x25mm cube exceed 200C (max temp = 141C). According to the method, if 25-mm cube test cube test is negative, then the waste must be evaluated by the 100-mm cube test.

Therefore, we need more material to perform the 100-mm test for the results to be conclusive.

Please let us know how to proceed.

Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

-----Original Message-----
From: Spies, Radonna S.
Sent: Monday, June 09, 2014 10:57 AM
To: 'Patel, Nita'; Greene, Keith R
Cc: Ramirez, Daniel; Dammann, Michael J.
Subject: RE: FYI

Nita -

With 50g of samples, we will have to use the 25 x 25 mm cube for METHOD 1050 TEST METHODS TO DETERMINE SUBSTANCES LIKELY TO SPONTANEOUSLY COMBUST - but according to the method, Section 11.4.9 states, " If the waste is suspected to have strong self-heating properties, the 25-mm cube test may be performed in lieu of the 100-mm cube test. If the results of this test are positive, then the test using the 100-mm cage need not be performed because the waste has self-heating properties. If the results of the 25-mm cube test are negative, then the waste must be evaluated by the 100-mm cube test in order to make a proper self-heating determination.". Therefore, if no self heating is indicated, then we will not have enough to perform the 100x100mm cube test.

We are begin the test today and should know by tomorrow morning if the material appears to be self heating. If it is not, then we will need to repeat with the 100x100mm cube. I know that a limited amount of sample was probably sent due to the oxidizer.

If you'd like, let us know the brand of kitty liter and we can purchase here, if available, and do the mixing of the concoction in the lab.

010016

Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

-----Original Message-----
From: Patel, Nita [mailto:npatel@lanl.gov]
Sent: Wednesday, June 04, 2014 9:09 PM
To: Ramirez, Daniel; Greene, Keith R
Cc: Spies, Radonna S.
Subject: Re: FYI

Hi Daniel. The sample is on a rush tat. Thank you, Nita

----- Original Message -----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

Keith,
Will it require a rush TAT?

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

010017

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

Ramirez, Daniel

From: Patel, Nita [npatel@lanl.gov]
Sent: Thursday, June 05, 2014 9:21 AM
To: Dammann, Michael J.
Cc: Ramirez, Daniel
Subject: Mike.. FW: FYI

010018

HI Mike, this sample has a mass ratio of 1:5 to 1. Kitty litter to sodium nitrate.

And the volume is 3:1.

Please email the preliminary results like last time. Also, send edd and data package to SMO.

-----Original Message-----
From: Patel, Nita
Sent: Wednesday, June 04, 2014 8:09 PM
To: 'daniel.ramirez@swri.org'; Greene, Keith R
Cc: 'radonna.spies@swri.org'
Subject: Re: FYI

Hi Daniel. The sample is on a rush tat. Thank you, Nita

----- Original Message -----
From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Wednesday, June 04, 2014 05:33 PM
To: Greene, Keith R
Cc: Spies, Radonna S. <radonna.spies@swri.org>; Patel, Nita
Subject: FW: FYI

Keith,
Will it require a rush TAT?

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

-----Original Message-----
From: Dammann, Michael J.
Sent: Wednesday, June 04, 2014 6:32 PM
To: Spies, Radonna S.; Ramirez, Daniel
Subject: FW: FYI

From: Greene, Keith R [kgreene@lanl.gov]
Sent: Wednesday, June 04, 2014 3:13 PM
To: Dammann, Michael J.
Cc: Patel, Nita
Subject: FYI

We are sending you guys another sample today that is 50 grams of a concocted matrix of sodium nitrate and kitty litter 1:1.5 ratio, for ignitability and flammability, txs

010019

SOUTHWEST RESEARCH INSTITUTE®

6220 CULEBRA ROAD 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

July 29, 2014

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, New Mexico 87545

Attn: Keith R. Greene

Subject:		
	COC ID:	ADEP
	SwRI Project Number:	19869.01.00X
	SDG:	558804
	SwRI Task Order Number:	140722-8
	SwRI Sample Receipt Number:	53554
	Samples received:	July 22, 2014
	Analysis:	Method 1040

Dear Mr. Greene,

Please find the enclosed results for the two (02) overall solid samples received on the above referenced dates. Should you have any questions, please feel free contact me directly at 210-522-3051, or by email at hschattenberg@swri.org.

Sincerely,

Herbert J. Schattenberg III
Program Manager

APPROVED:

Michael J. Dammann
Director

HJS: mg
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

NARRATIVE

Total Page Count:
Fraction: Data Report Pages: 010001 - 010023

Client: Los Alamos National Laboratory
SDG: 558804
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140722-8

OXIDIZER TEST

The sample was tested in accordance with the SW 846 Method 1040 *Test Method for Oxidizing Solids.* "This method provides a qualitative means to measure the potential of a solid waste to increase the burning rate or burning intensity of a combustible substance, specifically fibrous cellulose. The burning rates for 1:1 and 4:1 waste:cellulose mixtures (w/w) are compared to the burning rates for 3:7, 2:3, and 3:2 potassium bromate:cellulose mixtures. Potassium bromate is used as the reference oxidizing standard. The three mixing ratios of potassium bromate and cellulose provide a range of burning times by which the waste is classified. The 3:7 mixture ratio provides the longest burning time, the 3:2 mixture ratio provides the shortest burning time, and the 2:3 mixture ratio provides an intermediate burning time. The burning times for the potassium bromate:cellulose mixtures are correlated to their relative oxidizing strengths, i.e., the shorter the burning time, the greater the relative oxidizing strength. If the mean burning time for either waste/cellulose mixture is shorter than the mean burning time for the 3:7 potassium bromate/cellulose mixture, the waste is shown to exhibit oxidizer properties." See Table 1.

Table 1. Classification of Oxidizer Categories

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is....	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

Table 2 presents the results for the reference standards.

Table 2. Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

The standard or reference mixtures and the sample mixtures were tested five times at each cellulose mixing ratio. The sample was dried at 65 °C for a minimum of 12 hours and the clumps were broken up using a mortar and pestle. Testing was performed in a Fire Cabinet (Figure 1). A stainless steel mold was used to create individual ignition wires (Figure 2); a new wire was used for each test.

Client: Los Alamos National Laboratory
SDG: 558804
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140722-8

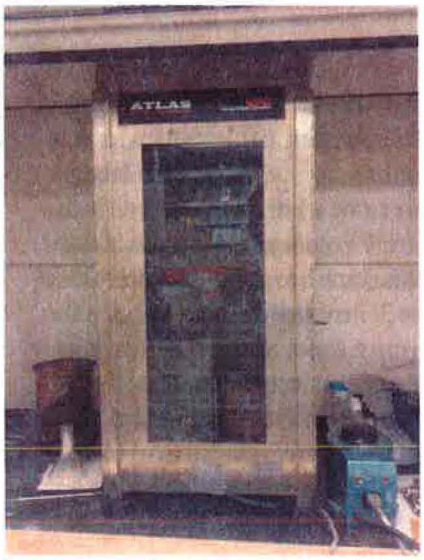


Figure 1. Fire Cabinet

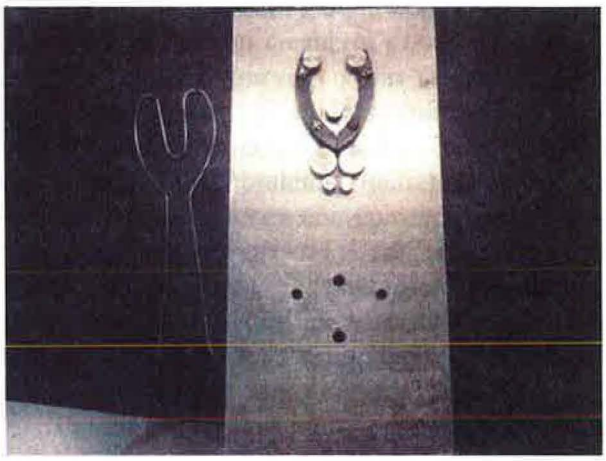


Figure 2. Ignition wire and mold

Client sample CYA-D (system ID 558804) was analyzed in duplicate. In each case, the 4:1 sample-to-cellulose ratios burned more quickly than the 1:1 ratio and produced a very small amount of liquefied molten salt during the burning. The 1:1 mixture burned steadily and had a very small amount of liquid molten salt produced. Based on Table 1, the original result was classified as a Category IV (non-oxidizer) but the duplicate was classified as a Category III. Although the mean burn time of the original and duplicate analysis were comparable (143.56 and 135.23 seconds, respectively), they fell on either side of the 3:7 $KBrO_3$:Cellulose Ratio burn time of 141.56 second.

Client sample CYA-N (system ID 558805), the 4:1 sample-to-cellulose ratios burned more quickly than the 1:1 ratio and produced a very small amount of liquefied molten salt during the burning. The 1:1 mixture, burned steadily and had a very small amount of liquid molten salt produced. The 4:1 sample-to-cellulose ratios had a shorter mean burn rate than that of 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 bromate:cellulose standard which classifies it as a Category III (oxidizer) according to the method.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI."

RSpies

Group Leader

07/29/14

Date

010004

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

WETCHEM ANALYSIS
SAMPLES RESULTS

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010005

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 07/22/14

SRR #: 53554

Task Order #: 140722-8

Tested in accordance with SW 846 Method 1040

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
CYA-D	558804	143.56	196.52	Category IV (a non-oxidizer)

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is....	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

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SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SAMPLE ANALYSIS DATA SHEET

010006

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 07/22/14

SRR #: 53554

Task Order #: 140722-8

Tested in accordance with SW 846 Method 1040

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
CYA-D	558804	135.23	185.3	Category III (oxidizer)

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is....	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

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SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010007

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 07/22/14

SRR #: 53554

Task Order #: 140722-8

Tested in accordance with SW 846 Method 1040

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
CYA-N	558805	121.48	183.56	Category III (oxidizer)

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is....	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

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010008

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

OXIDIZER RAW DATA

Southwest Research Institute 010009

Method: SW 8416 1040
Project #: 19869.01 0016
Client: Los Alamos National Laboratory
TO# 140722-8

RSpies 7/28/14

Sample Analysis

System ID: 558804

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0204	6.0046	98.48	
4:1	2	24.0102	6.0151	120.12	
4:1	3	24.0286	6.0061	121.00	
4:1	4	24.0067	6.0099	1810.88	After 3min (180 sec.) variac turned off
4:1	5	24.0130	6.0047	191.34	↓
4:1	Avg			143.56 ✓	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0217	15.0159	193.98	After 3min/180sec. variac turned off
1:1	2	15.0159	15.0178	223.21	↓
1:1	3	15.0137	15.0037	188.32	↓
1:1	4	15.0102	15.0047	188.16	↓
1:1	5	15.0112	15.0093	188.94	↓
1:1	Avg			196.52 ✓	

Weighted Samples: Monica Mendoza Balance#: 135 Date: 7/25/14
Tested Samples: Monica Mendoza Timer ID: Fisher Scientific Date: 7/25/14
Sample Dried ? (YES) / NO' Dried: 65°C oven # 22 *7/24-*7/25 overnight
Cellulose: Inorg# 52038 Dried: 105°C oven # 1 7/22 - 7/23 overnight
Variac Setting: 120V; 20

* WO 7/25/14 mm

Due to large particle size, samples were ground then weighed.

Southwest Research Institute

010010

Method: SW846 1040
Project #: 19869.01.0016
Client: Los Alamos National Laboratory
TO# 140722-8

RS 7/28/14
29 RS 7/28/14

Sample Analysis

System ID: 558804.D

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0180	6.0153	107.81	
4:1	2	24.0135	6.0097	135.47	
4:1	3	24.0116	6.0165	111.41	
4:1	4	24.0169	6.0033	186.88	
4:1	5	24.0120	6.0249	134.60	
4:1	Avg			135.23	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0118	15.0183	181.37	variac turned off at 180 sec./3min
1:1	2	15.0043	15.0077	186.34	↓
1:1	3	15.0067	15.0072	187.25	↓
1:1	4	15.0028	15.0158	185.97	↓
1:1	5	15.0224	15.0097	185.59	↓
1:1	Avg			185.30	

Weighted Samples: M. Mendoza Balance#: 135 Date: 7/29/14
Tested Samples: M. Mendoza Timer ID: Fisher Scientific Date: 7/29/14
Sample Dried ? (YES) NO Dried: 65°C oven #22 7/28 - 7/29
Cellulose: Inorg# 52038 Dried: 105°C oven #01 7/28 - 7/29
Variac Setting: 120 v, 20

Sample was mortar & pestled prior to weighing.

010011

Southwest Research Institute

Method: SW 8461040
Project #: 19869.01.006
Client: Los Alamos National Laboratory
TO# 140722-8

RSpies 7/28/14

Sample Analysis

System ID: 558805

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

* RE 7/25/14 mm

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0142	*~~24.0128~~ 6.0082	119.78	
4:1	2	24.0128	6.0134	129.66	
4:1	3	24.0320	6.0135	118.09	
4:1	4	24.0336	6.0164	122.41	
4:1	5	24.0070	6.0689	117.44	
4:1	Avg			121.48	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0468	15.0199	170.09	
1:1	2	15.0406	15.0272	185.91	turned variac off after 3min/180sec
1:1	3	15.0156	15.0185	189.06	
1:1	4	15.0100	15.0209	186.28	
1:1	5	15.0327	15.0287	186.47	
1:1	Avg			183.56	

Weighted Samples: Monica Mendoza Balance#: 135 Date: 7/25/14
Tested Samples: Monica Mendoza Timer ID: Fisher Scientific Date: 7/25/14
Sample Dried ? (YES) / NO Dried: 105°C oven #22 7/24 - 7/25 over night
Cellulose: Inorg# 52038 Dried: 105°C oven #01 7/22 - 7/23 over night
Variac Setting: 120v; 20

Due to large particle size, samples were ground prior to weighing.

010012

Southwest Research Institute

Method: SW846 1040
Project #: 19819.01.0010
Client: Los Alamos National Lab
TO# 140722-8

✓RS plus 7/28/14

Reference Substance

$KBrO_3$:Cellulose	Wt $KBrO_3$, g	Wt Cellulose, g
3:7	9	21
2:3	12	18
3:2	18	12

*RE 7/24/13 mm

Ratio	Rep	Actual KBrO3 Wt, g *	Actual Cellulose Wt, g *	Burning Time, sec	Comment
3:7	1	9.01085	21.0042	164.510	7/24/13 (burned) weighed 7/24
3:7	2	9.0128	21.0010	133.18	7/23 (burned) weighed 7/23
3:7	3	9.31698	21.0045	120.88	7/23 (burned) weighed 7/23
3:7	4	9.0522	21.0011	142.76	7/24 (burned) weighed 7/23
3:7	5	9.0698	21.0040	1416.44	7/24 (burned) weighed 7/23
3:7	**Avg**			141.516 ✓	

Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
2:3	1	12.0404	18.0048	92.83	7/24 (burned) weighed 7/23
2:3	2	12.0097	18.0110	84.03	7/24 (burned) weighed 7/23
2:3	3	12.0200	18.0080	97.91	7/24 (burned) weighed 7/23
2:3	4	12.00893	18.0154	94.81	7/24 (burned) weighed 7/23
2:3	5	12.0054	18.0630	90.53	7/24 (burned) weighed 7/23
2:3	**Avg**			92.02 ✓	

Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
3:2	1	18.0176	12.0147	29.35	7/25 burned weighed 7/25
3:2	2	18.003	12.0175	34.43	
3:2	3	18.0130	12.0103	40.94	
3:2	4	18.0187	12.0007	24.78	
3:2	5	18.0172	12.0109	25.57 ✓	
3:2	**Avg**			31.01 ✓	

Weighted Samples: Monica Mendoza Balance#: 135 Date: 7/23-7/25
Tested Samples: Monica Mendoza Timer ID: Fisher Scientific Date: 7/23-7/25
Potassium Bromate: Inorg# 52035 & 52037 Dried: 105°C Oven #22 (overnight) 7/22-7/23
Cellulose: Inorg# 52638 Dried: 105°C Oven #01 (overnight) 7/22-7/23
Variac Setting: 120V, 20

010013

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

COMMUNICATION

Ramirez, Daniel

010014

From: Spies, Radonna S.
Sent: Tuesday, July 29, 2014 2:56 PM
To: Patel, Nita
Cc: Ramirez, Daniel
Subject: 140722-8WCoxidizer.xls
Attachments: 140722-8WCoxidizer.xls

Nita –

In the final review of the data, CYN-N was classified as a Category III. Sample CYN-D was analyzed in duplicate and gave two different categories. The original result was Category IV (non-oxidizer) and the in the duplicate result a Category III. Classifications are based on burn times. Although the mean burn time of the original and duplicate analysis were comparable (143.56 and 135.23, respectively), they fell on either side of the lowest standard's burn time of 141.56, which is used for classification.

The full data package should follow shortly.

Let me know if you have any questions.
Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

Ramirez, Daniel

From: Spies, Radonna S.
Sent: Monday, July 28, 2014 5:09 PM
To: Ramirez, Daniel
Subject: FW: OXIDIZER TEST - CYA-N result

010015

Danny –

Talked to Nita and I got the go ahead from Nita to repeat CYN-D:1 ratio. I told her we will have it tomorrow.

Thanks
Radonna

From: Spies, Radonna S. [mailto:radonna.spies@swri.org]
Sent: Monday, July 28, 2014 12:37 PM
To: Patel, Nita
Subject: RE: OXIDIZER TEST - CYA-N result

The oxidizer classification of the sample is based on the average burn rate of 5 replicates – at two different ratios of sample:cellulose. This shortest average burn rate of the two ratios is used for comparison against burn rates of three reference standard:cellulose ratios.

For CYN-D, the fastest burn times were from the 4:1 sample:cellulose. The burn times of the 5 replicates were:

	98.48 sec
	120.12 sec
	121.00 sec
	186.88 sec
	191.34 sec
Avg	143.56 sec

The lowest reference standard mean burn time was 141.56 sec.

Note that the first three replicates had burn times less than the lowest reference standard (but greater than the intermediate standard) which would be a Category II classification; however, the remaining two standards had burn times substantially longer, which lead to a higher average and resulted in a Category IV (non-oxidizer) classification. Therefore, it is questionable whether the material should received a Category II or IV.

Its believe the inconsistent results may have been caused by sample inhomogeneity. Although the sample was particle size reduced with a mortar and pestle, the organic kitty litter did not "pulverize" well, and the particle size and density differences in the kitty litter and sodium nitrate salts cause settleablility issues, which may have led to uneven aliquots. I know that CYN-D is likely a duplicate sample of CYN-N but we didn't encounter an issue and the replicates were within 117.44-129.66 sec with an average of 121.48 sec – thus making is a Category II classification.

Want to know if you would like use to repeat the testing for this sample? Or include this write up in the narrative?

010016

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

From: Patel, Nita [mailto:npatel@lanl.gov]
Sent: Monday, July 28, 2014 10:08 AM
To: Ramirez, Daniel
Cc: Spies, Radonna S.; Dammann, Michael J.
Subject: RE: OXIDIZER TEST - CYA-N result

HI Radonna. Hope you had a good break... Please let me know when the data is available. I already have folks asking... ☺

From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Friday, July 25, 2014 5:16 PM
To: Greene, Keith Robert; Patel, Nita
Cc: Spies, Radonna S.; Dammann, Michael J.
Subject: OXIDIZER TEST - CYA-N result

Keith / Nita,
See below. SDG 558804, SwRI Sample Receipt 53554, assigned Task Order 140722-8.

We will have the final report to upload, with some videos on Monday, which will give Radonna an opportunity to review all the applicable data.

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry
Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

From: Mendoza, Monica V.
Sent: Friday, July 25, 2014 6:10 PM
To: Ramirez, Daniel
Subject: RE: SAMPLE ONE FOR OXIDIZER TEST

Sample ID	SwRI System ID	Mean Burn Time, sec	Mean Burn Time, sec	

		4:1 Sample:Cellulose Ratio	1:1 Sample:Cellulose Ratio	Classification
CYA-N	558805	121.48	183.56	Category II (oxidizer)

Monica Mendoza

010017

Analytical and Environmental Chemistry
Southwest Research Institute
monica.mendoza@swri.org

010018

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

SAMPLE RECEIPT, TASK ORDER & CHAIN OF CUSTODY

Sample Receipt

010019

Southwest Research Institute

Sample Receipt Number: 53554

VTSR: 07/22/14 Time: 08:10:00

Project: 19869.01.00X
Case #: ADEP
Client: Los Alamos National Laboratory

Manager: DAMMANN, MIKE
Logged in by: SRAMIREZ
Creation Date:

Notes

Sample was delivered intact at 5.0 °C (blue ice).

Fed Ex #(s):
5908 1777 3747

See Task Order for full requirements.

See chain of custody as part of the SRR system for more information.

Phases:
001 - admin
002 - extraction
005 - 8082
006 - metals/radchem
007 - drg

Background CPM: <100 cpm
Container Wipe CPM: <100 cpm
Total CPM: <100

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
558804	CYA-D	07/17/14	Solid	1	
558805	CYA-N	07/17/14	Solid	1	
Containers: 2				**Samples: 2**	

These documents are associated with this receipt: 161753[COC for SRR 53554], 161754[SRR Paperwork for SRR 53554]

Thermometer: 010209
Temperature: 5.0

Page Printed: 29 Jul 2014 17:04:17
ver (07/18/2014)

Client: Los Alamos Nat[illegible] SRR#: 53554

FRM-002

Southwest Research Institute

Laboratory Task Order

TO #: 140722-8 Revision: 0

Project(s): 19869.01.00X
Manager(s): DAMMANN, MIKE
To Client: 07/24/14

SDG: 558804
VTSR: 07/22/14
CASE: ADEP

SRR #'s: 53554
Client(s): Los Alamos National Laboratory

010020

Instructions

Los Alamos National Laboratory _ Subcontract No. 250954
Lab Request # ADEP
SDG is 558804.

RUSH TAT. 3-business days
ALL DATA IS DUE TO THE CLIENT ON 07/25/2014.

2 overall SOLID samples (2 containers) were received on 07/22/2014.

Requires:
Method 1040
See client email for additional info.

PRELIMS _ Email prelims to: Keith Greene kgreene@lanl.gov, Nita Patel npatel@lanl.gov
---
EDD REQUIRED. Please note, All results have to be merged under 1 EDD "file."
See Exhibit "D" Scope of Work and Technical Specifications for Off-Site Analytical Laboratory Services
---
Main point-of-contact is Keith R. Greene, kgreene@lanl.gov; Additional contact Nita Patel npatel@lanl.gov
Send Hardcopy & CD TO:
Los Alamos National Laboratory
ATTN: Keith R. Greene
TA-3 SM-271 Drop point 02U
Los Alamos, NM 87545

Documents Related to this task order: 161753[COC for SRR 53554], 161754[SRR Paperwork for SRR 53554]

Deliverables --> Hard Copy: -YES- EDD: no PDF: -YES-

Test: OXIDIZING_1040 Holding: 180 days from CED
Section: WETCHEM SW846 Method 1040 for Oxidizing Solids Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
558804		1	Solid	CYA-D	17 Jul 14	13 Jan 15
558805		1	Solid	CYA-N	17 Jul 14	13 Jan 15

FIELD CHAIN- OF CUSTODY

ADEP

010021

NAME: Philip Leonard

Z#: _____

PHONE: 695-8884

TA: _____

OU: _____

CHAGE CODE: _____

SAMPLE #	ORDER CODE	CONTAINER	PREV. COLLECTED: Time /date	SPECIAL instructions
CYA-W	UNDOT oxidizer	1L Poly	7/17/14	12:00
CYA-D	"	1L Poly	7/17/14	12:00

Need Results by 7/25 if possible.

Client: Los Alamos National Laboratory
BwRI Projec #18849.01.06X
VTBR: 07/22/14 0816
Battery Check: Y
Cooler/Container Wipe: <100 cpm
Total cpm-mR/h (samples): <100 cpm / <0.5mR/hr
(see Radioactive Material Receiving Form for more information

BwRI BRR #53554
Case:ADEP
Sample(s) Received: Intact
Background Check: <100 cpm (Lab 103)
Temp.: 5.0°C (blue ice) / #818299
Wipe Frisk Description: Cooler(s) - 1

Send results to Keith Greene at LanL.

RELINQUISHED BY:	Date/Time	RECEIVED BY;	Date/Time
Philip Leonard	7/18/14 10:30	K. Greene	7/18/14 10:30
K. Greene	7/21/14 15:00		07/22/14 08

Southwest Research Institute

Traffic Report

010022

Sample Custodian Signature: _____

1. Custody Seal — Present
2. Chain of Custody — Present
3. Sample Tags — Not Present
   Sample Tag Numbers — Not on COC
4. SMO Forms — Not Present

Client: Los Alamos National Laboratory

Project: 19869.01.00X

Case: ADEP / SDG: _____

Sample Receipt: 53554

Airbill: 5908 1777 3747

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
07/22/14	08:10:00	ADEP	CYA-D	N/A	558804	YES	Intact
07/22/14	08:10:00	ADEP	CYA-N	N/A	558805	YES	Intact

SAMPLE LOG-IN SHEET

010023

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): STEVEN RAMIREZ	Log-in Date: 07/22/2014
Received By (Signature): Steven Ramirez	
Case Number: ADEP	Sample Delivery Group No.: N/A
Remarks: 19869.01.00X	SAS Number: N/A

1. Custody Seal(s)	Present/Absent* Intact/Broken	
2 Custody Seal Nos.	N/A	
3 Chain-of Custody Records	Present/Absent*	
4. Traffic Reports or Packing Lists	Present/Absent*	
5. Airbill	Airbill/Sticker Present/Absent*	
6. Airbill No.	5908 1777 3747	
7. Sample Tags	Present/Absent*	
Sample Tag Numbers	Listed/Not listed on Chain of Custody	
8. Sample Condition	Intact/Broken*/Leaking	
9. Cooler Temperature	5.0C	
10. Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*	
11. Date Received at Lab	07/22/2014	
12. Time Received	08:10:00	

EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc
CYA-D	N/A	558804	Intact
CYA-N	N/A	558805	Intact

Sample Transfer		
Fraction: INORG	Fraction	
Area #: (R. SPIES)	Area #	
By: STEVEN RAMIREZ	By	
On: 07/22/2014	On	

* Contact SMO and attach record of resolution

Reviewed By:	Logbook No.: Sample Receipt (53554)
Date: 7.23.14	Logbook Page No.: 8793 SEC 1 OF 5

SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

August 05, 2014

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, New Mexico 87545

Attn: Keith R. Greene

Subject:		
	COC ID:	ADEP
	SwRI Project Number:	19869.01.00X
	SDG:	558804
	SwRI Task Order Number:	140722-8
	SwRI Sample Receipt Number:	53554
	Samples received:	July 22, 2014
	Analysis:	UN Oxidizer

Dear Mr. Greene,

Please find the updated report, which was revised to correct the method referenced throughout. The revised forms are notated in the data package with a "REV" on them. Should you have any questions, please feel free contact me directly at 210-522-3051, or by email at hschattenberg@swri.org.

Sincerely,

for Herbert J. Schattenberg III
Program Manager

APPROVED:

Michael J. Dammann
Director

HJS: mg
Encl

SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

July 29, 2014

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, New Mexico 87545

Attn: Keith R. Greene

Subject:		
	COC ID:	ADEP
	SwRI Project Number:	19869.01.00X
	SDG:	558804
	SwRI Task Order Number:	140722-8
	SwRI Sample Receipt Number:	53554
	Samples received:	July 22, 2014
	Analysis:	Method 1040

Dear Mr. Greene,

Please find the enclosed results for the two (02) overall solid samples received on the above referenced dates. Should you have any questions, please feel free contact me directly at 210-522-3051, or by email at hschattenberg@swri.org.

Sincerely,

Herbert J. Schattenberg III
Program Manager

APPROVED:

Michael J. Dammann
Director

HJS: mg
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

NARRATIVE

Total Page Count:
Fraction: Data Report Pages: 010001 - 010023

Client: Los Alamos National Laboratory
SDG: 558804
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140722-8

OXIDIZER TEST

The samples were tested in accordance with the United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34, *Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1.* (SW 846 Method 1040 *Test Method for Oxidizing Solids* is based on the UN method). The UN test procedure assesses the relative hazard of oxidizing substances so that an appropriate classification for transport can be made. Tests are conducted on the samples mixed with dry fibrous cellulose in mixing ratios of 1:1 and 4:1, by mass, of sample to cellulose. The burning characteristics of the mixtures are compared with the standard 3:7 mixture, by mass, of potassium bromated to cellulose. If the burning time is equal to or less than the standard mixture, the burning times should be compared with those from packing group I or II reference standards, 3:2 and 2:3, by mass, of potassium bromated to cellulose, respectively. See Table 1 for classification. Table 2 presents the results for the reference standards.

Table 1. UN Packing Group Classifications

The test criteria for determining oxidizing properties of the substance are:	Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

Table 2. Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

The standard or reference mixtures and the sample mixtures were tested five times at each cellulose mixing ratio. The sample was dried at 65 °C for a minimum of 12 hours and the clumps were broken up using a mortar and pestle. Testing was performed in a Fire Cabinet (Figure 1). A stainless steel mold was used to create individual ignition wires (Figure 2); a new wire was used for each test.

Client: Los Alamos National Laboratory
SDG: 558804
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140722-8

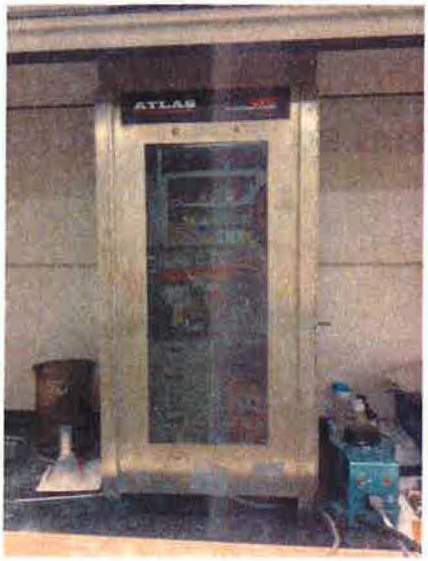


Figure 1. Fire Cabinet

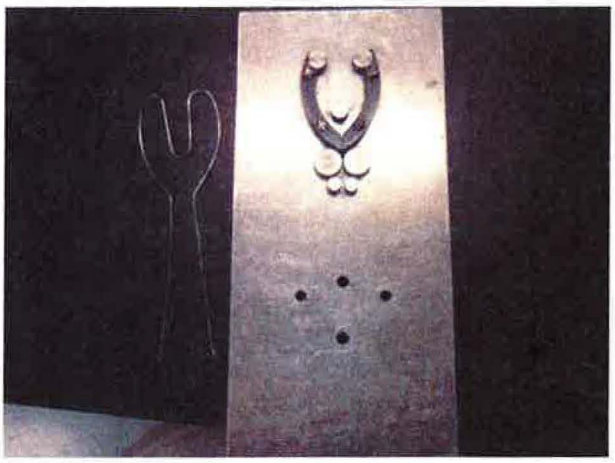


Figure 2. Ignition wire and mold

Client sample CYA-D (system ID 558804) was analyzed in duplicate. In each case, the 4:1 sample-to-cellulose ratios burned more quickly than the 1:1 ratio and produced a very small amount of liquefied molten salt during the burning. The 1:1 mixture burned steadily and had a very small amount of liquid molten salt produced. Based on Table 1, the original result was classified as a "Not Division 5.1" but the duplicate was classified as a "Packing group III". Although the mean burn time of the original and duplicate analysis were comparable (143.56 and 135.23 seconds, respectively), they fell on either side of the 3:7 $KBrO_3$:Cellulose Ratio burn time of 141.56 second.

Client sample CYA-N (system ID 558805), the 4:1 sample-to-cellulose ratios burned more quickly than the 1:1 ratio and produced a very small amount of liquefied molten salt during the burning. The 1:1 mixture, burned steadily and had a very small amount of liquid molten salt produced. The 4:1 sample-to-cellulose ratios had a shorter mean burn rate than that of 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 bromate:cellulose standard which classifies it as a "Packing group III" according to the method.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI."

RSpies

Group Leader

08/05/14

Date

010004

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

WETCHEM ANALYSIS SAMPLES RESULTS

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010005
Rev 1

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 07/22/14

SRR #: 53554

Task Order #: 140722-8

Tested in accordance with United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
CYA-D	558804	143.56	196.52	Not Division 5.1

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

The test criteria for determining oxidizing properties of the substance are:	Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing groups I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

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SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SAMPLE ANALYSIS DATA SHEET

010006
Rev 1

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 07/22/14

SRR #: 53554

Task Order #: 140722-8

Tested in accordance with United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
CYA-D	558804	135.23	185.3	Packing group III

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

The test criteria for determining oxidizing properties of the substance are:	Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing groups I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

010007
Rev 1

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 07/22/14

SRR #: 53554

Task Order #: 140722-8

Tested in accordance with United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
CYA-N	558805	121.48	183.56	Packing group III

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
141.56	92.02	31.01

The test criteria for determining oxidizing properties of the substance are:	Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing groups I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

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010008

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

OXIDIZER RAW DATA

Southwest Research Institute

(c1) 8/5/14 mm

Method: ~~SW 8440 1040~~ UN Oxidizer method

Project #: 19869.01.0006

Client: Los Alamos National Laboratory

TO# 140722-8

010009 Rev 1

RSpm 7/28/14

Sample Analysis

System ID: 558804

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0204	6.0046	98.48	
4:1	2	24.0102	6.0151	120.12	
4:1	3	24.0286	6.0061	121.00	
4:1	4	24.0067	6.0099	1810.88	After 3min (180 sec.) variac turned o
4:1	5	24.0130	6.0047	191.34	↓
4:1	Avg			143.56 ✓	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0217	15.0159	193.98	After 3min/180sec. variac turned off
1:1	2	15.0159	15.0178	223.21	↓
1:1	3	15.0137	15.0037	188.32	↓
1:1	4	15.0102	15.0047	188.16	↓
1:1	5	15.0112	15.0093	188.94	↓
1:1	Avg			196.52 ✓	

Weighted Samples: Monica Mendoza Balance#: 135 Date: 7/25/14

Tested Samples: Monica Mendoza Timer ID: Fisher Scientific Date: 7/25/14

Sample Dried ? (YES) NO Dried: 65°C oven # 22 *7/24 - *7/25 overnight

Cellulose: Inorg# 52038 Dried: 105°C oven # 1 7/22 - 7/23 overnight

Variac Setting: 120V; 20

* WO 7/25/14 mm

Due to large particle size, samples were ground then weighed.

Southwest Research Institute

© 8/5/14 mm

Method: ~~SW846 1040~~ LLN Oxidizer method

Project #: 19869.01.006

Client: Los Alamos National Laboratory

TO# 140722-8

010010 Rev-1

RS 7/28/14 29 RS 7/29/14

Sample Analysis

System ID: 558804.D

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0180	6.0153	107.81	
4:1	2	24.0135	6.0097	135.47	
4:1	3	24.0116	6.0165	111.41	
4:1	4	24.0169	6.0033	186.88	
4:1	5	24.0120	6.0249	134.60	
4:1	Avg			135.23	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0118	15.0183	181.37	variac turned off at 180 sec./3 min
1:1	2	15.0043	15.0077	186.34	↓
1:1	3	15.0067	15.0072	187.25	
1:1	4	15.0028	15.0158	185.97	
1:1	5	15.0224	15.0097	185.59	
1:1	Avg			185.30	

Weighted Samples: M. Mendoza Balance#: 135 Date: 7/29/14

Tested Samples: M. Mendoza Timer ID: Fisher Scientific Date: 7/29/14

Sample Dried ? (YES) NO Dried: 65°C oven #22 7/28 - 7/29

Cellulose: Inorg# 52038 Dried: 105°C oven #01 7/28 - 7/29

Variac Setting: 120 v; 20

Sample was mortar & pestled prior to weighing.

(1) 8/5/14 mm

Southwest Research Institute

Method: ~~SW 846 1010~~ UN oxidizer method

Project #: 19869.01.006

Client: Los Alamos National Laboratory

TO# 140722-8

RSpus 7/28/14

Sample Analysis

System ID: 558805

010011 Rev 1

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

* EE 7/25/14 mm

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0142	~~24.0128~~ 6.0082	119.78	
4:1	2	24.0128	6.0134	129.66	
4:1	3	24.0320	6.0135	118.09	
4:1	4	24.0336	6.0164	122.41	
4:1	5	24.0070	6.0689	117.44	
4:1	Avg			121.48	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0468	15.0199	170.09	
1:1	2	15.0406	15.0272	185.91	turned variac off after 3min/180 sec.
1:1	3	15.0156	15.0185	189.06	
1:1	4	15.0100	15.0209	186.28	
1:1	5	15.0327	15.0287	186.47	
1:1	Avg			183.56	

Weighted Samples: Monica Mendoza Balance#: 135 Date: 7/25/14

Tested Samples: Monica Mendoza Timer ID: Fisher Scientific Date: 7/25/14

Sample Dried ? (YES) / NO Dried: 105°C oven #22 7/24-7/25 over night

Cellulose: Inorg# 52038 Dried: 105°C Oven #01 7/22-7/23 over night

Variac Setting: 120v; 20

Due to large particle size, samples were ground priar to weighing.

Southwest Research Institute

ⓒ 8/5/14 mm

Method: ~~SW846 1040~~ UN Oxidizer Method

Project #: 19819.01.0010

Client: Los Alamos National Lab

TO# 140722-8

✓RSpus 7/28/14

Reference Substance

010012 Rev 1

$KBrO_3$:Cellulose	Wt $KBrO_3$, g	Wt Cellulose, g
3:7	9	21
2:3	12	18
3:2	18	12

*RE 7/24/13 mm

Ratio	Rep	Actual KBrO3 Wt, g *	Actual Cellulose Wt, g *	Burning Time, sec	Comment
3:7	1	9.01085	21.0042	164.510	7/24/13 (burned) weighed 7/24
3:7	2	9.0128	21.0010	133.18	7/23 (burned) weighed 7/23
3:7	3	9.3698	21.0045	120.88	7/23 (burned) weighed 7/23
3:7	4	9.0522	21.0011	142.76	7/24 (burned) weighed 7/23
3:7	5	9.0098	21.0040	146.44	7/24 (burned) weighed 7/23
3:7	**Avg**			141.516 ✓	

Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
2:3	1	12.0464	18.0048	92.83	7/24 (burned) weighed 7/23
2:3	2	12.0097	18.0110	84.03	7/24 (burned) weighed 7/23
2:3	3	12.0200	18.0080	97.91	7/24 (burned) weighed 7/23
2:3	4	12.00893	18.0154	94.81	7/24 (burned) weighed 7/23
2:3	5	12.0054	18.0630	90.53	7/24 (burned) weighed 7/23
2:3	**Avg**			92.02 ✓	

Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
3:2	1	18.0176	12.0147	29.35	7/25 burned weighed 7/25
3:2	2	18.003	12.0175	34.43	
3:2	3	18.0130	12.0103	40.94	
3:2	4	18.0187	12.0007	24.78	
3:2	5	18.0172	12.0109	25.57	
3:2	**Avg**			31.01 ✓	

Weighted Samples: Monica Mendoza Balance#: 135 Date: 7/23 - 7/25

Tested Samples: Monica Mendoza Timer ID: Fisher Scientific Date: 7/23 - 7/25

Potassium Bromate: Inorg# 52035 & 52037 Dried: 105°C Oven#22 (overnight) 7/22 - 7/23

Cellulose: Inorg# 52038 Dried: 105°C Oven#01 (overnight) 7/22 - 7/23

Variac Setting: 120V; 20

010013

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

COMMUNICATION

Ramirez, Daniel

From: Spies, Radonna S.
Sent: Tuesday, July 29, 2014 2:56 PM
To: Patel, Nita
Cc: Ramirez, Daniel
Subject: 140722-8WCoxidizer.xls
Attachments: 140722-8WCoxidizer.xls

010014

Nita –

In the final review of the data, CYN-N was classified as a Category III. Sample CYN-D was analyzed in duplicate and gave two different categories. The original result was Category IV (non-oxidizer) and the in the duplicate result a Category III. Classifications are based on burn times. Although the mean burn time of the original and duplicate analysis were comparable (143.56 and 135.23, respectively), they fell on either side of the lowest standard's burn time of 141.56, which is used for classification.

The full data package should follow shortly.

Let me know if you have any questions.
Thanks

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

Ramirez, Daniel

010015

From: Spies, Radonna S.
Sent: Monday, July 28, 2014 5:09 PM
To: Ramirez, Daniel
Subject: FW: OXIDIZER TEST - CYA-N result

Danny –

Talked to Nita and I got the go ahead from Nita to repeat CYN-D:1 ratio. I told her we will have it tomorrow.

Thanks
Radonna

From: Spies, Radonna S. [mailto:radonna.spies@swri.org]
Sent: Monday, July 28, 2014 12:37 PM
To: Patel, Nita
Subject: RE: OXIDIZER TEST - CYA-N result

The oxidizer classification of the sample is based on the average burn rate of 5 replicates – at two different ratios of sample:cellulose. This shortest average burn rate of the two ratios is used for comparison against burn rates of three reference standard:cellulose ratios.

For CYN-D, the fastest burn times were from the 4:1 sample:cellulose. The burn times of the 5 replicates were:

98.48 sec
120.12 sec
121.00 sec
186.88 sec
191.34 sec
Avg 143.56 sec

The lowest reference standard mean burn time was 141.56 sec.

Note that the first three replicates had burn times less than the lowest reference standard (but greater than the intermediate standard) which would be a Category II classification; however, the remaining two standards had burn times substantially longer, which lead to a higher average and resulted in a Category IV (non-oxidizer) classification. Therefore, it is questionable whether the material should received a Category II or IV.

Its believe the inconsistent results may have been caused by sample inhomogeneity. Although the sample was particle size reduced with a mortar and pestle, the organic kitty litter did not "pulverize" well, and the particle size and density differences in the kitty litter and sodium nitrate salts cause settleablility issues, which may have led to uneven aliquots. I know that CYN-D is likely a duplicate sample of CYN-N but we didn't encounter an issue and the replicates were within 117.44-129.66 sec with an average of 121.48 sec – thus making is a Category II classification.

Want to know if you would like use to repeat the testing for this sample? Or include this write up in the narrative?

010016

Radonna Spies
Group Leader
Analytical and Environmental Chemistry
Southwest Research Institute
ph: 210-522-3242
fax: 210-522-3649
email: rspies@swri.org

From: Patel, Nita [mailto:npatel@lanl.gov]
Sent: Monday, July 28, 2014 10:08 AM
To: Ramirez, Daniel
Cc: Spies, Radonna S.; Dammann, Michael J.
Subject: RE: OXIDIZER TEST - CYA-N result

HI Radonna. Hope you had a good break... Please let me know when the data is available. I already have folks asking... ☺

From: Ramirez, Daniel [mailto:daniel.ramirez@swri.org]
Sent: Friday, July 25, 2014 5:16 PM
To: Greene, Keith Robert; Patel, Nita
Cc: Spies, Radonna S.; Dammann, Michael J.
Subject: OXIDIZER TEST - CYA-N result

Keith / Nita,
See below. SDG 558804, SwRI Sample Receipt 53554, assigned Task Order 140722-8.

We will have the final report to upload, with some videos on Monday, which will give Radonna an opportunity to review all the applicable data.

Daniel Ramirez
Southwest Research Institute
Department of Analytical and Environmental Chemistry
Division 01
6220 Culebra Road
San Antonio, Texas 78238
Phone (210) 522.3867
Fax (210) 522.5938

From: Mendoza, Monica V.
Sent: Friday, July 25, 2014 6:10 PM
To: Ramirez, Daniel
Subject: RE: SAMPLE ONE FOR OXIDIZER TEST

Sample ID	SwRI System ID	Mean Burn Time, sec	Mean Burn Time, sec	

		4:1 Sample:Cellulose Ratio	1:1 Sample:Cellulose Ratio	Classification
CYA-N	558805	121.48	183.56	Category II (oxidizer)

Monica Mendoza

010017

Analytical and Environmental Chemistry
Southwest Research Institute
monica.mendoza@swri.org

010018

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140722-8
SRR: 53554
SDG: 558804
VTSR: July 22, 2014
PROJECT#: 19869.01.00X

SAMPLE RECEIPT, TASK ORDER
&
CHAIN OF CUSTODY

010019

Sample Receipt

Sample Receipt Number: 53554

Southwest Research Institute

VTSR: 07/22/14 Time: 08:10:00

Project: 19869.01.00X
Case #: ADEP
Client: Los Alamos National Laboratory

Manager: DAMMANN, MIKE
Logged in by: SRAMIREZ
Creation Date:

Notes

Sample was delivered intact at 5.0 °C (blue ice).

Fed Ex #(s):
5908 1777 3747

See Task Order for full requirements.

See chain of custody as part of the SRR system for more information.

Phases:
001 - admin
002 - extraction
005 - 8082
006 - metals/radchem
007 - drq

Background CPM: <100 cpm
Container Wipe CPM: <100 cpm
Total CPM: <100

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
558804	CYA-D	07/17/14	Solid	1	
558805	CYA-N	07/17/14	Solid	1	
Containers: 2				Samples: 2	

These documents are associated with this receipt: 161753[COC for SRR 53554], 161754[SRR Paperwork for SRR 53554]

Thermometer: 010209
Temperature: 5.0

Client: Los Alamos Nat[illegible] SR#: 53554

Page Printed: 29 Jul 2014 17:04:17
ver (07/18/2014)

FRM-002

Southwest Research Institute

Laboratory Task Order

TO #: 140722-8 Revision: 1

010020 Rev 1

Project(s): 19869.01.00X
Manager(s): DAMMANN, MIKE
To Client: 07/24/14

SDG: 558804
VTSR: 07/22/14
CASE: ADEP

SRR #'s: 53554
Client(s): Los Alamos National Laboratory

Instructions

Los Alamos National Laboratory _ Subcontract No. 250954
Lab Request # ADEP
SDG is 558804.

RUSH TAT. 3-business days
ALL DATA IS DUE TO THE CLIENT ON 07/25/2014.

2 overall SOLID samples (2 containers) were received on 07/22/2014.

Requires:
United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34, Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1.
See client email for additional info.

PRELIMS _ Email prelims to: Keith Greene kgreene@lanl.gov, Nita Patel npatel@lanl.gov

---

EDD REQUIRED. Please note, All results have to be merged under 1 EDD "file."
See Exhibit "D" Scope of Work and Technical Specifications for Off-Site Analytical Laboratory Services

---

Main point-of-contact is Keith R. Greene, kgreene@lanl.gov; Additional contact Nita Patel npatel@lanl.gov
Send Hardcopy & CD TO:
Los Alamos National Laboratory
ATTN: Keith R. Greene
TA-3 SM-271 Drop point 02U
Los Alamos, NM 87545
REVISION 1, DRmz 08/05/14: Task Order revised to remove method 1040 and replace with correct one.

Documents Related to this task order: 161753[COC for SRR 53554], 161754[SRR Paperwork for SRR 53554]

Deliverables -> Hard Copy: -YES- EDD: no PDF: -YES-

Test: Oxidizer_UN
Section: WETCHEM

Holding: 180 days from CED

United Nations (UN) Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1.Division 5.1.

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
558804		1	Solid	CYA-D	17 Jul 14	13 Jan 15
558805		1	Solid	CYA-N	17 Jul 14	13 Jan 15

FIELD CHAIN- OF CUSTODY

ADEP 010021

NAME: Philip Leonard

Z#:

PHONE: 695-8884

TA:

OU:

CHAGE CODE:

SAMPLE #	ORDER CODE	CONTAINER	PREV. COLLECTED: Time /date	SPECIAL instructions
CYA-W	UNDOT oxidizer	1L Poly	7/17/14	12:00
CYA-D	"	1L Poly	7/17/14	12:00

Need Results by 7/25 if possible.

Client: Los Alamos National Laboratory
SwRI Projec #18568.01.90X
VTSR: 07/22/14 0810
Battery Check: Y
Coolers/Container Wipe: <100 cpm
Total cpm-mR/h (samples): <100 cpm / <0.5mR/hr
(see Radioactive Material Receiving Form for more information

SwRI SRR #53554
Case:ADEP
Sample(s) Received: Intact
Background Check: <100 cpm (Lab 103)
Temp.: 5.0°C (blue ice) : #010209
Wipe Frisk Description: Cooler(s) - 1

Send results to Keith Greene at LanL.

RELINQUISHED BY:	Date/Time	RECEIVED BY;	Date/Time
Philip Leonard	7/18/14 10:30	K. Greene	7/18/14 10:30
K. Greene	7/21/14 15:00		07/22/14 0810

Southwest Research Institute

Traffic Report

010022

Sample Custodian Signature: _____

1. Custody Seal — Present
2. Chain of Custody — Present
3. Sample Tags — Not Present
   Sample Tag Numbers — Not on COC
4. SMO Forms — Not Present

Client: Los Alamos National Laboratory

Project: 19869.01.00X

Case: ADEP / SDG: _____

Sample Receipt: 53554

Airbill: 5908 1777 3747

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
07/22/14	08:10:00	ADEP	CYA-D	N/A	558804	YES	Intact
07/22/14	08:10:00	ADEP	CYA-N	N/A	558805	YES	Intact

SAMPLE LOG-IN SHEET

010023

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): STEVEN RAMIREZ	Log-in Date: 07/22/2014
Received By (Signature): Steven Ramirez	
Case Number: ADEP	Sample Delivery Group No.: N/A
	SAS Number: N/A

Remarks: 19869.01.00X

			EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc
1.	Custody Seal(s)	(Present)/Absent* (Intact)/Broken	CYA-D	N/A	558804	Intact
2	Custody Seal Nos.	N/A	CYA-N	N/A	558805	Intact
3	Chain-of Custody Records	(Present)/Absent*				
4.	Traffic Reports or Packing Lists	Present (Absent)				
5.	Airbill	Airbill/Sticker (Present)/Absent*				
6.	Airbill No.	5908 1777 3747				
7.	Sample Tags	Present (Absent)				
	Sample Tag Numbers	Listed/(Not) listed on Chain of Custody				
8.	Sample Condition	(Intact)/Broken*/ Leaking				
9.	Cooler Temperature	5.0C				
10.	Does Information on custody records, traffic reports, and sample tags agree?	(Yes)/No*				
11.	Date Received at Lab	07/22/2014				
12.	Time Received	08:10:00				

Sample Transfer					
Fraction: INORG	Fraction				
Area #: (R. SPIES)	Area #				
By: STEVEN RAMIREZ	By				
On: 07/22/2014	On				

* Contact SMO and attach record of resolution

Reviewed By:	Logbook No.: Sample Receipt (53554)
Date: 7.23.14	Logbook Page No.: 8793 SEC 1 OF 5

SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

September 9, 2014

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, New Mexico 87545

Attn: Keith R. Greene

Subject:		
	COC ID:	ADEP
	SwRI Project Number:	19869.01.00X
	SDG:	560542
	SwRI Task Order Number:	140828-6
	SwRI Sample Receipt Number:	53778
	Samples received:	08.28.14
	Analysis:	Method 1040

Dear Mr. Greene,

Please find the enclosed results for the one (01) overall solid sample received on the above referenced dates. Should you have any questions, please feel free contact me directly at 210-522-3051, or by email at hschattenberg@swri.org.

Sincerely,

Herbert J. Schattenberg III
Program Manager

APPROVED:

Michael J. Dammann
Director

HJS: aa
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140828-6
SRR: 53778
SDG: 560542
VTSR: 08.28.14
PROJECT #: 19869.01.00X

NARRATIVE

Client: Los Alamos National Laboratory
SDG: 560542
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140828-6

OXIDIZER TESTS

United Nations (UN) *"Recommendations on the Transport of Dangerous Goods", Section 34, Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1*

This method assesses the relative hazard of oxidizing substances so that an appropriate classification for transport can be made. The test method is designed to measure the potential for a solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. Tests are conducted on the substance mixed with dry fibrous cellulose in mixing ratios of 1:1 and 4:1, by mass, of sample to cellulose. The burning characteristics of the mixtures are compared with the standard 3:7 mixture, by mass, of potassium bromated to cellulose. If the burning time is equal to or less than the standard mixture, the burning times should be compared with those from Packing Group I or II reference standards, 3:2 and 2:3, by mass, of potassium bromate to cellulose, respectively. See Table 1 for classification. Table 2 presents the results for the reference standards.

Since the method states that the test substance should be tested in the form in which it will be transported, the sample was tested "as received". The sample was not dried or particle size reduced.

Table 1. Oxidizer Classifications for UN Methhod

The test criteria for determining oxidizing properties of the substance are:	UN Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

Table 2. Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
117.17	64.12	21.23

Client: Los Alamos National Laboratory
SDG: 560542
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140828-6

Client sample SwheatScoop-NaNO3 (system ID 560542-2MX) was analyzed in duplicate following the UN method. In each case, the 4:1 sample-to-cellulose ratios burned more quickly than the 1:1 ratio and produced liquefied molten salt during the burning. The 1:1 mixture burned fairly steadily with sporadic start and stopping of the flames. Timing of the sample was continued if the sample ignited again within a few seconds. The sample also produced a small amount of liquid molten salt. Based on Table 1, the 4:1 sample-to-cellulose ratios had a shorter mean burn rate than that of 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 bromate:cellulose standard which classifies it as a "Packing group II" according to the method.

SW 846 Method 1040 *Test Method for Oxidizing Solids*.

This method provides a qualitative means to measure the potential of a solid waste to increase the burning rate or burning intensity of a combustible substance, specifically fibrous cellulose. The burning rates for 1:1 and 4:1 waste:cellulose mixtures (w/w) are compared to the burning rates for 3:7, 2:3, and 3:2 potassium bromate:cellulose mixtures. Potassium bromate is used as the reference oxidizing standard. The three mixing ratios of potassium bromate and cellulose provide a range of burning times by which the waste is classified. The 3:7 mixture ratio provides the longest burning time, the 3:2 mixture ratio provides the shortest burning time, and the 2:3 mixture ratio provides an intermediate burning time. The burning times for the potassium bromate:cellulose mixtures are correlated to their relative oxidizing strengths, i.e., the shorter the burning time, the greater the relative oxidizing strength. If the mean burning time for either waste/cellulose mixture is shorter than the mean burning time for the 3:7 potassium bromate/cellulose mixtures, the waste is shown to exhibit oxidizer properties." See Table 3 for sample results and Table 2 for the reference mixture times.

The sample was dried at 65 °C for a minimum of 12 hours. The method states that the sample should be cut, crushed, or ground so that the particle size of the sample to be tested is no larger than 0.5 mm. Due to the nature of the sample, it was not feasible to particle size reduce the Swheat material to <0.5mm; however, the dried sample was passed through a 2.00 mm sieve and the larger particles retained on the sieve were then ground using a mortar and pestle to pass through the sieve openings. Therefore, the particle size of the sample tested was less than 2 mm. (See Figures 1 and 2).

According to Method 1040, "Once the pile is ignited, turn off the power to the ignition wire.... If the waste mixture does not appear to ignite, continue heating the ignition wire for a period of at least three minutes"; however, the UN method states "Power is applied to the ignition wire and is maintained for the duration of the test or for three minutes if the mixture does not ignite or burn.' For the purposes of comparison and err on the side of caution, the power to the ignition wire was allowed to remain on for the duration of the test or three minutes if the mixture did not ignite for Method 1040. Therefore, since the timing of the power to the ignition wire remained the same for Method 1040 and the UN method, only one set of reference mixtures were needed (Table 2) to evaluate both method.

Client: Los Alamos National Laboratory
SDG: 560542
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140828-6

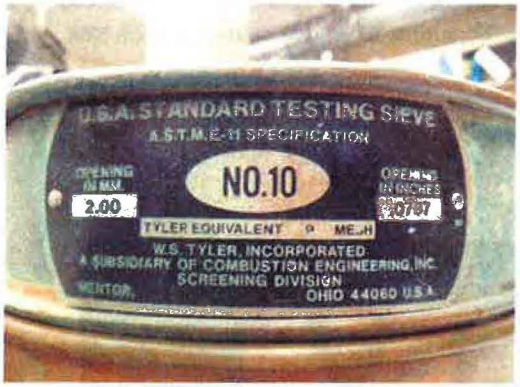


Figure 1. 2.00mm Testing Sieve



Figure 2. Sample poured through sieve

Table 3. Classification of Oxidizer Categories for 1040 Method

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is....	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

Client sample SwheatScoop-NaNO3 (system ID 560542-1LY) was analyzed in duplicate following Method 1040. In each case, the 4:1 sample-to-cellulose ratios burned more quickly than the 1:1 ratio and produced a very small amount of liquefied molten salt during the burning. The 1:1 mixture, burned steadily and had little to no liquid molten salt produced. The 4:1 sample-to-cellulose ratios had a shorter mean burn rate than that of 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 bromate:cellulose standard which classifies it as a "Category II (oxidizer)" according to the method.

Client: Los Alamos National Laboratory
SDG: 560542
SwRI Project Number: 19869.01.00X
SwRI Task Order Number(s): 140828-6

Testing for both UN and Method 1040 were performed in a Fire Cabinet (Figure 3). A stainless steel mold was used to create individual ignition wires (Figure 4); a new wire was used for each test.

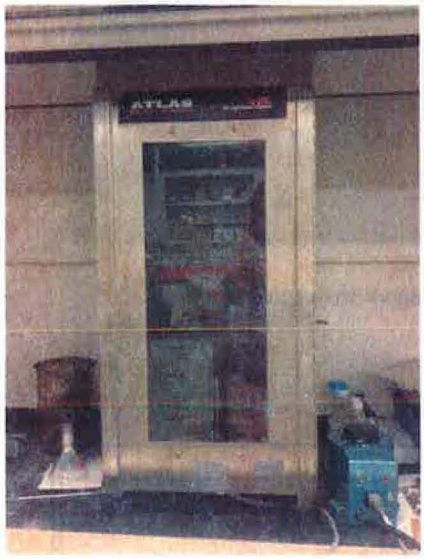


Figure 3. Fire Cabinet

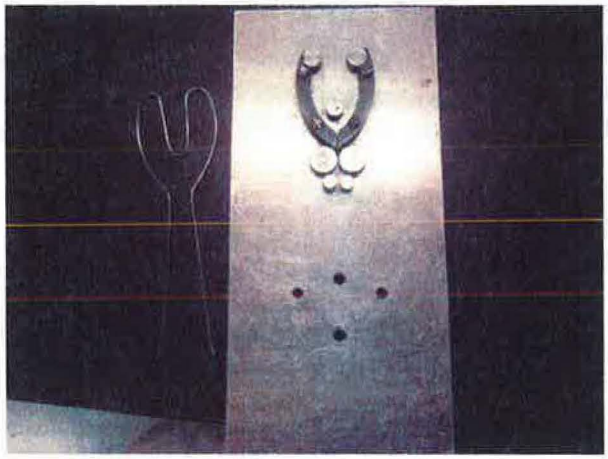


Figure 4. Ignition wire and mold

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI."

RS Spies

Group Leader

09/09/14
Date

010006

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140828-6
SRR: 53778
SDG: 560542
VTSR: 08.28.14
PROJECT #: 19869.01.00X

SAMPLE RECEIPT, TASK ORDER
&
CHAIN OF CUSTODY

Sample Receipt

010007

Southwest Research Institute

Sample Receipt Number: 53778

VTSR: 08/28/14

Time: 08:45:00

Project: 19869.01.00X
Case #: ADEP
Client: Los Alamos National Laboratory

Manager: DAMMANN, MIKE
Logged in by: SRAMIREZ
Creation Date: 08/28/14

Notes

Sample was delivered intact at a temperature of 11.0°C (blue ice).

Fed Ex #(s):
5908 1777 6492

See Task Order for full requirements.

See chain of custody as part of the SRR system for more information.

Phases:
001 - admin
002 - extraction
005 - 8082
006 - metals/radchem
007 - drg

Background CPM: <100 cpm
Container Wipe CPM: <100 cpm
Total CPM: <100

System ID	Customer ID	CED	Matrix	Containers	Special Reqs
560542	SwheatScoop-NaN03	08/25/14	Solid	2	

Containers: 2 **Samples: 1**

These documents are associated with this receipt: 163889[COC for SRR 53778], 163890[SRR Paperwork for SRR 53778]

Thermometer: 021056
Temperature: 11.0

Page Printed: 09/09/2014 11:48
ver: (7/18/2014)

53778 Los Alamos National Laborato

Southwest Research Institute

Laboratory Task Order

TO #: 140328-6 Revision: 0

010008

SDG: 560542
VTSR: 08/28/14
CASE: ADEP

SRR #'s: 53778
Client(s): Los Alamos National Laboratory

Project(s): 19869.01.00X
Manager(s): DAMMANN, MIKE
To Client: 09/03/14

Instructions

Los Alamos National Laboratory _ Subcontract No. 250954
Lab Request # ADEP
SDG is 560542.

RUSH TAT. 7-day TAT
ALL DATA IS DUE TO THE CLIENT ON 09/04/2014.

1 overall SOLID sample (2 containers) was received on 08/28/2014.

Requires:
SW846 Method 1040 for Oxidizing Solids
United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34, Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1.

PRELIMS _ Email prelims to: Keith Greene kgreene@lanl.gov, Nita Patel npatel@lanl.gov

---

EDD REQUIRED. Please note, All results have to be merged under 1 EDD "file."
See Exhibit "D" Scope of Work and Technical Specifications for Off-Site Analytical Laboratory Services

---

Main point-of-contact is Keith R. Greene, kgreene@lanl.gov; Additional contact Nita Patel npatel@lanl.gov
Send Hardcopy & CD TO:
Los Alamos National Laboratory
ATTN: Keith R. Greene
TA-3 SM-271 Drop point 02U
Los Alamos, NM 87545

Documents Related to this task order: 163889[COC for SRR 53778], 163890[SRR Paperwork for SRR 53778]

Deliverables --> Hard Copy: -YES- EDD: -YES- PDF: -YES-

Test: Oxidizer_UN
Section: WETCHEM

Holding: 180 days from CED

United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34, Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1

Cnt: 1

System ID	Type	Cont	Matrix		Customer ID	CED	Method Date
560542		1	Solid	SwheatScoop	NaN03	25 Aug 14	21 Feb 15
560542		2	Solid	SwheatScoop	NaN03	25 Aug 14	21 Feb 15

Test: OXIDIZING_1040
Section: WETCHEM

Holding: 180 days from CED

SW846 Method 1040 for Oxidizing Solids

Cnt: 1

System ID	Type	Cont	Matrix		Customer ID	CED	Method Date
560542		1	Solid	SwheatScoop	NaN03	25 Aug 14	21 Feb 15
560542		2	Solid	SwheatScoop	NaN03	25 Aug 14	21 Feb 15

FIELD CHAIN- OF CUSTODY

NAME: David Chavez

TA:

Z#:

OU:

PHONE:

CHAGE CODE:

SAMPLE #	ORDER CODE	CONTAINER	PREV. COLLECTED: Time /date	SPECIAL instructions
Swheat-NANO3		2	8/25/14	10:30
	1040 # un DOT oxidizer			

Client: Los Alamos National Laboratory
SwRI Projec #19889.01.00X
VTSR: 08/28/14 0845
Battery Check: Y
Cooler/Container Wipe: <100 cpm
Total cpm-mR/h (samples): <100 cpm / <0.5mR/hr
(see Radioactive Material Receiving Form for more information

SwRI SRR #53778
Case:ADEP
Sample(s) Received: Intact
Background Check: <100 cpm (Lab 103)
Temp.: 11.9°C (blue ice) / #021056
Wipe Frisk Description: Cooler(s) - 1

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
David Chavez	8/25/14 11:06 Am	K. Greene	8/25/14 11:05
	8/27/14 3100	Steven Rapp	08/28/14 0845

010009

Southwest Research Institute

Traffic Report

010010

Sample Custodian Signature: _____

1. Custody Seal	Present	**Client: Los Alamos National Laboratory**
2. Chain of Custody	Present	Project: 19869.01.00X
3. Sample Tags	Not Present	Case: ADEP / SDG: _____
Sample Tag Numbers	Not on COC	Sample Receipt: 53778
4. SMO Forms	Not Present	Airbill: 5908 1777 6492

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
08/28/14	08:45:00	Client COC	SwheatScoop-NaN03	N/A	560542	YES	Intact

SAMPLE LOG-IN SHEET

010011

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): STEVEN RAMIREZ	Log-in Date: 08/28/2014
Received By (Signature): Steven Ramirez	
Case Number: ADEP	Sample Delivery Group No.: N/A
Remarks: 19869.01.00X	SAS Number: N/A

1. Custody Seal(s)	Present/Absent* Intact/Broken	
2. Custody Seal Nos.	N/A	
3. Chain-of Custody Records	Present/Absent*	
4. Traffic Reports or Packing Lists	Present/Absent*	
5. Airbill	Airbill/Sticker Present/Absent*	
6. Airbill No.	5908 1777 6492	
7. Sample Tags	Present/Absent*	
Sample Tag Numbers	Listed/Not listed on Chain of Custody	
8. Sample Condition	Intact/Broken*/ Leaking	
9. Cooler Temperature	11.0C	
10. Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*	
11. Date Received at Lab	08/28/2014	
12. Time Received	08:45:00	

EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc
SwheatScoop-Na N03	N/A	560542	Intact

Sample Transfer		
Fraction: ORG	Fraction:	
Area #: COOLER 13	Area #:	
By: STEVEN RAMIREZ	By:	
On: 08/28/2014	On:	

* Contact SMO and attach record of resolution

Reviewed By:	Logbook No.: Sample Receipt (53778)
Date: 9.2.14	Logbook Page No.: ✓ 8830 SEC 2 OF 2

010012

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140828-6
SRR: 53778
SDG: 560542
VTSR: 08.28.14
PROJECT #: 19869.01.00X

Data Forms

SOUTHWEST RESEARCH INSTITUTE 010013

SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 08/28/14

SRR #: 53778

Task Order #: 140828-6

Tested in accordance with United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
SwheatScoop-NaNO3	560542-2	45.69	146.33	Packing group II

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
117.17	64.12	21.23

The test criteria for determining oxidizing properties of the substance are:	Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing groups I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

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SOUTHWEST RESEARCH INSTITUTE 10014

DUPLICATE SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 08/28/14

SRR #: 53778

Task Order #: 140828-6

Tested in accordance with United Nations (UN) "Recommendations on the Transport of Dangerous Goods", Section 34

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
SwheatScoop-NaNO3	560542-2	50.72	166.67	Packing group II

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
117.17	64.12	21.23

The test criteria for determining oxidizing properties of the substance are:	Classification
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.	Packing group I
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing group I	Packing group II
Any substance which, in the 4:1 or 1:1 sample-to-cellulose ration (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose; and which does not meet the criteria for packing groups I and II.	Packing group III
Any substance which, in both the 4:1 and 1:1 sample-to-cellulose ration(by mass) tested, does not ignite and burn, or exhibit mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.	Not Division 5.1

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SOUTHWEST RESEARCH INSTITUTE 010015

SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 08/28/14

SRR #: 53778

Task Order #: 140828-6

Tested in accordance with SW 846 Method 1040

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
SwheatScoop-NaNO3	560542-1	30.57	126.45	Category II (oxidizer)

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
117.17	64.12	21.23

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is....	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

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SOUTHWEST RESEARCH INSTITUTE 010016

DUPLICATE SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Los Alamos National Laboratory

Lab Code: SwRI

Project No.: 19869.01.00X

Matrix: Solid

Date Received: 08/28/14

SRR #: 53778

Task Order #: 140828-6

Tested in accordance with SW 846 Method 1040

Test Substance

Sample ID	SwRI System ID	Mean Burn Time, sec 4:1 Sample:Cellulose Ratio	Mean Burn Time, sec 1:1 Sample:Cellulose Ratio	Classification
SwheatScoop-NaNO3	560542-1	34.27	145.08	Category II (oxidizer)

Potassium Bromate and Cellulose Reference Mixtures

Mean Burn Time, sec 3:7 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 2:3 $KBrO_3$:Cellulose Ratio	Mean Burn Time, sec 3:2 $KBrO_3$:Cellulose Ratio
117.17	64.12	21.23

If the Shortest Mean Burn Time in Seconds for Any Waste Mixture Is...	Then the Waste Is:
Less than or equal to that of the 3:2 potassium bromate:cellulose standard	Category I (oxidizer)
Less than or equal to that of the 2:3 potassium bromate:cellulose standard and greater than that of the 3:2 potassium bromate:cellulose standard	Category II (oxidizer)
Less than or equal to that of the 3:7 potassium bromate:cellulose standard and greater than that of the 2:3 potassium bromate:cellulose standard	Category III (oxidizer)
Greater than that of the 3:7 potassium bromate:cellulose standard or does not ignite or burn within three minutes.	Category IV (a non-oxidizer)

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SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140828-6
SRR: 53778
SDG: 560542
VTSR: 08.28.14
PROJECT #: 19869.01.00X

UN Sec. 34 & Method 1040 Raw Data

010018

Southwest Research Institute

Method: UN sec. 34 ⅓ method 1040
Project #: 19869.01.006
Client: Los Alamos National Laboratory
TO# 140828-16

Reference Substance

$KBrO_3$:Cellulose	Wt $KBrO_3$, g	Wt Cellulose, g
3:7	9	21
2:3	12	18
3:2	18	12

RE 9/3/14 mm

Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
3:7	1	9.0075	21.0141	115.32	
3:7	2	9.0139	21.0010	116.47	
3:7	3	9.0027	21.0030	103.90	
3:7	4	9.0133	21.0037	130.85	
3:7	5	9.0026	21.0056	119.31	
3:7	Avg			117.17	
Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
2:3	1	12.0099	18.0079	65.31	
2:3	2	12.0127	18.0036	69.03	
2:3	3	12.0606	18.0032	100.96	
2:3	4	12.0108	18.0011	69.72	
2:3	5	12.0237	18.0017	55.59	
2:3	Avg			64.122	≈ 64.12
Ratio	Rep	Actual KBrO3 Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
3:2	1	18.0194	12.0044	20.16	
3:2	2	18.0198	12.0088	22.40	
3:2	3	18.0160	12.0031	22.63	
3:2	4	18.0041	12.0065	20.75	
3:2	5	18.0078	12.0035	20.19	
3:2	Avg			21.226	≈ 21.23

Weighted Samples: M. Mendoza Balance#: 135 Date: 9/3/13
Tested Samples: M. Mendoza Timer ID: Fisher Scientific Date: 9/3/13
Potassium Bromate: Inorg# 52035 Dried: Oven #31 @ 65°C
Cellulose: WO 10/14 Inorg# 34508 & 52038 Dried: Oven #01 @ 105°C
Variac Setting: 152 W Fluke true rms multimeter meter: AN # 008369
probe: AN# 019168

010019

Southwest Research Institute

Method: UN
Project #: 19869.61.0016
Client: Los Alamos National Laboratory
TO# 140828-6

RSPMS 918114

Sample Analysis

System ID: 560542-2mx

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0262	6.0293	47.72	
4:1	2	24.0427	6.0201	39.90	
4:1	3	24.0615	6.0419	44.59	
4:1	4	24.0340	6.0154	37.44	
4:1	5	24.0147	6.0365	58.78	
4:1	Avg			45.69	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0183	15.0216	165.25	
1:1	2	15.0698	15.0384	104.56	
1:1	3	15.0328	15.0357	163.75	
1:1	4	15.0853	15.0618	164.24	
1:1	5	15.0061	15.0192	133.85	
1:1	Avg			146.33	

Weighted Samples: M. Mendoza Balance#: 135 Date: 9/4/14
Tested Samples: M. Mendoza Timer ID: Fisher Scientific Date: 9/4/14
Sample Dried ? YES (NO) Dried: NA
Cellulose: Inorg# 34508 & 52038 Dried: Oven #01 @ 105°C
Variac Setting: 152 W

010020

Southwest Research Institute

Method: UN
Project #: 19869.01.0006
Client: Los Alamos National Laboratory
TO# 140828-16

Sample Analysis

System ID: 560542-2mx Dup

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0390	6.0066	44.97	
4:1	2	24.0320	6.0199	53.79	
4:1	3	24.0168	6.0047	55.43	
4:1	4	24.0097	6.0047	49.87	
4:1	5	24.0286	6.0038	49.54	
4:1	Avg			50.72	
Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec rerun for exact	Comment
1:1	1	15.0336	15.0039	~~>180~~ 203.04 (*)	15.0125g; 15.0473g ↳ Ran on 9/08/14
1:1	2	15.0515	15.0036	175.27	Power turned off at 180sec.
1:1	3	15.0246	15.0114	145.52	flames continued to burn
1:1	4	15.0184	15.0182	172.13	for 23.04 more seconds.
1:1	5	15.0049	15.0171	137.41	
1:1	Avg			~~162.07~~ 166.67	

Weighted Samples: M. Mendoza Balance#: 135 Date: 9/4/14
Tested Samples: M. Mendoza Timer ID: Fisher Scientific Date: 9/4/14
Sample Dried ? YES / (NO) Dried: NA
Cellulose: Inorg# 34508 & 52038 Dried: Oven #01 @ 105°C
Variac Setting: 152 W

(*) For the first 49 seconds only black smoke was observed. At 50seconds flames were observed but would extinguish and start up again a few seconds later. Heat source was left on for 3min./180sec then turned off. Fire continued even after heat source was

010021

Southwest Research Institute

Method: 1040
Project #: 19869.01.006
Client: Los Alamos National Laboratory
TO# 140828-6

Sample Analysis

System ID: 560542-1LY

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0186	6.0140	32.84	
4:1	2	24.0131	6.0092	31.53	
4:1	3	24.0022	6.0043	31.03	
4:1	4	24.0061	6.0057	28.03	
4:1	5	24.0058	6.0152	29.40	
4:1	Avg			30.57	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0082	15.0136	1116.19	
1:1	2	15.0054	15.0175	140.65	
1:1	3	15.0140	15.0018	166.00	
1:1	4	15.0093	15.0020	103.47	
1:1	5	15.0001	15.0099	105.93	
1:1	Avg			126.45	

Weighted Samples: James Moken Balance#: 135 Date: 9/5/14
Tested Samples: M. Mendoza Timer ID: Fisher Scientific Date: 9/5/14
Sample Dried ? (YES) NO Dried: Oven #31 @ 105°C overnight.
Cellulose: Inorg# 34508 & 52038 Dried: Oven #01 @ 105°C
Variac Setting: 152 W 105 RE 9/5/15 mm

After sample was allowed to cool, all of the sample was partical sized thraght a standard testing sieve NO. 10 2 mm opening.
RSS 9/8/14

010022

Southwest Research Institute

Method: 1040
Project #: 19869.01.006
Client: Los Alamos National Laboratory
TO# 140828-16

Sample Analysis

System ID: 560542-1LY Dup

Sample:Cellulose	Wt Sample, g	Wt Cellulose, g
4:1	24	6
1:1	15	15

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
4:1	1	24.0085	6.0007	33.75	
4:1	2	24.0134	6.0027	29.69	
4:1	3	24.0141	6.0013	32.81	
4:1	4	24.0108	6.0019	37.60	
4:1	5	24.0110	6.0004	37.50	
4:1	Avg			34.27	

Ratio	Rep	Actual Sample Wt, g	Actual Cellulose Wt, g	Burning Time, sec	Comment
1:1	1	15.0032	15.0001	127.32	
1:1	2	15.0120	15.0066	149.63	
1:1	3	15.0007	15.0032	155.78	
1:1	4	15.0075	15.0034	122.78	
1:1	5	15.0032	15.0020	170.50	
1:1	Avg			145.08	

Weighted Samples: James Moken Balance#: 135 Date: 9/5/14
Tested Samples: M. Madrid Timer ID: Fisher Scientific Date: 9/5/14
Sample Dried ? (YES) NO Dried: Oven # 31 @ 65°C
Cellulose: Inorg# 34508 & 52038 Dried: Oven # 01 @ 105°C
Variac Setting: 152 W

010023

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Los Alamos National Laboratory
TASK ORDER: 140828-6
SRR: 53778
SDG: 560542
VTSR: 08.28.14
PROJECT #: 19869.01.00X

Certificates of Analysis

Chemical Information Sheet

010024
#52035

Potassium Bromate

Grade:	Analytical
Type:	Neat
CAS:	7758-01-2
Lot:	MKBR6937V
Received:	07/21/2014
Expiration:	04/09/2024
Location:	Lab 26
Current Lab:	Lab 26 Bldg 70
Original Amount:	500 g
Amount Remaining:	500
Supplier:	Sigma-Aldrich
Concentration:	99.8 %
Project:	- No Data -
PO Number:	G48315MM
Internal Lab ID:	- No Data -
Density:	- No Data -
Storage Requirement:	Ambient
Measuring Device ID:	- No Data -
Date Disposed:	- No Data -
Notes:	

Component Table

Compound	Conc/Activity	CAS

010025

SwRI Chem ID: 52035

SIGMA-ALDRICH®

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Potassium bromate – ACS reagent, ≥99.8%

Product Number:	**309087**
Batch Number:	**MKBR6937V**
Brand:	SIAL
CAS Number:	7758-01-2
MDL Number:	MFCD00011359
Formula:	BrKO3
Formula Weight:	167.00 g/mol
Quality Release Date:	09 APR 2014

$KBrO_3$

SwRI Chem ID: 52035

Test	Specification	Result
Appearance (Color)	White	White
Appearance (Form)	Crystalline Powder	Crystalline Powder
X-Ray Diffraction	Conforms to Structure	Conforms
Titration by Na2S2O3	≥ 99.8 %	99.8 %
Insoluble matter	≤ 0.005 %	0.002 %
Bromides	Pass	Pass
Iron (Fe)	≤ 0.002 %	< 0.001 %
Heavy Metals (as Lead)	≤ 5 ppm	< 4 ppm
Sodium (Na)	≤ 0.01 %	< 0.01 %
pH C=5%, H2O at 25 Degrees Celsius	5.0 - 9.0	8.3
Sulfate (SO4)	≤ 0.005 %	< 0.005 %
Meets ACS Requirements 10th Edition	Meets Requirements	Meets Requirements

ali ataei

Ali Ataei, Manager
Quality Control
Milwaukee, WI US

SwRI Chem ID: 52035

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Chemical Information Sheet

010026

#34508

Cellulose

Grade:	Analytical
Type:	Commercial Stock
CAS:	9004-34-6
Lot:	089K0055
Received:	07/09/2010
Expiration:	07/09/2020
Location:	- No Data -
Current Lab:	Lab 26 Bldg 70
Original Amount:	1 kg
Amount Remaining:	1
Supplier:	Sigma Aldrich
Concentration:	100 %
Project:	- No Data -
PO Number:	- No Data -
Internal Lab ID:	8372
Density:	- No Data -
Storage Requirement:	Ambient
Measuring Device ID:	- No Data -
Date Disposed:	- No Data -
Notes:	

Component Table

Compound	Conc/Activity	CAS

010027

#52038

Chemical Information Sheet

Cellulose Fibers

Grade:	Analytical
Type:	Neat
CAS:	- No Data -
Lot:	MKBQ8042V
Received:	07/21/2014
Expiration:	12/18/2023
Location:	Lab 26
Current Lab:	Lab 26 Bldg 70
Original Amount:	1 Kg
Amount Remaining:	1
Supplier:	Sigma-Aldrich
Concentration:	100 %
Project:	- No Data -
PO Number:	G48315MM
Internal Lab ID:	- No Data -
Density:	- No Data -
Storage Requirement:	Ambient
Measuring Device ID:	- No Data -
Date Disposed:	- No Data -
Notes:	

Component Table

Compound	Conc/Activity	CAS

Attachment 2

Los Alamos
NATIONAL LABORATORY
EST. 1943

Associate Director for ESH
Environment, Safety, and Health
P.O. Box 1663, MS K491
Los Alamos, New Mexico 87545
505-667-4218/Fax 505-665-3811

National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87545
(505) 667-5794/Fax (505) 667-5948

Date: AUG 13 2014
Ref: ADESH-14-041

J. R. Stroble, Acting Assistant Manager
Office of Program Management
Carlsbad Field Office
U. S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Stroble,

Subject: Written Concurrence for Correction of Waste Manifests

The purpose of this letter is to follow up our recent conversation regarding a discrepancy on manifests for containers (see attachment) that were shipped from the Los Alamos National Laboratory (LANL) to the Waste Isolation Pilot Plant (WIPP). The containers were received at the WIPP facility between August 8, 2013, and January 29, 2014, in shipments associated with 49 separate manifests (see attachment). WIPP accepted the shipments for disposal, and the manifests were returned to LANL without any discrepancies identified. Due to recent events at WIPP, and re-evaluation of Acceptable Knowledge information, the Carlsbad Field Office (CBFO) notified LANL that there was a manifest discrepancy based on WIPP's determination that nitrate salt-bearing waste containers required application of the EPA Hazardous Waste Number D001 and DOT subsidiary Hazard Division 5.1. Further, CBFO requested concurrence from LANL that the manifests can be corrected pursuant to Section C-5b(1) of the WIPP Waste Analysis Plan (the WAP) which provides that errors on a manifest can be corrected by WIPP with a verbal (followed by a mandatory written) concurrence by the generator/storage site technical contact. This letter provides that written concurrence.

At the time LANL shipped the containers to WIPP, the manifests identified the hazardous waste numbers and hazard class determined to be appropriate at that time based on acceptable knowledge. Due to the recent events at WIPP, LANL has been re-evaluating the characterization of the waste stream. On July 30, 2014, the Department of Energy, National Nuclear Administration (DOE/NNSA) and Los Alamos National Security, LLC (LANS) notified the New Mexico Environment Department that LANL had decided to provisionally apply EPA Hazardous Waste

Number D001 for the characteristic of ignitability to certain nitrate salt-bearing waste containers stored at LANL.

We are continuing to re-evaluate the waste characterization information concerning these nitrate salt waste streams, and will keep you updated as to new relevant information. If you have questions please contact Michael Brandt (LANS) at (505) 667-4218, or Pete Maggiore (DOE) at (505) 665-5025.

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety, and Health
Los Alamos National Security, LLC

Peter Maggiore
Assistant Manager
Environmental Projects Office
Los Alamos Field Office

Enclosures: (1) List of Manifests Requiring Correction

Cy: Kimberly Davis Lebak, NA-LA, (E-File)
Lisa Cummings, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten M. Laskey, NA-LA, (E-File)
Eric L. Trujillo, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, (E-File)
Raeanna R. Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Jeffery D. Mousseau, ADEP, (E-File)
Daniel R. Cox, ADEP, (E-File)
Victoria A. George, REG-DO, (E-File)
Anthony R. Grieggs, ENV-CP, (E-File)
Deborah K. Woitte, LC-ESH, (E-File)
Debra Nevergold, LTP, (E-File)
Mark P. Haagenstad, ENV-CP, (E-File)
Luciana Vigil-Holterman, ENV-CP, (E-File)
lasomailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, (E-File)

ENCLOSURE 1

List of Manifests Requiring Correction

ADESH-14-041

Date: AUG 13 2014

List of applicable manifest numbers, shipment numbers, dates of receipt and container numbers from Waste Stream LA-MIN02-V.001				
Manifest Number	**Shipment Number**	**Received**	**Container Number**	**Container Count**
001600826GBF	IN130186	8-Sep-13	LA00000062547	1
001600826GBF	IN130186	8-Sep-13	LA00000063116	2
001600826GBF	IN130186	8-Sep-13	LA00000063198	3
001600826GBF	IN130186	8-Sep-13	LA00000063497	4
001600826GBF	IN130186	8-Sep-13	LA00000064665	5
001600826GBF	IN130186	8-Sep-13	LA00000064863	6
001600826GBF	IN130186	8-Sep-13	LAS822714	7
010784176JJK	LA130125	29-Aug-13	LA00000092217	8
010784176JJK	LA130125	29-Aug-13	LA00000092237	9
010784176JJK	LA130125	29-Aug-13	LA00000092347	10
010784176JJK	LA130125	29-Aug-13	LA00000092555	11
010784176JJK	LA130125	29-Aug-13	LA00000093588	12
010784176JJK	LA130125	29-Aug-13	LA00000093589	13
010784179JJK	LA130128	3-Sep-13	LA00000092220	14
010784180JJK	LA130129	4-Sep-13	LA00000092140	15
010784180JJK	LA130129	4-Sep-13	LA00000092219	16
010784180JJK	LA130129	4-Sep-13	LA00000092235	17
010784180JJK	LA130129	4-Sep-13	LA00000092495	18
010784180JJK	LA130129	4-Sep-13	LA00000093597	19
010784181JJK	LA130130	6-Sep-13	LA00000092246	20
010784181JJK	LA130130	6-Sep-13	LA00000092249	21
010784181JJK	LA130130	6-Sep-13	LA00000092252	22
010784181JJK	LA130130	6-Sep-13	LA00000093593	23
010784181JJK	LA130130	6-Sep-13	LA00000093598	24
010784182JJK	LA130131	6-Sep-13	LA00000092211	25
010784182JJK	LA130131	6-Sep-13	LA00000092239	26
010784182JJK	LA130131	6-Sep-13	LA00000092251	27
010784183JJK	LA130132	9-Sep-13	LA00000063182	28
010784183JJK	LA130132	9-Sep-13	LA00000064627	29
010784183JJK	LA130132	9-Sep-13	LA00000066376	30
010784183JJK	LA130132	9-Sep-13	LA00000092134	31
010784183JJK	LA130132	9-Sep-13	LA00000092145	32
010784183JJK	LA130132	9-Sep-13	LA00000092496	33
010784184JJK	LA130133	11-Sep-13	LA00000062912	34
010784184JJK	LA130133	11-Sep-13	LA00000063365	35

010784184JJK	LA130133	11-Sep-13	LA00000092136	36
010784184JJK	LA130133	11-Sep-13	LA00000092152	37
010784185JJK	LA130134	11-Sep-13	LA00000092171	38
010784185JJK	LA130134	11-Sep-13	LA00000092213	39
010784185JJK	LA130134	11-Sep-13	LA00000092215	40
010784185JJK	LA130134	11-Sep-13	LA00000092216	41
010784189JJK	LA130135	13-Sep-13	LA00000092122	42
010784189JJK	LA130135	13-Sep-13	LA00000092173	43
010784189JJK	LA130135	13-Sep-13	LA00000092470	44
010784189JJK	LA130135	13-Sep-13	LA00000092477	45
010784189JJK	LA130135	13-Sep-13	LA00000092482	46
010784189JJK	LA130135	13-Sep-13	LA00000092540	47
010784189JJK	LA130135	13-Sep-13	LA00000092565	48
010784189JJK	LA130135	13-Sep-13	LA00000092570	49
010784189JJK	LA130135	13-Sep-13	LA00000092888	50
010784189JJK	LA130135	13-Sep-13	LA00000092902	51
010784189JJK	LA130135	13-Sep-13	LA00000092937	52
010784189JJK	LA130135	13-Sep-13	LA00000092938	53
010784189JJK	LA130135	13-Sep-13	LA00000092940	54
010784188JJK	LA130136	14-Sep-13	LA00000063401	55
010784188JJK	LA130136	14-Sep-13	LA00000092156	56
010784188JJK	LA130136	14-Sep-13	LA00000092557	57
010784188JJK	LA130136	14-Sep-13	LA00000092572	58
010784188JJK	LA130136	14-Sep-13	LA00000092684	59
010784188JJK	LA130136	14-Sep-13	LA00000092905	60
010784188JJK	LA130136	14-Sep-13	LA00000092907	61
010784190JJK	LA130137	17-Sep-13	LA00000066866	62
010784190JJK	LA130137	17-Sep-13	LA00000092580	63
010784190JJK	LA130137	17-Sep-13	LA00000092674	64
010784190JJK	LA130137	17-Sep-13	LA00000092682	65
010784190JJK	LA130137	17-Sep-13	LA00000092890	66
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From: Haagenstad, Mark P
Sent: Wednesday, August 13, 2014 11:29 AM
To: Kieling, John, NMENV; Pullen, Steve, NMENV; Hall, Timothy, NMENV
Cc: Brandt, Michael Thomas; Sharp-Geiger, Raeanna Racine; Dorries, Alison Marie; Grieggs, Tony; Mousseau, Jeffrey David; Torres, Enrique; George, Victoria A; Turner, Gene E; Maggiore, Peter; Nickless, David J; Vigil-Holterman, Luciana R; Schumann, Paul B; Bacigalupa, Gian A; Diaz, Tammy; Martinez, Angela M; Thorp, Donald Thomas; McMichael, Susan Lynn; Cummings, Lisa K; Woitte, Deborah Kay
Subject: RE: Notification of Waste Profile Discrepancy Application of EPA Haz Waste Number D001
Attachments: ADESH-14-041-J R Stroble Written Concurrence for Correction of Waste Manifests.pdf

See attachment.

From: Haagenstad, Mark P
Sent: Wednesday, August 13, 2014 11:28 AM
To: Kieling, John, NMENV; 'Pullen, Steve, NMENV'; Hall, Timothy, NMENV
Cc: Brandt, Michael Thomas; Sharp-Geiger, Raeanna Racine; Dorries, Alison Marie; Grieggs, Tony; Mousseau, Jeffrey David; Torres, Enrique; George, Victoria A; 'Turner, Gene E.'; 'Maggiore, Peter'; Nickless, David J; Vigil-Holterman, Luciana R; Schumann, Paul B; Bacigalupa, Gian A; Diaz, Tammy; Martinez, Angela M; Thorp, Donald Thomas; McMichael, Susan Lynn; 'Cummings, Lisa'; Woitte, Deborah Kay
Subject: Notification of Waste Profile Discrepancy Application of EPA Haz Waste Number D001

Dear Mr. Kieling:

Subject: Notification of Waste Profile Discrepancy Regarding Application of EPA Hazardous Waste Number D001 to Nitrate-Salt-Bearing Waste Containers Shipped Off-Site From Los Alamos National Laboratory

The purpose of this email is to notify the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) of a waste characterization discrepancy as required by the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit (Permit). Section 2.4.7, Waste Characterization Review, of the Permit states that the Permittees shall "…(4) [R]echaracterize a hazardous waste stream whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they obtained from the Permittees' Facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittees shall notify the Department in writing within three days of their receipt of the notice of the discrepancy from a receiving facility."

The Department of Energy and Los Alamos National Security, LLC (DOE/LANS) (the Permittees) shipped nitrate-salt-bearing waste containers to the Waste Isolation Pilot Plant (WIPP) since 2011. Additional shipments of this waste stream were made to Waste Control Specialists (WCS) in Andrews, Texas, and the Idaho National Laboratory.

Since that time, the LANL and WIPP Permittees have each made the decision to add the Environmental Protection Agency (EPA) Hazardous Waste Number D001 for ignitability to the LANL nitrate-salt-bearing waste containers at their respective facilities. As a result, the characterization of the containers WIPP received from LANL no longer matches the pre-approved waste analysis certifications that accompanied the waste manifests and shipping papers associated with the original off-site shipments.

Based on the DOE/LANS' written concurrence allowing WIPP to correct the original manifests (see attached notification), the Permittees are hereby notifying the Department of the newly-identified discrepancy, in accordance with Permit Section 2.4.7(4). This email constitutes notification with respect to the wastes associated with the referenced manifests.

If you have comments or questions regarding this notification, please contact Gene E. Turner (DOE) at (505) 667-5794 or me at (505) 665-2014.

Mark Haagenstad
Environmental Protection Division
RCRA Permitting and Compliance Team Leader
Los Alamos National Security
Los Alamos National Laboratory
Office: (505) 665-2014
Mobile: (505) 699-1733

Los Alamos
NATIONAL LABORATORY
EST. 1943

Associate Director for ESH
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National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87545
(505) 667-5794/Fax (505) 667-5948

Date: AUG 13 2014
Ref: ADESH-14-041

J. R. Stroble, Acting Assistant Manager
Office of Program Management
Carlsbad Field Office
U. S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Stroble,

Subject: Written Concurrence for Correction of Waste Manifests

The purpose of this letter is to follow up our recent conversation regarding a discrepancy on manifests for containers (see attachment) that were shipped from the Los Alamos National Laboratory (LANL) to the Waste Isolation Pilot Plant (WIPP). The containers were received at the WIPP facility between August 8, 2013, and January 29, 2014, in shipments associated with 49 separate manifests (see attachment). WIPP accepted the shipments for disposal, and the manifests were returned to LANL without any discrepancies identified. Due to recent events at WIPP, and re-evaluation of Acceptable Knowledge information, the Carlsbad Field Office (CBFO) notified LANL that there was a manifest discrepancy based on WIPP's determination that nitrate salt-bearing waste containers required application of the EPA Hazardous Waste Number D001 and DOT subsidiary Hazard Division 5.1. Further, CBFO requested concurrence from LANL that the manifests can be corrected pursuant to Section C-5b(1) of the WIPP Waste Analysis Plan (the WAP) which provides that errors on a manifest can be corrected by WIPP with a verbal (followed by a mandatory written) concurrence by the generator/storage site technical contact. This letter provides that written concurrence.

At the time LANL shipped the containers to WIPP, the manifests identified the hazardous waste numbers and hazard class determined to be appropriate at that time based on acceptable knowledge. Due to the recent events at WIPP, LANL has been re-evaluating the characterization of the waste stream. On July 30, 2014, the Department of Energy, National Nuclear Administration (DOE/NNSA) and Los Alamos National Security, LLC (LANS) notified the New Mexico Environment Department that LANL had decided to provisionally apply EPA Hazardous Waste

Number D001 for the characteristic of ignitability to certain nitrate salt-bearing waste containers stored at LANL.

We are continuing to re-evaluate the waste characterization information concerning these nitrate salt waste streams, and will keep you updated as to new relevant information. If you have questions please contact Michael Brandt (LANS) at (505) 667-4218, or Pete Maggiore (DOE) at (505) 665-5025.

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety, and Health
Los Alamos National Security, LLC

Peter Maggiore
Assistant Manager
Environmental Projects Office
Los Alamos Field Office

Enclosures: (1) List of Manifests Requiring Correction

Cy: Kimberly Davis Lebak, NA-LA, (E-File)
Lisa Cummings, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten M. Laskey, NA-LA, (E-File)
Eric L. Trujillo, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, (E-File)
Raeanna R. Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Jeffery D. Mousseau, ADEP, (E-File)
Daniel R. Cox, ADEP, (E-File)
Victoria A. George, REG-DO, (E-File)
Anthony R. Grieggs, ENV-CP, (E-File)
Deborah K. Woitte, LC-ESH, (E-File)
Debra Nevergold, LTP, (E-File)
Mark P. Haagenstad, ENV-CP, (E-File)
Luciana Vigil-Holterman, ENV-CP, (E-File)
lasomailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, (E-File)

ENCLOSURE 1

List of Manifests Requiring Correction

ADESH-14-041

Date: AUG 13 2014

List of applicable manifest numbers, shipment numbers, dates of receipt and container numbers from Waste Stream LA-MIN02-V.001				
Manifest Number	**Shipment Number**	**Received**	**Container Number**	**Container Count**
001600826GBF	IN130186	8-Sep-13	LA00000062547	1
001600826GBF	IN130186	8-Sep-13	LA00000063116	2
001600826GBF	IN130186	8-Sep-13	LA00000063198	3
001600826GBF	IN130186	8-Sep-13	LA00000063497	4
001600826GBF	IN130186	8-Sep-13	LA00000064665	5
001600826GBF	IN130186	8-Sep-13	LA00000064863	6
001600826GBF	IN130186	8-Sep-13	LAS822714	7
010784176JJK	LA130125	29-Aug-13	LA00000092217	8
010784176JJK	LA130125	29-Aug-13	LA00000092237	9
010784176JJK	LA130125	29-Aug-13	LA00000092347	10
010784176JJK	LA130125	29-Aug-13	LA00000092555	11
010784176JJK	LA130125	29-Aug-13	LA00000093588	12
010784176JJK	LA130125	29-Aug-13	LA00000093589	13
010784179JJK	LA130128	3-Sep-13	LA00000092220	14
010784180JJK	LA130129	4-Sep-13	LA00000092140	15
010784180JJK	LA130129	4-Sep-13	LA00000092219	16
010784180JJK	LA130129	4-Sep-13	LA00000092235	17
010784180JJK	LA130129	4-Sep-13	LA00000092495	18
010784180JJK	LA130129	4-Sep-13	LA00000093597	19
010784181JJK	LA130130	6-Sep-13	LA00000092246	20
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010784181JJK	LA130130	6-Sep-13	LA00000092252	22
010784181JJK	LA130130	6-Sep-13	LA00000093593	23
010784181JJK	LA130130	6-Sep-13	LA00000093598	24
010784182JJK	LA130131	6-Sep-13	LA00000092211	25
010784182JJK	LA130131	6-Sep-13	LA00000092239	26
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010784183JJK	LA130132	9-Sep-13	LA00000064627	29
010784183JJK	LA130132	9-Sep-13	LA00000066376	30
010784183JJK	LA130132	9-Sep-13	LA00000092134	31
010784183JJK	LA130132	9-Sep-13	LA00000092145	32
010784183JJK	LA130132	9-Sep-13	LA00000092496	33
010784184JJK	LA130133	11-Sep-13	LA00000062912	34
010784184JJK	LA130133	11-Sep-13	LA00000063365	35

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010784185JJK	LA130134	11-Sep-13	LA00000092171	38
010784185JJK	LA130134	11-Sep-13	LA00000092213	39
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010784189JJK	LA130135	13-Sep-13	LA00000092477	45
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010784189JJK	LA130135	13-Sep-13	LA00000092902	51
010784189JJK	LA130135	13-Sep-13	LA00000092937	52
010784189JJK	LA130135	13-Sep-13	LA00000092938	53
010784189JJK	LA130135	13-Sep-13	LA00000092940	54
010784188JJK	LA130136	14-Sep-13	LA00000063401	55
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010784190JJK	LA130137	17-Sep-13	LA00000092674	64
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010784190JJK	LA130137	17-Sep-13	LA00000092913	70
010784190JJK	LA130137	17-Sep-13	LA00000092915	71
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010784203JJK	LA130149	1-Oct-13	LA00000093487	83
010784203JJK	LA130149	1-Oct-13	LA00000093516	84
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010784204JJK	LA130150	2-Oct-13	LA00000093573	87
010784204JJK	LA130150	2-Oct-13	LA00000093581	88
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010784238JJK	LA130179	3-Dec-13	LA00000068473	223
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010784243JJK	LA130184	13-Dec-13	LA00000068380	251
010784243JJK	LA130184	13-Dec-13	LA00000068384	252
010784243JJK	LA130184	13-Dec-13	LA00000068456	253
010784243JJK	LA130184	13-Dec-13	LA00000068470	254
010784243JJK	LA130184	13-Dec-13	LA00000068480	255
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010784243JJK	LA130184	13-Dec-13	LA00000068568	259
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010784243JJK	LA130184	13-Dec-13	LA00000068570	261
010784243JJK	LA130184	13-Dec-13	LA00000068575	262
010784243JJK	LA130184	13-Dec-13	LA00000092667	263
010784243JJK	LA130184	13-Dec-13	LA00000093582	264
010784244JJK	LA130185	17-Dec-13	LA00000068322	265
010784244JJK	LA130185	17-Dec-13	LA00000068412	266
010784244JJK	LA130185	17-Dec-13	LA00000068415	267
010784244JJK	LA130185	17-Dec-13	LA00000068457	268
010784244JJK	LA130185	17-Dec-13	LA00000068474	269
010784244JJK	LA130185	17-Dec-13	LA00000068482	270
010784244JJK	LA130185	17-Dec-13	LA00000068495	271
010784244JJK	LA130185	17-Dec-13	LA00000068537	272
010784244JJK	LA130185	17-Dec-13	LA00000068558	273
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010784244JJK	LA130185	17-Dec-13	LA00000068564	275
010784244JJK	LA130185	17-Dec-13	LA00000068572	276
010784244JJK	LA130185	17-Dec-13	LA00000068579	277
010784245JJK	LA130186	17-Dec-13	LA00000068560	278
010784245JJK	LA130186	17-Dec-13	LA00000068561	279
010784245JJK	LA130186	17-Dec-13	LA00000068565	280

010784245JJK	LA130186	17-Dec-13	LA00000068611	281
010784245JJK	LA130186	17-Dec-13	LA00000068612	282
010784245JJK	LA130186	17-Dec-13	LA00000068613	283
010784245JJK	LA130186	17-Dec-13	LA00000068633	284
010784245JJK	LA130186	17-Dec-13	LA00000068634	285
010784245JJK	LA130186	17-Dec-13	LA00000068637	286
010784253JJK	LA140003	8-Jan-14	LA00000068414	287
010784253JJK	LA140003	8-Jan-14	LA00000068549	288
010784253JJK	LA140003	8-Jan-14	LA00000068559	289
010784253JJK	LA140003	8-Jan-14	LA00000068574	290
010784253JJK	LA140003	8-Jan-14	LA00000068610	291
010784254JJK	LA140004	10-Jan-14	LA00000068343	292
010784254JJK	LA140004	10-Jan-14	LA00000068344	293
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010784254JJK	LA140004	10-Jan-14	LA00000068390	296
010784254JJK	LA140004	10-Jan-14	LA00000068392	297
010784254JJK	LA140004	10-Jan-14	LA00000068397	298
010784254JJK	LA140004	10-Jan-14	LA00000068398	299
010784254JJK	LA140004	10-Jan-14	LA00000068400	300
010784254JJK	LA140004	10-Jan-14	LA00000068427	301
010784254JJK	LA140004	10-Jan-14	LA00000068435	302
010784254JJK	LA140004	10-Jan-14	LA00000068436	303
010784254JJK	LA140004	10-Jan-14	LA00000068547	304
010784254JJK	LA140004	10-Jan-14	LA00000068551	305
010784254JJK	LA140004	10-Jan-14	LA00000068552	306
010784254JJK	LA140004	10-Jan-14	LA00000068557	307
010784254JJK	LA140004	10-Jan-14	LA00000068606	308
010784254JJK	LA140004	10-Jan-14	LA00000068608	309
010784254JJK	LA140004	10-Jan-14	LA00000068651	310
010784259JJK	LA140009	15-Jan-14	LA00000068554	311
010784259JJK	LA140009	15-Jan-14	LA00000068615	312
010784259JJK	LA140009	15-Jan-14	LA00000068650	313
010784260JJK	LA140010	16-Jan-14	LA00000068494	314
010784260JJK	LA140010	16-Jan-14	LA00000068571	315
010784260JJK	LA140010	16-Jan-14	LA00000068614	316
010784260JJK	LA140010	16-Jan-14	LA00000068623	317
010784260JJK	LA140010	16-Jan-14	LA00000068635	318
010784260JJK	LA140010	16-Jan-14	LA00000068636	319
010784260JJK	LA140010	16-Jan-14	LA00000068652	320
010784260JJK	LA140010	16-Jan-14	LA00000068671	321
010784260JJK	LA140010	16-Jan-14	LA00000068672	322

010784261JJK	LA140011	17-Jan-14	LA00000068541	323
010784261JJK	LA140011	17-Jan-14	LA00000068545	324
010784261JJK	LA140011	17-Jan-14	LA00000068548	325
010784261JJK	LA140011	17-Jan-14	LA00000068576	326
010784261JJK	LA140011	17-Jan-14	LA00000068581	327
010784261JJK	LA140011	17-Jan-14	LA00000068605	328
010784261JJK	LA140011	17-Jan-14	LA00000068609	329
010784261JJK	LA140011	17-Jan-14	LA00000068626	330
010784261JJK	LA140011	17-Jan-14	LA00000068629	331
010784261JJK	LA140011	17-Jan-14	LA00000068653	332
010784261JJK	LA140011	17-Jan-14	LA00000068654	333
010784261JJK	LA140011	17-Jan-14	LA00000068655	334
010784261JJK	LA140011	17-Jan-14	LA00000068659	335
010784261JJK	LA140011	17-Jan-14	LA00000068666	336
010784263JJK	LA140013	22-Jan-14	LA00000068616	337
010784264JJK	LA140014	23-Jan-14	LA00000068394	338
010784264JJK	LA140014	23-Jan-14	LA00000068395	339
010784264JJK	LA140014	23-Jan-14	LA00000068422	340
010784264JJK	LA140014	23-Jan-14	LA00000068423	341
010784264JJK	LA140014	23-Jan-14	LA00000068424	342
010784264JJK	LA140014	23-Jan-14	LA00000068501	343
010784264JJK	LA140014	23-Jan-14	LA00000068510	344
010784264JJK	LA140014	23-Jan-14	LA00000068511	345
010784264JJK	LA140014	23-Jan-14	LA00000068512	346
010784264JJK	LA140014	23-Jan-14	LA00000068513	347
010784264JJK	LA140014	23-Jan-14	LA00000068573	348
010784264JJK	LA140014	23-Jan-14	LA00000068577	349
010784264JJK	LA140014	23-Jan-14	LA00000068578	350
010784264JJK	LA140014	23-Jan-14	LA00000068582	351
010784264JJK	LA140014	23-Jan-14	LA00000068618	352
010784264JJK	LA140014	23-Jan-14	LA00000068647	353
010784264JJK	LA140014	23-Jan-14	LA00000068669	354
010784264JJK	LA140014	23-Jan-14	LA00000068680	355
010784265JJK	LA140015	28-Jan-14	LA00000068328	356
010784265JJK	LA140015	28-Jan-14	LA00000068555	357
010784265JJK	LA140015	28-Jan-14	LA00000068649	358
010784266JJK	LA140016	29-Jan-14	LA00000068459	359
010784266JJK	LA140016	29-Jan-14	LA00000068667	360
010784266JJK	LA140016	29-Jan-14	LA00000068668	361
010784266JJK	LA140016	29-Jan-14	LA00000068687	362
010784266JJK	LA140016	29-Jan-14	LA00000094152	363

010784268JJK	LA140017	29-Jan-14	LA00000068333	364
010784268JJK	LA140017	29-Jan-14	LA00000068607	365
010784268JJK	LA140017	29-Jan-14	LA00000068630	366
010784268JJK	LA140017	29-Jan-14	LA00000068660	367
010784268JJK	LA140017	29-Jan-14	LA00000068670	368

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Date: AUG 1 4 2014
Ref: ADESH-14-042

Ryan Williams
Vice President of Integrated Services
Waste Control Specialists LLC
Three Lincoln Centre
5430 LBJ Freeway, Ste. 1700
Dallas, Texas 75240

Dear Mr. Williams,

Subject: **Written Concurrence for Correction of Waste Manifests for Waste Shipped to Waste Control Specialists Facility**

The purpose of this letter is to follow up on our recent conversation regarding a discrepancy on manifests for containers (see attachment) that were shipped from the Los Alamos National Laboratory (LANL) to the Waste Control Specialists (WCS) facility in Andrews, Texas. The referenced containers were accepted by WCS for storage, and the manifests were returned to LANL without any discrepancies identified. At the time LANL shipped the containers to WCS, the manifests identified the hazardous waste numbers determined to be appropriate based on acceptable knowledge. Due to the recent events at WIPP, LANL has been re-evaluating the characterization of the waste stream. As we have discussed, it was determined, based on a review of Acceptable Knowledge information, that it would be prudent to conservatively add hazardous waste number (HWN) D001 for the 119 containers on the attached list. It is our understanding that WCS is required to amend the manifests associated with those containers. This letter provides LANL's concurrence with that decision.

We are continuing to re-evaluate the waste characterization information concerning these nitrate salt waste streams, and will keep you updated as to new relevant information. If you have questions please contact Michael Brandt (LANS) at (505) 667-4218, or Pete Maggiore (DOE) at (505) 665-5025.

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety, and Health
Los Alamos National Security, LLC

Peter Maggiore
Assistant Manager
Environmental Projects Office
Los Alamos Field Office

Enclosures: (1) List of Manifests Requiring Correction

Cy: Kimberly Davis Lebak, NA-LA, (E-File)
Lisa Cummings, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten M. Laskey, NA-LA, (E-File)
Eric L. Trujillo, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, (E-File)
Raeanna R. Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Jeffery D. Mousseau, ADEP, (E-File)
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Victoria A. George, REG-DO, (E-File)
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env-correspondence@lanl.gov (E-File)

ENCLOSURE 1

List of Manifests Requiring Correction

ADESH-14-042

Date: AUG 1 4 2014

WCS Package ID (SWB)	INNERCONTAINER ID	Total MIN02	NWP ID (SWB)	Manifest #
14-108472	68509	3	LASB50018	010784286JJK
	69087			
	69188			
14-108474	68342	3	LASB50019	010784286JJK
	69103			
	68584			
14-108493	69077	2	LASB50032	010784288JJK
	69195			
14-108527	68643	4	SB10174	010784296JJK
	S870129			
	S841295			
	S824056			
14-108583	68350	1	LASB50067	010784305JJK
14-108424	68426	1	LASB02166	010784277JJK
14-108615	68428	1	LASB50028	010784317JJK
14-108495	68543	1	LASB50031	010784288JJK
14-108549	68546	1	LASB50083	010784299JJK
14-108585	68627	1	LASB50059	010784305JJK
14-108440	68656	1	LASB02206	010784279JJK
14-108500	68676	1	LASB50005	010784289JJK
14-108546	69064	1	LASB50089	010784299JJK
14-108532	69067	1	LASB50015	010784296JJK
14-108486	69085	1	LASB50021	010784287JJK
14-108578	69154	1	LASB50061	010784303JJK
14-108457	69209	1	LASB50010	010784285JJK
14-108524	69295	1	LASB50040	010784294JJK
14-108613	93953	1	LASB50060	010784317JJK
14-108631	63130	1	LASB50410	010784319JJK
14-108589	68311	1	LASB50086	010784306JJK
14-108548	68314	2	LASB50012	010784299JJK
	69068			
14-108442	68315	2	LASB02204	010784279JJK
	S832485			
14-108547	68325	3	LASB50045	010784299JJK
	69422			
	69105			
14-108470	68341	2	LASB50020	010784286JJK
	69187			
14-108484	68347	2	LASB50026	010784287JJK
	93935			
14-108558	68425	1	LASB50036	010784300JJK
14-108465	68429	2	LASB50017	010784284JJK
	68433			
14-108518	68431	2	LASB50048	010784292JJK
	69102			
14-108491	68432	3	LASB50037	010784288JJK
	69182			
	68583			
14-108606	68449	1	LASB50072	010784315JJK

14-108551	68508	1	LASB50094	010784298JJK
14-108505	68580	2	LASB50025	010784290JJK
	69179			
14-108559	68617	3	LASB50039	010784300JJK
	69177			
	69043			
14-108603	68619	1	LASB50079	010784314JJK
14-108498	68620	2	LASB50002	010784289JJK
	69191			
14-108463	68625	2	LASB50013	010784284JJK
	68632			
14-108550	68628	2	LASB50082	010784298JJK
	69210			
14-108515	68661	2	LASB50046	010784291JJK
	69196			
14-108587	68679	3	LASB50102	010784305JJK
	69233			
	69180			
14-108579	68686	3	LASB50062	010784303JJK
	69091			
	69073			
14-108556	69014	1	LASB50095	010784300JJK
14-108534	69033	2	LASB50063	010784297JJK
	69097			
14-108513	69034	1	LASB50027	010784291JJK
14-108574	69041	2	LASB50104	010784304JJK
	69226			
14-108554	69045	1	LASB50071	010784298JJK
14-108582	69060	3	LASB50100	010784303JJK
	69413			
	69080			
14-108522	69061	2	LASB50035	010784294JJK
	69161			
14-108599	69063	1	LASB50107	010784313JJK
14-108538	69066	2	LASB50033	010784297JJK
	69181			
14-108619	69074	2	LASB50087	010784318JJK
	69212			
14-108566	69081	1	LASB50052	010784302JJK
14-108571	69083	1	LASB50098	010784301JJK
14-108634	69094	2	LASB50424	010784322JJK
	69555			
14-108629	69099	2	LASB50432	010784319JJK
	S802985			
14-108570	69158	1	LASB50055	010784301JJK
14-108601	69159	1	LASB50074	010784313JJK
14-108529	69162	2	LASB50066	010784296JJK
	69237			
14-108577	69163	3	LASB50057	010784303JJK
	69216			
	69402			
14-108617	69185	2	LASB50043	010784318JJK

	69492			
14-108595	69189	1	LASB50108	010784312JJK
14-108590	69192	1	LASB50105	010784306JJK
14-108511	69193	1	LASB50041	010784291JJK
14-108597	69194	1	LASB50088	010784312JJK
14-108461	69217	1	LASB50014	010784284JJK
14-108572	69234	2	LASB50034	010784301JJK
	69430			
14-108628	69279	2	LASB50421	010784319JJK
	69428			
14-108608	69282	1	LASB50064	010784315JJK
14-108609	69313	2	LASB50103	010784315JJK
	69236			
14-108607	69493	1	LASB50081	010784315JJK
14-108630	69565	1	LASB50414	010784319JJK
14-108581	69691	2	LASB50058	010784303JJK
	69069			
14-108697	69285	1	LASB50416	010784321JJK

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
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Date: AUG 2 1 2014
Symbol: ENV-DO-14-0219
LAUR: 14-26308
Locates Action No.: N/A

Mr. John E. Kieling
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Dear Mr. Kieling:

Subject: Notification of Waste Characterization Discrepancy Regarding Application of EPA Hazardous Waste Number D001 to Nitrate-Salt-Bearing Waste Containers Shipped Off-Site From Los Alamos National Laboratory

The purpose of this letter is to notify the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) of a waste characterization discrepancy as required by the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit (Permit). Section 2.4.7, *Waste Characterization Review*, of the Permit states that the Permittees shall "…(4) Recharacterize a hazardous waste stream whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they obtained from the Permittees' Facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittees shall notify the Department in writing within three days of their receipt of the notice of the discrepancy from a receiving facility." This letter is provided in follow-up to an August 13, 2014, electronic mail from Mark Haagenstad, Los Alamos National Security, LLC (LANS), to John Kieling, NMED-HWB, on the same subject.

The Department of Energy (DOE) and LANS (the Permittees) shipped nitrate-salt-bearing waste containers to the Waste Isolation Pilot Plant (WIPP) between August 8, 2013, and January 29, 2014, in shipments associated with 49 separate manifests. Additional shipments of this waste stream were made to Waste Control Specialists (WCS) in Andrews, Texas, and the Idaho National Laboratory. A list of the LANL manifest numbers for the referenced WIPP shipments is provided in Enclosure 1.

Since that time, the LANL and WIPP Permittees have each made the decision to add the Environmental Protection Agency (EPA) Hazardous Waste Number D001 for ignitability to the LANL nitrate-salt-bearing waste containers at their respective facilities. As a result, the characterization of the containers WIPP received from LANL no longer matches the pre-approved waste analysis certifications that accompanied the waste manifests and shipping papers associated with the original off-site shipments.

Based on the DOE/LANS' written concurrence that WIPP may correct the 49 original manifests (Enclosure 1), the Permittees are hereby notifying the Department of the newly-identified discrepancy, in accordance with Permit Section 2.4.7(4). This letter constitutes notification with respect to the wastes associated with the 49 referenced manifests.

If you have comments or questions regarding this notification, please contact Gene E. Turner (DOE) at (505) 667-5794 or Mark P. Haagenstad (LANS) at (505) 665-2014.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:TAD/lm

Enclosure: August 13, 2014 LANL Concurrence Letter to WIPP

Cy: Ryan Flynn, NMED, Santa Fe, NM, (E-File)
Tom Blaine, NMED, Santa Fe, NM, (E-File)
Steve Pullen, NMED/HWB, Santa Fe, NM, (E-File)
Timothy Hall, NMED/HWB, Santa Fe, NM, (E-File)
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Lisa Cummings, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Eric L. Trujillo, NA-LA, (E-File)
Kirsten Laskey, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, (E-File)
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Daniel R. Cox, ADEP, (E-File)
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Cy (Continued):
Kenneth M. Hargis, LTP-PTS, (E-File)
Mark P. Haagenstad, ENV-CP, (E-File)
Luciana Vigil-Holterman, ENV-CP, (E-File)
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ENCLOSURE 1

August 13, 2014, LANL Concurrence Letter to WIPP

ENV-DO-14-0219

LAUR-14-26308

Date: AUG 2 1 2014

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Date: AUG 1 3 2014
Ref: ADESH-14-041

J. R. Stroble, Acting Assistant Manager
Office of Program Management
Carlsbad Field Office
U. S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Stroble,

Subject: Written Concurrence for Correction of Waste Manifests

The purpose of this letter is to follow up our recent conversation regarding a discrepancy on manifests for containers (see attachment) that were shipped from the Los Alamos National Laboratory (LANL) to the Waste Isolation Pilot Plant (WIPP). The containers were received at the WIPP facility between August 8, 2013, and January 29, 2014, in shipments associated with 49 separate manifests (see attachment). WIPP accepted the shipments for disposal, and the manifests were returned to LANL without any discrepancies identified. Due to recent events at WIPP, and re-evaluation of Acceptable Knowledge information, the Carlsbad Field Office (CBFO) notified LANL that there was a manifest discrepancy based on WIPP's determination that nitrate salt-bearing waste containers required application of the EPA Hazardous Waste Number D001 and DOT subsidiary Hazard Division 5.1. Further, CBFO requested concurrence from LANL that the manifests can be corrected pursuant to Section C-5b(1) of the WIPP Waste Analysis Plan (the WAP) which provides that errors on a manifest can be corrected by WIPP with a verbal (followed by a mandatory written) concurrence by the generator/storage site technical contact. This letter provides that written concurrence.

At the time LANL shipped the containers to WIPP, the manifests identified the hazardous waste numbers and hazard class determined to be appropriate at that time based on acceptable knowledge. Due to the recent events at WIPP, LANL has been re-evaluating the characterization of the waste stream. On July 30, 2014, the Department of Energy, National Nuclear Administration (DOE/NNSA) and Los Alamos National Security, LLC (LANS) notified the New Mexico Environment Department that LANL had decided to provisionally apply EPA Hazardous Waste

Number D001 for the characteristic of ignitability to certain nitrate salt-bearing waste containers stored at LANL.

We are continuing to re-evaluate the waste characterization information concerning these nitrate salt waste streams, and will keep you updated as to new relevant information. If you have questions please contact Michael Brandt (LANS) at (505) 667-4218, or Pete Maggiore (DOE) at (505) 665-5025.

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety, and Health
Los Alamos National Security, LLC

Peter Maggiore
Assistant Manager
Environmental Projects Office
Los Alamos Field Office

Enclosures: (1) List of Manifests Requiring Correction

Cy: Kimberly Davis Lebak, NA-LA, (E-File)
Lisa Cummings, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten M. Laskey, NA-LA, (E-File)
Eric L. Trujillo, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, (E-File)
Raeanna R. Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Jeffery D. Mousseau, ADEP, (E-File)
Daniel R. Cox, ADEP, (E-File)
Victoria A. George, REG-DO, (E-File)
Anthony R. Grieggs, ENV-CP, (E-File)
Deborah K. Woitte, LC-ESH, (E-File)
Debra Nevergold, LTP, (E-File)
Mark P. Haagenstad, ENV-CP, (E-File)
Luciana Vigil-Holterman, ENV-CP, (E-File)
lasomailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, (E-File)

ENCLOSURE 1

List of Manifests Requiring Correction

ADESH-14-041

Date: AUG 1 3 2014

List of applicable manifest numbers, shipment numbers, dates of receipt and container numbers from Waste Stream LA-MIN02-V.001				
Manifest Number	**Shipment Number**	**Received**	**Container Number**	**Container Count**
001600826GBF	IN130186	8-Sep-13	LA00000062547	1
001600826GBF	IN130186	8-Sep-13	LA00000063116	2
001600826GBF	IN130186	8-Sep-13	LA00000063198	3
001600826GBF	IN130186	8-Sep-13	LA00000063497	4
001600826GBF	IN130186	8-Sep-13	LA00000064665	5
001600826GBF	IN130186	8-Sep-13	LA00000064863	6
001600826GBF	IN130186	8-Sep-13	LAS822714	7
010784176JJK	LA130125	29-Aug-13	LA00000092217	8
010784176JJK	LA130125	29-Aug-13	LA00000092237	9
010784176JJK	LA130125	29-Aug-13	LA00000092347	10
010784176JJK	LA130125	29-Aug-13	LA00000092555	11
010784176JJK	LA130125	29-Aug-13	LA00000093588	12
010784176JJK	LA130125	29-Aug-13	LA00000093589	13
010784179JJK	LA130128	3-Sep-13	LA00000092220	14
010784180JJK	LA130129	4-Sep-13	LA00000092140	15
010784180JJK	LA130129	4-Sep-13	LA00000092219	16
010784180JJK	LA130129	4-Sep-13	LA00000092235	17
010784180JJK	LA130129	4-Sep-13	LA00000092495	18
010784180JJK	LA130129	4-Sep-13	LA00000093597	19
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010784183JJK	LA130132	9-Sep-13	LA00000064627	29
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010784183JJK	LA130132	9-Sep-13	LA00000092134	31
010784183JJK	LA130132	9-Sep-13	LA00000092145	32
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010784204JJK	LA130150	2-Oct-13	LA00000093581	88
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010784254JJK	LA140004	10-Jan-14	LA00000068343	292
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010784254JJK	LA140004	10-Jan-14	LA00000068345	294
010784254JJK	LA140004	10-Jan-14	LA00000068389	295
010784254JJK	LA140004	10-Jan-14	LA00000068390	296
010784254JJK	LA140004	10-Jan-14	LA00000068392	297
010784254JJK	LA140004	10-Jan-14	LA00000068397	298
010784254JJK	LA140004	10-Jan-14	LA00000068398	299
010784254JJK	LA140004	10-Jan-14	LA00000068400	300
010784254JJK	LA140004	10-Jan-14	LA00000068427	301
010784254JJK	LA140004	10-Jan-14	LA00000068435	302
010784254JJK	LA140004	10-Jan-14	LA00000068436	303
010784254JJK	LA140004	10-Jan-14	LA00000068547	304
010784254JJK	LA140004	10-Jan-14	LA00000068551	305
010784254JJK	LA140004	10-Jan-14	LA00000068552	306
010784254JJK	LA140004	10-Jan-14	LA00000068557	307
010784254JJK	LA140004	10-Jan-14	LA00000068606	308
010784254JJK	LA140004	10-Jan-14	LA00000068608	309
010784254JJK	LA140004	10-Jan-14	LA00000068651	310
010784259JJK	LA140009	15-Jan-14	LA00000068554	311
010784259JJK	LA140009	15-Jan-14	LA00000068615	312
010784259JJK	LA140009	15-Jan-14	LA00000068650	313
010784260JJK	LA140010	16-Jan-14	LA00000068494	314
010784260JJK	LA140010	16-Jan-14	LA00000068571	315
010784260JJK	LA140010	16-Jan-14	LA00000068614	316
010784260JJK	LA140010	16-Jan-14	LA00000068623	317
010784260JJK	LA140010	16-Jan-14	LA00000068635	318
010784260JJK	LA140010	16-Jan-14	LA00000068636	319
010784260JJK	LA140010	16-Jan-14	LA00000068652	320
010784260JJK	LA140010	16-Jan-14	LA00000068671	321
010784260JJK	LA140010	16-Jan-14	LA00000068672	322

010784261JJK	LA140011	17-Jan-14	LA00000068541	323
010784261JJK	LA140011	17-Jan-14	LA00000068545	324
010784261JJK	LA140011	17-Jan-14	LA00000068548	325
010784261JJK	LA140011	17-Jan-14	LA00000068576	326
010784261JJK	LA140011	17-Jan-14	LA00000068581	327
010784261JJK	LA140011	17-Jan-14	LA00000068605	328
010784261JJK	LA140011	17-Jan-14	LA00000068609	329
010784261JJK	LA140011	17-Jan-14	LA00000068626	330
010784261JJK	LA140011	17-Jan-14	LA00000068629	331
010784261JJK	LA140011	17-Jan-14	LA00000068653	332
010784261JJK	LA140011	17-Jan-14	LA00000068654	333
010784261JJK	LA140011	17-Jan-14	LA00000068655	334
010784261JJK	LA140011	17-Jan-14	LA00000068659	335
010784261JJK	LA140011	17-Jan-14	LA00000068666	336
010784263JJK	LA140013	22-Jan-14	LA00000068616	337
010784264JJK	LA140014	23-Jan-14	LA00000068394	338
010784264JJK	LA140014	23-Jan-14	LA00000068395	339
010784264JJK	LA140014	23-Jan-14	LA00000068422	340
010784264JJK	LA140014	23-Jan-14	LA00000068423	341
010784264JJK	LA140014	23-Jan-14	LA00000068424	342
010784264JJK	LA140014	23-Jan-14	LA00000068501	343
010784264JJK	LA140014	23-Jan-14	LA00000068510	344
010784264JJK	LA140014	23-Jan-14	LA00000068511	345
010784264JJK	LA140014	23-Jan-14	LA00000068512	346
010784264JJK	LA140014	23-Jan-14	LA00000068513	347
010784264JJK	LA140014	23-Jan-14	LA00000068573	348
010784264JJK	LA140014	23-Jan-14	LA00000068577	349
010784264JJK	LA140014	23-Jan-14	LA00000068578	350
010784264JJK	LA140014	23-Jan-14	LA00000068582	351
010784264JJK	LA140014	23-Jan-14	LA00000068618	352
010784264JJK	LA140014	23-Jan-14	LA00000068647	353
010784264JJK	LA140014	23-Jan-14	LA00000068669	354
010784264JJK	LA140014	23-Jan-14	LA00000068680	355
010784265JJK	LA140015	28-Jan-14	LA00000068328	356
010784265JJK	LA140015	28-Jan-14	LA00000068555	357
010784265JJK	LA140015	28-Jan-14	LA00000068649	358
010784266JJK	LA140016	29-Jan-14	LA00000068459	359
010784266JJK	LA140016	29-Jan-14	LA00000068667	360
010784266JJK	LA140016	29-Jan-14	LA00000068668	361
010784266JJK	LA140016	29-Jan-14	LA00000068687	362
010784266JJK	LA140016	29-Jan-14	LA00000094152	363

010784268JJK	LA140017	29-Jan-14	LA00000068333	364
010784268JJK	LA140017	29-Jan-14	LA00000068607	365
010784268JJK	LA140017	29-Jan-14	LA00000068630	366
010784268JJK	LA140017	29-Jan-14	LA00000068660	367
010784268JJK	LA140017	29-Jan-14	LA00000068670	368

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Date: SEP 0 3 2014
Symbol: ENV-DO-14-0238
LAUR: Not Applicable
Locates Action No.: Not Applicable

Mr. John E. Kieling
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Dear Mr. Kieling:

Subject: Notification of Waste Profile Discrepancy Regarding Nitrate-Salt-Bearing Waste Containers Shipped to Waste Control Specialists (WCS) From Los Alamos National Laboratory

The purpose of this letter is to notify the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) of a waste characterization discrepancy as required by the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit (Permit). The discrepancy is related to manifests for 119 nitrate-salt-bearing waste containers that were shipped by the Department of Energy and Los Alamos National Security, LLC (DOE/LANS) (the Permittees) to the Waste Control Specialists facility in Andrews, Texas. This letter is provided as a follow-up to the August 14, 2014, electronic mail from Mark Haagenstad, Los Alamos National Security, LLC (LANS), to John Kieling, NMED-HWB, on the same subject.

Since the 119 containers were shipped to WCS, WCS and the LANL Permittees have each made the decision to add the Environmental Protection Agency (EPA) Hazardous Waste Number D001 for ignitability to the LANL nitrate-salt-bearing waste containers at their respective facilities. As a result, the characterization of the containers WCS received from LANL no longer match the pre-approved waste analysis certifications that accompanied the waste manifests and shipping papers associated with the original off-site shipments.

Based on the DOE/LANS written concurrence allowing WCS to correct the original manifests, the Permittees are hereby notifying the Department of this discrepancy, in accordance with Permit Section 2.4.7(4) which states that the Permittees shall "Recharacterize a hazardous waste stream whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they

obtained from the Permittees' Facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittees shall notify the Department in writing within three days of their receipt of the notice of the discrepancy from a receiving facility."

This letter constitutes notification with respect to the wastes associated with the referenced manifests. While the list included with the concurrence letter (Enclosure 1) includes the manifests identified by WCS as discrepancies, the Permittees continue to work with WCS personnel to ensure that all potential discrepancies have been identified. Follow-up on the progress of these efforts may be required.

If you have comments or questions regarding this notification, please contact Gene E. Turner (DOE) at (505) 667-5794 or Mark P. Haagenstad (LANS) at (505) 665-2014.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:LVH/ms

Enclosure: August 14, 2014 LANL Concurrence Letter to Waste Control Specialists Facility

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Date: SEP 0 3 2014
Symbol: ENV-DO-14-0238
LAUR: Not Applicable
Locates Action No.: Not Applicable

RECEIVED
SEP 4 2014
NMED
Hazardous Waste Bureau

Mr. John E. Kieling
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Dear Mr. Kieling:

Subject: Notification of Waste Profile Discrepancy Regarding Nitrate-Salt-Bearing Waste Containers Shipped to Waste Control Specialists (WCS) From Los Alamos National Laboratory

The purpose of this letter is to notify the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) of a waste characterization discrepancy as required by the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit (Permit). The discrepancy is related to manifests for 119 nitrate-salt-bearing waste containers that were shipped by the Department of Energy and Los Alamos National Security, LLC (DOE/LANS) (the Permittees) to the Waste Control Specialists facility in Andrews, Texas. This letter is provided as a follow-up to the August 14, 2014, electronic mail from Mark Haagenstad, Los Alamos National Security, LLC (LANS), to John Kieling, NMED-HWB, on the same subject.

Since the 119 containers were shipped to WCS, WCS and the LANL Permittees have each made the decision to add the Environmental Protection Agency (EPA) Hazardous Waste Number D001 for ignitability to the LANL nitrate-salt-bearing waste containers at their respective facilities. As a result, the characterization of the containers WCS received from LANL no longer match the pre-approved waste analysis certifications that accompanied the waste manifests and shipping papers associated with the original off-site shipments.

Based on the DOE/LANS written concurrence allowing WCS to correct the original manifests, the Permittees are hereby notifying the Department of this discrepancy, in accordance with Permit Section 2.4.7(4) which states that the Permittees shall "Recharacterize a hazardous waste stream whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they

ENCLOSURE 1

August 14, 2014 LANL Concurrence Letter to Waste Control Specialists Facility

ENV-DO-14-0238

Date: SEP 0 3 2014

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Date: AUG 1 4 2014
Ref: ADESH-14-042

Ryan Williams
Vice President of Integrated Services
Waste Control Specialists LLC
Three Lincoln Centre
5430 LBJ Freeway, Ste. 1700
Dallas, Texas 75240

Dear Mr. Williams,

Subject: Written Concurrence for Correction of Waste Manifests for Waste Shipped to Waste Control Specialists Facility

The purpose of this letter is to follow up on our recent conversation regarding a discrepancy on manifests for containers (see attachment) that were shipped from the Los Alamos National Laboratory (LANL) to the Waste Control Specialists (WCS) facility in Andrews, Texas. The referenced containers were accepted by WCS for storage, and the manifests were returned to LANL without any discrepancies identified. At the time LANL shipped the containers to WCS, the manifests identified the hazardous waste numbers determined to be appropriate based on acceptable knowledge. Due to the recent events at WIPP, LANL has been re-evaluating the characterization of the waste stream. As we have discussed, it was determined, based on a review of Acceptable Knowledge information, that it would be prudent to conservatively add hazardous waste number (HWN) D001 for the 119 containers on the attached list. It is our understanding that WCS is required to amend the manifests associated with those containers. This letter provides LANL's concurrence with that decision.

We are continuing to re-evaluate the waste characterization information concerning these nitrate salt waste streams, and will keep you updated as to new relevant information. If you have questions please contact Michael Brandt (LANS) at (505) 667-4218, or Pete Maggiore (DOE) at (505) 665-5025.

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety, and Health
Los Alamos National Security, LLC

Peter Maggiore
Assistant Manager
Environmental Projects Office
Los Alamos Field Office

Enclosures: (1) List of Manifests Requiring Correction

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Lisa Cummings, NA-LA, (E-File)
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Eric L. Trujillo, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, (E-File)
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Jeffery D. Mousseau, ADEP, (E-File)
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ENCLOSURE 1

List of Manifests Requiring Correction

ADESH-14-042

Date: AUG 1 4 2014

WCS Package ID (SWB)	INNERCONTAINER ID	Total MIN02	NWP ID (SWB)	Manifest #
14-108472	68509	3	LASB50018	010784286JJK
	69087			
	69188			
14-108474	68342	3	LASB50019	010784286JJK
	69103			
	68584			
14-108493	69077	2	LASB50032	010784288JJK
	69195			
14-108527	68643	4	SB10174	010784296JJK
	S870129			
	S841295			
	S824056			
14-108583	68350	1	LASB50067	010784305JJK
14-108424	68426	1	LASB02166	010784277JJK
14-108615	68428	1	LASB50028	010784317JJK
14-108495	68543	1	LASB50031	010784288JJK
14-108549	68546	1	LASB50083	010784299JJK
14-108585	68627	1	LASB50059	010784305JJK
14-108440	68656	1	LASB02206	010784279JJK
14-108500	68676	1	LASB50005	010784289JJK
14-108546	69064	1	LASB50089	010784299JJK
14-108532	69067	1	LASB50015	010784296JJK
14-108486	69085	1	LASB50021	010784287JJK
14-108578	69154	1	LASB50061	010784303JJK
14-108457	69209	1	LASB50010	010784285JJK
14-108524	69295	1	LASB50040	010784294JJK
14-108613	93953	1	LASB50060	010784317JJK
14-108631	63130	1	LASB50410	010784319JJK
14-108589	68311	1	LASB50086	010784306JJK
14-108548	68314	2	LASB50012	010784299JJK
	69068			
14-108442	68315	2	LASB02204	010784279JJK
	S832485			
14-108547	68325	3	LASB50045	010784299JJK
	69422			
	69105			
14-108470	68341	2	LASB50020	010784286JJK
	69187			
14-108484	68347	2	LASB50026	010784287JJK
	93935			
14-108558	68425	1	LASB50036	010784300JJK
14-108465	68429	2	LASB50017	010784284JJK
	68433			
14-108518	68431	2	LASB50048	010784292JJK
	69102			
14-108491	68432	3	LASB50037	010784288JJK
	69182			
	68583			
14-108606	68449	1	LASB50072	010784315JJK

14-108551	68508	1	LASB50094	010784298JJK
14-108505	68580	2	LASB50025	010784290JJK
	69179			
14-108559	68617	3	LASB50039	010784300JJK
	69177			
	69043			
14-108603	68619	1	LASB50079	010784314JJK
14-108498	68620	2	LASB50002	010784289JJK
	69191			
14-108463	68625	2	LASB50013	010784284JJK
	68632			
14-108550	68628	2	LASB50082	010784298JJK
	69210			
14-108515	68661	2	LASB50046	010784291JJK
	69196			
14-108587	68679	3	LASB50102	010784305JJK
	69233			
	69180			
14-108579	68686	3	LASB50062	010784303JJK
	69091			
	69073			
14-108556	69014	1	LASB50095	010784300JJK
14-108534	69033	2	LASB50063	010784297JJK
	69097			
14-108513	69034	1	LASB50027	010784291JJK
14-108574	69041	2	LASB50104	010784304JJK
	69226			
14-108554	69045	1	LASB50071	010784298JJK
14-108582	69060	3	LASB50100	010784303JJK
	69413			
	69080			
14-108522	69061	2	LASB50035	010784294JJK
	69161			
14-108599	69063	1	LASB50107	010784313JJK
14-108538	69066	2	LASB50033	010784297JJK
	69181			
14-108619	69074	2	LASB50087	010784318JJK
	69212			
14-108566	69081	1	LASB50052	010784302JJK
14-108571	69083	1	LASB50098	010784301JJK
14-108634	69094	2	LASB50424	010784322JJK
	69555			
14-108629	69099	2	LASB50432	010784319JJK
	S802985			
14-108570	69158	1	LASB50055	010784301JJK
14-108601	69159	1	LASB50074	010784313JJK
14-108529	69162	2	LASB50066	010784296JJK
	69237			
14-108577	69163	3	LASB50057	010784303JJK
	69216			
	69402			
14-108617	69185	2	LASB50043	010784318JJK

	69492			
14-108595	69189	1	LASB50108	010784312JJK
14-108590	69192	1	LASB50105	010784306JJK
14-108511	69193	1	LASB50041	010784291JJK
14-108597	69194	1	LASB50088	010784312JJK
14-108461	69217	1	LASB50014	010784284JJK
14-108572	69234	2	LASB50034	010784301JJK
	69430			
14-108628	69279	2	LASB50421	010784319JJK
	69428			
14-108608	69282	1	LASB50064	010784315JJK
14-108609	69313	2	LASB50103	010784315JJK
	69236			
14-108607	69493	1	LASB50081	010784315JJK
14-108630	69565	1	LASB50414	010784319JJK
14-108581	69691	2	LASB50058	010784303JJK
	69069			
14-108697	69285	1	LASB50416	010784321JJK

Attachment 3

LA-UR-14-23807
May 29, 2014

Summary of Evaluation and Identification of LANL Nitrate Salt Containers

Los Alamos
NATIONAL LABORATORY
EST. 1943

Prepared by the Environmental Programs Directorate

Los Alamos National Laboratory (LANL), operated by Los Alamos National Security (LANS), LLC, for the U.S. Department of Energy under Contract No. DE-AC52-06NA25396, has prepared this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

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BACKGROUND

Los Alamos National Laboratory (LANL) staff along with the Planning and Technical Solutions (PTS) team within the LANL TRU Waste Program (LTP) evaluated generator data to identify unconsolidated nitrate salts in the aboveground transuranic (TRU) waste container population. The evaluation was conducted from January to May 2012 to identify Technical Area 55 (TA-55) TRU waste containers that were consistent with the Central Characterization Project (CCP) Nonconformance Report (NCR) (NCR-LANL-0509-09) issued for drums with uncemented nitrate salts that originated from the TA-55 evaporator operations. Forty-eight (48) containers were identified in the NCR that may have required a waste stream reassignment consistent with homogeneous solids.

In addition, in May 2012, the LANL Carlsbad Office Difficult Waste Team authored a white paper (Amount of Zeolite Required to Meet the Constraints Established by the EMRTC Report RF 10-13: Application to LANL Evaporator Nitrate Salts, May 08, 2012) that established the remediation requirements for the Waste Isolation Pilot Plant (WIPP) to affirm that the final mixture of LANL nitrate salts meets WIPP acceptance criteria. The nitrate salt evaluation was conducted to identify the population of active aboveground containers that required management as unconsolidated nitrate salts in accordance with the newly identified requirements. Containers that had been, dispositioned, or belowground were considered beyond the scope of the evaluation.

EVALUATION METHODS

- Extracted all containers with LANL generator Waste Codes A25 (Leached Process Residues), A26 (Evaporator Bottom/Salts), A27 (Nitrate Salts), and A28 (Chloride Salts) that had originated from TA-55. These waste codes had been in use since 1971.
- Initially identified 2,568 containers across all solution packages and waste streams.
- Containers with generator Waste Code A28 were eliminated after initial review indicated all containers with A28 Waste Code were indeed from TA-55 chloride operations and not nitrate operations.
- Dates of generation of interest were from 1979 to 1991 because these dates spanned the period between the start-up of TA-55 nitrate evaporator operations in 1979 and full implementation of new evaporator and cement fixation operations in 1991. The latter eliminated the generation of unconsolidated nitrate salt wastes but allowed the generation of individual cemented cans on a case-by-case basis.
- The mid-1980s represent a time period when unconsolidated and cemented nitrate salts were generated concurrently, but the same generator Waste Codes were applied.
- Over 1,700 active aboveground containers were evaluated for the presence of unconsolidated nitrate salt in bags with attached generator Waste Codes of A25, A26, and A27.
- Reviewed and summarized TA-55 nitrate operational procedures to establish criteria for presence of unconsolidated nitrate salts.
- Identified processes that generated nitrate salts and eliminated those that did not, such as chloride salt operations.
- Examined waste generator records including discardable waste forms and logs that contained itemized descriptions of waste items that were not part of radioactive solid waste disposal forms and database comment fields.

- Discussed nitrate solution evaporation and cement fixation processes with TA-55 personnel (some since retired) to confirm timing of cementation process changes.

RESULTS OF INITIAL NITRATE SALT EVALUATION JUNE 2012

- Identified two hundred and sixty-five (265) nitrate salt or suspect original parent containers based on review of generator data. These had been independently assigned by CCP personnel to TA-55 waste streams LA-MHD01.001 and LA-CIN01.001-Cans (Table 1).
- All other containers in TA-55 waste streams LA-MHD01.001 and LA-CIN01.001-Cans not listed in Table 1 were considered to contain other waste forms, such as debris or cemented materials, and not nitrate or suspect nitrate salts.
- No nitrate or suspect nitrate salt containers were identified in TA-55 homogeneous waste streams (e.g., LA-MIN02-V.001 or LA-MIN04-S.001 or from other TAs).
- Assigned the following salt types to active TRU waste containers:
    - ***Nitrate*** salt, based on generator records that indicated unconsolidated nitrate salt or process room number or glovebox number associated with nitrate operations evaporator or waste management operations, because not all of the legacy records included waste or process descriptions.
    - ***Suspect*** nitrate salt, based on generator records that indicated nitrate salt or process room number or glovebox number, but the container was assigned to a cemented waste stream and additional information was thought necessary for proper assignment (e.g., real-time radiography [RTR] or evidence of cementation such as presence of cans during remediation or visual examination).
    - ***Miscellaneous***, based on generator records that indicated homogeneous solids were generated from operations other than TA-55 nitrate operations.
- Established Salt Type as data field in Container Management tracking spreadsheet.
- Containers that did not explicitly receive salt type designations were assigned *Not Applicable* because they are not nitrate salts.

No TA-21 (TA-55 predecessor facility) nitrate salts were identified because the TA-21 nitrate solutions were cemented.

Table 1
Summary of Initial Nitrate Salt Assignments to Original, Parent, TRU Waste Containers

Salt Type and Waste Stream	Count of Containers
Nitrate	**189**
LA-CIN01.001-Cans	**25**
SP 36	7
SP 37	18
LA-MHD01.001	**164**
SP 72	163
SP 78	1

Suspect	**76**
LA-CIN01.001-Cans	**76**
SP 36	1
SP 57	44
SP 72	31
Grand Total	**265**

PROGRESSION OF NITRATE SALT CONTAINERS FROM AUGUST 2012 TO APRIL 2014

As of May 2012, 376 containers existed because thirty-three (33) parent drums had been processed through the Waste Characterization, Reduction and Repackaging Facility (WCRFF) that resulted in a moderate population of active remediation daughters. Table 2 summarizes the population of nitrate and suspect nitrate salt containers as of July 31, 2012, and includes the Solution Package (SP) assignments. This date captures the assignment of salt types after the initial evaluation, but before additional nitrate salt drum processing had occurred.

Remediated daughter containers, created as part of the waste sorting and repackaging operations at WCRRF, were initially assigned to the homogeneous waste stream LA-MIN04-S.001.

Table 2
Summary of Nitrate and Suspect Nitrate Salt Containers, Including Waste Stream and Solution Package Codes (Data as of July 31, 2012)

Salt Type, Waste Stream, and Container Type	Count of Containers
Nitrate	**300**
Original	**156**
LA-CIN01.001-Cans	25
SP 36	7
SP 37	18
LA-MHD01.001	131
SP 72	130
SP 78	1
Remediation Daughter	**144**
LA-MHD01.001	128
SP 72	128
LA-MIN04-S.001	16
SP 72	16
Suspect	**76**
Original	**76**
LA-CIN01.001-Cans	76
SP 36	1
SP 57	44
SP 72	31
Grand Total	**376**

The nitrate salt container remediation process, including waste sorting, neutralization, and absorption of liquids according to the revised requirements, started in October 2012 and continued through March 2014 at WCRFF. Table 3 summarizes the population of nitrate and suspect nitrate salt containers as of May 8, 2014. This date captures the progression of the two hundred and sixty-five (265) initially identified nitrate and suspect nitrate salt drums through remediation and disposition operations largely conducted as part of the 3,706 Waste Campaign. Table 3 includes containers identified as "*Original*" that were not remediated as part of the 3,706 Waste Campaign and retained their original inner package configurations, as received from the TA-55 generator. These original containers were staged at LANL and had not yet been remediated at WCRRF, but may have been placed in compliant overpacks such as an 85-gal. drum or a standard waste box.

Table 3
Summary of Nitrate and Suspect Nitrate Salt Containers, Including Container Types and Waste Streams (Data as of May 8, 2014)

Salt Type, Waste Stream and Container Type	Count of Containers
Nitrate	**549**
LA-CIN01.001-Cans	**26**
Original in overpack	1
Original	24
Remediation Daughter	1
LA-MHD01.001	**84**
Remediation Daughter	84
LA-MIN02-V.001	**436**
Remediation Daughter	436
LA-MIN04-S.001	**3**
Remediation Daughter	3
Suspect	**154**
LA-CIN01.001-Cans	**89**
Original	7
Remediation Daughter	82
LA-MHD01.001	**4**
Remediation Daughter	4
LA-MIN02-V.001	**61**
Original in overpack	3
Remediation Daughter	58
Grand Total	**703**

As a result of radiological release at WIPP, a subsequent review of the 2012 nitrate salt evaluation was performed. This review of containers with nitrate, suspect nitrate salt, or miscellaneous salt types included review of remediation records and RTR data reports and videos. This review resulted in the identification of two (2) original containers (S855943 and S824181) that were not assigned as unconsolidated nitrate salts in July 2012. The assignment of nitrate salt type to the two (2) parent containers results in the assignment of nitrate salt type to four (4) remediation daughters. These four (4) containers were remediated and managed as nitrate salts. Table 4 summarizes the population of nitrate and suspect nitrate containers as of May 21, 2014, and their locations. This date captures the progression of the 265 originally identified nitrate and suspect nitrate salt drums in 2012, the expansion of the population through creation of remediation daughter, and their disposition, including the two (2) newly identified parents and their daughters. Table 4 summarizes the population of nitrate and suspect nitrate salt containers by waste stream and location, as of May 21, 2014.

The creation of remediation daughter drums during waste sorting, neutralization, absorption of liquids, and repackaging resulted in the redistribution of wastes from the parent to the daughters and subsequent reassignment of waste stream designations. For example, the parent container may have been assigned

to waste stream LA-MHD-01.001, a remediation daughter that contained more than 50% by volume homogeneous solids, and was reassigned to MIN02-V.001 by CCP. The majority of nitrate salt remediation daughters were reassigned to homogeneous solid waste stream LA-MIN02-V.001, including the four (4) remediation daughters discussed in the previous paragraph. A few were assigned to the homogeneous LA-MIN04-S.001 waste stream if they appeared to contain little nitrate salt material. Some remediation daughters may have retained the LA-MHD-01.001 or LA-CIN01.001 waste stream assignment if they contained more than 50% debris by volume or if the waste appeared to be cemented, respectively.

Table 4
Summary of Nitrate and Suspect Nitrate Salt Containers,
Including Waste Streams, Container Types and Locations (Data as of May 21, 2014)

Location	Container Type	Salt Type	Waste Stream	Count of Containers
LANL	**Original**	Nitrate	LA-CIN01.001-Cans	24
		Suspect	LA-CIN01.001-Cans	1
	Remediation Daughter	Nitrate	LA-MHD01.001	9
			LA-MIN02-V.001	21
		Suspect	LA-CIN01.001-Cans	1
			LA-MHD01.001	2
			LA-MIN02-V.001	24
	Original in overpack	Nitrate	LA-CIN01.001-Cans	1
		Suspect	LA-MIN02-V.001	3
LANL Total				**86**
WCS	**Original**	Suspect	LA-CIN01.001-Cans	1
	Remediation Daughter	Nitrate	LA-CIN01.001-Cans	1
			LA-MHD01.001	2
			LA-MIN02-V.001	100
		Suspect	LA-CIN01.001-Cans	2
			LA-MIN02-V.001	7
WCS Total				**113**
WIPP	**Original**	Suspect	LA-CIN01.001-Cans	5
	Remediation Daughter	Nitrate	LA-MHD01.001	73
			LA-MIN02-V.001	270
			LA-MIN04-S.001	3
		Suspect	LA-CIN01.001-Cans	79
			LA-MHD01.001	2
			LA-MIN02-V.001	21
WIPP Total				**453**
WIPP Panel 7	**Remediation Daughter**	Nitrate	LA-MIN02-V.001	49
		Suspect	LA-MIN02-V.001	6
WIPP Panel 7 Total				55
Total				**707**

DISCUSSION OF IDENTIFICATION OF NITRATE SALT CONTAINERS

This report summarizes the evaluations conducted to identify nitrate and suspect salts in the aboveground TRU inventory. The evaluation started in January 2012 with the identification of forty-eight (48) containers in NCR-LANL-0509-09. The evaluation focused on Waste Codes A25, A26, A27 and A28 that were a required part of the generator documentation. Containers that had been dispositioned or were belowground were not included in the evaluation. The initial evaluation in 2012 identified two hundred and sixty-five (265) nitrate salt or suspect nitrate salt original parent containers based on review of generator data. Forty (40) of the containers in the NCR were confirmed to be unconsolidated nitrate salts. The eight (8) other containers were identified as other salt or waste types. Two (2) additional nitrate salt containers were recently identified that brought the count of original parent containers to two hundred and sixty-seven (267). The processes of waste sorting, neutralization, absorption of liquids, and waste repackaging created remediation daughters that expanded the population nitrate or suspected nitrate salts to seven hundred and seven (707) containers, as summarized in Table 4.

The nitrate salt evaluation focused on the generation processes that created the nitrate salt wastes from TA-55 nitrate operations. The population of nitrate and suspect nitrate salt waste containers were identified and tracked through remediation, characterization, and disposition. The waste stream assignments were independently determined by CCP and were not considered an essential part of the assignment of nitrate or suspect nitrate salt type to specific containers. Thus, nitrate and suspect nitrate salt wastes were initially identified to exist in both LA-MHD01.001 and LA-CIN01.001-Cans waste streams. The salt type Suspect was assigned to containers in waste stream LA-CIN01.001-Cans until other independent evidence, such as visual examination or RTR, was obtained. This was not generally available in 2012 but was available and used in the May 2014 review of these containers. As described, all of the other containers in TA-55 waste streams LA-MHD01.001 and LA-CIN01.001-Cans were considered to contain other waste forms, such as debris or cemented materials, and were not, and are not, considered to contain unconsolidated nitrate or suspect nitrate salts. The WCRRF remediation technicians noted that some of the bags of salts appeared to be physically cemented. These were apparently retained in the LA-CIN01.001 waste stream.

The rest of the TRU waste inventory at TA-54 Area G that was not part of the focused evaluation was determined not to contain unconsolidated nitrate salts. Table 5 summarizes all TA-55 waste generated before 1991 that do not contain unconsolidated nitrate salts. The year 1991 represents full implementation of the new TA-55 nitrate solution evaporator and cement fixation operations that completely eliminated the generation of unconsolidated nitrate salt wastes. The Cemented and Miscellaneous salt (e.g., chlorides and other salt residues) waste streams are benign based on their chemical and physical characteristics. The remaining combustible and noncombustible trash, equipment, scrap metal, glass, plastic, and absorbed liquids do not contain any salt residues and are considered safe for storage based on current packaging configurations.

Table 5
Summary of other Homogeneous Solid and Debris TRU Wastes Generated at TA-55 Prior to 1991 That Do Not Contain Unconsolidated Nitrate Salts (Data as of May 28, 2014)

Waste Stream	Bldg Code	Waste Stream Description	Count of Containers
LA-CIN01.001	TA-55	Cemented	431
		Miscellaneous	81
LA-MHD01.001	TA-55	Cemented	1
		Miscellaneous	10
		Combustible Decontamination Waste	3
		Scrap Metal	16
		Other Combustibles	19
		Combustible Lab trash	12
		Non-Combustible Lab Trash	18
		Non-Property Numbered Equip.	1
		Property Number Equip.	3
		Non-Combustible Filter Media	3
		Glass	3
		Plastics	2
		Combustible Trash	1
LA-MIN02-V.001	TA-55	Silicon Base Oil on Vermiculite	1
LA-MIN04-S.001	TA-55	Miscellaneous	1
Total			**606**

ATTACHMENTS

Attachment 1 Summary of Legacy Nitrate Salt Timeline from 2012 Evaluation

Activities	**1984** - (7/6/84 Approval Date) MST-12 Procedure – Procedure: 485-REC-R00 Treatment of Evaporator "Bottoms"	**1987** - (2/18/87 Approval Date) MST-12 Standard Operating Procedure – Procedure: 485-REC-R01 Treatment of Evaporator Bottoms	**1989** - (2/9/89 Approval Date) MST-12 Standard Operating Procedure – Procedure: 485-REC-R02 Treatment of Evaporator Bottoms	**1991** - 9/22/91 (Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R01 Computer Operated Nitric Acid Volume Reduction and Treatment of Evaporator Bottoms	**1995** - (8/31/95 Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R03 Computer Operated Nitric Acid Volume Reduction and Treatment of Evaporator Bottoms	**1996** - (11/20/96 Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R04 Nitric Acid Process Evaporator	**1997** - (9/9/97 Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R05 Nitric Acid Process **Evaporator (EV)**	**2002** - (4/23/2002 Approval Date) NMT-2 Work Instruction – Procedure: NMT2-WI-002-REC-485 Nitric Acid Process Evaporator (Supersedes procedure NMT2-SOP-REC-485-R06)
	No Location Specified in the Procedure	**Location:**	**Location:**	**Location: (Computer Operated Evaporators)**	**Location: (Computer Operated Evaporators)**	**No Location Specified in the Procedure**	**No Location Specified in the Procedure**	**Location:**
Salts vacuum dried	Salts are vacuum dried	Salts are vacuum dried for at least 15 minutes						
Salts packaged in double bags	Salts are packaged in double bags	Salts are place in plastic bags/taped (salt is bagged as soon as it looks dry enough)						
Salts bagged out for disposal	Salts are placed in a 55-gal drum	Salts are discarded and bagged out	Salts are bagged out or given additional washing if not discardable					
Salts transferred to cement fixation (CF)				Salts are redissolved and added to the bottoms and filtered; otherwise, are transferred to CF in 5-L ss cans. Bottoms are transferred to CF	Filtrates and salts are transferred to CF if they meet discard limit per PFD	Bottoms is sent to CF; otherwise, to IX if above discard limit	Filtrate is sent to CF per PFD	Residue and salt are removed from the EV and sent to CF if it meets the discard limit; otherwise, to ion exchange

Activities	**1984** - (7/6/84 Approval Date) MST-12 Procedure – Procedure: 485-REC-R00 Treatment of Evaporator "Bottoms"	**1987** - (2/18/87 Approval Date) MST-12 Standard Operating Procedure – Procedure: 485-REC-R01 Treatment of Evaporator Bottoms	**1989** - (2/9/89 Approval Date) MST-12 Standard Operating Procedure – Procedure: 485-REC-R02 Treatment of Evaporator Bottoms	**1991** - 9/22/91 (Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R01 Computer Operated Nitric Acid Volume Reduction and Treatment of Evaporator Bottoms	**1995** - (8/31/95 Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R03 Computer Operated Nitric Acid Volume Reduction and Treatment of Evaporator Bottoms	**1996** - (11/20/96 Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R04 Nitric Acid Process Evaporator	**1997** - (9/9/97 Approval Date) NMT-2 Safe Operating Procedure – Procedure: 485-REC-R05 Nitric Acid Process **Evaporator (EV)**	**2002** - (4/23/2002 Approval Date) NMT-2 Work Instruction – Procedure: NMT2-WI-002-REC-485 Nitric Acid Process Evaporator (Supersedes procedure NMT2-SOP-REC-485-R06)
	No Location Specified in the Procedure	**Location:**	**Location:**	**Location: (Computer Operated Evaporators)**	**Location: (Computer Operated Evaporators)**	**No Location Specified in the Procedure**	**No Location Specified in the Procedure**	**Location:**
Solution (supernatant transferred to CF)	Supenatant solution is tranferred to CF if it contains the ff: Pu-242 and Uranium	Reduced solution goes to CF (Solutions are transferred to CF)	Bottoms are filtered and the solutions goes to CF	Distillate is transferred to TA-50		Distillate is transferred to TA-50 per PFD	Distillates to TA-50 if they meet discard limit per PFD	Distillate is transferred to TA-50 if it meets the discard limit; otherwise, it is redistilled
	Filteraid was used to absorb any moisture	If salts are not discardable, they are washed with 7 M HNO3		Bottoms are filtered and sent back to ion ex. for reprocessing if discard limit is exceeded	Distillate is transferred to TA-50; otherwise, transferred it's reprocessed through EV	Bottoms are filtered and salts remain in the filter is washed with water		Bottoms are filtered and washed with water to further dissolve and send to CF or ion ex. for reprocessing per PFD
	Supernatant solution containing no salts or Pu is recycled/ reprocessed	Chemicals use: 15.9 M HNO3	Solution goes back to ion ex. for reprocessing	Salt is transferred to CF if it meets the discard limit and bagged out per PFD				
	Drums have lead lined and poly liner							

Attachment 2 Itemized List of 265 Original, Nitrate, and Suspect Nitrate Containers

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S793450	S793450	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S793724	S793724	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S794448	S794448	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S801676	S801676	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S802641	S802641	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S802701	S802701	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S802739	S802739	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S802833	S802833	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S802853	S802853	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S802959	S802959	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S803078	S803078	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S803613	S803613	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S804948	S804948	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S804989	S804989	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S804995	S804995	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S805051	S805051	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S805289	S805289	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S811613	S811613	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S811692	S811692	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S811734	S811734	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S811812	S811812	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S811834	S811834	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S811872	S811872	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S813223	S813223	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S813385	S813385	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S813389	S813389	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S813471	S813471	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S813475	S813475	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S813545	S813545	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S813562	S813562	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S813601	S813601	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S813620	S813620	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S813676	S813676	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S814859	S814859	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S815176	S815176	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816304	S816304	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816305	S816305	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S816342	S816342	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816357	S816357	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816374	S816374	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816394	S816394	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816434	S816434	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S816440	S816440	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816469	S816469	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816664	S816664	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816667	S816667	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816692	S816692	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S816768	S816768	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S816773	S816773	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816810	S816810	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S816828	S816828	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816837	S816837	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S816890	S816890	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S816900	S816900	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S816915	S816915	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S818255	S818255	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S818354	S818354	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S818370	S818370	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S818382	S818382	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S818412	S818412	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S818435	S818435	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S818449	S818449	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S821203	S821203	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S822541	S822541	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S822542	S822542	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S822599	S822599	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S822679	S822679	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S822713	S822713	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S822838	S822838	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S822844	S822844	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S822876	S822876	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S822952	S822952	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823004	S823004	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823016	S823016	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S823124	S823124	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S823125	S823125	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S823126	S823126	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S823127	S823127	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S823153	S823153	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S823166	S823166	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823184	S823184	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S823187	S823187	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823194	S823194	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823221	S823221	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823229	S823229	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S823276	S823276	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824184	S824184	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824187	S824187	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824188	S824188	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824208	S824208	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824468	S824468	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S824508	S824508	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824541	S824541	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824551	S824551	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824660	S824660	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S824967	S824967	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S825020	S825020	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S825021	S825021	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S825639	S825639	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S825664	S825664	Nitrate	LA-MHD01.001	Original	78	7/31/2012
S825730	S825730	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S825810	S825810	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S825878	S825878	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S825879	S825879	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S825902	S825902	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832040	S832040	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832140	S832140	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832141	S832141	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832143	S832143	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832144	S832144	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832145	S832145	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832146	S832146	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S832147	S832147	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832148	S832148	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832149	S832149	Nitrate	LA-MHD01.001	Original	72	7/31/2012

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S832150	S832150	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832155	S832155	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832156	S832156	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832241	S832241	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832320	S832320	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832340	S832340	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832448	S832448	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832464	S832464	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S832499	S832499	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S833037	S833037	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S833261	S833261	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S833409	S833409	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S833481	S833481	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S833846	S833846	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S833937	S833937	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S834406	S834406	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S834539	S834539	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S834633	S834633	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S835283	S835283	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S835372	S835372	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S835376	S835376	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S841239	S841239	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S841240	S841240	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S841251	S841251	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S841292	S841292	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S841314	S841314	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S841320	S841320	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S841627	S841627	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S842181	S842181	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S842213	S842213	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S842234	S842234	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S842446	S842446	Suspect	LA-CIN01.001-Cans	Original	36	7/31/2012
S842463	S842463	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S842526	S842526	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S842528	S842528	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S843528	S843528	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S843593	S843593	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S843594	S843594	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S843672	S843672	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S843673	S843673	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S843962	S843962	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S844213	S844213	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S844215	S844215	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S844253	S844253	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S844573	S844573	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S844602	S844602	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S844684	S844684	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S844689	S844689	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S845031	S845031	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S845072	S845072	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S845104	S845104	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S845201	S845201	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846088	S846088	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846096	S846096	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846107	S846107	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846132	S846132	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S845338	S845338	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846037	S846037	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846055	S846055	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S846168	S846168	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846172	S846172	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846195	S846195	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S846660	S846660	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851415	S851415	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S851416	S851416	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S851418	S851418	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S851426	S851426	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851432	S851432	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851436	S851436	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851506	S851506	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851682	S851682	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851739	S851739	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851752	S851752	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851764	S851764	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851772	S851772	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S851852	S851852	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S852513	S852513	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852530	S852530	Nitrate	LA-MHD01.001	Original	72	7/31/2012

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S852588	S852588	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S852590	S852590	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852592	S852592	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852593	S852593	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852883	S852883	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852895	S852895	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852923	S852923	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852931	S852931	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S852952	S852952	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S853006	S853006	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853279	S853279	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853326	S853326	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853482	S853482	Suspect	LA-CIN01.001-Cans	Original	57	7/31/2012
S853492	S853492	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853641	S853641	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853714	S853714	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S853771	S853771	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853898	S853898	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S853899	S853899	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S854616	S854616	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855126	S855126	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855139	S855139	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855216	S855216	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855240	S855240	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855290	S855290	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855566	S855566	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S855677	S855677	Suspect	LA-CIN01.001-Cans	Original	72	7/31/2012
S855793	S855793	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S860014	S860014	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S860093	S860093	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S860095	S860095	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S860096	S860096	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S861975	S861975	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S861976	S861976	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S861980	S861980	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S861995	S861995	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S862241	S862241	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S862255	S862255	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S862411	S862411	Nitrate	LA-MHD01.001	Original	72	7/31/2012

Original Container ID	PKG_ID	Salt Type	Waste Stream	Type	Code	Dataset Date
S862888	S862888	Nitrate	LA-CIN01.001-Cans	Original	37	7/31/2012
S863696	S863696	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S863787	S863787	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S863788	S863788	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S863789	S863789	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S864213	S864213	Nitrate	LA-CIN01.001-Cans	Original	36	7/31/2012
S864662	S864662	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S864663	S864663	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S864694	S864694	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S870065	S870065	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S870213	S870213	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S870338	S870338	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S870381	S870381	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S870475	S870475	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S870478	S870478	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S871844	S871844	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S873554	S873554	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S881562	S881562	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S881563	S881563	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S881569	S881569	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S881570	S881570	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S881607	S881607	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S881608	S881608	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S883130	S883130	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S891279	S891279	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S891387	S891387	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S891513	S891513	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S892963	S892963	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S900215	S900215	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S901114	S901114	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S910170	S910170	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S910171	S910171	Nitrate	LA-MHD01.001	Original	72	7/31/2012
S910172	S910172	Nitrate	LA-MHD01.001	Original	72	7/31/2012

Attachment 4



Photo 1

LA-UR-14-23805

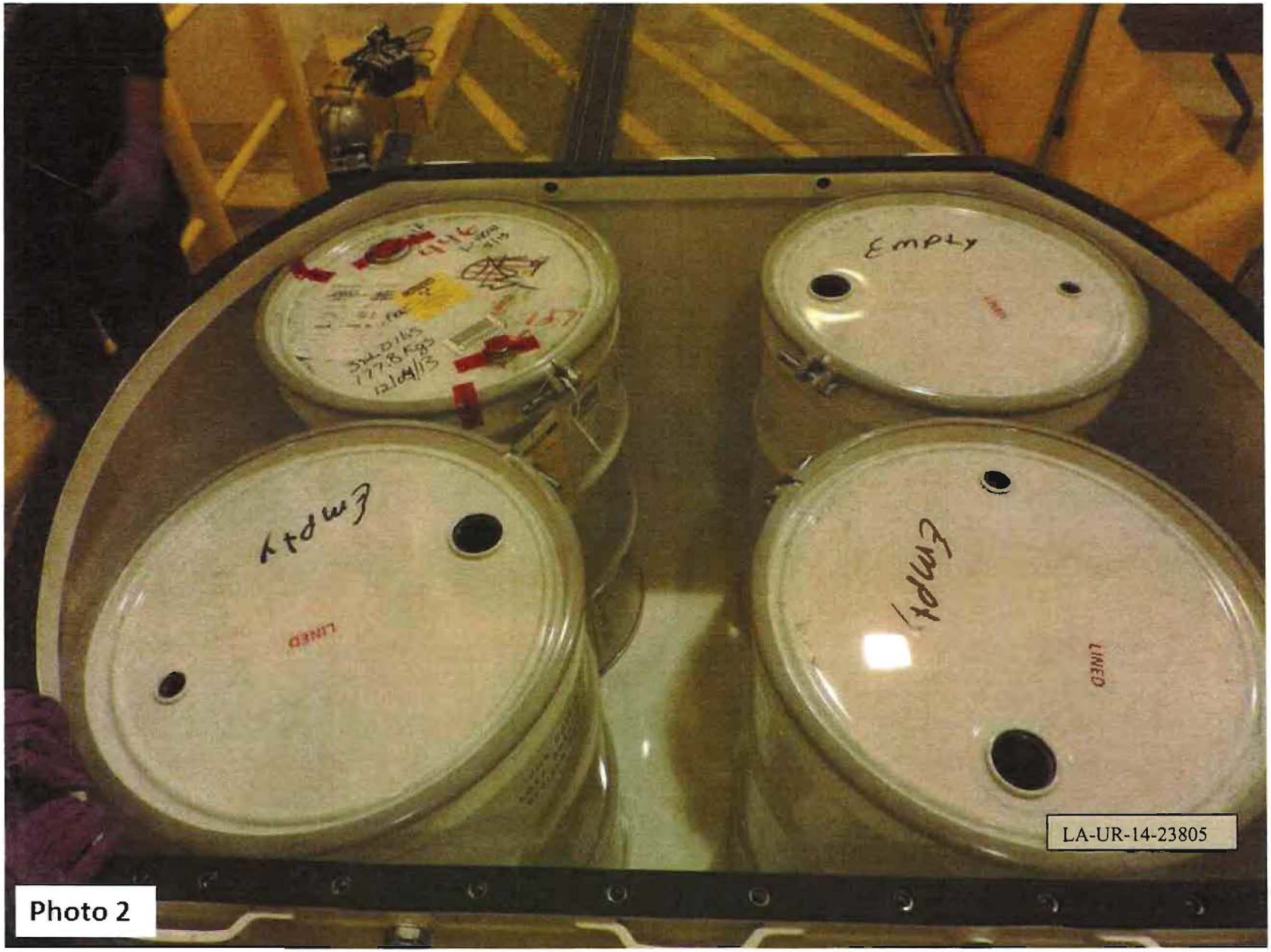


Photo 2


HAZARDOUS
WASTE
LA00000068685
Photo 3
LA-UR-14-23805

Attachment 5

Los Alamos NATIONAL LABORATORY Nuclear Material Control & Accountability Program **Functional Work Instruction**	**TID User Manual**	Operating Procedure Number: **NMCA-TID-FWI-002**
		Revision: 1
		Effective Date: 3/14/2014
		Review Date: 3/14/2016
	Preparer: Dana Sandoval	Date: 2/10/2014
	Team Leader: Carol Slaughter	Date: 2/24/2014
	Group Leader: Michael Kaufman	Date: 3/14/2014

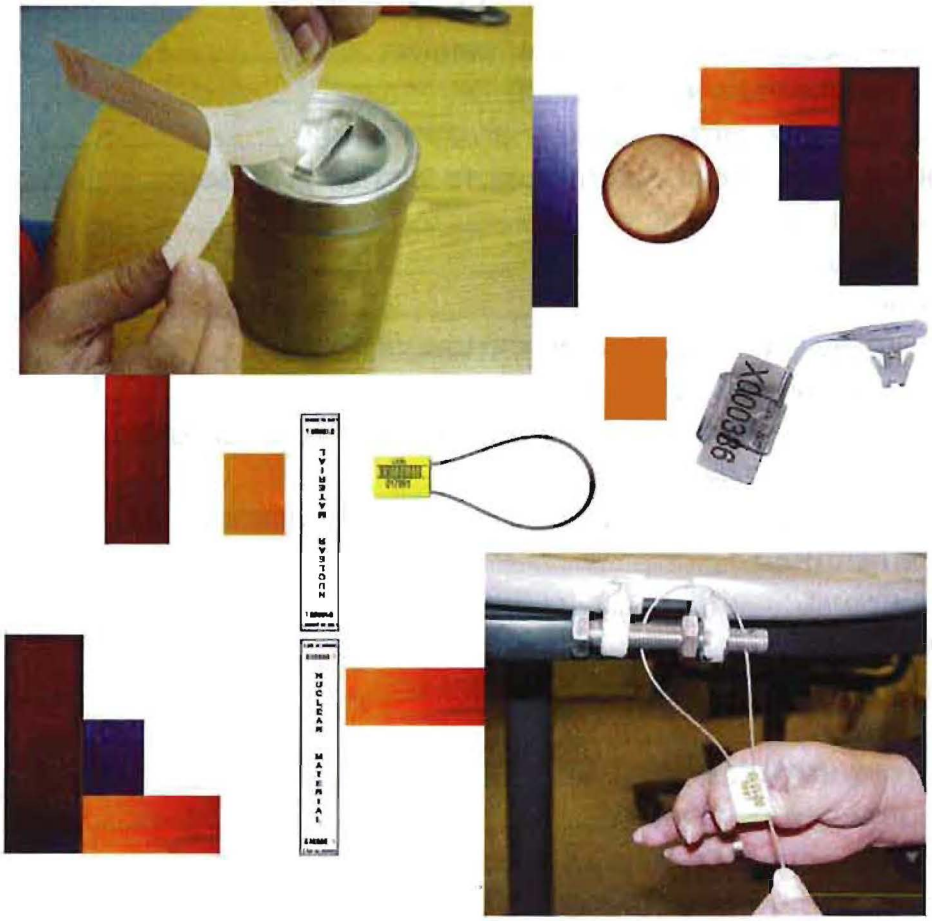


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History of Revisions

Revision	Effective Date	Action	Pages Revised	Description
000	9/11/13	☒ New ☐ Major revision ☐ Minor revision ☐ Reviewed, no change		
1	2/11/14	☐ New ☐ Major revision ☒ Minor revision ☐ Reviewed, no change	5 7, 19, 59	Changed reference to DOE O 474.2. TID Inventory form change.

1.0 PURPOSE

This User Manual sets forth the characteristics and requirements of the Laboratory Tamper Indicating Device (TID) Program. A TID is a device, such as a seal, that is applied to a container, door or object. The TID indicates tampering or entry has occurred. This program has been designed to enhance the control and protection of special nuclear material (NM) held by Los Alamos National Laboratory (LANL). The TID program is intended to complement existing Nuclear Material Control and Accountability (MC&A) programs. TIDs alert knowledgeable personnel of unauthorized tampering with a container, door, or object to which a TID has been affixed. TIDs are only considered a reliable safeguard when they are used in conjunction with an effective material surveillance program.

LANL's policy is to comply with Department of Energy (DOE) manual requirements for use of TIDs consistent with the graded safeguards described in DOE O 474.2, *"Nuclear Material Control and Accountability."* TIDs are administered by the Material Control and Accountability Group (SAFE-4) Nuclear Material Control Team.

TID personnel must have adequate training before applying, removing, voiding, or verifying TIDs. TIDs are a benefit only if they have been properly applied to readily indicate when they have been compromised.

2.0 SCOPE

2.1 WHEN TIDS ARE USED

TIDs are used before an accountability measurement, when the special nuclear material (SNM) transferred between material balance areas (MBA) is 50 grams (fissile) or more, when transporting NM from one material access area (MAA) to another or for external transfers containing accountable quantities of SNM.

2.2 BENEFITS OF USING TIDS

TIDs are only a benefit if they have been properly applied or have an intrinsic seal so that it is easy to detect when a container has been compromised. Improperly applied TIDs negate the benefits they provide under the graded safeguards requirements.

LANL acknowledges the validity of TIDs on items and shipping containers applied by other sites in the DOE complex.

3.0 PROCEDURE

3.1 RESPONSIBILITIES

3.1.1 TID ADMINISTRATOR

SAFE-4, TID Administrator in the Security, Safeguards, and Emergency Response Division is responsible for the TID Program, written procedures, procurement, storage, oversight of the RoboCrib, oversight of LANL TID training, for the TID program and other TID related activities.

3.1.2 RESPONSIBLE LINE MANAGERS

- Request the establishment of a TID account.
- Appoint a TID custodian and one or more designated TID alternates by completing form MCA-F201 (see Attachment 4).
- Appoint TID users by completing form MCA-F202 (see Attachment 5).
- Appoint TID users to utilize RoboCrib by completing form MCA-F233 (see Attachment 20).
- Ensure the designated TID custodians, designated TID alternates and TID users attend all required TID training. Ensure, with the assistance of the TID custodian, the TID training for all group personnel is current.
- Ensure group compliance with the TID Program.

NOTE: TID custodians and alternates may be assigned as the TID custodian or alternate to ONLY one TID account. The TID custodian and alternate can be designated as a TID user in multiple accounts.

3.1.3 TID CUSTODIANS/ALTERNATES

- May perform custodial functions in only one account.
- TID custodians/alternates assigned to the specific account are the ONLY individuals to have access to the TID repository, and TID records.
- Request TIDs, as needed, from the TID Administrator.
- Provide locked repository for TIDs and associated records.
- Ensure TIDs are issued sequentially to designated TID users assigned to their account.
- Ensure appropriate type of TID is issued for the intended use.

- Ensure appropriate application/removal forms are correctly filled out. TID records must be maintained for all TIDs, both applied and removed from item.
- All forms and documentation associated with the TID program must be kept in a TID Log Book, which includes:
  - TID Access Record (MCA-F219, see Attachment 17)
  - TID Application Forms (see Attachments)
  - TID Removal Forms (see Attachments)
  - TID Inventory Form (MCA-F217, see Attachment 16)
  - Discrepancy File
  - TID Users List (MCA-F200, see Attachment 3 or MCA-F205, see Attachment 6)
  - Intrinsically Tamper Indicating Item Forms (MCA-F208, see Attachment 8)
  - TID User Manual
- Records are kept INDEFINITELY. The records can be taken to the TID Administrator for archiving. (see Change of Documentation Custody)
- Maintain TID documentation and training records of TID users.
- Conduct biannual TID inventories on un-used TIDs and document the results of the inventory on the TID Inventory Form (MCA-F217, see Attachment 16).
- Participate in annual TID audit by the TID Administrator.
- Serve as the verifier as needed when TIDs are applied or removed within their TID account.
- Ensures TID's are updated on the nuclear material accountability system database.

NOTE: TID custodians and alternates may be assigned as the TID custodian or alternate to ONLY one TID account. The TID custodian and alternate can be designated as a TID user in multiple accounts.

NOTE: TIDs MUST NOT be left unattended.

3.1.4 TID USERS

- Ensure appropriate type of TID is issued for the intended use and is applied correctly.
- Ensure TID training is completed.
- Serve as the TID applicator, remover, or verifier when applying or removing TIDs. TID users may be authorized to conduct TID-related activities in more than one account.
- Ensure proper application, removal, verification, voidance, destruction and/or disposal of TIDs.
- Have knowledge of container contents.
- Complete and sign appropriate forms and return to the TID custodian/alternate.
- After the application of a TID, ensure that the correct TID serial number is entered into the nuclear material accountability system database.

NOTE: If using RoboCrib, please see TID User Responsibilities for RoboCrib.

NOTE: TIDs MUST NOT be left unattended.

3.2 PERSONNEL AUTHORIZED TO APPLY, REMOVE, VERIFY, AND DISPOSE OF TIDS

- The TID custodian/alternate CANNOT apply or remove TIDs in the TID account in which they are designated as a TID custodian or alternate. The TID custodian and alternate can however, verify TID application or removal of a TID within their TID account.

  NOTE: A TID custodian or alternate that is designated as a TID user in another TID account may perform TID user functions (apply/remove/verify) within that TID account.

- Qualified TID users are authorized to perform the TID application/removal/verification function provided they are assigned to that designated TID account.
- The TID Administrator may be called out to apply/remove/verify TIDs in any TID account.

  NOTE: Two-person rule applies to all TID activities.

NOTE: If using RoboCrib, please see TID User Responsibilities for RoboCrib.

3.3 CHANGE OF TID RESPONSIBILITIES

3.2.1 CHANGE WITHIN THE TID ACCOUNT

When a change occurs within a TID Account, the following actions are required:

1. Form (MCA-F200 or MCA-F205) must be sent to the TID custodian by the TID Administrator.

   NOTE: MCA-F200, Verification of TID Account (see Attachment 3), is a form that contains signatures from the Responsible Line Manager (RLM), TID custodian, TID alternate, and MBA custodian, verifying the TID users in a specific TID account.

NOTE: MCA-F205 is a form sent to the TID custodian when any type of change has been made to their TID account.

2. The TID custodian must verify the TID users in their specific TID account.
3. When the TID users are verified, form MCA-F200 must be completed, signed, and sent to the TID Administrator.

3.2.2 REMOVING TID USERS WITHIN A TID ACCOUNT

When TID custodians/alternates/users request removal from a TID account, the following actions are required:

1. Form MCA-F207 must be completed, signed and sent to the TID Administrator.
2. A signed copy must be retained in the TID Log Book.
3. The TID Administrator must notify the TID custodian and TID user of the change.
4. The TID Administrator will send an updated form MCA-F205 to the TID custodian with the current listing of authorized personnel for the TID account.

3.2.3 CHANGE OF TID CUSTODIAN/ALTERNATE

When a change of TID custodian/alternate is required, the following actions are required:

1. The existing TID custodian notifies the TID Administrator.
2. The incoming TID custodian/alternate must be appointed by the RLM. Form MCA-F201 must be completed, signed and sent to the TID Administrator.
3. The incoming and outgoing TID custodian/alternate must perform a 100% inventory of all TID holdings within the TID account.
4. The TID repository combinations/keys MUST be changed.

NOTE: If the outgoing TID custodian will remain as the TID alternate, a change of lock combinations/keys is not required.

5. When the inventory and the change of the repository combination/keys are complete, both incoming and outgoing TID custodian/alternate must note the inventory on the TID Inventory Form (MCA-F217, see Attachment 16) and sign. The form MCA-F201 is sent to the TID Administrator.
6. Changes are considered effective upon receiving notification from the TID Administrator.
7. The TID Administrator must send an updated form MCA-F205 to the TID custodian with the current listing of the TID account.

NOTE: The designated TID custodian/alternate/user must be qualified. If the requested TID user is new to the TID Program he or she must take the initial TID training.

3.2.4 DESIGNATING A NEW TID USER

When a TID user is requested, the following actions are required:

1. The incoming TID user must be appointed by the RLM. Form MCA-F202 must be completed, signed and sent to the TID Administrator.

NOTE: The designated TID custodian/alternate/user must be qualified. If the requested TID user is new to the TID Program, he or she must take initial TID training.

2. Changes are considered effective upon receiving notification from the TID Administrator.

3.4 FREQUENCEY AND METHOD OF TID VERIFICATION

TIDs require verification in a number of instances and under a variety of conditions.

TIDs must always be verified in the following instances:

- immediately before and after TID application,
- prior to removing, breaking, or voiding a TID,
- prior to receiving a container into a MBA,
- prior to shipping a container from an MBA,
- when selected (randomly or otherwise) during a physical inventory,
- as required during any occurrence investigation, and
- when a TID discrepancy has been reported.

NOTE: Receiver is not required to accept a shipment if a TID discrepancy exists.

NOTE: The verifier MUST be familiar with the contents of the container.

NOTE: If using RoboCrib, please see RoboCrib Verification.

3.5 NUCLEAR MATERIAL ACCOUNTABILITY SYSTEM DATABASE

Following application of a TID, the TID custodian/alternate must ensure that the TID serial number is entered into the nuclear material accountability system database.

Following removal of a TID, the TID custodian/alternate must ensure that the TID serial number is removed from the nuclear material accountability system database.

NOTE: The TID custodian/alternate/user assigned to the specific TID account and who is a nuclear material accountability system user is authorized to update the TID field on the nuclear material accountability system.

NOTE: If using RoboCrib, please see the TID User Responsibilities for RoboCrib.

3.6 CONDITIONAL VARIANCES

A conditional variance is any deviation from TID program requirements and may be granted in special cases. All requests for such variances must be forwarded to the TID Administrator and must include documentation justifying the request. The TID Administrator reviews and forwards the request to the NM Control and Performance Assurance Team Leader and SAFE-4 Group Leader for final approval.

NOTE: All conditional variances must be evaluated by the TID Administrator, NM Control and Performance Assurance Team Leader, and SAFE-4 Group Leader to

ensure no other graded safeguards requirements are diminished in any way and in order to maintain compliance with DOE Orders. Each variance must have an expiration date and must be in effect only until that date, unless a formal extension is requested and granted, prior to the expiration.

3.7 STORAGE

TIDs are not classified, however they are strictly controlled. The TID Administrator distributes TIDs to TID custodians/alternates, who are responsible for locked containment of the TIDs until they are to be applied. An approved safe is not a requirement for TID storage but at a minimum, a locked repository with controlled key or combination access must be provided to ensure detection should malevolent entry occur.



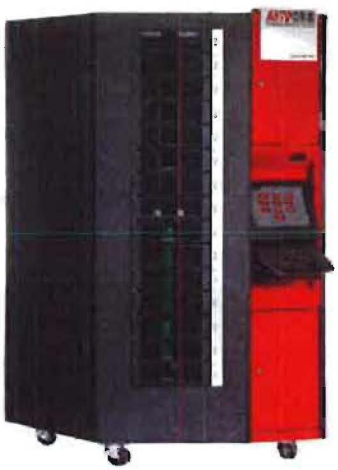
NOTE: Access to the locked repository is limited to TID Custodians/Alternates ONLY.

NOTE: All TID logbook documentation must be maintained and controlled by the TID custodian/alternate. The TID Log Book is stored in the locked repository along with assigned TIDs.

The TID custodian/alternates must maintain the TID Access Record form (MCA-F219, see Attachment 17), recording all access to the locked repository.

3.8 ROBOCRIB

The RoboCrib program allows only assigned personnel to use the RoboCrib to dispense TIDs. The Request for RoboCrib TID User form (MCA-F233, see Attachment 20), must be completed and submitted to the TID Administrator prior to attending the TID RoboCrib Initial training. All TID users using RoboCrib MUST have access to the nuclear material accountability system before they are allowed to dispense TIDs from RoboCrib. The TID user must maintain an active red crypto card, which will allow them to conduct activity within the nuclear material accountability system. Once the TID user successfully completes the RoboCrib Initial training the TID Administrator will notify the TID users that approval to use the RoboCrib has been granted.



3.8.1 TID USER RESPONSIBILITIES FOR ROBOCRIB

TID users are responsible for:

- **TID Use:** ensure appropriate type of TID issued for the intended use and is applied correctly.

NOTE: TID users CANNOT return unused TIDs. All unused TIDs MUST be physically destroyed and voided from the nuclear material accountability system.

- **TID Training:** ensure that TID training, RoboCrib Initial training and LANMAS/LAMCAS user training is complete. RoboCrib will only issue TIDs to qualified TID users whom have completed all training requirements.
- **TID Application, Removal, or Verification:** serve as the TID applicator, remover, or verifier when applying or removing TIDs. TID users may be authorized to conduct TID-related activities within TA-55 ONLY.

NOTE: The user who dispenses the TID MUST be the applicator of the TID.

- **Proper Procedural Operations:** ensure proper application, removal, voidance, destruction and/or disposal of TIDs.

NOTE: TID MUST be applied or voided as soon as possible, within the same working day.

- **Container Contents:** have knowledge of container contents.

NOTE: All TIDs MUST be accounted for within the nuclear material accountability system.

- **Intrinsically Tamper Indicating Items:** Have physical characteristics that, upon visual inspection, will immediately indicate tampering and violation of their integrity. When these items are created, the TID user will be responsible for providing the TID Administrator with the Intrinsically Tamper Indicating Item Form (MCA-F208). On the form, the TID user is required to complete the LOT ID, MBA #, Date, SNM, MT, Description of Item, Storage Location, Application Signature, Verifier Signature and the Derivative Classifier review. When the INTR item is altered the TID user is responsible for entering the removal into the nuclear material accountability system.

NOTE: TID users MAY NOT use any type of gloves when dispensing TIDs.

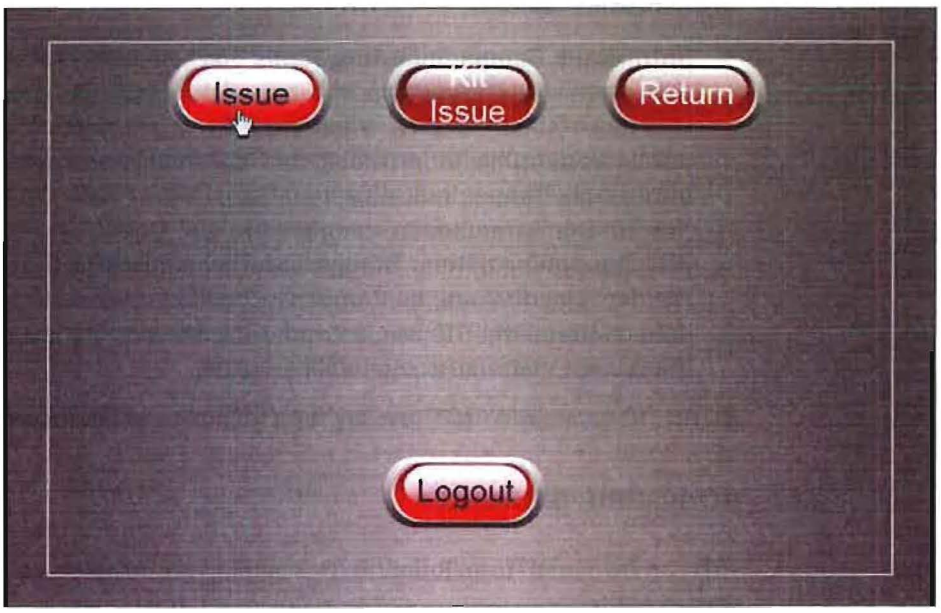
3.8.2 ROBOCRIB ISSUANCE

TIDs can be issued from RoboCrib by scanning the TID users badge on the badge reader.

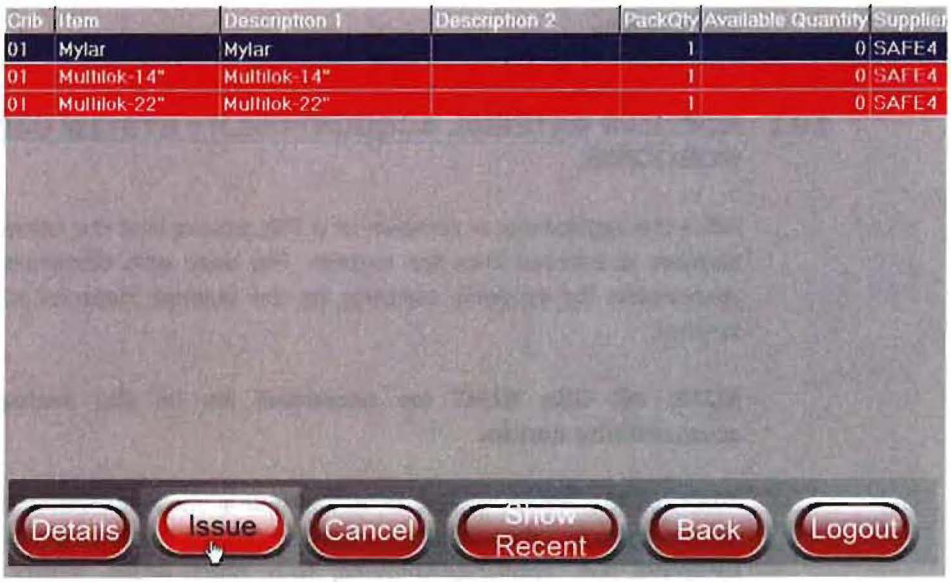
The z # will display and then the TID user can click on the "Login" button.



The TID user will need to click on the "Issue" button.



The TID user can select the type of TID (selected TID type will be highlighted). The TID user can click the "Issue" button.



Once this step has been completed the RoboCrib door will open and the TID user can retrieve the TID requested. Once the transaction is completed the login screen will display.



Transactions must be made one at a time.

NOTE: Multiple TIDs cannot be dispensed in a single transaction.

NOTE: TIDs must be applied or voided as soon as possible, within the same working day.

3.8.3 NUCLEAR MATERIAL ACCOUNTABILITY SYSTEM USING ROBOCRIB

After the application or removal of a TID, ensure that the correct TID serial number is entered into the system. The user who dispenses the TID is responsible for properly entering on the nuclear material accountability system.

NOTE: All TIDs MUST be accounted for in the nuclear material accountability system.

When a TID is being applied or removed to a container/material that is not on the nuclear material accountability system the transaction MUST be recorded. (i.e., applying/removing from pencil drops, empty containers, hoods, etc.)

When a TID has been voided the transaction MUST be recorded on the nuclear material accountability system as a void.

NOTE: A detailed description as to why the TID was voided MUST be entered.

If the TID user has a TID that has been dispensed from RoboCrib and is not being used, the TID user needs to physically destroy the TID and document it on the nuclear material accountability system as a "Void" with a detailed description as to why it was voided.

3.8.4 ROBOCRIB VERIFICATION

The TID Administrator will verify activities conducted through RoboCrib in conjunction with the nuclear material accountability system.

Verification of all activities will happen on a regular basis to ensure the TID users are entering the information accurately. If the TID users are not entering the nuclear material accountability system transactions accurately, further actions must be taken.

3.8.5 ROBOCRIB DISCREPANCY NOTIFICATION DOCUMENTATION

When a reportable TID discrepancy is discovered, the TID user is required to report the discrepancy to the RLM. Stop processing activities and segregate the discrepancy item.

The documentation of the investigation is forwarded to the TID Administrator.

If the TID discrepancy is not resolved within two hours from the time it was discovered then the TID user MUST notify the TID Administrator to initiate further investigation.

3.8 DISTRIBUTION

The TID Administrator distributes the TIDs to the TID custodian/alternates assigned to a specific TID account. The TID Administrator issues the TIDs to the TID account, the TID custodian/alternate verifies TID's that are being issued then signs the TID Administrator's TID Log Book.

It is the responsibility of the TID custodian/alternate to secure the TIDs in a locked repository and log the receipt of the SAFE-4 TIDs in the TID Log Book.

The TID custodian/alternate must complete the following steps when a TID user requests a TID:

1. The TID custodian/alternate must complete the TID Access Record Form (MCA-F219, see Attachment 17), indicating the date and time the repository is accessed.
2. The TID custodian/alternate must check the form (MCA-F200 or MCA-F205) to acknowledge the TID user and TID verifier are qualified and assigned to the specific TID account.
3. The TID custodian/alternate issues the appropriate type of TID in sequential order.
4. The TID user must sign the application form under the "Issued to" section next to the TID they are being issued. The TID verifier witnessing the issue must sign the "Issued Verifier" section. The TID custodian/alternate provides the TID user with the appropriate TID Application Form.
5. When the TID is applied and the application form is completed the TID user must return the form to the TID custodian/alternate.

NOTE: Once the TID user obtains the TID they must apply it, or maintain control of the un-used TID. If the TID is not applied it must be returned to the TID custodian/alternate.

NOTE: The TID Log Book must be kept in a locked repository along with the TIDs.

NOTE: TIDs may not be issued from one TID custodian's account to another TID custodian's account.

3.9 ABNORMAL EVENTS

If an abnormal event occurs during working hours please contact the TID Administrator.

If an abnormal event occurs outside normal working hours, the event must be documented and the TID Administrator must be notified the next business day. Unclassified documentation of the event must be provided to the TID Administrator via E-mail.

3.10 TID AUDITS

The TID Administrator audits the records and TID holdings of each TID custodian/alternate annually.

A schedule must be coordinated with the TID custodian/alternate and other affected personnel. Once a schedule is finalized, the TID Administrator provides the audit schedule to the TID custodian/alternate and the RLM.

The TID custodian will be audited on the following items:

- TID Access Record (MCA-F219),TID Application Forms (see Attachments),
- TID Removal Forms (see Attachments),
- TID Inventory Form (MCA-F217, see Attachment 16),
- Discrepancy File,
- TID Users List (MCA-F200, see Attachment 3 or MCA-F205, see Attachment 6),
- Intrinsically Tamper Indicating Item Forms (MCA-F208, see Attachment 8), and
- TID User Manual.

NOTE: A copy of 12 months of the above-listed TID records must be provided to the TID Administrator.

Upon completion of the TID audit, the TID administrator will send documentation to each RLM and TID custodian describing the results of the MC&A TID audit.

NOTE: If using RoboCrib, please see RoboCrib Verification.

3.11 TID INVENTORY

The TID custodian/alternate is required to conduct biannual TID inventories on un-used TIDs and document the results of the inventory on the TID Inventory Form (MCA-F217, see Attachment 16).

NOTE: TID records are kept INDEFINITELY.

3.12 TID GRAM

A TID GRAM (Attachment 1) is used by the TID Administrator to notify all TID custodian/alternates/users and RLMs that a change has been made to the TID Program. TID GRAMs also emphasize a requirement when a trend of deficiencies has been noted.

3.13 TID DISCREPANCIES

TID verification specifically requires an examination of each TID, sufficient to ensure that none of the TID discrepancies listed below exist:

- TID number discrepancy (i.e., missing, unreadable)
- Unauthorized TID
- Broken, damaged or deteriorating TID
- TIDs missing from TID custodian/alternate's inventory
- TIDs missing from NM containers
- Intrinsic discrepancies, such as prying, disassembling, or cutting the item to the point of violating its intrinsic characteristics
- Improperly applied TID
  - Mylar applied over tape or label
  - Mylar applied over old "voids"
  - Mylar applied less than 1 inch below lid
  - Mylar pulled too tightly and does not adhere to top of container
  - Mylar not applied on opposite sides of lid
  - Old "voids" not cleaned off container
  - Cup-Wire (Type E) Seal, Quickseals, and Multi-loks applied too loosely
  - Cup-Wire (Type E) Seal and Quickseals with no "figure eight"
  - Cup-Wire (Type E) Seal, Quickseals, and Multi-loks, where wire did not go through hole in bolt
  - Cup-Wire (Type E) Seal, where sleeve is not crimped properly

NOTE: If a discrepancy occurs, stop ALL processing activities for the item(s) in question, and segregate the item(s) in question, if possible.

The following actions are required:

1. Immediately notify a TID custodian/alternate and RLM. Stop processing activities and segregate the discrepancy item.

2. If the TID discrepancy cannot be resolved within two hours from the time of discovery, the TID custodian/alternate notifies the TID Administrator to initiate further investigative action.

3. A TID discrepancy requires the TID custodian/alternate to provide documentation of the incident to the TID Administrator detailing the incident, how it was resolved, and what steps will be taken to prevent future incidents.

4. The TID custodian/alternate must forward the documentation from the investigation and resolution of the TID discrepancy to the TID Administrator.

5. All TID discrepancies documentation must be maintained in the TID custodian/alternate records.

3.14 CONTAINER AND DEVICES

The TID user who applies TIDs to containers and devices must use the proper hardware (i.e., bolts, nuts, wire, copper collar, etc.) associated with TID application. This hardware is designed so that any unauthorized attempt to access the NM will compromise the TID.

To meet the requirements, a container must be constructed so that all means of access will violate the TID or the integrity of the container.

The following Table shows authorized containers on which TIDs can be applied:

Container Type	TID Type
Hagen Container	Multi-lok, Cup-Wire (Type E) Seal, Quickseal
5 gallon Metal Bolt-Ring Containers	Mylar
6M Shipping Drum	Multi-lok
DOT certified drums	Multi-lok, Cup-Wire (Type E) Seal, Quickseal
Pressure cooker	Multi-lok, Mylar
Solution bottles	Mylar
Doors	Mylar
Dressing jars	Mylar
Paint cans	Mylar
Glovebox doors	Mylar
Slip top containers	Mylar
Glass vials	Mylar
Nalgene bottles	Mylar
Waste drums	Multi-lok, Cup-Wire (Type E) Seal, Quickseal

3.14 TID RECORDS/ FILES

The TID custodian/alternate must maintain the following records/files in the TID repository. All required records/files are subject to audit by SAFE-4, DOE/Los Alamos Field Office and other auditing agencies.

The following forms must be in the TID Log Book:

- TID Access Record (MCA-F219),
- TID Application Forms (see Attachments),
- TID Removal Forms (see Attachments),
- TID Inventory Forms (MCA-F217, see Attachment 16),
- Discrepancy File,
- Current TID Users List (MCA-F200 or MCA-F205),
- Intrinsically Tamper Indicating Item Forms (MCA-F208, see Attachment 8), and
- TID User Manual.

NOTE: TID Log Book documentation is kept INDEFINITELY, access records are required to be kept for one year.

NOTE: The TID custodian/alternate must take old TID documentation to the TID Administrator for storage.

3.15 CHANGE OF DOCUMENTATION CUSTODY

When the TID logs books reach capacity the TID custodian/alternate can hand carry or mail their TID documentation to the TID Administrator.

The TID custodian/alternate must handle documentation according to LANL procedures. The TID custodian/alternate needs to pay particular attention to ensuring that OUO/UCNI/CLASSIFIED information is not included without being properly marked.

- If the documentation is sent through the mail, Change of Documentation Custody form (MCA-F231, see Attachment 19), must be included.
- If the documentation is hand carried, the TID Administrator will have the TID custodian/alternate sign the Change of Documentation Custody form (MCA-F231, see Attachment 19), acknowledging that they are relinquishing the custody of their documentation to the TID Administrator.

3.16 TID FORMS

All forms are located on the LANL homepage under- Security- Nuclear Materials- Tamper Indicating Devices- TID forms- Tamper Indicating Device (TID) Form.

3.17 TYPES OF TIDS

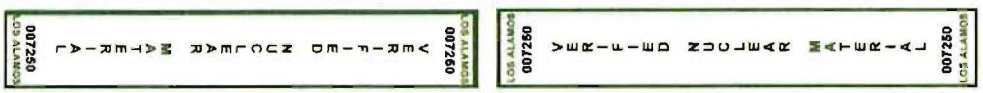
TIDs that are authorized in the LANL TID program are explained below and are documented in Attachment 2.

3.17.1 TIDS PREVIOUSLY USED

The following TIDs are still valid and are grandfathered into the TID program.

3.17.1.1 MYLAR

A Verified Nuclear Material TID contains a green border. This type of TID was applied to an item/container upon completion of a verification of accountability measurement.



A Confirmed Nuclear Material TID contains a yellow border. This type of TID was applied to an item/container upon completion of a confirmation measurement.



A Nonverified Nuclear Material TID contains a red border. This type of TID was applied to an item/container upon completion of a measurement that had been determined to be non-defensible or if an item/container had received no measurement.



A Mylar TID is a pressure-sensitive adhesive TID. It is 1 ¼ X 13" inches, made of Mylar and has tamper indicating qualities when lifted or removed. Pressure-sensitive adhesive TIDs are uniquely serialized, color coded, and have specific usages. Mylar TIDs are color coded blue and are applied prior to any measurement.



3.17.1.2 QUICKSEAL

The Quickseal is a plastic mechanism that clasps with a self cut wire. It contains a unique serial number.



3.17.2 TIDS CURRENTLY IN USE

3.17.2.1 CUP-WIRE (TYPE E) SEAL

The Cup-Wire (Type E) Seal TID is made of 1 inch diameter copper that consists of two halves, with the same unique serial number on both halves.



3.17.2.2 MYLAR

Mylar TIDs are pressure-sensitive and are physically the same size as the previously used TIDs. When removal or attempted removal/defeat occurs, the Mylar TID shows a clear "VOID/OPEN" security message but does not leave a residue on the surface of the container. They also contain a barcode for inventory and tracking purposes. These TIDs are also uniquely serialized and contain six numerical digits followed by the letter "L." These adhesive TIDs are red in color with the words "NUCLEAR MATERIAL" printed in black along the adhesive strip.



The QUARANTINE Mylar TIDs provides the same concept as the red Mylar TID shown above. These TIDs are to be applied by the MC&A team and cannot be removed. When removal or attempted removal/defeat occurs, the Mylar TID shows a clear "VOID/OPEN" security message but does not leave a residue on the surface of the container. They also contain a barcode for inventory and tracking purposes. These TIDs are also uniquely serialized and contain six numerical digits followed by the letter "Q." These adhesive TIDs are blue in color with the words "QUARANTINE DO NOT TAMPER CONTACT MC&A" printed in white along the adhesive strip.



3.17.2.3 MULTI-LOK

The Multi-lok TID has a free end of twisted-wire cable. The cable is passed through a hasp on the container and then inserted into a hole in a metal box. The box has spring loaded balls which allow the wire to pass by when initially inserted but bind with attempts to retract the wire. The metal box contains a unique identifier, but the wire does not.



3.18 INTRINSICALLY SEALED ITEMS

The LANL TID Program defines intrinsically sealed items as items that have physical characteristics that upon visual inspection will immediately indicate tampering and violation of their integrity. The types of items that are considered to be intrinsically tamper indicating are:

- special form radioactive material, defined by 49 CFR,
- sealed sources, defined by Procedure (P)121, *Radiation Protection*,
- fuel elements/fuel rods,
- welded containers (e.g. 3013 container),
- weapon assemblies/subassemblies/artillery shells, and
- other sealed sources not defined by P121 (e.g. PuBe, AmBe).

3.18.1 DETERMINATION OF AN INTRINSICALLY SEALED ITEM

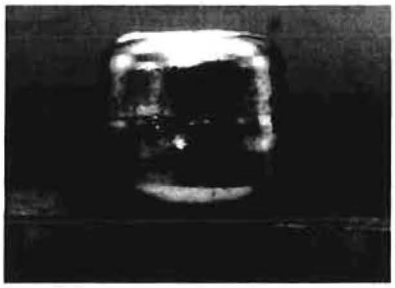
When an item is being considered for the determination "intrinsically sealed," the TID custodian/alternate/user will complete the Intrinsically Tamper Indicating Item Form (MCA-F208, see Attachment 8) and submit it to the TID Administrator. The TID Administrator or SAFE-4 Representative must visually inspect the item before making a determination. Once the item is determined to be intrinsically sealed, an "INTR####" will be assigned to the item on the nuclear material accountability system to identify the item as being intrinsically sealed.

If an intrinsically sealed item is altered (removed from a welded container, disassembled, and/or processed), the TID custodian/alternate/user must remove the INTR identifier from the seal field in the nuclear material accountability system.

NOTE: If using RoboCrib, please see the TID User Responsibilities for RoboCrib.

3.18.2 CONTAINERIZATION OF INTRINSICALLY SEALED ITEMS

Items identified as intrinsically sealed must be packaged in an outside container (if applicable), and can be containerized on the nuclear material accountability system with the approval of the TID Administrator. The outside packaging can have a conventional TID placed on it. Because intrinsically sealed items get the same safeguards credit as other items marked with conventional TIDs, this designation will aid SAFE-4 in selecting items to be inventoried during the physical inventories.



3.18.3 INTR FORM PROCEDURES

To submit an item to the TID Administrator for approval, the TID custodian/alternate/user must complete the portion indicated "To be filled out by TID custodian/alternate/user" on the Intrinsically Tamper Indicating Item Form (MCA-F208, see Attachment 8).

NOTE: The INTR form (MCA-F208) MUST be reviewed by a Derivative Classifier before it is submitted to the TID Administrator.

The TID custodian/alternate/user must complete the following sections of the form:

1. LOT ID -- Document the nuclear material accountability system LOTID
2. MBA #- The MBA/account where the item is currently located.
3. Date- The date of which the Intrinsically Tamper Indicating form is being completed.
4. SNM- Enter the element weight of the item.
5. Material Type (MT)- The item's material type(s)
6. Description of Item- Physical description of the item, what type of item it is (e.g., PuBe source, Rocky Flats pit, etc.), any other pertinent information that will aid in intrinsic determination.

7. Storage Location- Tech Area, building number, room and/or cabinet identifier.
8. TID Custodian/Alternate signature (if applicable)- The custodian/alternate requesting the designation or responsible for the item.
9. Applicator (signature) - The TID user that welded the item.
10. Verifier (signature) - The TID user that verified the weld.

When the TID custodian/alternate/user has completed the form (MCA-F208, see Attachment 8), the form must be sent to the TID Administrator for approval.

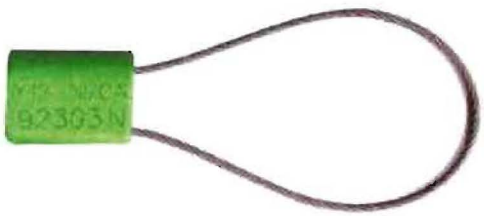
When the TID Administrator receives the Intrinsically Tamper Indicating Item form (MCA-F208, see Attachment 8), the TID Administrator or the SAFE-4 Representative shall contact the TID custodian/alternate/user to set up a time for the evaluation.

Once the item is approved the item will be assigned an "INTR####" by the TID Administrator.

If there are any questionable items that indicate INTR, the responsible TID custodian/alternate/user will be contacted to have the item investigated and/or validated.

3.19 NON-LANL TIDS

Items shipped from another facility with a Non-LANL TID are considered part of the LANL TID Program. Upon receiving the item, the receiving group must inspect the container and TID to verify that the container is sealed properly, to ensure the TID is not broken, damaged, or improperly applied, and to make sure the TID number corresponds to that provided by the shipper. The TID user must log the removal of the Non-LANL TID on the Non-LANL TID Removal Form (MCA-F220, see Attachment 18) and the TID verifier must verify the removal and destruction of the TID.



3.20 PROCEDURES FOR APPLICATION OF TIDS

3.20.1 CUP-WIRE (TYPE E) SEAL

When the Cup-Wire (Type E) Seal TID is attached to an object, it must be done in a manner that requires breaking the wire or destroying the TID to open the object.

Obtain the following equipment and material:

- Cup-Wire (Type E) Seal (top and bottom)
- Braided wire
- Crush-type sleeves/collars
- Pliers or a pair of wire cutters capable of crimping collars

NOTE: An authorized TID applicator and a TID verifier must be present when TIDs are applied.

The TID verifier must witness the application of the TID, verifying the following procedure has been followed by the TID applicator:

1. Verify that serial number of the TID bottom and top cups are identical.
2. Find a strategic location on the container where you will apply the TID. The location must ensure that the container cannot be opened without destroying the TID's integrity.
3. Estimate the length of wire needed and cut that amount from the roll. (Exact length will depend on the container).
4. Run the wire ends through the fixture and bring the ends together equally. For drums, insert wire through the hole in the bolt, into the gap in the split lug of the ring, and across one half of the lug (see photo). Remove any slack in the wire by pulling it "finger-tight." Then pull the end of the wire around the half lug, through the gap, and around the other half lug in a "figure-8."



5. Slip the TID bottom cup down the wire until it is in position near the fixture.
6. Thread the wire ends through the crimping sleeve.



7. Slide the crimping sleeve along the wire until it is in position near the TID bottom cup.
8. Use the pliers to crimp the sleeve firmly on the wire.



9. Trim the wire ends, leaving approximately ½ inch beyond the crimped sleeve end.
10. Loop the remaining ends of the wire into the inner cup area, then pull on the cup while pushing the wire and sleeve into the inner cup, ensuring that there will be no interference with closure of the TID.
11. Place the top cup over the bottom cup and apply firm pressure with fingers around the rim of the bottom cup to ensure full closure.



12. Tug on the applied cup seal to ensure that it has been applied correctly.
13. Inspect the Cup-Wire (Type E) Seal.

NOTE: If the wire was damaged during application or full closure was not achieved, cut the wire, remove the TID, and apply another Cup-Wire (Type E) Seal. The Cup-Wire (Type E) Seal that was removed must be voided and rendered unusable, and must be noted on the Cup-Wire (Type E) Seal TID Removal Form (MCA-F216, see Attachment 15) and removed from the nuclear material accountability system database.

14. The TID verifier must inspect the TID for proper application.
15. The TID applicator/verifier must complete the Cup-Wire (Type E) Seal TID Application Form (MCA-F212, see Attachment 11) and return the form to the TID custodian/alternate.

NOTE: Following application of a TID, the TID custodian/alternate must ensure the TID serial number is entered into the nuclear material accountability system database.

3.20.2 MYLAR

The Mylar TID consists of an adhesive strip that, when applied, acts as a seal on the item/container. It is applied in a manner that requires destroying the TID in order to open the object.

Obtain the following equipment and material:

- Mylar TID
- Scissors (if needed)

NOTE: An authorized TID applicator and a TID verifier must be present when TIDs are applied.

The TID verifier must witness the application of the TID, verifying the following procedure has been followed by the TID applicator:

NOTE: The container MUST be cleaned from any previous void markings before application.

1. Find a strategic location on the container where you will apply the TID. The location must ensure the container cannot be opened without destroying the TID's integrity.
2. Cut a Mylar TID in half for a large container if necessary. The Mylar TID must be located on the container so that it goes at least 1 inch down on each side and 1 inch across the top.

NOTE: If there is tape securing the container, be advised the Mylar TID must fit 1 inch below the tape down each side and 1 inch across the top.



3. If a Mylar TID is cut to fit on a large container, the ends must be placed on opposite sides of the container top from each other.
4. Inspect the Mylar TID.

NOTE: If the Mylar was damaged during application, remove the Mylar, and apply another Mylar. The Mylar that was removed must be voided and rendered un-usable, and must be noted in the Mylar TID Removal Form (MCA-F213, see Attachment 12) and removed from the nuclear material accountability system database.

5. The TID verifier must inspect the Mylar TID for proper application.
6. The TID applicator/verifier must complete the Mylar TID Application Form (MCA-F209, see Attachment 9) and return the form to the TID custodian/alternate.

NOTE: Following application of a TID, the TID custodian/alternate must ensure that the TID serial number is entered into the nuclear material accountability system database.

3.20.3 MULTI-LOK

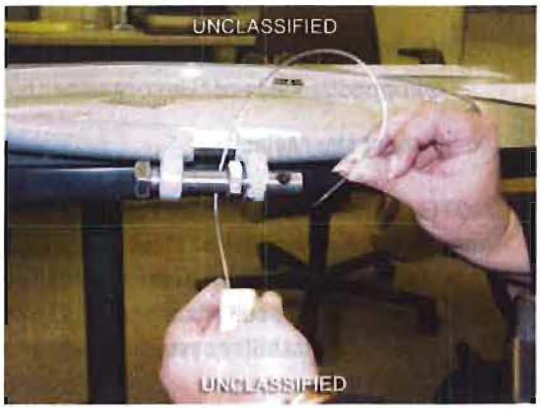
The Multi-lok TID is a metal TID made of 1-inch clasps, a wire and a unique serial number. When the wire is inserted into the 1-inch clasp, it tightly secures the mechanism. The wire is sealed in a manner that requires breaking the wire or destroying the TID to open the object.

Obtain the following equipment and material:

- Multi-lok TID

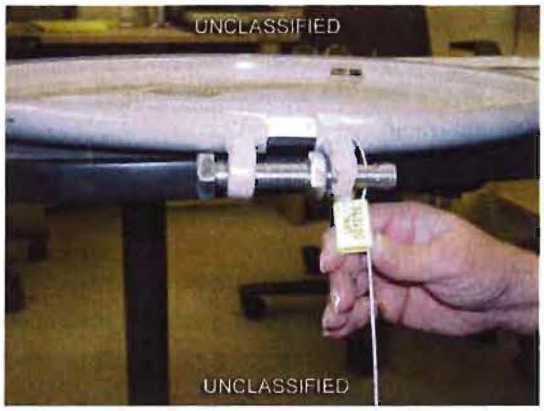
NOTE: An authorized TID applicator and a TID verifier must be present when TIDs are applied. The TID verifier must witness the application of the TID, verifying the following procedure has been followed by the TID applicator.

1. Find a strategic location on the container where you will apply the TID. The location must ensure that the container cannot be opened without destroying the TID's integrity.
2. Run the loose wire end through the fixture on the container.
3. Insert the loose end of the wire into the clasp and pull the wire through the clasp to tighten.



NOTE: For drums, insert the wire through the hole in the bolt, into the gap in the split lug of the ring, and across one half of the lug, and then insert it into the clasp.

4. Tug on the Multi-lok to ensure that it has been applied accurately.



5. Inspect the TID and wire.

NOTE: If the Multi-lok was damaged during application or full closure was not achieved, remove the Multi-lok, and apply another Multi-lok. The Multi-lok that was removed must be voided and rendered unusable, and must be noted in the Multi-lok TID Removal Form (MCA-F214, see Attachment 13) and removed from the nuclear material accountability system database.

6. The TID verifier must inspect the TID for proper application.

7. The TID applicator/verifier must complete the Multi-lok TID Application Form (MCA-F210, see Attachment 10) and return the form to the TID custodian/alternate.

NOTE: Following application of a TID, the TID custodian/alternate must ensure that the TID serial number is entered into the nuclear material accountability system database.

3.21 PROCEDURES FOR REMOVAL, VOIDING AND DISPOSAL OF TIDS

3.21.1 CUP-WIRE (TYPE E) SEAL

When removing, voiding, and destroying a TID, the two-person rule applies. The TID user must destroy the TID and the TID verifier must verify the destruction. The Cup-Wire (Type E) Seal TID Removal Form (MCA-F216, see Attachment 15) must be completed and marked as a void.

NOTE: An authorized TID user and a TID verifier must be present when TIDs are removed from NM containers.

Before a previously-applied Cup-Wire (Type E) Seal is removed, an authorized TID verifier inspects it as follows:

1. Verify that the serial number of the TID bottom and top cups are identical.

2. Verify the TID is not broken, damaged, or improperly applied.

3. Verify the TID serial number corresponds to the serial number recorded on the latest nuclear material accountability system listing, shipper back-up papers, or container label.

4. If the inspection fails to verify (1.) or (2.) above, the TID user notifies the TID custodian/alternate. The TID custodian/alternate immediately investigates and resolves the TID discrepancy. TID discrepancies that cannot be resolved within two hours require immediate notification of the TID Administrator.

Once the above four items are resolved, continue with the following:

5. Cut the wire at least two inches away from the TID (if possible) and remove the TID and wire from the container.

6. The TID verifier examines the TID to verify that both halves have the same serial number and that there is no evidence of tampering. If the numbers do not match or there is evidence of tampering, the TID user notifies the TID custodian/alternate. The TID custodian/alternate immediately investigates and resolves the TID discrepancy. TID discrepancies that cannot be resolved within two hours require immediate notification of the TID Administrator.



7. If everything is in order, the TID remover destroys the TID by poking holes in it and disposes of it as unclassified waste.



8. The TID remover and TID verifier complete and sign the Cup-Wire (Type E) Seal TID Removal Form (MCA-F216, see Attachment 15), and return the form to the TID custodian/alternate.

NOTE: Following the removal of a TID, the TID custodian/alternate ensures that the TID serial number is removed from the nuclear material accountability system database.

3.21.2 MYLAR

When removing, voiding, and destroying a TID, the two-person rule applies. The TID user must destroy the TID and the TID verifier must verify the destruction. The Mylar TID Removal Form (MCA-F213, see Attachment 12) must be completed and marked as a void.

NOTE: An authorized TID user and a TID verifier must be present when TIDs are removed from NM containers.

Before a previously applied Mylar TID is removed, an authorized TID verifier inspects it as follows:

1. Verify that the TID is not broken, damaged, or improperly applied.

2. Verify that the TID serial number corresponds to the serial number recorded on the latest nuclear material accountability system listing, shipper back-up papers, or container label.

3. If the inspection fails to verify (1.) or (2.) above, the TID user notifies the TID custodian/alternate. The TID custodian/alternate immediately

investigates and resolves the TID discrepancy. TID discrepancies that cannot be resolved within two hours require immediate notification of the TID Administrator.

Once the above three items are resolved, continue with the following:

4. The TID verifier examines the TID to verify that both halves have the same serial number and that there is no evidence of tampering. If the numbers do not match or there is evidence of tampering, the TID user notifies the TID custodian/alternate. The TID custodian/alternate must immediately investigate and resolve the TID discrepancy. TID discrepancies that cannot be resolved within two hours require immediate notification of the TID Administrator.



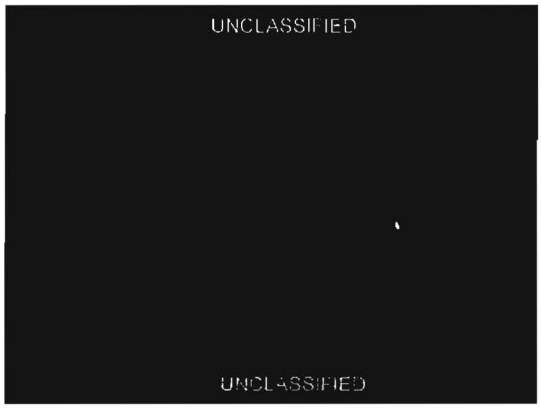
5. If the inspection verifies the integrity of the TID, it must be removed by peeling the Mylar from the container ("VOID" markings will appear).

NOTE: The Mylar TIDs that are currently being used does not leave a residue on the surface of the container.

6. To clean the "VOID" markings, use an approved solvent or eraser, or scrape them.

7. If everything is in order, the TID remover ensures that all removed/voided TIDs are rendered unsuitable for reuse by cutting them in small pieces and disposing them as unclassified waste or by shredding them in a paper shredder.

8. The designated TID remover and TID verifier complete and sign the Mylar TID Removal Form (MCA-F213, see Attachment 12), and return the form to the TID custodian/alternate.



NOTE: Following the removal of a TID, the TID custodian/alternate ensures that the TID serial number is removed from the nuclear material accountability system database.

3.21.3 MULTI-LOK

When removing, voiding, and destroying a TID, the two-person rule applies. The TID user must destroy the TID and the TID verifier must verify the destruction. The Multi-lok TID Removal Form (MCA-F214, see Attachment 13) must be completed and marked as a void.

NOTE: An authorized TID user and a TID verifier must be present when TIDs are removed from NM containers.

Before a previously-applied Multi-lok TID is removed, an authorized TID verifier inspects it as follows:

1. Verify that the TID is not broken, damaged, or improperly applied.

2. Verify that the TID serial number corresponds to the serial number recorded on the latest nuclear material accountability system listing, shipper back-up papers, or container label.

3. Verify that there is no evidence of tampering.

4. If the inspection fails to verify (1.), (2.), or (3.) above, the TID user notifies the TID custodian/alternate. The TID custodian/alternate immediately investigates and resolves the TID discrepancy. TID discrepancies that cannot be resolved within two hours require immediate notification of the TID Administrator.

Once the above four items are resolved, continue with the following:

5. Cut the wire at the base of the loop away from the TID (if possible) and remove the TID from the container.



6. If everything is in order, the TID remover renders the TID unsuitable for reuse by cutting the wire and disposes of it as unclassified waste.



7. The designated TID remover and TID verifier complete and sign the Multi-lok TID Removal Form (MCA-F214, see Attachment 13), and return the form to the TID custodian/alternate.

NOTE: Following the removal of a TID, the TID custodian/alternate ensures that the TID serial number is removed from the nuclear material accountability system database.

3.21.4 QUICKSEAL

Quickseal's have been phased out of the LANL TID Program and are no longer issued to TID accounts. However, they may still be on containers from previous applications. When removing, voiding or disposing of a TID,

the two-person rule applies. The TID user must destroy the TID and the TID verifier must verify the destruction. The Quickseal TID Removal Form (MCA-F215, see Attachment 14) must be completed and marked as a void.

NOTE: An authorized TID user and a TID verifier must be present when TIDs are removed from nuclear material containers.

Before a previously-applied Quickseal TID is removed, an authorized TID verifier inspects it as follows:

1. Verify that the TID is not broken, damaged, or improperly applied.

2. Verify that the TID serial number corresponds to the serial number recorded on the latest nuclear material accountability system listing, shipper back-up papers, or container label, whichever is appropriate.

3. Verify that there is no evidence of tampering.

4. If the inspection fails to verify (1.), (2.), or (3.) above, the TID user notifies the TID custodian/alternate. The TID custodian/alternate immediately investigates and resolves the TID discrepancy. TID discrepancies that cannot be resolved within two hours require immediate notification of the TID Administrator.

Once the above four items are resolved, continue with the following:

5. Cut the Quickseal on the loop, and remove the TID and wire from the container.



6. Destroy the Quickseal by slicing the numbers with pliers.



7. If everything is in order, the TID remover renders the TID unsuitable for reuse and disposes of it as unclassified waste.



8. The designated TID remover and TID verifier complete and sign the Quickseal TID Removal Form (MCA-F215, see Attachment 14), and return the form to the TID custodian/alternate.

NOTE: Following the removal of a TID, the TID custodian/alternate must ensure that the TID serial number is removed from the nuclear material accountability system database.

4.0 TRAINING

The level of training on this functional work instruction is determined by training analysis in accordance with P781-1, Conduct of Training Manual and recorded on the document action request form (DAR).

The TID Training Program is provided to ensure that TID custodians/alternates/ users are trained in regards to the TID program.

4.1 INITIAL TRAINING

Authorized personnel must attend an initial training and demonstrate proficiency in applying the information provided for TIDs.

4.2 RE-QUALIFICATION TRAINING

TID custodians/alternates/users are required to complete re-qualification training every two years to retain their work assignments for the TID Program.

4.3 ROBOCRIB INITIAL TRAINING

TID users identified to use RoboCrib must attend an initial training and demonstrate proficiency in distributing TIDs.

5.0 DEFINITIONS AND ACRONYMS

5.1 DEFINITIONS

See LANL Definition of Terms or the Security Policy Resource.

Application Form: Forms required for documenting the application of TIDs. (MCA-F209, MCA-F210, MCA-F211, MCA-F212)

Controlled Conditions: Storage conditions that prevent access to controlled documents and TIDs by unauthorized individuals.

Deface: The act of altering the physical appearance of a TID so that re-use and acceptance as a valid TID is precluded.

Intrinsically Sealed: Items that have physical characteristics that visually indicate an attempt to remove material.

Knowledgeable Personnel: Persons familiar with the operational and nuclear materials activities being performed, who must be trained and qualified to the TID Program.

Locked Repository: A toolbox with a combination or key lock, a locked cabinet, or a locked safe.

MC&A: Material Control & Accountability

Nuclear Material Accountability System: The material accountability safeguards system is the hub of LANL's NM graded safeguards program. It is an essential element in detecting, verifying, and evaluating gains or losses in the Laboratory's

NM inventory. NM accounting and report generation are performed using the nuclear material accountability system.

Removal Forms: Forms required for documenting the removal, or voiding of TIDs. (MCA-F213, MCA-F214, MCA-F215, MCA-F216)

Responsible Line Manager (RLM): An individual with management responsibility for a TID account.

RoboCrib: A machine that dispenses TIDs to qualified TID users.

Tamper Indicating Device (TID): A device that may be used on items such as containers and doors, which because of its uniqueness in design or structure, reveals violations of containment integrity (devices that indicate, upon inspection, whether tampering or entry has occurred).

TID Administrator: SAFE-4 staff member assigned the responsibility for procuring, controlling, distributing, inventorying, and destroying TIDs.

TID Custodian/Alternate: Authorized individual who maintains and issues TIDs to authorized TID users assigned to the specific TID account.

TID Discrepancy: Any condition that is a deviation from the normal control or use of TIDs.

TID GRAM: Documentation issued from the TID Administrator to TID custodians/alternate/users and RLMs, informing them of any changes in the TID program and also used to pass along useful information.

TID Inventory Form: Used by TID custodians/alternates when TIDs are received from the TID Administrator or are being inventoried. (MCA-F217, see Attachment 17)

TID Log Book: A binder or folder that contains TID information maintained by the TID custodian/alternate.

TID User: Qualified individual who can apply/remove/verify TIDs in an assigned TID account. The TID user must have knowledge of container content.

5.2 ACRONYMS

See LANL Acronym Master List or the Security Policy Resource

Acronym	Definition
DOE	Department of Energy
INTR	Intrinsically Sealed
LANL	Los Alamos National Laboratory
MAA	Material Access Area
MBA	Material Balance Area
MC&A	Material Control and Accountability
MT	Material Type
NM	Nuclear Material
P	Procedure
RLM	Responsible Line Manager
SNM	Special Nuclear Material
TID	Tamper Indicating Device

6.0 REFERENCES

1. DOEO 474.2 Chg 2, Attachment 1 CRD, *Nuclear Material Control and Accountability*LANL Nuclear Material Control & Accountability (MC&A) Plan
2. 49 CFR
3. P121, *Radiation Protection*

7.0 ATTACHMENTS

Attachment 1- TID GRAM (sample)

SAMPLE

TID GRAM

May, 2010
TID GRAM #19

Subject: Change of TID Custodian/Alternate Responsibilities

There has been a change to the TID custodian/alternate responsibilities. TID custodians and alternates can no longer apply or remove TIDs in the TID account in which they are designated as a TID custodian or alternate. The TID custodian and alternate can however, verify TID application or removal in their TID account.

A TID custodian or alternate that is designated as a TID user in another TID account may perform TID user functions (apply/remove/verify) in that account.

An initial TID user course will be held on May 19th. To designate other TID users please, fill out the TID user form and sign up on the following link:

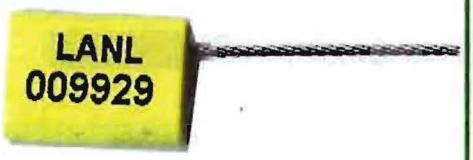
http://www.hr.lanl.gov/tiocourses/coursesearch.aspx?CourseNo=7273&scope=here&category_path=%252FOrganization%2523Operations%252FTraining%2523Education

Dana Sandoval
SAFE-4 Material Control & Accountability
Los Alamos National Laboratory
Phone: 5-3108
Email: danam@lanl.gov

UNCLASSIFIED

Authorized LANL TIDs

Nuclear Material Multi-lok



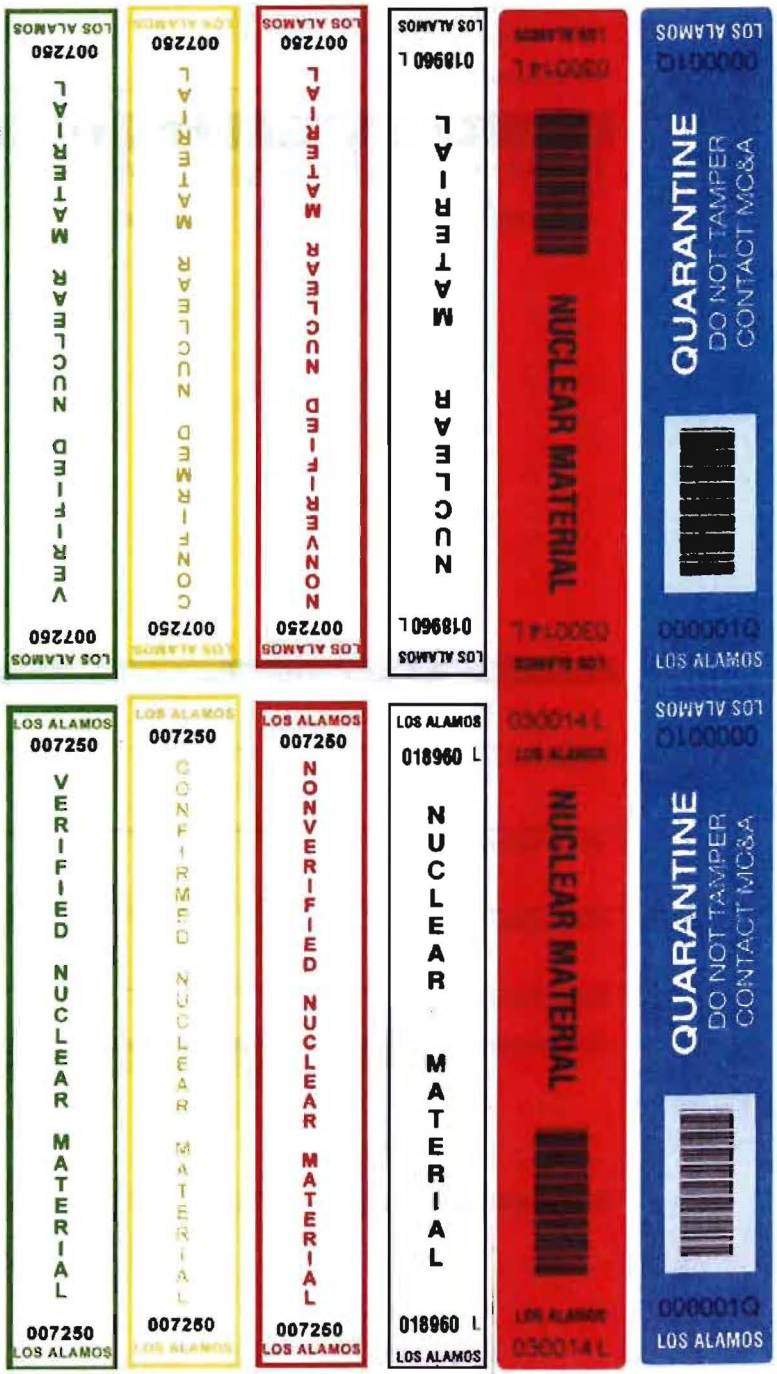
Nuclear Material Quickseal



Nuclear Material Cup-Wire (Type E) Seal



Nuclear Material Mylar



Los Alamos NATIONAL LABORATORY (EST. 1943)

Verification of TID Account

Date _____ TID Account # _____

TID Custodian _____

Please verify the following personnel are on your TID account

Account #	Z#	First Name	Last Name	Group	TID	Expiration Date

Signatures

TID Custodian	*Date*
TID Alternate Custodian	*Date*
MBA Custodian	*Date*
Responsible Line Manager	*Date*

WHEN FORM IS COMPLETED AND SIGNED, MAIL ORIGINAL TO: TID ADMINISTRATOR, MS-G735, SAFE-4
*****A copy must be kept in the TID Log Book for the TID Account*****

NMControl Form MCA-F200 January 22, 2009

Los Alamos NATIONAL LABORATORY EST 1943

Change of TID Custodian/Alternate

Date _____ TID Account # _____

Group _____

Existing TID Custodian _____ Z# _____

New TID Custodian / Alternate _____ Z# _____

Outgoing TID Custodian / Alternate _____ Z# _____

INCOMING AND OUTGOING TID CUSTODIANS/ALTERNATES MUST PERFORM A 100% INVENTORY OF THE UNUSED TID HOLDING

Has a 100% inventory been completed?	☐ Yes	☐ No
Have all TID's been accounted for?	☐ Yes	☐ No
Has the combinations/lock on the repository been changed?	☐ Yes	☐ No

Signatures

_____
Existing TID Custodian *Date*

_____
New TID Custodian / Alternate *Date*

_____
Outgoing TID Custodian / Alternate *Date*

_____
Responsible Line Manager *Date*

_____
TID Administrator *Date*

WHEN FORM IS COMPLETED AND SIGNED, MAIL TO: TID ADMINISTRATOR, MS-G735, SAFE-4

NMControl Form MCA-F201 May 17, 2010

Los Alamos NATIONAL LABORATORY EST. 1943

Request for New TID User

Date _____

Group _____

TID Custodian (Print Name) _____ Z# _____

TID Custodian Signature *Date*

Responsible Line Manager (Print Name) _____ Z# _____

Responsible Line Manager Signature *Date*

New TID User (Print Name) _____ Z# _____

TID Account User will be assigned to _____

New TID User Signature *Date*

WHEN FORM IS COMPLETED AND SIGNED, MAIL TO: TID ADMINISTRATOR, MS-G735, SAFE-4

NMControl Form MCA-F202 May 17, 2010

Los Alamos NATIONAL LABORATORY EST. 1943

TID Account

Date _____ TID Account # _____

TID Custodian _____

The following personnel are assigned to your TID account

Z#	First Name	Last Name	Group	TID	Training Expiration

A copy must be kept in the TID Log Book for the TID Account

Los Alamos NATIONAL LABORATORY EST 1943

TID User Removal Request

Date _____

Group _____

TID Custodian (Print Name) _____ Z# _____

TID Custodian Signature *Date*

Responsible Line Manager (Print Name) _____ Z# _____

Responsible Line Manager Signature *Date*

Remove TID User (Print Name) _____ Z# _____

TID Account User will be removed from account _____

Will the TID User be assigned to a TID account?

☐ Yes (TID user must complete form MCA-F202)

☐ No (TID user will be removed from the TID program)

To remain on the TID program you must be assigned to a specific TID account.

TID User Removal Signature *Date*

WHEN FORM IS COMPLETED AND SIGNED, MAIL TO: TID ADMINISTRATOR, MS-G736, SAFE-4

NMControl Form MCA-F207 May 17, 2010

Los Alamos NATIONAL LABORATORY

Intrinsically Tamper Indicating Item Form

LANMAS Entry

Date _____ LANMAS Transaction # _____ INTR ID _____

To be filled out by TID Custodian/Alternate/User

LOT ID _____ MBA # _____ Date _____

SNM _____ MT _____

Description of Item _____

Storage Location (TA, Bldg, Room, Safe and/or Cabinet Identifier) _____

Signatures

TID Custodian/Alternate Signature (if applicable)	*Z number*	*Date*
Applicator Signature	*Z number*	*Date*
Verifier Signature	*Z number*	*Date*

Derivative Classifier

☐ Unclassified ☐ Confidential ☐ Secret ☐ Official Use Only	☐ Restricted Data ☐ Formerly Restricted Data ☐ National Security Information	☐ Unclassified Controlled Nuclear Information Not for Public Dissemination Unauthorized dissemination subject to civil and criminal Sanctions under section 148 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2168). Guidance Used: _____

DC Print Name/Z#:	Organization:	Signature:	Date:

SAFE-4 Evaluation (To be filled out by TID Administrator or SAFE-4 Representative)

Evaluation and Comment _____

Approved ☐ Yes ☐ No (If no, explain in comment section reason for rejection)

Signatures

TID Administrator or SAFE-4 Representative Signature	*Z number*	*Date*

MCA-F208 Rev. 0 March 2013

Attachment 9- MCA-F209 – Mylar TID Application Form

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

MYLAR TID Application Form

TID Account #_____

TID NUMBER	LOT ID	LOCATION	SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				

UNCLASSIFIED

May 14, 2010

NMControl Form MCA-F209

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

MULTI-LOK TID Application Form

TID Account #_____

TID NUMBER	LOT ID	LOCATION	SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				

UNCLASSIFIED

May 14, 2010

NMControl Form MCA-F210

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

Cup-Wire (Type E) Seal TID Application Form

TID Account #_____

TID NUMBER	LOT ID	LOCATION	1. APPLICATOR SIGNATURE 2. VERIFIER SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				
			Issued to				N/A
			Issued Verifier				
			Applicator				
			Verifier				

UNCLASSIFIED

May 14, 2010

NMControl Form MCA-F212

Attachment 12- MCA-F213 – Mylar TID Removal Form

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

MYLAR TID Removal Form

TID Account #_____

TID NUMBER	LOT ID	REMOVE (R) VOID (V)	LOCATION	1. REMOVER SIGNATURE 2. VERIFIER SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				

UNCLASSIFIED

May 14, 2010

NMControl Form MCA-F213

Attachment 13- MCA-F214 – Multi-Lok TID Removal Form

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

MULTI-LOK TID Removal Form

TID Account #_____

TID NUMBER	LOT ID	REMOVE (R) VOID (V)	LOCATION	1. REMOVER SIGNATURE 2. VERIFIER SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				

UNCLASSIFIED

May 14, 2010

NMControl Form MCA-F214

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST 1943

QUICKSEAL TID Removal Form

TID Account #_____

TID NUMBER	LOT ID	REMOVE (R) VOID (V)	LOCATION	1. REMOVER SIGNATURE 2. VERIFIER SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
				1. 2.				
				1. 2.				
				1. 2.				
				1. 2.				
				1. 2.				

UNCLASSIFIED

August 21, 2008

NMControl Form MCA-F215

Attachment 15- MCA-F216 – Cup-Wire (Type E) Seal TID Removal Form

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY

Cup-Wire (Type E) Seal TID Removal Form

TID Account #_____

TID NUMBER	LOT ID	REMOVE (R) VOID (V)	LOCATION	1. REMOVER SIGNATURE 2. VERIFIER SIGNATURE	Z #	GROUP	DATE	TRANS # MASS UPDATE
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				
				1.				
				2.				

UNCLASSIFIED

August 21, 2008

NMControl Form MCA-F216

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST 1943

TID Inventory Form

TID Account #_____

DATE	TIDs RECEIVED FROM SAFE-I	UNAPPLIED TIDs INVENTORIED	SIGNATURE	Z #	VERIFIER SIGNATURE	Z#

INVENTORIES ON THE TIDs MUST BE PERFORMED BIANNUALLY.

UNCLASSIFIED

February 10, 2014

NMControl Form MCA-F217

Attachment 17- MCA-F219 – TID Access Record

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

TID Access Record

TID Account #_____

DATE	TIME IN	TIME OUT	INITIAL	Z#

UNCLASSIFIED

NMControl Form MCA-F219 February 23, 2010

UNCLASSIFIED

Los Alamos NATIONAL LABORATORY EST. 1943

Non-LANL TID Removal Form

TID Account #_____

TID NUMBER	LOT ID	REMOVE (R) VOID (V)	LOCATION	1. REMOVER SIGNATURE 2. VERIFIER SIGNATURE	Z #	GROUP	DATE	TRANS.# MASS UPDATE
				1. 2.				
				1. 2.				
				1. 2.				
				1. 2.				
				1. 2.				

UNCLASSIFIED

August 28, 2008

NMControl Form MCA-F220

Los Alamos NATIONAL LABORATORY EST 1943

Change of Documentation Custody Form

LANMAS Entry

Date _____ TID Account _____ Group _____

I (TID custodian/alternate) acknowledge that I am giving the LANL TID Administrator the documentation from my TID Log Book. I am acknowledging that it does not contain ANY classified documentation. If classified documentation needs to be transmitted to the LANL TID Administrator, I will follow the LANL Policy on transmitted classified documentation.

Signatures

TID Custodian/Alternate Signature _____ Z Number _____ Date _____

Derivative Classifier

☐ Unclassified ☐ Confidential ☐ Secret ☐ Official Use Only	☐ Restricted Data ☐ Formerly Restricted Data ☐ National Security Information	☐ Unclassified Controlled Nuclear Information Not for Public Dissemination Unauthorized dissemination subject to civil and criminal Sanctions under section 148 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2168) Guidance Used: _____

DC Print Name/Z#	Organization:	Signature:	Date:

MCA-F231 Rev. 0 March 2013

Los Alamos NATIONAL LABORATORY EST 1943

Request for RoboCrib TID User

Date _____

Group _____

Responsible Line Manager (Print Name) _____ Z# _____

Responsible Line Manager Signature *Date*

Are the following courses completed:

TID curricula #1550 ☐ Yes ☐ No

LANMAS / LAMCAS curricula #10982 ☐ Yes ☐ No

Do you have an active red crypto card? ☐ Yes ☐ No

To enroll in the TID RoboCrib course you must have all curricula's above completed. You MUST maintain a red crypto card which, allows you to conduct TID activity within LANMAS.

TID User (Print Name) _____ Z# _____

TID User Signature *Date*

WHEN FORM IS COMPLETED AND SIGNED, SEND TO: TID ADMINISTRATOR, MS-G735, SAFE-4

To be filled out by SAFE-4

TID Administrator *Date*

NMControl Form MCA-F233 March 12, 2013

Attachment 6

TA-54 Area G Nitrate-Salt Waste Container Response Instructions

Effective Date: 01/30/15

The Responsible Manager has determined that the following organizations' review/concurrence is required for the initial document, and for major revisions a same type and level review is required. Review documentation is contained in the Document History File:

EWMO Engineering
LANL TRU Programs – Shipping and Safe Storage Disposition
LANL TRU Programs – Drum Disposition Project
LANL TRU Programs – Oversized Container Disposition Project
Subject Matter Expert
EWMO Environmental, Safety, and Health Manager
Emergency Response
Emergency Management
Environmental Compliance Programs

Responsible Manager, EWMO Facility Operations Director

Rick Alexander	/ 114624	/ /s/ Rick Alexander	/ 01/14/15
Name (print)	Z#	Signature	Date

Classification Review: ☐ N/A ☒ Unclassified ☐ UCNI ☐ Classified _____

Teri Tingey	/ 200975	/ /s/ Teri Tingey	/ 01/12/15
Name (print)	Z#	Signature	Date

Working Copy / Information Only (circle one)
Initials / Date: _____/_____

This document fully satisfies the requirements of P300, Integrated Work Management, in order to systematically describe the work activity, the associated hazards, and the controls that **MUST** be employed to mitigate the risks.

REVISION HISTORY

Document No./Revision No.	Issue Date	Action	Description
EP-AREAG-PLAN-1248, R.0	May 28, 2014	New Document	
EWMO-AREAG-PLAN-1248, R.1	January 30, 2015	Minor Revision	Revise document to incorporate new PermaCon drawings and make editorial corrections as necessary such as changing document number from “EP” to “EWMO”. This revision does not introduce any new hazards.

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1. PURPOSE

The purpose of this plan is to provide pre-planning and initial entry requirements for potential release scenarios from the nitrate salt-bearing waste containers. This plan is intended to minimize the consequences to personnel and the environment from a potential incident.

2. HISTORY

On February 14, 2014 there was a radiological release in the underground at the Waste Isolation Pilot Plant (WIPP). It was postulated that an energetic chemical reaction occurred. On May 15, 2014 WIPP released photographs which showed a Los Alamos National Laboratory (LANL) drum containing remediated nitrate salt-bearing waste had breached in Panel 7, Room 7. The cause of the breach and other potentially impacted drums is currently unknown, but is being actively investigated.

The current inventory of nitrate salt-bearing waste containers fall into 3 categories: 1) remediated, 2) un-remediated, and 3) cemented. Only the remediated containers have been "treated" and therefore are suspected of possible reactions. The remediated drums have all been placed in standard waste boxes (SWBs) and are located in a HEPA-ventilated, temperature-controlled PermaCon with a fire suppression system. The un-remediated drums have all been placed in 85-gal overpacks and will be transferred to a HEPA-ventilated, temperature-controlled PermaCon with a fire suppression system. The layouts of the TA-54-231 and TA-54-375 fire suppression systems within the PermaCons are illustrated on Appendix 1, TA-54-231 PermaCon Fire Protection System, and Appendix 2, TA-54-375 PermaCon Fire Protection System.

All of the remediated drums in SWBs are located in the PermaCon in TA-54-375. Appendix 3, TA-54-375 SWB Storage Layout Plan, is a diagram of the SWB layout in TA-54-375. The un-remediated drums are located in TA-54-230 and will be moved into the TA-54-231 PermaCon.

The cemented waste containers are <u>not</u> considered to present any risk and are therefore <u>not</u> addressed here.

3. SITE CONSIDERATIONS

The drums and SWBs are spaced to satisfy the Resource Conservation and Recovery Act (RCRA) requirements, which require a minimum of two feet between containers. Until the final configuration for the un-remediated drums is achieved a list of drum locations will be kept and provided to Emergency Management (EM). EM is the central point of distribution and will provide appropriate information to responders, including Emergency Response (ER) and Los Alamos Fire Department (LAFD). When the final configuration is achieved, a diagram with drum locations within the TA-54-231 PermaCon will be produced, provided to EM, and posted in the TA-54 Operations Center. A preliminary walkdown of TA-54-230, TA-54-231, TA-54-375 and TA-54-412 has been completed with EM and ER. A walkdown with LAFD will be completed. Photos of the final configuration will be provided to EM.

Appendix 4, TA-54 Area G Structure Location Map, is a map showing the 100-meter initial standoff distance from all affected facilities and a copy of it will be posted in the TA-54 Operations Center and the Emergency Operations Center (EOC).

The primary access into Area G will be the west entrance adjacent to the TA-54 Operations Center. Due to wind conditions, response organizations may have to enter Area G through the east gate. That road is not paved, but is maintained and it will be regularly inspected by appropriate personnel, including Emergency Operations (EO) and LAFD, to ensure accessibility. The road is inspected in accordance with EWMO-AREAG-WO-DOP-1246, Nitrate Salt-Bearing TRU Waste Container Monitoring, and repaired after each significant rain event.

4. BUILDING CONSIDERATIONS

Domes TA-54-231 and TA-54-375 have PermaCons installed within them. PermaCons are stainless steel enclosures designed for contamination control. Each has high-efficiency particulate air (HEPA) filtration and has been tested to ensure adequate airflow through the PermaCon. Each has several Continuous Air Monitors (CAMs) to monitor for airborne radioactive contamination. Two remotely monitored CAMs are installed in the TA-54-375 PermaCon which provides notification when there is a significant airborne release. Each structure has HVAC for heating and cooling within the PermaCons. All combustibles and flammable liquids have been removed from the domes, and the PermaCons. There are no hazardous materials, other than those in the waste containers, within the domes or PermaCons. The domes are not routinely occupied although daily and hourly inspections are performed. Access to the PermaCons is restricted by EWMO-AREAG-SO-1247, TA-54 Area G Domes TA-54-231 and TA-54-375 PermaCon Access Restrictions.

Dome TA-54-230 is a fabric dome with fire suppression. It is considered short-term storage and all un-remediated drums will be moved to the TA-54-231 PermaCon the week of May 26.

5. VENTILATION STATUS

Because the HEPA ventilation is a key component of the contamination control within the PermaCon, if it were to be non-functional, the contamination control provided by the PermaCon would be compromised. Therefore, its status should be monitored and mitigative actions implemented if non-functional. EWMO-AREAG-FO-DOP-1246 performs hourly inspections of the containers contains a requirement to verify the HEPA ventilation is operating. Therefore any failure of the system would be known within an hour. If the ventilation system is found to be non-functional, the inspector will notify the Shift Operations Manager (SOM) who will coordinate with appropriate resources to repair the system as soon as possible. If the ventilation is non-functional for an extended period of time, the frequency of temperature measurements of the containers will be increased at the direction of the SOM.

6. LTP PERSONNEL

The TA-54 Operations Center is manned 5 x 12 (Monday - Friday). Core work hours are 0600 to 1800. All normal support personnel are available during those hours. The Abnormal Operating Procedures and Emergency Response Procedure (see references) rely on the TA-54 Operations Center personnel to make notifications, contact Subject Matter Experts (SMEs), and coordinate with response organizations. EWMO-AREAG-FO-DOP-1246 provides direction to personnel performing hourly inspections on the backshift and weekends since they will not have access to TA-54 Operations Center personnel.

To support a backshift or weekend response, the TA-54 Operations Center will maintain an on-call list with the following personnel:

- Facility Operations Director (FOD)
- Operations Manager (OM)
- SOM
- Shift Operations Supervisor (SOS)
- Radiological Control Technician (RCT) Foreman
- RCT (2)
- Industrial Hygiene (IH)
- Operations Center Operator (OCO)
- Nuclear Operator

In accordance with company procedure, on-call LTP personnel are required to be on site within two hours of notification. Radiation Protection (e.g., Radiological Control Technicians) respond within one hour.

7. RESPONSE ACTIONS

The following actions will initiate a response action requiring notification to LAFD via 911 and the Emergency Operations Support Center (EOSC) 667-6211:

1. Loss of container integrity such as evidence of leakage and/or lid or lid container gasket compromised
2. Bulging such as expansion of side walls or top
3. Chemical reaction such as smoke or release of internal contents to atmosphere
4. Evidence of fire or smoke
5. Blistering paint on a container
6. A container temperature measurement that is greater than 15 °F higher than the control temperature in accordance with EWMO-AREAG-FO-DOP-1246
7. A CAM alarm

Response personnel will initially mobilize to 100 meters from the affected facility as shown on the figure in Appendix 4. If specialized tools are identified (none have been to date), they will be staged in a central location more than 100 meters from any of the potential facilities. The forklift with blast protection will be staged between TA-54-231 and TA-54-375 as shown in Appendix 4. The Hazardous Material (HazMat) team will develop an incident specific response plan and safety plan per EO procedures (see references), which will be approved by the Incident Commander (IC) prior to any mitigation. LAFD, LTP SMEs, HazMat, and the Field Monitor Team (FMT) from Emergency Response will be involved in the planning for any mitigation and will be included in the pre-job briefing. In addition, the FMT has pre-planned the placement of additional monitoring equipment if it is needed. EO has personnel on call to support the IC including chemists, modelers, health physicists, samplers, etc.

8. REFERENCES

EP-DIV-BEP-20048, EWMO Division Building Emergency Plan (BEP)

EP-DIV-RM-AOP-20201, Discovery of an Airborne, Liquid and/or Solid Material Release or Spill

EP-DIV-RM-AOP-20204, Waste Container Questionable Integrity

EP-DIV-RM-ERP-20200, EWMO Area Emergency Response

EWMO-AREAG-FO-DOP-1246, Nitrate Salt-Bearing TRU Waste Container Monitoring

9. REFERENCES (continued)

EWMO-AREAG-SO-1247, TA-54 Area G Domes TA-54-231 and TA-54-375 PermaCon Access Restrictions

EO-ER-600-005, EO-ER Emergency Response Plan

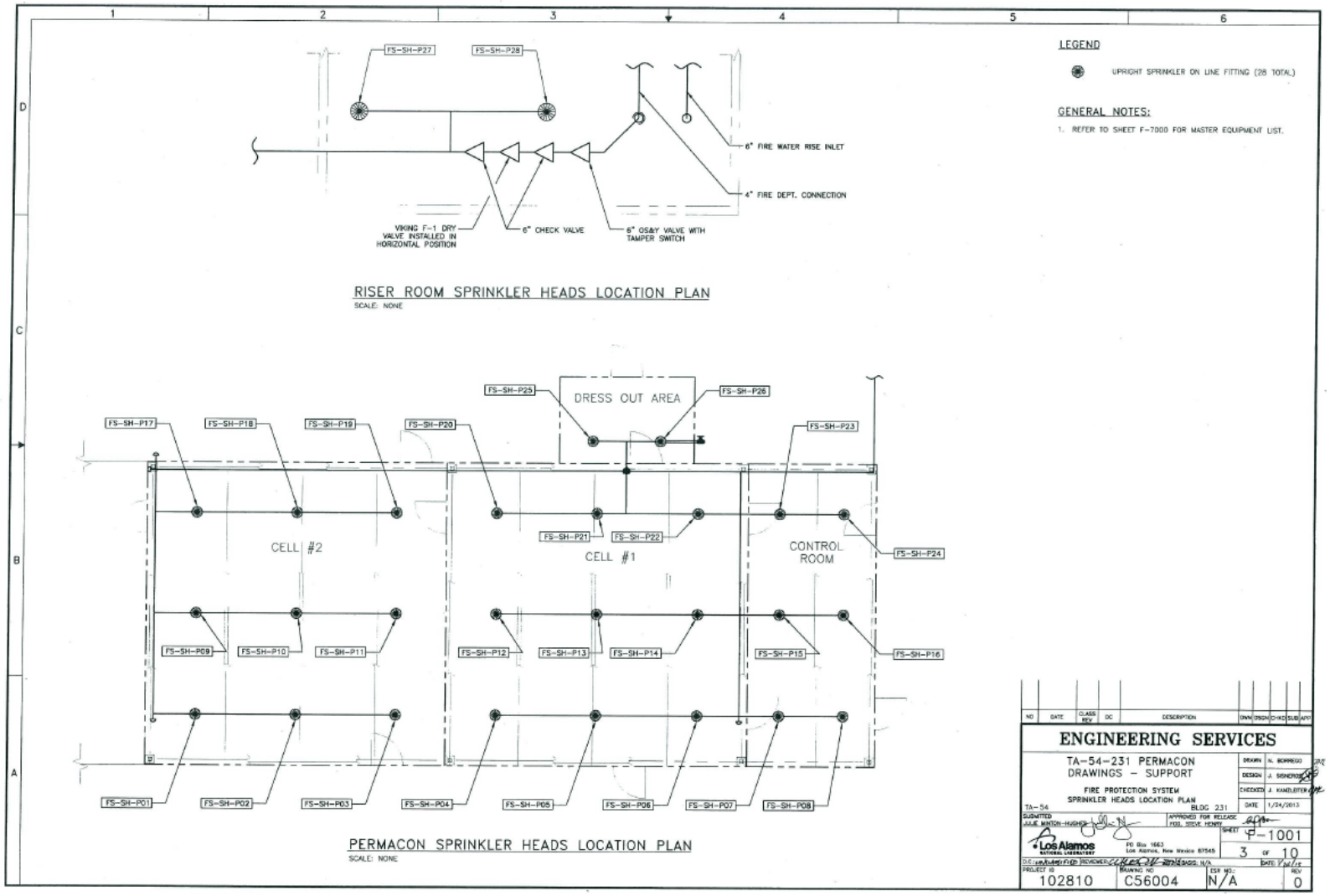
EO-ER-630-003, Hazmat Safety Officer Guidelines

EO-ER-630-001, Hazmat Group Supervisor Guidelines

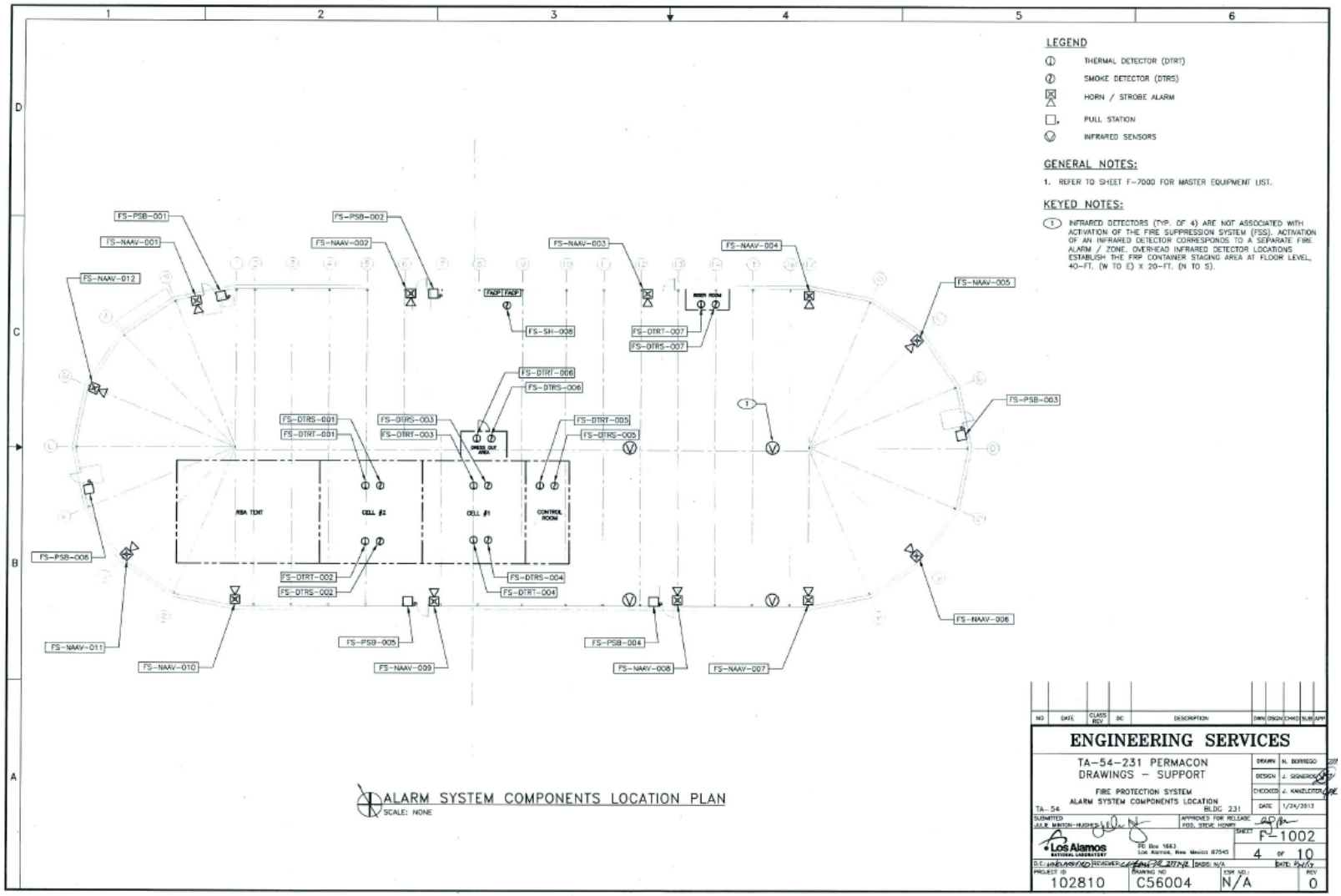
LANL Hazardous Waste Permit, Attachment D, Contingency Plan

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TA-54-231 PERMACON FIRE PROTECTION SYSTEM

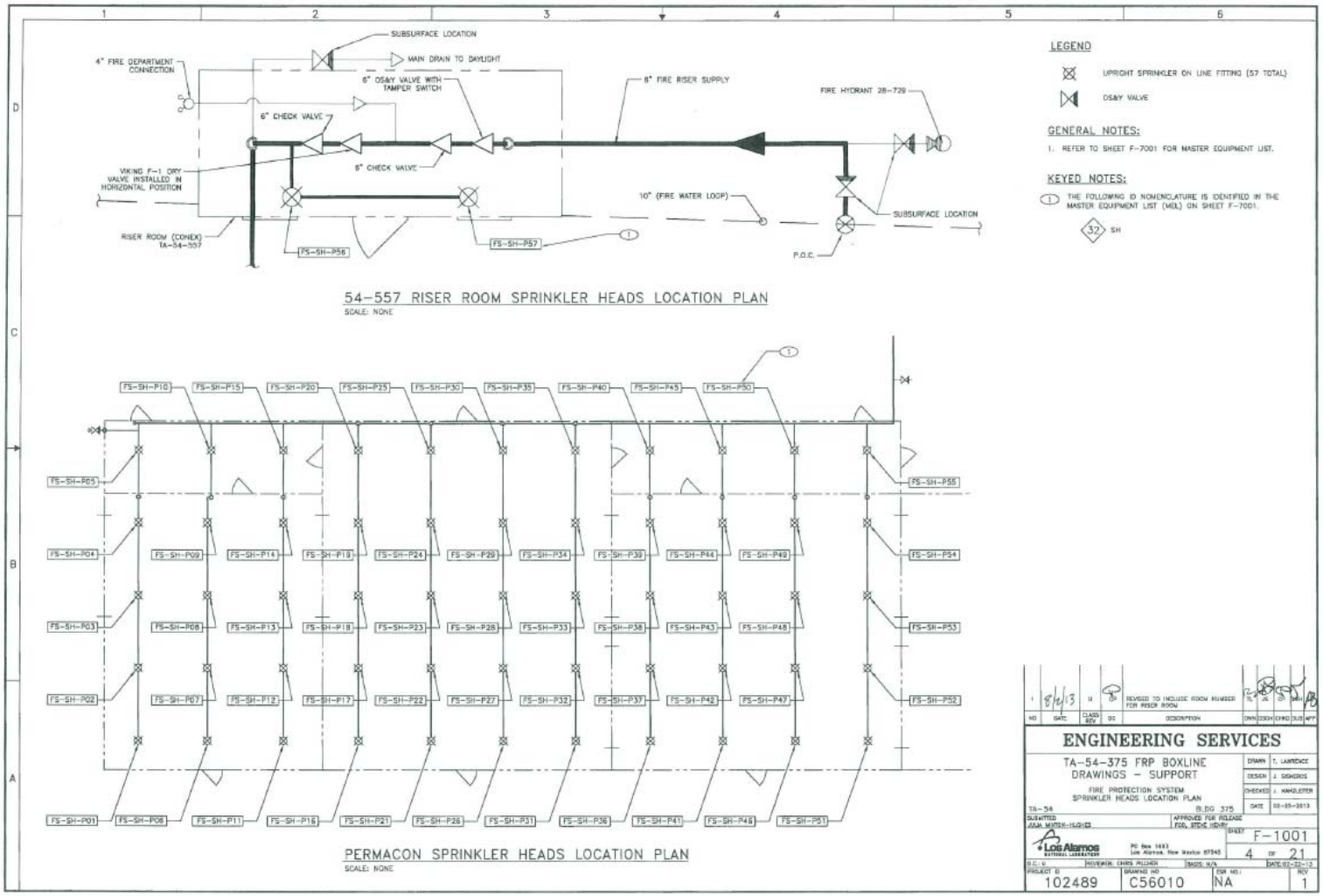


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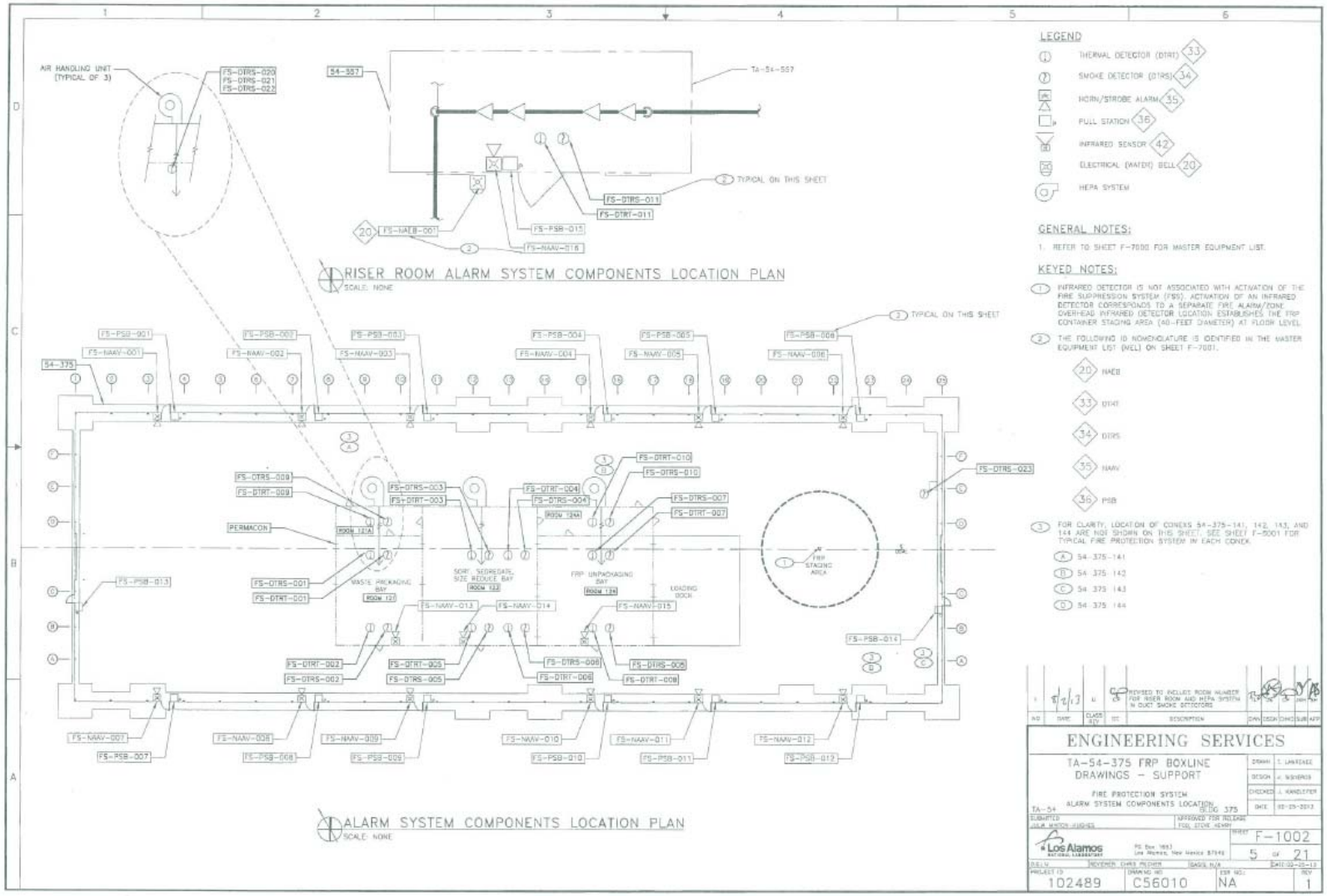


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TA-54-375 PERMACON FIRE PROTECTION SYSTEM

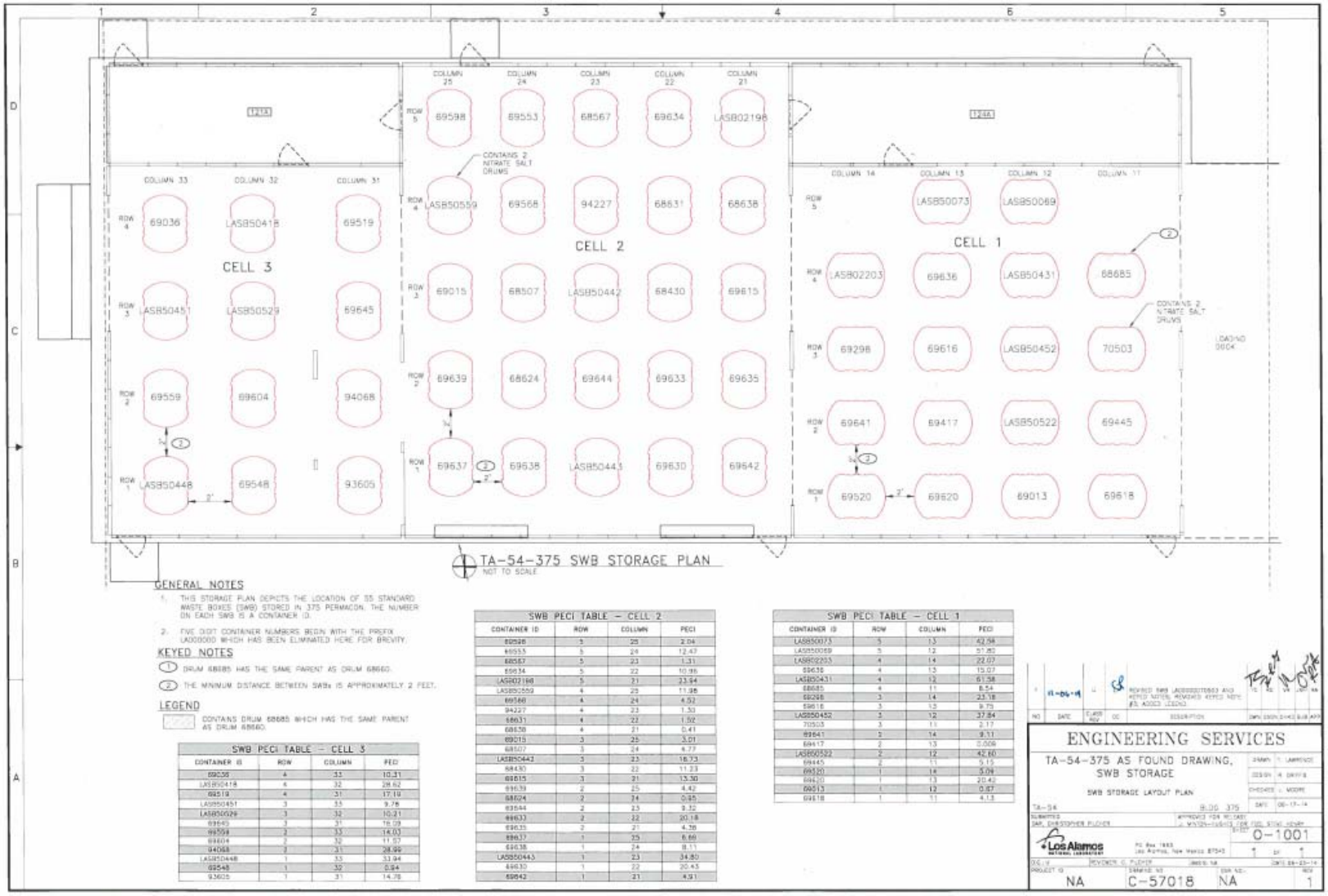


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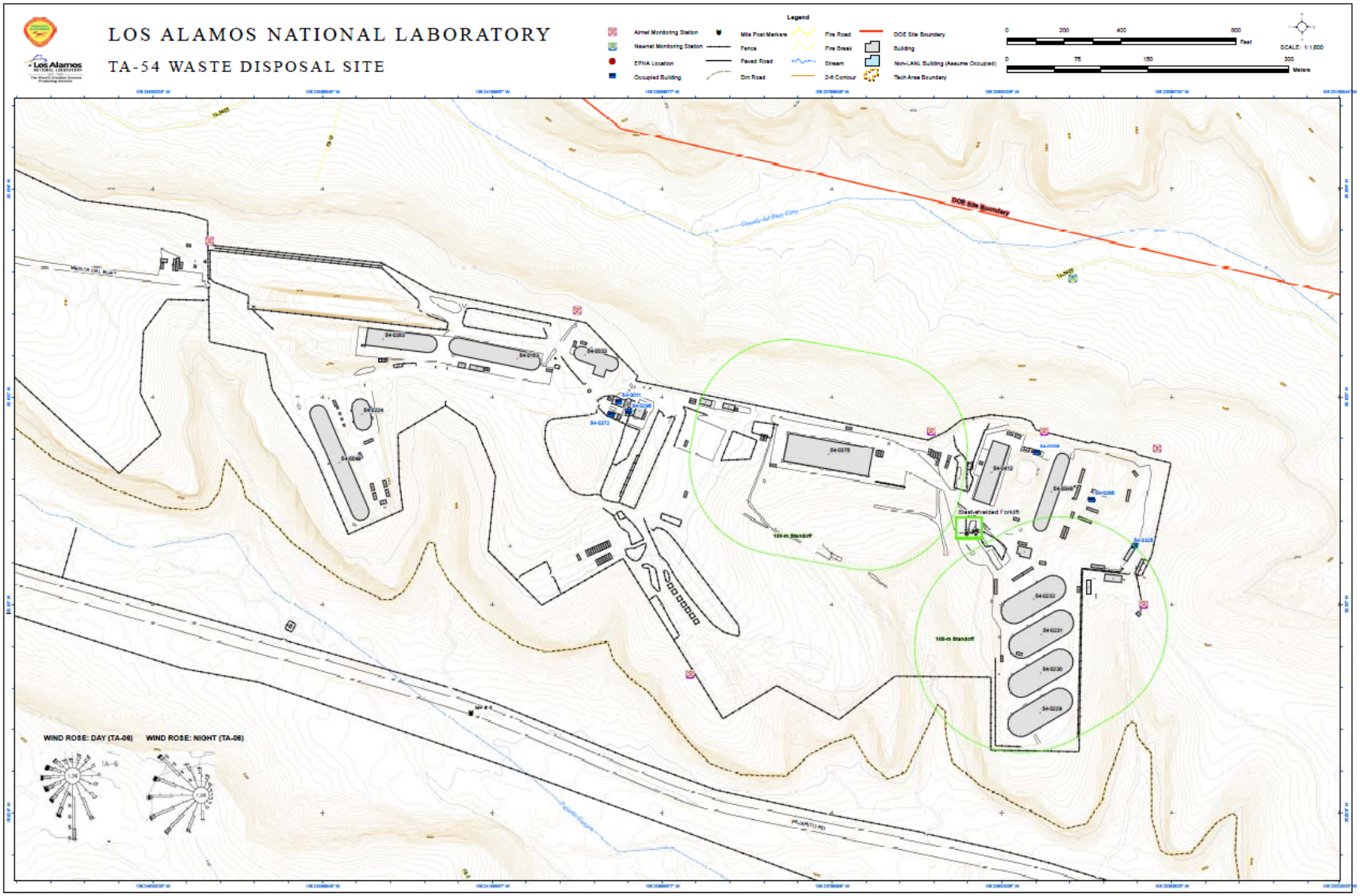
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TA-54-375 SWB STORAGE LAYOUT PLAN



APPENDIX 4
Page 1 of 1

TA-54 AREAG STRUCTURE LOCATION MAP



Attachment 7

Nitrate Salt-Bearing TRU Waste Container Monitoring

Effective Date: March 26, 2015

Hazard Class:	☐	Low	☒	Moderate	☐	High/Complex
Usage Mode:	☐	Reference	☒	UET	☐	Both UET & Reference

The Responsible Manager has determined that the following organizations' review/concurrence is required for the initial document release as well as subsequent major revisions. Review documentation is contained in the Document History File:

Environmental Compliance
EWMO Criticality Safety
EWMO Industrial Hygiene and Safety Professional
EWMO Shift Operations Supervisor
EWMO Quality Assurance
EWMO Radiation Protection
EWMO Shift Operations Manager
LTP EWMO Engineering
LTP-SSS Team Lead
Safety Basis
Subject-Matter Expert

Responsible Manager, LTP-SSS Operations Manager

David Frederici	/ 233890	/ /s/ David Frederici	/ 03/25/15
Name (print)	Z#	Signature	Date

Classification Review: ☐ N/A ☒ Unclassified ☐ UCNI ☐ Classified _____

Chris Pilcher	/ 233242	/ /s/ Chris Pilcher	/ 03/25/15
Name (print)	Z#	Signature	Date

Working Copy / Information Only (circle one)
Initials / Date: _____/_____

This document fully satisfies the requirements of P300, Integrated Work Management, in order to systematically describe the work activity, the associated hazards, and the controls that **MUST** be employed to mitigate the risks.

REVISION HISTORY

Document No./Revision No.	Issue Date	Action	Description
EP-AREAG-FO-DOP-1246, R.0	May 29, 2014	New Procedure	Generated to incorporate EP-AREAG-SO-1237, TA-54 Area G Temperature Readings of Remediated Nitrate Salt Containers, EP-AREAG-SO-1244, TA-54 Area G Nitrate Waste Container Inspection. A Job hazard analysis was developed and controls incorporated into the procedure through precautions, limitations, warnings, cautions and notes.
EP-AREAG-FO-DOP-1246, R.1	Approved for Training	Major Revision	Revise procedure to incorporate container numbers into the procedure, checks, and actions for HVAC Low D/P and make editorial corrections as necessary. Section 6, added note to clarify Attachment 2 lists the container numbers. Correct step 5.[6] to revise word from smoking to smoke. Added Step 6.[8] to address container number discrepancies. This revision does not introduce any new hazards.
EP-AREAG-FO-DOP-1246, R.2	July 15, 2014	Major Revision	Revise procedure to incorporate ENV-CP comments and make editorial corrections as necessary. This revision does not introduce any new hazards.
EP-AREAG-FO-DOP-1246, R.3	August 1, 2014	Major Revision	Revise procedure to allow for performing the temperature measurements in TA-54-231 and TA-54-375 independent of each other. Allow for multiple infrared thermometers to be used. Delete control drum temperature readings throughout. Revise attachments to include a separate attachment for recording daily temperatures in each cell in TA-54-375. Make process improvement changes. Make editorial corrections as necessary. This revision does not introduce any new hazards. This revision is a total rewrite and revision bars have been omitted.
EWMO-AREAG-FO-DOP-1246, R.4	September 11, 2014	Major Revision	Revised procedure to change Procedure number from EP to EWMO. Deleted Step 6.[19] and the associated SOM initials for the daily review on Attachments 2 through 6. Moved Step 8.1[1] Operator signoff to the end of Sections 5 and 6. Deleted Step 8.1[1]. Delete SOM initials on attachments 2 through 6. Rev bars is in the left column display location of changes. No additional hazards were identified during this revision.

REVISION HISTORY (continued)

Document No./Revision No.	Issue Date	Action	Description
EWMO-AREAG-FO-DOP-1246, R.5	November 03, 2014	Major Revision	Revise procedure to incorporate the ability to use remote temperature indication from thermocouples and to update waste container numbers. This revision is a total rewrite and revisions bars have been omitted. This revision does not introduce any new hazards.
EWMO-AREAG-FO-DOP-1246, R.5 IPC-1	November 17, 2014	IPC	Revise procedure to change the drums in SWB LA00000070503 from "68553 and 69445" to "68540 and 68553". This revision does not introduce any new hazards.
EWMO-AREAG-FO-DOP-1246, R.6	March 26, 2015	Major Revision	Revise procedure to implement Specific Administrative Controls for daily visual inspection and monthly overpack inspection provided in AREAG-ESS-14-002-R3. This revision does not introduce any new hazards.

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1. PURPOSE

This procedure provides the instructions and directions for performing nitrate salt-bearing Transuranic (TRU) WASTE container monitoring.

2. SCOPE

Monitoring of nitrate salt-bearing waste performed within this procedure includes:

- Hourly visual inspections of waste containers in accordance with LANL Nitrate Salt-Bearing Waste Container Isolation Plan
- Daily visual inspections of waste containers in accordance with AREAG-ESS-14-002
- Daily and hourly temperature readings of waste containers in accordance with LANL Nitrate Salt-Bearing Waste Container Isolation Plan
- Monthly visual inspections of overpack closure in accordance with AREAG-ESS-14-002

This procedure applies to Los Alamos National Laboratory (LANL) Transuranic Programs (LTP) and Environmental and Waste Management Operations (EWMO) personnel who will be monitoring the nitrate salt TRU WASTE containers. Activities associated with the nitrate salt-bearing TRU WASTE containers and the associated storage locations other than identified in this procedure will require prior approval from the EWMO-Facility Operations Director (EWMO FOD) and the Associate Director of Environmental Programs.

Inspections required by Attachment E, Inspection Plan, of the LANL Hazardous Waste Permit are performed in accordance with EWMO-DOP-20215, EWMO RCRA Inspections and Notifications.

3. PRECAUTIONS AND LIMITATIONS

- Procedure steps marked with the **($)** symbol implement key requirements associated with the facility's safety basis. These steps may <u>not</u> be changed without engineering approval to ensure that the Technical Safety Requirements (TSRs) and other associated requirements are maintained.

- Safety basis requirements incorporated and controlled within this procedure include:
  - Standard Waste Boxes (SWBs) and Pipe Overpack Containers (POCs) containing remediated nitrate salt (RNS) waste **SHALL** remain closed. (ESS-14-002, SAC 3)
  - SWBs and POCs containing RNS waste **SHALL** be visually inspected daily for signs of degradation. (ESS-14-002, SAC 4)

3. PRECAUTIONS AND LIMITATIONS (continued)

- Activities, items, and containers **SHALL** satisfy approved design specifications, regulatory requirements, process-specific parameters, and procedural requirements. Activities, items, or containers that do not conform to the approved specifications and requirements are considered nonconforming and Nonconformance Reports (NCRs) **SHALL** be generated in accordance with P330-6, Nonconformance Reporting, as required.

- When a worker observes an unsafe condition or act that may pose an imminent danger or other safety concern/hazard, the worker has the authority and responsibility to inform the worker engaged in the work and request that the work activity be paused and/or stopped based on the risk posed to the individual, the employees, the environment, or the facility in accordance with P101-18, Procedure for Pause/Stop Work.

- Not Applicable (N/A) is documented on the attachments during the performance of this procedure indicating information that is not required to be recorded.

- Personnel associated with this procedure **SHALL** review and understand the requirements of the Radiological Work Permit (RWP).

- Personal protective equipment (PPE) **SHALL** be worn as required by the RWP and Industrial Hygiene personnel.

- To comply with the intent of the As Low As Reasonably Achievable (ALARA) Program, all personnel **SHALL** apply the principles of time, distance, and shielding when working with radiological materials.

- Infrared thermometer is equipped with a laser. Care should be taken to prevent pointing beam to eyes. Do not allow eyes of user or observers to become exposed to the beam.

- Waste containers with liquids (any amount or configuration) that have not been solidified (absorbed) and are stored or staged for a period longer than 24 hours **SHALL** be labeled "Free Liquids" and managed on secondary containment pallets or in structures designed to satisfy the secondary containment requirements (e.g., Sheds, Bldg. TA-54-1027, 1028, 1030, 1041, 144, 145, 146, and 177, and Dome 230).

- Support Services Subcontractors executing this procedure **SHALL** comply with the safety and health requirements documented in contractual agreements with the LANL.

4. PREREQUISITE ACTIONS

NOTE *The listed prerequisite actions may be completed in any order.*

4.1 Planning and Coordination

PIC/Designee

[1] **ENSURE** that the performance of this procedure has been scheduled on the TA-54 Area G schedule.

[2] **ENSURE** that the procedure is the latest revision, and **IDENTIFY** this document as Working Copy or Information Only on the Title Page.

[3] **ENSURE** that, as a minimum, the following personnel trained to the use of this procedure are available for the performance of this procedure, as required:

- Two Operators
- One Radiological Control Technician (RCT) [when performing operations within a Contamination Area (CA)]

[4] **ENSURE** that a pre-job briefing is conducted for all personnel involved in the performance of this procedure in accordance with EP-DIV-AP-0112, EWMO Pre-Job Briefings.

Operator/Designee

[5] **IF** performing Section 6, Temperature Readings of Nitrate Salt TRU Waste Containers, **THEN:**

[A] **ENSURE** that the applicable PermaCon round sheet (i.e., Dome TA-54-231, Dome TA-54-375) is completed.

[B] **ENSURE** that an RWP has been issued for the planned activity, as applicable.

4.2 Materials and Equipment

4.2.1 Measuring and Test Equipment (M&TE)

Operator/Designee

[1] **IF** performing Section 6,
AND an infrared thermometer is to be used to obtain the waste container temperatures,
THEN:

[A] **ENSURE** that a calibrated infrared thermometer is available.

[B] **RECORD** the following infrared calibration information on Attachment 2 through 6, as applicable:
- Brand name
- Model number
- Calibration due date
- File number

[C] **IF** the infrared thermometer has exceeded the calibration due date,
THEN:

[a] **NOTIFY** the TA-54 Operations Center of the discrepancy.

[b] **OBTAIN** another infrared thermometer that is within the calibration due date.

[c] **GO** to Step 4.2.1[1][A].

5. INSTRUCTIONS—VISUAL INSPECTIONS OF NITRATE SALT TRU WASTE CONTAINERS

This section is a stand-alone section and may be performed independently of, or in conjunction with, other Instructions sections.

This activity will be performed at a minimum of once an hour to meet the requirements of the LANL Nitrate Salt-Bearing Waste Container Isolation Plan. Performance of the first inspection of the day shift is credited to meet the daily surveillance frequency of AREAG-ESS-14-002, SAC 4.

NOTE *Multiple storage locations may be visually inspected concurrently.*

Operator/Designee

[1] **ENSURE** that the prerequisite actions have been completed.

NOTE *Visual inspections at TA-54-231 and TA-54-375 are conducted from outside of the PermaCon through the windows.*

[2] **IF** assuming nitrate drum observation (NDO) duties,
THEN DOCUMENT the following in the Comments section of Attachment 1, Nitrate Salt TRU Waste Container Visual Inspection Data Sheet:
- Time and assumption of duties
- Signature and Z number

[3] **IF** turning over NDO duties,
THEN DOCUMENT the following in the Comments section of Attachment 1:
- Time and turnover of duties
- Printed name of relief
- Signature

[4] **PROVIDE** a description of any unsatisfactory conditions, notifications, and corrective actions in the Comments section of Attachment 1.

[5] **IF** performing the first hourly inspection of the night shift,
THEN RECORD "N/A" (not applicable) and **DRAW** a line through the first row of Attachment 1.

5. INSTRUCTIONS—VISUAL INSPECTIONS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

[6] **RECORD** the following information on Attachment 1:

- Date range and time (24 hours)
- Storage Area (e.g., TA-54-231 PermaCon or TA-54-375 PermaCon)

[7] **DETERMINE** whether the following applicable PermaCon HVAC system components (TA-54-231 or TA-54-375) are operational, and **CHECK** (√) YES or NO on Attachment 1:

TA-54-231

- FE-1000, ON and operating
- FE-2000, ON and operating
- FE-3000, ON and operating
- FE-4000, ON and operating
- PDI-1000 and PDI-2000 alarm light are not illuminated (panel outside cell)

TA-54-375

- FE-001, VFD-001 is ON and set to HAND, 30 to 60 Hz, and
- FE-002, VFD-002 is ON and set to HAND, 30 to 60 Hz, and
- PDA-001, PDA-002, and PDA-003 alarm light are not illuminated (panel outside cell)

[8] **IF** NO was checked (√) in the previous step,
THEN:

[A] **GO TO** EP-AREAG-RM-ARP-1123, 231 PermaCon Low Cell D/P Alarm, or EP-AREAG-RM-ARP-1150, 375 PermaCon Low Cell D/P Alarm, as applicable.

[B] **NOTIFY** the TA-54 Operations Center and Shift Operation Manager (SOM) for applicable actions.

5. INSTRUCTIONS—VISUAL INSPECTIONS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

NOTE *The first hourly inspection of the day shift of waste containers at TA-54-375 containing RNS waste is credited to meet the inspection frequency of AREAG-ESS-14-002.*

[9] **($) VISUALLY INSPECT** nitrate salt waste containers for signs of degradation, indications of an abnormal condition including an internal reaction (e.g., chemical/thermal), and/or loss of container integrity: (ESS-14-002, SAC 4)

- Evidence of deterioration such as signs of discoloration, paint peeling or yellowing
- Loss of container integrity such as evidence of leakage, or lid compromised
- Bulging such as pressurized, expansion of side walls, or round bottom
- Chemical reaction such as smoke or release of internal contents to atmosphere
- Signs of smoke and fire from a container

NOTE 1 *During back-shifts or off-shifts, or if the TA-54 Operations Center is not available, the SOM can be notified directly at 505-231-8289. Additional notifications to the Emergency Operations Support Center (EOSC), 505-667-6211, or 911, are performed based upon the severity of the situation or in accordance with direction from the SOM.*

NOTE 2 *Any follow-up calls to 911 should be conducted at a safe location from the incident after the activation of a manual pull.*

[10] **IF** a chemical reaction such as smoke, fire, or release of internal contents to the atmosphere are discovered,
THEN:

[A] **ACTIVATE** the manual pull station in the general area of the incident if safe to do so.

[B] **PERFORM** an Emergency response in accordance with EP-DIV-BEP-20048, EWMO Division Building Emergency Plan (BEP), to include:

- **SUSPEND** work.
- **WARN** others.
- **ISOLATE** immediate area.
- **EVACUATE** to an upwind Assembly/Muster area from the incident.
- **MAKE** notifications [e.g., TA-54 Operations Center, EOSC, 911].

[C] **CHECK** (√) UNSAT for the inspection location, and **DOCUMENT** the condition in the Comments section of Attachment 1 when in a safe area and at a time when operationally convenient.

5. INSTRUCTIONS—VISUAL INSPECTIONS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

[11] **IF** evidence of deterioration is discovered, such as signs of discoloration, paint peeling or yellowing, loss of container integrity such as evidence of leakage or a compromised lid, bulging, pressurization (expansion of side walls, or round bottom) are discovered, **THEN:**

[A] **PERFORM** an off-normal response in accordance with EP-DIV-BEP-20048, to include:

- **SUSPEND** work.
- **WARN** others.
- **ISOLATE** the immediate area.
- **MOVE-AWAY** upwind from the area of concern.
- **MAKE** notifications (e.g., TA-54 Operations Center).

[B] **CHECK** (√) UNSAT for the status of the inspection location, and **DOCUMENT** the condition in the Comments section of Attachment 1 when in a safe area and at a time when operationally convenient.

[12] **CHECK** (√) SAT for the status of the affected inspection location on Attachment 1.

[13] **RECORD** initials and Z number on Attachment 1.

[14] **REPEAT** Steps 5.[2] through 5.[13] until each nitrate salt TRU WASTE container storage location has been visually inspected.

[15] **PRINT** name, **SIGN**, and **RECORD** Z#, initials, and date on Attachment 1.

6. INSTRUCTIONS—TEMPERATURE READINGS OF NITRATE SALT TRU WASTE CONTAINERS

This section is a stand-alone section and may be performed independently of, or in conjunction with, other Instructions sections.

This section provides the instructions for performing hourly or daily temperature readings.

NOTE 1 *Waste container temperature measurements are obtained by entering the applicable PermaCon (e.g., TA-54-231 or TA-54-375) Contamination Area and individually measuring and recording the waste container temperatures or by observing the waste container temperature on the computer located in the TA-54-375 PermaCon Control Room.*

NOTE 2 *The temperature indications for each waste container with an input to the TA-54-375 PermaCon Control Room computer are labeled with the waste container number except for the ambient temperature thermocouple which is labeled AMBIENT.*

NOTE 3 *Separate attachments are provided to allow for recording daily waste container temperatures independently as listed below:*

- *Attachment 2, TA-54 Area G TA-54-231 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet*
- *Attachment 3, TA-54 Area G TA-54-375 Cell 1 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet*
- *Attachment 4, TA-54 Area G TA-54-375 Cell 2 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet*
- *Attachment 5, TA-54 Area G TA-54-375 Cell 3 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet*

NOTE 4 *Attachment 6, TA-54 Area G Nitrate Salt TRU Waste Container Hourly Temperature Data Sheet, is set up for documenting hourly readings of one or more containers as directed by the LTP-SSS management.*

Operator/Designee

[1] **ENSURE** that all prerequisite actions have been completed.

6. INSTRUCTIONS—TEMPERATURE READINGS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

[2] **PROVIDE** a description of any unsatisfactory conditions, notifications, and corrective actions in the Comments section of Attachment 2 through 6, as applicable.

[3] **IF** at any time during the performance of this section a chemical reaction such as smoke, fire, or release of internal contents to the atmosphere is discovered,
THEN:

[A] **ACTIVATE** the manual pull station in the general area of the incident if safe to do so.

[B] **PERFORM** an Emergency response in accordance with EP-DIV-BEP-20048, to include:
- **SUSPEND** work.
- **WARN** others.
- **ISOLATE** the immediate area.
- **EVACUATE** to an upwind Assembly/Muster Area from the incident.
- **MAKE** notifications (e.g., TA-54 Operations Center, EOSC, 911).

[C] **DOCUMENT** the condition in the Comments section of the applicable attachment when in a safe area and at a time when operationally convenient.

[4] **IF** at any time during the performance of this section evidence of deterioration is discovered, such as signs of discoloration, paint peeling or yellowing, loss of container integrity such as evidence of leakage or a compromised lid, bulging, pressurization (expansion of side walls, or round bottom) are discovered,
THEN:

[A] **PERFORM** an off-normal response in accordance with EP-DIV-BEP-20048, to include:
- **SUSPEND** work.
- **WARN** others.
- **ISOLATE** the immediate area.
- **MOVE-AWAY** upwind from the area of concern.
- **MAKE** notifications (e.g., TA-54 Operations Center).

[B] **DOCUMENT** the condition in the Comments section of the applicable attachment when in a safe area and at a time when operationally convenient.

6. INSTRUCTIONS—TEMPERATURE READINGS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

[5] **DETERMINE** whether the daily or hourly temperature readings are to be conducted as directed by the SOM.

[6] **RECORD** the date range and start time on the applicable attachment.

[7] **DETERMINE** the ambient temperature (e.g., the wall of the contamination control enclosure or designated location using an infrared thermometer or the AMBIENT temperature indication on the TA-54-375 PermaCon Control Room computer), and **RECORD** the ambient temperature (in °F) on the applicable attachment.

NOTE 1 *Attachments 2 through 5 are pre-populated with the container numbers for TA-54-231 PermaCon and for Cells 1, 2, and 3 of TA-54-375 PermaCon.*

NOTE 2 *SWBs that were not packaged for Waste Isolation Pilot Plant (WIPP) shipment (without a LASBxxxxx number) identify the location of the nitrate salt-bearing drum inside by the location of the container label on the outside of the SWB.*

NOTE 3 *SWBs that were packaged for WIPP shipment (with a LASBxxxxx number) do not have the location of the nitrate salt-bearing drum identified on the outside of the SWB.*

NOTE 4 *The temperature indications for each waste container with an input to the TA-54-375 PermaCon Control Room computer are labeled with the waste container number except for the ambient temperature thermocouple which is labeled AMBIENT.*

[8] **IF** the nitrate salt-bearing drum location within the SWB is known,
THEN OBTAIN the nitrate salt-bearing drum temperature using one or both of the following methods and **RECORD** the container number, as applicable, and temperature on the applicable attachment:

- **MEASURE** the temperature (in °F) on the top approximate center of each nitrate salt drum, through the SWB lid, using an infrared thermometer
- **READ** the SWB temperature (°F) indication on the TA-54-375 PermaCon Control Room computer

6. INSTRUCTIONS—TEMPERATURE READINGS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

[9] **IF** the nitrate salt-bearing drum location within the SWB is **NOT** known, **THEN MEASURE** the temperature (in °F) on the top approximate center of each drum in the SWB, through the SWB lid, using an infrared thermometer, and **RECORD** the container number, as applicable, and the highest temperature measurement on the applicable attachment.

[10] **IF** a container's temperature is greater than 10 °F higher than the ambient temperature, **THEN:**

[A] **EXIT** the PermaCon.

[B] **NOTIFY** the TA-54 Operations Center of the discrepancy, **REPORT** the container's temperature and amount greater than ambient, and **REQUEST** direction.

TA-54 Operations Center

[C] **NOTIFY** the Operations Manager and EOSC at 505-667-6211 of the discrepancy.

[D] **IF** a container's temperature is greater than 15 °F higher than the ambient temperature, **THEN REQUEST** support from EOSC at 505-667-6211 and **NOTIFY** the Operations Manager of the discrepancy.

Operator/Designee

[11] **IF** a deficiency with a container number pre-populated on the attachment is discovered, **THEN:**

[A] **SUSPEND** operations.

[B] **NOTIFY** the TA-54 Operations Center and SOM for guidance and direction.

[12] **REPEAT** Steps 6.[8] through 6.[11] for the current location until all of the nitrate salt container temperatures have been recorded.

6. INSTRUCTIONS—TEMPERATURE READINGS OF NITRATE SALT TRU WASTE CONTAINERS (continued)

NOTE *The ambient temperature of the contamination control enclosure will be measured a second time after measuring the temperature of the last nitrate salt waste container.*

[13] **DETERMINE** the ambient temperature [e.g., of the contamination control enclosure using an infrared thermometer or the AMBIENT temperature indication on the TA-54-375 PermaCon Control Room computer], and **RECORD** the ambient temperature (in °F) on the applicable attachment.

[14] **RECORD** the end time and **INITIAL** on the applicable attachment.

[15] **RECORD** "N/A" (not applicable) for temperature readings that were not recorded and **DOCUMENT** an explanation in the Comments section of the applicable attachment.

[16] **IF** a temperature is recorded incorrectly,
THEN RECONCILE the discrepancy and **INITIAL** on the applicable attachment.

[17] **REPEAT** Steps 6.[1] through 6.[16] for remaining nitrate salt-bearing container storage locations (e.g., TA-54-231 and TA-54-375).

[18] **PRINT** name, **SIGN**, and **RECORD** Z#, initials, and date on the applicable attachments (Attachments 2 through 6).

7. INSTRUCTIONS—OVERPACK INSPECTION OF REMEDIATED NITRATE SALT WASTE CONTAINERS

This section is a stand-alone section and may be performed independently of, or in conjunction with, other Instructions sections.

This section provides the instructions for performing monthly inspections of the closure of outer SWBs and POCs containing RNS waste.

Operator/Designee

[1] **ENSURE** that all prerequisite actions have been completed.

[2] **RECORD** the date and time for beginning the RNS waste container overpack inspection on Attachment 7, TA-54 Area G Remediated Nitrate Salt Monthly Overpack Inspection Data Sheet.

NOTE *Visual inspections at TA-54-375 are conducted from outside of the PermaCon through the windows.*

[3] **($) VISUALLY INSPECT** the outer SWBs and POCs containing RNS waste to verify that the containers are closed (i.e., lid is in place and secured), and **CHECK** (√) SAT or UNSAT on Attachment 7 for the waste containers within each cell at TA-54-375. (ESS-14-002, SAC 3)

[4] **IF** UNSAT is checked for the inspection location,
THEN:

[A] **PERFORM** an off-normal response in accordance with EP-DIV-BEP-20048, to include:

- **SUSPEND** work.
- **WARN** others.
- **ISOLATE** the immediate area.
- **MOVE-AWAY** upwind from the area of concern.
- **MAKE** notifications (e.g., TA-54 Operations Center).

[B] **DOCUMENT** the condition in the Comments section of Attachment 7 when in a safe area and at a time when operationally convenient.

[5] **PRINT** name, **SIGN**, and **RECORD** Z#, initials, and date on the Attachment 7.

8. INSTRUCTIONS—TA-54 AREA G EAST ENTRANCE/ROAD INTO AREA G MONITORING

This section is a stand-alone section and may be performed independently of, or in conjunction with, other Instructions sections.

This section is performed in response to significant precipitation (rain fall greater than 0.25 inches within 30 minutes or greater than a 0.5 inches in 24 hours of rain fall) that may cause damage or road deterioration of east entrance/road into TA-54 Area G. Weather information may be obtained from TA-54 Meteorological Station or National Oceanic and Atmospheric Administration (NOAA).

Shift Operations Manager

[1] **VISUALLY INSPECT** the TA-54 Area G East entrance/road for deterioration (e.g., washout).

[2] **IF** deterioration is observed,
THEN:

[A] **NOTIFY** Maintenance and Site Services.

[B] **GENERATE** a Facility Service Request (FSR) to repair roadway as applicable.

[C] **NOTIFY** the Los Alamos Fire Department (LFPD) of road condition.

9. POST-PERFORMANCE ACTIVITY

9.1 Disposition

SOM or designee

[1] **REVIEW** the applicable attachments (Attachments 1 through 7) for accuracy and completeness.

[2] **PRINT** name, **SIGN**, and **RECORD** Z#, initials, and date on the applicable attachments (Attachments 1 through 6).

NOTE *Completing a Post-Job Review may be accomplished using the applicable P300 form or online (the preferred method since the institution has access to feedback and lessons learned http://int.lanl.gov/safety/iwmc/ [Click on the Submit IWD Part 4 Post-Job Review]).*

[3] **IF** any of the following occur:

- A new activity was completed for the first time
- A request was made by anyone involved with the performance of this procedure to perform a post-job review
- An abnormal event occurred
- A revision to an existing procedure was issued and it has been determined by the procedure owner or designee that a Post-Job Review is required

THEN PERFORM a Post-Job Review in accordance with P300.

[4] **IF** the Post-Job Review identified any necessary changes to this procedure,
THEN INITIATE a revision to this procedure.

9.2 Records Processing

Operator/Designee

[1] Ensure that documents generated by the performance of this procedure are processed as follows:

Record Identification	Record Type Determination	Protection/Storage Methods	Processing Instructions
Attachment 1, Nitrate Salt TRU Waste Container Visual Inspection Data Sheet Attachment 2, TA-54 Area G TA-54-231 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet Attachment 3, TA-54 Area G TA-54-375 Cell 1 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet Attachment 4, TA-54 Area G TA-54-375 Cell 2 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet Attachment 5, TA-54 Area G TA-54-375 Cell 3 Nitrate Salt TRU Waste Container Daily Temperature Data Sheet Attachment 6, TA-54 Area G Nitrate Salt TRU Waste Container Hourly Temperature Data Sheet Attachment 7, TA-54 Area G Remediated Nitrate Salt Monthly Overpack Inspection Data Sheet	QA Record	Supervision **SHALL** implement a reasonable level of protection to prevent loss and degradation. Records should be maintained in a one-hour fire rated metal file cabinet when not in use.	When the records are ready for final disposition, the record is transferred to Records Management in accordance with EP-DIR-AP-10003, Records Management Procedure For ADEP Employees.

10. REFERENCES

AREAG-ESS-14-002, Transuranic (TRU) Waste Drums Containing Treated Nitrate Salts May Challenge the Safety Basis

EP-AREAG-RM-ARP-1123, 231 PermaCon Low Cell D/P Alarm

EP-AREAG-RM-ARP-1150, 375 PermaCon Low Cell D/P Alarm

EP-DIR-AP-10003, Records Management Procedure For ADEP Employees

EP-DIV-AP-0112, EWMO Pre-Job Briefings

EP-DIV-BEP-20048, EWMO Division Building Emergency Plan (BEP)

EWMO-DOP-20215, EWMO RCRA Inspections and Notifications

LANL Hazardous Waste Facility Permit

LANL Nitrate Salt-Bearing Waste Container Isolation Plan

P101-18, Procedure for Pause/Stop Work

P300, Integrated Work Management

P330-6, Nonconformance Reporting

ATTACHMENT 1
Page 1 of 2

NITRATE SALT TRU WASTE CONTAINER VISUAL INSPECTION DATA SHEET

NOTE *The first hourly inspection of the day shift of waste containers at TA-54-375 containing RNS waste is credited to meet the inspection frequency of AREAG-ESS-14-002. The first line of this Attachment is not used during the night shift.*

5.[6] Date: From _____ to _____

First Day Shift Inspection Time (5.[5]/5.[6])	Remediated Nitrate Salt Storage Area	HVAC Operational (5.[7])	**($)** Visual Inspection (ESS-14-002, SAC 4) (5.[9])	Operator Initials and Z# (5.[13])
	TA-54-375 PermaCon	☐ YES ☐ NO	☐ SAT ☐ UNSAT	
Time (24 hrs) (5.[6])	Storage Area (e.g., 231, 375) (5.[6])	HVAC Operational (5.[7])	Visual Inspection (5.[10][C]/5.[11][B]/ 5.[12])	Operator Initials and Z# (5.[13])
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
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		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	
		☐ YES ☐ NO	☐ SAT ☐ UNSAT	

ATTACHMENT 1
Page 2 of 2

5.[2]/[3]/[4] Comments: _____

5.[15] Performed by:

Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date
Operator (print)	Signature	Z #	Initials	Date

9.1[2] Reviewed By:

SOM or designee (print)	Signature	Z #	Initials	Date

ATTACHMENT 2
Page 1 of 3

TA-54 AREA G TA-54-231 NITRATE SALT TRU WASTE CONTAINER DAILY TEMPERATURE DATA SHEET

6.[6] Date: From _____ to _____

	Monday 6.[6] Start Time: _____	Tuesday 6.[6] Start Time: _____	Wednesday 6.[6] Start Time: _____	Thursday 6.[6] Start Time: _____	Friday 6.[6] Start Time: _____	Saturday 6.[6] Start Time: _____	Sunday 6.[6] Start Time: _____
TA-54-231							
Calibrated Infrared Thermometer (4.2.1[1][B])	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____
Ambient Temperature (6.[7])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
Container ID #	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
S818435							
S802833							
S801676							
S816810							
70069							
S822844							
S825879							
S793724							
S813545							
S822713							
S802739							
69907							
S804995							
S816434							

ATTACHMENT 2
Page 2 of 3

6.[6] Date: From _____ to _____

Container ID #	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
TA-54-231 (continued)							
S805289							
S862888							
70072							
S823184							
S822599							
69904							
S805051							
S864213							
S853714							
S803078							
S825878							
S823124							
S804948							
S813385							
S842446							
Ambient Temperature (6.[13])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
End Time (6.[14])	_____	_____	_____	_____	_____	_____	_____
6.[14]	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____

ATTACHMENT 2
Page 3 of 3

6.[6] Date: From _____ to _____

6.[2] Comments: _____

6.[18] Performed by:

Operator (print)	Signature	Z#	Initials	Date
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	/	/	/	/

Operator (print)	Signature	Z#	Initials	Date
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	/	/	/	/

9.1[2] Reviewed by:

SOM or designee (print)	Signature	Z#	Initials	Date
	/	/	/	/

ATTACHMENT 3
Page 1 of 3

TA-54 AREA G TA-54-375 CELL 1 NITRATE SALT TRU WASTE CONTAINER DAILY TEMPERATURE DATA SHEET

6.[6] Date: From _____ to _____

	Monday 6.[6] Start Time: _____	Tuesday 6.[6] Start Time: _____	Wednesday 6.[6] Start Time: _____	Thursday 6.[6] Start Time: _____	Friday 6.[6] Start Time: _____	Saturday 6.[6] Start Time: _____	Sunday 6.[6] Start Time: _____
TA-54-375 Cell 1							
Calibrated Infrared Thermometer (4.2.1[1][B])	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____
Ambient Temperature (6.[7])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
Container ID #	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
68685							
LA00000070503 68540							
LA00000070503 68553							
69445							
69618							
69013							
LASB50522							
LASB50452							
LASB50431							
LASB50069							
LASB50073							
69636							
69616							
69417							

ATTACHMENT 3
Page 2 of 3

6.[6] Date: From _____ to _____

Container ID #	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
TA-54-375 Cell 1 (continued)							
69620							
69520							
69641							
69298							
LASB02203							
Ambient Temperature (6.[13])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
End Time (6.[14])	_____	_____	_____	_____	_____	_____	_____
6.[14]	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____

6.[2] Comments:

ATTACHMENT 3
Page 3 of 3

6.[6] Date: From _____ to _____

6.[18] Performed by:

Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date

Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date

9.1[2] Reviewed by:

SOM or designee (print)	/ Signature	Z#	Initials	/ Date

ATTACHMENT 4
Page 1 of 3

TA-54 AREA G TA-54-375 CELL 2 NITRATE SALT TRU WASTE CONTAINER DAILY TEMPERATURE DATA SHEET

6.[6] Date: From _____ to _____

	Monday 6.[6] Start Time: _____	Tuesday 6.[6] Start Time: _____	Wednesday 6.[6] Start Time: _____	Thursday 6.[6] Start Time: _____	Friday 6.[6] Start Time: _____	Saturday 6.[6] Start Time: _____	Sunday 6.[6] Start Time: _____
TA-54-375 Cell 2							
Calibrated Infrared Thermometer (4.2.1[1][B])	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____
Ambient Temperature (6.[7])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
Container ID #	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
LASB02198							
68638							
69615							
69635							
69642							
69630							
69633							
68430							
68631							
69634							
68567							
94227							
LASB50442							
69644							
LASB50443							
69638							

ATTACHMENT 4
Page 2 of 3

6.[6] Date: From _____ to _____

Container ID #	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
TA-54-375 Cell 2 (continued)							
68624							
68507							
69568							
69553							
69598							
LASB50559							
69015							
69639							
69637							
Ambient Temperature (6.[13])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
End Time (6.[14])	_____	_____	_____	_____	_____	_____	_____
6.[14]	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____

6.[2] Comments:

ATTACHMENT 4
Page 3 of 3

6.[6] Date: From _____ to _____

6.[18] Performed by:

Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date
Operator (print)	/ Signature	Z#	Initials	/ Date

9.1[2] Reviewed by:

SOM or designee (print)	/ Signature	Z#	Initials	/ Date

ATTACHMENT 5
Page 1 of 3

TA-54 AREA G TA-54-375 CELL 3 NITRATE SALT TRU WASTE CONTAINER DAILY TEMPERATURE DATA SHEET

6.[6] Date: From _____ to _____

	Monday 6.[6] Start Time: _____	Tuesday 6.[6] Start Time: _____	Wednesday 6.[6] Start Time: _____	Thursday 6.[6] Start Time: _____	Friday 6.[6] Start Time: _____	Saturday 6.[6] Start Time: _____	Sunday 6.[6] Start Time: _____
TA-54-375 Cell 3							
Calibrated Infrared Thermometer (4.2.1[1][B])	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____
Ambient Temperature (6.[7])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
Container ID #	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
69519							
69645							
94068							
93605							
69548							
69604							
LASB50529							
LASB50418							
69036							
LASB50451							
69559							
LASB50448							
87823							
87825							
87826							
87827							

ATTACHMENT 5
Page 2 of 3

6.[6] Date: From _____ to _____

Container ID #	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
TA-54-375 Cell 3 (continued)							
Ambient Temperature (6.[13])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
End Time (6.[14])	_____	_____	_____	_____	_____	_____	_____
6.[14]	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____	Operator: _____ Operator:_____

6.[2] Comments:

ATTACHMENT 5
Page 3 of 3

6.[18] Performed by:

Operator (print)	Signature	Z#	Initials	Date
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Operator (print)	Signature	Z#	Initials	Date
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9.1[2] Reviewed by:

SOM or designee (print)	Signature	Z#	Initials	Date
	/	/	/	/

ATTACHMENT 6
Page 1 of 3

TA-54 AREA G NITRATE SALT TRU WASTE CONTAINER HOURLY TEMPERATURE DATA SHEET

6.[6] Date: From _____ to _____ Location: _____

	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____	Start Time: 6.[6] _____
Calibrated Infrared Thermometer (4.2.1[1][B])	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____	Brand: _____ Model: _____ Cal. Due Date: _____ File Number _____
Ambient Temperature (6.[7])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
Container ID # (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])

ATTACHMENT 6
Page 2 of 3

6.[6] Date: From _____ to _____ Location: _____

Container ID # (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])	Temp (°F) (6.[8]/6.[9])
Ambient Temperature (6.[13])	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F	_____°F
End Time (6.[14])	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
6.[14]	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____	Operator: _____ Operator: _____

ATTACHMENT 6
Page 3 of 3

6.[6] Date: From _____ to _____ Location: _____

6.[2] Comments:

6.[18] Performed by:

Operator (print)	Signature	Z#	Initials	Date
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9.1[2] Reviewed by:

SOM or designee (print)	Signature	Z#	Initials	Date
	/	/	/	/

ATTACHMENT 7
Page 1 of 1

TA-54 AREA G REMEDIATED NITRATE SALT MONTHLY OVERPACK INSPECTION DATA SHEET

7.[2] Date and time: _____

Remediated Nitrate Salt Storage Area	**($)** Overpack Closure Visual Inspection (7.[3]) (ESS-14-002, SAC 3)
TA-54-375 Cell 1	☐ SAT ☐ UNSAT
TA-54-375 Cell 2	☐ SAT ☐ UNSAT
TA-54-375 Cell 3	☐ SAT ☐ UNSAT

Comments: _____

_____

_____

_____

_____

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_____

7.[5] Performed by: _____ / _____ / _____ / _____ / _____
Operator (print) Signature Z # Initials Date

9.1[2] Reviewed By: _____ / _____ / _____ / _____ / _____
SOM or designee (print) Signature Z # Initials Date

Attachment 8

EP-DIV-BEP-20048, R.1

EWMO Division Building Emergency Plan (BEP)

Effective Date: 12/10/13

The Responsible Manager has determined that the following organizations' review/concurrence is required for the initial document, and for major revisions, a same type and level review is required. Review documentation is contained in the Document History File:

Emergency Planning and Preparedness
Operations Center SME
Engineering
Facility Operations Director (FOD)
Fire Protection Engineering
Industrial Hygiene and Safety
Operations Managers
Quality Assurance
Training
Radiation Protection
Shift Operations Managers
SME WCRRF, RANT, TA-54 SOSs

Responsible Manager, EWMO Facility Operations Director

Steve M. Henry	/ 219172	/ /s/ Steve Henry	/ 12/10/13
Name (print)	Z#	Signature	Date

Classification Review: ☐ N/A ☒ Unclassified ☐ UCNI ☐ Classified _____

Teri Tingey	/ 200975	/ /s/ Teri Tingey	/ 12/10/13
Name (print)	Z#	Signature	Date

Working Copy / Information Only (circle one)
Initials / Date: _____/_____

LA-UR-14-23780

REVISION HISTORY

Document No./Revision No.	Issue Date	Action	Description
EP-DIV-BEP-20048, Rev. 0	December 9, 2013	New Procedure	This new Division-level building emergency plan supersedes the following facility-level BEPs: • EP-DIV-PLAN-10, Radioassay and Nondestructive Testing Facility Emergency Plan • EP-DIV-PLAN-05, Waste Characterization, Reduction, and Repackaging Facility Building Emergency Plan • EP-DIV-PLAN-01, TA-54 Areas G, H, J, L, and Administrative Area Building Emergency Plan • TA-21-PLAN-00008, TA-21 Emergency Plan • EP-DIV-BEP-0102, TA-54 Buildings 1009 and 1014 Building Emergency Plan EP-AREAG-RM-AOP-0421, Security Incident Notifications, EP-WCRR-RM-AOP-0208, Special Shapes, EP-AREAG-RM-ARP-0302, Evacuation Alarm, EP-RANT-RMC-ARP-0303, Evacuation Alarm, EP-AREAG-RM-EOP-0206, Seismic Event, EP-AREAG-RM-EOP-0207, Vehicle Accident, EP-RANT-RMB-EOP-0207, Vehicle Accident, EP-RANT-RMB-EOP-0208, Seismic Event, EP-RANT-RM-EOP-0206, Injured Person with Contamination, EP-WCRR-RM-EOP-0304, Security Threat, EP-WCRR-RM-EOP-0308, Seismic Event, EP-WCRR-RM-EOP-0309, Injured Person at WCRRF. This procedure also supersedes EP-DIV-AP-20045, EWMO Abnormal Event Notification Process. EP-DIV-AP-20045 requirements were incorporated into EWMO Response procedure and references LANL Site Requirements. Nuclear Environmental Site (NES) are also included in the BEP. No hazardous analysis was required; this is considered and administrative procedure.
EP-DIV-BEP-20048, Rev. 1	December 10, 2013	Minor Revision	Revise procedure to remove the OUO designation in accordance with SAFE-1. This revision does not introduce any new hazards.

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Appendix 10, TA-21 Assembly/Muster Station Area 47

1. PURPOSE

The Environmental and Waste Management Operations (EWMO) Division Building Emergency Plan (BEP) captures the Site Emergency Management and Response program requirements from Los Alamos National Laboratory (LANL) procedure P1201-4, Emergency Procedures and Protective Actions and P315, Conduct of Operations Manual. In addition, the EWMO BEP identifies area-specific response requirements for (1) Technical Area (TA)-50-69 Waste Characterization, Reduction, and Repackaging Facility (WCRRF) complex, (2) TA-54 Area G, H, J, L and TA-54 Administrative areas, (3) TA-54 Radioassay and Nondestructive Testing (RANT) Building 54-38 complex, (4) TA-21, and (5) Nuclear Environmental Sites (NES).

2. SCOPE

The EWMO BEP requirements apply to all personnel, subcontractors, tenants, and visitors entering the TA-54, RANT, WCRRF complex, TA-21, and NES.

Building residents who are assigned and qualified for escorting visitors assume the responsibility for ensuring that visitors possess the appropriate level of area-specific information (e.g., rules, regulations, exits, evacuation routes, assembly/muster areas, area specific alarms, and response procedures) necessary to respond appropriately in the event of an off-normal or emergency situation that may arise. Management has the overall responsibility for personnel accountability during an off-normal/emergency event.

The EWMO Division BEP will be reviewed on an annual basis and updated as necessary for changes that alter the scope of this document, corrections based on internal and audit findings, emergency drill and exercise lessons learned external changes in governing standards and references, and changes to facility operations and associated hazards.

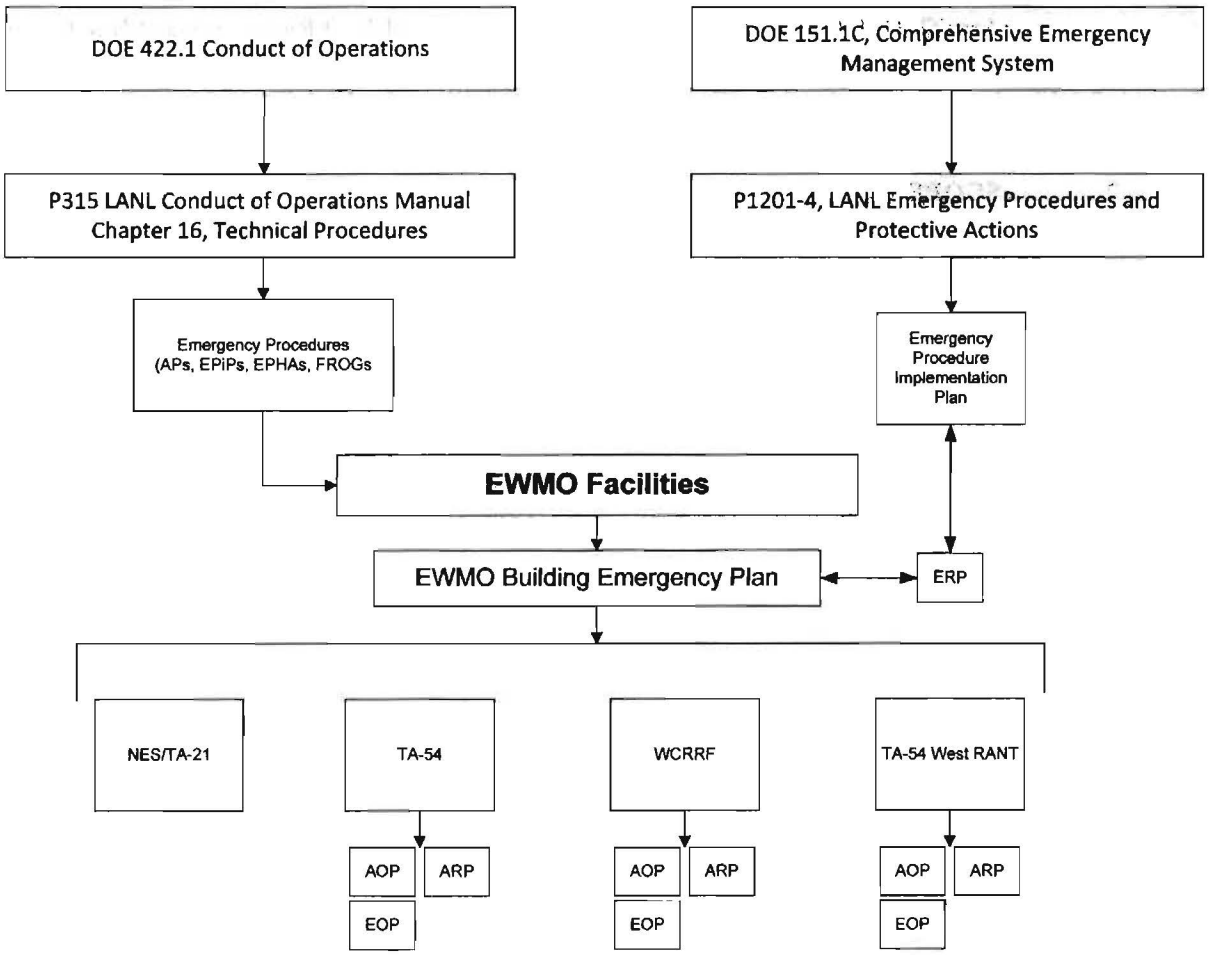
3. OVERVIEW

The EWMO Division BEP plays a key role in the successful implementation of the Site Emergency Management and Response program, Conduct of Operations, and area-specific response procedures for TA-54, WCRRF, RANT, TA-21 and NES. This plan also defines roles and responsibilities that are necessary to ensure that the chain of command is established and to ensure that employees respond correctly and consistently in a safe and timely manner when off-normal/emergency situations arise. Section 5, BEP Requirements, provides the requirements, roles, protective equipment, and standardized responses (i.e., Notification, Off-Normal, and Emergency) for employees working in EWMO facilities. Sections 6 through 10 provide building/area-specific requirements for WCRRF, TA-54, RANT, TA-21 and NES.

3. OVERVIEW (continued)

Figure 1, Emergency Management Process Requirements Flow-down illustrates the requirements derived from Department of Energy to LANL and into the EWMO BEP.

FIGURE 1, EMERGENCY MANAGEMENT PROCESS REQUIREMENTS FLOW-DOWN



4. RESPONSIBILITIES

4.1 First Responder at the Awareness Level

The first responder at the awareness level has the following responsibilities (i.e., first person at the scene of an off-normal/emergency event):

- Stops or suspends work
- Activates the appropriate alarm (i.e., fire, evacuation), as necessary
- Warns others in the immediate area of the off-normal/emergency event
- Secures the incident area to prevent others from entering
- Makes notifications to the Operation Centers, Emergency Operations and Support Center (EOSC) 7-6211, and/or 911 as appropriate

4.2 Shift Operations Manager/Facility Lead (SOM/FL)

NOTE *In EWMO facilities, the Shift Operations Manager (SOM) is the Facility Operations Director (FOD) designee in the field and assumes responsibilities as the Facility Leader (FL). The SOM/FL assumes the role of the FOD in the field. However, an Operations Manager (OM) may also conduct FL duties as long as the OM is trained, qualified, and knowledgeable of the area operations.*

The SOM/FL is the person in charge of the facility during an off-normal/emergency event and/or up until transfer to the Incident Commander (IC).

The SOM/FL has the following responsibilities:

- Coordinates with the Assembly/Muster Area Leader for personnel accountability, condition, and locations
- Ensures that 911 or EOSC 7-6211 has been called as necessary
- Updates the OM/designee of the situation
- Evaluates the event and potential hazards and determines whether additional evacuations are necessary
- Works with support personnel to mitigate the event within the EWMO facility

4.2 Shift Operations Manager/Facility Lead (SOM/FL) (continued)

- Available on-call outside normal working hours including nights, weekends, and holidays when assigned
- Determines appropriate actions for mitigation and notifications during an off-normal event
- Ensures appropriate actions are completed to protect the safety of workers, facility, equipment, records, and the environment
- Authorizes elevation of an off-normal event to an emergency event as necessary
- Makes notifications in accordance with respective response procedure
- Ensures that employees who may need special assistance are identified, and designates personnel to assist these employees
- Ensures accountability of all personnel
- Evaluates the potential hazards and determines the protective actions
- Briefs emergency responders and management personnel during an emergency
- Assists the IC in recovery and reentry efforts
- Transfers command and control to the IC and notifies Operations Center personnel when command and control is transferred

4.3 Incident Commander

Incident Commander is the formal title for the individual who is designated as the person in charge of an emergency response for the Site. This person will be a member of a designated emergency response organization and have completed formal training in emergency management and incident command.

NOTE *The IC will be from one of the formally designated and trained emergency response organizations from the Emergency Operations and Emergency Management (EO-EM), Los Alamos Fire Department (LAFD), SOC, or in unusual cases, from the Federal Bureau of Investigation (FBI) or other Federal agency, and will formally declare that he/she has assumed the IC role.*

- Manages the emergency event until mitigated or transferred back to the SOM/FL
- Authority to call out other response personnel and additional resources
- Assumes the role of IC during an emergency event

4.4 Shift Operations Supervisor

- Assists the SOM/FL to determine appropriate actions for mitigation and notifications during off-normal events
- Serves as a resource for the FL/IC and offsite responders during off-normal/emergency events
- Ensures that actions are initiated to protect the safety of site workers, programmatic equipment, records, and the environment
- Ensures that employees who require special assistance during an emergency are supported

4.5 Operations Center Operator

- Notifies personnel through various communication systems (e.g., E-pagers, public address system, land-line, two-way radio, cell phone, and face to face) on initial off-normal/emergency activities at WCRRF, TA-54, and TA-54 West RANT.
- Notifies adjacent facilities of off-normal/emergency events as applicable
- Facilitates command and control functions under the direction of the SOM/FL until turned over to the IC
- Records and logs initial and ongoing notifications in accordance with this plan
- Acts as a liaison between SOM/FL, IC, and the workers
- Coordinates accounting of personnel at the Assembly/Muster areas
- Assists in directing emergency response personnel and equipment to emergency site/areas
- Monitors the two-way radio base station and the Site Wide Alert Notification System (SWANS) radio
- Maintains a written log of off-normal and/or emergency events in the Operations Center log book
- Ensures that the SWANS radio is operational
- Develops and maintains the Emergency Contact List at the respective Operations Center (Appendices 3, 5, and 8)

4.6 Support Personnel (Environment, Safety, and Health)

The support personnel receive notification from the Operations Center and/or SOM/FL when an off-normal/emergency event arises as necessary.

- Acts a subject matter in their field of expertise (e.g., Industrial Hygiene/Safety) during off-normal/emergency events
- Supports IC or SOM/FL in developing remedial and recovery plans

4.7 Assembly/Muster Area Leader

- Assumes command of Assembly/Muster area
- Collects and gathers information from personnel who were at the incident site
- Liaison between Operations Center and personnel
- Initiates the accountability of personnel
- Makes notification to the respective Operations Center
- Ensures that personnel who may be radiologically contaminated are segregated from the general population
- Delegates tasks as necessary to employees at the Assembly/Muster area during an emergency event
- Directs vehicle traffic on roadways to ensure emergency response vehicles have an open route to the event area as necessary

4.8 Facility Resident

- Notifies Operations Center of off-normal/emergency events
- Notifies EOSC 7-6211 and/or 911 for emergency events
- Responds to off-normal/emergency events in accordance with the requirements of this plan and the facility-specific off-normal/emergency response procedures
- Performs assigned duties from Assembly/Muster Area Leader
- Performs escort responsibilities if assigned

4.9 Visitor

- Responds to alarms and notifications in the event of an off-normal/emergency event
- Stays with their designated escort during off-normal/emergency events

5. BEP REQUIREMENTS

5.1 Site Events

The Laboratory has identified several abnormal/emergency events (e.g., chemical, biological, radiological, fire, security, weather, vehicular accident, and personnel injury) that may affect the general laboratory population, the public, and the environment. These events and their responses are captured in LANL policies and procedures Table 1, General Site Events and References.

NOTE *Unless otherwise recommended or directed by EWMO management, the events listed in Table 2 below provide specific events and the associated reference that contains the response actions.*

TABLE 1, GENERAL SITE EVENTS AND REFERENCES

Bomb threat	P1201-4, LANL Emergency Procedures and Protective Actions
COOP	P1201-4
Fire, Smoke and Explosion	P1201-4
Flood	P1201-4
Hazardous Substance/Chemical Spill	P1201-4
Lightning	P1201-4
Power Outage	P1201-4
Security Concern	P1201-4
Seismic Event (Earthquake)	P1201-4
SIP/Stay Put	P1201-4
Snow and Ice	P1201-4
Suspicious/Unattended Packages	P1201-4
Unexploded Ordnance	P1201-4
Vehicle Accidents	P101-7, Vehicles and Pedestrian Safety
Work Related Injury, Illness	P102-2, Occupational Medicine
Workplace Violence	P724, Workplace Violence

5.2 Facility Specific Procedures

TA-54 and WCRRF Operations Centers maintain controlled copies of the facility-specific response procedures that apply to TA-54, WCRRF, and RANT. Four types of response procedures are used in accordance with P315, Conduct of Operations Manual, Section 16, Technical Procedures.

5.2.1 Abnormal Operating Procedure (AOP)

AOPs provide instructions for responding to events that affect several systems, threaten the safety envelope, or require action to mitigate damage.

5.2.2 Alarm Response Procedure (ARP)

ARPs direct the response of personnel to visible and audible alarms.

5.2.3 Emergency Operating Procedure (EOP)

EOPs provide instructions for responding to events that result in operation outside the safety envelope.

5.2.4 Emergency Response Procedure (ERP)

ERPs provide instructions for responding to an emergency in progress. ERPs include steps or reference other procedures that define the response to additional casualties that could result from the initial event.

5.3 Response Actions

EWMO has developed the following three worker response actions.

5.3.1 Notification Response

The notification response is a notification by the worker of an upset condition. Notification response does not require immediately exiting or evacuating. Once the worker has completed the notification response steps, the SOM/FL and/or support team will provide guidance and protective measures for the worker via the applicable Operations Center.

The notification response action is as follows;

1. **MAKE** Notifications (i.e., Operations Center).
2. **WARN** others.
3. **WAIT** for directions and guidance from the Operations Center and FL/IC.

5.3.1 Notification Response (continued)

The following events have been categorized as requiring a Notification Response:

TA-54 Area G	RANT	WCRRF
• Loss of Electronic Badge Reader • 231 Permacon HVAC LOW Cell D/P • 375 Permacon HVAC LOW Cell D/P • Fire Department Manning Less than 50 Percent	• Loss of Electronic Badge Reader • Fire Department Manning Less than 50 Percent	• Loss of Electronic Badge Reader • Fire Department Manning Less than 50 Percent • WCRRF Loss of Confinement Ventilation System (CVS) • WCRRF Glovebox Fire Suppression Inadvertent Initiation • WCRRF WCG High Pressure Alarms • WCRRF Confinement Ventilation System (CVS) Low Flow Alarms • WCRRF Confinement Ventilation System (CVS) Room 102 High Pressure Alarms • WCRRF CVS HEPA Filter Alarms • WCRRF Confinement Ventilation System (CVS) GBE High Pressure Alarms • WCRRF TE/TI-001 and 002 Low Temperature Alarms • WCRRF Confinement Ventilation System HVA Low Flow Alarm

5.3.2 Off-Normal Response

An off-normal response is an action taken by the worker in a timely manner to ensure they back away from the immediate area (e.g., out of harm's way) until the event can be evaluated and appropriate actions taken to mitigate the situation to prevent it from elevating to an emergency.

The off-normal response steps are:

1. **SUSPEND** work.
2. **WARN** others.
3. **ISOLATE** the immediate area.
4. **MOVE-AWAY** upwind from the area of concern
5. **MAKE** Notifications (e.g., Operations Center and SOS).

Once the worker has performed the off-normal response steps listed above, there are no further actions taken by the worker to mitigate the incident at this time. The SOM/FL and the support team will provide guidance and protective measures to the workers via the applicable Operations Center.

The following list below provides events that have been categorized as response procedures requiring an off-normal response:

TA-54 Area G	RANT	WCRRF
• Discovery of an Airborne, Liquid or Solid Material Release or Spill • Unplanned Loss of Electrical Power • Waste Container • Questionable Integrity • CSLA Non-Compliance	• Discovery of an Airborne, Liquid or Solid Material Release or Spill • Unplanned Loss of Electrical Power • Waste Container • Questionable Integrity • CSLA Non-Compliance	• Discovery of an Airborne, Liquid or Solid Material Release or Spill • Loss of Glovebox Integrity • Unplanned Loss of Electrical Power • Waste Container • Questionable Integrity • CSLA Non-Compliance

5.3.3 Emergency Response

Emergency response actions taken by the operator in the event of an emergency to ensure personnel safety and prompt notification to management and/or Emergency Management. There are no actions taken by the worker to attempt to mitigate the event. Once the worker has performed the emergency response steps listed below, the EOSC, 911, SOM/FL, and the support team will provide guidance and protective measures to the workers via the applicable Operations Center.

The emergency response activities are as follows:

1. **SUSPEND** work.
2. **WARN** others.
3. **ISOLATE** immediate area.
4. **EVACUATE** to an upwind Assembly/Muster area from the incident.
5. **MAKE** Notifications (e.g., SOS, OC, EOSC, 911).

TA-54 Area G	RANT	WCRRF
• EWMO Area Emergency Response	• EWMO Area Emergency Response	• EWMO Area Emergency Response

5.4 Operations Center Response Protocol

Upon entering the abnormal or emergency response procedure (i.e., AOP, EOP, or ERP) the SOM will designate roles and responsibilities (record keeping, log keeping, phones, communications systems) to members of the Operations Center as necessary. The SOM's primary duty during an off-normal/emergency event is to act as the facility leader and overall controller of activities and operations in order to maintain attention to the incident. The response procedure is used to document all event activities (e.g. times, dates, actions) and is a quality record. The OCO logbook is the official logbook that requires documenting the entry into, and exit from, the response procedure and other important non-incident specific information. The SOS and SOM are not required to keep logs during the incident. When a facility enters an ARP, the Operations Center will be notified, but other activities at the facilities will continue normal operations, including the Operations Center, unless deemed otherwise by the SOM.

5.5 Responsibilities Assembly/Muster Areas

Assembly/Muster areas are designated areas for workers and visitors to gather in the event of an emergency or as directed by the SOM/FL.

The Assembly/Muster areas are identified by a large yellow metal box and an orange and white striped wind sock on a pole. Assembly/Muster areas maps for WCRRF, TA-54, RANT, and TA-21 are illustrated in the appendices of this procedure. Assembling/Mustering to a secondary location after initial evacuation if necessary is directed by the Operations Center/SOM/FL and/or the IC.

NOTE *Assembly/Muster area equipment and supplies are inspected weekly in accordance with EP-DIV-DOP-0102, EWMO RCRA Inspections.*

Assembly/Muster areas contain at a minimum the following equipment and supplies for use during off-normal/emergency events:

- A clipboard with roll-call checklists and two-way radio instructions (shown in Appendix 2)
- A copy of the Division Building Emergency Plan
- Assembly/Muster area lead vest (blue)
- Assembly/Muster Area Leader Checklist (instructions for Assembly/Muster Area Leader)
- First aid kit
- Grease pens and pencils
- Instruction card and "Gone to Assembly/Muster area #" card
- Two-way radio
- Wind sock
- Orange vest (for personnel performing traffic control)

The first person to arrive at the Assembly/Muster area during an emergency who is knowledgeable and willing to perform the duties assigned, acts as the Assembly/Muster Area Leader. A checklist is available at each Assembly/Muster area that provides actions to be performed by the Assembly/Muster Area Leader.

5.6 Accountability

Each worker has the primary responsibility to report to the Assembly/Muster Area Leader for accountability.

In EWMO organizations, there are three methods for obtaining personnel accountability during an off-normal/emergency event:

- Badge reader
- Sweep process
- Sign-in sheets at Assembly/Muster areas

The electronic badge reader system records and tracks personnel who enter and exit TA-54 Area G, TA-54 Area L, RANT, and WCRRF. If a situation arises where personnel accountability is required, the applicable Operations Center can generate a personnel accountability report from the badge reader system which provides a list of personnel currently logged into a specific area (e.g., TA-54 G, L, RANT, and WCRRF).

The sweep process is used primarily in administration areas and other areas that do not possess an electronic accountability system. When personnel are required to evacuate, each person will perform a visual sweep and verbal communications (e.g., is anyone here? the area is being evacuated) for personnel in the exit route out of the building. The last person to egress the facility will provide personnel accountability information to the Assembly/Muster Area Leader. Once employees assemble at the Assembly/Muster areas, they will complete a sign-in sheet/roster to document their location.

In all three methods, personnel not accounted for will be communicated to the FL/IC.

5.7 Protective Actions

5.7.1 Shelter-In-Place (SIP)

SIP means to make a shelter where workers are currently located. It is a method to protect occupants until help arrives or otherwise directed by Operations Center and FL. This type of sheltering is for hazardous material events (chemical, biological, radiological). Taking cover in any building will provide some shelter, and is safer than staying outside and potentially receiving a greater exposure to the hazard. Personnel are instructed to remain inside and follow instructions from the SOM/FL or IC. SIP is a temporary protective action and is short-term (1 to 3 hours) until the hazardous situation has passed, and the "All Clear" has been announced. The SOM/FL or IC will make the decision to SIP. Notifications will be communicated via one or more of the following: Public Address system, two-way radio, e-pagers, cell phones, and/or face to face.

General guidelines to SIP include:

- If a SIP kit is not available: assign workers to shut all windows (if any), doors, and assemble in a location away from windows and doors (hallway) for SIP
- Turn building thermostats off to stop outside airflow into building
- Conduct accountability and report results to respective Operations Center/FL/SOM
- Remain in shelter location until the Operations Center/FL/SOM informs personnel it is safe and the sheltering order has been lifted

5.7.2 Stay-Put

The type of sheltering utilized most often by the LANL population is Stay-Put sheltering. Stay-Put sheltering is the protective action used during non-hazardous material events (terrorism event, inclement weather, wild fire). This protective action calls for personnel to move or remain indoors due to an event that may place personnel in harms way outside. Examples of these events are wild land fire, a terrorism event, or inclement weather. The SOM/FL or IC will make the decision to Stay-Put.

Recommended actions to Stay-Put include:

- Stay inside
- Notify building personnel and visitors of the protective action and information about the event (if provided)
- Contact the applicable Operations Center and provide personnel status and accountability

5.7.3 Lightning

If lightning is sighted, employees **SHALL** use the 30/30 rule:

- Seek shelter if lightning is within 6 miles (flash to bang count is 30)
- Move away from any metal objects and grounding system components
- Do not remain upright in an open area or seek shelter near tall, upright objects (trees), take cover in a vehicle or building
- Shelter for at least 30 minutes after the last lightning strike within 6 miles

5.8 Chain of Command Process

The chain of command is the process that identifies positions, roles, and responsibilities for those individuals who are designated and authorized as the person-in-charge during an off-normal/emergency event.

The FL (e.g., SOM, OM) directs the initial command and control during an Off-normal/emergency event. The SOM/FL is a person who possesses the experience and knowledge associated with the area to lead the facility management and workers in an off-normal/emergency response and/or until relieved by the Site IC. An IC will be a designated Emergency Management person who responds as the individual authorized by the institution with the authority and responsibility for command and control at the incident scene.

When the responsibility for command and control is transferred to the IC, the SOM/FL remains available to the IC for area-specific technical support and assistance. A formal transfer of duty from the SOM/FL to the IC is required in a timely manner. Transferring command and control back to the SOM/FL is also a formal process. The level of formality is based upon the severity level of the event.

EWMO utilizes the Operations Center model at WCRRF and TA-54 as part of the EWMO organizational structure which acts as a liaison between LTP management, Facility Lead, IC, Emergency Operations and Emergency Management (EO-EM), and the workers. The TA-54 and WCRRF Operations Centers are staffed during normal operations. The notification process for off-normal hours is performed through the EWMO on-call list and Emergency Operations and Support Center (EOSC) 7-6211.

5.8 Chain of Command Process (continued)

Figure 2, Chain of Command Model

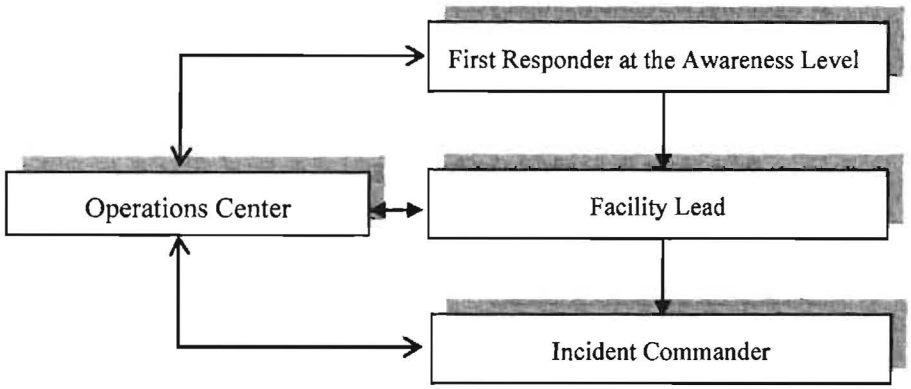
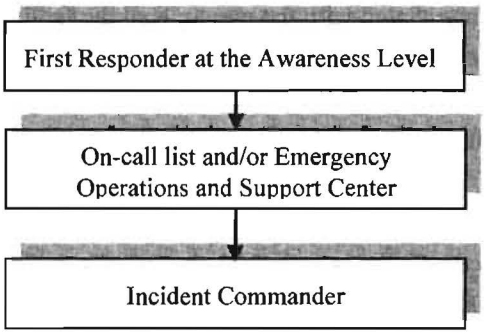


Figure 3, Chain of Command Model Off-Hours



5.9 EWMO Communication Equipment and Warning Systems

EWMO maintains a variety of communication equipment and warning systems to effectively communicate with personnel and emergency responders when off-normal/emergency situations arise.

Cell Phones – Cell phones may be used for notifying the applicable Operations Center, EOSC 7-6211, and 911. Cell phones may also be set-up to receive emergency text messages the same as E-Pagers. If cell phones are used to contact 911, callers must communicate their location and the location of the event. Cell phones are a primary means of communication during an off-normal/emergency event.

Conventional Telephones – Conventional telephones may be used to notify the Operations Center, EOSC, and 911 in the event of an off-normal/emergency event.

5.9 EWMO Communication Equipment and Warning Systems (continued)

Continuous Air Monitor (CAM) – CAMs are used in areas that require continuous air monitoring for radiological airborne contamination. If radiological airborne contamination reaches the pre-determined level, the CAM will produce an audible and visual alarm warning personnel that radiological airborne contamination is present thus requiring personnel not wearing respiratory protection to exit the area and follow the instructions of a supporting Radiological Control Technician (RCT).

E-Pagers – E-pagers are electronic devices set-up to receive text messages from a variety of sources (e.g., LANL phone book, LAN line, EOSC) for the purposes of communicating general information to employees. E-Pagers are limited to 140 characters. E-pagers can also be set-up to receive broadcast emergency messages from Operations Center and LANL.

Evacuation Alarm – The evacuation alarm provides an audible alarm that can be heard throughout the area to alert workers to evacuate to the nearest upwind Assembly/Muster areas. An evacuation alarm system is available at TA-54 Area G, L, and the Administrative area, and an additional independent system for the RANT complex. The evacuation alarm can be activated from several locations as illustrated on Appendix 7, TA-54 Area G Evacuation Alarm Button Locations, and Appendix 10, RANT Evacuation Alarm Button Locations. Any worker who determines an emergency situation that endangers all workers in the area can activate the evacuation alarm. The evacuation alarm is a local alarm, and is not connected to Central Alarm Systems (CAS).

Fire Alarms – Fire alarm systems and warning devices are engineered for facilities and a structure's specific needs (e.g., sprinkler head, heat sensors, and manual pull station). Fire alarms emit an audible long whooping tone that warns personnel in the immediate area to evacuate to the nearest upwind Assembly/Muster area and the alarm transmits and signals to CAS. See Sections 6, 7, and 8 for area-specific fire system information.

Conventional Phones – Land lines can be used for communicating off-normal and emergency information to the Operations Center, EOSC, and 911.

PA System – Public address systems are installed in the TA-54 and RANT facilities to provide a means for broadcasting audio communication to employees for off-normal/emergency events. Use of the PA for non-emergency announcements SHALL require approval from the Operations Center and the SOM.

5.9 EWMO Communication Equipment and Warning Systems (continued)

Two-Way Radios –Two-way radios are another method to communicate between Assembly/Muster areas, SOS, Operations Center, SOM/FL and EOSC. Each Assembly/Muster area is equipped with a two-way radio.

Site Wide Area Notification System (SWANS) Radio – The SWANS Radio is a LANL-wide emergency radio system designed primarily as a back-up communication system in the event normal communication systems are diminished or unavailable. SWANS radios are monitored in the Operations Center. Instructions for proper testing and operation are listed in Appendix 2, Site Wide Area Notification System (SWANS).

Wind Sock – Wind socks are placed strategically placed throughout LANL site to provide a visual means for employees to determine the wind direction. There are two different colors schemes. Wind socks that are solid orange are placed throughout the site in areas that are populated with workers that would require a reference point to determine wind direction. Wind socks that are orange with white strips denote the location of an Assembly/Muster area. Wind socks are especially important when an abnormal/emergency event occurs which requires employees to quickly determine wind direction for the purposes of staying upwind from the event to prevent unnecessary exposure to potential hazardous materials.

5.10 Support Personnel

Support personnel are subject matter experts (SMEs) in their field who assist the SOM/FL or IC during an off-normal/emergency event as necessary.

The following personnel groups may support the FL/IC in an off-normal/emergency event:

- Industrial Safety and Hygiene
- Radiological Protection

Additional organizations that may provide assistance:

- Criticality Safety Officer
- Criticality Safety Engineer
- Emergency Management
- Engineering
- Environmental
- Hazardous Waste
- Maintenance
- On-Site Transportation
- Operations Manager
- Security
- Utilities
- Waste Coordinator

5.11 Emergency Access Control

During an emergency, saving life **SHALL** take precedence. Emergency personnel **SHALL** be allowed to enter the area without delay. Personnel **SHALL** not leave the incident area unless directed to do so by the IC.

5.12 Adjacent Facilities

Off-normal/emergency events have the potential to impact adjacent facilities (e.g., response vehicles, road closures). Notification to adjacent facilities will normally be accomplished by the Operations Center, SOM/FL and/or the EOSC.

5.13 EWMO Abnormal Event Notification Process

The first communication is defined as Initial Notification. During an off-normal/emergency event, the initial notification from the first responder (awareness) to the respective Operations Center and/or 911 initiates the process. The Operations Center will in turn notify the Shift Operations Manager.

The SOM/FL is responsible for notifying the Operations Manager who in turn will at a minimum notify the FOD, ES&H Manager, and the Project Manager as necessary.

Communications up the chain of command are required in accordance with P322-3 and with directorate-level reporting requirements as described in SOP-5228, ADEP Reporting Requirements for Abnormal Events.

5.14 Recovery Plan

The recovery plan is a process to determine actions required to return the facility/area to normal operations. The Recovery Manager will develop the requirements for resuming normal operations. A graded approach to the level of formality should be applied based upon the type of event/incident and hazards involved; extent of damage to facility, equipment, and environment; cause of the emergency/event; and actions required to prevent a re-occurrence. For an off-normal event, the SOM/FL has the authorization to return operations to normal. If the event is considered an emergency event, reentry and return to normal operation **SHALL** be at the discretion of the IC.

5.14 Recovery Plan (continued)

If the Duty Emergency Manager has categorized the emergency as an Operational Emergency, reentry and return to normal operations will be at the discretion of the Emergency Director at the EOSC. The FOD will generally be appointed as the Recovery Manager for returning the facility to normal operations.

When an emergency is over, then the IC will declare that the emergency has ended and direct that the "All Clear" be announced.

- Only the IC may declare an emergency is over
- Each Assembly/Muster area may be released individually
- Some Assembly/Muster areas may be released prior to others if the hazards are localized
- Assembly/Muster area **SHALL** be released only if the release will not endanger personnel or present problems for mitigating the situation

Each event will be evaluated independently for reentry and return to normal operation. Under no circumstances are personnel authorized to reenter the affected area, in an emergency unless given the "All Clear" by the IC.

An off-normal/emergency event **SHALL** not be considered over when an alarm is silenced or acknowledged.

6. WCRRF SPECIFIC REQUIREMENTS

The WCRRF Operations Center is the access control point for entry to WCRRF Building TA-50-69 and WCRRF 50-69 yard.

Assembly/Muster Areas
The Assembly/Muster areas are illustrated on Appendix 4, WCRRF Assembly/Muster Area Locations.

Fire Alarms – WCRRF Building TA-50-69 is equipped with automatic fire suppression and manual pull stations to notify personnel of a fire. The automatic and manual stations are connected to the Digital Alarm Communication System (DACS) which in turn will communicate the alarm with the Central Alarm Station (CAS). There is one DACS panel for Building TA-50-69: Fire Alarm Control Panel DACS 1522 (-1).

Fire alarm manual pull stations are distinctive red metal boxes mounted on walls inside Building TA-50-69. In the event of a fire or explosion, personnel should activate the manual fire alarm pull stations and call 911 and the WCRRF Operations Center at 665-2797, or the Maintenance on Call (MOC) pager 500-6965 (after hours). When an automatic or manual fire manual pull station is activated at WCRRF, the LAFD is automatically notified of the location. The WCRRF Operations Center will notify personnel of the situation using one or more of the communication systems (Public address, two-way radio, e-pagers, cell phones, and/or face to face).

Additional requirements when an off-normal or emergency event occurs:

- If wearing a respirator, do not attempt to remove the respirator until given direction by a RCT.
- If working with classified or sensitive material, and the area is established as a Temporary Limited Area, and if safe to do so, cover up the material prior to exiting the facility, and inform the Assembly/Muster Area Lead and Supervisor of the situation.
- When working in a facility/structure that is designed with a Confinement Ventilation System (e.g., TA-50-69) for the purpose of maintaining a negative differential pressure, employees **SHALL** ensure that one set of personnel airlocks remains closed upon exiting
- If working in a radiological controlled area during an off-normal event, follow the instructions of an RCT.
- During an emergency event, all personnel who may be potentially contaminated should not commingle with other personnel at the Assembly/Muster area prior to being surveyed by an RCT.

7. TA-54 SPECIFIC REQUIREMENTS

TA-54 consists of the TA-54 Administrative Area, and Areas G, H, J, and L. RANT complex is known as TA-54 West RANT and is described in Section 8, RANT Specific Requirements.

The TA-54 Operations Center is the access point for Area G is located at the entrance of the TA-54 Area G Controlled Area TA-54-315, Room 105). The Operations Center is staffed during day shift (0700) to 1730 hours). The Operations Center may be staffed to support after-hour activities as determined by management. The TA-54 Operations Center maintains a phone number for regular business activities at extension 665-2735. When notifying the TA-54 Operations Center of an abnormal/emergency event the following number **665-1288 SHALL** be used. The Operations Center will ensure this phone number receives priority over all other calls.

TA-54 maintains a database of the hazardous constituents contained within the waste at TA-54 Area G. The database is accessible from the Waste Services group and the Information Management group. Emergency Planning and Preparedness maintains Building Run Sheets that contain limited information on hazardous material inventories for the FL/IC and emergency responders.

The fire alarms are zoned into five areas, which operate independently.

TABLE 2, DACS IN TA-54

Zone 1, Fire Alarm Control Panel DACS 6148(-1) (located in 54-48)	Structures 54-48, 54-229, 54-230, 54-231, 54-232, 54-289
Zone 2, Fire Alarm Control Panel DACS 6146(-1) (located in 54-412)	Structure 54-412
Zone 3, Fire Alarm Control Panel DACS 6149(-1) (located in 54-11)	Structures 54-2, 54-11, 54-33, 54-49, 54-153, 54-224, 54-273, 54-283, 54-287, 54-302, 54-321, 54-322, 54-323, 54-375, 54-491, 54-1027, 54-1028, 54-1030, 54-1041,
Zone 4, Fire Alarm Control Panel DACS 6147(-1) (located in 54-51)	Structures 215 (Area L), Admin. Bldgs: 54-22, 54-37, 54-51, 54-60, 54-64, 54-244, 54-245, 54-246, 54-247, 54-290, 54-434, 54-1050,
Zone 5, Fire Alarm Control Panel DACS 6144 (-1), Structure 54-38	Structures 54-38

7. TA-54 SPECIFIC REQUIREMENTS (continued)

Building 54-532 and 54-533 do not have fire alarms. Areas J and H do not possess automated fire alarms systems.

Additional TA-54 requirements during an off-normal or emergency event

- If wearing a respirator, do not attempt to remove the respirator until given direction by the RCT.
- The location of the safe zone may vary depending on whether the event is inside or outside the facility.
- If working in a radiological controlled area during an off-normal event, follow the instructions of an RCT.
- During an emergency event, all personnel who may be potentially contaminated should not commingle with other personnel at the Assembly/Muster area prior to being surveyed by a RCT.
- If working with classified or sensitive material, and the area is established as a Temporary Limited Area, and if safe to do so, cover up the material prior to exiting the facility, and/or inform the Assembly/Muster Area Lead of the situation.
- When working in a facility/structure that is designed as a contamination control enclosure (e.g., TA-54-412 Tent, TA-54-231 PermaCon, and TA-54-375 PermaCon), employees **SHALL** ensure that all doors to the contamination control enclosure remain closed upon exiting.

TA-54 is divided into eight response zones that correspond to locations where the fire alarm was initiated or activated (see Appendix 6). Emergency response zones were developed because of the size of the work areas at TA-54, thus allowing the worker to exit to the nearest upwind Assembly/Muster Area and to provide pertinent information to the TA-54 Operations Center for the zone in which the alarm was activated.

Area G Controlled Area Domes Buildings Structures	Zones I – IV
Area G Operations Center	Zone IV
Main Administrative Area	Zone V
Area L Storage Yard	Zone V
Building 54-532 and 54-533	Zone VI
Area between Area J and Building 54-533	Zone VI
Area J and Area H	Zone VII
Radioassay and Nondestructive Testing Facility (RANT)	Zone VIII

Other Alarms – TA-54 Area G maintains additional alarms (such as Tritium, O2, low flow) in certain areas that warn personnel in the immediate vicinity.

8. RANT SPECIFIC REQUIREMENTS

RANT is equipped with an Evacuation Alarm system that may be activated from several strategic locations in the RANT facility for the purpose of alerting all employees to evacuate to the nearest upwind Assembly/Muster area (see Appendix 9, RANT Assembly/Muster Area Locations). This alarm is not connected to the CAS.

Additional requirements at RANT during an off-normal or emergency event:

- Workers in a facility/structure that is designed with ventilation (e.g., TA-54-38) for the purpose of personnel comfort (heating, cooling) **SHALL** ensure that exterior doors of the facility are closed upon exiting during an off-normal event.
- Alarms are considered actual unless notified by TA-54 Operations Center or Facility Lead.
- Personnel who are trained and qualified to use fire extinguishers may attempt to mitigate small incipient fires.
- If working in a radiological controlled area during an off-normal event, follow the instructions of an RCT.
- During an emergency event, all personnel who may be potentially contaminated should not commingle with other personnel at the Assembly/Muster area prior to being surveyed by an RCT.

Fire Alarm System – RANT Building TA-54-38 is equipped with automatic fire suppression and manual pull stations in the event a fire develops. The automatic and manual stations are connected to Digital Alarm Communication System (DACS) which in turn will communicate the alarm with Central Alarm Station (CAS). There is one DACS panel for Bldg. TA-54-38: Fire Alarm Control Panel DACS 6144 (-1).

Fire alarm manual pull stations are distinctive red metal boxes mounted about 4 feet above the ground on walls inside Building TA-54-38. In the event of a fire or explosion, personnel should activate the manual fire alarm pull stations and notify 911 and call either the TA-54 Operations Center at **665-1288**, or the Maintenance on Call (MOC) pager **500-6965** (after hours). The TA-54 Operations Center maintains a phone number for regular business activities at extension **665-2735**. When an automatic or manual pull station is activated at RANT, the LAFD is automatically notified of the location. The TA-54 Operations Center will notify personnel of the situation using one or more communication systems (Public address, two-way radio, e-pagers, cell phones, and/or face to face).

9. TA-21 SPECIFIC REQUIREMENTS

TA-21 is a secured and locked area. Access and work activities are controlled through the TA-64 Operations Center. Any work conducted at TA-21 will be performed under an approved Integrated Work Document (IWD). The IWD at a minimum **SHALL** identify the following requirements for personnel entering and/or conducting work activities at TA-21:

- Assembly/Muster station locations
- Process for accountability of personnel in an abnormal/emergency event
- Type of communications systems (e.g., two-way radio, cell phones)

The following types of activities are conducted at TA-21 under an approved IWD

- Maintenance of lights on water towers
- PMIs
- Stormwater/Pollution Prevention
- Vegetation control
- Water/Air Quality activities

10. NES SPECIFIC REQUIREMENTS

Any work conducted at Nuclear Environmental Sites will be under an approved Integrated Work Document (IWD). The IWD at a minimum **SHALL** identify the following requirements for personnel entering and/or conducting work activities at NES:

- Assembly/Muster station locations
- Process for accountability of personnel in an abnormal/emergency event
- Type of communications systems (e.g., two-way radio, cell phones)

11. TRAINING

Workers will be trained to the information in this BEP as determined by analysis to be commensurate with their job, access, and duty requirements.

12. RECORD PROCESSING

None

13. REFERENCES

EP-DIV-DOP-0102, EWMO RCRA Inspections

P101-7, Vehicles and Pedestrian Safety

P102-2, Occupational Injury and Illness reporting and Investigation

P201-3, Reporting Known and Potential Incidents of Security Concern

P315, Conduct of Operations Manual

P322-3, Performance Improvement for Abnormal Events

P724, Workplace Violence

P1201-4, LANL Emergency Procedures and Protective Actions

SOP-5228, ADEP Reporting Requirements for Abnormal Events

APPENDIX 1
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DEFINITIONS AND ACRONYMS

Definitions

Assembly Muster Station – A designated rallying point away from the work area equipped with communication equipment and first aid supplies. Personnel evacuate to the upwind Assembly/Muster areas in response to emergency situations.

Chain of Command – The chain of command is the formal process of establishing authority to manage an off-normal or emergency event.

Controlled Area – Any area to which access is controlled in order to limit access of the general public to radiation and radioactive materials. A Controlled Area is an area in which elevated radiation and/or contamination levels may exist as a consequence of routine or non-routine site operations.

Emergency Management & Response – A Laboratory organization tasked with directing and coordinating response actions to emergencies throughout the Laboratory.

Emergency Management Group – A Laboratory organization tasked with directing and coordinating response actions to emergencies throughout the Laboratory.

Emergency Operations and Support Center – LANL's Emergency Operations Center (EOC) runs the 24/7 Emergency Operations Support Center staffed by communications specialists and on-call emergency managers, LANL personnel can call the Center for assistance with or information about all non-life-threatening situations that involve off-normal or unusual circumstances.

Facility Leader – The FL is the TA-54 Facility person in charge of emergency operations until transferred to the incoming IC.

First Responder at the Awareness Level – The first person to become aware of an abnormal/emergency event.

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DEFINITIONS AND ACRONYMS

Incident Commander – A trained and qualified emergency professional from emergency management, SOC Los Alamos (the Laboratory's protective force), Los Alamos County Fire Department, Los Alamos County Police Department, or other federal authority having jurisdiction that takes command and control of the event.

Stay-Put – The type of sheltering utilized most often by the LANL population is stay-put sheltering. Stay-put sheltering is the protective action used during non-hazardous material events. This protective action calls for personnel to move or remain indoors due to an event that puts personnel in harm's way outside. The SOM/FL or IC will make the decision to Stay-Put.

Shelter-in-Place – A protective action taken by personnel to isolate themselves from a hazard.

Spill – An intentional or unintentional release of oil, PCBs, liquid hazardous substances, or liquid radioactive substances to the environment that is not permitted under Laboratory, state, or federal permits.

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DEFINITIONS AND ACRONYMS

Technical Area 54 – Technical Area 54 is comprised of process and administrative support areas. Contained in TA-54 are the following Area G, H, J, L, 54 Administrative areas, and RANT complex.

Visitor – Any individual, including Laboratory employees or subcontractors, who requires access to RANT but does not have authorized access to the specific area he/she wishes to enter.

Acronyms

A/MAL	Assembly/Muster Area Lead
BEP	Building Emergency Plan
CAM	Continuous Air Monitor
CAS	Central Alarm Station
EO-EM	Emergency Operations and Emergency Management
EOSC	Emergency Operations and Support Center
EWMO	Environmental Waste Management Organization
FL	Facility Leader
FOD	Facility Operations Director
IC	Incident Commander
IS&H	Industrial Safety and Hygiene
LAFD	Los Alamos Fire Department
LAPD	Los Alamos Police Department
LTP	LANL TRU Programs
NES	Nuclear Environmental Sites
OCO	Operations Center Operator
OM	Operations Manager
PA	Public Address
RANT	Radioassay and Nondestructive Testing Facility
RCT	Radiological Control Technician
SIP	Shelter in Place
SP	Stay-Put
SOM	Shift Operations Manager
SWANS	Site Wide Alert Notification System
TA	Technical Area
WCRRF	Waste Characterization, Reduction, and Repackaging Facility

APPENDIX 2
Page 1 of 2

SITE WIDE AREA NOTIFICATION SYSTEM (SWANS)

Radio Instructions

The Site Wide Area Notification System (SWANS) Radio is a LANL-wide emergency radio system for the purpose of back-up communications, in the event normal communications protocols are diminished or not available. Emergency Operations and Emergency Management (EO-EM) monitors the SWANS frequency during normal working hours. The Central Alarm Station (CAS) monitors the frequency continuously.

WARNING

Do not use the SWANS Radio instead of calling 911. Always call 911 first if needed.

To Contact Emergency Operations and Support Center

[1] **TURN** up the volume.
[2] **DEPRESS** the Push-To-Talk button.
[3] **SPEAK** after the solid tone ends.
[4] **SAY**, "EOSC, EOSC, this is [*your name*] at TA-__, Building____."
[5] **LET GO** of the Push-To-Talk button to hear response.
[6] **IF** evacuation to an Assembly/Muster area is necessary,
THEN the Operations Center will take the SWANS radio.

Daily Monitoring with the SWANS Radio (Operations Center)

[1] **LEAVE** radio turned on and sitting in charger and on Channel 1.
[2] **ENSURE** the volume is turned up enough to hear radio traffic.
[3] **IF** you receive an alert tone (4 beeps, pause, 4 beeps, continuously)
THEN:
  [A] **PRESS** the Push-To-Talk button to stop the alert tone.
  [B] **TURN** the volume up.
  [C] **FOLLOW** the directions that are given on the radio.
  [D] **RELAY** message as applicable.
  [E] **IF** your building or organization is addressed directly,
  THEN respond immediately.
[4] **IF** you return to the office and hear an alert tone,
THEN:
  [A] **PRESS** the Push-To-Talk button to stop the alert tone.
  [B] **CONTACT** EOSC by radio or phone (7-6211).
  [C] **INFORM** EO-EM the alert tone was sounding on your radio, and they will relay the alert tone message.

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Radio Testing Instructions

Use of the Orange Panic Button

If the orange panic button located on the top of the radio is pushed, EOSC will try to call you on the radio. If there is no response, EOSC will try to call you on the phone. If there is still no response, the duty Emergency Manager will respond to your location.

Testing and Maintenance

[1] **PERFORM** a radio check once a week by calling EOSC and saying, "TA--- _____Facility to EOSC, radio check"

[2] **CALL** EOSC at 7-6211 if you have any problems with the radio. (A warbling tone may indicate the battery is failing)

[3] **IF** you are getting excessive static or poor reception,
THEN notify EOSC so a test can be run.

WARNING

Use the orange panic button for extreme emergency only.

Two-Way Radio Instructions

[1] **TURN** the radio on.

[2] **SWITCH** the radio to Channel 1.

[3] **PRESS** the button on the side of the radio to transmit.

[4] **ESTABLISH** contact with the Operations Center. Speak slowly and clearly.

[5] **IF** you do not receive an immediate response,
THEN remain calm and **REPEAT** steps [3] and [4].

[6] **WHEN** contact is established,
THEN transmit your name and location AND **WAIT** for the Operations Center to ask for additional information.

[7] **UPON** request from the Operations Center,
THEN transmit the names and condition of personnel at your location. Only relevant and essential information should be given.

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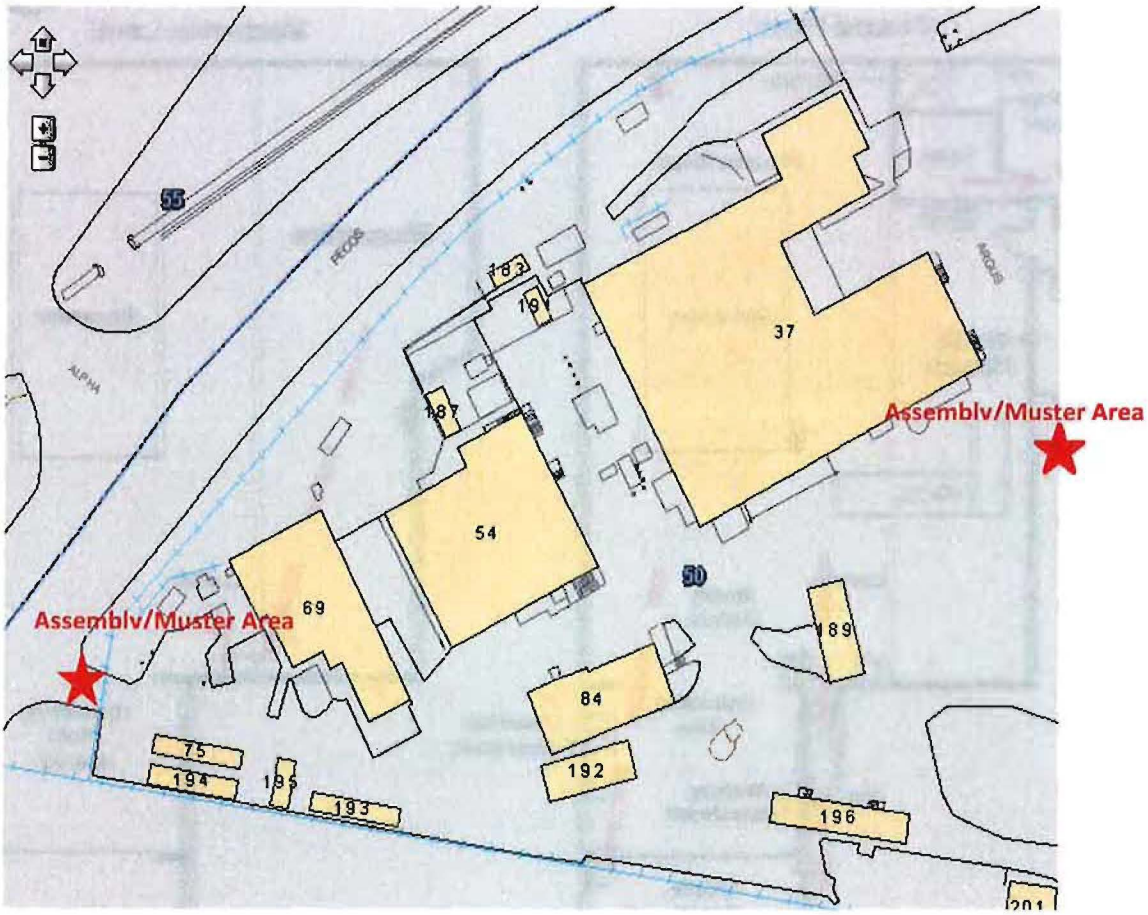
WCRRF TA-50-69 EMERGENCY CONTACT LIST

Organizations
Emergency Operations Support Services 7-6211
Engineering
Environmental
EWMO FOD
Fire/Ambulance
Fire Protection Engineer
Industrial Safety/Hygiene
Maintenance Manager
On-call list
Occupational Medicine Nurse's Station
Operations Manager
Radiation Protection
RP Supervisor
Security
Shift Operations Manager
Site Services Subcontractor (EnergySolutions)
Transportation
Utilities
Waste Coordinator
*Surrounding facilities contacts

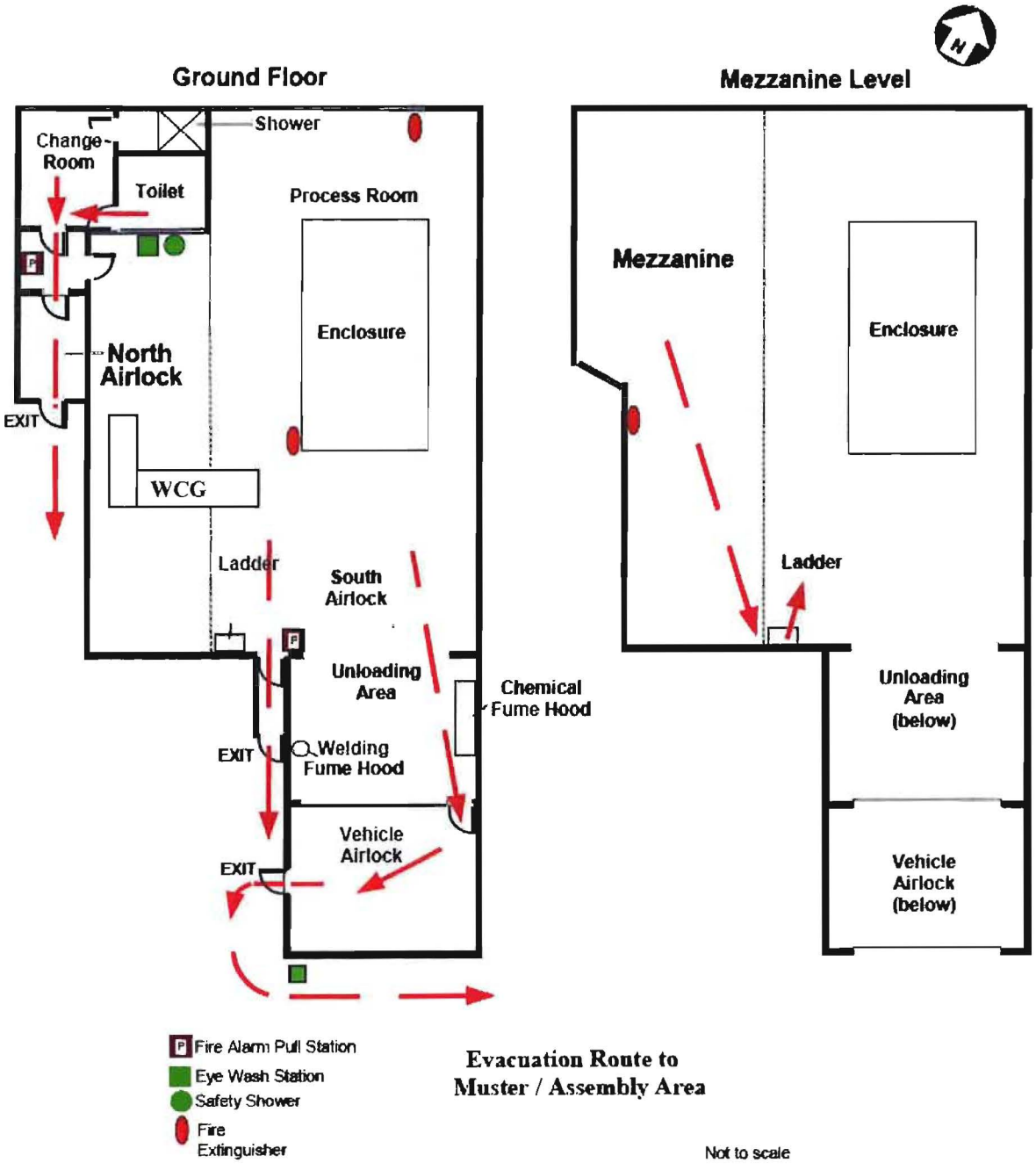
* Identify surrounding facilities for performing notifications of an off-normal/emergency event

APPENDIX 4
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WCRRF ASSEMBLY/MUSTER AREA LOCATIONS



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APPENDIX 5
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TA-54 AND RANT EMERGENCY CONTACT LIST

Organizations
Emergency Operations Support Services 7-6211
Engineering
Environmental
EWMO FOD
Fire Protection Engineer
Fire/Ambulance
Industrial Safety/Hygiene
Maintenance Manager
On-call list
Occupational Medicine Nurse's Station
Operations Manager
Radiation Protection
RP Supervisor
Security
Shift Operations Manager
Shift Operations Supervisor
Transportation
Utilities
Waste Coordinator
LTP-SOS
HMLW
Site Services Contractor
Operations Center SOS
*Surrounding facilities contacts

* Identify surrounding facilities for performing notifications of an off-normal/emergency event

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TA-54 AND RANT EMERGENCY CONTACT LIST

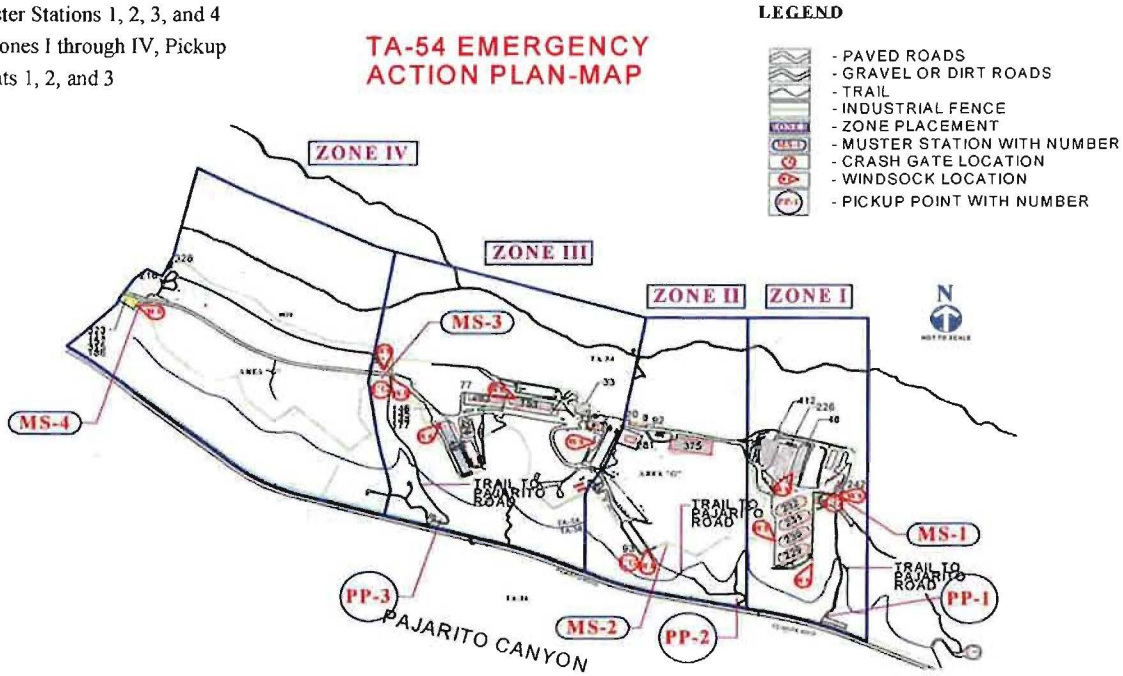
Organizations
Emergency Operations Support Services 7-6211
Engineering
Environmental
EWMO FOD
Fire/Ambulance
Fire Protection Engineer
Industrial Safety/Hygiene
Maintenance Manager
On-call list
Occupational Medicine Nurse's Station
Operations Manager
Radiation Protection
RP Supervisor
Security
Shift Operations Manager
Shift Operations Supervisor
Transportation
Utilities
Waste Coordinator
*Surrounding facilities contacts

* Identify surrounding facilities for performing notifications of an off-normal/emergency event

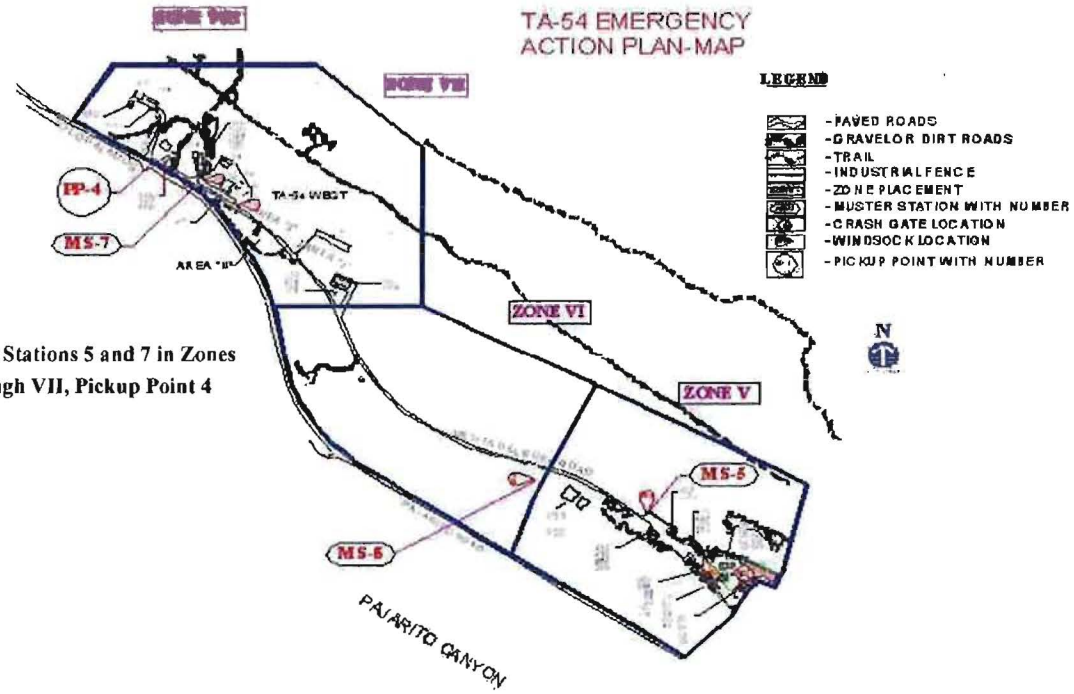
APPENDIX 6
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TA-54 ZONE BORDERS, PICKUP POINTS, AND ASSEMBLY/MUSTER AREA LOCATIONS

Muster Stations 1, 2, 3, and 4 in Zones I through IV, Pickup Points 1, 2, and 3



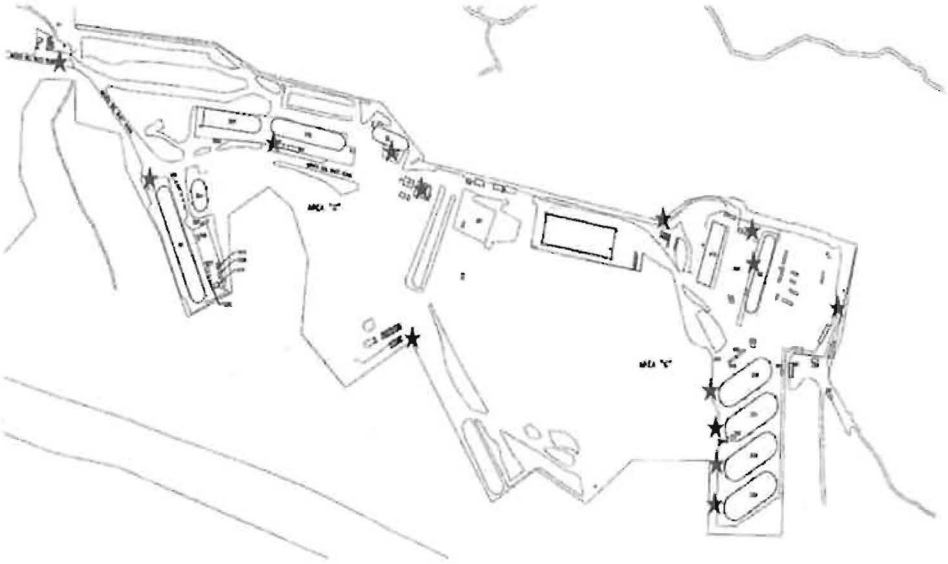
APPENDIX 6
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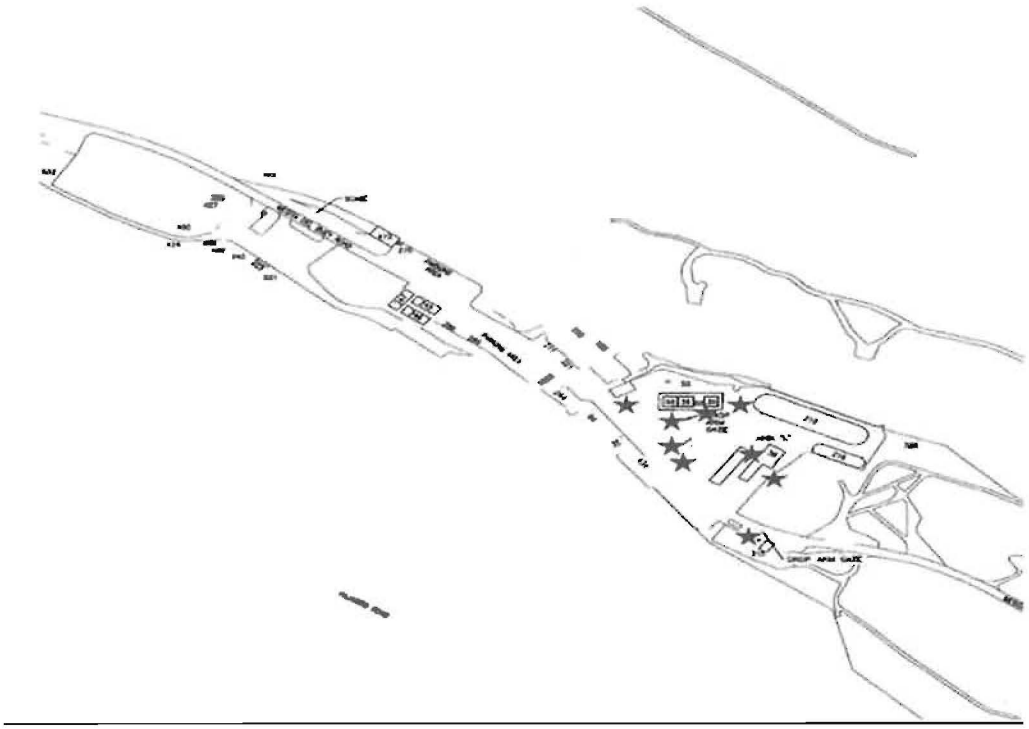
Muster Stations 5 and 7 in Zones V through VII, Pickup Point 4

APPENDIX 7
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TA-54 AREA G EVACUATION ALARM BUTTON LOCATIONS

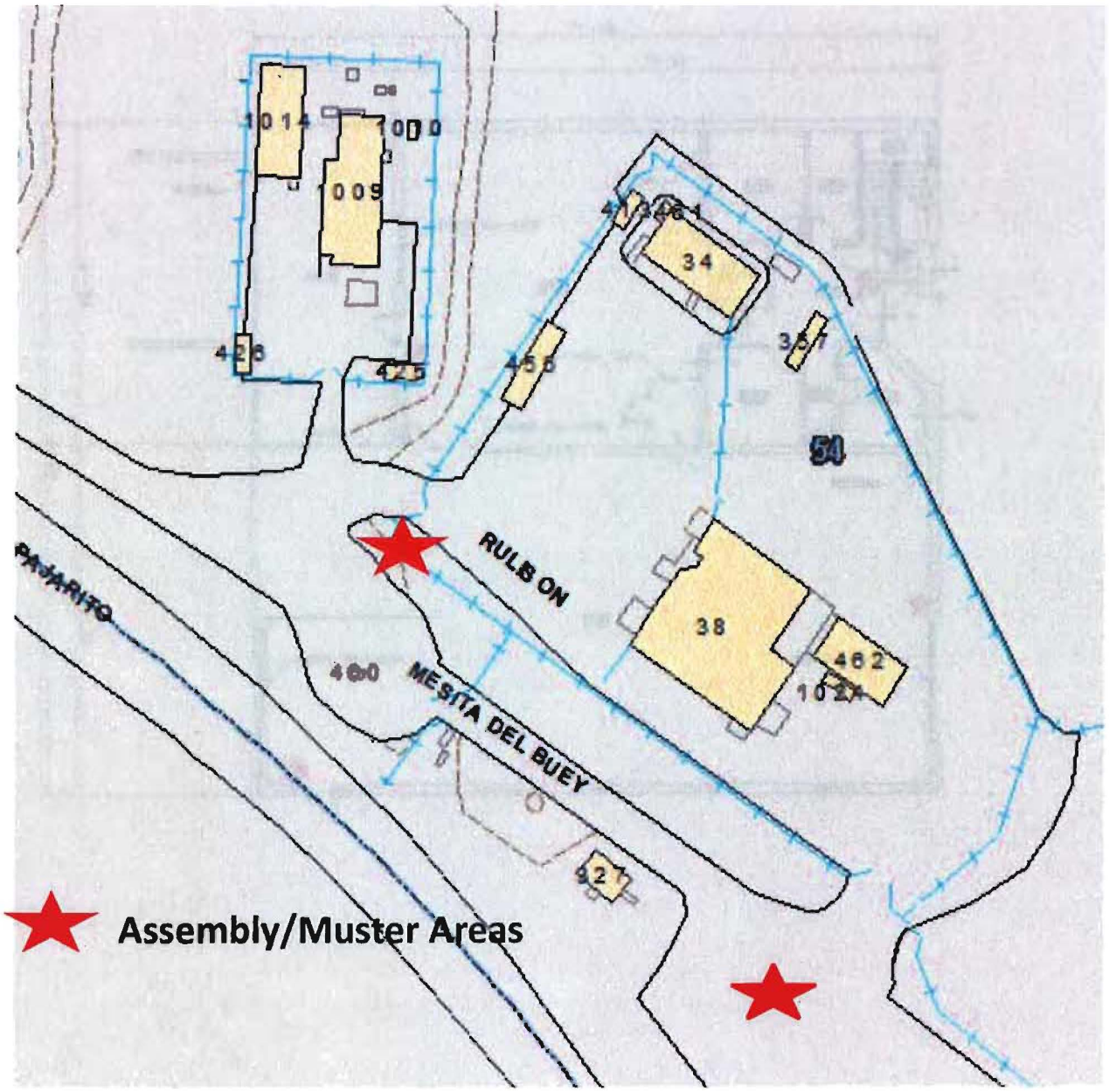


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APPENDIX 8
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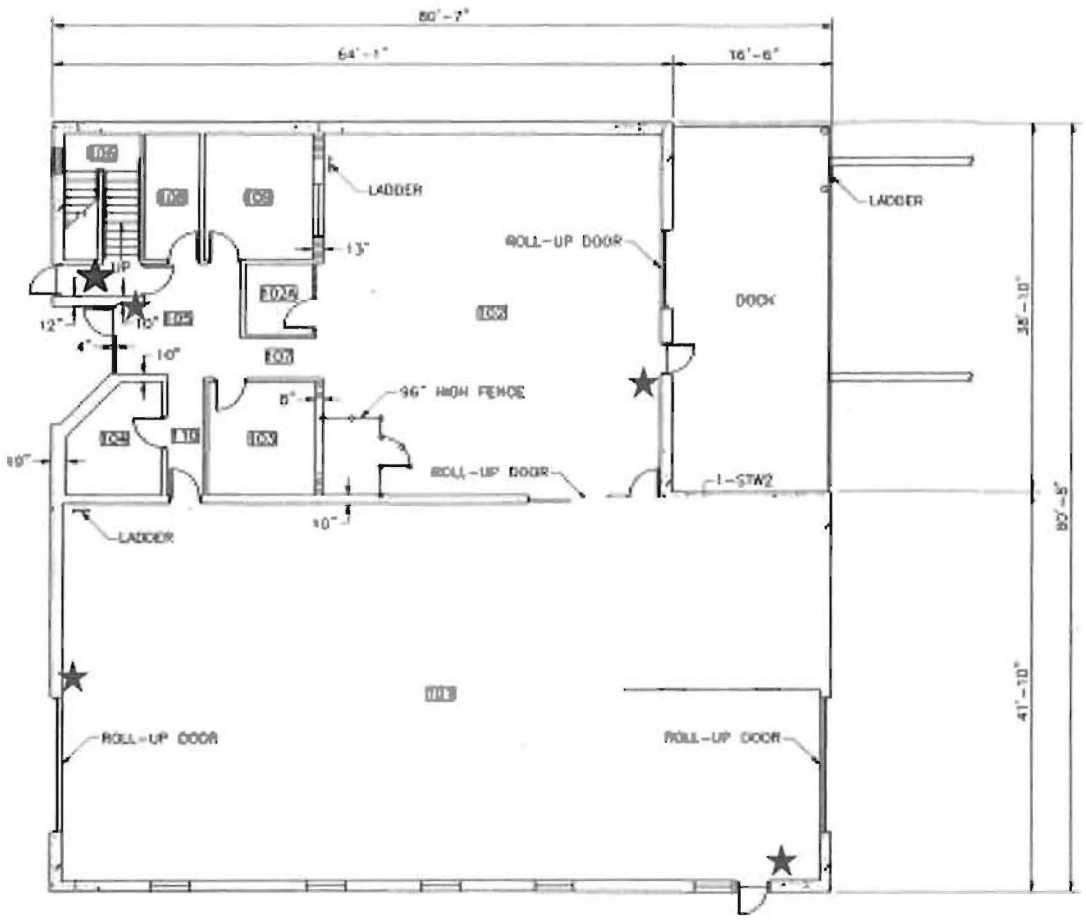
RANT ASSEMBLY/MUSTER AREA LOCATIONS



APPENDIX 9

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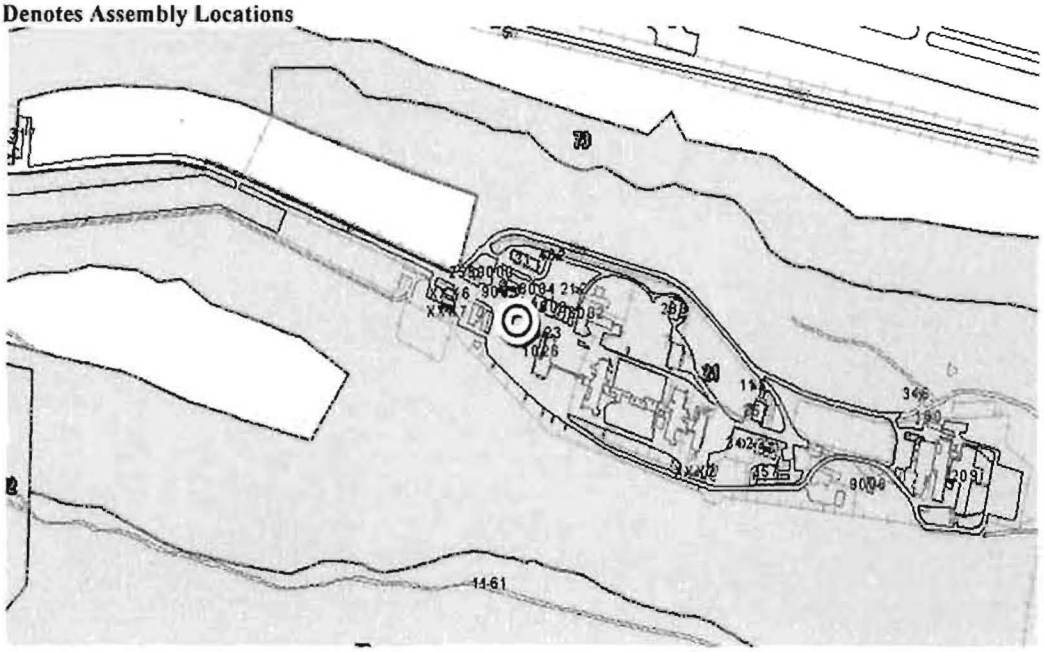
RANT EVACUATION ALARM BUTTON LOCATIONS



APPENDIX 10
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TA-21 ASSEMBLY AREA LOCATIONS

◎ - **Denotes Assembly Locations**



Attachment 9

EP-DIV-RM-ERP-20200, R.0

EWMO Area Emergency Response

Effective Date: 12/09/13

The Responsible Manager has determined that the following organizations' review/concurrence is required for the initial document, and for major revisions a same type and level review is required. Review documentation is contained in the Document History File:

Emergency Operations
Engineering
IH&S
Operations Managers
Quality Assurance
Radiation Protection
Shift Operations Managers

Responsible Manager, EWMO Facility Operations Director

Steve M. Henry	/ 219172	/ /s/ Andy Baumer for	/ 12/04/13
Name (print)	Z#	Signature	Date

Classification Review: ☐ N/A ☒ Unclassified ☐ UCNI ☐ Classified _____

Art Crawford	/ 080070	/ /s/ Art Crawford	/ 12/05/13
Name (print)	Z#	Signature	Date

Working Copy / Information Only (circle one)
Initials / Date: _____ / _____

LA-UR-14-23782

1.0 ENTRY CONDITIONS

- Request is made for Emergency Response Personnel support
- Visual observation of a Fire, smoke
- Audible fire alarm
- Manual fire pull station activated
- Serious personnel injury (job related)
- Utility (water, gas, electricity) outages or leaks (water, fuel, sewer, oil) with significant impact to the facility or the environment
- Situations where the likely potential for involvement of more than one emergency response elements

2.0 IMMEDIATE RESPONSE ACTIONS

√	Time/Date	#	ACTIONS
Operations Center			
		2.1	**ENSURE** personnel have completed the Emergency Response in accordance with EWMO-DIV-BEP-20048, Building Emergency Plan, and **OBTAIN** incident information from the caller. (e.g., location, inside/outside building/structure). Narrative/Comments:
		2.2	**NOTIFY** personnel of incident. (e.g., Public address, 2-way radio, E-Pagers, cell phones, and face to face)
		2.3	**NOTIFY** the Shift Operations Manager/Facility Lead (SOM/FL). Name:_____
NOTE			*The following steps may be performed out of sequence.*
		2.4	**ENSURE** that Emergency Operations and Support Center (7-6211), Fire Department, and/or 911 was notified.

2.0 IMMEDIATE RESPONSE ACTIONS (continued)

√	Time/Date	#	ACTIONS
		2.5	**PERFORM** accountability of the personnel in affected area.
		2.6	**DISPATCH** a Nuclear Operator/Waste Handler to meet the Emergency Response vehicles and **OPEN** access gates if safe to do so.
		2.7	**NOTIFY** the support personnel to assist Shift Operations Manager. (e.g., Environmental, Safety and Health)
Shift Operations Manager/Facility Lead			
NOTE			*When the Operations Manager is not physically present and/or on shift, the SOM will conduct the minimum notifications up the chain of command (e.g., FOD, ES&H Manager, and Project Manager).*
		2.8	**NOTIFY** the applicable Operations Manager of the event, and **REQUEST** the Operations Manager to conduct the minimum notifications (e.g., FOD, ES&H Manager and Project Manager).
		2.9	**BRIEF** support personnel and the emergency responders upon arrival to incident site.
		2.10	**CONDUCT** formal transfer of command and control to the Incident Commander (IC).
		2.11	**ENSURE** EWMO support team is available to assist IC as necessary.

3.0 SUBSEQUENT ACTIONS

√	Time/Date	#	ACTIONS
Shift Operations Manager/Facility Lead			
		3.1	**ENSURE** a formal transfer of command and control from IC is performed once the emergency has been downgraded.
Operations Center			
		3.2	**IF** actions were developed after transfer from IC, **THEN IMPLEMENT** actions to return area/operations to normal. Actions:
		3.3	**PROCESS** the procedure as a quality record in accordance with EP-DIR-AP-10003, Records Management Procedure For ADEP Employees.

Narrative/Comments:

Completed By:

Printed Name	Signature	Z#	Date/Time

Attachment 10

EP-DIV-RM-AOP-20201, R.0

Discovery of an Airborne, Liquid, and/or Solid Material Release or Spill

Effective Date: 12/9/2013

The Responsible Manager has determined that the following organizations' review/concurrence is required for the initial document, and for major revisions a same type and level review is required. Review documentation is contained in the Document History File:

Engineering
IH&S
Operations Managers
Quality Assurance
Radiation Protection
Shift Operations Managers

Responsible Manager, EWMO Facility Operations Director

Steve M. Henry	/ 219172	/ /s/ Andy Baumer 234651 for SMH	/ 12/3/13
Name (print)	Z#	Signature	Date

Classification Review: ☐ N/A ☒ Unclassified ☐ UCNI ☐ Classified _____

Teri Tingey	/ 200975	/ /s/ Teri Tingey	/ 12/3/13
Name (print)	Z#	Signature	Date

Working Copy / Information Only (circle one)
Initials / Date: _____ / _____

LA-UR-14-23781

1.0 ENTRY CONDITIONS

- Discovery of airborne, liquid, and/or solid material release
- Uncontrolled release of hazardous and/or radioactive material into the environment
- Hazardous material release or spill in an area that does not possess controls to mitigate the consequences
- Strong chemical odor (e.g., acid, ammonia, liquefied petroleum, gasoline)

2.0 IMMEDIATE RESPONSE ACTIONS

√	Time/Date	#	ACTIONS
Operations Center			
		2.1	**ENSURE** personnel have completed the Off-Normal Response in accordance with EWMO-DIV-BEP-20048, Building Emergency Plan and **OBTAIN** incident information from the caller (e.g., location, odor, gas, liquid, amount, inside/outside building/structure). Narrative/Comments:
		2.2	**NOTIFY** personnel of incident. (e.g. Public address, 2-way radio, E-Pagers, cell phones, and face to face)
		2.3	**NOTIFY** the Shift Operations Manager/Facility Lead (SOM/FL). Name:_____
	NOTE *The following steps may be performed out of sequence.*		
		2.4	**NOTIFY** the support personnel to assist Shift Operations Manager. (e.g., Environmental, Safety, and Health)

2.0 IMMEDIATE RESPONSE ACTIONS (continued)

√	Time/Date	#	ACTIONS
Shift Operations Manager/Facility Lead			
			NOTE *When the Operations Manager is not physically present and/or on shift, the SOM will conduct the minimum notifications up the chain of command (e.g., FOD, ES&H Manager, and Project Manager).*
		2.5	**NOTIFY** the applicable Operations Manager of the event, and **REQUEST** the Operations Manager to conduct the minimum notifications (e.g., FOD, ES&H Manager and Project Manager).
		2.6	**CONDUCT** information gathering, such as the following applicable items: • Container number and contents • Inside/outside facility structure • Location and amount • Spills or release • Temporary Limited Area • Weather conditions
		2.7	**DETERMINE** and **EVALUATE** the incident to develop actions as applicable.
		2.8	**IF** Emergency Response Personnel are required, **THEN GO** to EP-DIV-RM-ERP-20200, EWMO Area Emergency Response and **EXIT** this procedure as necessary.

3.0 SUBSEQUENT ACTIONS

Operations Center			
		3.1	**IF** actions were developed, **THEN IMPLEMENT** actions to return area/operations to normal. Actions:
		3.2	**PROCESS** the procedure as a quality record in accordance with EP-DIR-AP-10003, Records Management Procedure For ADEP Employees.

Narrative/Comments:

Completed By:

Printed Name	Signature	Z#	Date/Time

Attachment 11

EP-DIV-RM-AOP-20204, R.0

Waste Container Questionable Integrity

Effective Date: 12/9/2013

The Responsible Manager has determined that the following organizations' review/concurrence is required for the initial document, and for major revisions a same type and level review is required. Review documentation is contained in the Document History File:

Engineering
IH&S
Operations Managers
Quality Assurance
Radiation Protection
Shift Operations Managers

Responsible Manager, EWMO Facility Operations Director

Steve M. Henry	/ 219172	/ /s/ Andy Baumer 234651 for SMH	/ 12/3/13
Name (print)	Z#	Signature	Date

Classification Review: ☐ N/A ☒ Unclassified ☐ UCNI ☐ Classified _____

Teri Tingey	/ 200975	/ /s/ Teri Tingey	/ 12/3/13
Name (print)	Z#	Signature	Date

Working Copy / Information Only (circle one)
Initials / Date: _____/_____

LA-UR-14-23782

1.0 ENTRY CONDITIONS

- Visual indication of a fallen/dropped waste container
- Visual inspection of a waste container indicates an unanticipated loss of waste container integrity (e.g., missing or broken filter, puncture, corrosion, missing drum locking ring, external contamination
- Visual indication of a bulging waste drum
- Visual indication of a bulging inner waste drum

2.0 IMMEDIATE RESPONSE ACTIONS

√	Time/Date	#	ACTIONS
Operations Center			
		2.1	**ENSURE** personnel have completed the Off-Normal Response in accordance with EWMO-DIV-BEP-20048, Building Emergency Plan and **OBTAIN** incident information from the caller (e.g., location, position, container information, visual damage to exterior of container, leaking, personnel injury, inside/outside building/structure). Narrative/Comments:
		2.2	**NOTIFY** personnel of incident. (e.g., Public address, 2-way radio, E-Pagers, cell phones, and face to face)
		2.3	**NOTIFY** the Shift Operations Manager/Facility Lead (SOM/FL). Name:_____

2.0 IMMEDIATE RESPONSE ACTIONS (continued)

√	Time/Date	#	ACTIONS
	NOTE		*The following steps may be performed out of sequence.*
		2.4	**NOTIFY** the support personnel to assist Shift Operations Manager. (e.g., Environmental, Safety and Health, Engineering, Waste Coordinator, and Security)
Shift Operations Manager/Facility Lead			
	NOTE		*When the Operations Manager is not physically present and/or on shift, the SOM will conduct the minimum notifications up the chain of command (e.g., FOD, ES&H Manager, and Project Manager).*
		2.5	**NOTIFY** the applicable Operations Manager of the event, and **REQUEST** the Operations Manager to conduct the minimum notifications (e.g., FOD, ES&H Manager and Project Manager).
		2.6	**CONDUCT** information gathering, such as the following applicable items: • Container number and contents • Spills/release • Temporary Limited Area • Weather conditions
		2.7	**DETERMINE** and **EVALUATE** the incident to develop actions in accordance with the applicable compliance documents (e.g., Safety Basis, RCRA, Radiation Protection).
		2.8	**IF** Emergency Response Personnel are required, **THEN GO** to EP-DIV-RM-ERP-20200, EWMO Area Emergency Response and **EXIT** this procedure as necessary.

3.0 SUBSEQUENT ACTIONS (continued)

√	Time/Date	#	ACTIONS
Operations Center			
		3.1	**IF** actions were developed, **THEN IMPLEMENT** actions to return area/operations to normal. Actions:
		3.2	**PROCESS** the procedure as a quality record in accordance with EP-DIR-AP-10003, Records Management Procedure For ADEP Employees.

Narrative/Comments:

Completed By:

Printed Name	/ Signature	/ Z#	/ Date/Time

Attachment 12

STANDING ORDER

1. Standing Order Number: EWMO-AREAG-SO-1247, R.2

2. Standing Order Type: (check one) ☐ **Division** ☒ **Facility**

3. Applicable Facilities: TA-54 Area G

4. Standing Order Title: TA-54 Area G Domes TA-54-231 and TA-54-375 PermaCon Access Restrictions

5. Distribution List: (By Functional Title): TA-54 Timely Order Book and Environmental Programs (EP) Document Control

6. Approval:

Gail Welsh	/s/ Gail Welsh	10/15/14
Print name	Signature	Date

(Approval Authority for division-level standing orders is the FOD, for facility-level, the OM or designee.)

Standing Order Effective Date: 10/15/14

Convert this Standing Order to a procedure? ☐ Yes, by _____ (Date) ☒ No

7. Purpose:

This standing order restricts access to the PermaCons in Domes TA-54-231 and TA-54-375 to prevent workers from coming into unnecessary contact with the waste containers and establishes restrictions for the entry into the TA-54-375 PermaCon [e.g., personal protective equipment (PPE) and waste container temperature].

Background: Monitoring requirements of LA-UR-14-23820, LANL Nitrate Salt-Bearing Waste Container Isolation Plan, (i.e., Isolation Plan) is accomplished by the performance of EWMO-AREAG-FO-DOP-1246, Nitrate Salt-Bearing TRU Waste Container Monitoring. The required monitoring performed includes hourly visual inspection and daily temperature measurements of all waste containers within the TA-54-231 and TA-54-375 PermaCon. Additionally, hourly temperature measurements are obtained for waste containers within the TA-54-375 PermaCon that have attached thermocouples, using computer located inside of the TA-54-375 PermaCon Control Room. Daily head-space gas sampling is performed for containers 68685 and LASB50522. Biweekly head space gas sampling is also performed for five additional waste containers.

The following personnel are affected by this standing order: EWMO Operations Manager, Shift Operations Managers, Nuclear Operators, Radiological Control Technicians, and Operations Center Operators.

8. Actions and Duration:

8.1 Requirement

Shift Operations Manager (SOM) approval is required to access the PermaCons in Domes TA-54-231 and TA-54-375, except for inspections performed in accordance with EWMO-AREAG-FO-DOP-1246.

The PermaCons in Domes TA-54-231 and TA-54-375 **SHALL** be posted on the outside of each access point instructing personnel to obtain SOM approval before entering the PermaCon, unless they are performing EWMO-AREAG-FO-DOP-1246.

8.1 Requirement (continued)

Additional Dome TA-54-375 PermaCon access requirements:

- Entry into any cell requires Level I PPE (coveralls, booties, hood, and gloves) and Air Purifying Respirators with a dual GMC-P100 cartridge, in addition to the applicable Radiological Work Permit.
- Before entry the temperature of Standard Waste Box (SWB) 68685 **SHALL** be verified to be is less than or equal to 10 °F above ambient using the computer in the TA-54-375 PermaCon Control Room.

8.2 Action(s) to be taken

8.2.1 TA-54-231 PermaCon Entry

[1] **OBTAIN** SOM approval for entry except to perform EWMO-AREAG-FO-DOP-1246 inspections.

8.2.2 TA-54-375 PermaCon Entry

[1] **OBTAIN** SOM approval for entry except to perform EWMO-AREAG-FO-DOP-1246 inspections.

NOTE *The following action is performed using the computer located inside of the TA-54-375 PermaCon Control Room and receiving input from SWB 68685 using three thermocouples (T1 – SWB top, T2 – SWB side, and T3 – ambient).*

[2] **DETERMINE** whether the T1 (SWB top thermocouple) and T2 (SWB side thermocouple) indicated temperatures are less than or equal to 10 °F above the T3 (ambient thermocouple) indicated temperature.

[3] **IF** either the T1 or T2 indicated temperature is greater than 10 °F above than the T3 (ambient) temperature,
THEN STOP activities associated with the entry into the TA-54-375 PermaCon and **NOTIFY** the TA-54 Operations Center of the discrepancy.

[4] **IF** both the T1 and T2 indicated temperatures satisfy either of the following:

- Less than the T3 (ambient temperature
- Less than or equal to 10 °F above the T3 (ambient) temperature,

THEN OBTAIN and **DON** level I PPE and Air Purifying Respirator with a dual GMC-P100 cartridge for the TA-54-375 PermaCon entry.

8.2.3 EWMO-AREAG-FO-DOP-1246 Inspections

Hourly visual inspections will be conducted from outside of the PermaCon through the windows into the cells and hourly temperature measurements will be obtained from using the TA-54-375 PermaCon control Room computer. Daily head-space gas sampling will be conducted as required by the Isolation Plan. Temperature measurements of the exterior of the waste containers and visual inspection of the waste containers by personnel within the PermaCon will also be performed daily.

8.3 Duration

This standing order will remain in effect until cancelled or superseded.

9. Unreviewed Safety Question (USQ) Review:

USQ process complete? ☒ Yes ☐ N/A

USQ No. (if applicable): AREAG-14-441-C

If "N/A" is checked, then justify below:

USQ Qualified Evaluator (QEV)

Lawrence Garcia	/ /s/ Lawrence Garcia	/ 10/14/14
Print name	Signature	Date

10. Derivative Classifier Review:

This document was reviewed to ensure proper classification and is classified as:

☒ Unclassified ☐ Unclassified Controlled Nuclear Information (UCNI)

☐ Official Use Only (OUO) ☐ Classified

NOTE: If this document is OUO, UCNI, and/or classified, add the appropriate markings, distribution limitation statement, and guidance data block(s).

Derivative Classifier (DC)

Art Crawford	/ /s/ Art Crawford	/ 10/15/14
Print name	Signature	Date

11. Standing Order Cancellation:

Choose one of the following: ☐ USQ complete ☐ N/A

USQ No. (if applicable): _____

Responsible Manager (FOD for division-level standing orders, OM or designee for facility-level)

Print name	Signature	Date

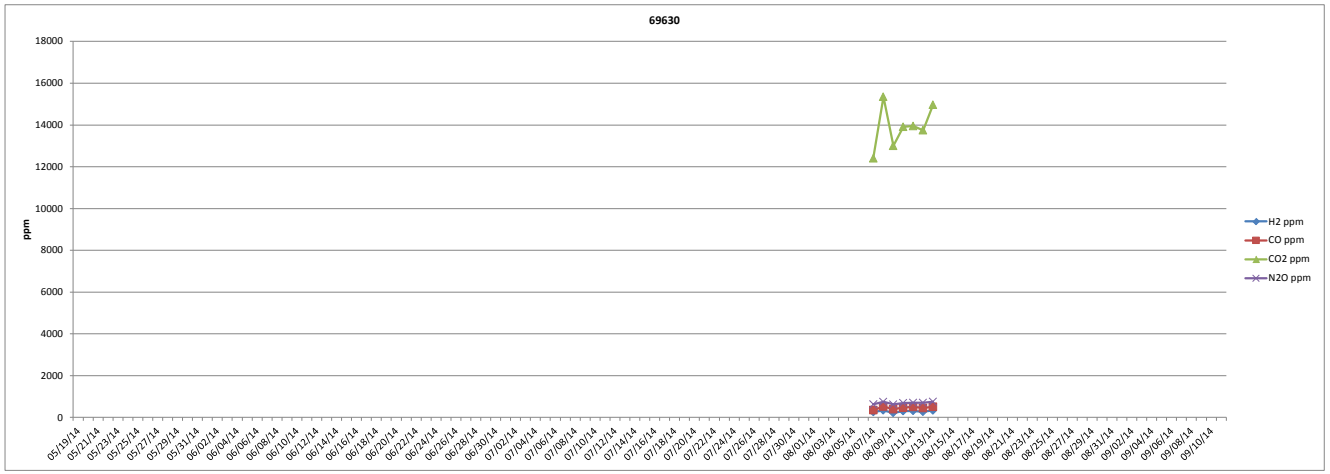
(Attach Attachment 2, Timely Order Reviewer Signoff Sheet, to document reviews of this standing order.)

Attachment 13

	69630			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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07/19/14				

	69630			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
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07/25/14				
07/26/14				
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08/04/14				
08/05/14				
08/06/14				
08/07/14	258	351	12403	629
08/08/14	337	520	15351	744
08/09/14	221	395	13000	622
08/10/14	301	468	13909	689
08/11/14	311	505	13951	705
08/12/14	269	454	13745	705
08/13/14	334	509	14968	751
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09/11/14				

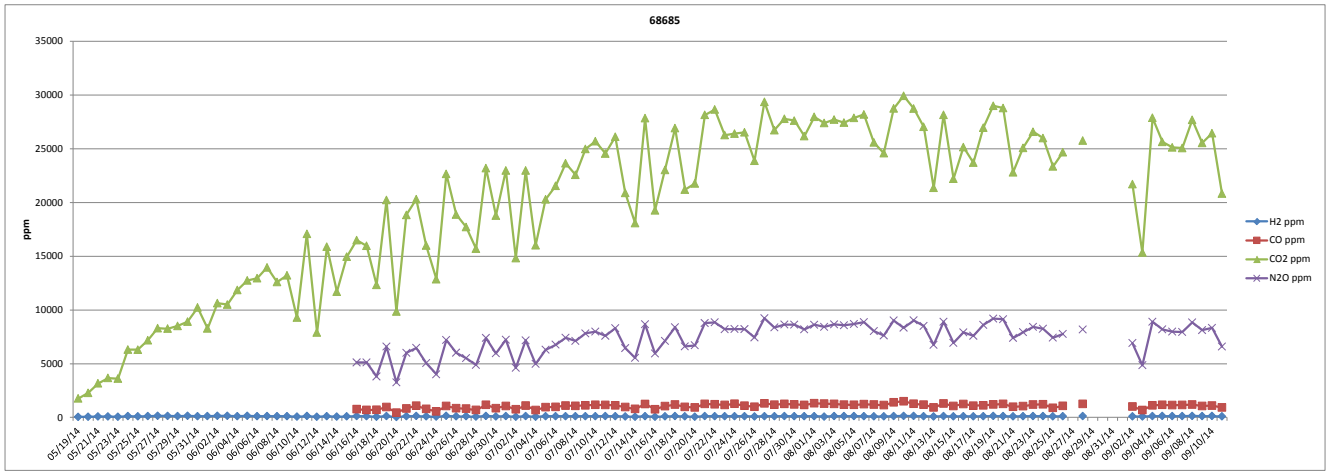
Maximum	337	520	15351	751
Minimum	221	351	12403	622



	68685			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14	54		1772	
05/20/14	62		2282	
05/21/14	80		3171	
05/22/14	87		3677	
05/23/14	65		3609	
05/24/14	127		6314	
05/25/14	97		6302	
05/26/14	126		7180	
05/27/14	143		8300	
05/28/14	138		8263	
05/29/14	123		8506	
05/30/14	147		8909	
05/31/14	107		10230	
06/01/14	125		8278	
06/02/14	145		10639	
06/03/14	146		10506	
06/04/14	115		11863	
06/05/14	143		12754	
06/06/14	112		12955	
06/07/14	121		13962	
06/08/14	111		12602	
06/09/14	114		13219	
06/10/14	69		9287	
06/11/14	131		17089	
06/12/14	57		7904	
06/13/14	114		15887	
06/14/14	74		11701	
06/15/14	99		14963	
06/16/14	121	769	16498	5110
06/17/14	112	691	15969	5117
06/18/14	64	713	12334	3804
06/19/14	119	964	20237	6591
06/20/14	35	443	9853	3255
06/21/14	114	830	18847	6009
06/22/14	133	1091	20304	6477
06/23/14	100	788	15999	5059
06/24/14	71	565	12856	4010
06/25/14	142	1057	22667	7203
06/26/14	92	852	18877	6016
06/27/14	104	818	17714	5517
06/28/14	69	693	15710	4886
06/29/14	136	1175	23205	7394
06/30/14	81	849	18787	5966
07/01/14	126	1063	22982	7231
07/02/14	56	757	14828	4619
07/03/14	122	1100	22978	7167
07/04/14	61	680	16019	4982
07/05/14	106	949	20298	6295
07/06/14	107	974	21555	6771
07/07/14	115	1096	23660	7412
07/08/14	107	1072	22584	7119
07/09/14	106	1123	24984	7819
07/10/14	107	1172	25711	7990
07/11/14	119	1165	24560	7600
07/12/14	113	1127	26119	8302
07/13/14	84	963	20897	6452
07/14/14	64	788	18083	5541
07/15/14	105	1245	27856	8669
07/16/14	63	762	19271	5946
07/17/14	99	1055	23037	7118
07/18/14	118	1193	26921	8391
07/19/14	91	978	21197	6608

	68685			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	55	925	21770	6716
07/21/14	121	1262	28155	8784
07/22/14	110	1224	28656	8854
07/23/14	111	1160	26284	8206
07/24/14	108	1264	26414	8230
07/25/14	109	1091	26541	8212
07/26/14	89	991	23888	7444
07/27/14	115	1301	29375	9226
07/28/14	111	1186	26734	8372
07/29/14	119	1257	27797	8642
07/30/14	108	1214	27628	8637
07/31/14	107	1155	26177	8194
08/01/14	110	1321	27978	8623
08/02/14	78	1283	27404	8426
08/03/14	119	1255	27718	8660
08/04/14	116	1178	27441	8571
08/05/14	120	1174	27878	8691
08/06/14	115	1236	28195	8867
08/07/14	102	1194	25590	8031
08/08/14	101	1142	24599	7633
08/09/14	123	1404	28754	9018
08/10/14	134	1505	29935	8352
08/11/14	128	1265	28751	9033
08/12/14	114	1183	27049	8514
08/13/14	87	927	21367	6749
08/14/14	116	1293	28165	8900
08/15/14	98	1058	22213	6941
08/16/14	110	1243	25159	7912
08/17/14	98	1092	23720	7590
08/18/14	107	1121	26968	8612
08/19/14	131	1205	29004	9193
08/20/14	116	1258	28791	9130
08/21/14	96	988	22811	7399
08/22/14	115	1050	25082	7937
08/23/14	120	1196	26589	8430
08/24/14	119	1225	26003	8258
08/25/14	99	886	23361	7423
08/26/14	108	1078	24679	7765
08/27/14				
08/28/14	117	1261	25765	8184
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	96	1013	21716	6918
09/03/14	88	677	15348	4857
09/04/14	126	1120	27887	8902
09/05/14	129	1172	25641	8192
09/06/14	121	1145	25132	7982
09/07/14	125	1165	25072	7951
09/08/14	139	1191	27700	8839
09/09/14	122	1061	25544	8121
09/10/14	132	1104	26452	8332
09/11/14	100	930	20830	6597

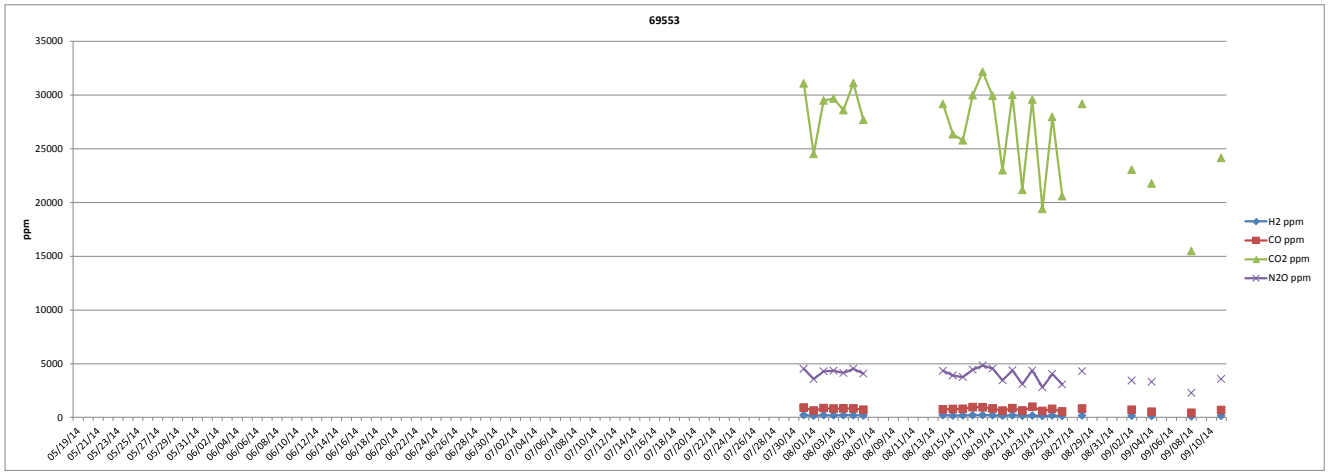
Maximum	147	1505	29935	9226
Minimum	35	443	1772	3255



	69553			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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	69553			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
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07/24/14				
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07/28/14				
07/29/14				
07/30/14				
07/31/14	214	909	31097	4517
08/01/14	160	637	24522	3564
08/02/14	210	863	29498	4282
08/03/14	191	819	29686	4347
08/04/14	202	844	28601	4142
08/05/14	196	833	31130	4539
08/06/14	168	707	27704	4077
08/07/14				
08/08/14				
08/09/14				
08/10/14				
08/11/14				
08/12/14				
08/13/14				
08/14/14	206	740	29180	4340
08/15/14	166	784	26350	3902
08/16/14	179	799	25790	3757
08/17/14	205	946	29995	4439
08/18/14	219	939	32177	4833
08/19/14	196	835	29942	4551
08/20/14	154	616	23009	3448
08/21/14	196	856	30029	4389
08/22/14	146	636	21173	3105
08/23/14	171	987	29584	4365
08/24/14	131	602	19406	2810
08/25/14	175	795	27973	4049
08/26/14	133	544	20587	3069
08/27/14				
08/28/14	176	814	29173	4303
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	146	711	23055	3428
09/03/14				
09/04/14	125	519	21770	3307
09/05/14				
09/06/14				
09/07/14				
09/08/14	87	429	15482	2288
09/09/14				
09/10/14				
09/11/14	150	683	24156	3579

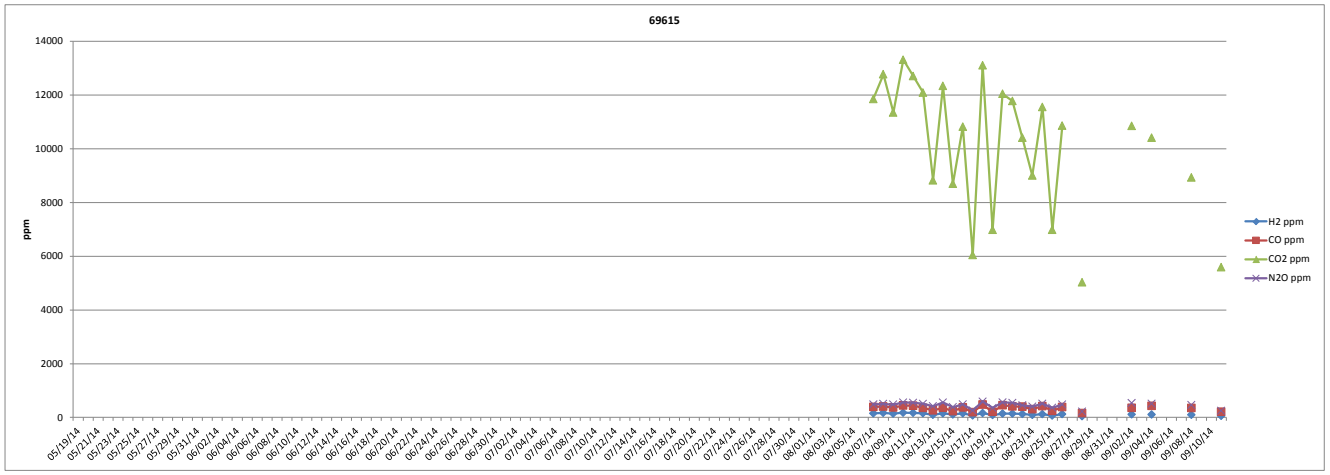
Maximum	219	987	32177	4833
Minimum	87	429	15482	2288



	69615			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
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	69615			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
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08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14	151	392	11857	485
08/08/14	172	405	12777	506
08/09/14	141	369	11350	481
08/10/14	174	444	13317	558
08/11/14	169	436	12708	548
08/12/14	157	358	12093	510
08/13/14	96	263	8828	421
08/14/14	153	362	12342	557
08/15/14	108	236	8699	386
08/16/14	151	372	10826	489
08/17/14	72	194	6049	261
08/18/14	162	480	13109	592
08/19/14	88	208	6983	353
08/20/14	142	452	12049	562
08/21/14	141	412	11782	544
08/22/14	128	399	10413	453
08/23/14	94	307	9007	407
08/24/14	122	420	11559	513
08/25/14	66	246	6986	362
08/26/14	121	384	10866	484
08/27/14				
08/28/14	42	161	5032	221
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	114	355	10853	535
09/03/14				
09/04/14	106	428	10414	511
09/05/14				
09/06/14				
09/07/14				
09/08/14	95	352	8935	465
09/09/14				
09/10/14				
09/11/14	57	208	5595	251

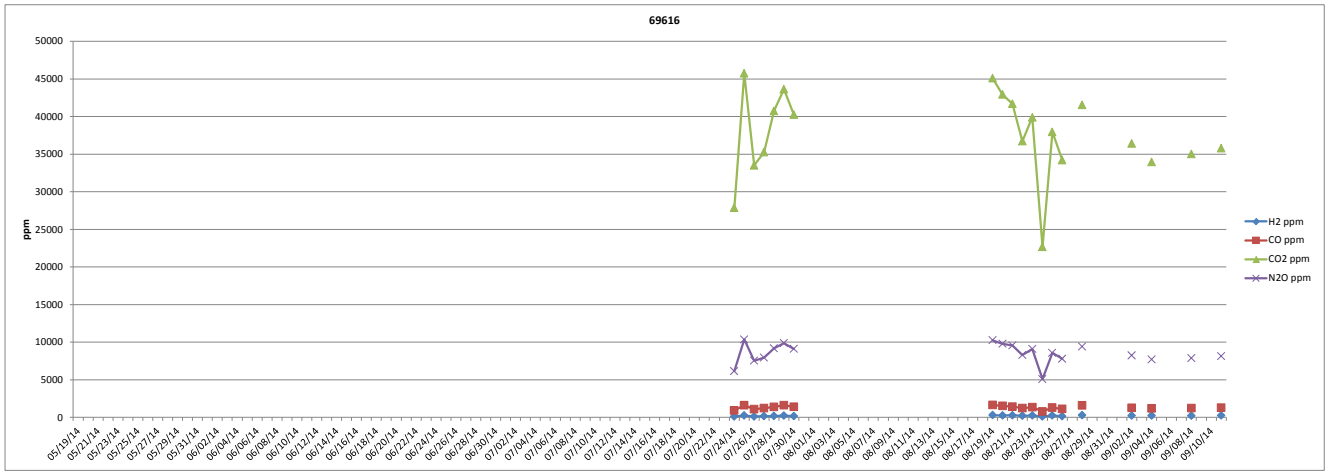
Maximum	174	480	13317	592
Minimum	42	161	5032	221



	69616			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
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07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69616			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	115	918	27870	6152
07/25/14	268	1617	45757	10363
07/26/14	126	1098	33518	7547
07/27/14	165	1229	35267	7962
07/28/14	185	1396	40753	9194
07/29/14	239	1618	43649	9892
07/30/14	171	1406	40257	9120
07/31/14				
08/01/14				
08/02/14				
08/03/14				
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08/14/14				
08/15/14				
08/16/14				
08/17/14				
08/18/14				
08/19/14	311	1650	45119	10266
08/20/14	266	1536	42951	9801
08/21/14	282	1437	41706	9580
08/22/14	226	1236	36738	8301
08/23/14	266	1367	39895	9110
08/24/14	118	788	22677	5088
08/25/14	264	1315	37969	8574
08/26/14	149	1125	34212	7789
08/27/14				
08/28/14	289	1605	41551	9423
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	246	1275	36423	8257
09/03/14				
09/04/14	235	1200	33958	7707
09/05/14				
09/06/14				
09/07/14				
09/08/14	225	1245	35036	7885
09/09/14				
09/10/14				
09/11/14	261	1283	35802	8142

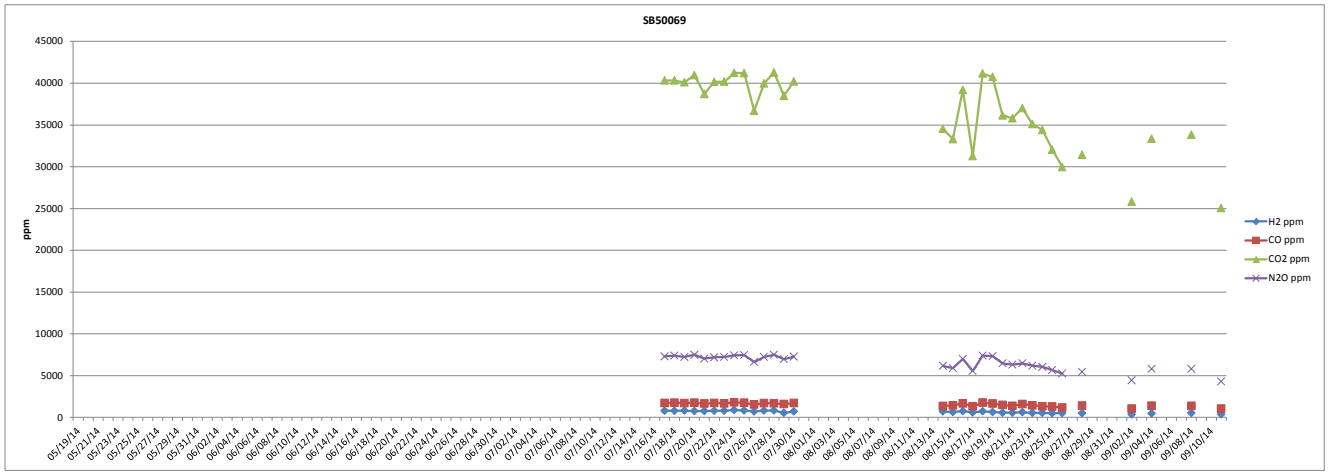
Maximum	311	1650	45757	10363
Minimum	115	788	22677	5088



	SB50069			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
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07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	799	1719	40330	7297
07/18/14	790	1752	40331	7402
07/19/14	821	1717	40114	7231

	SB50069			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	768	1765	40967	7495
07/21/14	776	1657	38707	7034
07/22/14	795	1724	40159	7193
07/23/14	794	1686	40188	7244
07/24/14	891	1810	41238	7433
07/25/14	835	1758	41207	7454
07/26/14	713	1547	36694	6643
07/27/14	809	1716	39981	7234
07/28/14	831	1694	41282	7502
07/29/14	547	1607	38496	6963
07/30/14	727	1720	40217	7274
07/31/14				
08/01/14				
08/02/14				
08/03/14				
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08/12/14				
08/13/14				
08/14/14	720	1370	34540	6169
08/15/14	647	1437	33305	5908
08/16/14	758	1682	39200	6989
08/17/14	595	1333	31273	5554
08/18/14	741	1775	41161	7389
08/19/14	639	1657	40763	7335
08/20/14	569	1498	36150	6483
08/21/14	570	1386	35803	6314
08/22/14	623	1594	37026	6477
08/23/14	541	1442	35104	6190
08/24/14	542	1331	34395	6049
08/25/14	498	1301	32036	5664
08/26/14	522	1183	29958	5262
08/27/14				
08/28/14	499	1413	31439	5454
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	364	1048	25820	4435
09/03/14				
09/04/14	484	1391	33346	5801
09/05/14				
09/06/14				
09/07/14				
09/08/14	529	1387	33835	5812
09/09/14				
09/10/14				
09/11/14	375	1055	25053	4295

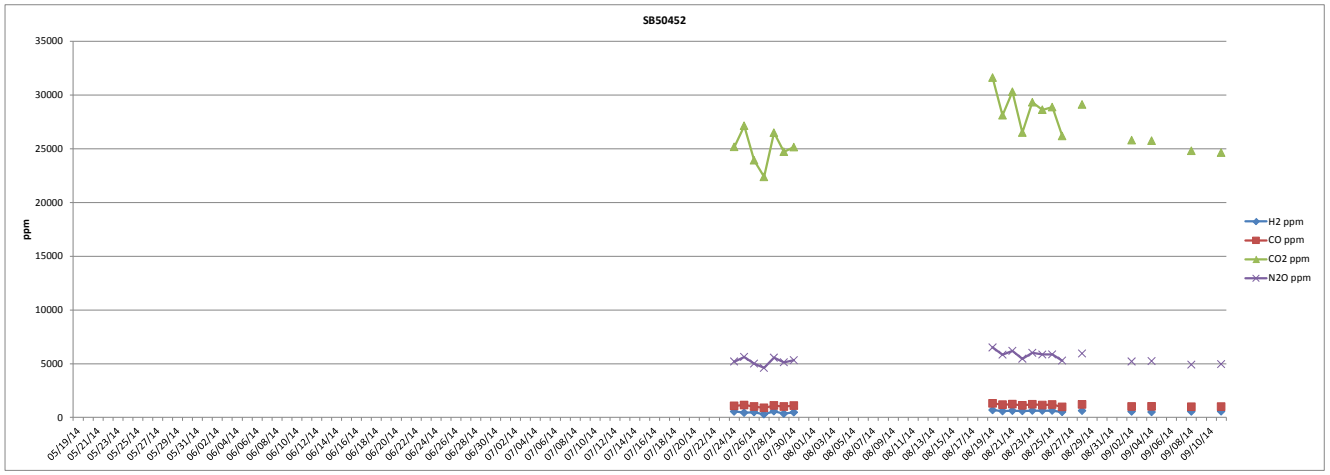
Maximum	891	1810	41282	7502
Minimum	364	1048	25053	4295



	SB50452			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
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07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	SB50452			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	551	1069	25183	5196
07/25/14	439	1149	27142	5630
07/26/14	486	1014	23931	5001
07/27/14	296	895	22385	4603
07/28/14	578	1113	26505	5555
07/29/14	359	1017	24723	5128
07/30/14	480	1093	25154	5320
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
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08/06/14				
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08/12/14				
08/13/14				
08/14/14				
08/15/14				
08/16/14				
08/17/14				
08/18/14				
08/19/14	677	1311	31626	6510
08/20/14	582	1181	28124	5833
08/21/14	624	1228	30314	6185
08/22/14	594	1121	26516	5457
08/23/14	634	1218	29331	6004
08/24/14	639	1148	28632	5854
08/25/14	639	1195	28881	5866
08/26/14	513	977	26195	5284
08/27/14				
08/28/14	624	1208	29125	5949
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	548	1012	25803	5199
09/03/14				
09/04/14	499	1021	25752	5240
09/05/14				
09/06/14				
09/07/14				
09/08/14	543	985	24810	4914
09/09/14				
09/10/14				
09/11/14	565	997	24647	4958

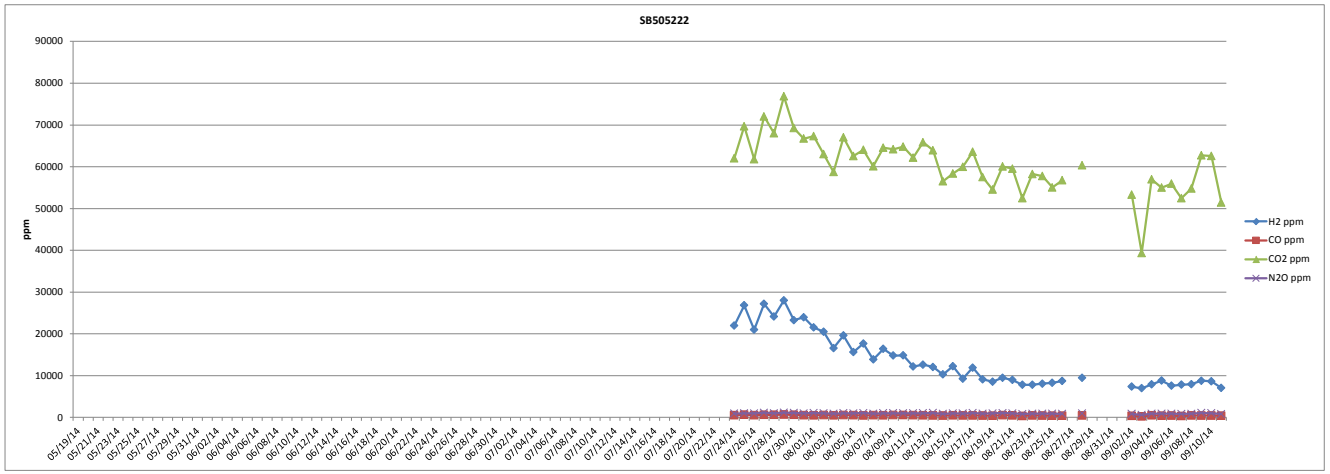
Maximum	677	1311	31626	6510
Minimum	296	895	22385	4603



	SB50522			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
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07/13/14				
07/14/14				
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07/16/14				
07/17/14				
07/18/14				
07/19/14				

	SB50522			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	21975	539	62032	945
07/25/14	26838	662	69674	993
07/26/14	20998	537	61790	971
07/27/14	27179	639	72050	1134
07/28/14	24154	630	68024	1011
07/29/14	28020	684	76858	1155
07/30/14	23282	626	69258	1086
07/31/14	23961	525	66745	982
08/01/14	21551	509	67320	1068
08/02/14	20507	563	63031	989
08/03/14	16585	510	58759	916
08/04/14	19640	554	67041	1031
08/05/14	15630	522	62544	964
08/06/14	17687	476	64068	1036
08/07/14	13890	520	60111	920
08/08/14	16420	496	64567	1027
08/09/14	14813	573	64181	1032
08/10/14	14862	554	64810	991
08/11/14	12188	538	62173	1017
08/12/14	12624	507	65850	1028
08/13/14	12071	472	63927	1104
08/14/14	10291	439	56528	873
08/15/14	12242	489	58382	976
08/16/14	9258	455	59976	928
08/17/14	11912	469	63588	1078
08/18/14	9111	448	57532	918
08/19/14	8549	419	54547	968
08/20/14	9490	543	60061	1040
08/21/14	8971	460	59551	972
08/22/14	7829	352	52471	829
08/23/14	7816	456	58254	894
08/24/14	8081	443	57782	908
08/25/14	8300	394	55044	920
08/26/14	8713	400	56774	872
08/27/14				
08/28/14	9472	455	60365	967
08/29/14				
08/30/14				
08/31/14				
09/01/14				
09/02/14	7373	362	53304	859
09/03/14	6986	259	39338	633
09/04/14	7911	500	57002	924
09/05/14	8823	407	55026	900
09/06/14	7588	425	55944	907
09/07/14	7841	343	52486	840
09/08/14	7930	460	54799	886
09/09/14	8771	427	62741	1082
09/10/14	8625	427	62596	1031
09/11/14	7071	391	51431	822

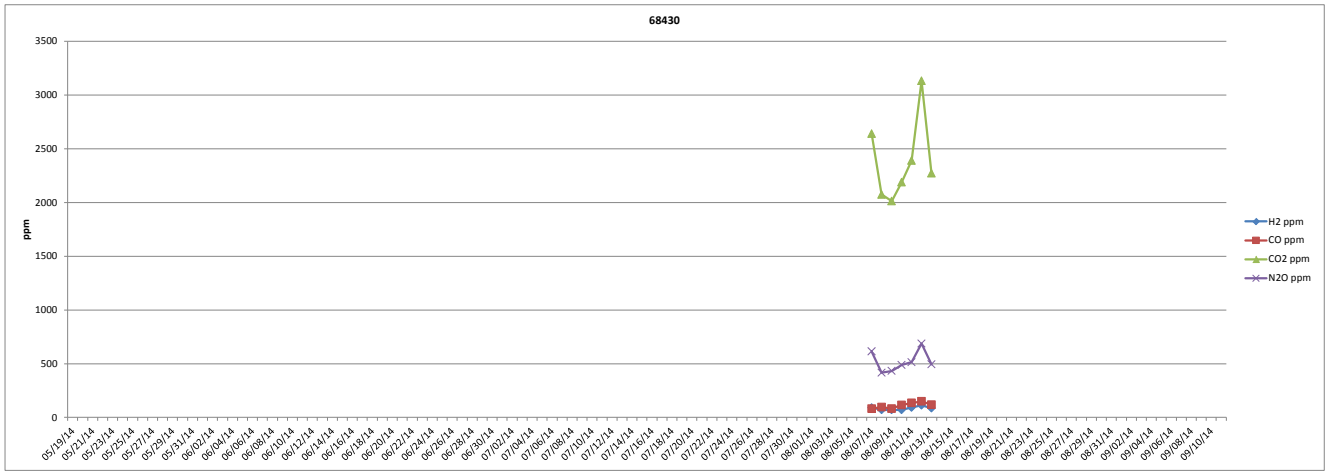
Maximum	28020	684	76858	1155
Minimum	6986	259	39338	633



	68430			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
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05/31/14				
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07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	68430			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14	91	82	2642	615
08/08/14	70	96	2075	416
08/09/14	69	82	2014	433
08/10/14	70	116	2189	488
08/11/14	92	135	2391	514
08/12/14	112	150	3133	687
08/13/14	86	118	2272	494
08/14/14				
08/15/14				
08/16/14				
08/17/14				
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09/10/14				
09/11/14				

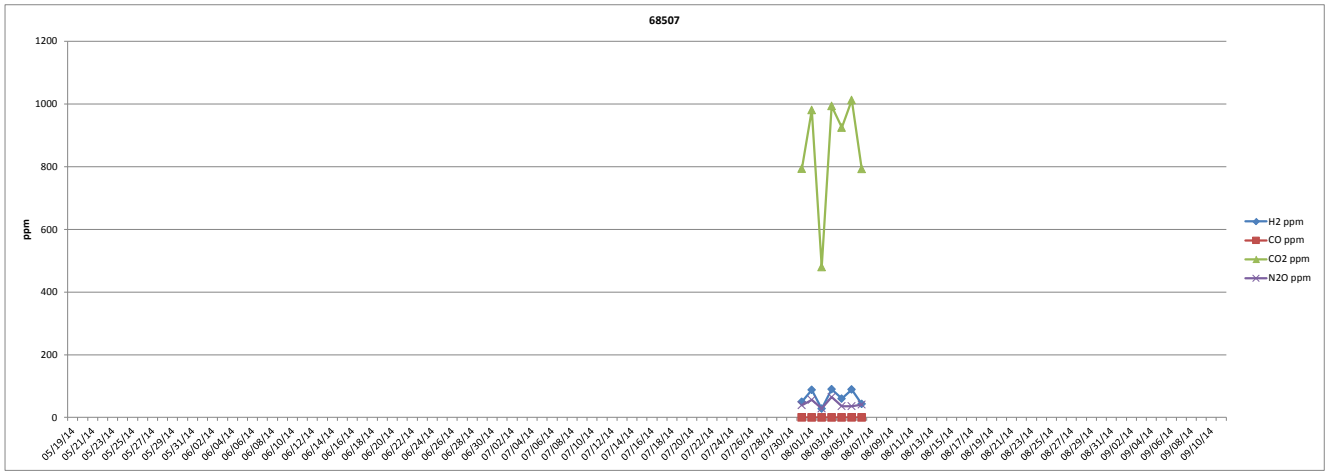
Maximum	112	150	3133	687
Minimum	69	82	2014	416



	68507			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
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	68507			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	50	0	794	39
08/01/14	88	0	981	56
08/02/14	28	0	480	29
08/03/14	90	0	994	65
08/04/14	60	0	925	36
08/05/14	89	0	1013	36
08/06/14	43	0	793	41
08/07/14				
08/08/14				
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09/11/14				

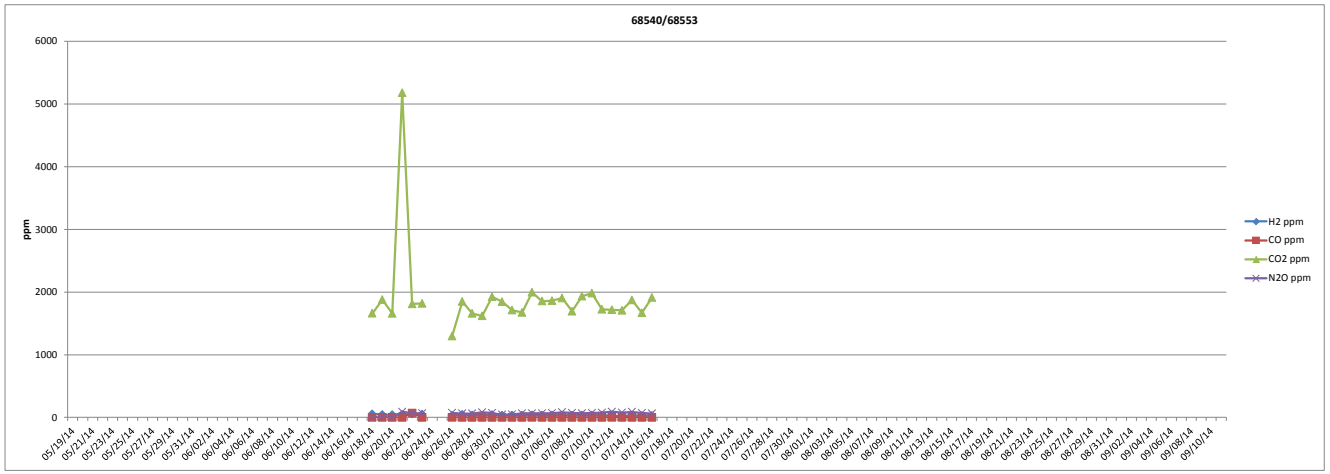
Maximum	90	0	1013	65
Minimum	28	0	480	29



	68540/68553			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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06/11/14				
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06/13/14				
06/14/14				
06/15/14				
06/16/14				
06/17/14				
06/18/14	56	0	1662	0
06/19/14	45	0	1880	0
06/20/14	43	0	1660	0
06/21/14	45	0	5182	90
06/22/14	53	69	1811	68
06/23/14	52	0	1820	67
06/24/14				
06/25/14				
06/26/14	33	0	1298	73
06/27/14	48	0	1850	62
06/28/14	37	0	1661	63
06/29/14	35	0	1621	81
06/30/14	44	0	1925	70
07/01/14	35	0	1846	43
07/02/14	38	0	1712	47
07/03/14	36	0	1674	65
07/04/14	40	0	1997	64
07/05/14	37	0	1856	64
07/06/14	37	0	1863	68
07/07/14	37	0	1906	84
07/08/14	35	0	1694	72
07/09/14	37	0	1934	64
07/10/14	37	0	1983	71
07/11/14	37	0	1725	76
07/12/14	28	0	1718	90
07/13/14	22	0	1708	78
07/14/14	33	0	1874	89
07/15/14	29	0	1669	72
07/16/14	31	0	1914	63
07/17/14				
07/18/14				
07/19/14				

	68540/68553			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
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07/24/14				
07/25/14				
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09/11/14				

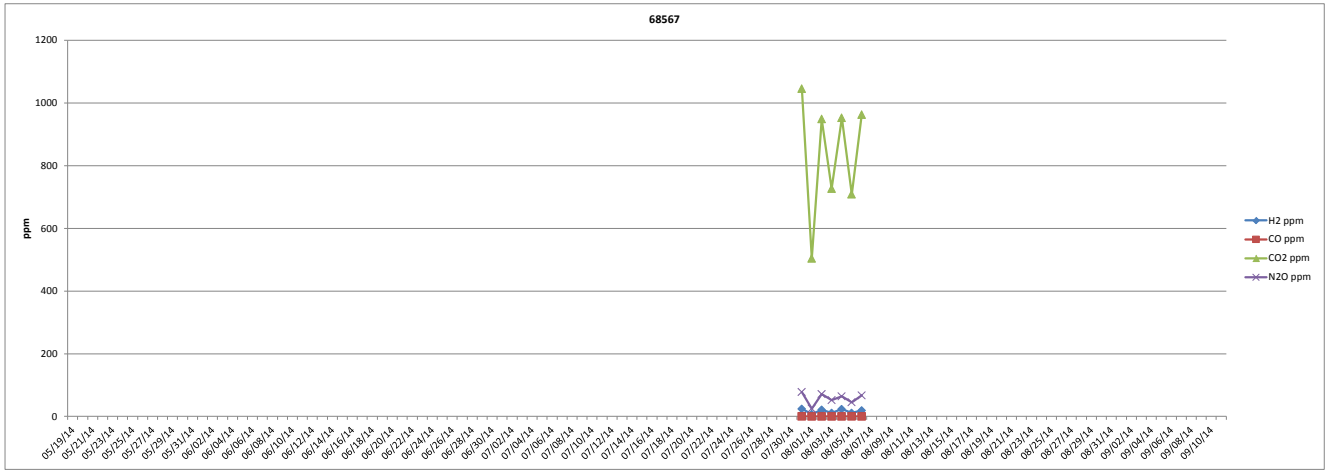
Maximum	56	69	5182	90
Minimum	22	0	1298	0



	68567			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
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07/18/14				
07/19/14				

	68567			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	24	0	1046	78
08/01/14	7	0	504	25
08/02/14	21	0	949	71
08/03/14	11	0	727	52
08/04/14	23	0	953	64
08/05/14	11	0	709	45
08/06/14	19	0	963	67
08/07/14				
08/08/14				
08/09/14				
08/10/14				
08/11/14				
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09/09/14				
09/10/14				
09/11/14				

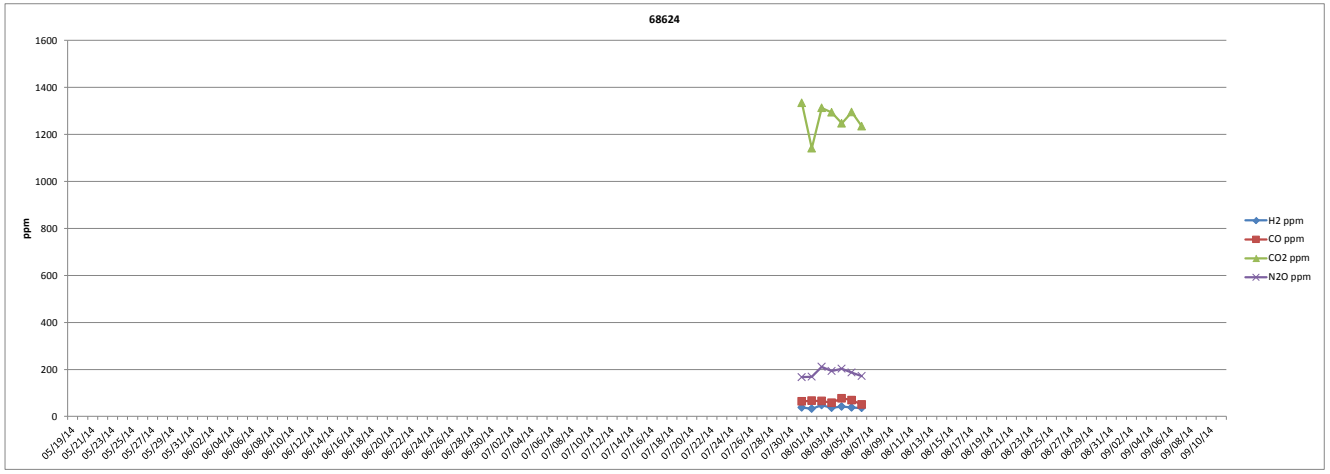
Maximum	24	0	1046	78
Minimum	7	0	504	25



	68624			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
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07/17/14				
07/18/14				
07/19/14				

	68624			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	38	64	1334	167
08/01/14	33	67	1141	169
08/02/14	48	66	1313	211
08/03/14	37	58	1294	193
08/04/14	42	77	1247	203
08/05/14	38	69	1295	187
08/06/14	36	51	1235	172
08/07/14				
08/08/14				
08/09/14				
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09/10/14				
09/11/14				

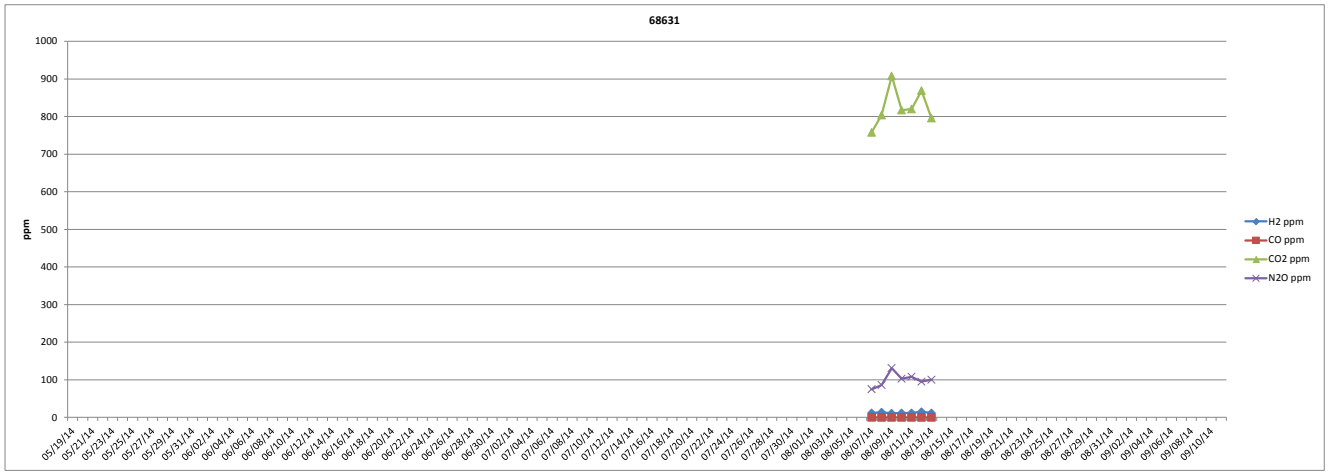
Maximum	48	77	1334	211
Minimum	33	51	1141	167



	68631			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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07/13/14				
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07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	68631			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14	12	0	758	75
08/08/14	14	0	804	86
08/09/14	11	0	908	131
08/10/14	12	0	817	103
08/11/14	12	0	820	108
08/12/14	15	0	869	95
08/13/14	12	0	796	100
08/14/14				
08/15/14				
08/16/14				
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09/09/14				
09/10/14				
09/11/14				

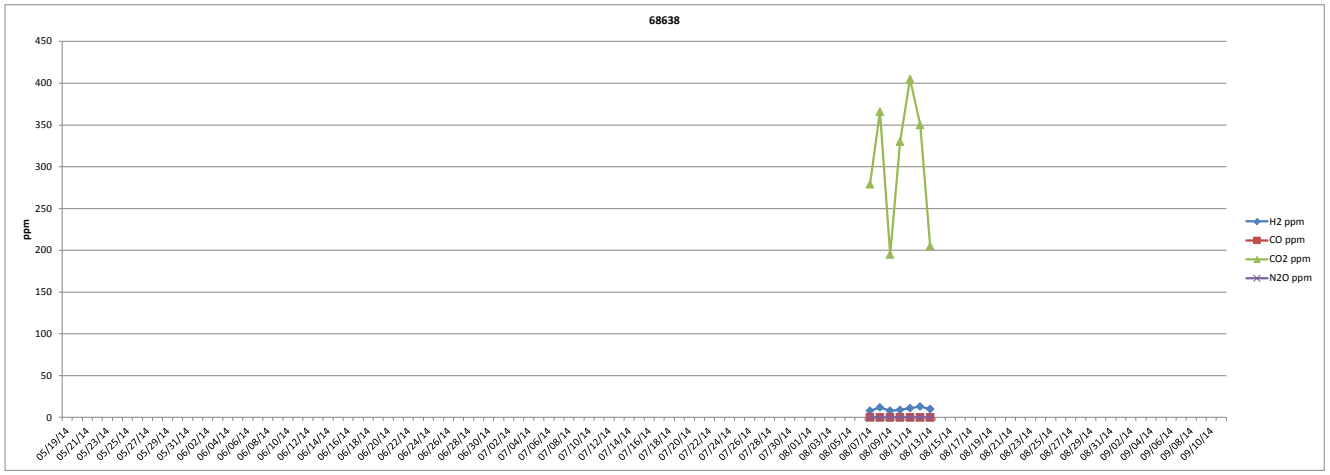
Maximum	15	0	908	131
Minimum	11	0	758	75



	68638			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
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07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	68638			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14	8	0	279	0
08/08/14	12	0	366	0
08/09/14	8	0	195	0
08/10/14	9	0	330	0
08/11/14	11	0	405	0
08/12/14	13	0	350	0
08/13/14	10	0	205	0
08/14/14				
08/15/14				
08/16/14				
08/17/14				
08/18/14				
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09/06/14				
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09/08/14				
09/09/14				
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09/11/14				

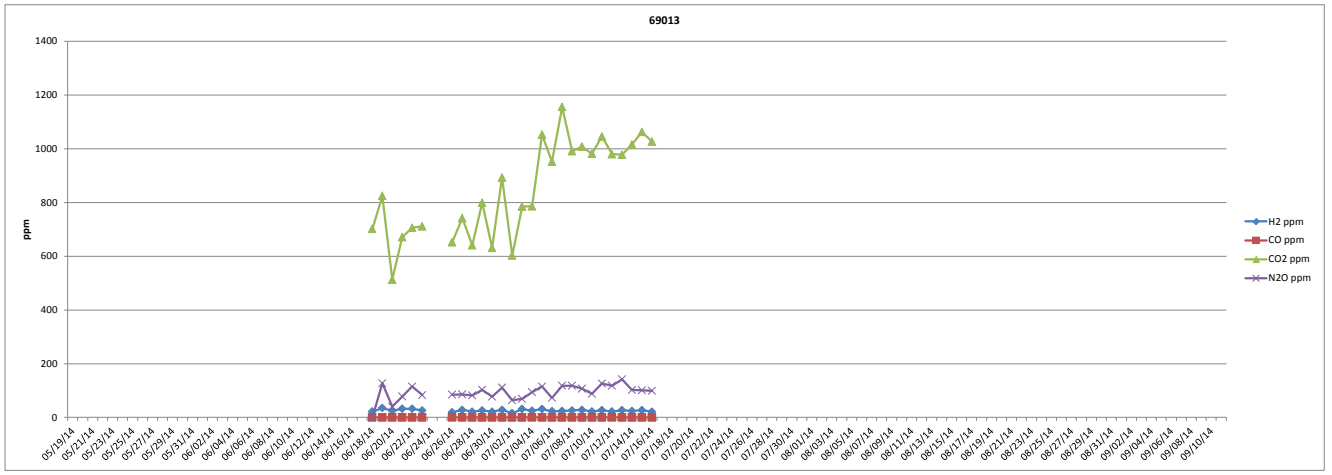
Maximum	13	0	405	0
Minimum	8	0	195	0



	69013			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
06/01/14				
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06/06/14				
06/07/14				
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06/09/14				
06/10/14				
06/11/14				
06/12/14				
06/13/14				
06/14/14				
06/15/14				
06/16/14				
06/17/14				
06/18/14	22	0	702	0
06/19/14	35	0	825	127
06/20/14	25	0	513	40
06/21/14	32	0	671	78
06/22/14	32	0	706	115
06/23/14	26	0	711	83
06/24/14				
06/25/14				
06/26/14	19	0	652	85
06/27/14	28	0	742	86
06/28/14	21	0	641	82
06/29/14	26	0	799	103
06/30/14	21	0	631	77
07/01/14	28	0	893	111
07/02/14	16	0	603	64
07/03/14	31	0	785	69
07/04/14	25	0	786	94
07/05/14	31	0	1053	115
07/06/14	23	0	952	73
07/07/14	24	0	1156	118
07/08/14	26	0	991	118
07/09/14	28	0	1008	107
07/10/14	22	0	982	88
07/11/14	27	0	1046	126
07/12/14	22	0	980	118
07/13/14	27	0	978	142
07/14/14	24	0	1016	102
07/15/14	27	0	1063	101
07/16/14	21	0	1027	99
07/17/14				
07/18/14				
07/19/14				

	69013			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
08/02/14				
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09/09/14				
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09/11/14				

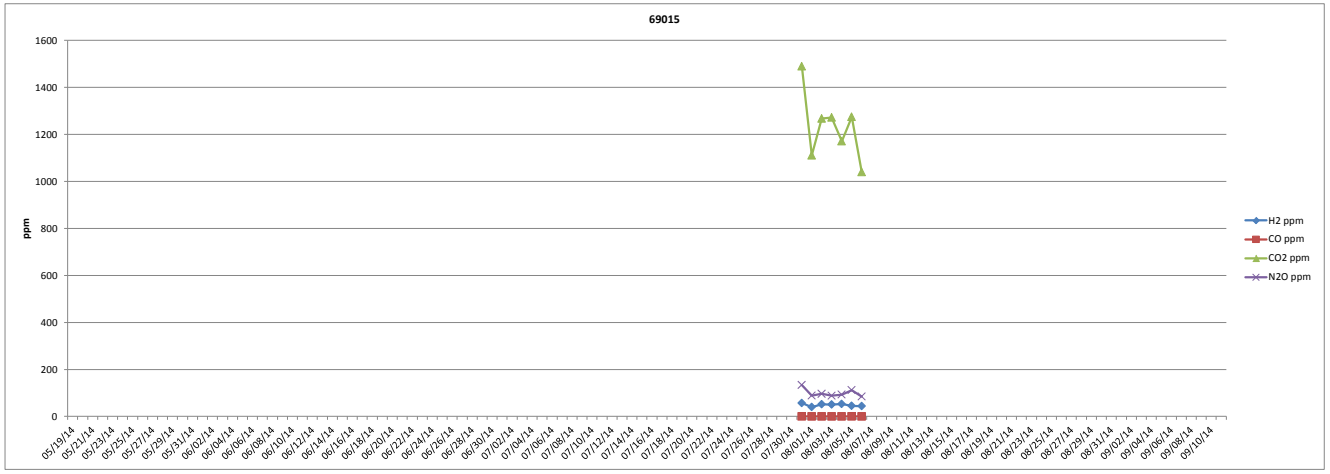
Maximum	35	0	1156	142
Minimum	16	0	513	0



	69015			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69015			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	57	0	1490	134
08/01/14	40	0	1111	89
08/02/14	52	0	1268	96
08/03/14	51	0	1272	88
08/04/14	53	0	1171	93
08/05/14	45	0	1275	112
08/06/14	44	0	1040	85
08/07/14				
08/08/14				
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08/31/14				
09/01/14				
09/02/14				
09/03/14				
09/04/14				
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09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

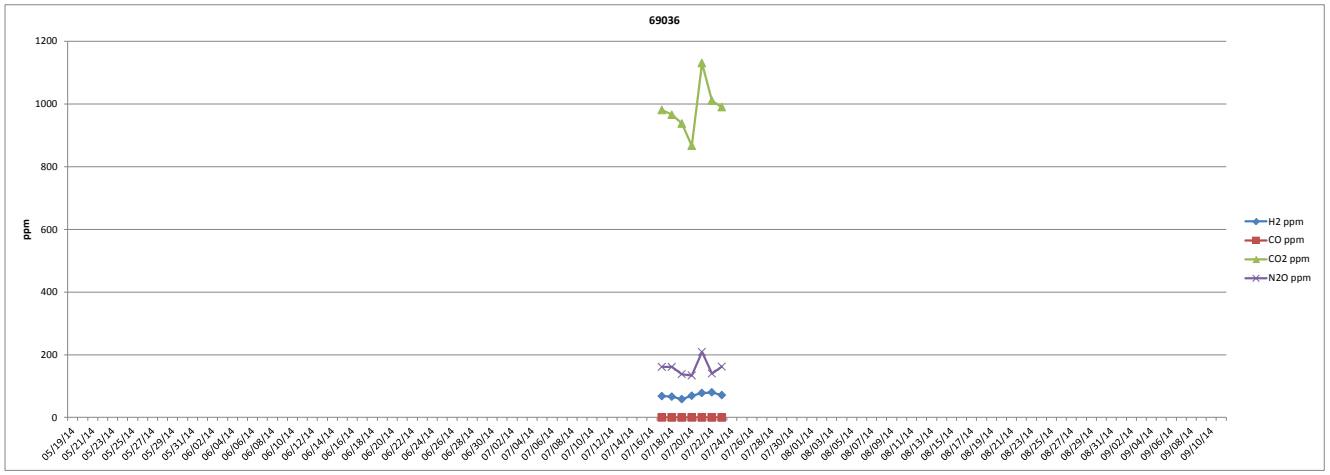
Maximum	57	0	1490	134
Minimum	40	0	1040	85



	69036			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
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07/07/14				
07/08/14				
07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	68	0	981	161
07/18/14	66	0	966	161
07/19/14	58	0	938	138

	69036			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	69	0	867	134
07/21/14	78	0	1131	209
07/22/14	80	0	1011	140
07/23/14	71	0	990	162
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
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08/31/14				
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09/02/14				
09/03/14				
09/04/14				
09/05/14				
09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

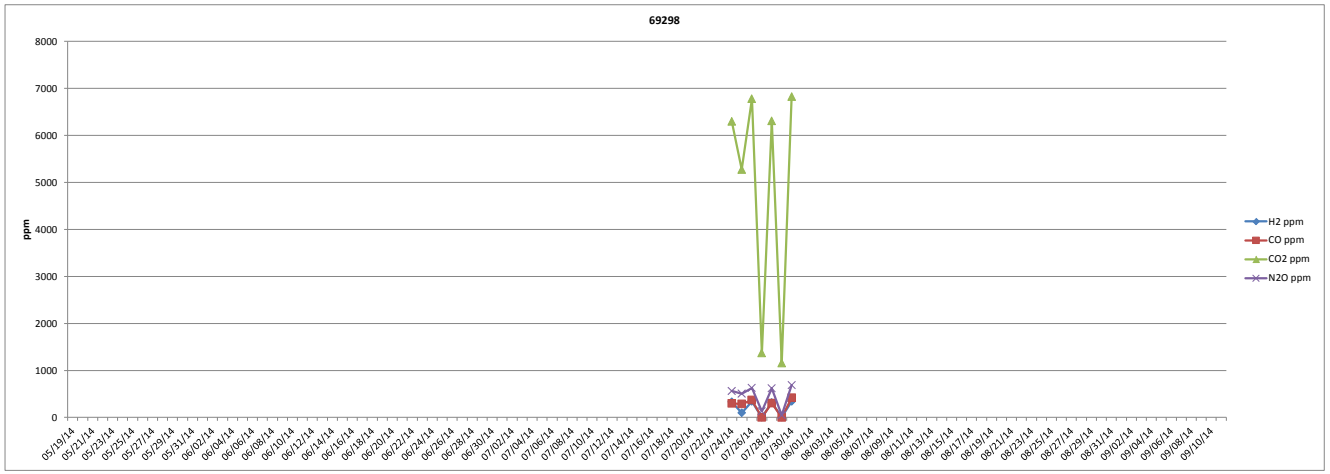
Maximum	80	0	1131	209
Minimum	58	0	867	134



	69298			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
06/01/14				
06/02/14				
06/03/14				
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06/05/14				
06/06/14				
06/07/14				
06/08/14				
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06/11/14				
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06/13/14				
06/14/14				
06/15/14				
06/16/14				
06/17/14				
06/18/14				
06/19/14				
06/20/14				
06/21/14				
06/22/14				
06/23/14				
06/24/14				
06/25/14				
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06/27/14				
06/28/14				
06/29/14				
06/30/14				
07/01/14				
07/02/14				
07/03/14				
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07/05/14				
07/06/14				
07/07/14				
07/08/14				
07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69298			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	333	298	6298	562
07/25/14	97	288	5274	505
07/26/14	339	371	6780	627
07/27/14	3	0	1370	132
07/28/14	317	305	6308	619
07/29/14	4	0	1156	46
07/30/14	339	418	6826	687
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14				
08/08/14				
08/09/14				
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08/11/14				
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08/26/14				
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08/28/14				
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08/30/14				
08/31/14				
09/01/14				
09/02/14				
09/03/14				
09/04/14				
09/05/14				
09/06/14				
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09/08/14				
09/09/14				
09/10/14				
09/11/14				

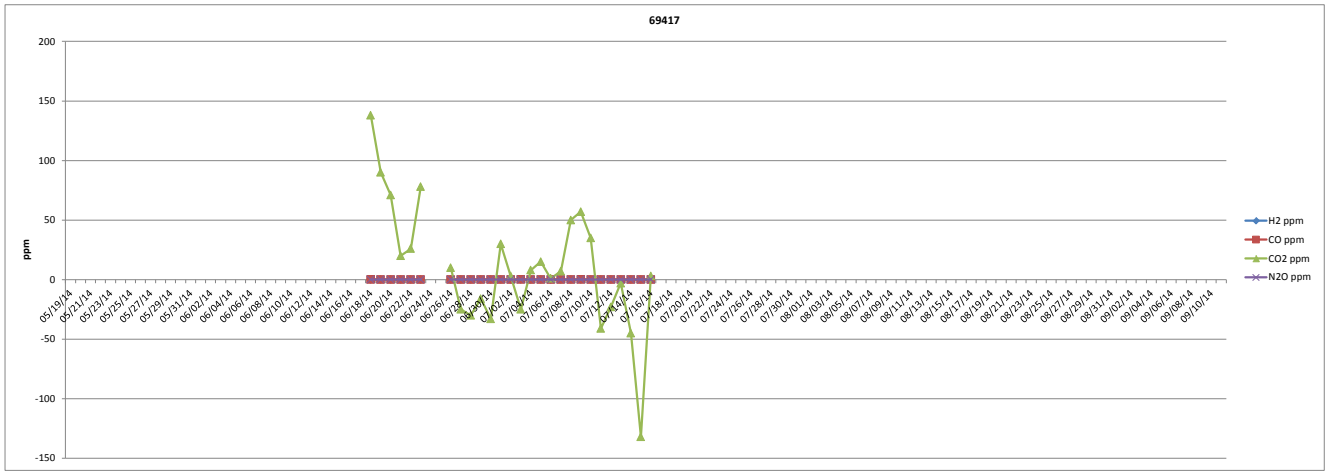
Maximum	339	418	6826	687
Minimum	3	0	1156	46



	69417			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
06/01/14				
06/02/14				
06/03/14				
06/04/14				
06/05/14				
06/06/14				
06/07/14				
06/08/14				
06/09/14				
06/10/14				
06/11/14				
06/12/14				
06/13/14				
06/14/14				
06/15/14				
06/16/14				
06/17/14				
06/18/14	0	0	138	0
06/19/14	0	0	90	0
06/20/14	0	0	71	0
06/21/14	0	0	20	0
06/22/14	0	0	26	0
06/23/14	0	0	78	0
06/24/14				
06/25/14				
06/26/14	0	0	10	0
06/27/14	0	0	-25	0
06/28/14	0	0	-30	0
06/29/14	0	0	-16	0
06/30/14	0	0	-33	0
07/01/14	0	0	30	0
07/02/14	0	0	3	0
07/03/14	0	0	-25	0
07/04/14	0	0	8	0
07/05/14	0	0	15	0
07/06/14	0	0	1	0
07/07/14	0	0	7	0
07/08/14	0	0	50	0
07/09/14	0	0	57	0
07/10/14	0	0	35	0
07/11/14	0	0	-41	0
07/12/14	0	0	-23	0
07/13/14	0	0	-3	0
07/14/14	0	0	-45	0
07/15/14	0	0	-132	0
07/16/14	0	0	3	0
07/17/14				
07/18/14				
07/19/14				

	69417			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
08/02/14				
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09/04/14				
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09/06/14				
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09/08/14				
09/09/14				
09/10/14				
09/11/14				

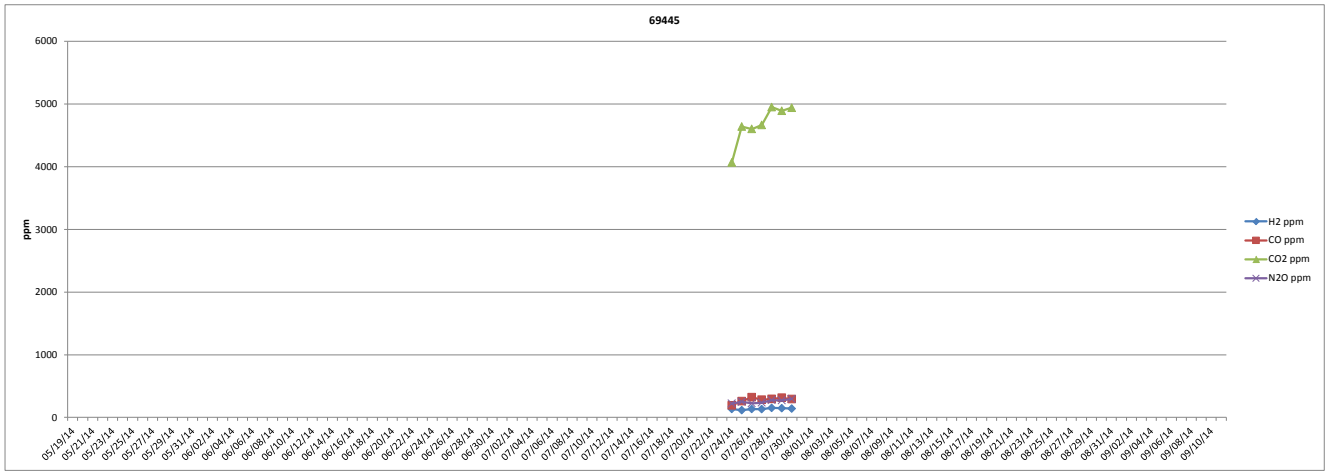
Maximum	0	0	138	0
Minimum	0	0	-132	0



	69445			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
06/01/14				
06/02/14				
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07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69445			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	133	192	4067	222
07/25/14	115	260	4642	250
07/26/14	133	322	4603	226
07/27/14	131	282	4667	237
07/28/14	151	295	4951	276
07/29/14	147	314	4892	271
07/30/14	141	293	4941	296
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14				
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09/02/14				
09/03/14				
09/04/14				
09/05/14				
09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

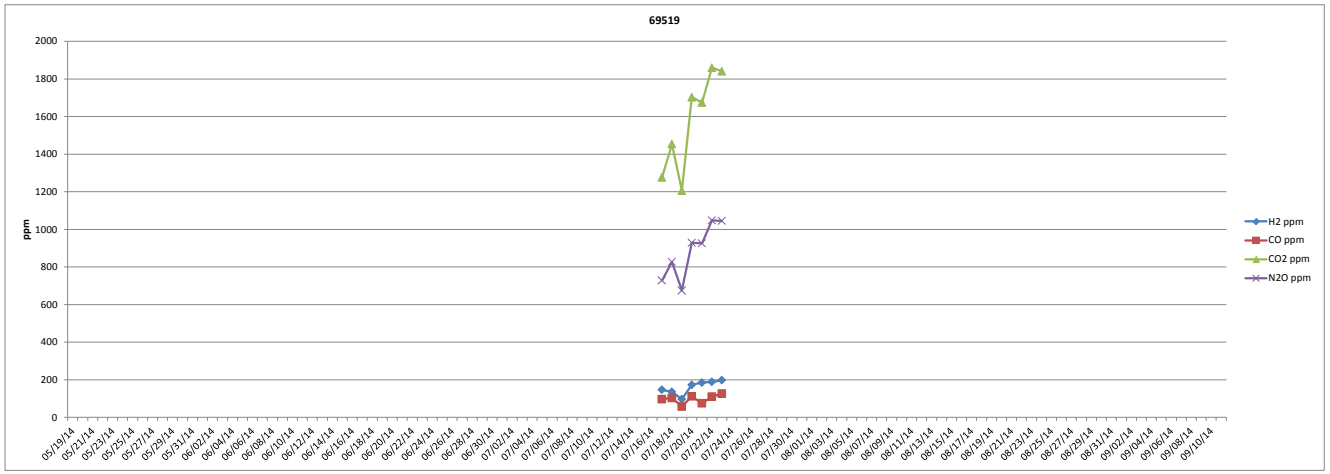
Maximum	151	322	4951	296
Minimum	115	192	4067	222



	69519			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
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07/06/14				
07/07/14				
07/08/14				
07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	147	97	1276	729
07/18/14	136	103	1454	827
07/19/14	97	58	1206	675

	69519			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	173	112	1703	929
07/21/14	185	75	1675	926
07/22/14	189	110	1860	1048
07/23/14	198	126	1841	1045
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
08/02/14				
08/03/14				
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08/30/14				
08/31/14				
09/01/14				
09/02/14				
09/03/14				
09/04/14				
09/05/14				
09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

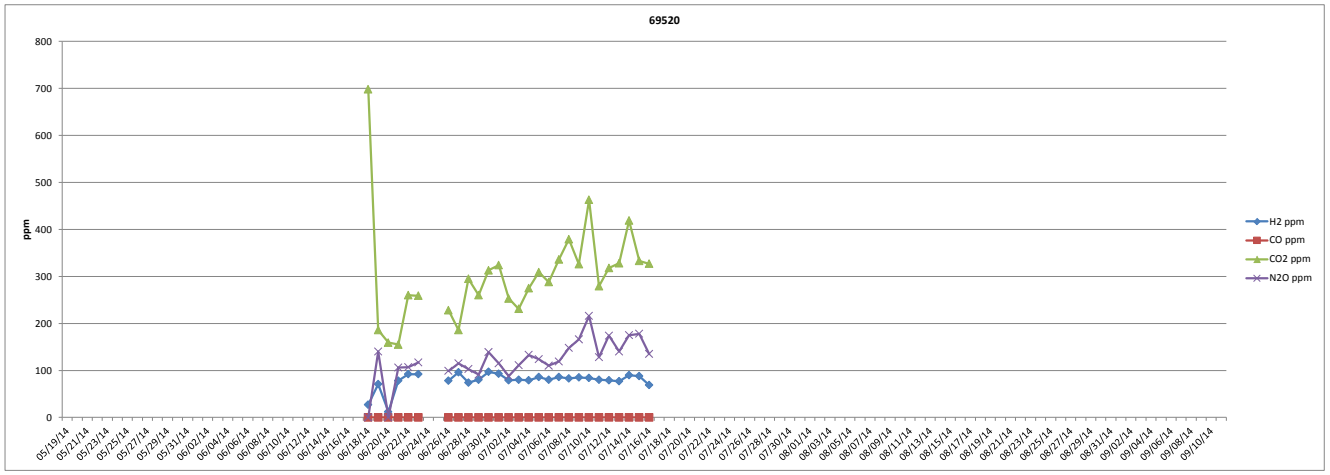
Maximum	198	126	1860	1048
Minimum	97	58	1206	675



	69520			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
06/01/14				
06/02/14				
06/03/14				
06/04/14				
06/05/14				
06/06/14				
06/07/14				
06/08/14				
06/09/14				
06/10/14				
06/11/14				
06/12/14				
06/13/14				
06/14/14				
06/15/14				
06/16/14				
06/17/14				
06/18/14	27	0	698	0
06/19/14	71	0	186	140
06/20/14	12	0	159	0
06/21/14	78	0	155	106
06/22/14	92	0	260	107
06/23/14	92	0	259	117
06/24/14				
06/25/14				
06/26/14	78	0	228	99
06/27/14	96	0	186	115
06/28/14	74	0	295	103
06/29/14	80	0	260	91
06/30/14	97	0	313	139
07/01/14	93	0	324	115
07/02/14	79	0	253	88
07/03/14	80	0	231	111
07/04/14	79	0	275	133
07/05/14	86	0	309	124
07/06/14	80	0	288	110
07/07/14	86	0	336	119
07/08/14	83	0	379	148
07/09/14	85	0	326	166
07/10/14	84	0	463	216
07/11/14	80	0	279	128
07/12/14	79	0	318	174
07/13/14	77	0	328	140
07/14/14	90	0	419	175
07/15/14	88	0	333	178
07/16/14	69	0	327	135
07/17/14				
07/18/14				
07/19/14				

	69520			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
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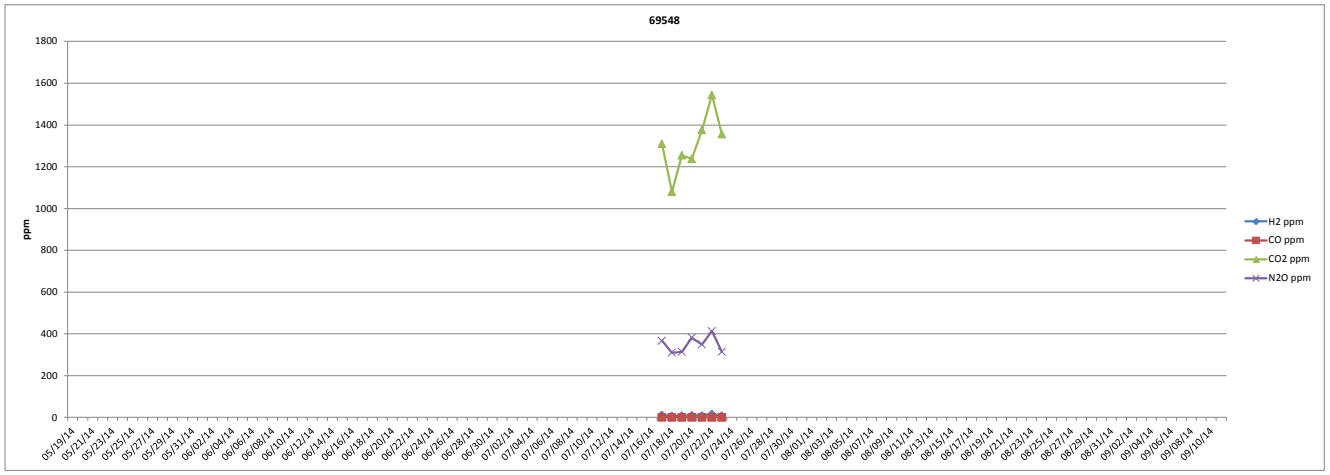
Maximum	97	0	698	216
Minimum	12	0	155	0



	69548			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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07/14/14				
07/15/14				
07/16/14				
07/17/14	11	0	1310	367
07/18/14	7	0	1080	310
07/19/14	8	0	1255	314

	69548			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	10	0	1237	382
07/21/14	9	0	1376	349
07/22/14	16	0	1544	413
07/23/14	8	0	1356	314
07/24/14				
07/25/14				
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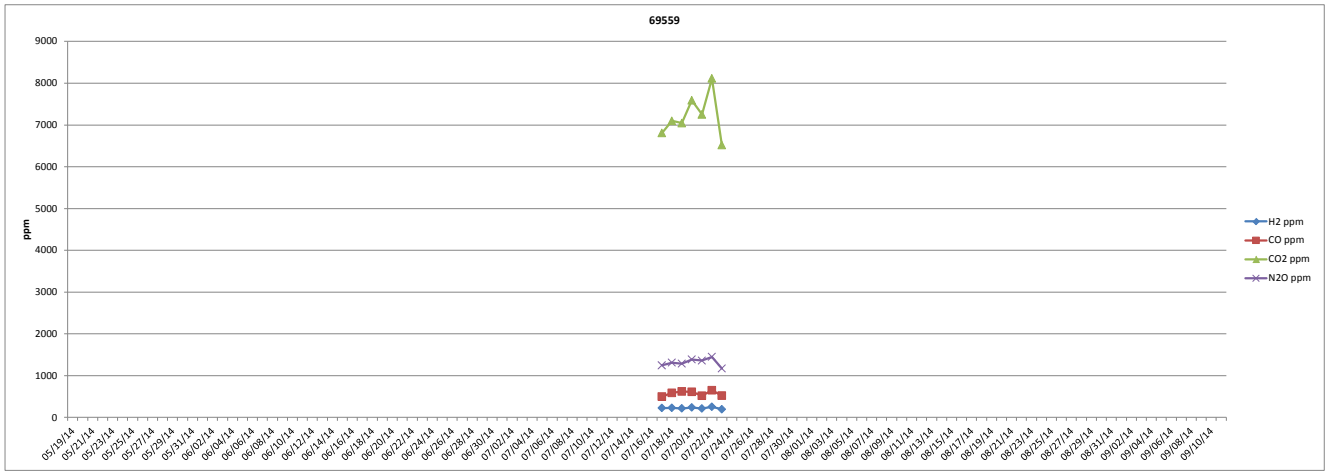
Maximum	16	0	1544	413
Minimum	7	0	1080	310



	69559			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
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07/11/14				
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07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	225	498	6809	1247
07/18/14	230	587	7097	1311
07/19/14	216	622	7043	1288

	69559			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	237	613	7591	1387
07/21/14	214	517	7252	1360
07/22/14	253	649	8114	1450
07/23/14	196	520	6519	1170
07/24/14				
07/25/14				
07/26/14				
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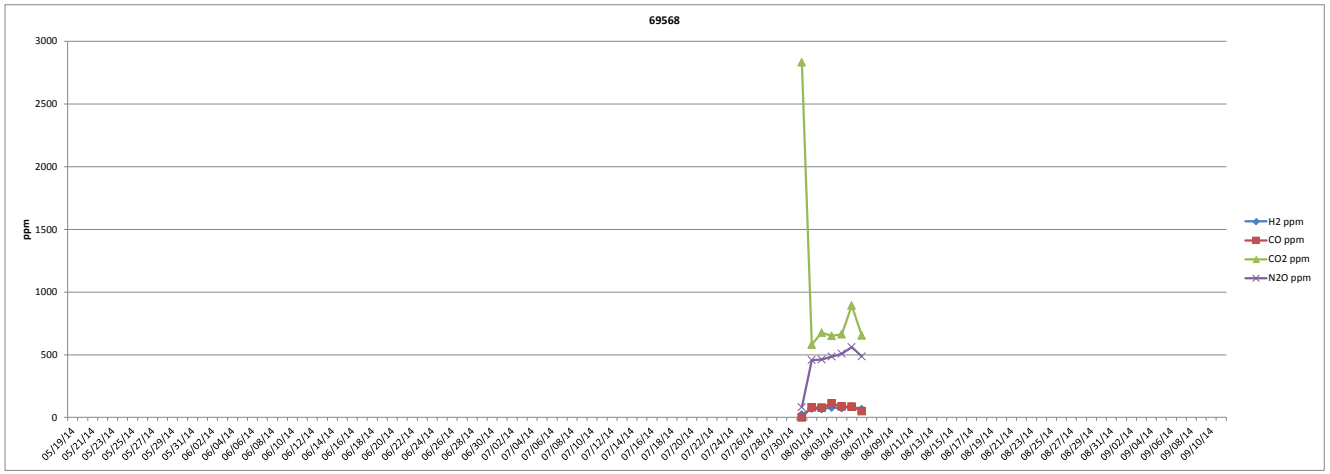
Maximum	253	649	8114	1450
Minimum	196	498	6519	1170



	69568			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
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07/15/14				
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07/17/14				
07/18/14				
07/19/14				

	69568			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	23	0	2833	82
08/01/14	70	81	581	458
08/02/14	66	77	676	463
08/03/14	78	112	651	486
08/04/14	74	88	664	509
08/05/14	87	86	894	561
08/06/14	65	50	654	487
08/07/14				
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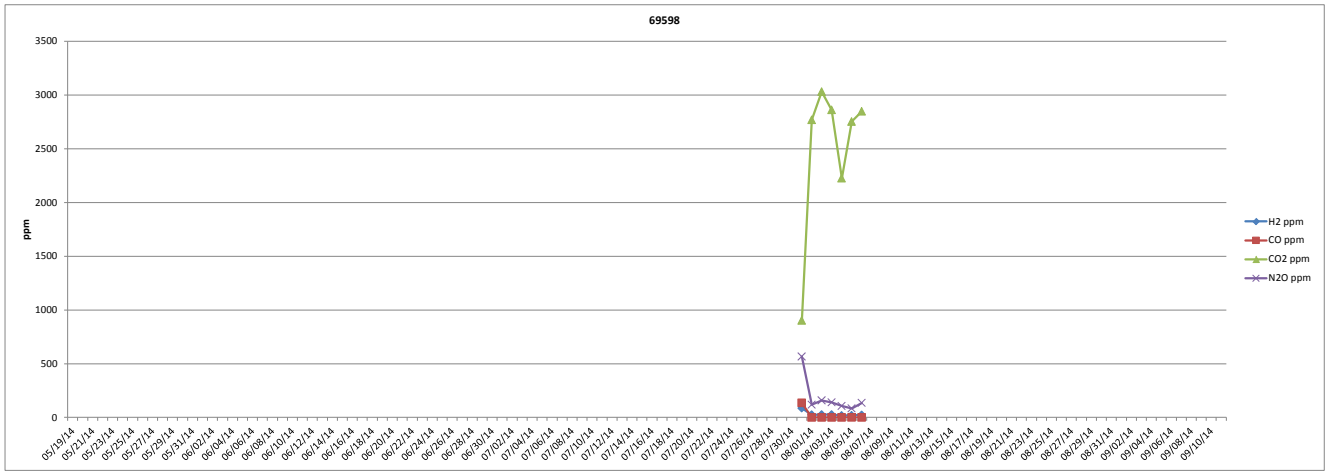
Maximum	87	112	2833	561
Minimum	23	0	581	82



	69598			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
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07/17/14				
07/18/14				
07/19/14				

	69598			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	85	135	902	567
08/01/14	25	0	2770	118
08/02/14	27	0	3032	159
08/03/14	27	0	2863	140
08/04/14	18	0	2226	106
08/05/14	20	0	2754	84
08/06/14	23	0	2849	135
08/07/14				
08/08/14				
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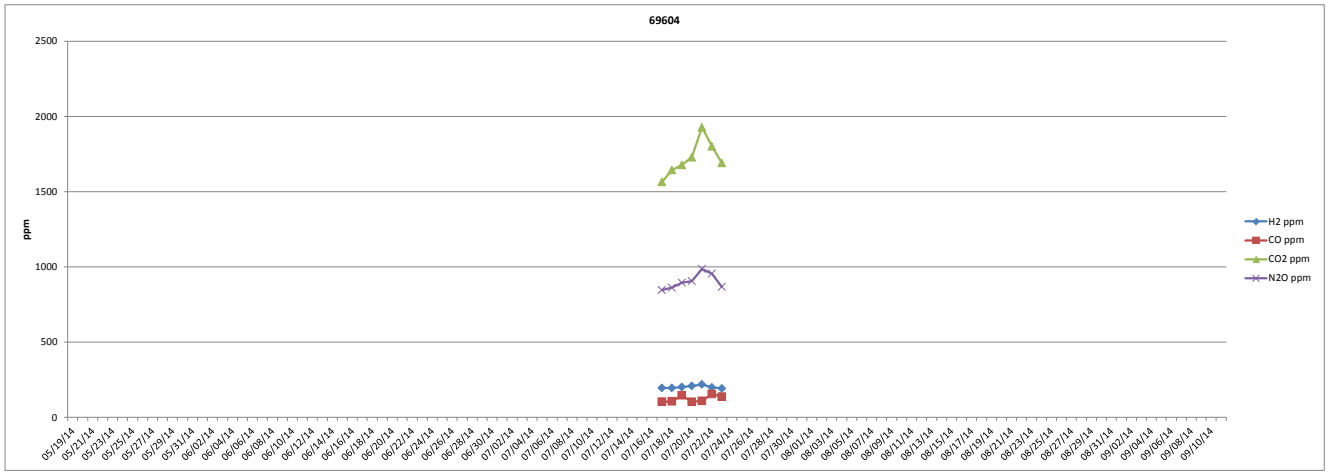
Maximum	85	135	3032	567
Minimum	18	0	902	84



	69604			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
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07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	196	105	1566	847
07/18/14	196	107	1645	863
07/19/14	202	147	1678	896

	69604			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	209	104	1730	906
07/21/14	220	110	1929	987
07/22/14	200	156	1802	956
07/23/14	193	138	1691	868
07/24/14				
07/25/14				
07/26/14				
07/27/14				
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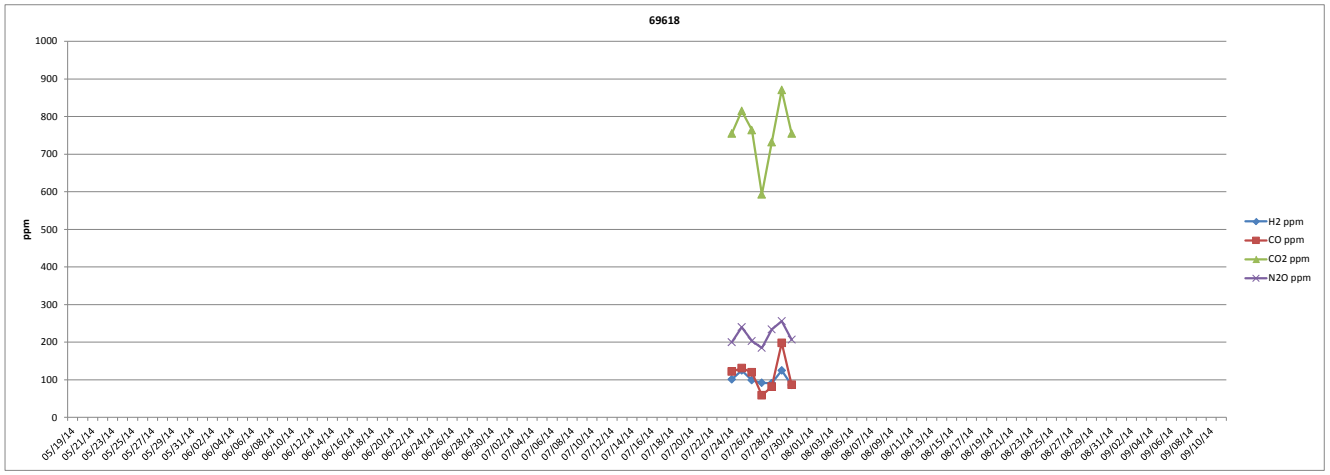
Maximum	220	156	1929	987
Minimum	193	104	1566	847



	69618			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
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05/25/14				
05/26/14				
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07/18/14				
07/19/14				

	69618			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	101	122	755	200
07/25/14	125	131	815	240
07/26/14	99	120	764	203
07/27/14	92	59	593	185
07/28/14	91	82	732	234
07/29/14	125	198	871	256
07/30/14	86	87	755	207
07/31/14				
08/01/14				
08/02/14				
08/03/14				
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09/08/14				
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09/11/14				

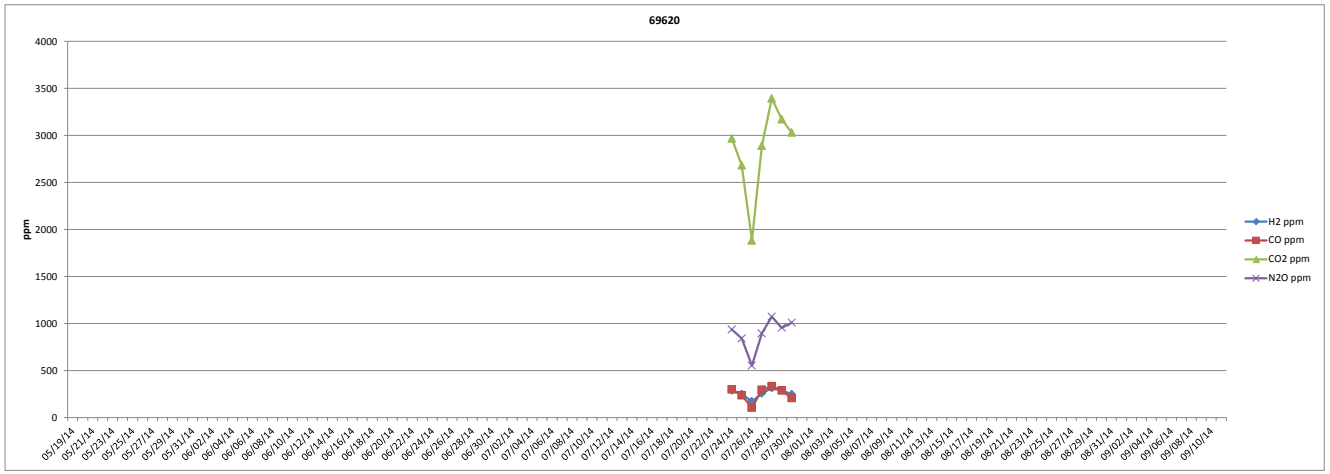
Maximum	125	198	871	256
Minimum	86	59	593	185



	69620			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
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07/19/14				

	69620			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	287	299	2967	935
07/25/14	248	236	2682	840
07/26/14	171	105	1883	551
07/27/14	255	294	2890	895
07/28/14	313	332	3394	1072
07/29/14	287	288	3172	954
07/30/14	247	206	3031	1009
07/31/14				
08/01/14				
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09/10/14				
09/11/14				

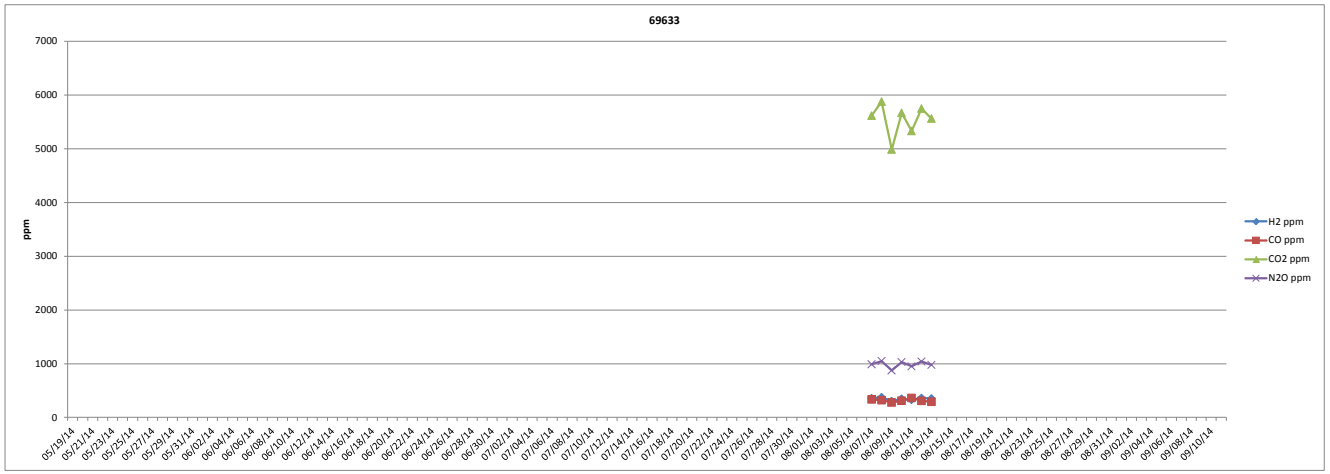
Maximum	313	332	3394	1072
Minimum	171	105	1883	551



	69633			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
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07/18/14				
07/19/14				

	69633			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
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07/27/14				
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07/30/14				
07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14	357	334	5617	989
08/08/14	375	321	5879	1050
08/09/14	302	278	4987	875
08/10/14	346	310	5669	1031
08/11/14	328	362	5332	951
08/12/14	362	308	5749	1041
08/13/14	351	290	5564	978
08/14/14				
08/15/14				
08/16/14				
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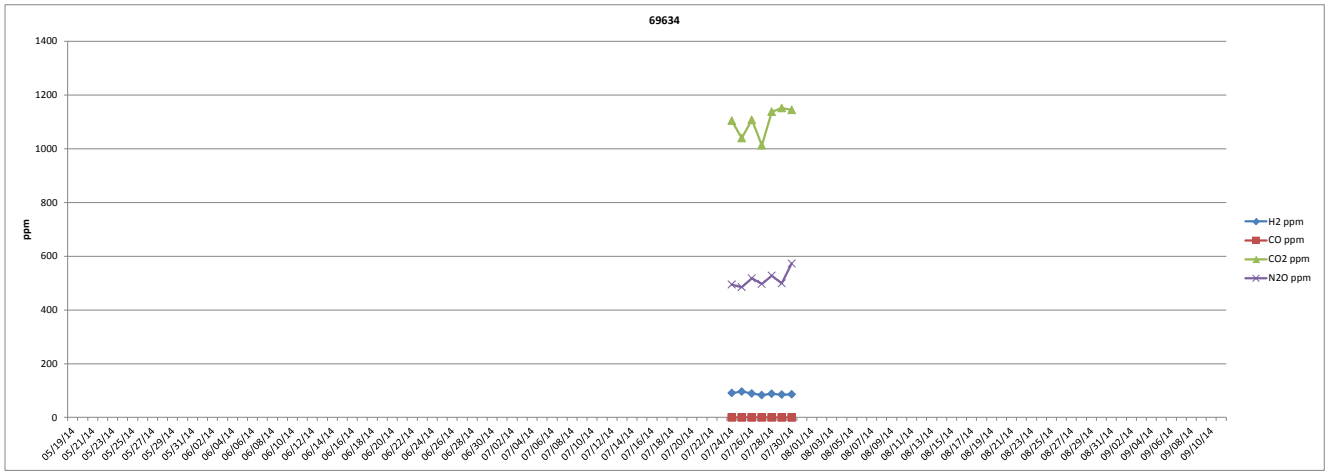
Maximum	375	362	5879	1050
Minimum	302	278	4987	875



	69634			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
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07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69634			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	91	0	1105	495
07/25/14	96	0	1040	485
07/26/14	89	0	1108	518
07/27/14	83	0	1013	497
07/28/14	88	0	1138	528
07/29/14	85	0	1152	499
07/30/14	86	0	1145	573
07/31/14				
08/01/14				
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09/09/14				
09/10/14				
09/11/14				

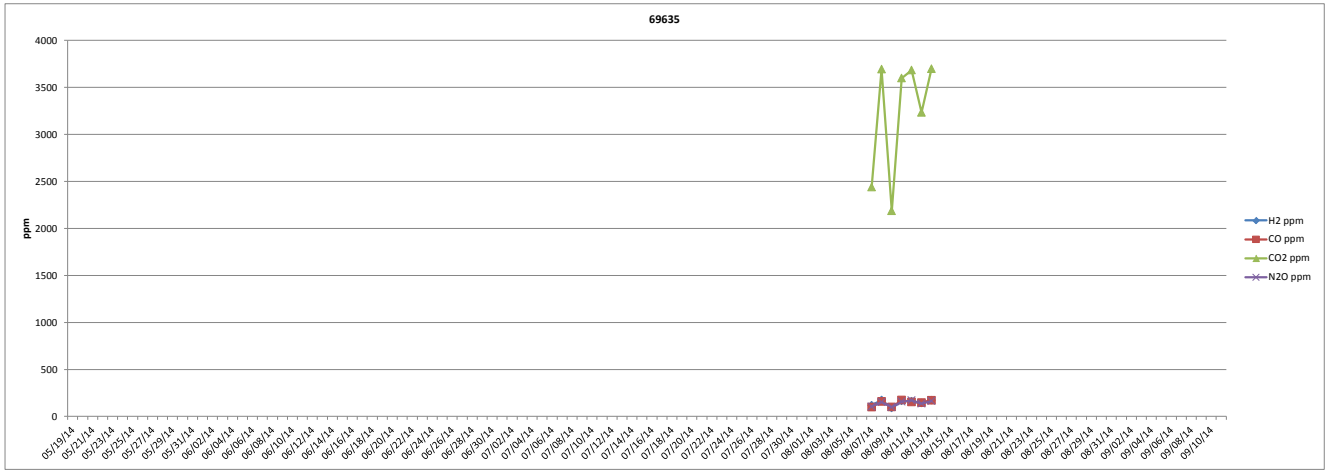
Maximum	96	0	1152	573
Minimum	83	0	1013	485



	69635			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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07/18/14				
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	69635			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
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07/31/14				
08/01/14				
08/02/14				
08/03/14				
08/04/14				
08/05/14				
08/06/14				
08/07/14	118	99	2439	104
08/08/14	175	159	3694	153
08/09/14	89	100	2187	99
08/10/14	165	175	3599	158
08/11/14	162	154	3684	171
08/12/14	142	146	3233	137
08/13/14	173	172	3698	164
08/14/14				
08/15/14				
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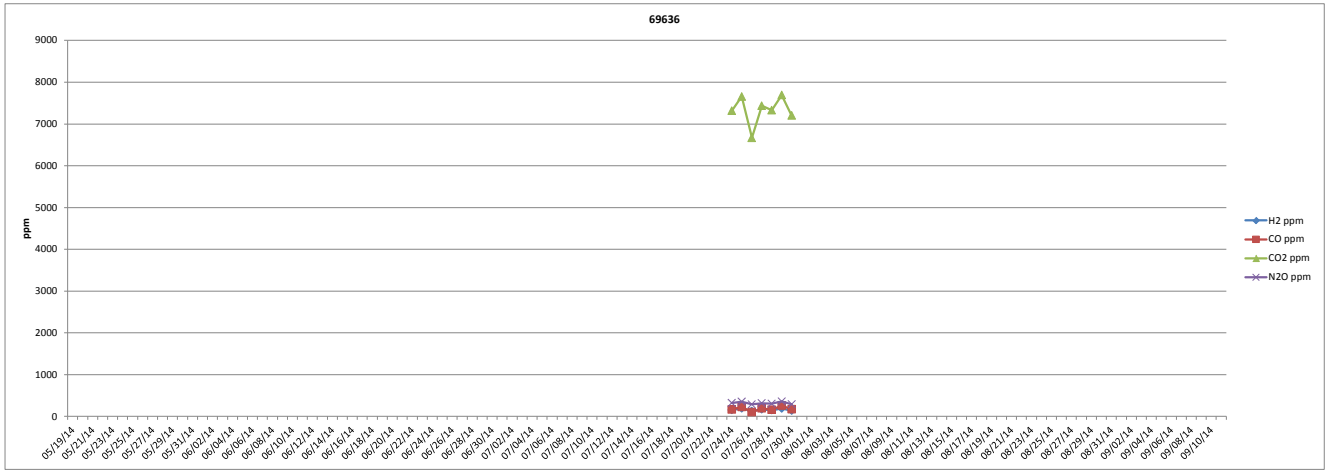
Maximum	175	175	3698	171
Minimum	89	99	2187	99



	69636			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69636			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	153	167	7317	323
07/25/14	192	227	7657	352
07/26/14	128	103	6668	288
07/27/14	170	195	7437	317
07/28/14	149	159	7330	304
07/29/14	188	261	7693	358
07/30/14	139	172	7202	293
07/31/14				
08/01/14				
08/02/14				
08/03/14				
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09/10/14				
09/11/14				

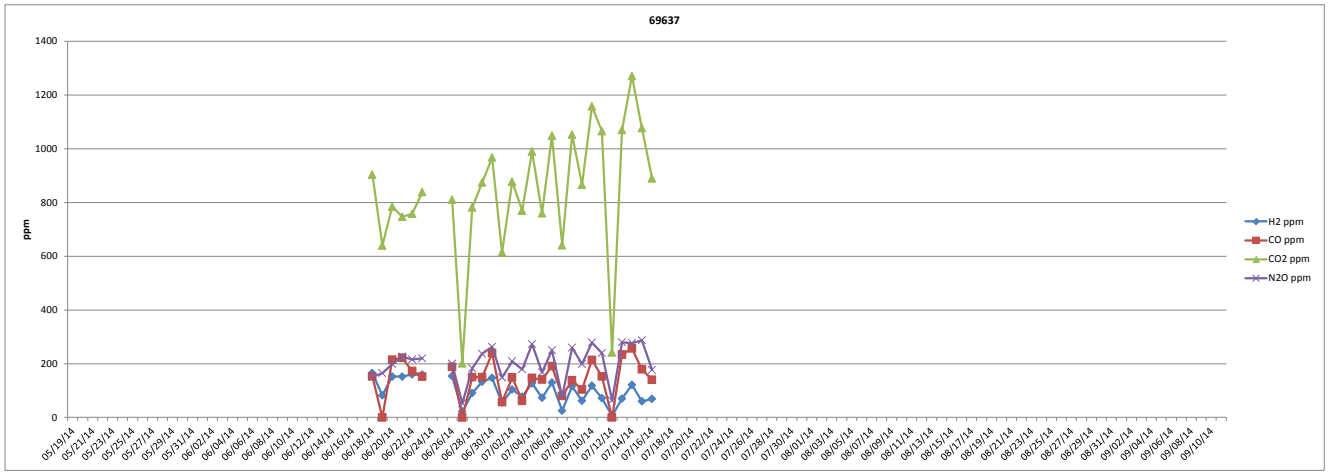
Maximum	192	261	7693	358
Minimum	128	103	6668	288



	69637			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
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06/11/14				
06/12/14				
06/13/14				
06/14/14				
06/15/14				
06/16/14				
06/17/14				
06/18/14	165	153	904	152
06/19/14	82	0	640	165
06/20/14	152	215	785	199
06/21/14	152	222	747	226
06/22/14	160	173	758	216
06/23/14	159	152	839	220
06/24/14				
06/25/14				
06/26/14	154	188	811	200
06/27/14	22	0	201	52
06/28/14	91	150	782	183
06/29/14	133	150	875	237
06/30/14	147	240	968	263
07/01/14	55	57	614	149
07/02/14	104	149	878	209
07/03/14	77	62	770	179
07/04/14	127	147	990	273
07/05/14	73	141	760	168
07/06/14	130	191	1049	250
07/07/14	25	80	641	78
07/08/14	116	138	1053	260
07/09/14	62	104	866	199
07/10/14	118	214	1158	279
07/11/14	72	153	1066	240
07/12/14	6	0	242	63
07/13/14	70	234	1070	280
07/14/14	121	257	1271	277
07/15/14	60	179	1077	287
07/16/14	69	140	890	177
07/17/14				
07/18/14				
07/19/14				

	69637			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
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09/11/14				

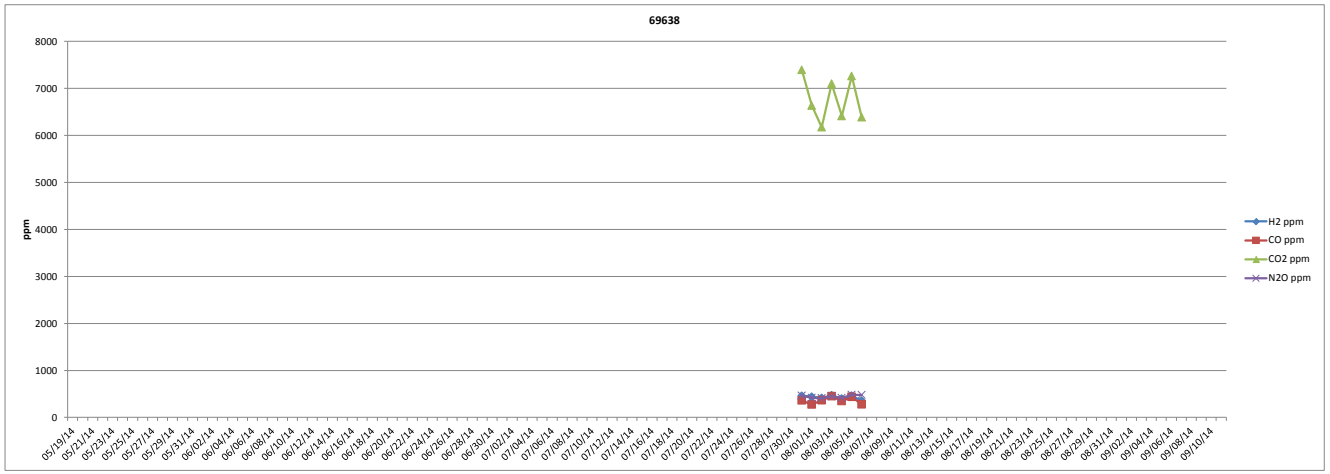
Maximum	165	257	1271	287
Minimum	6	0	201	52



	69638			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	69638			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	460	363	7394	464
08/01/14	441	275	6636	418
08/02/14	415	365	6173	409
08/03/14	472	451	7101	446
08/04/14	402	348	6412	415
08/05/14	462	437	7263	483
08/06/14	356	279	6386	479
08/07/14				
08/08/14				
08/09/14				
08/10/14				
08/11/14				
08/12/14				
08/13/14				
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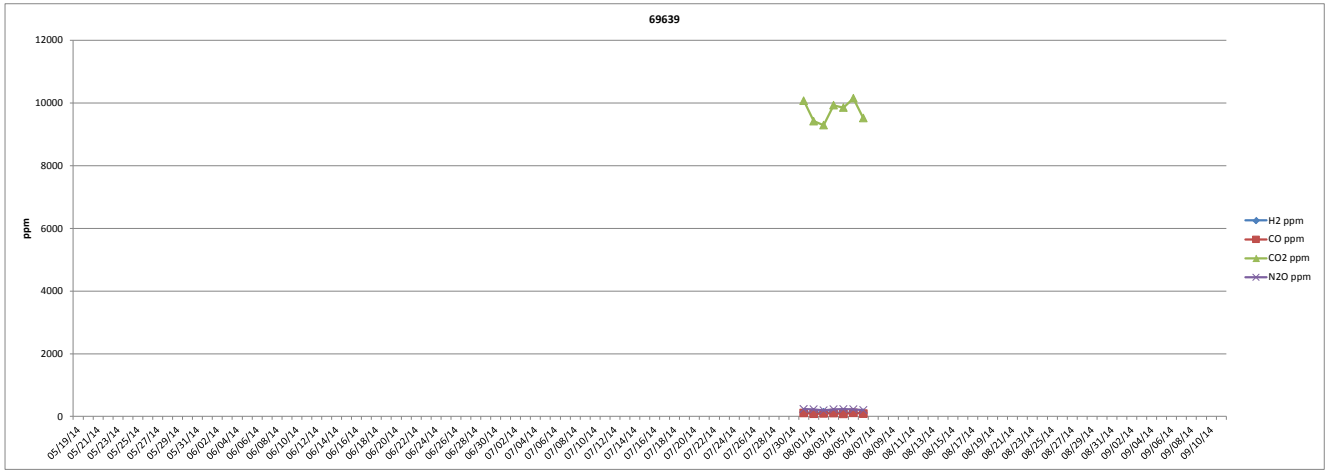
Maximum	472	451	7394	483
Minimum	356	275	6173	409



	69639			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
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	69639			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
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07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	134	109	10075	233
08/01/14	120	85	9422	227
08/02/14	131	96	9295	194
08/03/14	125	105	9930	226
08/04/14	125	80	9858	230
08/05/14	125	111	10155	226
08/06/14	112	89	9521	201
08/07/14				
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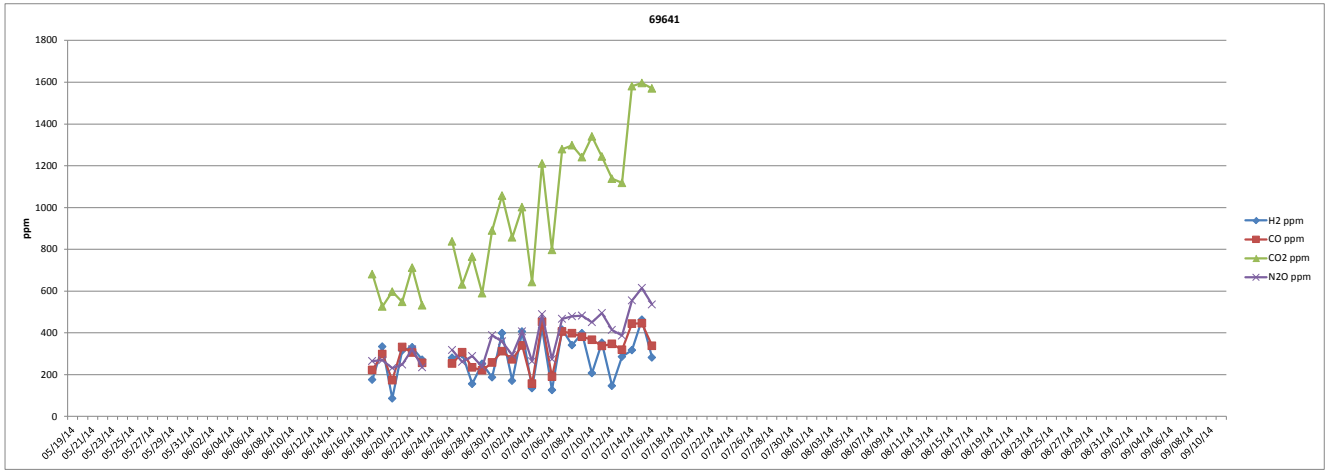
Maximum	134	111	10155	233
Minimum	112	80	9295	194



	69641			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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06/16/14				
06/17/14				
06/18/14	176	222	681	265
06/19/14	334	298	526	269
06/20/14	86	173	597	231
06/21/14	315	332	548	248
06/22/14	331	306	712	321
06/23/14	271	256	532	235
06/24/14				
06/25/14				
06/26/14	281	253	838	318
06/27/14	297	307	632	261
06/28/14	156	235	765	289
06/29/14	252	221	590	238
06/30/14	187	258	890	389
07/01/14	399	312	1057	359
07/02/14	171	273	857	294
07/03/14	406	340	1002	407
07/04/14	135	157	643	264
07/05/14	424	453	1211	489
07/06/14	126	190	797	274
07/07/14	416	406	1279	467
07/08/14	341	398	1298	479
07/09/14	398	381	1241	482
07/10/14	207	367	1340	451
07/11/14	353	337	1244	495
07/12/14	146	347	1138	414
07/13/14	286	319	1118	387
07/14/14	317	444	1581	555
07/15/14	463	446	1596	615
07/16/14	282	338	1570	536
07/17/14				
07/18/14				
07/19/14				

	69641			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
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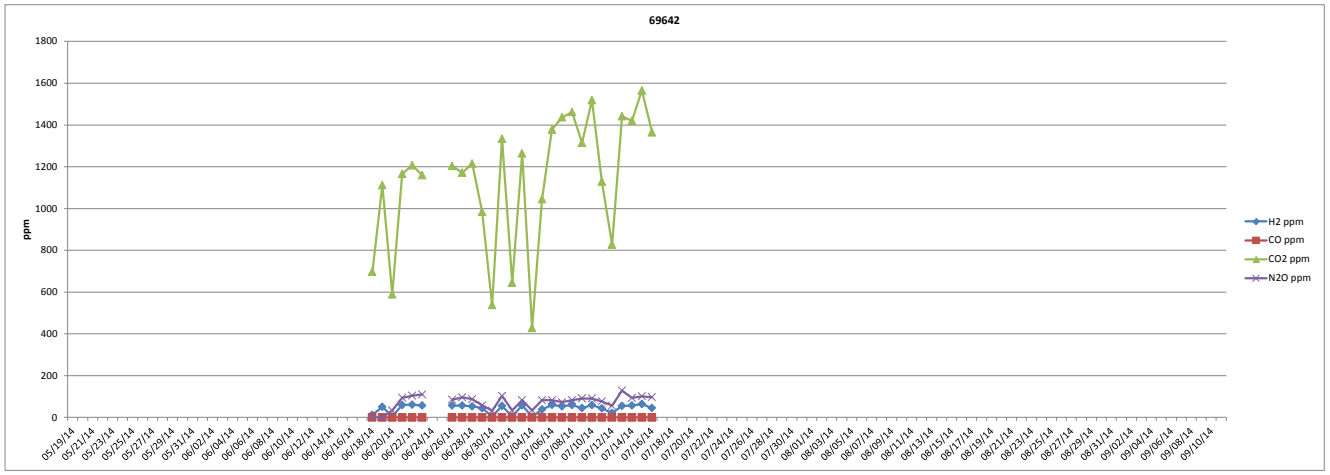
Maximum	463	453	1596	615
Minimum	86	157	526	231



	69642			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
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05/20/14				
05/21/14				
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06/16/14				
06/17/14				
06/18/14	12	0	698	0
06/19/14	51	0	1112	0
06/20/14	4	0	589	33
06/21/14	59	0	1166	94
06/22/14	61	0	1207	104
06/23/14	57	0	1160	110
06/24/14				
06/25/14				
06/26/14	57	0	1204	85
06/27/14	57	0	1172	96
06/28/14	53	0	1215	87
06/29/14	44	0	984	58
06/30/14	5	0	538	32
07/01/14	55	0	1334	103
07/02/14	5	0	645	34
07/03/14	58	0	1264	83
07/04/14	3	0	428	34
07/05/14	38	0	1045	82
07/06/14	60	0	1378	82
07/07/14	53	0	1437	73
07/08/14	59	0	1462	83
07/09/14	45	0	1315	91
07/10/14	59	0	1519	91
07/11/14	43	0	1129	77
07/12/14	21	0	827	56
07/13/14	55	0	1442	129
07/14/14	57	0	1420	93
07/15/14	64	0	1565	101
07/16/14	45	0	1365	97
07/17/14				
07/18/14				
07/19/14				

	69642			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
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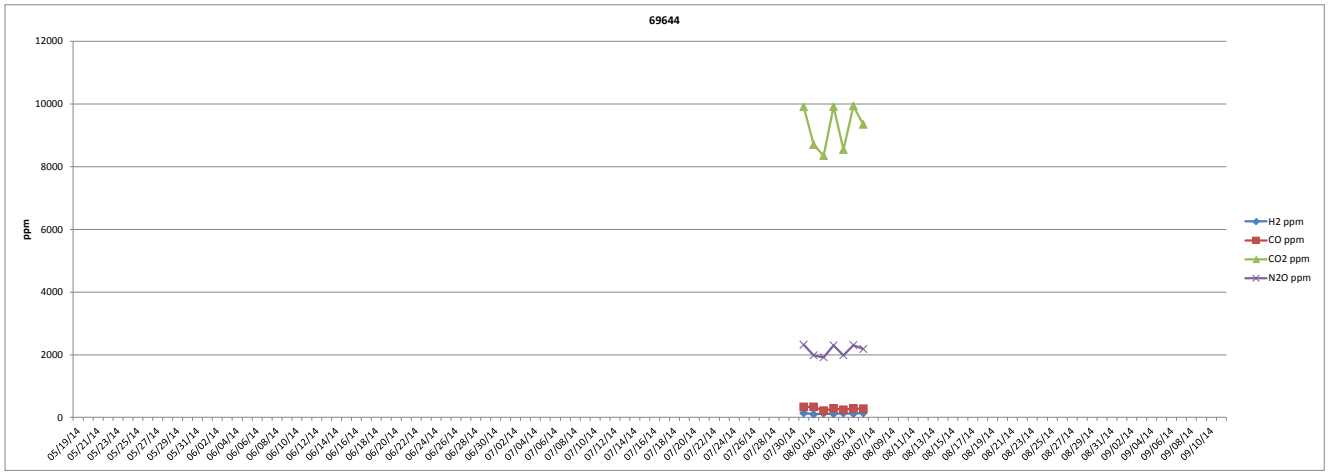
Maximum	64	0	1565	129
Minimum	3	0	428	0



	69644			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
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	69644			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
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07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	138	336	9910	2316
08/01/14	100	336	8703	1980
08/02/14	127	212	8354	1916
08/03/14	114	290	9913	2299
08/04/14	133	244	8546	1986
08/05/14	119	287	9938	2306
08/06/14	139	277	9348	2182
08/07/14				
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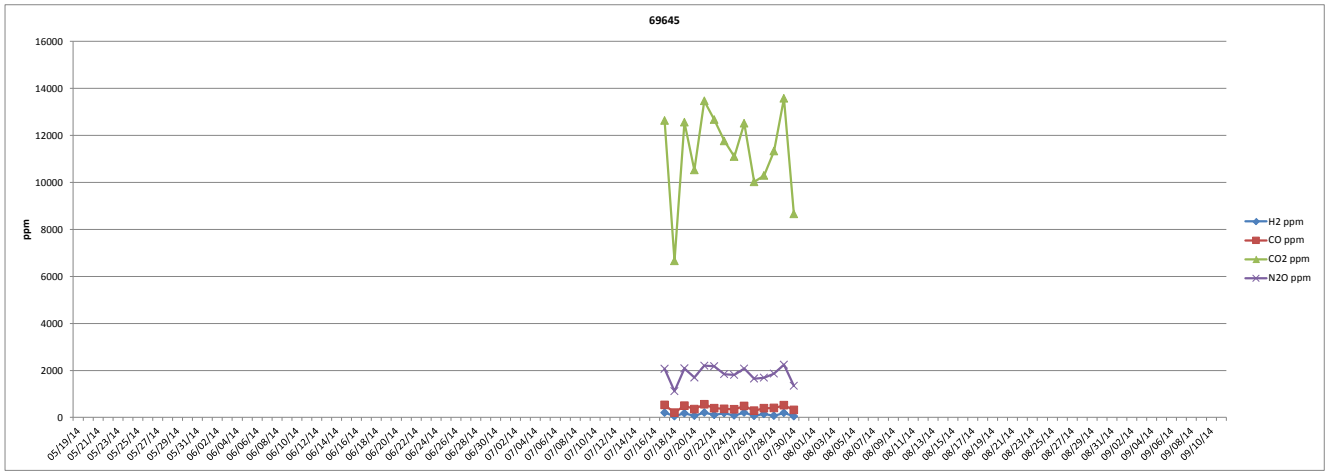
Maximum	139	336	9938	2316
Minimum	100	212	8354	1916



	69645			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
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07/15/14				
07/16/14				
07/17/14	198	529	12633	2064
07/18/14	48	201	6662	1115
07/19/14	180	497	12558	2089

	69645			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	73	349	10526	1697
07/21/14	207	560	13468	2200
07/22/14	107	390	12673	2178
07/23/14	182	361	11764	1844
07/24/14	84	345	11099	1811
07/25/14	206	488	12515	2079
07/26/14	67	286	10023	1654
07/27/14	147	389	10294	1691
07/28/14	72	400	11331	1862
07/29/14	193	520	13579	2240
07/30/14	52	316	8656	1343
07/31/14				
08/01/14				
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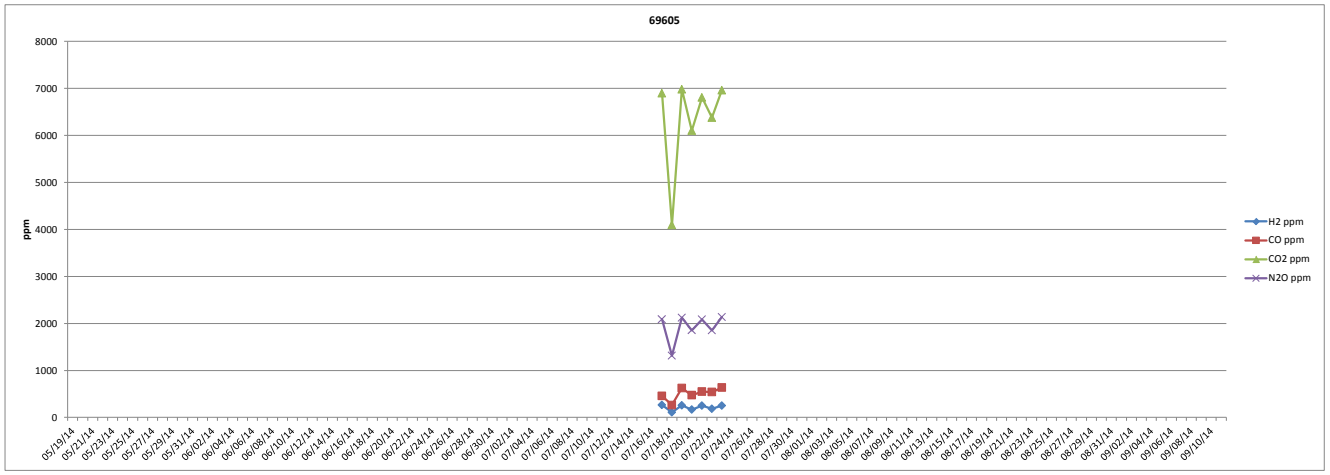
Maximum	207	560	13579	2240
Minimum	48	201	6662	1115



	93605			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	264	457	6896	2087
07/18/14	109	263	4094	1314
07/19/14	258	625	6982	2122

	93605			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	166	473	6101	1855
07/21/14	252	551	6807	2085
07/22/14	183	540	6378	1852
07/23/14	250	636	6962	2136
07/24/14				
07/25/14				
07/26/14				
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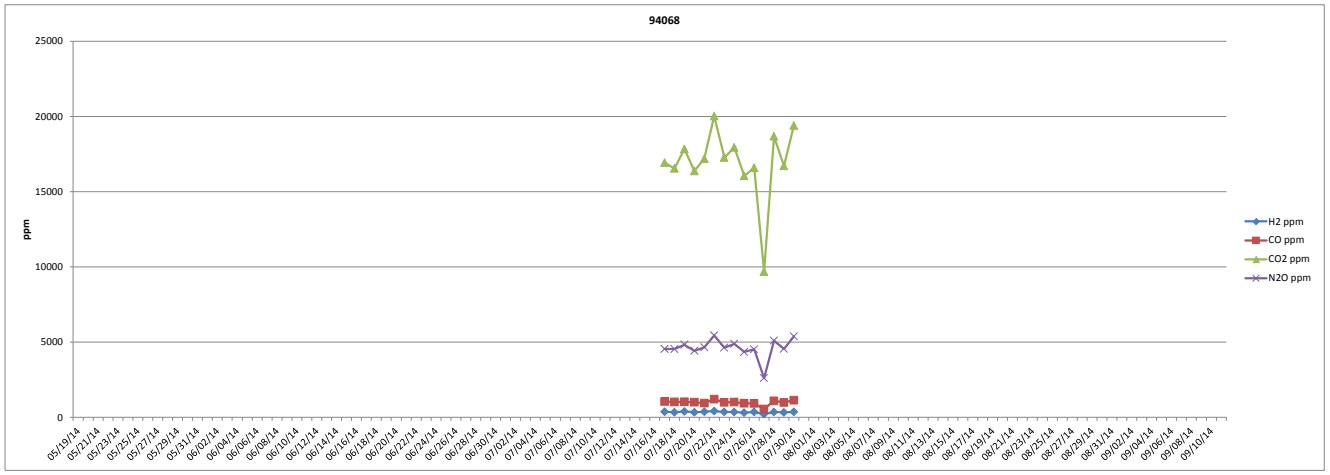
Maximum	264	636	6982	2136
Minimum	109	263	4094	1314



	94068			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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07/12/14				
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07/15/14				
07/16/14				
07/17/14	374	1059	16939	4550
07/18/14	343	1027	16553	4543
07/19/14	395	1035	17845	4838

	94068			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	342	1010	16381	4435
07/21/14	378	952	17205	4665
07/22/14	419	1210	20037	5448
07/23/14	365	1004	17277	4642
07/24/14	356	1017	17948	4897
07/25/14	314	944	16056	4356
07/26/14	368	932	16600	4523
07/27/14	216	555	9692	2615
07/28/14	359	1102	18690	5114
07/29/14	333	998	16720	4560
07/30/14	362	1142	19412	5386
07/31/14				
08/01/14				
08/02/14				
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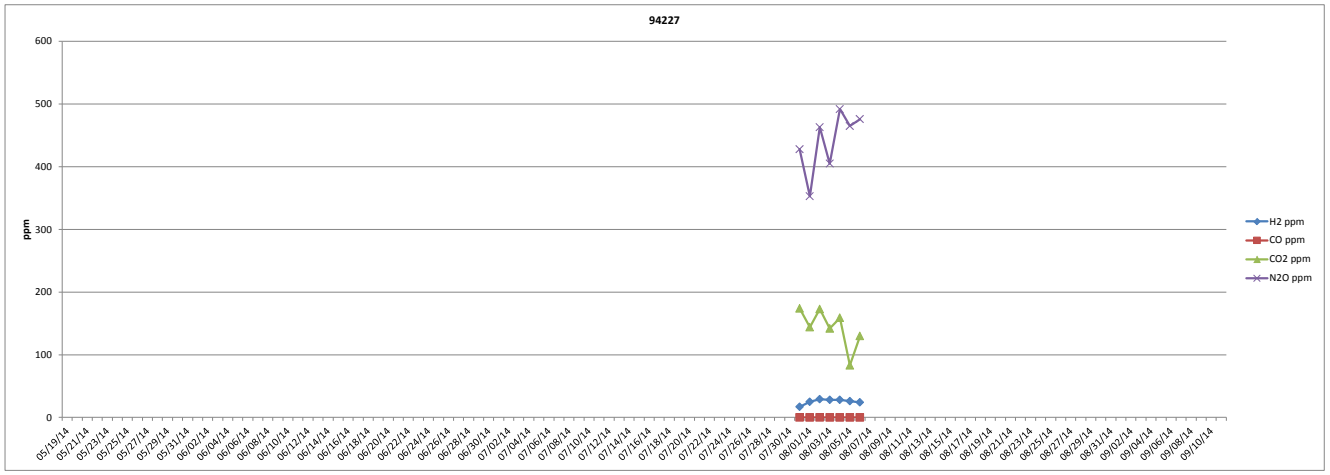
Maximum	419	1210	20037	5448
Minimum	216	555	9692	2615



	94227			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
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	94227			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
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07/30/14				
07/31/14	17	0	174	428
08/01/14	25	0	144	353
08/02/14	29	0	173	463
08/03/14	28	0	142	405
08/04/14	28	0	159	492
08/05/14	26	0	83	465
08/06/14	24	0	130	476
08/07/14				
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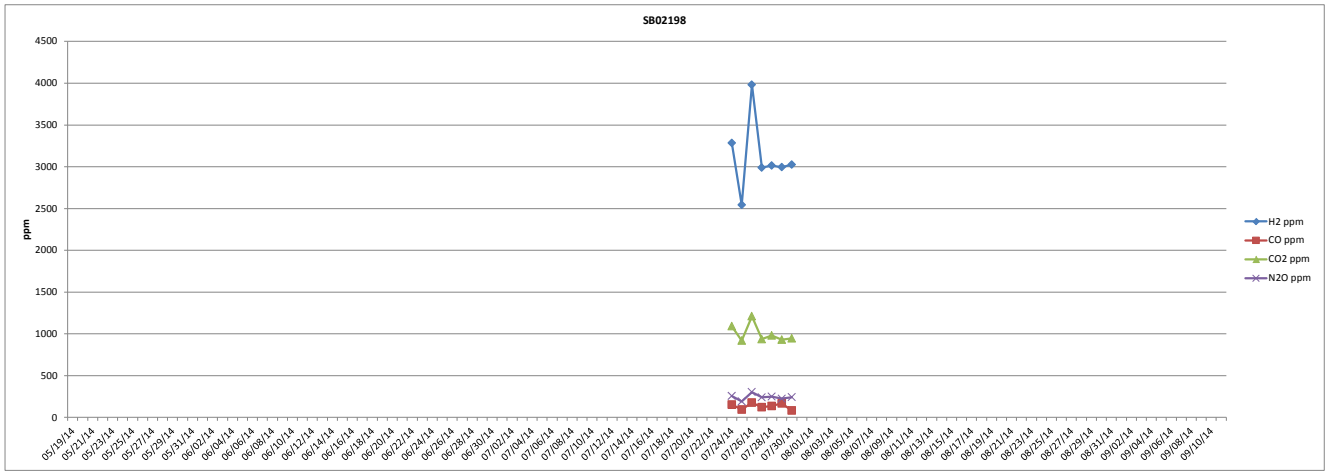
Maximum	29	0	174	492
Minimum	17	0	83	353



	SB02198			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
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	SB02198			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	3285	153	1093	258
07/25/14	2543	94	920	192
07/26/14	3982	178	1212	304
07/27/14	2989	123	938	240
07/28/14	3014	137	982	250
07/29/14	2996	168	931	225
07/30/14	3026	83	947	243
07/31/14				
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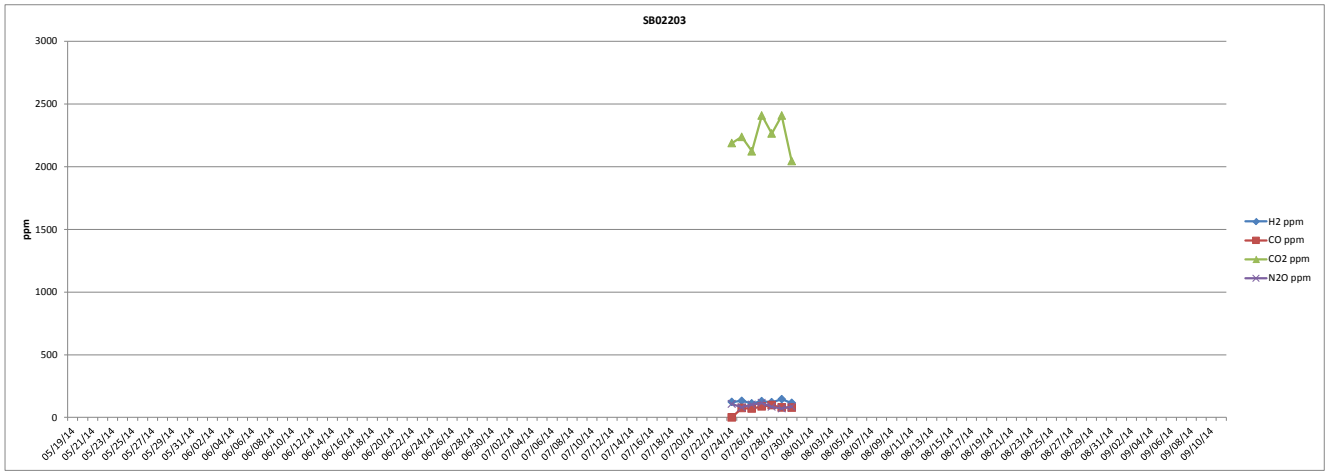
Maximum	3982	178	1212	304
Minimum	2543	83	920	192



	SB02203			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
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	SB02203			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14	123	0	2189	108
07/25/14	132	75	2238	81
07/26/14	112	71	2123	102
07/27/14	130	88	2409	116
07/28/14	121	98	2265	85
07/29/14	145	80	2408	71
07/30/14	116	78	2045	86
07/31/14				
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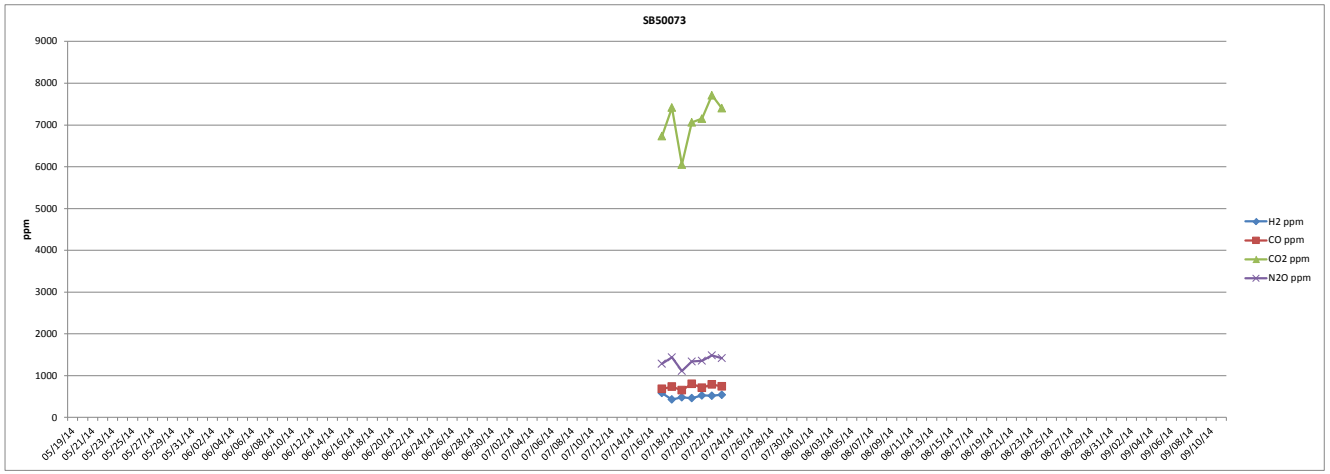
Maximum	145	98	2409	116
Minimum	112	0	2045	71



	SB50073			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
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07/16/14				
07/17/14	585	684	6734	1284
07/18/14	429	739	7416	1438
07/19/14	481	653	6050	1112

	SB50073			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	460	804	7063	1338
07/21/14	525	710	7150	1355
07/22/14	517	790	7709	1484
07/23/14	541	745	7402	1420
07/24/14				
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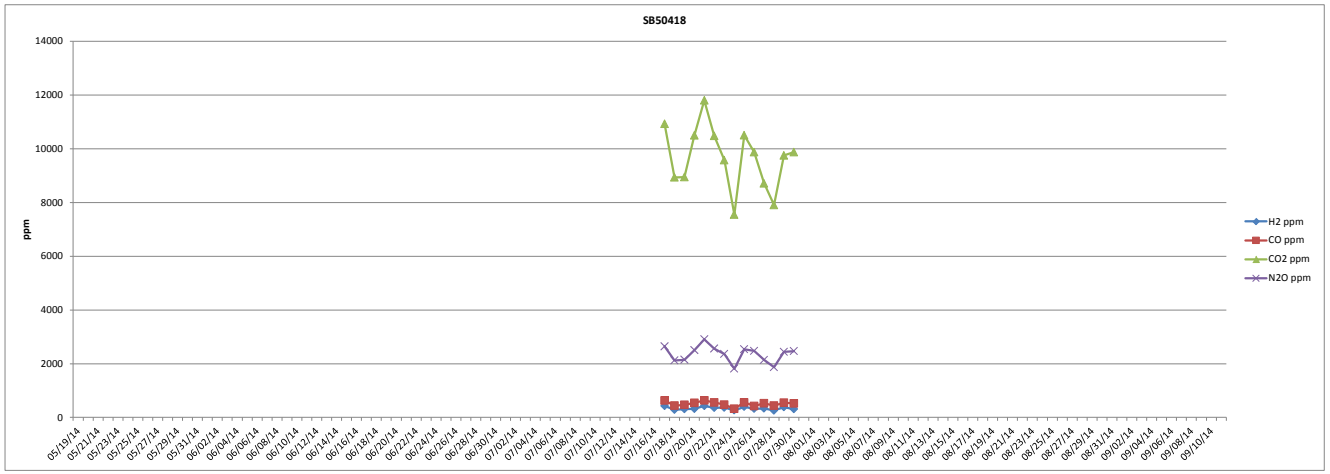
Maximum	585	804	7709	1484
Minimum	429	653	6050	1112



	SB50418			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
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05/20/14				
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07/16/14				
07/17/14	428	630	10930	2646
07/18/14	290	439	8938	2126
07/19/14	311	470	8949	2150

	SB50418			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	324	543	10502	2504
07/21/14	431	635	11807	2910
07/22/14	360	556	10482	2566
07/23/14	364	474	9581	2363
07/24/14	266	323	7552	1815
07/25/14	398	558	10506	2542
07/26/14	325	426	9875	2474
07/27/14	335	525	8716	2140
07/28/14	257	438	7906	1870
07/29/14	386	545	9757	2444
07/30/14	314	522	9877	2469
07/31/14				
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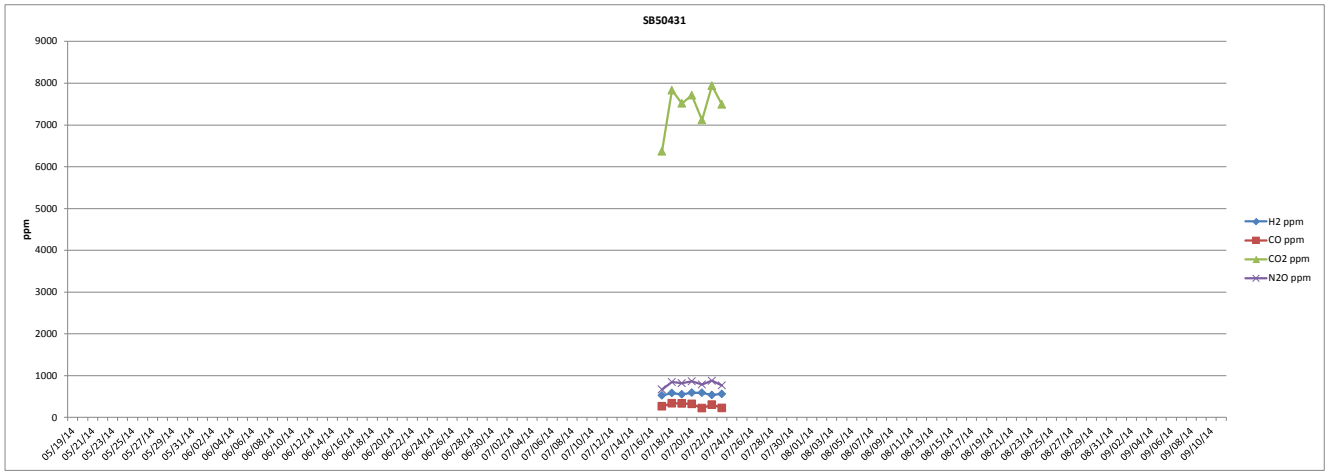
Maximum	431	635	11807	2910
Minimum	257	323	7552	1815



	SB50431			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
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07/14/14				
07/15/14				
07/16/14				
07/17/14	526	268	6369	670
07/18/14	585	338	7833	847
07/19/14	554	336	7517	818

	SB50431			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	593	323	7711	864
07/21/14	590	222	7119	788
07/22/14	536	305	7943	877
07/23/14	563	227	7494	767
07/24/14				
07/25/14				
07/26/14				
07/27/14				
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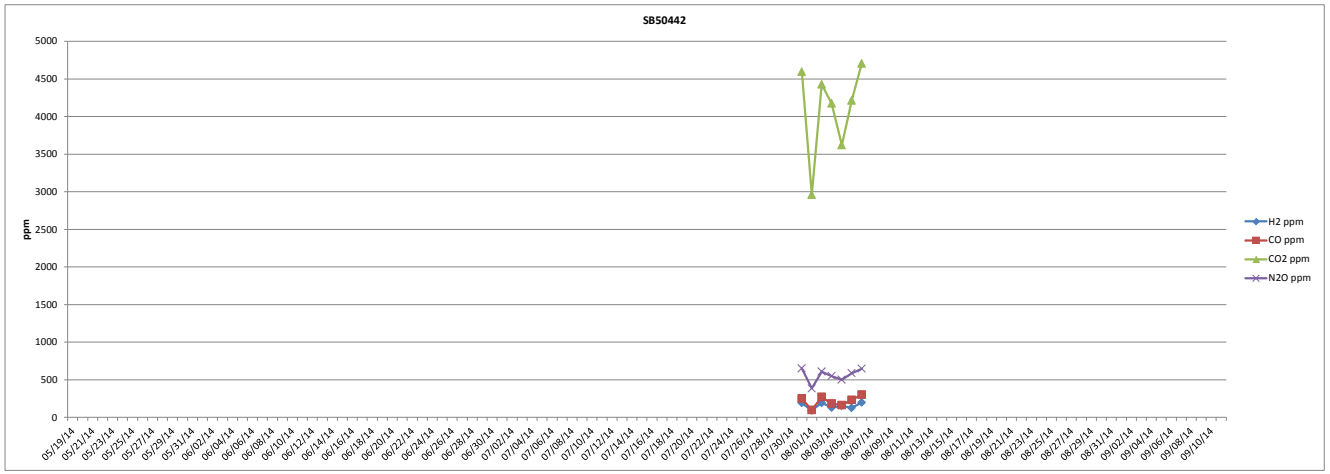
Maximum	593	338	7943	877
Minimum	526	222	6369	670



	SB50442			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
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07/16/14				
07/17/14				
07/18/14				
07/19/14				

	SB50442			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	193	251	4597	652
08/01/14	92	99	2963	386
08/02/14	194	273	4430	610
08/03/14	130	185	4176	551
08/04/14	155	164	3622	502
08/05/14	128	233	4215	589
08/06/14	199	304	4707	648
08/07/14				
08/08/14				
08/09/14				
08/10/14				
08/11/14				
08/12/14				
08/13/14				
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09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

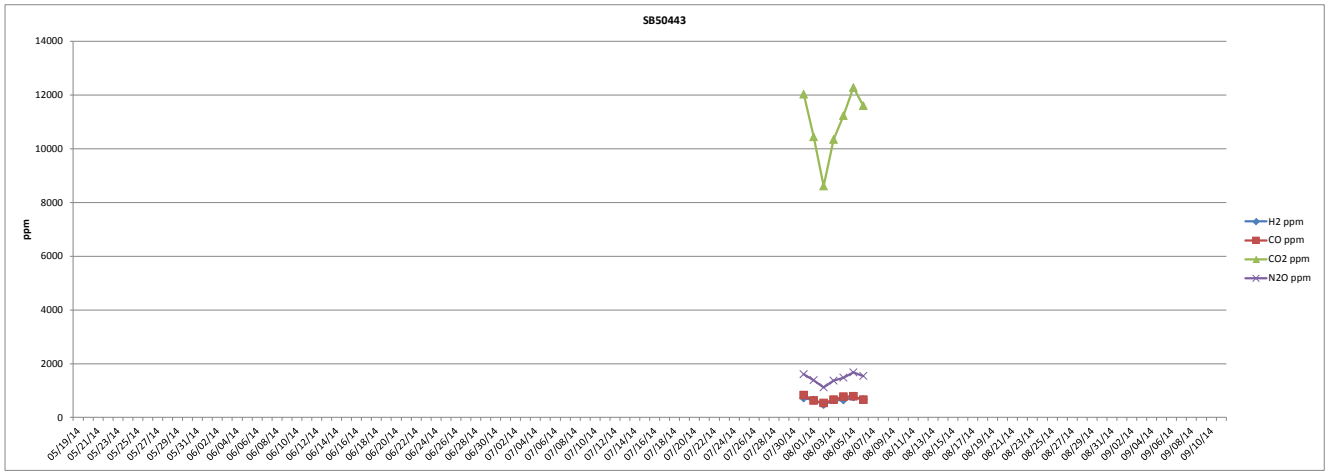
Maximum	199	304	4707	652
Minimum	92	99	2963	386



	SB50443			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
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07/15/14				
07/16/14				
07/17/14				
07/18/14				
07/19/14				

	SB50443			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	717	832	12029	1607
08/01/14	651	631	10445	1385
08/02/14	473	539	8610	1119
08/03/14	648	660	10346	1367
08/04/14	646	772	11235	1480
08/05/14	756	785	12279	1677
08/06/14	665	660	11608	1541
08/07/14				
08/08/14				
08/09/14				
08/10/14				
08/11/14				
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09/02/14				
09/03/14				
09/04/14				
09/05/14				
09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

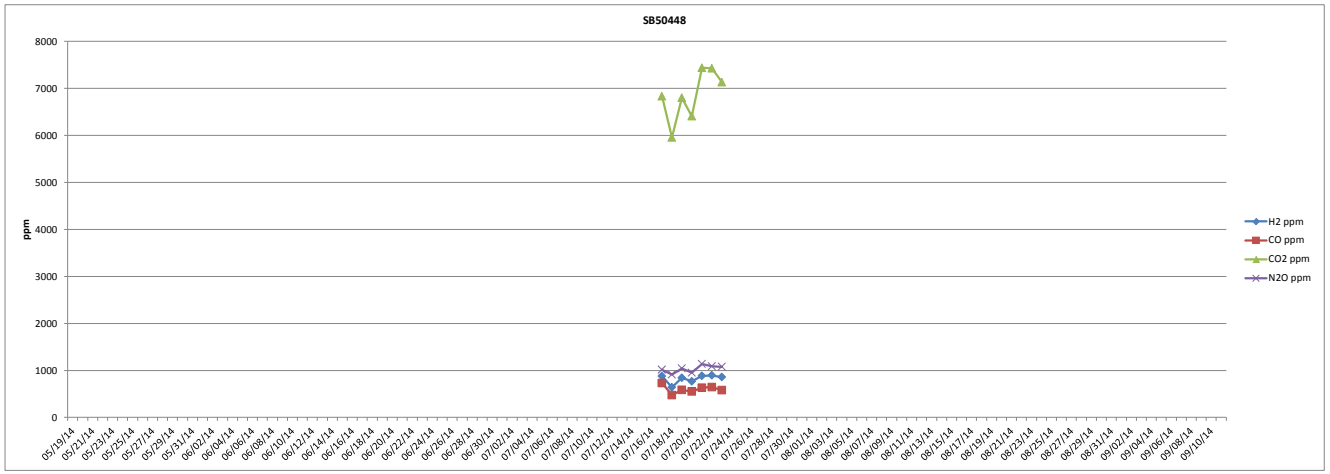
Maximum	756	832	12279	1677
Minimum	473	539	8610	1119



	SB50448			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	878	732	6833	1015
07/18/14	641	474	5956	912
07/19/14	844	587	6802	1043

	SB50448			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	768	553	6408	952
07/21/14	886	631	7439	1140
07/22/14	895	644	7427	1088
07/23/14	860	580	7132	1079
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
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09/02/14				
09/03/14				
09/04/14				
09/05/14				
09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

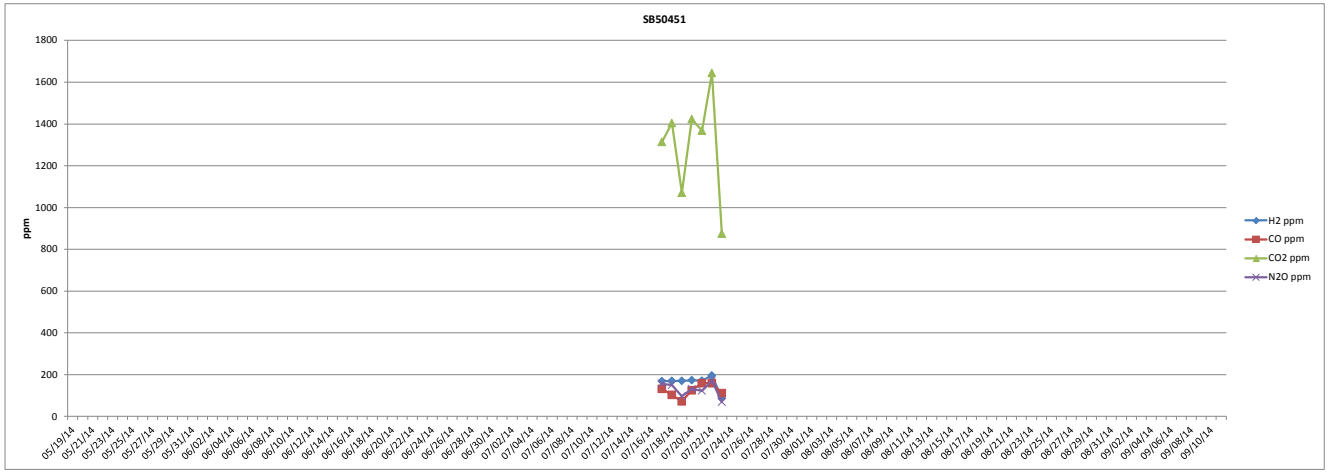
Maximum	895	732	7439	1140
Minimum	641	474	5956	912



	SB50451			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	169	132	1314	157
07/18/14	170	103	1404	150
07/19/14	170	72	1071	97

	SB50451			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	173	125	1423	131
07/21/14	171	159	1368	123
07/22/14	196	159	1644	172
07/23/14	86	111	875	69
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
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09/02/14				
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09/06/14				
09/07/14				
09/08/14				
09/09/14				
09/10/14				
09/11/14				

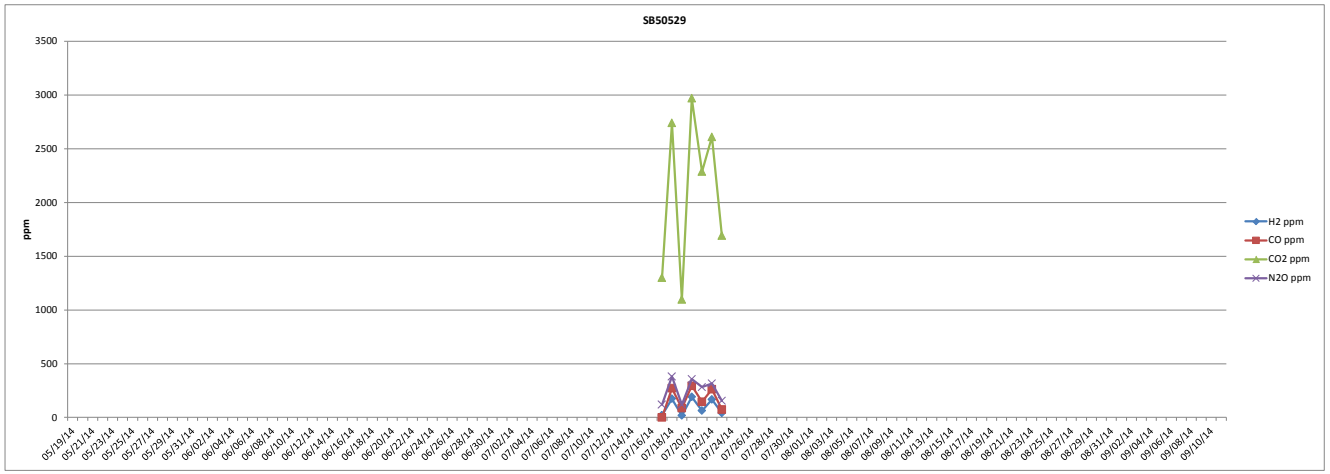
Maximum	196	159	1644	172
Minimum	86	72	875	69



	SB50529			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
05/27/14				
05/28/14				
05/29/14				
05/30/14				
05/31/14				
06/01/14				
06/02/14				
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06/07/14				
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07/07/14				
07/08/14				
07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				
07/16/14				
07/17/14	21	0	1301	119
07/18/14	174	272	2741	381
07/19/14	18	87	1098	119

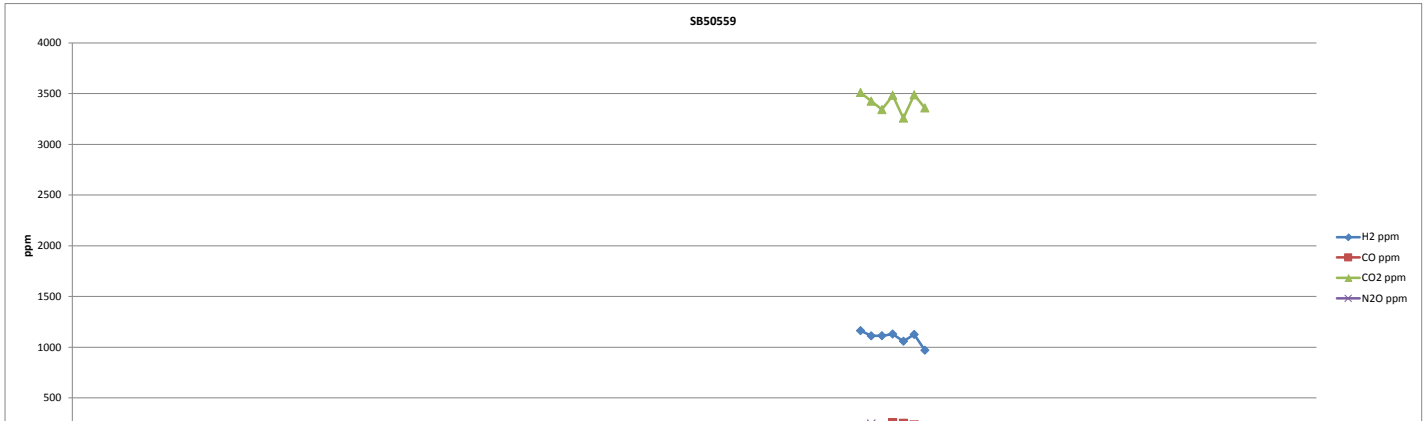
	SB50529			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/20/14	192	294	2971	357
07/21/14	63	145	2289	282
07/22/14	167	263	2611	316
07/23/14	42	73	1693	155
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14				
08/01/14				
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09/04/14				
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09/09/14				
09/10/14				
09/11/14				

Maximum	192	294	2971	381
Minimum	18	0	1098	119



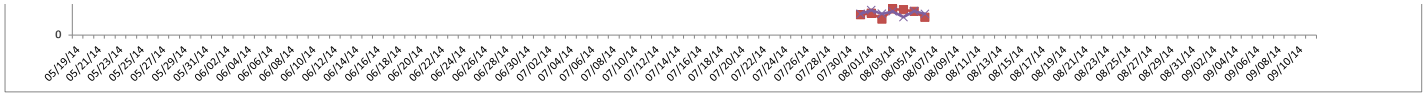
	SB50559			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
05/19/14				
05/20/14				
05/21/14				
05/22/14				
05/23/14				
05/24/14				
05/25/14				
05/26/14				
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06/30/14				
07/01/14				
07/02/14				
07/03/14				
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07/05/14				
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07/07/14				
07/08/14				
07/09/14				
07/10/14				
07/11/14				
07/12/14				
07/13/14				
07/14/14				
07/15/14				

	SB50559			
Date	H_2 ppm	CO ppm	CO_2 ppm	N_2O ppm
07/16/14				
07/17/14				
07/18/14				
07/19/14				
07/20/14				
07/21/14				
07/22/14				
07/23/14				
07/24/14				
07/25/14				
07/26/14				
07/27/14				
07/28/14				
07/29/14				
07/30/14				
07/31/14	1163	200	3511	208
08/01/14	1112	215	3425	245
08/02/14	1113	156	3342	209
08/03/14	1130	256	3483	233
08/04/14	1059	249	3259	176
08/05/14	1125	233	3488	235
08/06/14	970	174	3359	208
08/07/14				
08/08/14				
08/09/14				
08/10/14				
08/11/14				
08/12/14				
08/13/14				
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08/30/14				
08/31/14				
09/01/14				
09/02/14				
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09/08/14				
09/09/14				
09/10/14				
09/11/14				



Headspace Gas Analysis Results for Container 68685

	SB50559			
Date	**H_2 ppm**	**CO ppm**	**CO_2 ppm**	**N_2O ppm**
Maximum	1163	256	3511	245
Minimum	970	156	3259	176



Attachment 14

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected
7/17/2014	None detected
7/18/2014	None Detected
7/19/2014	None Detected
7/20/2014	None Detected
7/21/2014	None Detected
7/22/2014	None Detected
7/23/2014	None Detected
7/24/2014	None detected
7/25/2014	None Detected
7/26/2014	None Detected
7/27/2014	None Detected
7/28/2014	None Detected
7/29/2014	None Detected
7/30/2014	None Detected
7/31/2014	None Detected
8/1/2014	None Detected
8/3/2014	None Detected
8/4/2014	None Detected
8/5/2014	None Detected
8/6/2014	None Detected
8/7/2014	None Detected
8/8/2014	None Detected
8/9/2014	None Detected
8/10/2014	None Detected
8/11/2014	None Detected
8/12/2014	None Detected
8/13/2014	None Detected
8/14/2014	None Detected
8/15/2014	None Detected

8/16/2014	None Detected
8/17/2014	None Detected
8/18/2014	None Detected
8/19/2014	None Detected
8/20/2014	None Detected
8/21/2014	None Detected
8/22/2014	None Detected
8/23/2014	None Detected
8/24/2014	None Detected
8/25/2014	None Detected
8/26/2014	None Detected
8/27/2014	None Detected
8/28/2014	None Detected
8/29/2014	None Detected
8/30/2014	None Detected
8/31/2014	None Detected
9/1/2014	None Detected
9/2/2014	None Detected
9/3/2014	None Detected
9/4/2014	None Detected
9/5/2014	None Detected
9/6/2014	None Detected
9/7/2014	None Detected
9/8/2014	None Detected
9/9/2014	None Detected
9/10/2014	None Detected
9/11/2014	None Detected
9/12/2014	None Detected
9/13/2014	None Detected
9/14/2014	None Detected
9/15/2014	None Detected
9/16/2014	None Detected
9/17/2014	None Detected

Date	Xylene Concentration (ppb)	Trimethylbenzene Concentration (ppb)
	Data reported below in ppb. Many of these results are <1ppm	
7/24/2014	470	320
7/25/2014	710	480
7/26/2014	750	500
7/27/2014	630	450
7/28/2014	1040	750
7/29/2014	740	520
7/30/2014	760	530
7/31/2014	420	270
8/1/2014	800	550
8/3/2014	680	380
8/4/2014	1080	760
8/5/2014	870	470
8/6/2014	1130	820
8/7/2014	1060	790
8/8/2014	430	280
8/9/2014	490	330
8/10/2014	920	680
8/11/2014	450	280
8/12/2014	720	470
8/13/2014	820	550
8/14/2014	770	450
8/15/2014	790	490
8/16/2014	990	590
8/17/2014	590	430
8/18/2014	590	390
8/19/2014	600	410
8/20/2014	610	450
8/21/2014	600	320
8/22/2014	570	380
8/23/2014	640	430
8/24/2014	600	400
8/25/2014	520	350
8/26/2014	630	440
8/28/2014	730	540
9/2/2014	740	480
9/3/2014	640	390
9/4/2014	710	480
9/5/2014	560	420
9/6/2014	490	340
9/7/2014	550	360
9/8/2014	590	410
9/9/2014	670	570
9/10/2014	570	410
9/11/2014	600	420
9/12/2014	630	440

9/13/2014	820	570
9/14/2014	630	400
9/15/2014	640	440
9/16/2014	640	440
9/17/2014	690	490

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	Not Analyzed
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

Date	Compounds Detected (>1 ppm)
7/1/2014	None detected
7/2/2014	None Detected
7/3/2014	None Detected
7/4/2014	None Detected
7/5/2014	None Detected
7/6/2014	None Detected
7/7/2014	None Detected
7/8/2014	None Detected
7/9/2014	None Detected
7/10/2014	None Detected
7/11/2014	None Detected
7/12/2014	None Detected
7/13/2014	None Detected
7/14/2014	None Detected
7/15/2014	None Detected
7/16/2014	None Detected

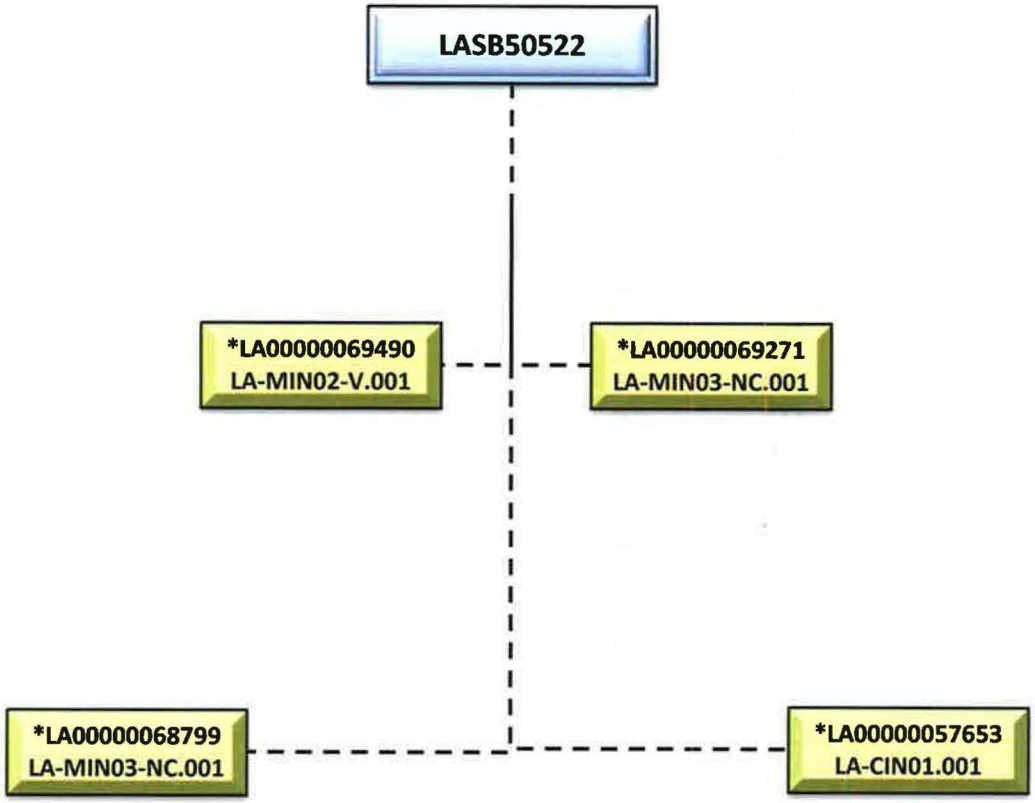
Attachment 15

LASB50522 – STANDARD WASTE BOX

Flammable Gas Data

LA-UR-14-27300

LASB50522 Genealogy



*** Highlighted containers are packaged into LASB50522**

LA00000069490 – 55 GALLON DRUM

LA-MIN02-V.001

InstName : Unit-2

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\140314C\
Data File : 69490.D
Acq On : 14 Mar 2014 10:31 am (#1); 14-Mar-14, 10:31:04 (#2)
Operator : NW
Sample :
Misc : 55 GALLON DRUM THROUGH FILTER (Sig #1); (Sig #2)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 14 10:39:39 2014
Quant Method : C:\msdchem\1\METHODS\VOCGAS.M
Quant Title : Flammable Gas Analysis
QLast Update : Mon Aug 26 13:12:56 2013
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
3) Fluorobenzene	3.532	96	3209452	205.75	ppmv	0.01
15) Chlorobenzene-d5	5.848	117	2555935	177.50	ppmv	-0.01
Target Compounds						Qvalue
1) Hydrogen	1.612	GC1	2058m	273.70	ppmv	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

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LA00000069271 – 55 GALLON DRUM

LA-MIN03-NC.001

InstName : Unit-2

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\140213c\
Data File : 69271.D
Acq On : 13 Feb 2014 11:14 am (#1); 13-Feb-14, 11:13:39 (#2)
Operator : EL
Sample :
Misc : 55 Gal Drum Through Unobstructed,NucFil-019Ds (Sig #1); (Sig #2)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Feb 13 12:22:31 2014
Quant Method : C:\msdchem\1\METHODS\VOCGAS.M
Quant Title : Flammable Gas Analysis
QLast Update : Mon Aug 26 13:12:56 2013
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
3) Fluorobenzene	3.552	96	3083006	205.75	ppmv	0.03
15) Chlorobenzene-d5	5.858	117	2445381	177.50	ppmv	0.00
Target Compounds						Qvalue
1) Hydrogen	1.630	GC1	4169	554.45	ppmv	100
20) m and p-xylene	6.021	106	1926009	234.68	ppmv	93
23) 1,2,4-Trimethylbenzene	7.195	120	152771	20.26	ppmv	94

(#) = qualifier out of range (m) = manual integration (+) = signals summed

VOCGAS.M Fri Jul 25 08:00:22 2014

LA00000068799 – 55 GALLON DRUM

LA-MIN03-NC.001

No Flammable Gas Analysis was performed

LA00000057653 – 55 GALLON DRUM

LA-CIN01.001

Quantitation Report (QT Reviewed)

InstName : FGA Unit 12

Data Path : C:\msdchem\1\DATA\131114c\
Data File : 57653.D
Acq On : 14 Nov 2013 1:50 pm (#1); 14 Nov 2013 1:49 pm (#2)
Operator : EL
Sample :
Misc : 55 Gallon Drum Through Filter, NucFil-013 (Sig #1); (Sig #2)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Nov 14 13:54:11 2013
Quant Method : C:\msdchem\1\METHODS\H2-CH4.M
Quant Title : Flammable Gas Analysis for Transportation Only
QLast Update : Thu May 23 08:37:45 2013
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Target Compounds						Qvalue
1) Hydrogen	1.897	GC1	418487	1467.08	ppmv	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

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Attachment 16

Los Alamos
NATIONAL LABORATORY

memorandum

Weapons Experiments Division

To/MS: Bruce A. Robinson, CNP, MS H816, robinson@lanl.gov DJF
From/MS: David J. Funk, WX-DO, MS P942, djf@lanl.gov and David L. Clark, NSEC, MS T001, dlclark@lanl.gov
Phone/Fax: 7-9659 / 5-2326

Symbol: WXDIV-14-1554
Date: December 19, 2014

SUBJECT: Hazards Associated with Legacy Nitrate Salt Waste Drums Managed under the Container Isolation Plan

At present, there are 29 drums of nitrate waste salts (oxidizers with potentially acidic liquid bearing RCRA characteristics D001 and D002) that are awaiting processing, specifically to eliminate these characteristics and to allow for ultimate disposition at WIPP. As a result of the Feb. 14th, 2014 drum breach at WIPP, and the subsequent identification of the breached drum as a product of LANL TRU waste disposition on May 15th, 2014, these 29 containers were moved into the Permacon in Dome 231 at TA-54 Area G, as part of the New Mexico Environment Department (NMED) approved container isolation plan. The plan is designed to mitigate hazards associated with the nitrate salt bearing waste stream. The purpose of this document is to articulate the hazards associated with un-remediated nitrate salts while in storage at LANL. These hazards are distinctly different from the Swheat-remediated nitrate salt bearing drums, and this document is intended to support the request to remove the un-remediated drums from management under the container isolation plan. Plans to remediate and/or treat both of these waste types are being developed separately, and are beyond the scope of this document.

Historical Generation of TRU Nitrate Salt Waste

Wastes contaminated with transuranic (TRU) isotopes have been generated at Los Alamos National Laboratory (LANL) since the 1940s in research and development activities for nuclear weapons, nuclear fuel, and related national security missions. Historically, radioactive waste was buried in shallow landfills called Material Disposal Areas (MDAs); Area G at TA-54 first received radioactive waste in 1957 and has served as the primary onsite radioactive waste management facility since 1959.

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LA-UR-15-20084

Nitrate salt wastes result from aqueous nitric acid processing to recover and purify plutonium.[1] After plutonium recovery, the resulting nitric acid solution contains a number of metal ions that result from the processing operations. These nitric acid solutions were concentrated through distillation until the nonvolatile salts in the evaporator were close to saturation. According to procedures, 500 to 600 L of feed was reduced to 10 to 25 L of "bottoms". The hot evaporator "bottoms" were poured into a water-cooled tray and flash-crystallized, which precipitates primarily nitrate salts and leaves a liquid supernatant. After filtration, the salts were vacuum dried, which consisted of pulling air through the salts using house vacuum for approximately 15 minutes. The nitrate salts from the ion exchange processes were often washed with 3.3 M nitric acid to remove plutonium and ensure they met the Economic Discard Limit (EDL) for plutonium. However, nitrate salts derived from oxalate filtrates were not washed with bulk acid because it would accelerate decomposition of any oxalic acid present in the salts and could result in pressurization of the sealed 55-gallon drums containing the salts with oxalate.

The final composition of nitrate salts depends on the original process feed that was sent to the evaporator. The evaporator feed included ion-exchange effluent (both lean residue and chloride anion) and the filtrate from oxalate precipitation. The majority of LANL MIN02 wastes were derived from the ion exchange feed. Veazey et al documented the composition of the evaporator bottoms from each of these processes for waste batches produced between April 1992 and February 1994.[2] The solution concentrations[3] of the major metal ions from the lean residue are shown in Table 1. Contaminated most often with plutonium and americium, these granular, off-white salts were packaged into plastic bags and placed in containers for temporary, retrievable, onsite storage until a permanent waste facility became available—the Waste Isolation Pilot Plant (WIPP). LANL has used evaporators to concentrate liquids that contain nitrate salts since operations began at the TA-55 Plutonium Processing Facility in 1979.[1] This specific type of TRU waste was generated until 1991, when LANL developed a process to solidify the evaporator bottoms in grout rather than dispose of the nitrate salt waste as granular salts.

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[1] (a) Christensen, E. L.; Maraman, W. J. *Plutonium Processing at the Los Alamos Scientific Laboratory*; LA-3542; Los Alamos National Laboratory: Los Alamos, NM, 1969; (b) Christensen, E. L. *Plutonium Recovery at the Los Alamos Scientific Laboratory*; LA-UR-80-1168; Los Alamos National Laboratory: Los Alamos, NM, 1980.

[2] (a) Veazey, G. W. *TA-55 Evaporator Bottom Characterization*; Los Alamos National Laboratory: 1995. (b) Veazey, G. W.; Castaneda, A. *Characterization of TA-55 Evaporator Bottoms Waste Stream*; NMT-2:FY 96-13; Los Alamos National Laboratory: Los Alamos, NM, 1996.

[3] We note that the supernatant fluid metal ion concentrations will not represent the ion concentrations of the precipitated salts, which will be dominated by those metal nitrates with the lowest solubility product.

Table 1. Important metal ion concentrations (median values) in evaporator bottoms from Veazey, et al.[2] (in g/l)

	Ion Exchange	Oxalate Filtrate
Ca	61	10.5
Mg	58.7	13.3
K	17.6	4.8
Fe	17.0	7.9
Na	7.4	23.9
Al	4.6	2.3
Cr	3.0	1.94
Ni	1.8	1.205
Pb	0.19	0.056

Nitrate salts are oxidizers, with the generally accepted DOT definition that they can promote or initiate combustion in other flammable materials. In general, oxidizers can:[4]

- Intensify combustion
- Widen the flammable range of flammable gases and liquids
- Lower the flashpoints and ignition temperatures of combustible materials so these materials ignite more readily

Typically, the increase in flammability results from either direct reaction of the oxidizer with a combustible material (fuel) or through the release of oxygen, which then stimulates the oxidation or combustion processes.

Thus, the principal hazard of an oxidizer is in its ability to stimulate or promote combustion, which requires fuel. In the case of legacy nitrate salts – those that have not been neutralized and remediated with Spilftyer and Swheat – these legacy salts were processed and stored in a configuration (lead-lined polyethylene liners placed inside of a 55 gallon steel drum) that eliminates this principal hazard. Without the presence of combustible material or fuel, the oxidizers cannot, in storage, lead to combustion. Thus, the un-remediated salts do not present the potential hazard of spontaneous combustion or enhanced combustion in their current configuration, and can be stored in any area in which combustible material is minimized and separated from the nitrate salt bearing containers, without fear of a release of radioactive materials through combustion processes.

[4] University of Nebraska Lincoln Safe Operating Procedure: Oxidizer Hazards and Risk Minimization

The nitrate salts remediated with Swheat, however, pose just the opposite risk. In this case, the remediation process introduced combustible material (Swheat) to the drum, creating a fuel-oxidizer mixture with the potential for combustion, if heated either internally or externally. In fact, while the specific trigger or ignition of the breached WIPP drum (68660) is still being investigated, there is no question that the fuel oxidizer mixture ignited and burned causing the breach of the drum and releasing radioactive combustion products.

Continued storage of the remediated nitrate salt bearing waste according to the container isolation plan is prudent, to prevent an additional release if one of these drums were to ignite.

DJF:dv

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LA-UR-15-20084