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31 March 2017

Ms. Rachel Roque
Director, Real Estate Division
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Saipan, MP 96950

RE: Final – Phase II Environmental Site Assessment Report for the Masalog Ammunition Depot, Pina, Tinian, CNMI
Contract No. 600431-OC (DPL-15-003); USEPA Grant ID No. BF-00T27401-0

Dear Ms. Roque,

Enclosed is an electronic copy of the Final Phase II Environmental Site Assessment Report for the Masalog Ammunition Depot, Pina, Tinian, CNMI. Please provide your review of the document within the next business 30 days. If you have any questions or comments, please contact me at your convenience at 671-646-5231 x505. EA appreciates this opportunity to provide these Phase II ESA services to the CNMI DPL.

Sincerely,

Robert Shambach, P.G.
Project Manager

cc: Tim Lang, TRL
Project file:

Attachments

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FINAL

PHASE II ENVIRONMENTAL SITE ASSESSMENT

Masalog Ammunition Depot

Pina, Tinian

31 March 2017

Prepared for:

Commonwealth of the Northern Mariana Islands
Department of Public Lands
2nd Floor, Joeten Dandan Commercial Building
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Robert Shambach, P.G.
Project Manager

31 March 2017

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Appendix F Data Validation Report

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ACRONYMS AND ABBREVIATIONS

AMPRO	All Hazardous Management Professionals
APP	Accident Prevention Plan
BECQ	Bureau of Environmental and Coastal Quality
bgs	below ground surface
cm	centimeter(s)
CNMI	Commonwealth of the Northern Mariana Islands
COPC	chemical of potential concern
CSM	conceptual site model
DEQ	Division of Environmental Quality
DoD	Department of Defense
DPL	Department of Public Lands
DU	decision unit
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
Eurofins	Eurofins Lancaster Laboratory
GPS	global positioning system
ID	identification
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
MEC	munitions and explosives of concern
mg/kg	milligram(s) per kilogram
MI	multi-increment
MS	matrix spike
MSD	matrix spike duplicate
PAH	polycyclic aromatic hydrocarbon
QA	quality assurance
QC	quality control

ACRONYMS AND ABBREVIATIONS (Continued)

RPD	relative percent difference
RSD	relative standard deviation
RSL	Regional Screening Level
RTI	RTI Laboratory
SAP	Sampling and Analysis Plan
SSL	soil screening level
SSHP	Site Safety and Health Plan
SUXOS	Senior Unexploded Ordnance Supervisor
UCL	upper confidence limit
UXO	unexploded ordnance
UXOTII	UXO Technician II
UXOQCS/SO	Unexploded Ordnance Quality Control Specialist/Safety Officer
WP	Work Plan
WWII	World War II

EXECUTIVE SUMMARY

The Department of Public Lands, Commonwealth of the Northern Marianas Islands (CNMI) retained EA Engineering, Science, and Technology, Inc., PBC (EA) to conduct a Phase II Environmental Site Assessment (ESA) in a portion of the former Masalog Ammunition Depot Site, Pina, Tinian, CNMI. The Phase II ESA was performed within an approximately 12-hectare (30-acre) portion of the Masalog Ammunition Depot, identified as the Pina Tinian Lot 271 T61 Site, and hereafter referred to as the site.

The purpose of the Phase II ESA was to assess the nature and extent of potential munitions-related contamination in the surface and near-surface soil at the site; and the results are documented in this report. A secondary purpose of the Phase II ESA was to perform a surface assessment of unexploded ordnance (UXO) and munitions of explosive concern (MEC) within the site boundaries and to a depth of 30 centimeters (cm) from the surface; and the results are documented separately in an appendix to this report.

To perform the field investigation, EA mobilized personnel and equipment to the site during two phases of fieldwork, which included: (1) vegetation removal along transect lines and establishment of the grid network and (2) UXO/MEC surface assessment and soil sampling. The establishment of a grid network and transits, allowed full coverage of the site. This was accomplished with the support of an Unexploded Ordnance (UXO) Technician II that provided UXO anomaly avoidance support prior to vegetation removal and prior to placing grid network corner stakes in the ground. The UXO/MEC surface assessment and soil sampling were performed concurrently. During subsurface soil sampling activities, two UXO Technicians provided UXO anomaly avoidance support.

The assessment included the collection of multi-increment[1] (MI) soil samples from five decision units (DUs) defined at the site and laboratory analysis of soil samples. The MI soil samples consisted of 30 increments that were collected from between the ground surface and 1 foot below ground surface within each DU. The soil samples were submitted to offsite analytical laboratories under standard chain-of-custody procedures and were analyzed for explosives, polycyclic aromatic hydrocarbons (PAHs), metals, and white phosphorus.

The results of soil samples were compared to screening levels, which include the 2016 Tropical Pacific Environmental Screening Levels (ESLs) including background concentrations for metals and the 2016 U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) and risk-based Soil Screening Levels (SSLs). The following parameters were detected at concentrations exceeding screening and background levels in soil samples collected during the Phase II ESA.

1 Multi-increment is a registered trademark of EnviroStat, Inc.

- The PAH constituent naphthalene was detected in the five MI soil samples at concentrations ranging from 0.0021 to 0.0049 milligrams per kilogram (mg/kg) which exceeded the EPA risk-based soil screening level (SSL) of 0.00054 mg/kg.

- Silver was detected in the five MI soil samples at concentrations ranging from 0.108 to 3.46 mg/kg; the highest concentration of silver exceeded both the background concentration (1.5 mg/kg) and the EPA risk-based SSL (0.80 mg/kg).

As shown above, naphthalene and silver were detected in one or more samples at concentrations that exceeded their respective EPA risk-based SSLs and background concentration for silver. The EPA risk-based SSLs are based on groundwater protection concerns and indicates there is a potential leaching concern for these two constituents.

None of the detected concentrations exceeded ESLs based on residential or commercial/industrial land use, and none of the detected concentrations exceeded EPA RSLs based on residential or industrial land use; which indicates the soils in their present condition do not pose a direct exposure human health concern.

Based on industry standards, it is estimated that removal of all MEC and other metallic debris to a depth of 18-inches from the surface at the 30-acre site could range from between $1,040,000 to $1,730,000.

1 INTRODUCTION AND PURPOSE

The Department of Public Lands (DPL), Commonwealth of the Northern Marianas Islands (CNMI) retained EA Engineering, Science, and Technology, Inc., PBC (EA) to conduct a Phase II Environmental Site Assessment (ESA) in a portion of the former Masalog Ammunition Depot Site, Pina, Tinian, CNMI. Tinian is part of the CNMI, located north of Guam, and south of Saipan. The site is classified as a brownfields site, with funding from the U.S. Environmental Protection Agency (EPA) under Site-Specific Hazardous Substance – Grant No. BF-00T27401-0.

Based on the recommendations from a Phase I ESA (EA 2016a), a Phase II ESA was performed within an approximately 12-hectare (30-acre) portion of the Masalog Ammunition Depot, identified as the Pina Tinian Lot 271 T61 Site, and hereafter referred to as the site. Figure 1, Vicinity Map, shows the location of the site on the island of Tinian. Figure 2, General Location, shows the general location of the site. The site consists of a rectangular parcel of land at the former Masalog Ammunition Depot, within the Masalog Ridge Area, approximately 2.5 miles from San Jose village, the largest community on Tinian. Figure 3, Site Grid and Transect Lines, shows the overall site layout, transects, and grid system set up to perform the field assessment activities.

1.1 PURPOSE

The purpose of the Phase II ESA was to assess the nature and extent of potential munitions-related contamination in the surface and near-surface soil at the site; and the results are documented in this report. A secondary purpose of the Phase II ESA was to perform a surface assessment of unexploded ordnance (UXO) and munitions of explosive concern (MEC) within the site boundaries and to a depth of 30 centimeters (cm) from the surface; and the results are documented separately in an appendix to this report.

1.2 SCOPE OF WORK

The project scope of work consisted of the following tasks:

- Mobilized and performed site preparatory activities.
- Cleared vegetation, obstructions, and overburden necessary to access the ground to assess the UXO, with on-site vegetation management.
- Performed surface UXO/MEC assessment.

- Collected soil samples, including quality control (QC) samples, from the site to evaluate the nature and extent of potential contamination.

- Analyzed soil samples for the identified chemicals of potential concern, including polycyclic aromatic hydrocarbons (PAHs), explosives, metals, and white phosphorus.

- Disposed of investigation derived wastes.

- Surveyed sample locations and site features using geographic information system instrumentation.

- Performed data validation and assessment on the analytical data.

- Prepared this Phase II ESA report detailing field activities, deviations from the Final Sampling and Analysis Plan and Work Plan for Phase II Environmental Site Assessment, Masalog Ammunition Depot, Pina, Tinian (SAP/WP) dated April 2016 (EA 2016b), and recommendations for additional studies or remedial actions, along with associated costs. This Phase II ESA report includes Appendix D, After Action Report for MEC Anomaly Avoidance and Surface Clearance that details the results of the UXO surface assessment activities.

1.3 REPORT ORGANIZATION

This report documents the results of the Phase II ESA performed at the site. The UXO/MEC surface clearance results are presented separately in Appendix D. This report is organized in sections as follows:

- ***Section 1, Introduction and Purpose*** – Describes the overall project and purpose of the site investigation activities.

- ***Section 2, Background*** – Presents background information.

- ***Section 3, Field Activities*** – Presents the site description and a description of field activities.

- ***Section 4, Analytical Results*** – Presents laboratories used to analyze samples, analytical methods, applicable action levels, laboratory sample preparation, analytical results and comparison to screening levels.

- ***Section 5, Data Quality*** – Presents a data quality assurance (QA)/QC discussion.

- ***Section 6, Summary of Results, Conclusions, and Recommendations*** – Presents a summary of the Phase II ESA results, conclusions, and recommendations.

- ***Section 7, References*** – Presents references cited in this report.

- ***Appendix A, Permits*** – Provides copies of permits or consultations performed prior to implementing field activities.

- ***Appendix B, Photographs*** – Provides representative photographs collected during field activities.

- ***Appendix C, Daily Reports and Field Logbook*** – Provides daily reports and field logbook from EA Field Team Leader relating to the Phase II ESA.

- ***Appendix D, After Action Report, Munitions of Explosive Concern Anomaly Avoidance and Surface Clearance*** – Provides the information and discussion of MEC surface clearance activities performed concurrently with Phase II ESA activities. This report includes daily reports from the Senior Unexploded Ordnance Supervisor (SUXOS), and Unexploded Ordnance Quality Control Supervisor/Safety Officer (UXOQCS/SO).

- ***Appendix E, Analytical Reports and Chain-of-Custody Records*** – Provides a copy of the complete laboratory analytical report including chain-of-custody records.

- ***Appendix F, Data Validation Report*** – Provides a copy of the data validation report.

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2 BACKGROUND

This section presents the site description, operational history, previous investigations and meetings, geological information, and potential impacts at the site.

2.1 SITE DESCRIPTION

The Masalog Ammunition Depot was a World War II (WWII) ordnance storage depot used during 1944 and 1945, intended primarily to service B-29 bombers during the aerial bombardment and planned invasion of Japan. The depot consists of open revetments and covers an elongated area of approximately 96 hectares (237 acres) along the eastern portion of Tinian.

The site is located within the former Masalog Ammunition Depot on Tinian, CNMI. The site is rectangular in shape, approximately 1,400 feet by 900 feet and occupies approximately 30 acres of undeveloped land (Figure 3).

The site is not occupied and is overgrown with scrub vegetation and tall grasses. The vegetation on the site is primarily by tangantangan (*Luceana leococephala*) forest. The tangantangan is characterized by stems that are approximately 10 to 20 feet in height with diameters at breast height ranging, on average, from 3 to 5 inches. The stems in general are 3 to 5 feet apart, though some areas are more open. The visibility through the tangantangan forest ranges from around 20 to 50 feet depending on the thickness of the tangantangan stands. Approximate 3- to 5-foot tall grass and thorny vegetation occurs along the road and in some open areas in the tangantangan. Typically, at least 6- to 8-inch high various herbaceous weeds cover the tangantangan forest floor.

Masalog Beach Road runs within the east and south eastern portion of the site. There are several regularly spaced WWII revetments along the road approximately 4 to 5 feet in height and 15 to 20 feet wide encompassing an area approximately 100 feet square. These revetments were used for the storage of aerial bombs and other ordnance for the US Army Air Corps operations associated with North Field and Tinian West Field bombardment squadrons during WWII (Allied Pacific Environmental Consulting 2014). There are no other structures present within the site.

2.2 OPERATIONAL HISTORY

During WWII, large quantities (estimated to be in the millions of pounds) of ammunition and ordnance were stored at the site by the United States of America in anticipated use during the attack and impending invasion of Mainland Japan. Following WWII, much of this ordnance was left in their storage locations on the islands of Saipan and Tinian. Several ordnance storage sites on Tinian and Saipan consisted of strategically positioned earthen revetments including the

Masalog Ammunition Depot which was designed to support of the B-29 bomber airfields on Tinian. The amount of ordnance stored on the site remains unknown. However, complete rounds, partially exploded munitions, and MEC from previous removal efforts (performed at the end of WWII), and burial pits containing discarded military munitions was suspected to be within the boundaries of the site.

The site was previously held by the Trust Territory of the Pacific from WWII until the creation of the CNMI government in 1976. The land was then transferred to the DPL under the CNMI Executive Branch. In 2013, the CNMI Bureau of Environmental & Coastal Quality (BECQ) Site Assessment and Remediation branch submitted and received approval from the EPA for the land to be classified as a Brownfields site (CNMI Division of Environmental Quality [DEQ] 2013).

2.3 PREVIOUS INVESTIGATIONS/REGULATORY INVOLVEMENT

The investigation site is located within the former Masalog Ammunition Depot on Tinian, CNMI. This particular site has not been widely investigated. A MEC survey for the general area was completed in 2008, and a site visit and reconnaissance was conducted in January 2016, as presented below. It is known that the site had ordnance stockpiles, but the nature and extent of the MEC is unknown. Further details on the previous investigations are presented below.

A UXO survey was conducted at the Masalog Ammunition Depot by All-Hazardous Management Professionals (AMPRO) Consultants in 2008 for the CNMI DPL. As a result of the survey a significant number of UXO and MEC components were located within the search area for the survey. Ordnance items included 500-pound incendiary bombs, 10-pound incendiary bomblets, fragmentation bombs, incendiary cluster adapters and components, and other miscellaneous ordnance components. There was evidence of detonation holes at and near revetment structures, likely due to WWII era “blown in place” disposal. The survey recommended a complete vegetation removal to assess the level of risk presented by the remaining MEC (AMPRO 2008). No environmental samples were collected.

A Phase I ESA for the entire Masalog Ammunition Depot was completed in July 2014 (Allied Pacific Environmental Consulting 2014) for the CNMI BECQ. Transect T-2 west was located within the subject site boundaries. A revetment berm, MK53 350 Pound Depth bomb, and a AN/M57 250 Pound General Purpose Bomb were identified on the subject site. In general, large quantities of MEC were found on adjacent sites. The Phase I ESA indicated that it was possible that chemical constituents from corroding UXO, such as Tritonal, trinitrotoluene, Composition B or Amatol, may have leached into the soils of the Ammunition Depot. No environmental samples were collected.

A Phase I ESA site reconnaissance of the site was conducted in January 2016 and a final report submitted in April 2016 (EA 2016a). The Phase I ESA included a database and records review;

personal interviews; a map, aerial photograph, and archival research; and a site reconnaissance and data collection. The following findings were noted during the 2016 Phase I ESA:

- There is a potential for explosive hazards to exist based on the significant number of MEC items identified.
- Over approximately 75 years, it is assumed that a percentage of the munitions will have deteriorated and may have resulted in the release of munitions constituents to the environment which could be a potential concern to human and ecological receptors.

The 2016 EA Phase I ESA recommended further investigation to assess the potential environmental risks and explosive hazards. The collection of soil samples has not been performed at the site during previous investigations.

2.4 SCOPING MEETING

On 15 December 2015, a project kickoff and scoping meeting was conducted between EA and DPL. The scope of work was discussed and refined according to the final proposal submitted by EA to the DPL.

A site visit was conducted on 4 to 5 January 2016 with representatives from EA and munitions support subcontractor Unitek Environmental Guam. A site brief and site walk was conducted on of portions of the site. Munitions debris was visible on the ground surface and other metals objects related to heavy equipment and vehicles were located throughout the site. No explosive hazards were seen, but incendiary bombs components were noted. Based on observations made during the site visit, there was concern that a “large amount” of material was buried beneath the ground surface, potentially including UXO. Unitek recommended on-site UXO technical support for future surveys and the performance of full MEC clearance for future intrusive work (Unitek 2016).

2.5 ENVIRONMENTAL SETTING

The site is located on the southeastern ridge of Tinian on the Pina Plateau. The soil class is Dandan-Chinen, shallow to moderately deep, well drained and nearly level with strongly sloping soils. This class is part of the common Mariana Limestone geologic unit. This unit include fine to coarse-grained fragmented limestone, and small amounts of clay. It is highly porous, and water flow easily through it (Gingerich 2002).

The site gently slopes to the southeast. Slopes increase (approximately 10 to 20 percent) to the southeast of the road. There are hummocky areas associated with past disturbance in several areas across the site. Several mounds occur adjacent to the road that are typically 8 to 10 feet high, 15 to 20 feet across at the base, and 30 to greater than 60 feet long. The mounds along the road appear to be comprised of earthen material with a vegetative cover. There are some boulders and a few small boulder piles in areas adjacent to the road. The rocks and boulders in general are 1 to 3 feet in diameter.

The Commonwealth Utilities Corporation public system extracts water from one horizontal Maui-type well (Maui Well #2) located approximately 0.75 miles southwest of the site beneath the Makpo wetland (Figure 2). Before Maui Well #2 was put into service, the public system extracted water from the adjacent Maui Well #1. Maui Well #1 is currently out of service due to failed equipment and difficulty obtaining repair parts (Department of the Navy 2015).

Depth to groundwater in the vicinity of the site is approximately 200 feet below ground surface (bgs). Groundwater is the potable water supply source for residents in Tinian (United States Geological Survey 2000).

There are no surface water features on or near the site.

2.6 IMPACT ON HUMAN HEALTH AND/OR THE ENVIRONMENT

It is anticipated that over the past 75 years, a large percentage of the munitions deteriorating on the surface or shallow subsurface at the site may have resulted in a release of munitions constituents into the environment in soils as chemicals of potential concern (COPCs) to human and ecological receptors. COPCs associated with the historical use of the site as a munitions depot in shallow surface soil include MEC related constituents, including PAHs, explosive residue, metals, and white phosphorus.

2.7 LAND USE

The types of human receptors that may be present at the site now and in the future are site workers and occasional users/trespassers. Future planned land use is classified as either landfill or recreational.

2.8 EXPOSURE PATHWAYS

Possible exposure pathways are present through inhalation, ingestion, external and dermal contact of surface and shallow subsurface soil.

3 FIELD ACTIVITIES

The field activities documented in this section were performed in accordance with the Final SAP/WP (EA 2016b). The Final SAP/WP was reviewed and approved by DPL and EPA prior to performing field activities. Significant deviations from the Final SAP/WP and significant field observations related to implementing the field activities are presented and discussed in Section 3.9. Appendix B presents representative digital photographs of field activities.

3.1 PERMITTING

The following permits were obtained prior to mobilization to perform fieldwork:

- CNMI Commercial Earthmoving & Erosion Control Permit

No other permits were required for the Phase II ESA field effort.

3.2 MOBILIZATION AND SITE PREPARATION

Following approval of the Final SAP/WP and completion of permitting activities, personnel and equipment were mobilized to the site according to the phase of field work to be performed. Fieldwork was performed in two phases that included: (1) vegetation removal along transect lines and establishment of the grid network, and (2) MEC surface assessment and soil sampling. In general, mobilization activities included general preparatory activities, on-site project kickoff meetings, and safety briefings. Tailgate safety meetings were conducted in the field at the start of each work day.

The mobilization for the first phase of fieldwork occurred on 14 November 2016. Prior to arrival at the site, project personnel attended a briefing to review the Final SAP/WP, which included an Accident Prevention Plan (APP), and Site Safety and Health Plan (SSHP). An overview of planned vegetation clearance activities was reviewed, as well as a general site orientation and review of health and safety issues. Demobilization for the first phase of fieldwork occurred on 20 November 2016.

The mobilization for the second phase of fieldwork occurred on 05 December 2016. Prior to arrival at the site, project personnel attended a safety briefing to review the Final SAP/WP, APP, and SSHP (Appendix B, Photo 1). Personnel were familiarized with the site and attended a site safety brief conducted by the SUXOS and UXOQCS/SO. Personnel reviewed the applicable project documents, safety plans, and signed acknowledgement forms indicating they had received and reviewed pertinent forms and plans. Demobilization for the second phase of fieldwork occurred on 13 December 2016.

3.3 VEGETATION CLEARANCE AND GRID NETWORK ESTABLISHMENT

During the first mobilization, limited vegetation clearance was performed along transect lines to facilitate project activities and provide access to the site. The transect lines were spaced every 200 feet within the site (Figure 3). Based on the presence of UXO and MEC documented in previous investigations, a UXO Technician II (UXOTII) provided anomaly avoidance in advance of the vegetation clearance team, which consisted of four laborers. The UXOTII utilized a handheld Schonstedt (i.e., magnetometer) to assess the surface and near-surface soil (30 cm) for metallic anomalies. When an anomaly was identified, the UXOTII inspected the surface for the presence of MEC/UXO. If MEC/UXO was not observed on the ground surface, the vegetation clearance team was permitted to continue along the prescribed transect line.

No MEC items were identified during the UXO anomaly avoidance activities conducted during vegetation clearance and grid network establishment.

A grid network was established using a Trimble® GeoXH™ GPS Pathfinder handheld Global Positioning System (GPS) to provide positional control during the UXO surface clearance and soil sampling. The grid network was comprised of 126 individual grids that measured 100 feet by 100 feet (Figure 3). Along the cut transect lines, grid corners were cleared for surface MEC and subsurface UXO anomaly avoidance procedures were followed prior to marking each grid corner along each transect line with stakes marked with the designated grid alpha-numeric designator (A100, A200, …).

As shown on Figure 4, each grid was assigned an alpha-numeric designator based on its location in the grid network, which was the method used to track and control fieldwork activities.

Following the establishment of transect lines and the grid network, a site inventory was performed to identify locations of revetments and former roadways. The results from the site inventory are presented on the site features Figure 5.

3.4 SURFACE CLEARANCE OF MUNITIONS AND EXPLOSIVES OF CONCERN

The purpose of the surface clearance was to identify and mark the locations of potential UXO/MEC on the surface and detectable anomalies within 30 cm bgs. No subsurface intrusive investigations were performed on any subsurface anomalies. Appendix C presents the daily reports and the field notebook related to the Phase II ESA activities prepared by the EA Team Leader. Appendix D presents the After Action Report that describes the approach and documents the results from the surface clearance at the site.

UXO surface clearance was performed using a 15-foot effective line spacing over the entire project site, covering a minimum of 33 percent of the total site area. Surface clearance was performed prior to soil sampling using five- to six-person MEC Teams using handheld magnetometers. The MEC Team typically consisted of one SUXOS, one UXOQCS/SO, and three to four UXOTII or UXO Technician I (UXOTI).

During the surface clearance, the SUXOS followed behind the sweep lines, monitoring the UXO Technicians progress and direction, and ensuring the sweep lane was covered. In addition, the UXOQCS/SO followed behind the SUXOS while performing a quality assessment check of anomaly detection within sweep lanes.

The SUXOS and UXOQCS/SO were responsible for the final determination of a MEC item that was suspected to be live. Suspected live MEC items, or Materials Potentially Presenting an Explosive Hazard (MPPEH), were clearly marked with three red pin flags for final disposal procedures by Department of Public Safety (DPS) Explosive Response Team (XRT). Suspected live MEC items or MPPEH were logged, marked, and GPS coordinates were recorded.

MEC items determined to be live, or suspected to contain hazardous components, were marked for final disposal to be performed in the future by the DPS XRT. If the condition of an item could not be determined, it was considered live and marked for future DPS XRT disposal. The DPL PM was notified of all MEC discoveries. Small arms rounds (e.g., 5.56, 7.62, .45, .50 caliber) were not considered MEC, and were not observed at the project site during surface clearance operations.

MEC, MPPEH, and MD items were left in place and were not removed from the field. No off-site transportation of MEC or MD items for disposal was performed. The UXO team did not conduct disposal operations including handling or disposing of MEC, MPPEH, or MD identified at the site.

A total of 1,365 subsurface anomalies, surface anomalies, and MEC/ MPPEH were identified within the project site. Four pieces of MEC/MPPEH were identified within Grids A400, F400, G500, and L700. The locations of the items are shown on Appendix D, Figure 7.

3.5 UXO ANOMALY AVOIDANCE DURING SOIL SAMPLING

A UXO Team consisting of one UXOTII and one UXO Technician I, provided UXO anomaly avoidance support during the soil sampling field activities. At each soil sample collection location, the UXO technicians used a handheld magnetometer to ensure the area was free of any surface and subsurface anomalies within 3 feet of the sample location and to an approximate depth of 2 feet bgs. If the location was clear of anomalies, a soil sample was collected at a depth of 1 foot bgs. If the area was not clear of surface and subsurface anomalies, a nearby area free of surface and subsurface anomalies was utilized as the soil sample location. Subsurface anomalies were detected at approximately 10 percent of the sample locations, and these locations were off-set as described. The source of the subsurface anomalies were not investigated.

3.6 SOIL SAMPLING

This section presents the approach and implementation of the soil sampling field activities.

3.6.1 Definition of Decision Units

A decision unit (DU) is an area of the site about which a decision is to be made regarding the extent, magnitude, and the potential human health or environmental hazards posed by contaminants within the DU. The selection of DUs is unique to each site and depends, in part, on the specific environmental receptors and hazards under investigation. The appropriate type, size, shape, and number of DUs for a given project is necessarily site-specific and must take into consideration the historical, current, and future use of the site. Potential future use of this project site includes a landfill; however, future land use may include recreational or resort. Therefore, the investigation was performed in a manner that evaluates unrestricted (i.e., residential) land use.

For this project, five DUs were defined that provided coverage across the project site (Figure 6). DUs were defined as exposure areas for human and ecological receptors. To define each DU area, the project site was divided into five equal areas, each approximately 6 acres in area. The depth of each DU was 1 foot.

3.6.2 Multi-Increment Sampling Approach

Multi-increment (MI) soil samples were collected from each DU. MI soil samples are prepared by collecting a minimum number of small soil “increments” from a specified DU, and combining the increments into a single sample, referred to as the MI sample. The number of increments incorporated into field MI samples, and the overall mass of the MI samples collected is not dependent on the size of the DU.

For this project, each MI sample from each DU consisted of 30 increments. Within each DU, the location of each of the 30 increments was selected using a systematic random approach. Initially, a random starting location was selected and sampled. After the random starting location was sampled, the remaining increment locations were selected on a systematic basis, which consisted of pacing an equal distance around the DU with the goal of even distribution across the DU surface.

To collect an MI soil sample, after the UXO technicians performed anomaly avoidance, a hole was excavated to a depth of 1 foot bgs (with some exceptions; see next paragraph) using a shovel. After the hole was dug, a new disposable stainless steel spoon was used to remove additional soil along one side of the hole, from the bottom to the top of the hole. This removed the soil that potentially contacted the shovel used to dig the hole. After the fresh soil was exposed along the whole sidewall, the spoon was used to collect a profile of soil from the bottom to the top of the hole. Approximately 2 ounces of soil was collected from each increment location, which was placed into a re-sealable bag. Following the collection of the last increment, the sample was processed, which included mixing within the sample collection bag, then collecting one 4-ounce aliquot in a glass jar (for white phosphorus analysis). The sample bag and sample jars were then sealed, labeled, and placed in a cooler with ice to begin the preservation process prior to shipment to the analytical laboratory. The disposable sampling spoon was then disposed of as investigation-derived waste.

During sample collection, the excavations for collection of individual increments were advanced to 1 foot bgs when possible. In the northwest portion of the site, which correlated to the highest elevations of the site, excavation beyond 6 inches bgs was not possible due to underlying coralline deposit; and increments were collected from the shallow locations when required. Less than 10 percent of the sample locations were collected from excavations that were approximately 6 inches to less than 1 foot bgs in depth.

Field replicates were collected from one DU during the MI sampling effort. The replicate samples included one duplicate and one triplicate that were collected in a manner identical to the primary sample collected within the DU. To collect the duplicate and triplicate samples, after the location of the primary sample was identified and swept for subsurface anomalies, a second and third location were identified within a 20-foot radius from the primary sample location; the distance from the primary location was chosen randomly. The direction away from the primary sample location for both the duplicate and triplicate were also chosen randomly and were determined by the UXO technicians during sample collection. The duplicate and triplicate samples were labeled in the same manner as the primary sample; however, a unique sample identification was used and the samples were submitted blind to the laboratory so they were not able to identify them as QC samples.

The handheld GPS was used to record the location of each of the individual increments within a DU. The GPS also recorded the increment locations for the duplicate and triplicate samples. The increment collections locations within each DU are presented in Figure 6.

3.6.3 Sample Labeling, Preservation, and Chain of Custody

Sample containers were labeled with unique sample identifications and the date and time of collection. They were then placed into a cooler containing ice to begin the preservation process prior to delivery to the analytical laboratory. Samples were transported to Saipan following demobilization, where the sample coolers were repackaged with fresh ice and prepared for shipment via Federal Express to the analytical laboratory under standard chain-of-custody procedures. The chain-of-custody record included the project identification, project manager contact information, sample identification, and requested analysis. The chain-of-custody record was signed by the persons relinquishing and taking possession of the sample cooler.

3.6.4 Soil Sample Identification

Sample identifications for the MI soil samples were assigned according to the following general format: MAD-DU##.

Where MAD indicates Masalog Ammunition Depot and DU## designates the DU number (between 01 and 05).

Two replicate samples were collected from DU05, which were identified as MAD-DU06 (duplicate) and MAD-DU07 (triplicate).

3.6.5 Soil Sample Collection Observations

Generally, the soils at the site consisted of a thin layer of silty sand with abundant organic material underlain by hard coralline deposits. During sample collection, it was noted that the soil layer was thinner (approximately 6 inches thick) in the northwest portion of the site, which was the area highest in elevation (upslope). The soil layer thickened toward the southeast portion of the site, which was closer to the ocean.

3.7 DECONTAMINATION PROCEDURES

A shovel was used to excavate a hole at each increment location prior to using a disposable sampling spoon to collect each increment. Decontamination of the shovel was performed between each DU; the equipment did not require decontamination between each increment location within one DU.

Decontamination of the shovel consisted of manually removing clumps of soil from the surface of the shovel. Subsequently, the shovel was washed with a scrub brush in a non-phosphate detergent solution. After washing in the detergent solution, the shovel was rinsed twice using bottled drinking water, then allowed to air dry in a dust free location.

3.8 INVESTIGATION DERIVED WASTE

Investigation-derived waste generated during this project included used personal protective equipment and disposable sampling equipment. The used personal protective equipment and disposable sampling equipment was double bagged and placed in municipal refuse dumpster. These wastes are not considered hazardous and were disposed of at the municipal landfill.

3.9 DEVIATIONS FROM THE WORK PLAN

The Final SAP/WP indicated that a systematic random sample collection scheme would be used to collect the MI sample. The approach indicated that each DU would be divided into five columns and six rows. The ends of each row and column would be marked with flags to help establish approximate lines for the collection of increments. Further, the Final SAP/WP indicated the 30 individual increment locations per DU would then be collected by placing 1 increment at the start of each row and additional increments placed at the intersection of the rows and columns.

During the implementation of field efforts, a systematic random sample collection scheme was used, but deviated from the approach described in the Final SAP/WP. During field activities, rows and columns were not established due to the dense vegetation and substantial labor effort required to mark five columns and six rows with flagging in each DU.

The modified approach to ensure a systematic random sample collection scheme was employed included using the 100-foot by 100-foot grid concept and the handheld GPS. In general, each DU consisted of 18 full 100-foot by 100-foot grids plus 9 partial grids. The GPS was used to navigate to a random area within each of the 27 full or partial grids and a random location was selected for the collection of a single increment; plus 3 totally random locations were selected; for a total of 30 increment locations per DU. This approach ensured that the increment locations were systematically randomly located, but also spread across the entire DU. Further, each increment location was recorded on the handheld GPS and the locations are shown on Figure 6.

As can be observed on Figure 6, some of the increment locations were on or just outside of individual DU boundaries. This was a result of the dense vegetation that was difficult to navigate while maintaining positional awareness. Also, some partial 100-foot by 100-foot grids were included in each DU, which also resulted in difficulty in maintaining positional awareness. Overall, the result of some increments being collected on or just outside of the individual DU boundaries is considered negligible. If the sampling effort were to be repeated, similar results are expected because similar positional awareness difficulties would be experienced during future efforts.

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4 ANALYTICAL RESULTS

This section presents the analytical support information including the identity of the laboratories, analyses requested, screening levels, laboratory subsampling procedures, analytical results, and the comparison of analytical results to screening levels.

4.1 LABORATORIES AND ANALYTICAL METHODS

The samples collected at this site were analyzed by two laboratories: Eurofins Lancaster Laboratory (Eurofins) in Lancaster, Pennsylvania and RTI Laboratory (RTI) in Livonia, Michigan. The field samples were shipped to Eurofins and a separate aliquot of undisturbed sample for white phosphorus analysis only was forwarded to RTI by the sample receiving personnel at Eurofins.

The MI soil samples were analyzed for the following:

- PAHs (SW8270C using selected ion monitoring)
- Metals (SW6010B/6020/7471A)
- Explosives (SW8330B)
- White phosphorus (SW7580).

Eurofins performed the analysis of PAHs, explosives, and metals and RTI performed the analysis of white phosphorus. Laboratory analytical reports and chain-of-custody records are presented in Appendix E.

4.2 APPLICABLE ACTION LEVELS

This report documents analytical results from soil samples, which were initially compared to (1) Tropical Pacific Tier 1 Environmental Screening Levels (ESLs) published in Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Volume 2: Background Documentation for the Development of Tier 1 Environmental Action Levels, Appendix 1: Detailed Lookup Tables, Tropical Pacific Edition, Co-Sponsored by CNMI DEQ and Guam Environmental Protection Agency, Summer 2016 and updated in December 2016 (CNMI DEQ 2016; hereafter referred to as the “TP EHE Guidance”), and (2) EPA Regional Screening Levels (RSLs) (EPA 2016).

4.2.1 Tropical Pacific Tier 1 Environmental Screening Levels

The term “Tier 1 ESL” is used to identify the lowest of the individual ESLs relevant to the media (i.e., soil, soil gas, or groundwater). The Tier 1 ESLs were updated between the Final SAP/WP and the preparation of this report, and the updated Tier 1 ESLs are reflected herein. For soil, the Tier 1 ESLs are selected as the lowest of the individual ESLs for the following:

- Direct/indirect exposure with impacted soil (includes ingestion, dermal absorption, inhalation of vapors and dust in outdoor air)
- Protection of groundwater quality (leaching of chemicals from soil)
- Protection against gross contamination concerns (free product, odors, etc.) and general resource degradation.

Tier 1 ESLs are concentrations of contaminants in soil, soil gas, and groundwater above which the contaminants could pose a potential adverse threat to human health and the environment. Exceeding the Tier 1 ESL does not necessarily indicate that contamination at the site poses environmental hazards. However, it does indicate that additional evaluation is warranted, which may include additional site investigation and a more detailed evaluation of the specific, tentatively identified hazards. The ESLs can be used to delineate specific areas of the site that require remedial actions. These actions can vary, depending on the hazard present and site conditions.

The ESLs allow the option to select "commercial/industrial land use only" over unrestricted (or "residential") land use. However, the TP EHE Guidance advises the following (CNMI DEQ 2016):

> *"As the category heading implies, use of the soil ESLs listed under "Commercial/Industrial Use Only" places implicit land-use restrictions on the affected property. The short-term cost savings of limiting site cleanup to meet only commercial/industrial-use ESLs rather than unrestricted land use should be carefully weighted against potential restrictions on future property use. In addition to land use restrictions, cleanup to commercial/industrial-use ESLs may also encumber the site with long-term environmental monitoring requirements and requirements for future subsurface excavation activities."*

Therefore, the analytical results were compared to both unrestricted and commercial/industrial land use Tier 1 ESLs.

The Tier 1 ESL lookup tables are organized to reflect three of the most important factors that control the magnitude of environmental hazards posed by contaminated soil and groundwater (CNMI DEQ 2016):

- Accessibility of the impacted soil (e.g., currently or potentially exposed at the ground surface versus isolated in the subsurface).

- Beneficial use of the groundwater immediately underlying the site or otherwise potentially threatened by the release (e.g., drinking water resource threatened versus no drinking water resource threatened).

- Current and anticipated future use of the site (e.g., residential land use permitted or commercial/industrial land use only).

Conceptual Site Model

These factors are incorporated into a total of eight conceptual site models (CSMs) that describe default site conditions used to develop the Tier 1 ESLs. The CSM and associated Tier 1 ESLs that most directly applies to the site under investigation are selected to screen for potential environmental hazards. Therefore, the CSM for this site includes (1) shallow soil less than 3 meters in depth, and (2) the site lies in area of potential drinking water source or were a drinking water resource is threatened (CNMI DEQ 2016; Table A-1 for Unrestricted Land Use, Table A-2 for Commercial/Industrial Land Use).

Background Metals

Background metals concentrations tend to be higher in soils developed over volcanic rocks and can exceed risk-based screening levels in some cases. This is especially true for arsenic, but can also occur for heavy metals such as antimony, cadmium, chromium (in comparison to screening levels for hexavalent chromium), thallium, and vanadium associated with soils developed over volcanic bedrock. If a release of one of these chemicals is suspected at a site then additional evaluation may be warranted (e.g., testing of soil specifically for hexavalent chromium) and more stringent, risk-based screening levels. Therefore, analytical results for metals were additionally compared to natural background concentrations (CNMI DEQ 2016; Table M).

Limits of Quantitation

The laboratory sets method limits of quantitation (LOQs) based on the method or instrument detection limits established for the analytical methods. The LOQs are also dependent on (1) sample matrix, (2) COPCs in the analytical sample (i.e., high concentrations of COPCs may require dilution for accurate quantification), and (3) field chemical preservation (i.e., methanol preservation).

Some analytes had LOQs that were equal to or greater than their respective Tier 1 ESL. This is a commonly recognized condition, and is addressed in Section 2.7 of the Tropical Pacific Edition of the Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Volume 1: User's Guide (CNMI DEQ 2016):

> *"In cases where an ESL for a specific chemical is less than the standard method detection limit for a commercial laboratory (as agreed upon by the overseeing regulatory agency), it is generally acceptable to consider the method detection limit in place of the action level."*

Note that the above guidance used "method detection limit" which is analogous to LOQ.

The following explosives residue analytes were not detected at concentrations exceeding their respective laboratory LOQs, but the LOQs exceeded their respective Tier 1 ESLs:

- 2,4-Dinitrotoluene
- 2,6-Dinitrotoluene
- Nitrobenzene
- 2-Nitrotoluene
- 3-Nitrotoluene
- Nitroglycerin
- RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine).

4.2.2 EPA Regional Screening Levels

The EPA publishes RSLs that were developed using risk assessment guidance from the EPA Superfund program. The RSLs are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by the EPA to be protective for humans (including sensitive groups) over a lifetime; however, RSLs are not always applicable to a particular site and do not address non-human health endpoints, such as ecological impacts. The RSLs contained in the RSL table are generic; they are calculated without site-specific information. They may be re-calculated using site-specific data.

Similar to the Tier 1 ESLs, the RSLs are published for both residential and commercial/industrial land use scenarios, as well as risk-based soil screening levels (SSLs) based on the protection of groundwater. The RSLs are calculated based on a target cancer risk of 1.0×10^{-6} and a target hazard quotient of 1.0. The most current version of the RSLs can be accessed the following website:

https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016

4.3 LABORATORY SUBSAMPLING

The MI samples were submitted to the laboratories for processing prior to analysis. The MI samples were air dried then sieved to less than 2-millimeter particle size. Sub-sampling was accomplished with a sectorial splitter (also called a rotary riffle splitter), or a representative subsample was hand collected by taking approximately 30 small increments from systematic random locations from the dried and sieved sample spread out in a thin layer. Sub-sampling was used to provide a representative laboratory subsample (and any laboratory replicates) for a single MI sample, and to provide representative sub-samples for multiple analyses. The mass of sample needed for the subject analytical test or tests was used to determine the parameters for splitting the sample with the sectorial splitter, or in selecting the mass of each increment if hand collecting the sub-sample. It is critical that the entire mass of dried and sieved sample is used in the sub-sampling process.

4.4 SOIL SAMPLE ANALYTICAL RESULTS

During the site investigation activities documented in this report, a total of seven MI soil samples were collected from five DUs. The seven MI soil samples consisted of five primary samples collected from DUs 1 through 5, one duplicate sample collected from DU 5, and one triplicate sample collected from DU 5. The analytical results for the five primary samples are discussed below and the analytical results for the two replicate samples are discussed in Section 5.2. The MI soil samples were analyzed for the constituents listed in Section 4.1 and were compared to applicable action levels listed in Section 4.2. The analytical results and comparison to the applicable action levels is presented in Table 1.

4.4.1 Polycyclic Aromatic Hydrocarbons

The PAH list analyzed by the laboratory includes 18 separate analytes, as listed in Table 1.

Naphthalene was detected in the five primary and two replicate MI soil samples at concentrations ranging from 0.0056 to 0.0049 milligrams per kilogram (mg/kg). The seven detected concentrations exceed the EPA risk-based SSL of 0.00054 mg/kg. The seven detected concentrations were below the unrestricted and commercial/industrial Tier 1 ESL (3.1 mg/kg), the EPA residential RSL (3.8 mg/kg), and the EPA industrial RSL (17 mg/kg).

The following five PAH analytes were detected at concentrations exceeding their respective LOQs in one or more MI soil samples; however, the detected concentrations were significantly below their respective Tier 1 ESLs and EPA RSLs:

- Acenaphthylene
- Anthracene

- Benzo(b)fluoranthene
- Chrysene
- 2-Methylnaphthalene.

The remaining 12 PAH analytes were not detected at concentrations above their respective laboratory LOQs in the five MI soil samples.

4.4.2 Explosive Residues

The explosive residues list analyzed by the laboratory includes 19 analytes, as listed on Table 1. None of the 19 explosive residues analytes were detected at concentrations above their respective laboratory LOQs in the five MI soil samples.

4.4.3 White Phosphorus

White phosphorus was not detected at a concentration above the laboratory LOQ in the five soil samples (Table 1).

4.4.4 Total Metals

The metals analyzed for this project includes 13 separate metals, as presented in Table 1.

Silver was detected in five primary and two replicate MI soil samples at concentrations ranging from 0.108 to 3.46 mg/kg. The highest concentration, 3.46 mg/kg detected in sample MAD-DU02, exceeds the background concentration of 1.5 mg/kg and the EPA risk-based SSL of 0.80 mg/kg. However, the highest detected concentration was below the unrestricted Tier 1 ESL (78 mg/kg), the commercial/industrial Tier 1 ESL (1,200 mg/kg), the EPA residential RSL (390 mg/kg), and the EPA industrial RSL (5,800 mg/kg). The concentrations of silver detected in the remaining four MI soil samples were below the ESLs and RSLs.

The remaining 12 metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, and zinc) were detected at concentrations below their respective background concentrations.

5 DATA QUALITY ASSESSMENT

A QA/QC program was implemented during the field investigation to ensure the generation of data of adequate and defensible quality. The specifications for the QA/QC program were outlined in the SAP/WP (EA 2016b). The QA/QC program was designed to minimize error, provide early identification and correction of potential problems, control the data acquisition process, and evaluate the performance of the sampling program. The QA/QC procedures were followed in the field as well as at the offsite laboratories. A general discussion and specific results of the QA/QC program as well as an evaluation of data generated from environmental samples and a summary of potential impacts on data quality are presented in the sections below.

5.1 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field QC samples were collected in the field and submitted to the offsite laboratory following the requirements of the SAP/WP (EA 2016b). Field QC samples included one set of replicate samples and the purpose, preparation, and frequency of these samples are summarized below.

Replicate samples consisting of a duplicate and a triplicate were collected at a minimum 10 percent frequency of the total number of MI samples collected from the five DUs. Field QC samples are listed in Table 2. For this project, replicate samples included sample identification (ID) MAD-DU06 (duplicate) and sample ID MAD-DU07 (triplicate) associated with primary sample ID MAD-DU05 collected within DU05. The sample identifications for the duplicate and triplicate samples were selected to submit the samples “blind” to the laboratory. Replicate MI soil samples were collected using the same methodology as the primary soil sample, as discussed in Section 3.6.2. Analytical results for original and replicate soil samples are presented in Table 2.

Standard Deviation and Relative Standard Deviation

The standard deviation is a statistical measure of the scatter, or variability, of several sample values around their average. The lower the standard deviation, the lower the variability of the sample values observed in the data.

The relative standard deviation (RSD), expressed as a percent, is a measure of precision between several sample values (the primary, duplicate, and triplicate samples). The RSD differs from the relative percent difference (RPD) in that it measures the precision between several sample values versus just two sample values. The RSD is calculated as the standard deviation divided by the mean (average). The RSD is useful for comparing the uncertainty between different measurements. As presented in the SAP/WP, the RSD goal for this investigation is 30 percent or less. Tables 2 and 3 present the RSDs calculated for chemical constituents with detected concentrations above the LOQ for the primary, duplicate, and triplicate MI samples.

Overall, the RSDs, shown on Table 2, for MI soil sample results are acceptable (less than or equal to 30 percent) with one exception; the calculated RSD for acenaphthylene was 32 percent, which is above the goal of 30 percent.

95 Percent Upper Confidence Limit

The 95 percent upper confidence limit (UCL) is a statistical measure of the precision for a series of measurements. In this case, the primary, duplicate and triplicate samples were be used to calculate a mean (or average) value and a standard deviation. The mean and standard deviation were used to calculate, with 95 percent confidence, the mean value for each contaminant detected. The 95 percent UCL calculations for the MI soil samples with detections in the primary, duplicate, and triplicate samples are shown on Table 3. Note that the calculation of the 95 percent UCL was performed when the normal, duplicate, and triplicate samples had positive detections of an individual analyte. If one of the three samples contained non-detectable or estimated concentrations (i.e., J flag data qualifier), the 95 percent UCL was not calculated. The 95 percent UCL for the MI soil samples are shown on Table 3.

5.2 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

The chemical analyses were performed in accordance with the SAP/WP (EA 2016b) by the selected offsite laboratories: Eurofins Lancaster Laboratory in Lancaster, Pennsylvania and RTI Laboratories in Livonia, Michigan. The complete analytical reports and chain-of-custody records are included in Appendix E. The laboratories followed the QA/QC procedures outlined in the EPA publication entitled “Test Methods for Evaluating Solid Waste, SW-846” (EPA 1996).

Matrix spike (MS) and matrix spike duplicate (MSD) sample pairs were prepared by the analytical laboratories at a minimum frequency of five percent. If necessary, additional sample volume was provided for the preparation of MS pairs as per laboratory specifications. At the laboratories, known concentrations of target analytes were added to the sample material to prepare the MS/MSD samples. The MS/MSD samples were carried through the preparation and analytical procedures in the same manner as the associated field samples. The percent recoveries and RPDs of the spike analytes in the MS/MSD samples were used to evaluate the effect of the sample matrix on accuracy and precision.

Additional laboratory QC samples (i.e., method blanks, laboratory control and laboratory control duplicate samples, and laboratory duplicates as well as surrogates, internal standards, and serial dilutions, if applicable) were prepared as required by the analytical methods and analyzed as per the approved SAP/WP (EA 2016b). These samples were used to perform the internal laboratory QC as described within the SAP/WP (EA 2016b) and the Department of Defense (DoD) Quality System Manual (DoD 2017) prior to delivery of data for validation. The laboratory’s evaluation of the QC results includes comparison to the internal statistically-generated control charts as well as the project limits presented in the SAP/WP (EA 2016b) to allow detections of trends or bias in the generated results. The procedures used for the qualification of analytical data based on the laboratory QC are presented in Table 4.

5.3 DATA VERIFICATION, VALIDATION, AND ASSESSMENT

The purpose of data validation and data quality review is to eliminate suspect analytical data and to assign data qualifiers, as appropriate, for potential data quality issues identified. The analytical data collected during the field investigation were verified and validated prior to use in this report. The data validation report is included in Appendix F. Results of the data validation, in the form of data qualifiers, were incorporated into the data summary table (Table 1).

A usability assessment of data quality against the objectives set forth in the SAP/WP (EA 2016b) was also completed for the analytical results (Section 1.4). This assessment was performed to determine the data usability in terms of precision, accuracy, representativeness, sensitivity, comparability, and completeness. The usability assessment considers whether data meet project quality objectives as they relate to the decision(s) to be made, and evaluates whether data are suitable for making that decision.

The analytical data packages were validated by the EA Project Chemist in accordance with the National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2016b) and the National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA 2016c) with respect to the QA/QC parameters and as specified in the project-specific planning documents.

The validation consisted of a review of the reported results, and an evaluation of the following, as appropriate for the analytical method (raw data were not reviewed):

- Data package completeness
- Sample management (including sample preservation, handling, transport, chain-of-custody protocol, holding times, and condition at laboratory receipt)
- Initial and continuing calibrations
- Instrument tuning and performance
- Detection limits
- Blanks results

- Blank spikes (laboratory control samples [LCSs] and/or LCS duplicates recoveries and RPD(s)
- MS recoveries and RPD
- Reported detection limits
- Serial dilutions
- Surrogate and internal standard recoveries
- Field and laboratory duplicate RPD and RSD
- Post-digestion spike results
- Interference check sample results
- Manual integrations
- Target analyte list verification
- Data qualifiers.

Additionally, on a subset of the analytical results (minimum of 10 percent) the review includes the reported results and associated raw data. A complete review of the data reporting forms is performed to ensure compliance with project requirements and quality objectives. The raw data, including records of sample preparation, instrument conditioning, and calibrations and verifications, were reviewed against summarized forms for completeness and correctness. Chromatograms and ion spectra were reviewed to verify target compound identification. Calculation checks were performed to verify reported values in the summarized forms, including initial calibrations, calibration verifications, spike recovery, duplicate relative differences, and target analyte quantitation. The additional validation encompassed the elements presented above, as well as the following, when appropriate for the analytical method:

- Compound identification and quantification
- Transcription verification
- Review of calculations and raw data
- Verification of the electronic data report.

Data validation guidelines for qualifying sample results have been developed according to the method requirements, professional judgement, and general DoD requirements as shown in Table 4.

Qualitative rather than quantitative assessments of data quality were performed because the data validation guidelines produce qualitative results (U, UJ, J, and R flags rather than a numerical error or variability value associated with each data point) and because it is difficult to accurately quantify sources of error. Data qualified with the “R” flag are considered unusable. Data qualified with the “UJ” (nondetectable results) or “J” (detectable) flags are considered estimated concentrations. If data are qualified, one final qualifier was applied using the following order of precedence: R, J, UJ, and U. The data qualifiers used are defined in Table 1.

5.4 DATA QUALITY INDICATORS

This section outlines the qualitative and quantitative assessment of the analytical data quality. A quantitative assessment of the analytical data was measured using the parameters of precision, accuracy, and completeness. The acceptance limits for each of these parameters are presented in the SAP/WP (EA 2016b). Qualitative assessment of the analytical data quality was measured by assessing the representativeness and comparability of the data. The sensitivity of the reported results was also evaluated. This section evaluates whether the quality and usability of the data collected during the Phase II ESA investigation achieved the objectives specified in the SAP/WP (EA 2016b).

Precision—defined as the degree of agreement among repeated measurement of the same parameter. Precision also characterizes the natural variation of the matrix. Precision was evaluated through the use of field replicate samples to assess the potential bias of field and laboratory conditions on the results, and also through the use of MS pairs or sample replicates to assess the laboratory’s precision. The quantitative indicator of precision is the RPD or RSD between the results of the field replicates and the original sample, the laboratory MS/MSD pairs, or laboratory replicates and original sample.

The method and matrix precision were generally in control; specific exceptions are presented in the data validation report presented in Appendix F. The results qualified from out-of-control precision are qualified as estimated concentrations. The collected data show that the field activities adequately collected representative samples and that the laboratory evaluated the matrix consistently.

Accuracy—measures the closeness of an observed value to the “true” value. Accuracy is evaluated through the use of blank spike and MS sample recoveries, which are compared to control limits specified in the SAP/WP (EA 2016b).

Matrix and method accuracy results were generally in control; specific exceptions are presented in the data validation reports presented in Appendix E. The results qualified from out-of-control matrix accuracy are considered to be estimated concentrations. Overall, the laboratory and matrix accuracy are acceptable.

Representativeness—expresses the degree to which sample data accurately and precisely represent the characteristics of the population that is sampled.

Sample data were representative of site conditions at the time of sample collection. The samples were properly stored and preserved and analyzed within holding times. No contaminants were detected in method blanks at concentrations greater than one-half the LOQ. During data verification and validation, the condition of samples at laboratory receipt and the associated documentation were evaluated. No significant issues were identified that could potentially affect the quality of the generated sample data. No results were qualified or rejected based upon this review.

Completeness—measure of the amount of usable data obtained versus the total possible planned data. The evaluation included an assessment of the number of valid results divided by the possible number of individual results, expressed in a percentage. The samples proposed in the project planning documents were collected and no data were qualified as unusable (R); therefore, the completeness for project data is 100 percent.

Comparability—qualitative indicator that expresses the confidence with which one data set can be compared to another. This goal is achieved by using Standard Operating Procedures to collect and analyze representative samples, and reporting data in standardized formats. The samples were reported in industry-standard units, as specified in the project planning documents. Results obtained are comparable to industry standards, as the collection and analytical techniques performed followed approved and documented procedures. The sampling and testing were conducted in accordance with the specifications of the SAP/WP (EA 2016b) and are, therefore, deemed to be comparable.

Sensitivity—ability of an analytical system (i.e., sample preparation and instrumental analysis) to detect a target component in a given sample matrix within a defined level of confidence. Factors affecting the sensitivity of an analytical system may include analytical system background (e.g., laboratory artifact or method blank contamination), sample matrix (e.g., mass spectrometry ion ratio change, co-elution of peaks, or baseline elevation), and instrument instability.

To evaluate if the analytical sensitivity achieved the project goals, sample-specific limits of detection (LODs) were compared against the goals set forth in the project planning documents. In addition, sample results were compared to detections of target analytes in method blanks to identify potential effects of laboratory background on sensitivity.

The LODs for a number of target compounds exceeded the project screening levels where the compounds were not detected at or above the LODs. The higher LODs for these compounds were primarily the results of limitations associated with the analytical methods. The uncertainty associated with these compounds was recognized in the project planning documents. The LODs that did not meet the project screening levels in one or more samples are listed in Section 4.2.1.

5.5 OVERALL DATA ASSESSMENT

The data reported were found to meet the objectives specified in the WP/SAP (EA 2016b) and are considered accurate and usable as qualified for the intended purpose and to be representative of site conditions at the time of collection, based on the data evaluation presented in the section above.

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6 SUMMARY OF RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this project was to assess the nature and extent of potential munitions-related contamination in the surface and near-surface soil at the site. The assessment included the collection of MI soil samples from five DUs defined at the site and laboratory analysis of soil samples. The MI soil samples consisted of 30 increments that were collected from between the ground surface and 1 foot bgs within each DU.

Naphthalene was detected in the five primary and two replicate MI soil samples at concentrations ranging from 0.0021 to 0.0056 mg/kg, which exceeded only the EPA risk-based SSL of 0.00054 mg/kg (which represents leaching/groundwater protection concerns).

Silver was detected in five primary and two replicate ISM soil samples at concentrations ranging from 0.108 to 4.48 mg/kg. The highest concentration, 3.46 mg/kg detected in sample MAD-DU02, exceeds the background concentration of 1.5 mg/kg and the EPA risk-based SSL of 0.80 mg/kg. The concentrations of silver detected in the remaining four MI soil samples were below the ESLs and RSLs.

As shown above, naphthalene and silver were detected in one or more samples at concentrations that exceeded their respective EPA risk-based SSLs as well as the background concentration for silver. The EPA risk-based SSLs are based on groundwater protection concerns and indicates there is a leaching concern for these four constituents.

None of the detected concentrations exceeded ESLs based on residential or commercial/ industrial land use, and none of the detected concentrations exceeded EPA RSLs based on residential or industrial land use; which indicates the soils in their present condition do not pose a direct exposure human health concern.

Based on the results of the Phase II ESA no further action or investigation for soil contaminates is recommended at this time. Four locations with MEC or MPPEH remain at the site, therefore there exists a potential for explosive hazards during any ground disturbance activities. More than 1,200 subsurface magnetic anomalies were identified within the site boundaries based on 33 percent screening of the site.

If site should be developed in the future, a full cleanup of MEC and MPPEH metallic debris should be performed at the site. Removal of vegetation and metallic debris on the surface to 18 inches below ground surface is assumed following industry standards for sites with MEC. An effective and efficient method of removing vegetation at the 30-acre site is the use of mechanical equipment supplemented by hand-held tools. Most of the vegetation could be removed mechanically using skid-steer track loaders with forestry mulchers and rotary brush-cutting attachments. The attachments should be configured such that vegetation will not be removed closer than six inches from the ground surface. Where mechanical equipment access is difficult, vegetation may need to be hand-cut, using man-portable brush cutting equipment (e.g., chain saws, trimmers with steel brush-cutting blades). This method of vegetation mulching would alleviate the need to dispose of the green waste off site. This retards initial re-growth of undesirable vegetation, prevents erosion, and replenishes the topsoil. Unlike other land and lot clearing methods, forestry mulching leaves no brush piles to burn, bury or haul off. UXO support personnel would be needed to provide UXO avoidance during vegetation clearing.

An estimate of removal alternatives is provided below.

	Estimated Cost (Low)	**Estimated Cost (High)**
Vegetation Clearing (per acre)	$3,000	$6,000
Surface and Subsurface Metallic Debris Removal (per acre)	$30,000	$50,000
Environmental Permitting (per site)	$50,000	$50,000
Total Costs for 30 Acre Site	$1,040,000	$1,730,000

This estimated cost is to be used for planning purposes only and is based on Best Professional Judgment and experience gained from completed and ongoing similar projects on Guam, Saipan, and in the United States. All costs are based on Fiscal Year 2017 rates.

7 REFERENCES

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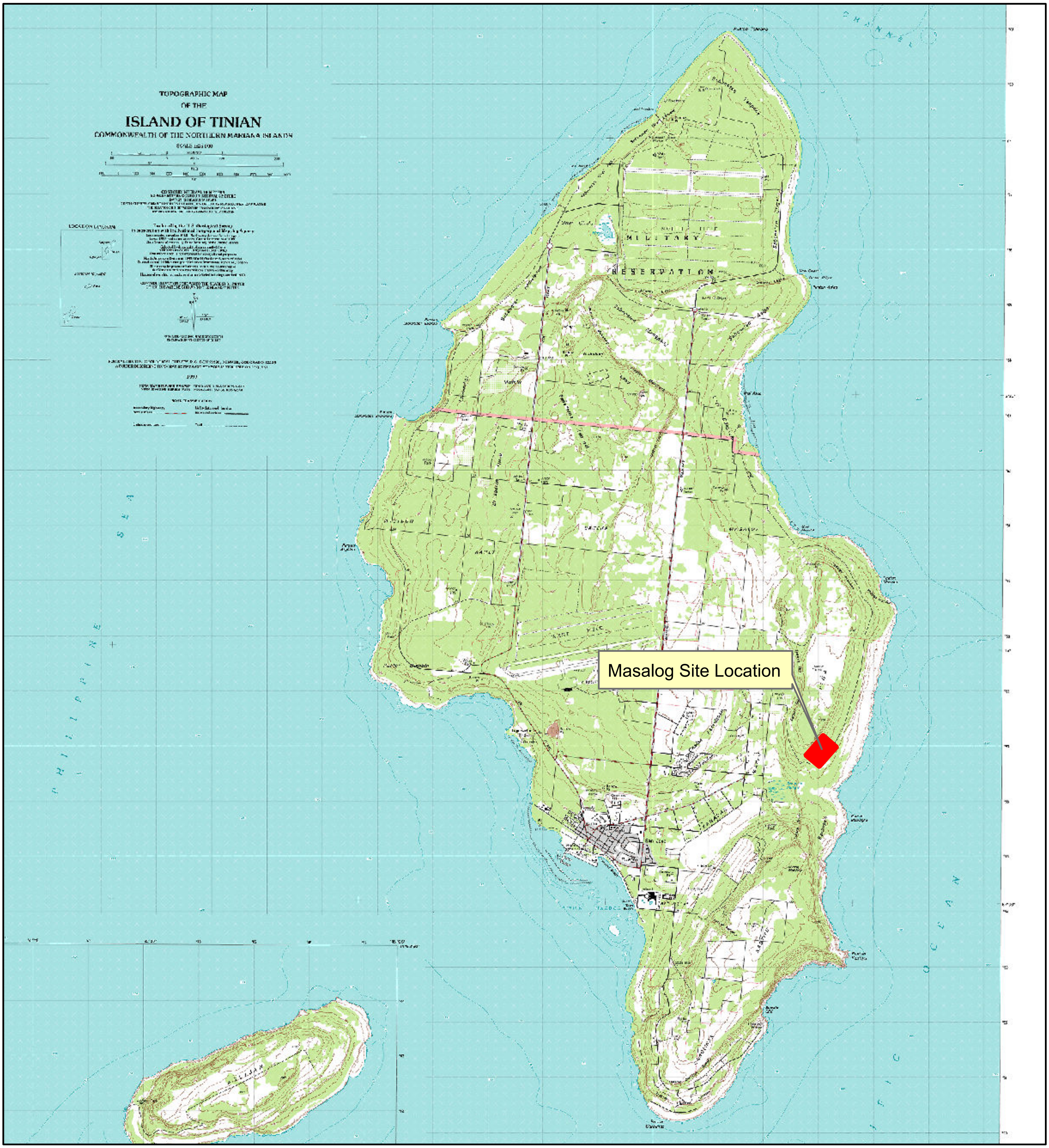
FIGURES



COORDINATE/REFERENCE: USGS, 1999

Legend

Masalog Site Location

7,800 3,900 0 7,800 15,600 Feet

EA	EA Project No. 63019.01
Proposed Tinian Landfill Phase I/II ESA	
Figure 1 Vicinity Map	

COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

Legend

Site Boundary

General Direction of Groundwater Flow

N

EA Engineering, Science, and Technology, Inc., PBC
1001 Army Drive, Suite 103,
Barrigada, 96913-1402
Telephone: (671) 646-5231
Facsimile: (671) 646-5230

Tinian Landfill Phase I / II
Environmental Site Assessment

Figure 2
General Location

Date: 03/04/16 | Drawn By: JSoriano | EA Project No. 63019.

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COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

0 150 300 600 Feet

N

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Tinian Landfill Phase I / II
Environmental Site Assessment

Figure 3
Site Grid and Transect Lines

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COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

0 150 300 600 Feet

N

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Tinian Landfill Phase I / II
Environmental Site Assessment

Figure 4
Grid Identification

Date: 01/27/2017 | Drawn By: RKinchla | EA Project No. 63019

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COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

0 150 300 600
Feet

N

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Tinian Landfill Phase I / II
Environmental Site Assessment

Figure 5
Site Features

Date: 01/27/2017	Drawn By: RKinchla	EA Project No. 63019

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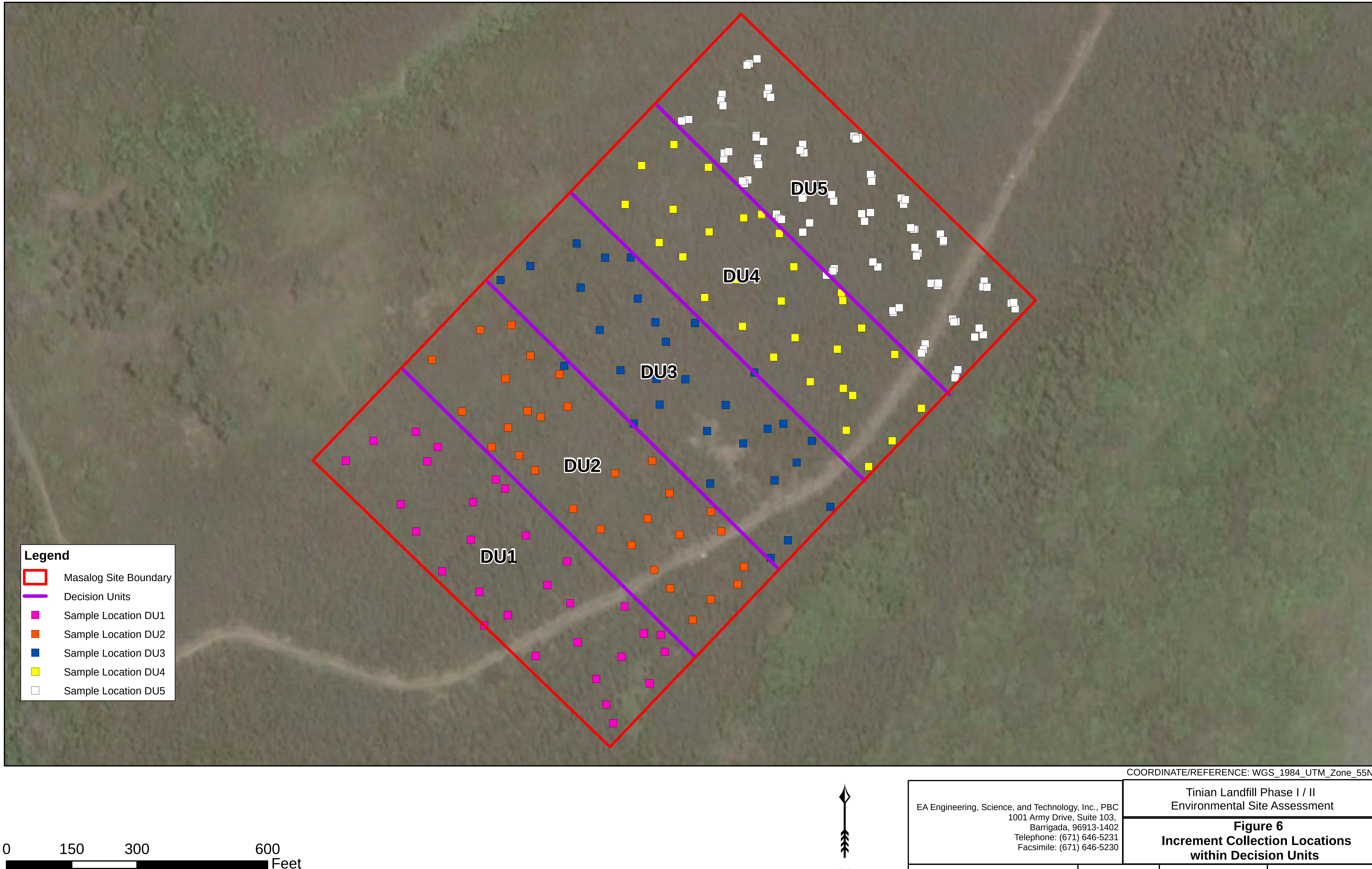

COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

EA Engineering, Science, and Technology, Inc., PBC 1001 Army Drive, Suite 103, Barrigada, 96913-1402 Telephone: (671) 646-5231 Facsimile: (671) 646-5230	Tinian Landfill Phase I / II Environmental Site Assessment **Figure 6** **Increment Collection Locations within Decision Units**		
	Date: 01/27/17	Drawn By: RKinchla	EA Project No. 63019

TABLES

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Table 1 - Analytical Results for Soil Samples

Phase II Environmental Site Assessment

Masalog Ammunition Depot

										Field Sample Identifier	MAD-DU01		MAD-DU02		MAD-DU03		MAD-DU04		MAD-DU05	
										Sample Description	DU01		DU02		DU03		DU04		DU05	
										Date of Sample Collection	11-Dec-2016		11-Dec-2016		11-Dec-2016		12-Dec-2016		12-Dec-2016	
Analyte	**Analytical Method**	**CASRN**	**Units**	**TPESLs[1]**			**EPA Regional Screening Levels[2]**													
				Unrestricted	**Commercial/Industrial**	**Background**	**c/nc**	**Residential**	**Industrial**	**Risk-based SSL**	**Results**	**Q**	**Results**	**Q**	**Results**	**Q**	**Results**	**Q**	**Results**	**Q**
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	SW8270C SIM	83-32-9	mg/kg	120	120	NS	nc	3,600	45,000	5.5	0.00084	U	0.00085	U	0.00083	U	0.00093	U	0.00095	U
Acenaphthylene	SW8270C SIM	208-96-8	mg/kg	5.5	5.5	NS	-	NS	NS	NS	0.00042	U	**0.0032**		0.0021	J	**0.0041**		**0.0071**	J
Anthracene	SW8270C SIM	120-12-7	mg/kg	4.2	4.2	NS	nc	18,000	230,000	58	**0.0023**		0.00042	U	0.00041	U	0.00047	U	0.00047	U
Benzo(a)anthracene	SW8270C SIM	56-55-3	mg/kg	10	10	NS	c	0.16	2.9	0.0042	0.00084	U	0.00085	U	0.00083	U	0.00093	U	0.00095	U
Benzo(b)fluoranthene	SW8270C SIM	205-99-2	mg/kg	5.4	5.4	NS	c	0.16	2.9	0.041	0.0021	J	**0.0034**		**0.0036**		**0.0024**		**0.0045**	
Benzo(k)fluoranthene	SW8270C SIM	207-08-9	mg/kg	29	29	NS	c	1.6	29	0.40	0.00084	U	0.00085	U	0.0010	J	0.00093	U	0.00095	U
Benzo(g,h,i)perylene	SW8270C SIM	191-24-2	mg/kg	35	35	NS	-	NS	NS	NS	0.00084	UJ	0.00085	U	0.00083	U	0.00093	U	0.00095	U
Benzo(a)pyrene	SW8270C SIM	50-32-8	mg/kg	1.6	2.9	NS	c	0.016	0.29	0.0040	0.00084	U	0.00085	U	0.00086	J	0.00093	U	0.00095	U
Chrysene	SW8270C SIM	218-01-9	mg/kg	30	30	NS	c	16	290	1.2	0.0013	J	0.0015	J	0.0016	J	0.0010	J	**0.0027**	
Dibenz(a,h)anthracene	SW8270C SIM	53-70-3	mg/kg	1.6	2.9	NS	c	0.016	0.29	0.013	0.00084	UJ	0.00085	U	0.00083	U	0.00093	U	0.00095	U
Fluoranthene	SW8270C SIM	206-44-0	mg/kg	87	87	NS	nc	2,400	30,000	89	0.0011	J	0.0010	J	0.0012	J	0.00093	U	0.0023	J
Fluorene	SW8270C SIM	86-73-7	mg/kg	93	93	NS	nc	2,400	30,000	5.4	0.00084	U	0.0012	J	0.0013	J	0.0016	J	0.0015	J
Indeno(1,2,3-cd)pyrene	SW8270C SIM	193-39-5	mg/kg	9.6	9.6	NS	c	0.16	2.9	0.13	0.00084	UJ	0.00085	U	0.00083	U	0.00093	U	0.00095	U
1-Methylnaphthalene	SW8270C SIM	90-12-0	mg/kg	0.89	0.89	NS	c	18	73	0.0060	0.00084	U	0.00085	U	0.00083	U	0.0016	J	0.0016	J
2-Methylnaphthalene	SW8270C SIM	91-57-6	mg/kg	1.9	1.9	NS	nc	240	3,000	0.19	0.0014	J	0.00085	U	0.0018	J	**0.0031**		**0.0028**	
Naphthalene	SW8270C SIM	91-20-3	mg/kg	3.1	3.1	NS	c	3.8	17	0.00054	**0.0024**		**0.0021**		**0.0049**		**0.0030**		**0.0043**	
Phenanthrene	SW8270C SIM	85-01-8	mg/kg	69	69	NS	-	NS	NS	NS	0.00084	U	0.0011	J	0.0013	J	0.00093	U	0.0016	J
Pyrene	SW8270C SIM	129-00-0	mg/kg	44	44	NS	nc	1,800	23,000	13	0.00084	U	0.00085	U	0.0010	J	0.00093	U	0.0021	J
Explosive Residues																				
2-Amino-4,6-dinitrotoluene	SW8330B	35572-78-2	mg/kg	1.8	1.8	NS	n	150	2,300	0.030	0.040	UJ	0.041	UJ	0.040	UJ	0.041	UJ	0.041	UJ
4-Amino-2,6-dinitrotoluene	SW8330B	19406-51-0	mg/kg	0.52	0.52	NS	n	150	2,300	0.030	0.040	UJ	0.041	UJ	0.040	UJ	0.041	UJ	0.041	UJ
2,4-Diamino-6-nitrotoluene	SW8330B	6629-29-4	mg/kg	NS	NS	NS	-	NS	NS	NS	0.097	UJ	0.10	UJ	0.098	UJ	0.10	UJ	0.10	UJ
2,6-Diamino-4-nitrotoluene	SW8330B	59229-75-3	mg/kg	NS	NS	NS	-	NS	NS	NS	0.097	UJ	0.10	UJ	0.098	UJ	0.10	UJ	0.10	UJ
3,5-Dinitroaniline	SW8330B	618-87-1	mg/kg	NS	NS	NS	-	NS	NS	NS	0.040	UJ	0.041	UJ	0.040	UJ	0.041	UJ	0.041	UJ
1,3-Dinitrobenzene	SW8330B	99-65-0	mg/kg	0.12	0.12	NS	nc	6.3	82	0.0018	0.039	UJ	0.040	UJ	0.039	UJ	0.040	UJ	0.040	UJ
2,4-Dinitrotoluene	SW8330B	121-14-2	mg/kg	0.024	0.024	NS	c	1.7	7.4	0.00032	0.039	UJ	0.040	UJ	0.039	UJ	0.040	UJ	0.040	UJ
2,6-Dinitrotoluene	SW8330B	606-20-2	mg/kg	0.0051	0.0051	NS	c	0.36	1.5	0.000067	0.11	UJ	0.11	UJ	0.11	UJ	0.11	UJ	0.11	UJ
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	SW8330B	2691-41-0	mg/kg	19	19	NS	nc	3,900	57,000	1.3	0.21	UJ	0.21	UJ	0.21	UJ	0.21	UJ	0.21	UJ
Nitrobenzene	SW8330B	98-95-3	mg/kg	0.0053	0.0053	NS	c	5.1	22	0.000092	0.097	UJ	0.10	UJ	0.098	UJ	0.10	UJ	0.10	UJ
Nitroglycerin	SW8330B	55-63-0	mg/kg	0.039	0.039	NS	n	6.3	82	0.00085	0.78	UJ	0.80	UJ	0.78	UJ	0.80	UJ	0.80	UJ
2-Nitrotoluene	SW8330B	88-72-2	mg/kg	0.0049	0.0049	NS	c	3.2	15	0.00030	0.073	UJ	0.075	UJ	0.074	UJ	0.075	UJ	0.075	UJ
3-Nitrotoluene	SW8330B	99-08-1	mg/kg	0.12	0.12	NS	nc	6.3	82	0.0016	0.11	UJ	0.11	UJ	0.11	UJ	0.11	UJ	0.11	UJ
4-Nitrotoluene	SW8330B	99-99-0	mg/kg	0.29	0.29	NS	c	34	140	0.0040	0.11	UJ	0.11	UJ	0.11	UJ	0.11	UJ	0.11	UJ
PETN (Pentaerythritol tetranitrate)	SW8330B	78-11-5	mg/kg	2.1	2.1	NS	nc/c	130	570	0.028	0.78	UJ	0.80	UJ	0.78	UJ	0.80	UJ	0.80	UJ
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	SW8330B	121-82-4	mg/kg	0.010	0.010	NS	c	6.1	28	0.00027	0.039	UJ	0.04	UJ	0.039	UJ	0.040	UJ	0.040	UJ
Tetryl (Methyl-2,4,6-trinitrophenylnitramine)	SW8330B	479-45-8	mg/kg	31	31	NS	nc	160	2,300	0.37	0.097	UJ	0.10	UJ	0.098	UJ	0.10	UJ	0.10	UJ
1,3,5-Trinitrobenzene	SW8330B	99-35-4	mg/kg	2.8	2.8	NS	nc	2,200	32,000	2.1	0.039	UJ	0.040	UJ	0.039	UJ	0.040	UJ	0.040	UJ
2,4,6-Trinitrotoluene	SW8330B	118-96-7	mg/kg	1.2	1.2	NS	c	21	96	0.015	0.043	UJ	0.044	UJ	0.043	UJ	0.044	UJ	0.044	UJ

Table 1 - Analytical Results for Soil Samples

Phase II Environmental Site Assessment

Masalog Ammunition Depot

										Field Sample Identifier	MAD-DU01		MAD-DU02		MAD-DU03		MAD-DU04		MAD-DU05	
										Sample Description	DU01		DU02		DU03		DU04		DU05	
										Date of Sample Collection	11-Dec-2016		11-Dec-2016		11-Dec-2016		12-Dec-2016		12-Dec-2016	
				TPESLs[1]			**EPA Regional Screening Levels[2]**													
Analyte	**Analytical Method**	**CASRN**	**Units**	**Unrestricted**	**Commercial/Industrial**	**Background**	**c/nc**	**Residential**	**Industrial**	**Risk-based SSL**	**Results**	**Q**	**Results**	**Q**	**Results**	**Q**	**Results**	**Q**	**Results**	**Q**
Other Explosives																				
White phosphorus	SW7580	7723-14-0	mg/kg	NS	NS	NS	n	1.6	23	0.0015	0.0011	UJ	0.0010	UJ	0.00091	UJ	0.0010	UJ	0.0010	UJ
Total Metals																				
Antimony	SW6020	7440-36-0	mg/kg	6.3	93	45	nc	31	470	0.35	0.341		0.418		0.759		0.274		0.340	
Arsenic	SW6020	7440-38-2	mg/kg	24	95	20	c	0.68	3.0	0.0015	10.4		9.47		14.2		10.4		8.80	
Beryllium	SW6020	7440-41-7	mg/kg	31	150	3.0	n	160	2,300	19	1.07		1.00		0.950		1.08		0.833	
Cadmium	SW6020	7440-43-9	mg/kg	7.4	65	15	nc	71	980	0.69	2.55		2.94		3.60		2.05		1.97	
Chromium[3]	SW6020	7440-47-3	mg/kg	1,100	1,100	1,000	c	0.30	6.3	0.00067	124		118		132		128		93.0	
Copper	SW6020	7440-50-8	mg/kg	630	2,500	190	nc	3,100	47,000	28	105		106		124		108		94.0	
Lead	SW6020	7439-92-1	mg/kg	400	800	50	-	400	800	NS	14.3		20.2		24.5		14.5		14.5	
Mercury	SW7471A	7439-97-6	mg/kg	4.7	70	0.72	nc	11	46	0.033	0.141		0.158		0.165		0.171		0.134	J
Nickel	SW6020	7440-02-0	mg/kg	410	750	410	nc	1,500	22,000	26	24.9		23.3		36.3		25.1		20.0	
Selenium	SW6020	7782-49-2	mg/kg	78	1,200	7.1	nc	390	5,800	0.52	0.533		0.563		0.531		0.564		0.531	
Silver	SW6020	7440-22-4	mg/kg	78	1,200	1.5	nc	390	5,800	0.80	0.216		**3.46**		0.674		0.156		0.142	
Thallium[4]	SW6020	7440-28-0	mg/kg	0.78	12	5.5	nc	0.78	12	0.014	0.482		0.424		0.379		0.451		0.337	
Zinc	SW6020	7440-66-6	mg/kg	1,000	2,500	350	nc	23,000	350,000	370	87.6		91.7		93.1		86.1		71.6	

Notes:

Results shown in bold and highlighted blue equal or exceed one or more of the criteria listed.

c - carcinogenic; nc - noncarcinogenic

[1] TPESLs - Tropical Pacific Environmental Screening Levels for shallow soils (<3 meters below ground surface) where groundwater IS a current or potential source of drinking water (updated December 2016).

[2] EPA May 2016 Regional Screening Levels (RSLs) as presented at the following website at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016 for target cancer risk of 1E-06 and target hazard quotient of 1.0. Risk based soil screening levels (SSLs) are based on the protection of ground water.

[3] RSL is for hexavalent chromium

[4] Selected background screening level from Table M in Volume 2: Background Documentation for the Development of Tier 1 Environmental Action Levels, Appendix 1: Detailed Lookup Tables (Tropical Pacific Edition).

CASRN = Chemical Abstracts Service Registry Number

NS = not specified

EPA - U.S. Environmental Protection Agency

SIM = selected ion monitoring

mg/kg = milligram(s) per kilogram

Data Qualifiers:

J = The analyte was positively identified; the quantitation is estimated.

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the limit of detection.

UJ = The analyte was not detected; however, the quantitation limit is estimated due to discrepancies in the associated quality control criteria.

Table 2 - Analytical Results for Replicate Soil Samples
Phase II Environmental Site Assessment
Masalog Ammunition Depot

										Field Sample Identifier	MAD-DU05		MAD-DU06		MAD-DU07		Relative Standard Deviation[3]
										Sample Description	DU05		Replicate from DU05		Replicate from DU05		
										Date of Sample Collection	12-Dec-2016		12-Dec-2016		12-Dec-2016		
Analyte	Analytical Method	CASRN	Units	TPESLs[1]			EPA Regional Screening Levels[2]										
				Unrestricted	Commercial/Industrial	Background	c/nc	Residential	Industrial	Risk-based SSL	Results	Q	Results	Q	Results	Q	
Polycyclic Aromatic Hydrocarbons																	
Acenaphthene	SW8270C SIM	83-32-9	mg/kg	120	120	NS	nc	3,600	45,000	5.5	0.00095	U	0.00096	U	0.0011	J	NC
Acenaphthylene	SW8270C SIM	208-96-8	mg/kg	5.5	5.5	NS	-	NS	NS	NS	**0.0071**	J	**0.012**	J	**0.014**	J	32%
Anthracene	SW8270C SIM	120-12-7	mg/kg	4.2	4.2	NS	nc	18,000	230,000	58	0.00047	U	0.00054	J	0.00053	J	NC
Benzo(a)anthracene	SW8270C SIM	56-55-3	mg/kg	10	10	NS	c	0.16	2.9	0.0042	0.00095	U	0.00096	U	0.0011	U	NC
Benzo(b)fluoranthene	SW8270C SIM	205-99-2	mg/kg	5.4	5.4	NS	c	0.16	2.9	0.041	**0.0045**		**0.0050**		**0.0049**		6%
Benzo(k)fluoranthene	SW8270C SIM	207-08-9	mg/kg	29	29	NS	c	1.6	29	0.40	0.00095	U	0.00096	U	0.0011	U	NC
Benzo(g,h,i)perylene	SW8270C SIM	191-24-2	mg/kg	35	35	NS	-	NS	NS	NS	0.00095	U	0.00096	U	0.0011	U	NC
Benzo(a)pyrene	SW8270C SIM	50-32-8	mg/kg	1.6	2.9	NS	c	0.016	0.29	0.0040	0.00095	U	0.00096	U	0.0011	U	NC
Chrysene	SW8270C SIM	218-01-9	mg/kg	30	30	NS	c	16	290	1.2	**0.0027**		0.0024	J	0.0019	J	NC
Dibenz(a,h)anthracene	SW8270C SIM	53-70-3	mg/kg	1.6	2.9	NS	c	0.016	0.29	0.013	0.00095	U	0.00096	U	0.0011	U	NC
Fluoranthene	SW8270C SIM	206-44-0	mg/kg	87	87	NS	nc	2,400	30,000	89	0.0023	J	0.0015	J	0.0013	J	NC
Fluorene	SW8270C SIM	86-73-7	mg/kg	93	93	NS	nc	2,400	30,000	5.4	0.0015	J	0.0022	J	0.0023	J	NC
Indeno(1,2,3-cd)pyrene	SW8270C SIM	193-39-5	mg/kg	9.6	9.6	NS	c	0.16	2.9	0.13	0.00095	U	0.00096	U	0.0011	U	NC
1-Methylnaphthalene	SW8270C SIM	90-12-0	mg/kg	0.89	0.89	NS	c	18	73	0.0060	0.0016	J	0.0017	J	0.0011	U	NC
2-Methylnaphthalene	SW8270C SIM	91-57-6	mg/kg	1.9	1.9	NS	nc	240	3,000	0.19	**0.0028**		**0.0033**		0.0019	J	NC
Naphthalene	SW8270C SIM	91-20-3	mg/kg	3.1	3.1	NS	c	3.8	17	0.00054	**0.0043**		**0.0056**		**0.0030**		30%
Phenanthrene	SW8270C SIM	85-01-8	mg/kg	69	69	NS	-	NS	NS	NS	0.0016	J	0.0022	J	0.0016	J	NC
Pyrene	SW8270C SIM	129-00-0	mg/kg	44	44	NS	nc	1,800	23,000	13	0.0021	J	0.0015	J	0.0013	J	NC
Explosive Residues																	
2-Amino-4,6-dinitrotoluene	SW8330B	35572-78-2	mg/kg	1.8	1.8	NS	n	150	2,300	0.030	0.041	UJ	0.041	UJ	0.040	UJ	NC
4-Amino-2,6-dinitrotoluene	SW8330B	19406-51-0	mg/kg	0.52	0.52	NS	n	150	2,300	0.030	0.041	UJ	0.041	UJ	0.040	UJ	NC
2,4-Diamino-6-nitrotoluene	SW8330B	6629-29-4	mg/kg	NS	NS	NS	-	NS	NS	NS	0.10	UJ	0.099	UJ	0.098	UJ	NC
2,6-Diamino-4-nitrotoluene	SW8330B	59229-75-3	mg/kg	NS	NS	NS	-	NS	NS	NS	0.10	UJ	0.099	UJ	0.098	UJ	NC
3,5-Dinitroaniline	SW8330B	618-87-1	mg/kg	NS	NS	NS	-	NS	NS	NS	0.041	UJ	0.041	UJ	0.040	UJ	NC
1,3-Dinitrobenzene	SW8330B	99-65-0	mg/kg	0.12	0.12	NS	nc	6.3	82	0.0018	0.040	UJ	0.040	UJ	0.039	UJ	NC
2,4-Dinitrotoluene	SW8330B	121-14-2	mg/kg	0.024	0.024	NS	c	1.7	7.4	0.00032	0.040	UJ	0.040	UJ	0.039	UJ	NC
2,6-Dinitrotoluene	SW8330B	606-20-2	mg/kg	0.0051	0.0051	NS	c	0.36	1.5	0.000067	0.11	UJ	0.11	UJ	0.11	UJ	NC
HMX	SW8330B	2691-41-0	mg/kg	19	19	NS	nc	3,900	57,000	1.3	0.21	UJ	0.21	UJ	0.21	UJ	NC
Nitrobenzene	SW8330B	98-95-3	mg/kg	0.0053	0.0053	NS	c	5.1	22	0.000092	0.10	UJ	0.099	UJ	0.098	UJ	NC
Nitroglycerin	SW8330B	55-63-0	mg/kg	0.039	0.039	NS	n	6.3	82	0.00085	0.80	UJ	0.79	UJ	0.78	UJ	NC
2-Nitrotoluene	SW8330B	88-72-2	mg/kg	0.0049	0.0049	NS	c	3.2	15	0.00030	0.075	UJ	0.074	UJ	0.074	UJ	NC
3-Nitrotoluene	SW8330B	99-08-1	mg/kg	0.12	0.12	NS	nc	6.3	82	0.0016	0.11	UJ	0.11	UJ	0.11	UJ	NC
4-Nitrotoluene	SW8330B	99-99-0	mg/kg	0.29	0.29	NS	c	34	140	0.0040	0.11	UJ	0.11	UJ	0.11	UJ	NC
PETN (Pentaerythritol tetranitrate)	SW8330B	78-11-5	mg/kg	2.1	2.1	NS	nc/c	130	570	0.028	0.80	UJ	0.79	UJ	0.78	UJ	NC
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	SW8330B	121-82-4	mg/kg	0.010	0.010	NS	c	6.1	28	0.00027	0.040	UJ	0.040	UJ	0.039	UJ	NC
Tetryl (Methyl-2,4,6-trinitrophenylnitramine)	SW8330B	479-45-8	mg/kg	31	31	NS	nc	160	2,300	0.37	0.10	UJ	0.099	UJ	0.098	UJ	NC
1,3,5-Trinitrobenzene	SW8330B	99-35-4	mg/kg	2.8	2.8	NS	nc	2,200	32,000	2.1	0.040	UJ	0.040	UJ	0.039	UJ	NC
2,4,6-Trinitrotoluene	SW8330B	118-96-7	mg/kg	1.2	1.2	NS	c	21	96	0.015	0.044	UJ	0.044	UJ	0.043	UJ	NC
Other Explosives																	
White phosphorus	SW7580	7723-14-0	mg/kg	NS	NS	NS	n	1.6	23	0.0015	0.0010	UJ	0.0011	UJ	0.0010	UJ	NC

Table 2 - Analytical Results for Replicate Soil Samples
Phase II Environmental Site Assessment
Masalog Ammunition Depot

										Field Sample Identifier	MAD-DU05		MAD-DU06		MAD-DU07		Relative Standard Deviation[3]
										Sample Description	DU05		Replicate from DU05		Replicate from DU05		
										Date of Sample Collection	12-Dec-2016		12-Dec-2016		12-Dec-2016		
Analyte	Analytical Method	CASRN	Units	TPESLs[1]			EPA Regional Screening Levels[2]										
				Unrestricted	Commercial/Industrial	Background	c/nc	Residential	Industrial	Risk-based SSL	Results	Q	Results	Q	Results	Q	
Total Metals																	
Antimony	SW6020	7440-36-0	mg/kg	6.3	93	45	nc	31	470	0.35	0.340		0.342		0.262	J	14%
Arsenic	SW6020	7440-38-2	mg/kg	24	95	20	c	0.68	3.0	0.0015	8.80		9.40		8.42		6%
Beryllium	SW6020	7440-41-7	mg/kg	31	150	3.0	n	160	2,300	19	0.833		0.901		0.870		4%
Cadmium	SW6020	7440-43-9	mg/kg	7.4	65	15	nc	71	980	0.69	1.97		1.97		1.82		5%
Chromium[3]	SW6020	7440-47-3	mg/kg	1,100	1,100	1,000	c	0.30	6.3	0.00067	93.0		104		99.2		6%
Copper	SW6020	7440-50-8	mg/kg	630	2,500	190	nc	3,100	47,000	28	94.0		102		86.3	J	8%
Lead	SW6020	7439-92-1	mg/kg	400	800	50	-	400	800	NS	14.5		15.0		18.6		14%
Mercury	SW7471A	7439-97-6	mg/kg	4.7	70	0.72	nc	11	46	0.033	0.134	J	0.142		0.137	J	NC
Nickel	SW6020	7440-02-0	mg/kg	410	750	410	nc	1,500	22,000	26	20.0		23.1		19.4	J	10%
Selenium	SW6020	7782-49-2	mg/kg	78	1,200	7.1	nc	390	5,800	0.52	0.531		0.557		0.484		7%
Silver	SW6020	7440-22-4	mg/kg	78	1,200	1.5	nc	390	5,800	0.80	0.142		0.113		0.108		15%
Thallium[4]	SW6020	7440-28-0	mg/kg	0.78	12	5.5	nc	0.78	12	0.014	0.337		0.408		0.378		10%
Zinc	SW6020	7440-66-6	mg/kg	1,000	2,500	350	nc	23,000	350,000	370	71.6		74.4		66.2	J	6%

Notes:

Results shown in bold and highlighted blue equal or exceed one or more of the criteria listed.

[1] TPESLs - Tropical Pacific Environmental Screening Levels for shallow soils (<3 meters below ground surface) where groundwater IS a current or potential source of drinking water (updated December 2016).

[2] EPA May 2016 Regional Screening Levels (RSLs) as presented at the following website at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016 for target cancer risk of 1E-06 and target hazard quotient of 1.0. Risk

[3] RSL is for hexavalent chromium

[4] Selected background screening level from Table M in Volume 2: Background Documentation for the Development of Tier 1 Environmental Action Levels, Appendix 1: Detailed Lookup Tables (Tropical Pacific Edition).

CASRN = Chemical Abstracts Service Registry Number
NC = not calculated
EPA - U.S. Environmental Protection Agency
NS = not specified
mg/kg = milligram(s) per kilogram
SIM = selected ion monitoring

Data Qualifiers:

J = The analyte was positively identified; the quantitation is estimated.

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the limit of detection.

UJ = The analyte was not detected; however, the quantitation limit is estimated due to discrepancies in the associated quality control criteria.

Table 3 - Relative Standard Deviation and 95 Percent Upper Confidence Limit Calculations for Replicate Samples
Phase II Environmental Site Assessment
Masalog Ammunition Depot

Analyte	EPA Method	Sample Identification	Sample Type	Result (mg/kg)	Mean	Standard Deviation	Relative Standard Deviation	95% UCL Calculations Number of samples	t value	95% UCL	Comment
Acenaphthylene	SW8270C SIM	MAD-DU05	Primary	0.0071	0.011	0.0036	32%	3	2.9	0.017	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	0.012							that the true mean for acenaphthylene does not exceed
		MAD-DU07	Triplicate	0.014							0.017 mg/kg within this Decision Unit
Benzo(b)fluoranthene	SW8270C SIM	MAD-DU05	Primary	0.0045	0.0048	0.0003	6%	3	2.9	0.0052	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	0.0050							that the true mean for benzo(b)fluoranthene does not exceed
		MAD-DU07	Triplicate	0.0049							0.0052 mg/kg within this Decision Unit
Naphthalene	SW8270C SIM	MAD-DU05	Primary	0.0043	0.0043	0.0013	30%	3	2.9	0.0065	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	0.0056							that the true mean for naphthalene does not exceed
		MAD-DU07	Triplicate	0.0030							0.0065 mg/kg within this Decision Unit
Antimony	SW6020	MAD-DU05	Primary	0.340	0.315	0.046	14%	3	2.9	0.392	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	0.342							that the true mean for antimony does not exceed
		MAD-DU07	Triplicate	0.262							0.392 mg/kg within this Decision Unit
Arsenic	SW6020	MAD-DU05	Primary	8.80	8.9	0.494	5.6%	3	2.9	9.7	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	9.40							that the true mean for arsenic does not exceed
		MAD-DU07	Triplicate	8.42							9.7 mg/kg within this Decision Unit
Beryllium	SW6020	MAD-DU05	Primary	0.833	0.87	0.034	3.9%	3	2.9	0.93	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	0.901							that the true mean for beryllium does not exceed
		MAD-DU07	Triplicate	0.870							0.93 mg/kg within this Decision Unit
Cadmium	SW6020	MAD-DU05	Primary	1.97	1.92	0.087	5%	3	2.9	2.07	The data indicates that there is 95% confidence
		MAD-DU06	Duplicate	1.97							that the true mean for cadmium does not exceed
		MAD-DU07	Triplicate	1.82							2.07 mg/kg within this Decision Unit

Table 3 - Relative Standard Deviation and 95 Percent Upper Confidence Limit Calculations for Replicate Samples
Phase II Environmental Site Assessment
Masalog Ammunition Depot

Analyte	EPA Method	Sample Identification	Sample Type	Result (mg/kg)	Mean	Standard Deviation	Relative Standard Deviation	95% UCL Calculations			Comment
								Number of samples	t value	95% UCL	
Chromium	SW6020	MAD-DU05	Primary	93.0	99	5.5	6%	3	2.9	108	The data indicates that there is 95% confidence that the true mean for chromium does not exceed 108 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	104							
		MAD-DU07	Triplicate	99.2							
Copper	SW6020	MAD-DU05	Primary	94.0	94	7.85	8%	3	2.9	107	The data indicates that there is 95% confidence that the true mean for copper does not exceed 107 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	102							
		MAD-DU07	Triplicate	86.3							
Lead	SW6020	MAD-DU05	Primary	14.5	16.0	2.24	14%	3	2.9	19.8	The data indicates that there is 95% confidence that the true mean for lead does not exceed 19.8 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	15.0							
		MAD-DU07	Triplicate	18.6							
Nickel	SW6020	MAD-DU05	Primary	20.0	20.8	1.986	10%	3	2.9	24.2	The data indicates that there is 95% confidence that the true mean for nickel does not exceed 24.2 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	23.1							
		MAD-DU07	Triplicate	19.4							
Selenium	SW6020	MAD-DU05	Primary	0.531	0.524	0.037	7%	3	2.9	0.586	The data indicates that there is 95% confidence that the true mean for selenium does not exceed 0.586 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	0.557							
		MAD-DU07	Triplicate	0.484							
Silver	SW6020	MAD-DU05	Primary	0.142	0.12	0.018	15.2%	3	2.9	0.15	The data indicates that there is 95% confidence that the true mean for silver does not exceed 0.152 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	0.113							
		MAD-DU07	Triplicate	0.108							
Thallium	SW6020	MAD-DU05	Primary	0.337	0.37	0.036	10%	3	2.9	0.43	The data indicates that there is 95% confidence that the true mean for thallium does not exceed 0.434 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	0.408							
		MAD-DU07	Triplicate	0.378							
Zinc	SW6020	MAD-DU05	Primary	71.6	71	4.2	6%	3	2.9	78	The data indicates that there is 95% confidence that the true mean for zinc does not exceed 78 mg/kg within this Decision Unit
		MAD-DU06	Duplicate	74.4							
		MAD-DU07	Triplicate	66.2							

NOTES:
mg/kg Milligram(s) per kilogram
UCL Upper Confidence Limit
% Percent

Table 4 - General Data Qualifying Conventions
Phase II Environmental Site Assessment
Masalog Ammunition Depot

QC Requirement	Criteria	Flag	Flag Applied To
Holding Time	Time exceeded for extraction or analysis	J for the positive results; R or UJ for non-detects*	Analytes in the sample
Sample Preservation	Sample not preserved (If sample preservation was not done in the field but was performed at the laboratory upon sample receipt, no flagging is required)	J positive results; R or UJ for non-detects*	Sample
	Temperature out of control	J for positive results; R or UJ for non-detects*	Sample
Sample Integrity (volatile analytes)	Bubbles in VOA vial >1/4 inch used for analysis	J for the positive results; UJ for non-detects	Sample
Instrument Tuning	Ion abundance method-specific criteria not met	R for all results	Associated samples in analytical batch
Initial Calibration	Target analytes must be within method-specified criteria	J for positive results; R for non-detects	Associated samples in analytical batch
Second Source Check or Continuing Calibration	Target analytes must be within method-specified criteria	High Bias: J for positive results, no flag for non-detects Low Bias: J for positive results, UJ for non-detects R for all non-detects greater than twice the control criteria	All associated samples in analytical batch
Low Level Calibration Check or Interference Check Sample	Target analytes must be within 20% of expected value	High Bias: J for positive results, no flag for non-detects Low Bias: J for positive results, UJ for non-detects R for all non-detects greater than twice the control criteria	All associated samples in analytical batch
LCS	%R > UCL %R < LCL	J for the positive results; J for the positive results; R for the non-detects	The specific analyte(s) in all samples in the associated analytical batch
Internal Standards	Area > UCL Area < LCL Sample is re-extracted and reanalyzed and recovery outside of criteria is confirmed as a matrix effect	J for positive results J for positive results J for positive results; UJ for non-detects	Sample
Surrogate Spikes	%R > UCL %R < LCL and >10% %R <10% Excessive dilution*	J for positive results J for positive results; UJ for non-detects J for positive results; R for non-detects No flag required	Sample
Blanks (Method, calibration, or field)	Analyte(s) detected > 1/2 LOQ (use the blank of the highest concentration)	UJ for positive sample results less than or equal to 5x highest blank concentration (10x for common lab contaminants)	All samples in preparation, field or analytical batch, whichever applies

Table 4 - General Data Qualifying Conventions
Phase II Environmental Site Assessment
Masalog Ammunition Depot

QC Requirement	Criteria	Flag	Flag Applied To
Field duplicates or field replicates	RPD or RSD >CL and field duplicates/replicates >LOQs or one field duplicate/replicate >LOQ, one ND	J for the positive results UJ for the non-detects	The specific analyte(s) in samples collected on the same sampling date. Note: No flagging is required for RSDs based on results reported below the LOQ.
MS/MSD	MS or MSD % R>UCL or MS or MSD % R<LCL or MS/MSD RPD>CL; Sample concentration > 4× spike concentration; Excessive dilution*	J for detected results and UJ for non-detected results No flag required No flag required	The specific analyte(s) in the parent sample
Post-Digestion Spike	Target analytes must be within 25% of expected value	High Bias: J for positive results Low Bias: J for positive results; UJ for non-detects	The specific analyte(s) in the parent sample
Serial Dilutions	Target analytes must be within 10% of expected value	If post spike not analyzed High Bias: J for positive results Low Bias: J for positive results; UJ for non-detects	The specific analyte(s) in the parent sample
Confirmation	RPD between primary and confirmation results > 40%	J for positive results	Sample
Retention Time Window	Analyte within established window	R for all results	Sample

* = Based on analyte-specific review for nondetectable results, general guidelines for nonvolatile analytes is UJ flag if holding time has not been exceeded by factor of 2 and R flag if greater than a factor of 2. For volatile analytes, the guideline is R flag if holding time has been exceeded.

QC = quality control

LCL = lower confidence limit

LCS = laboratory control sample

MS = matrix spike

MSD = matrix spike duplicate

ND = not detected

LOQ = limit of quantitation

RPD = relative percent difference

RSD = relative standard deviation

UCL = upper confidence limit

APPENDIX A

PERMITS

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Commonwealth of the Northern Marian Islands
OFFICE OF THE GOVERNOR
Bureau of Environmental and Coastal Quality
DEQ: P.O. Box 501304, DCRM: P.O. Box 10007, Saipan, MP 96950-1304
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Ralph DLG. Torres
Governor

Victor B. Hocog
Lt. Governor

Frank M. Rabauliman
Administrator

Frances A. Castro
Director, DCRM

June 15, 2016

Robert Shambach (Permittee)
EA Engineering, Science and Technology
1001 Army Drive Suite 103
Barrigada, Guam 96913

RE: Commercial Earthmoving & Erosion Control Permit No. 2016 COM 116T

Dear Robert Shambach:

The Division of Environmental Quality (DEQ) has reviewed your earthmoving permit application to conduct earthmoving activities, and has approved issuance of this permit. Thus, under the authority granted to DEQ by the Commonwealth Environmental Protection Act (CEPA), PL 3-23, 2 CMC §3122, and the CNMI Earthmoving and Erosion Control Regulations, NMIAC §65-30, and taking into consideration the comments and conditions requested by the other "ONE START" permitting agencies (including the CNMI Division of Fish and Wildlife, Historic Preservation Office, and Coastal Resource Management Office), DEQ hereby grants approval for your earthmoving activity provided you adhere to the following conditions:

APPLICABILITY

1. This permit applies only to land clearing and/or earthmoving activities for the proposed **Phase II ESA, Masalog Ammunition Depot project** to be conducted on Lot # 271 T 61, located in Pina, Tinian. Methods, which will be employed in this project, include; Hand digging, and hand clearing of vegetation only.

GENERAL CONDITIONS

GENERAL OBLIGATIONS AND LIMITATIONS

2. **The permittee must notify DEQ at least two (2) working days prior to commencement of the permitted activity.**

3. **The permittee shall keep this permit readily available at the project site, at all times. The permittee may be ordered to cease all work if the earthmoving and erosion control permit is not available during inspection by DEQ staff or inspectors from other ONE-START agencies.**

4. If the permittee is not the same person as the final owner or operator of the final facility, activity, and/or lot for which this permit is being issued, the permittee shall be responsible for providing the final facility/activity/lot owner and operator with a copy of this permit; for notifying them of all requirements of this permit, and all post-construction maintenance requirements that may be associated with the permanent stormwater control and ESC systems; and any post-construction requirements that may be included as conditions of this permit by any other ONE-START agency (including, but not limited to land clearing restrictions and archeological resource protection requirements.)

5. **All earthmoving operations shall be conducted in accordance with the plans and specifications stated in your DEQ approved earthmoving application package, including all revisions that may have been approved by DEQ**. Should there be any deviation from the approved plans and specifications, DEQ must be notified in writing within ten (10) working days prior to the planned commencement of construction work related to the revisions. Commencement of construction related to any revisions may not start without approval by DEQ.

6. The earthmoving permit applies to land clearing and/or earthmoving activities for the proposed **Phase II ESA, Masalog Ammunition Depot project only**. DEQ must be notified in writing If the permittee plans to revise or expand the approved project, prior to commencement of any work related to the proposed revisions or expansion. DEQ may require additional submission of plans and specifications, or may require the permittee to apply for an amendment or a new permit.

7. The permittee shall immediately cease further earthmoving and/or landclearing activity upon the discovery of any hazardous or unusual substance or objects (e.g. ordinance, old drums, oils, chemicals, etc.), and shall immediately report the discovery to DEQ. Failure to immediately report such findings may result in enforcement proceedings and penalties, including permit revocation.

8. Excavated material may only be re-used on-site, as part of the approved grading plans, or at a designated landfill facility operated by the CNMI government. Disposal or re-use of excavated material on any other location may only occur if in accordance with an approved Earthmoving and Erosion Control Permit for each additional location.

9. The permittee shall provide Temporary Toilet Facilities (TTF) for any construction job-site where working toilets connected to a sanitary sewer system are not readily

available for the needs of the employees. One temporary toilet facility is required for 1-15 employees, two TTF for 15-30 employees, three TTF for 31-50 employees.

10. The permittee shall apply for an Individual Wastewater Disposal System (IWDS) or Other Wastewater Treatment System (OWTS) permit prior to construction of any type of on-site wastewater treatment and disposal system, such as a septic system or on-site package treatment plant.

11. The permittee shall apply for and obtain a Pesticide Structural Treatment permit from DEQ, at least 30 days prior to conducting applications of any type of pesticide treatment on concrete structure or building foundation projects. Failure to comply with this permit condition may result in enforcement proceedings and penalties, including permit revocation.

12. The permittee shall be responsible for preventing discharge of construction site chemicals through the proper use of Best Management Practices, such as storage, material use, spill prevention and control, hazardous waste management, concrete waste management, vehicle and equipment cleaning, and maintenance and fueling. The permittee is directed to internet resources provided at no cost by the U.S. Environmental Protection Agency for guidance as to how to apply such best management practices, which can be found at the following URL:

    http://cfpub1.epa.gov/npdes/stormwater/swppp.cfm

13. Earthmoving or land clearing activities which disturb one or more acres of land are regulated by the Federal government, and are required to obtain coverage under the "Construction General Permit" (CGP), administered by the U.S. Environmental Protection Agency (USEPA), under the National Pollutant Discharge Elimination System (NPDES) permit system. All permittees are responsible for determining whether they are responsible for obtaining coverage under this permit, and for submittal of all application documents as required, including the Notice of Intent (NOI) form to USEPA, and the preparation of a Stormwater Pollution Prevention Plan (SWPPP), which must be submitted and approved by DEQ prior to receiving coverage under the CGP.

    On-line instructions for applying for coverage under the CGP may be found here:
    http://cfpub1.epa.gov/npdes/stormwater/application_coverage.cfm

    Instructions and guidance on preparing an SWPPP may be found here:
    http://cfpub1.epa.gov/npdes/stormwater/swppp.cfm

14. For projects that include clearing of trees and other vegetation on public land, CNMI Forestry Office permitting regulations may apply. Applicant shall contact the Commonwealth Forestry Office for further details.

15. The Division of Environmental Quality (DEQ) reserves the right to impose additional mitigating measures as deemed necessary to protect the welfare of the public or the environment.

TEMPORARY EROSION AND SEDIMENT CONTROL (ESC)

16. All earthmoving operations shall be conducted in accordance with the approved ESC plans and in a manner that prevents accelerated land erosion, off-site runoff, and/or off-site discharge of sediment and other pollutants. Erosion & Sediment Control Plans must be readily available on-site.

17. The area affected by earthmoving operations at any one time during activities shall be kept to a minimum by either selective clearing; incremental phasing of development; or other means.

18. No land clearing and/or earthmoving activities shall be conducted during periods of heavy rainfall or storm events, unless discharge of runoff, sediment, or other pollutants is not possible, and the permittee receives written permission from DEQ to continue operations in such conditions.

19. **Whenever the ground cover is removed or disturbed or whenever fill material is placed on the site, the exposed surface shall be treated to the extend necessary to eliminate dust arising from the exposed material.**

20. All areas disturbed by earthmoving operations must be stabilized (e.g., by re-vegetation, paving, slope stabilization, or other approved means) as soon as possible after final grade has been established. DEQ must be notified in writing in the event that stabilization measures within any area disturbed by construction are delayed by more than fourteen (14) calendar days.

21. The approved temporary erosion and sediment control (ESC) measures or structures (silt fence, ponding basin, swale, earth berm etc.) must be installed prior to commencement of other construction, land clearing and/or earthmoving activities at the project site. **DEQ must be notified for inspection no less than two (2) working days following implementation of the approved temporary erosion and stormwater control structures.**

22. The permittee shall be responsible for seeing that proper erosion & sediment control (ESC) measures are implemented to prevent soil erosion, stormwater runoff, and discharge of sediment from the project site. It is an expected variable of construction that additional ESC measures are sometimes appropriate and required, beyond the ESC measures provided for in the original, approved plans and specifications. The permittee is obligated to monitor the performance of the ESC measures and correct failures, shortcomings, and deficiencies as they arise. Based

on the findings by DEQ following any inspection of the permitted activity, the permittee may also be directed by DEQ to repair or install additional ESC measures to mitigate for inadequate control of off-site or on-site runoff, erosion, or sedimentation; other discharges of pollutants; and/or nuisance conditions.

23. All ESC measures (for example, silt fence, swales, sedimentation basins, etc.) shall be maintained in good working order by the permittee, until such time that final stabilization of all disturbed areas has been achieved (e.g., by re-vegetation, paving, slope stabilization, or other approved means). Inspection of all ESC measures must be conducted and recorded by the permittee at least weekly, and after every runoff event. Inspection and maintenance records shall be kept by the permittee on-site, and readily accessible to DEQ inspection personnel. Failure to adequately maintain ESC measures and/or keep records may be grounds for enforcement proceedings and penalties, including permit revocation.

PERMANENT STORMWATER CONTROL SYSTEM

23. The permittee shall notify DEQ for inspection prior to concealment (i.e., burial) of any underground drainage and runoff disposal/treatment systems, such as infiltrators, seepage pits, and leaching fields. No concealment of such drainage system components shall commence without approval from DEQ. DEQ may require excavation to expose concealed work if the permittee fails to provide proper notification.

24. The permittee shall notify DEQ before final paving of parking lots, roadways and driveways, where any underground drainage or disposal (e.g., infiltration system, leaching field) has been constructed. No paving activities shall commence without approval from DEQ. DEQ may require cutting of pavement and excavation to expose concealed work if the permittee fails to provide proper notification.

25. The permittee shall be responsible for protecting all permanent stormwater system components from damage caused by erosion and sedimentation until construction is completed, or until the drainage area serviced by the component is completely stabilized. Temporary protection measures such as catch basin protection may not have been included in the plans and specifications provided by the permittee. Nevertheless, the permittee is responsible for protecting such components, and is directed to the 2006 CNMI / Guam Stormwater Management Manual for standard plans and specifications for installing such protective measures.

POST-CONSTRUCTION REQUIREMENTS

26. All unused materials and debris (e.g. large rocks and construction waste materials or debris-concrete, hollow blocks, rebar, tin roof, wooden frames, scaffolds, cement and asphalt slabs, pipes, plastic sheets, electrical material, etc.) must immediately

be removed from the project site and disposed at the Tinian Dump/Landfill. No other disposal site or method of debris disposal is permitted, without prior, written approval from DEQ.

27. Long-term maintenance of any permanent ESC measures and/or permanent stormwater control system components is the responsibility of the owner and/or operator of the final facility, activity, or lot. The owner and/or operator shall be responsible for timely correction of any failure or damage to any component of the permanent ESC or stormwater control system.

AGENCY CONDITIONS:

DIVISION OF FISH & WILDLIFE CONDITIONS:

1. **The Division of Fish & Wildlife has reviewed the above referenced permit, and visited the permit site. Fish & Wildlife does not anticipate any impacts to threatened or endangered species from the proposed actions.**

HISTORIC PRESERVATION CONDITIONS:

1. **The permittee shall notify the Tinian Historic Preservation Office no less than five (5) working days prior to the commencement of this proposed project activity, so that HPO can coordinate an appropriate schedule to perform monitoring work/procedure on the project.**

2. **In the event that unanticipated significant historic and /or archaeological deposits or features are discovered during the project's earthmoving activities, the permittee is required to immediately cease all work in the vicinity of the discovery and notify HPO for consultation and possible development of mitigation measures.**

3. **HPO will determine appropriate mitigation measures in which the permittee must ensure that these measures are implemented. Mitigation measures could include further research, monitoring, survey, testing, and/or excavation. Mitigation measures must be carried out by a professional archaeologist meeting the qualifications published by the U.S. Department of the Interior's standards 36 CFR Part 61.**

4. **The permittee is responsible for all costs of mitigation.**

5. **Failure of the permittee to comply with the above HPO conditions will result in a violation upon which a fine may be assessed.**

DIVISION OF COASTAL RESOURCES MANAGEMENT

1. **No DCRM permit required.**

OTHER GOVERNMENT PERMITS AND REQUIREMENTS

28. This permit does not relieve the permittee or the final owner or operator of any obligations imposed by other CNMI or Federal Laws, either statutory or otherwise.

TERM OF PERMIT

29. **This permit expires one year from the issued date. DEQ must be notified in writing at least one (1) month before to the expiration date for any renewal or extension of this permit.**

RIGHT OF ENTRY AND INSPECTION

30. As provided for under the Earthmoving and Erosion Control Regulations at NMIAC §65-30-600, and 2 CMC §3132, the permittee shall allow DEQ personnel, as well as inspection personnel from other ONE-START agencies, prompt access to the premises covered by this permit for the purposes of inspecting the premises for compliance with the terms of this permit. Inspections may be made with or without advance notice to the permittee.

PENALTIES

Failure to comply with the above conditions shall constitute a violation of the CNMI Earthmoving Rules and Regulations, and may result in enforcement action, including civil penalties of up to $25,000 per violation, per day; or criminal penalties, as authorized under the Earthmoving and Erosion Control Regulations at NMIAC §65-30-700 and 2 CMC §3131.

If you have any questions regarding the conditions of this permit, please contact our office at telephone numbers 664-8500 & 8501.

Sincerely,

FRANK M. RABAULIMAN
Administrator

BUREAU OF ENVIROMENTAL AND COASTAL QUALITY

EARTHMOVING AND EROSION CONTROL NOTICE OF AUTHORIZATION

DATE EXPIRES: 06/15/2017 **PERMIT NUMBER:** 2016 COM 116T

PERMITTEE: Robert Shambach

ADDRESS: 1001 Army Drive Suite 103, Barrigada, Guam 96913

ATHORIZED WORK: Phase II ESA, Masalog Ammunition Depot

LOCATION: Pina **ISLAND:** Tinian

Frank M. Rabauliman
ADMINISTRATOR'S SIGNATURE

06/15/2016
DATE

THIS NOTICE MUST BE CONSPICUOUSLY DISPLAYED AT THE SITE OF WORK
DEQ CONTACT: 664-8500

APPENDIX B

PHOTOGRAPHS

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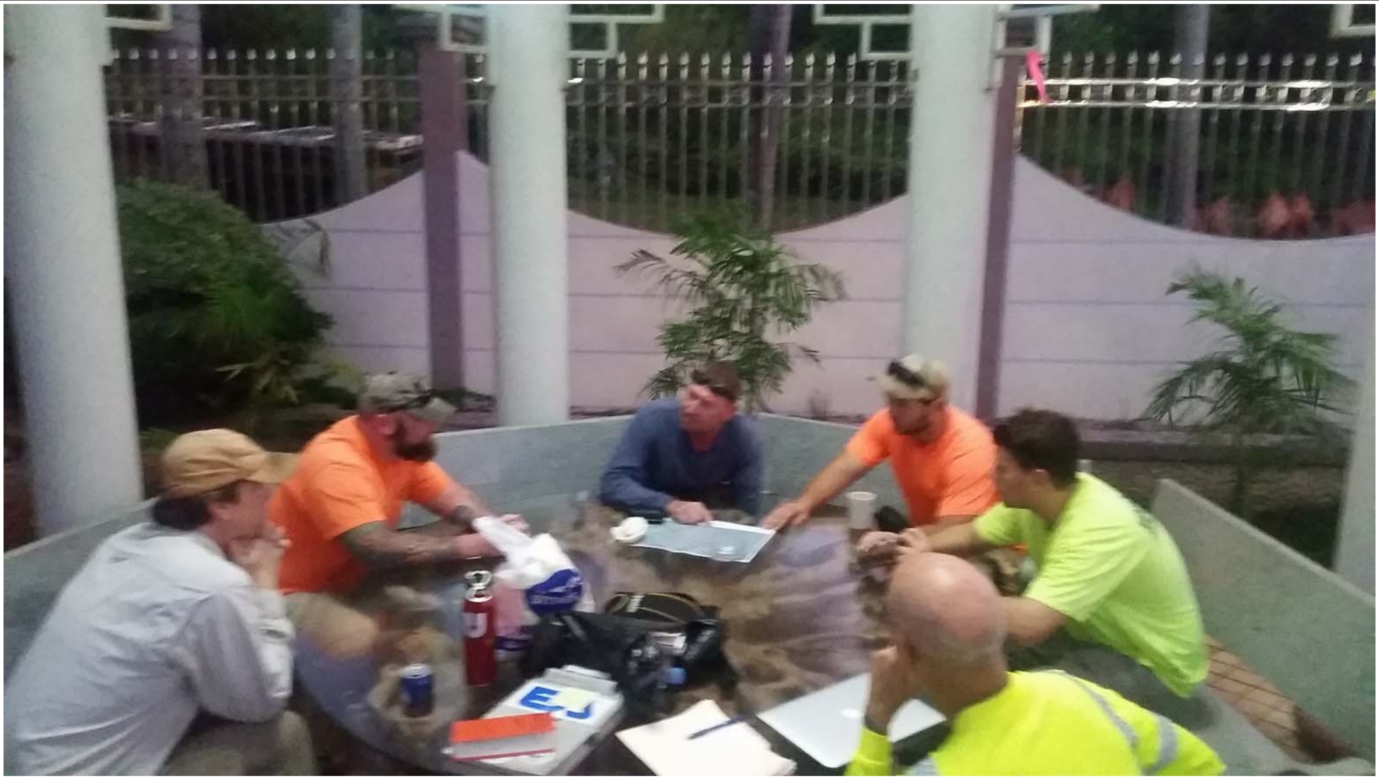


Project No. 63019.01	Description:	Team briefing to review Final WP/SAP, APP, and SSHP prior to traveling to the field to perform fieldwork.	Photo 1
	Site Name:	Phase II ESA at Masalog Ammunition Depot	Photo Date 12/05/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	Description:	UXO field team performing surface sweep in individual 5-foot wide lanes with 15 feet between sweep lanes; SUXOS in blue shirt following to maintain spacing and direction of individual UXO Technicians; looking northeast.	Photo 2
	Site Name:	Phase II ESA at Masalog Ammunition Depot	Photo Date 12/05/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

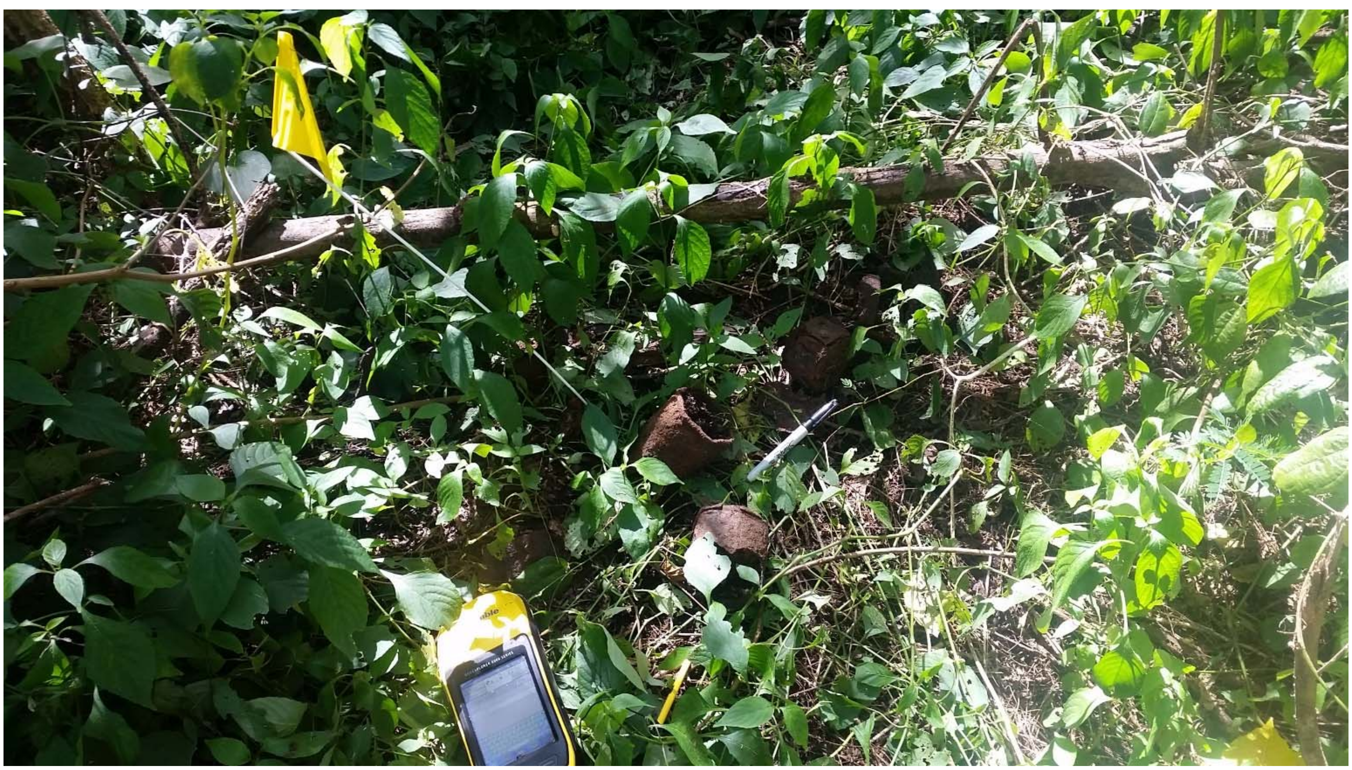
Project No. 63019.01	**Description:**	Typical example of surface munitions debris of former 500 pound bomb with partially breached shell; looking northwest.	**Photo 3**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/08/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Typical example of surface munitions debris of former 500 pound bomb with fully breached shell; looking north.	**Photo 4**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/08/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Surface munitions debris consisting of former bomb baseplate; looking south.	**Photo 5**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/05/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Surface munitions debris consisting of incendiary tubes; looking west.	**Photo 6**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/06/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Munitions debris brought to surface within root ball of fallen tree; looking north.	**Photo 7**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/07/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	



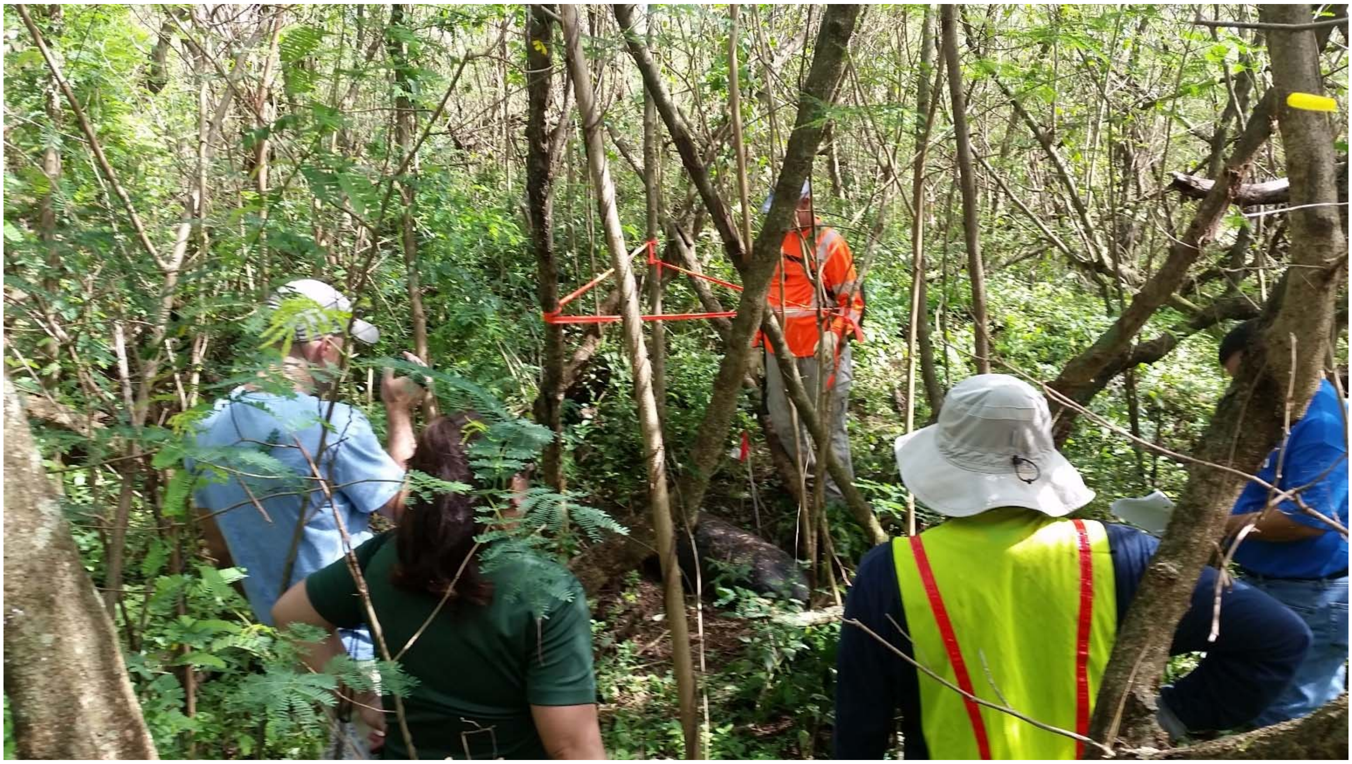
Project No. 63019.01	**Description:**	Surface munitions debris consisting of end caps from incendiary tubes; looking southwest.	**Photo 8**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/07/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Material Potentially Presenting an Explosive Hazard on left side of photo, located in Grid A400; looking north.	**Photo 9**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/07/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Side view of Photograph 9; Material Potentially Presenting an Explosive Hazard, located in Grid A400; looking east.	**Photo 10**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/05/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Cluster of surface munition debris consisting of interior of incendiary bomb, located in Grid J200; looking southeast.	**Photo 11**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/09/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	**Description:**	Material of Explosive Concern located on the surface of Grid L700; looking east.	**Photo 12**
	Site Name:	Phase II ESA at Masalog Ammunition Depot	**Photo Date** 12/10/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	



Project No. 63019.01	Description:	Site visit from CNMI DPL viewing surface Material of Explosive Concern located in Grid L700; looking northeast.	Photo 13
	Site Name:	Phase II ESA at Masalog Ammunition Depot	Photo Date 12/13/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

Project No. 63019.01	Description:	Site visit from CNMI DPL hiking up revetment located on K transect line; looking southeast.	Photo 14
	Site Name:	Phase II ESA at Masalog Ammunition Depot	Photo Date 12/13/2016
	Client:	Department of Public Lands, Commonwealth of Northern Marianas Islands	

APPENDIX C

DAILY REPORTS AND FIELD LOGBOOK

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Daily Reports

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 1 Date: 05 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Sunny, Precipitation: None, Temp: Min. 80°F, Max. 85°F, Wind: Trade winds, 10 to 15 mph from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	10
Nigel Harman	UXO Technician II	Aerotek	10
James Hipp	UXO Technician I	Aerotek	10
Jonathan Clark	UXO Technician I	Aerotek	10

Daily Activities:

1. Safety briefing & review of Work Plan
2. Tailgate safety meeting
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   A000, A100, A200, A300, A400, A500, A600, A700, A800
   B000, B100, B200, B300, B400, B500, B600, B700, B800
4. 18 grids assessed today; cumulatively 18 out of 126 total grids assessed during fieldwork
5. One significant unknown munitions debris located in grid A400; base plate present on ground surface but unable to assess if still connected to projectile
6. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Continue UXO assessment on remaining grids
- GPS UXO assessment flag placements

Outstanding Issues:

- UXO assessment performed on 40 foot strip along A cut line and 40 foot strip along C cut line leaving approximately 120 not assessed between the 40 foot strips in A and B grids. Deviated from Work Plan, but still provided approximately 40 percent coverage. Reviewed approach with Bob Shambach (EA Project Manager).
- Initial four grids cleared with Schonstedt set at Level 3, which assessed approximately 2 to 2.5 feet below ground surface (bgs). Large quantity of subsurface anomalies (more than 50 per grid) detected at this setting, which is below the planned 1 foot bgs soil sampling horizon. Reset Schonstedt at Level 2 after four grids complete, which assessed approximately 1.5 feet bgs.

Corrective Actions:

- Review UXO assessment approach described in Work Plan and revise field approach for tomorrow to conform with Work Plan assessment description.

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 2 Date: 06 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Mostly Sunny, Precipitation: Passing Showers, Temp: Min. 80°F, Max. 85°F, Wind: Trade winds, 15 to 20 mph from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	10
Nigel Harman	UXO Technician II	Aerotek	10
James Hipp	UXO Technician I	Aerotek	10
Jonathan Clark	UXO Technician I	Aerotek	10

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   C000, C100, C200, C300, C400, C500, C600, C700, C800
   D000, D100, D200, D300, D400, D500, D600, D700, D800
   E500, E600, E700, E800
   F500, F600, F700, F800
4. 26 grids assessed today; cumulatively 44 out of 126 total grids assessed during fieldwork
5. GPS UXO assessment flag locations
6. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Continue UXO assessment on remaining grids
- GPS UXO assessment flag placements

Outstanding Issues:

- Slip, trip, and fall hazards prevalent in field (holes, vines around ankles/feet, stepping over/under dead vegetation). Areas cleared for transects have hazards associated with cut vegetation. Hazards more prevalent due to fast pace of grid clearance performed today. Will advise to maintain safety with respect to footing during upcoming fieldwork.

Corrective Actions:

- Revised UXO assessment approach to conform with description presented in Work Plan. UXO Technicians responsible for a linear 5 foot sweep area with 15 foot buffer in between UXO Technicians. Multiple sweeps of a single grid required to complete this approach.

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 3 Date: 07 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Partly Cloudy-Mostly Sunny, Precipitation: Passing Showers, Temp: Min. 80 °F, Max. 85 °F, Wind: Trade winds, 10 mph from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	10
Nigel Harman	UXO Technician II	Aerotek	10
James Hipp	UXO Technician I	Aerotek	10
Jonathan Clark	UXO Technician I	Aerotek	10

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting with emphasis on foot placement & avoidance of slip, trip, fall hazards
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   E000, E100, E200, E300, E400
   F000, F100, F200, F300, F400
   G800, H800, I800, K800
4. 14 grids assessed today; cumulatively 58 out of 126 total grids assessed during fieldwork
5. GPS UXO assessment flag locations
6. Significant unknown located in Grid F400
7. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Continue UXO assessment on remaining grids
- GPS UXO assessment flag placements

Outstanding Issues:

- Grid naming convention inconsistent between EA and SUXOS. Review grid naming convention and rectify identity of grids cleared. Confusion stemmed from grid nodes identified on common fieldwork map, but grid identities not clearly defined. SUXOS indicated grids 000 through 800 required clearing while EA indicated grids 100 through 900 required clearing.

Corrective Actions:

- Meet with SUXOS and UXOQCS to rectify grid naming convention and identity of grids cleared.

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 4 Date: 08 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Mostly Sunny with Scattered Clouds, Precipitation: None, Temp: Min. 80 °F, Max. 85 °F, Wind: Trade winds, 15 to 20 mph from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	10
Nigel Harman	UXO Technician II	Aerotek	10
James Hipp	UXO Technician I	Aerotek	10
Jonathan Clark	UXO Technician I	Aerotek	10

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   G000, G100, G200, G300, G400
   H000, H100, H200, H300, H400
   I000, I100, J000, J100
4. 14 grids assessed today; cumulatively 72 out of 126 total grids assessed during fieldwork
5. GPS UXO assessment flag locations
6. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Continue UXO assessment on remaining grids
- GPS UXO assessment flag placements

Outstanding Issues:

- None

Corrective Actions:

- None

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 5 Date: 09 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Mostly Sunny, Precipitation: None, Temp: Min. 80 °F, Max. 85 °F, Wind: Trade winds, 10 to 15 mph from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	10
Nigel Harman	UXO Technician II	Aerotek	10
James Hipp	UXO Technician I	Aerotek	10
Jonathan Clark	UXO Technician I	Aerotek	10

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   G500, G600, G700, H500, H600, H700
   I200, I300, I400, I500, I600, I700
   J200, J300, J400, J500, J600, J700
4. Significant unknown munitions debris located in grid G500; consists of 500 pound bomb with shell breached (interior material weathered away), tail end buried under ground surface and unable to assess whether fuse still present
5. 18 grids assessed today; cumulatively 90 out of 126 total grids assessed during fieldwork
6. GPS UXO assessment flag locations
7. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Continue UXO assessment on remaining grids
- GPS UXO assessment flag placements

Outstanding Issues:

- None

Corrective Actions:

- None

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 6 Date: 10 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Mostly Sunny, Precipitation: Passing Showers, Temp: Min. 80 °F, Max. 85 °F, Wind: Trade winds, 10 to 15 mph from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	10
Nigel Harman	UXO Technician II	Aerotek	10
James Hipp	UXO Technician I	Aerotek	10
Jonathan Clark	UXO Technician I	Aerotek	10

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   K000, K100, K200, K300, K400, K500, K600, K700, K800
   L000, L100, L200, L300, L400, L500, L600, L700, L800
4. Material of Explosive Concern (MEC) located in grid L700; consists of intact 500 pound bomb with fuses removed
5. 18 grids assessed today; cumulatively 108 out of 126 total grids assessed during fieldwork
6. Additional UXO assessment completed in 120 foot wide strip in A and B grids
7. GPS UXO assessment flag locations
8. Debrief and daily summary meeting with SUXOS and UXOQCS
9. Julie Duay arrived on Tinian in afternoon

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Collection of multi-increment soil samples in Decision Units 1, 2, and 3
- GPS soil sample increment collection locations

Outstanding Issues:

- None

Corrective Actions:

- None

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 7 Date: 11 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Sunny, Precipitation: None, Temp: Min. 80 °F, Max. 85 °F, Wind: Light trade winds, from E/NE

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	10
Julie Duay	Field Assistant	EA Engineering	10
Roger Perkins	UXOQCS/Health & Safety	Aerotek	10
Shannon Linnane	UXO Technician II	Aerotek	5
Nigel Harman	UXO Technician II	Aerotek	5
James Hipp	UXO Technician I	Aerotek	5
Jonathan Clark	UXO Technician I	Aerotek	5

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. Collect multi-increment soil samples consisting of 30 increments from each of three decision units 1, 2, and 3
4. GPS soil sample increment locations
5. Debrief and daily summary meeting with Julie

Equipment Onsite:

- Two Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Continue UXO assessment on remaining grids
- Continue collection of multi-increment soil samples in Decision Units 4 and 5
- GPS soil sample increment collection locations

Outstanding Issues:

- None

Corrective Actions:

- None

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 8 Date: 12 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Cloudy, Precipitation: Steady rain with periods of downpours, Temp: Min. 80 °F, Max. 85 °F, Wind: None

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	8
Julie Duay	Field Assistant	EA Engineering	8
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	8
Roger Perkins	UXOQCS/Health & Safety	Aerotek	8
Shannon Linnane	UXO Technician II	Aerotek	8
Nigel Harman	UXO Technician II	Aerotek	8
James Hipp	UXO Technician I	Aerotek	8
Jonathan Clark	UXO Technician I	Aerotek	8

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. UXO assessment completed in 100 ft x 100 ft grids as follows:
   M000, M100, M200, M300, M400, M500, M600, M700, M800
   N000, N100, N200, N300, N400, N500, N600, N700, N800
4. 18 grids assessed today; cumulatively 126 out of 126 total grids assessed during fieldwork
5. Collect multi-increment soil samples consisting of 30 increments from each of two decision units 4 and 5, duplicate and triplicate samples collected from decision unit 5 and submitted blind to laboratory
6. GPS soil sample increment locations
7. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Prepare for client visit to site and demonstration of field activities
- GPS UXO assessment flag placements

Outstanding Issues:

- None

Corrective Actions:

- None

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

EA Engineering, Science and Technology, Inc., PBC

Phase II Environmental Site Assessment
MASALOG AMMUNITION DEPOT SITE, PINA, TINIAN, CNMI

Contract No.: 600431-OC (DPL 15-003)
Project No.: 6301901
Daily Field Report No.: 9 Date: 13 December 2016
Project Title & Location: Phase II Environmental Site Assessment; Masalog Ammunition Depot Site, Pina, Tinian, CNMI

Weather: Cloudy, Precipitation: Mostly sunny with passing clouds, Temp: Min. 80 °F, Max. 85 °F, Wind: None

NAMES OF PERSONNEL ON SITE

NAME	FUNCTION	COMPANY	FIELD HOURS
Michael Kelley	Field Oversight	EA Engineering	8
Julie Duay	Field Assistant	EA Engineering	8
Trevor Barlow	SUXOS/Field Team Lead	Aerotek	8
Roger Perkins	UXOQCS/Health & Safety	Aerotek	8
Shannon Linnane	UXO Technician II	Aerotek	8
Nigel Harman	UXO Technician II	Aerotek	8
James Hipp	UXO Technician I	Aerotek	8
Jonathan Clark	UXO Technician I	Aerotek	8

Daily Activities:

1. Safety briefing and review planned field activities
2. Tailgate safety meeting
3. GPS UXO assessment flag locations
4. Client visit for demonstration and filming of field activities
5. Debrief and daily summary meeting with SUXOS and UXOQCS

Equipment Onsite:

- Six Schonstedt GA-52Cx metal detectors
- Global Positioning System (GPS) receiver

Next Anticipated Work:

- Demobilize and pack equipment for end of project

Outstanding Issues:

- None

Corrective Actions:

- None

For questions regarding this daily report please contact **Michael Kelley at (808) 589-1455 x 111 (office) or (808) 679-2976 (mobile).**

Field Logbook

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CNMI DPL
TINIAN - MASALOG
AMMUNITION DEPOT
PIÑA, TINIAN, CNMI

Forestry Suppliers, Inc.
1-800-647-5368
#49352 Field Book

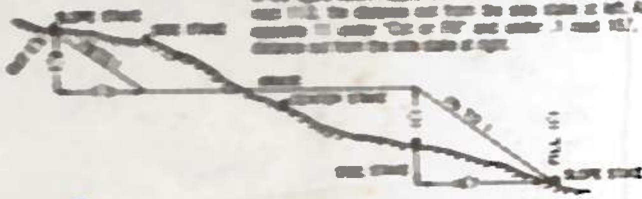
Book 1

BOB SHAMBACH 671-727-6094

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

[illegible] Width. Side Slopes 1½ to 1.

[illegible]



JCZ

Cut or Fill	0	1	2	3	4	5	6	7	8	9	Cut or Fill
0										1.4	0
1										2.9	1
2										4.4	2
3										5.9	3
4										7.4	4
5										8.9	5
6										10.4	6
7										11.9	7
8										13.4	8
9										14.9	9
10										16.4	10
11										17.9	11
12										19.4	12
13										20.9	13
14										22.4	14
15										23.9	15
16										25.4	16
17										26.9	17
18										28.4	18
19										29.9	19
20										31.4	20
21										32.9	21
22										34.4	22
23										35.9	23
24										37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

Ray Cing

285-0550

433-9245

Tinian DPL

rcing@dpl.gov.mp

TINIAN, MASALOG AMMUNITION DEPOT, PINA.

CNMI

Dept. of Public Lands Contract

POC: Rachel Rogue

Tim Lang, TRL

670-287-6403 (m).

The paper in this book is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

CONTENTS

PAGE NO.	REFERENCE	DATE
	Mayor - Tinian	
	Joe Patrick San Nicolas	
	Ernie Hofschneider (tinian).	
	670-785-8764	
	Joel Untalan.	
	Director	
*	Flemming Hotel	
	Debra Flemming.	
	~~[illegible]~~	
	tourific.tinian@	
	gmail.com.	
	670-286-0405	
	Don Farrell -	
	670-433-3082	

1

LoriLynn's Hotel, San Jose Tinian
670-433-3256

Tinian DPS (Dept. Public Safety)
Police offer 1
Kerry Borja
670 783-5379 (m)
423-9222 (Front desk).
kborja13185@gmail.com

~~CHIEF OF~~ Tinian DPS Director
Juan E. Santos
670-783-8083 (m)

Marines were @ site 1-2 yrs Ago
came to Survey the site Area @
Masalog

talk to Ray Pangelinan
Casino & Bridge Capital
- 783-0407 (m).
- try later this week.

2

Carl Lindlan (unitek MEC)
UXO TECH 671-565-3151
671-727-0448
mec6@unitekguam.com

3

1/4/2016 - Monday

0600 Shambach travels to Tinian via Saipan. meet up with Unitek employee Carl Lindau, UXO Tech

0800 - arrive in Sapan, get gear and go to Commuter terminal for Tinian flight

0845 - arrive in Tinian, get rental car and go to fire dept. to brief them on our work and site location.

0900 @ site - get bearings and make plan to meander the site for recon. Started at NE end of site on North part of roadway. items on or near surface were munitions debris, various bomb components, and vehicle parts. →

SAM PALACIOS — NMC CREES
Lawrence Duponcheel
1300 - 30-Day veg clearing permit
Land clearing permit. (BECQ)
tinian cattlemen@gmail.com
Co-op - Service

FLEMMING HOTEL (
LORILYNNS (By Gym)
MAIN STREET

1515

[illegible] - Department of Lands
Gil Borja - Director

1/5/2016 Tuesday

6

7

1/6/2016 wednesday

1/13/2016 – Wednesday

1330 – call from Director Kioshi @
Tinian Fire Dept.
670-783-7950

1418 – Call Mr. Kioshi
- files –
- Can't find anything in files.

ignacio~~[illegible]~~ @gmail.com
kiyoshi

– will send.

6/16/16.

1550 - Call Lorilynns Hotel - San Jose

To

llorilynns@ 88@yahoo.com

670-433-3252 (DIGNA) - spoke

Aug 1 - 11 (5 rooms). - yes -

Aug 10 - 18 (7 rooms) - no -

- $55 / room.
- TV - Aircon - no wifi
- outside kitchen - stove -
- cash
- Cashiers check.
-

Lion House - Sunny 9 rooms

(O) 670-433-0105

(M) 670-287-0105

Tinian ACE Hardware 670-433-9322

11/2/16

1636 - Call Lion House.

tinianpopz@hotmail.com

(12)

11/13/2016 – Sunday.

(13)

1240 R. Shambach travelled from Guam to Saipan for Tinian.

1300 arrive in Saipan, meet w/ Mahesh Balakrishnan (TANGS CORP.) to get & meet up with Shannon Limone – UXO tech II. He's on saipan for 1 night. going to tinian @ 4pm.

1600 – Shannon & Robert Shambach get flight to Tinian (Star Marianas)
– get rental truck & Van @ AVIS.
– go to Lion House hotel.

1800 – go with San Jose for dinner & to get groceries for stay.

2000 – turn in for the night, big day of setting up grid tomorrow

14

11/14/16 - Monday.

0730 Bob + Shannon go for breakfast @ JC Cafe.

0820 go to Historic Preservation Office (HPO) to let them know we're on site, met w/ Gilbert Borja & Mike Umana.

0830 Stop @ Police & XRT to let them know we will be onsite

0845 @ ACE Hardware to get supplies.

1000 - Arrive on site & set up Grid, Show Shannon around.

1045 walk into site on fence line "A" South to point A-000
find point & Also A-100, A-200
mark A-300, B-000 & C-000.
- continue north on line A up to A-700 point.

1250 come out of site and go for lunch @ JC Cafe.

1345 back @ site, meet up w/ toilet port-a-potty.

1440 - go to east side & find & mark O-000, O-100, O-200, and N-000.

1530 off site.

15

1600 Shambach to Airport to get Tanga Corp. employees - 4 pax.

1730 back @ Lion House.

11/15/16

0800 Crew on site to cut veg. &
survey line @ site.
Robert Shambach (CEP)
Shannon Luinone (Acrotek)
ORI ENIS (TANGS)
RAY OLOPAI (TANGS)
RICKY SOULENG (TANGS)
JESSE RUBEN (TANGS).

- Tailgate H&S meeting
830 finish up line "A"
More cuts finishing line C from
C-000 to C-900, then check on
NE Corner of surveyed corner.
1200 take lunch
1300 back to work on line "C"
No issues today
- Shambach gets more water &
ice in San Jose.

1600 done @ site, go back to Hotel
- pick up provisions for wed.

18

11/16/16 Wednesday

0700 crew meets at Hotel.
0715 leave for site.
0730 arrive at site.
Robert Shambach
Shannon Luinane (Aerotech)
ORI ENIS (Tango)
RAY OLOPAI (Tango)
Ricky Souleng (Tango)
Jesse Ruben. (Tango)
— Tailgate H&S meeting, hydrate check gear, gas up chain saws.
Plan today is to finish "C" Line to C-900 ft. then cut 100 line from D-100 to O-100
0740 Start "C" Line. North.
0845 @ C600 ft, we cut west to A600 to confirm 200 ft & grid shape. we are on!
— Mark of old roads as we proceed.
0900 Joel UNTALAN, Director DPW Tinian stopped by the site for 10-15 minutes.
1200 take lunch

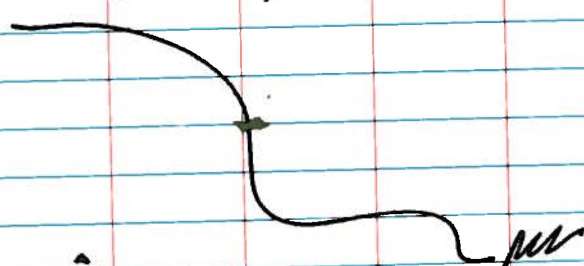
11/16/16 19

1330 get back into field, cutting starts @ G-100, headed to O-100.
1530. @ L-100 - 300 ft to go today.
1630 — finish Line 100 to O-100. Crew leave site for hotel.
1645 - Shambach goes to Tinian Airport to pick up Mahesh Balakrishnan of Tango Corporation. take Mahesh to site where his workers are working.
1745 drop Mahesh @ Airport.
1830 - Shannon & Bob have dinner with Joel Untalan (DPW Director).
— plan tomorrow is to get the grid points set @ O-000, O-100, O-200.
then cut 100 ft lines SE to E-000, G-000, I-000, K-000, M-000
— then cut line E to 900 ft.

— finished 1,800 ft today.

11/17/16 Thursday

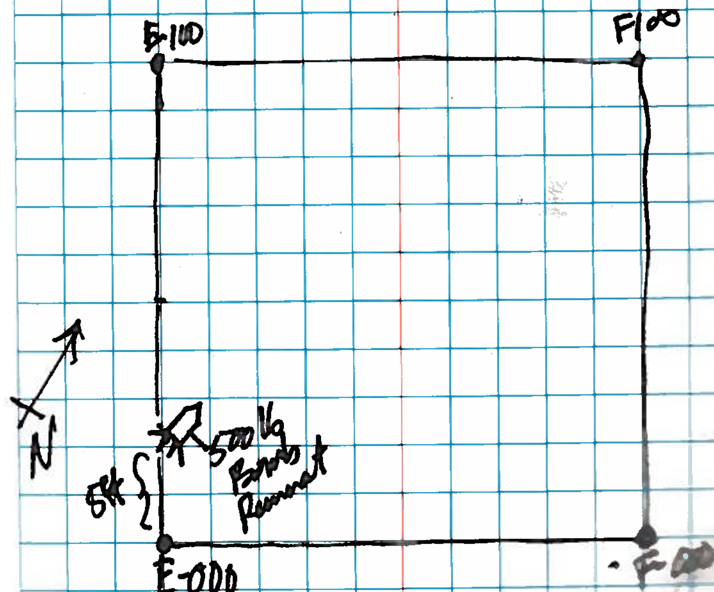
0700 Crew meets @ Hotel.
0710 leave for site.
0720 arrive @ site.
R. Shambach
S. Linnane
O. Ennis
R. OLOPAI
R. Soulang
J. Ruben.
0730 tailgate H&S. Brief.
Cover chain saw safety, slips, trip
fall, Bees & biological hazards.
All sign daily sheet.



0920 Shambach leaves site to get
Sheeka Toreyama @ Airport.
1045 Shambach & Sheeka on site.
CNMI fish & wildlife stopped
by site 5 min ago. Looking
for permit.

11/17/16 - Thursday

1116 - CNMI Div. of fish & wildlife.
Steve Mullin, wildlife Biologist
Kika Sablan, wildlife Tech.
\-
1359 - find remnant 500-lb bomb ~
25 ft North ~~force~~ of E-00
grid pt. took photo.
— Shannon linnane shows crew &
explains dangers & what to
watch for.



22 11/17/16

1600 - Finished 100 lines from
& E000 to E 600.

1605 - Head back to hotel to secure and conduct maintenance on field equipment.

1700 - all field equipment maintenance complete.

End of day

Total ft. cleared = 1500ft.

11/18/16 23

0700 - crew meets at hotel. loading equipment and supplies.

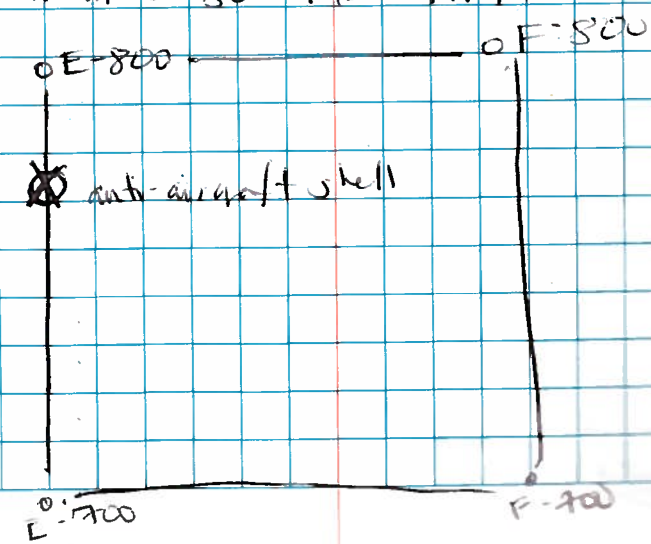
0708 - arrive on-site

0710 - conduct safety tailgate meeting on site

S. Tarayama
S. Linnane
D. Enis
J. Ruben
R. Sunleng
R. Olopai

0715 - work line cutting begins at E-600.

0945 - Anti-aircraft shell found ~3 meters from E-800. Photo taken.



(24) 11/18/16

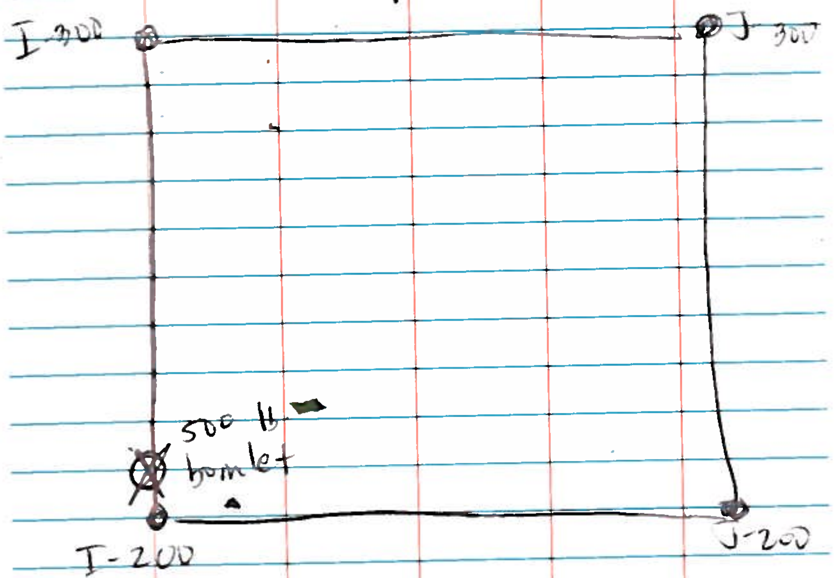
S. Linnane discusses shell remnant found.

1000 - Begin cutting line along G transect.

1430 - Finish cutting line along G transect completed G000 to G-900

1435 - Begin cutting line along I transect.

1500 - 500 lb bomblet found ~1 meter from I-200 point



S. Linnane discusses bomblet found.

1400 - End of field day. Line clearing and cutting ends at I-300.

1410 - Return to hotel for equipment

11/18/16 (25)

maintenance and securing

1700 End of day

Total ft cleared = 1800 ft.

26 11/19/16

0700 - Crew meets at hotel to load field equipment
0710 - Safety tailgate meeting on-site
S. Tareyama R. Sonlorg
S. Linnare J. Ruben
O. Enis
R. Olopai
0715 - Continue cutting line at I-300
1130 - complete line cutting along I-transect
1135 - take lunch
1205 - Begin cutting line along K-transect.
1600 - complete cutting along K-transect
1607 - Head back to hotel to secure and conduct equipment maintenance
1700 - End of day. All equipment secured
Total line cut = 1500 ft.

11/20/16 27

0700 - crew meets at hotel to load field equipment
0715 - Safety tailgate meeting on-site
S. Tareyama J. Ruben
S. Linnare R. Sonlorg
O. Enis
R. Olopai
0720 - Begin cutting line along M-transect
1145 - complete cutting along M-transect.
1150 - S. Tareyama, J. Ruben, R. Olopai and O. Enis conduct walk through all 900 ft cut lines to locate burns and old roads. (see map).
1245 - Head back to hotel to secure equipment and perform maintenance
1400 - End of day
total line cut = 900 ft.
1730 - Drop field crew to airport.

25 11/21/16

0800 - pack and secure all supplies and equipment at hotel.

1000 - return and fuel up rental car vehicles.

1020. S. Tareyama leaves Tinian.

1510 - S. Tareyama returns to Guam.

29 12/5/16

0600 - Safety briefing @ hotel. General safety followed by UXO safety by Roger. Then review work approach by Trevor.

0655 - Safety briefing & work approach meeting complete. Load equipment

0710 - To breakfast. Then H2O & Tea

0810 - At field site. Unload equip. Final safety briefing.

0830 - Crew moves to grid location A000 to begin surface sweep. Weather: Sunny, > 80°F, trades 10 to 15 mph from E/NE. M Kelly (MJK) to hardware store to purchase machetes & other miscellaneous equipment.

0920 - MSK back on site.

0925 - Crew emerges from jungle onto road. Finished A000 to A100. Break for H_2O. Plan to continue to A200.

0953 - MSK read map wrong →

30

0953 Lout - Crew had moved from A000 to A300 next to road.

0955 - Located unknown but possible MEC near A400. Photo of flag & GPS. object is 7 inches round & ~1" protruding from surface.

1013 - Near A500 another 7" diameter projectile base plate. Non MEC base plate. Non MEC.

1026 - Portable toilet truck arrive on site. Drop toilet & fill w/ chem solution.

1038 - Porta toilet truck off site.

1103 - Reach end of grids @ A900.

1117 - Back @ vehicles for break & water & lunch.

1135 - Back @ field site.

1145 - Move to C000 line UXO crew btwn C000 & B000 to work a 40 ft swath to the NW to B900 & C900.

1500 - Finish btwn B900 & C900 so all of DUI has been cleared 2/3 of the area today

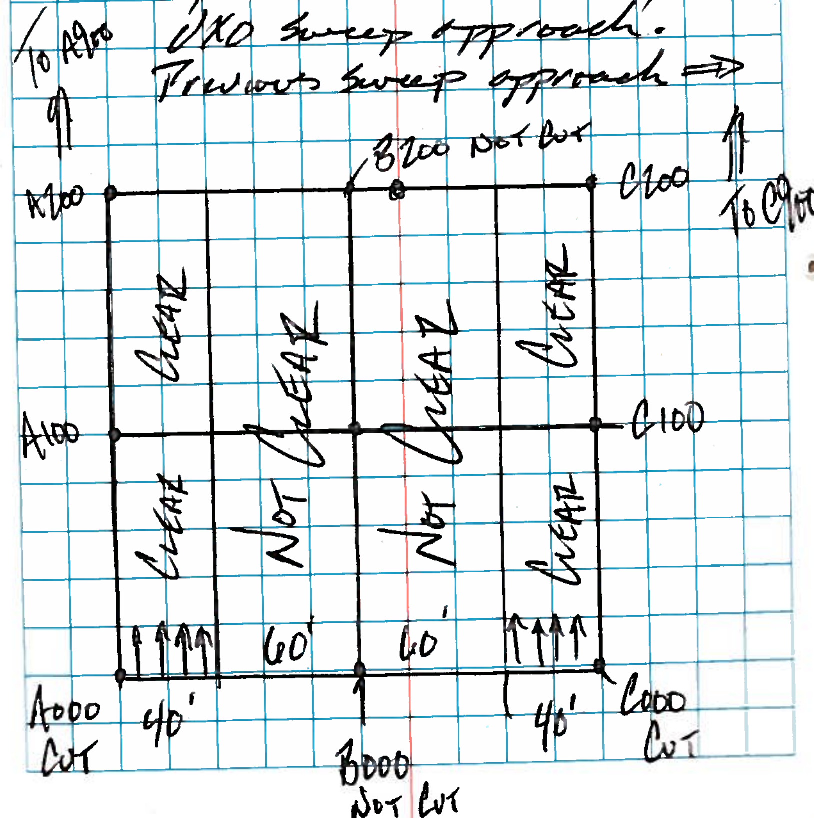
31

1510 - All off site & back to hotel

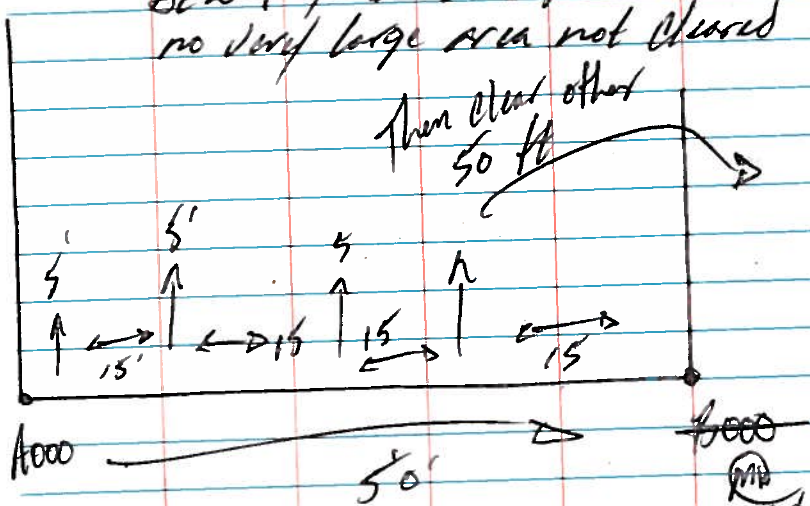
1720 - Call Bob Shambach (BS) to review today's progress & approach.

1815 - Meet w/ Roger (UXO QC/SO) & Trevor (~~[illegible]~~ MD 12/5/16 SUXOSO) to review discussion w/ BS. Plan to modify the UXO sweep approach.

Trevor's sweep approach ⇒



1815 Cont - Will change approach to have each person resp. for 5 ft swath w/ 15 ft btwn to be sure there is no very large area not cleared



MD 12/5/16

This approach also covers 30 % but ~~fails~~ MD 12/5 does not leave 120 ft betwn cleared areas.

Note: Start of yesterday the shovestaffs were set on 3 which is most sensitive. Ended up flagging ~ 100 points w/in first grid 40' by 100'. Kept the detectors on 3 until

after A400 since it became obvious that site was heavily impacted by MD & more than 1000 flags would be placed. After setting to 2 sensitivity, were locating ~ 20 to 40 points in each 40' by 100' area.

1845 - After discussion w/ BS, will go back to start & collect GPS of flags. Will have to group flags in first few grids.

MD

12/6/16 (34)

Makalou MEC / Sonic Sambre Cont.

0600 - Safety brief. Review yesterday approach & progress. Discuss modified sweep approach. MJK & Nigel will work on GPS while crew starts at grids bounded by C000, D000, C100 & D100.

0630 - Leave for field site.

0715 - MJK & Nigel Harman (NH) move to A000 & assess best method to collect GPS.

0720 - At A000. Berm located in area of A000

0725 - Passing heavy showers. Weather is > 80°F, trade winds @ 15 to 20 mph from E/NE, partly cloudy w/ passing showers

0736 GPS = 126-A001 has 17 anomalies w/in 40 ft by 40 ft area
1656664.10 N
355989.10 E
Photo #1 looking N from GPS & #2

(35)

0743 - Move to NW along cleared transect. GPS area from previous was close to 40' by 50' along A cut line

0745 - 23 anomalies in second 50' by 40' area
GPS = 126-002
1655674.00 N
355988.11 E
Photo #3 looking NW from GPS.
Photo #4 taken looking west & 10' NW of #3.

0750 - Photo #5 taken looking SW along B cut line looking @ A100
Photo #6 looking south from Photo 5 showing previous GPS location & several flags

0800 - Trouble w/ GPS. Recording points don't stay saved in GPS memory. Troubleshoot at truck. Call BS to review GPS setup.

0820 - Call w/ BS. Reboot GPS

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to try to correct problem.
GPS will record location in memory but will not plot it on the map.

0825 - UXO crew starting to N of road. They have cleared grids C000, D000, E000 to C100, D100, E100 ~ 2 grids. They are starting at C100 lined up btwn C200 & working toward NE
btwn lines C100 & D100.

0832 - GPS behind crew.
GPS = 126-003 within grid described above. Flag w/ subsurface hit.
1656760.40N
355967.82 E.

0835 - GPS location w/ subsurface hit
GPS = 126-004
1656767.71 N
355973.92 E

0837 - GPS subsurface hit
GPS = 126-005
1656759.19 N
355983.37 E

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0840 - 2 subsurface flags ~4' apart.
GPS = 126-006
1656770.50 N
355996.80 E

0843 - 5 flags w/in 10 ft radius of each other.
Subsurface
GPS = 126-007
1656780.00 N
355996.11 E

0846 - Berm w/ 5 flags within berm - subsurface.
GPS = 126-008
1656786.50 N
365005.55 E

0849 - Backside of same berm as above. Near Flag E300.
GPS = 126-009
1656794.97 N
356000.50 E.
There are 5 flags running linear along backside of berm

0851 - Corner of same berm
2 flags w/ subsurface
GPS = 126-010
1656788.90 N
355965.72 E

0853 - Subsurface flag
GPS = 126-011
1656788.86 N
355984.01 E

0855 - subsurface anomaly
GPS = 126-012
1656782.19 N
355981.46 E

0858 - 8 subsurface along C line cut
linear & w/in 20 ft of each other in cut
GPS = 126-13
1656772.16 N
355943.90 E.
Photo #1 looking NW along Cut line w/ many flags

0902 - Small mound w/ 4 flags subsurface w/in 30' radius

GPS = 126-014
1656774.69 N
355937.57 E

0905 - 5 flags along berm w/in 30 ft of each other
GPS = 126-015
1656786.07 N
355955.82 E

0907 - on inside of same berm seven subsurface flags
GPS = 126-016
1656792.60 N
355956.57 E
Flags w/in 30' radius

0910 - South side of same berm w/ 6 subsurface w/in 30 ft radius
GPS = 126-017
1656790.94 N
12/6 MW ~~355~~ 355965.35 E

0912 - One subsurface flag
GPS = 126-018
1656803.35 N
355974.70 E

40

0915 - 2 flags ~3 ft apart subsurface
GPS = 126-019
1656808.05 N
355970.11 E
0917 - subsurface flag to E of berm
GPS = 126-020
1656808.93 N
355964.36 E
0927 - Seven flags w/in a line on east side of berm w/in 40' of each other & one flag on west side of berm 10' away.
GPS = 126-021
1656799.97 N
355950.94 E.
0940 - Phone call w/ Jay in EA Guam office re: points plotting on map. She indicates that only one file is needed to collect data for locations. At each flag, select point location, add comment & let count to 30 on GPS for

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accuracy. After accuracy is established, then select done to finish individual point.
1006 - MK & NH back on East line. Start collecting data. After the flag has been GPS, will use sharpie to mark flag w/ black mark. to indicate data collected.
1115 - MJK feeling overheated. Take break in vehicle A/C & hydrate & have lunch.
1200 - MJK & RH back to GPS locations.
1410 - Break @ vehicle. H_2O & snack. NH @ M/4
1430 - MJK & ~~RH~~ to UXO Crew.
1515 - UXO crew back @ vehicles. Pack equipment.
1550 - Back @ lodging. Unpack both vehicles b/c they need to be swapped w/ others @ AVIS - Roger & MJK to airport to switch vehicles.
1640 - ~~Batt~~ Stop for gas on

MW

(42)

way to airport. Then back to lodging. Shower & clean up

1745 - Leave for dinner.
1850 - Back @ lodging.
1905 - MJK, Roger & Trevor meet to review days progress
UXO Crew cleared all 9 grids in the C & D grid lines & from E500 up to E900.
Discussed rate of progress, which seems really fast & the amount of coverage that is being cleared w/ Schonstadts.
Trevor indicates he thinks they are clearing more than 33% of the surface area or more than what was IDd in work plan.
Discuss H&S, specifically Heat & Trip & Fall hazards. Many vines pose trip hazards. Several falls were observed today. Also sharp sticks pointing up from cut tracks

(43)

pose more danger.
Reviewed w/ Trevor & Roger production rate, Coverage, H&S issues.
1940 - Meeting finished. Fill out paperwork & download photos. Prep to call Bob to provide update.
1955 - Can not locate EA digital Camera. Might have been dropped in the field.
2010 - Call BS to review todays progress & issues. Left msg on voicemail
2015 - Review email from work from today.
2120 - Phone Call w/ Chip Brown to review progress of overall project & any issues.

12/7/14 (44)

0600 - Safety meeting @ lodging. Emphasize health & safety, Tripping hazards, wasp stings & heat illness

0635 - MJK & Shannon Lorraine (SL) at A line cut to continue collecting GPS data toward A900.

0745 - Bathroom & hydration break.

0800 - Back to work.

0909 - At A900. Head back down to C cut line @ C000.

1010 - Back @ road & vehicle. Hydrate & snack.

1015 - MJK stung on R ring finger by unknown insect.

1025 - Back to GPS. Move from road up C cut toward C900.

1135 - Back to vehicle & break for lunch.

1220 - Back up C cut line @ C700 working to C900.

1328 - Back @ vehicle after GPS to E of road. Change batteries

(45)

in GPS. Hydrate.

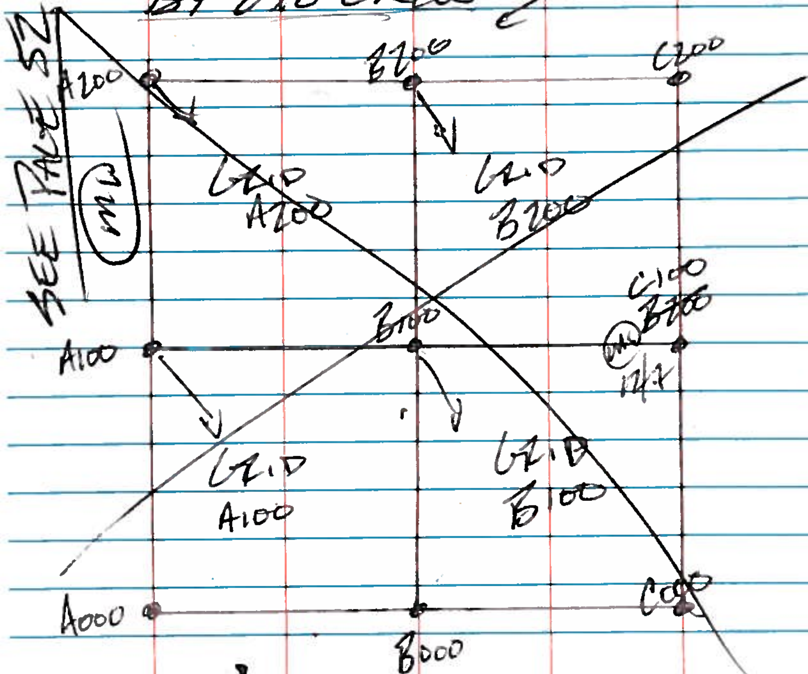
1502 - Finished GPS for day. ~480 locations collected. Head back to vehicles & meet UXO crew.

1510 - Pack equipment & drive back to lodging.

2000 - Meet w/ Roger & Trevor to review today's progress. UXO crew cleared E100 → E500, F100 → F500, G900, H900, I900, J100 today. Discussed that 127 x 100' x 100' grids are shown on Figure 3 of work plan, but text indicates there are 150 grids to clear total. It appears there should be an additional row of grids below the 000 line and also to East of P000 → P900 line. Will clarify w/ BS tomorrow. However the figure does not show DUs covering the extra rows discussed above. Also discussed that the crew cleared 4 more

100' x 100' grids yesterday than was prev. reported. The 4 grids were F600, F700, F800, F900

GRID ID CONVENTION USED BY UXO CREW?



During GPS data collection, it looks like grid A100 was swept across whole 100' x 100' while no flags were marked in grid B100. Will resweep grid B100 at end of job

if time permits. UXO crew also indicated there may be a grid # problem or error along the K cut line. They will work w/ SL who cut the lines first thing in the morning to try to correct error. GPS will occur btwn E & G cut lines from 000 to 900 tomorrow.

See pages 48 & 49 for grid clearance summary

Also review H&S for crew. Discuss possibility of Sunday work if required to complete project on time.

1025 - Done w/ UXO & H&S meeting

2055 - Done w/ writing notes & done for day

Grid Clearance Summary

Date	Grids Cleared
MW Mon ~~12/4/16~~ 12/5/16 (18) grids	A000 MW A100, A200, A300, A400, A500, A600 A700, A800, ~~A900~~ MW, B100, B200, B300, B400, B500, B600, B700 B800, ~~B900~~, B000 MW
Tues 12/6/16 (26) grids MW No 500	C000 MW C100, C200, C300, C400, C500, C600 C700, C800, ~~C900~~ MW, D100, D200, D300, D400, D500, D600, D700 D800, ~~D900~~ MW ~~D000~~ MW E500 MW ~~E500~~, E600, E700, E800, ~~E900~~ F600, F700, F800, ~~F900~~ F500 MW
Wed 12/7/16 (14) grids	E000 MW E100, E200, E300, E400, ~~E500~~ MW F000 MW ~~F100~~, F200, F300, F400, ~~F500~~ MW ~~G900~~, ~~H900~~, ~~J900~~, ~~K900~~ F100 MW MW G800, H800, J800, K800
Thurs 12/8/16 (14) grids	G000, G100, G200, G300, G400 H000, H100, H200, H300, H400 I000, I100, J000, J100

Continued on Page 49

Date	Grids Cleared
Friday 12/9/16 (18) Grids	G500, G600, G700 H500, H600, H700 I200, I300, I400, I500, I600, I700 J200, J300, J400, J500, J600, J700
Saturday 12/10/16 (18) grids	K000, K100, K200, K300, K400 K500, K600, K700, K800 L000, L100, L200, L300, L400 L500, L600, L700, L800
Saturday	Plus 120 ft strip in A & B Grids
Monday 12/12/16 (18) grids	M000, M100, M200, M300, M400 M500, M600, M700, M800 N000, N100, N200, N300, N400 N500, N600, N700, N800

126 Grids Complete

0600 - Meeting @ lodging to review safety & production.
0630 - Crew out in field. Review safety again in field. UXO crew to re sweep grid B100 based on review of data. Then they will work the G cut line. Note: they will review grid node to To be sure accurate before proceeding.
MJK & NH to collect GPS data between E. & G cut lines planning to clear E & F grids.
Weather Clear, scattered clouds. Tradewind 15-20 mph from E/NE, ≥ 80°F, Humid.
0645 - Leave vehicles & into field.
0940 - Back to vehicles for snack & H_2O.
0948 - Bob Shambach on site. Team meeting w/ Bob.
1030 - Back to work.

1200 - Back to vehicles for lunch.
1250 - MJK & NH back to GPS.
Note: Bob off site ~1215.
1415 - Back to vehicles for H_2O
Bob back on site while we were out GPS. Bob w/ UXO sweep crew.
1525 - Bob off site.
1540 - UXO crew back @ vehicles. Pack equipment & back to lodging.
NOTE: During team meeting w/ Bob, reviewed the total # of 100' x 100' grids to be cleared we noted last night on page 45 127 vs 150. Bob indicated that the 127 grids shown on Figure 3 was correct & represented 30 acres whereas 150 grids is equal to 34 acres. Discussed rate of progress for clearing grids & possibility of working on Sunday for soil sampling or GPS work.

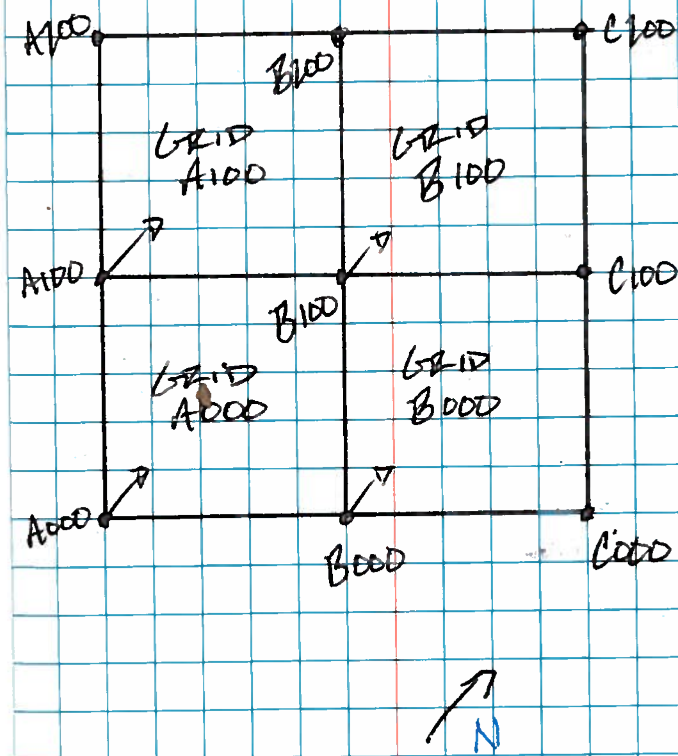
(52)

2015 - Met w/ Roger & Trevor to review today's progress.
When reviewing total # & identification of grids cleared, the grid ID shown on page 46 is not correct.
See page 53 for correct grid naming convention.
At end of today, 72 out of 127 grids cleared leaving 55 grids remaining to be cleared. GPS locations for marked surface or subsurface detections are catching up to production of UXO sweep.
→ Two significant unknown surface detections have been recorded on GRID A400 & F400.
Provide field progress update to Bob via photos.

2130 - Done for day.

(53)

UPDATED CORRECT GRID NAMING CONVENTION FOR UXO CLEARANCE



12/9/16 (54)

0600 - Safety meeting. Review slip, trip, fall hazards, both from covers of holes in the ground. Emphasize sure & steady pace & foot placement.

0640 - In field near I cut line.

0740 - Additional safety brief.

0750 - UXO Crew working between G & I cut lines from 500 to 900. GPS w/ Shannon & working btwn G & I cut lines from 200 to 900.

1100 - Back to vehicle for lunch.

1140 - Meet w/ Trevor to review progress of H&S. They are progressing well and should complete 16 to 18 grids today.

1150 - MK & SL back in field GPS from I cut to K cut moving 000 to 900.

1520 - Back to vehicles & pack equipment.

(55)

1000 - Meet w/ Trevor to review today's progress.
UXO crew cleared.
No significant H&S issues.
UXO sweep cleared 18 grids today. See page 49 for list.
→ One significant unknown located on grid G500. Tail end of 500 lb bomb under ground surface. May be tail fuse but very unlikely. Most likely does not present explosive hazard. Send daily progress update to Bob.

1145 - Done for day.

12/10/16 (56)

0600 - Safety meeting @ lodging
0645 - Crew in field & prep for
UXO sweep & GPS.
GPS will start btwn
I 400 & K 400 to finish the
I & J grids
UXO crew starting btwn.
K000 & M000 and work
toward the 800 grids.
0800 - Back to vehicle for H_2O
Weather is mostly sunny w/
passing showers, >80°F
CALM w/ no front winds.
1120 - Back to vehicles, break
for lunch.
1210 - Back to work GPS locations.
1240 - UXO crew back @ vehicles.
Report they located & flagged
an intact 500 lb bomb
w/in grid L800. Call Bob
to report & will report to
Dept. Public Safety &
XRT @ end of field day.
Note separate crew working

(57)

working on the east side
of this site. Approach &
discuss their scope of work.
ROBERT JORDAN w/ APEC
is in charge of 4 workers
who are cutting transects
for future golf course site.
They cut ~50 feet to
west of 0 cut line.
They indicate they are done
w/ this phase of project
and are leaving site. Their
company will be back
in Jan ~~2018~~ 2017 to perform
UXO sweep. They did not
have a UXO avoidance tech
on site for their transect
cutting.
ROBERT JORDAN
ROBAIRJORDAN@GMAIL.com
670 483 4831.
1300 - Back to GPS collection.
1500 - Crew back @ Vehicles.
Mike & Roger to airport to
pick up Julie (EA) for

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assistance of soil sampling & stop @ hardware store to pick up more flagging tape.

1535 - At police station to report MEC to Dept. Public Safety & Explosives Response Team (XRT). Police & XRT at station and agreed that there were MEC in the area. Did not record names of people made notification to, but they ~~[illegible]~~ indicated that MEC was common. They would notify Dept. of Defense when appropriate.

1600 - Back @ lodging. MK move rooms to accommodate Julie in larger upstairs room.

2000 - Meet w/ Julie to begin briefing & update on project progress.

2010 - Meeting w/ SUXOS and health & safety. Review today's UXO sweep progress

see page 49 for grids cleared.

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MW 12/10

~~Review~~ No health & safety issues noted today.

Review plan for soil sampling for tomorrow. No UXO sweep activities planned. MK & Julie will work w/ 2 UXO technicians to clear locations & dig holes for collection of samples from decision units (DUs). Review safety for excavation & sample collection.

2100 - Meeting w/ SUXOS and H&S Done. Continue meeting w/ Julie.

2125 - Finish meeting w/ Julie. Write up daily summary for Bob.

2200 - End of day.

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61

12/11/16 (62)

0600 - Safety meeting @ lodging.
Prepare equipment & supplies
and pack vehicle.

0700 - out to field site & prep
to collect soil samples.
Weather is sunny, no clouds
~80° F, trade winds 10 to 15
mph from E/NE.
Review UXO sweep & excavation
procedure and # of increments
for each DU to be collected
DU1. DU1 consists of
all of A & B grids plus
the western 70% of C grids.
Goal for collecting increments
is to have one increment
from each 100' x 100' grid from
A000 to A800, B000 to B800, and
C000 to C800 (in western 70%
of C grids). Increment locations
will selected randomly from
available sampling area w/
restrictions on vegetation (trees)
and avoiding digging right

(MD) NOTE: START SAMPLE 12/11 IN DU1 C0720
Western (MD)

(63)

over anomalies detected w/
Schonstedt (I.E. will not dig
over location that indicates
metal directly below the
surface).
To collect an individual
increment, UXO crew using
shovel to dig hole to
1 ft below ground surface
while scanning for metal.
After reaching 1 ft, Jolie &
MK move to the hole.
Use new disposable stainless
steel spoon to scrape side
of hole to expose fresh
soil on side from ground
surface to 1 ft bgs. Then
use spoon to collect 1 to 3
tablespoons from ground
surface to 1 ft bgs being
careful not to bias toward
top or bottom of hole.
Note that in 700 & 800 grids,
there is only 1 to 6 inches
of soil before hitting

(64)

Continuous hard Coral.
Depth in some locations
is restricted by Coral. Tried
several locations w/ same
result. Therefore, collected
some increments from the
soil that was available.
Generally below the 700
grids the thickness of
the soil profile increases
and holes dug to 1 ft
bgs as planned.
1105 - Finish 30 increments in
DU01.
ID = MAD-DU01
Used GPS to locate each of
the 30 increments.
Sample consists of 1 large
Ziplock bag w/ 2 to 3 lbs of
soil plus 1x 4 oz amber
glass jar for white phosphorus
plus 1x 4 oz clear jar for
moisture content. Soil in
Ziplock to be analyzed for
metals and explosives.

(65)

1115 - Break for lunch & H_2O
UXO avoidance crew from
morning (Shannon & James)
switch w/ Nigel & John
for afternoon.
1200 - Begin MI sampling in
DU02. Same procedure
will be followed for all
5 DU's to be sampled
In morning, MK was
12" (MW) ~~got~~ collecting soil increments
while JD was GPS and
directing UXO crew to
next location. However,
JD is on the site for
first time & not oriented
well, which slowed progress.
In afternoon, MK GPS &
directing UXO crew to next
location while JD was
collecting increments. Resulted
in much faster progress.
1330 - Finish 30 increments in DU02
ID = MAD-DU02.
Same # sample containers.

Samples triple bagged & placed in cooler w/ ice as soon as out of field & labels applied. IC → Sample cooler in vehicle under custody of Roger (H&S) or w/in locked vehicle.

1405 - Start sampling in DU03.

1420 Note less coral bedrock & thicker soil profile in 700 & 800 grids.

1520 - Finish 30 increments in DU03.

ID = MAD-DU03

Same # sample containers. Sample labeled, triple bagged & put in cooler w/ ice.

1540 - All off site.

1650 - Meet w/ Julie to review today and plan for tomorrow.

1720 - Send update to Bob.

1730 - Done for day w/ exception of re-icing samples collected today.

 12/12/16

0600 - Safety meeting @ lodging. Get ice & supplies. Re-ice samples collected yesterday.

0640 - IN field. Tailgate safety meeting. Sharpen shovels.

0705 - MK, JD, Shannon & James to collect sample from DU04. UXO crew to sweep grids M000 → M800 & N000 → N800.

Weather: Rainy, steady w/ periods of heavy downpour & periods of less rain, >80°F no to very light winds

0900 - Finish 30 increments in DU04

ID = MAD-DU04

Same # sample containers as previous. Sample into cooler w/ ice.

0910 - Sampling crew to hardware to purchase shovel & other supplies. Previous shovel handle almost broken.

(68)

0950 - Back on site. UXO sweep progressing steadily.
1000 - Sampling crew break for lunch. & wait out heavy downpour.
1045 - Decon equipment & prep to sample last DU05. Plan to collect Dupe & triplicate from DU05.
1100 - Sampling crew back into field.
1215 - Switch UXO crew for John & Nigel. UXO sweep of 18 grids complete. Shannon & James to vehicle to rest & dry out slightly
1315 - Switch UXO crew again Shannon & James continue UXO avoidance & digging holes for sampling.
Note: For collection of Dupe & trip → First locate & dig hole for primary sample, then move in random direction w/in 20 ft, of radios

12/12 (MD)

(69)

primary location and dig second hole for dupe. Return to primary location and repeat to dig third hole for triplicate sample.
1415 - Finish collecting primary duplicate & triplicate samples. Dupe & trip to be submitted blind to lab, therefore mark other time on sample labels for lab, shown below. Also different sample ID.
ID = MAD-DU05 - Primary @ 1415
DUPE = MAD-DU06 @ 1030
TRIP = MAD-DU07 @ 1230
All dated 12/12/16.
Same # sample containers as previous for all samples.
1430 - Decon equipment in downpour. Pack vehicles.
1930 - Meet w/ SUXOS & Health & Safety to review today's activities & progress.
2010 - Meeting w/ SUXOS & H&S Complete.

(70)

2010 Con't - Meet w/ Julie to review today. Plan for tomorrow is to send MK, JD, Roger & Shannon to field @ 0600 to finish GPS of UXO sweep locations from today plus A&B 120ft strip. The rest of UXO crew to be in field @ 0800 to prepare for client meeting expected between 0830 & 0900. Plan to demonstrate procedures used to complete this phase of project.

12/12 MW ~~2030~~

2030 - Meeting finished. Prepare daily update.

2200 - Done for day.

---

(71) 12/13/16

0600 - Safety meeting @ lodging. To town to get drinking H_2O, ice & other supplies.

0630 - Back @ lodging to recv samples.

0705 - MK, JD, Shannon & Roger in field to GPS flag locations in M & O plus A & B grids.

0715 - Head up O cut line to GPS flags laid down past.

0815 - Julie back to vehicle to prep sample setup for client demonstration

0910 - MK & Shannon back to vehicles to prep for client visit.

0950 - RACHEL ROQUE, CNMI DPL & TIM LANE ON site w/ Bob Shambach. They are on site for tour and to see a demo of the process for UXO sweep and soil sampling. Roger provide safety briefing

(72)

and visitors log. Walk around site, view the MEC in grid L000 plus the surface MD in the K out line. Then proceed to the grid A100 to demo the UXO sweep and soil sampling procedure.

1220 - Rachel, Tim & Bob off site. UXO crew back to lodging to demobe and clean, pack equipment. John (UXO Tech) MK & JD stay on site to finish GPS of UXO sweep flags in the A & B grids plus the remaining grids (M & N).

1400 - Finish GPS of UXO flags. Back to lodging.

1430 - Bob at lodging. Debrief.

1930 - Repack all samples w/ fresh ice to transport to Saipan tomorrow w/ JD prior to FedEx to lab.

(73)

2140 - Samples iced & prepared to ship w/ JD to Saipan. Will be reiced prior to shipping from Saipan to Eurofins Laboratory in Lancaster PA.

Note: Samples to be analyzed for PAH SW8270C Sim
METALS SW6010B/6020/7471A
EXPLOSIVES SW8330B
WHITE PHOSPHORUS SW7580

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SUXOS Log

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E A

TINIAN SUXOS LOG

MASALOG

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CONTENTS

PAGE NO.	REFERENCE	DATE

EA

MONDAY 12-5-2016 TINIAN 01

0600 MORNING SAFETY AND SUXOS BRIEF
0630 EQUIPMENT LOAD INTO THE
VEHICLE DEPARTED TO THE SITE
0845 ON SITE
0850 IUS CHECKS SATISFACTORY
TEAM MEMBERS: (SUXOS/TL) TREVOR BARLOW
(T2) SHANNON LINNANES (T2) NIGEL HARMEN
(T1) JAMES HIPP (T1) JONATHAN CLARK
0900 STARTED GRID A000/TAILGATE SAFETY BRIEF (TSB)
0940 COMPLETED GRIDS A000, A100, A200, A300
0950 SIGNIFICANT UNKNOWN FOUND IN GRID
A400 PHOTO TAKEN
1150 COMPLETED GRIDS A400, A500, A600,
A700, A800, AND ~~A900~~ TJB 12-8-16
1200 LUNCH
1330 ON SITE
1500 COMPLETED GRIDS B000, B100, B200
B300, B400, B500, B600, B700, B800
AND ~~B900~~ TJB 12-8-16
1510 BACK TO VEHICLES
1530 BACK AT LODGING
BEGIN ADMIN
1700 ADMIN COMPLETE

Trevor Barlow

EA
TINIAN (02)

TUESDAY 12-6-2016

0600 MORNING SAFETY AND SUXOS BRIEF
0630 EQUIPMENT LOAD OUT
0645 DEPART FOR SITE
0650 ON SITE
0700 IVS CHECKS COMPLETE SATISFACTORY
TEAM MEMBERS: (SUXOS/TL) TREVOR BARLOW
(T2) SHANNON LINNANES (T2) NIGEL HARMAN
(T1) JAMES HIPP (T1) JONATHAN CLARK
0705 JONATHAN CLARK REPORTS INSECT BITES
0710 STARTED GRIDS C000/D000 / TSB
0735 COMPLETED GRIDS C000/D000
STARTED GRIDS C100/D100
0755 COMPLETED GRIDS C100/D100
0935 COMPLETED GRIDS C200/D200, C300,
D300, AND C400/D400
1130 COMPLETED GRIDS C500/D500, C600/D600
AND C700/D700
1300 LUNCH
1300 STARTED GRIDS C800/D800
1500 COMPLETED GRIDS C800/D800, ~~C900~~ TJB
~~D900~~ TJB, ~~E900~~ TJB/~~F900~~ TJB, E800/F800, E700/F700
AND E600/F600
ALL 900 LINE OUTS DATED 12-8-16

Trevor Barlow

EA
TINIAN (03)

WEDNESDAY 12-7-2016

0600 MORNING SAFETY AND SUXOS BRIEF
0630 EQUIPMENT MAINTENANCE AND LOAD OUT
0900 TEAM ON SITE
0905 IVS CHECK COMPLETE SATISFACTORY
0910 STARTED GRIDS ~~G400~~/~~H400~~/TSB
0945 COMPLETED GRIDS ~~G400~~, ~~H400~~
~~F400~~, ~~J400~~, I800 AND J800
BREAK COMPLETED G800 AND H800 GRIDS
1000 STARTED GRIDS E400/F400
1020 FOUND SIGNIFICANT UNKNOWN
GRID F400
1050 COMPLETED GRIDS E400/F400
BREAK
1105 STARTED GRIDS E300 AND F300
1145 COMPLETED GRIDS E300 AND F300
1200 LUNCH
1300 STARTED GRIDS E200 AND F200
1345 COMPLETED GRIDS E200 AND F200
1425 COMPLETED GRIDS E100 AND F100
1500 COMPLETED GRIDS E000 AND F000
1510 BACK AT VEHICLES
1520 DEPARTED SITE
NFE TE
[signature]

EA
TINIAN (04)

THURSDAY 12-8-2016

0600 MORNING SAFETY AND SUXOS BRIEF
0630 EQUIPMENT LOAD OUT
0645 ON SITE
0650 IVS CHECKS SATISFACTORY
TEAM MEMBERS: SUXOS/TL TREVOR BARLOW
(T2) SHANNON LINNANES (T2) NIGEL HARMAN
(T1) JAMES HIPP (T1) JOHNATHAN CLARK
0700 TAILGATE SAFETY BRIEF (TSB)
0710 TEAM SURVEYED GRIDS K AND I FOR
VERIFICATION OF PROPER DISTANCE
DISTANCE BETWEEN I AND K OBSERVED
TO BE TOO CLOSE TOGETHER
0800 STARTED GRID G100/H100
0920 COMPLETED G100, H100, I100 & J100
0925 STARTED J000 AND I000.
0950 COMPLETED J000 AND I000
BREAK TO MEET WITH PM BOB SHAMBACH
1030 ~~COMPLETED~~ STARTED G000 AND H000
1120 COMPLETED G000 AND H000
1130 STARTED G200 AND H200
1200 LUNCH
1300 COMPLETED G200 AND H200
1530 COMPLETED G300, H300, G400 AND H400
1545 DEPARTED SITE

Trevor Barlow

EA
TINIAN 05

FRIDAY 12-9-2016

0600 MORNING SAFETY AND SUXOS BRIEF
0615 EQUIPMENT LOAD OUT
0630 DEPART TO SITE
0645 IVS CHECKS SATISFACTORY
TEAM MEMBERS: (SUXOS/TL) TREVOR BARLOW
(T2) SHANNON LANNANE (T2) NIGEL HARMAN
(T1) JAMES HIPP (T1) JONATHAN CLARK
0650 TAILGATE SAFETY BRIEF
0700 STARTED GRIDS G500 - 700
0715 FOUND SIGNIFICANT UNKNOWN IN G500
0740 COMPLETED GRIDS G500, H500,
G600, H600, G700, AND H700
0742 STARTED GRID I700 AND J700
1030 COMPLETED GRIDS I700, J700, I600,
J600, I500 AND J500
1200 LUNCH
1300 STARTED GRIDS I300 AND J300
1335 COMPLETED GRIDS I300 AND J300
1400 COMPLETED GRIDS I400 AND J400
1445 COMPLETED GRID I200 AND J200
1500 LOADED EQUIPMENT
1520 DEPARTED SITE
NFETP

Trevor Barlow

EA
TWIAN 06

SATURDAY 12-10-2016

0600 MORNING SAFETY AND SUXOS BRIEF
0630 EQUIPMENT LOAD OUT DEPART TO SITE
0645 IVS CHECKS SATISFACTORY
TEAM MEMBERS: SUXOS/TL TREVOR BARLOW
(T2) SHANNON LINNANE (T2) NIGEL HARMAN
(T1) JAMES HIPP (T1) JONATHAN CLARK
0650 TAIGATE SAFETY BRIEF
0700 STARTED GRIDS K000 AND L000
0730 COMPLETED GRIDS K000 & L000
0810 COMPLETED GRIDS K100 AND L100
0845 COMPLETED GRIDS K200 AND L200
BREAK
0900 STARTED GRIDS K300 AND L300
0930 COMPLETED K300 AND L300
1015 COMPLETED K400 AND L400
1050 COMPLETED K500 AND L500
1130 COMPLETED K600 AND L600
1150 FOUND MEC BOMB ON THE L800 SIDE OF L700 PHOTO
1210 COMPLETED GRID K700 AND L700
1245 COMPLETED GRID K800 AND L800

07

1300 LUNCH
1400 SWEPT MIDDLE OF A & B GRID LINES FROM A/B 000 - A/B 800
1510 BACK TO VEHICLES
1530 BACK AT LODGING
BEGIN ADMIN
1700 END ADMIN SECURE FOR DAY

NFETP
Trevor Barlow

EA
TINIAN 08

MONDAY 12-12-2016

0600 MORNING SAFETY AND SUXOS BRIEF
0615 EQUIPMENT LOAD OUT
0630 DEPART TO SITE
0645 ON SITE
0700 IVS CHECKS COMPLETE
TEAM MEMBERS: (SUXO) (T2) TREVOR BARLOW
(T2) SHANNON LINNANE (T2) NIGEL HARMAN
(T1) JAMES HIPP (T1) JONATHAN CLARK
0705 STARTED GRIDS M000 AND N000
1200 COMPLETED GRIDS M000, M100, M200, M300, M400, M500, M600, M700, M800, N000, N100, N200, N300 N400, N500, N600, N700 AND N800
LUNCH
1300 JOINED THE SOIL SAMPLE TEAM
1420 DEPART SITE

NFETP
Trevor Barlow

EA
TINIAN (9)

TUESDAY 12-13-2016

0600 MORNING SAFETY BRIEF
0615 EQUIPMENT LOAD OUT FOR SOIL
SAMPLES & DATA COLLECTION
0630 DEPART FOR SITE
0640 ON SITE (T2) SHANNON LINNANE
0700 START DATA COLLECTION ON THE
M AND N GRIDS
0800 TEAM ARRIVES ON SITE
TAIL GATE SAFETY BRIEF
TEAM MEMBERS: (SUXOS/TL) TREVOR BARLOW
(T2) NIGEL HARMAN (T1) JAMES HIPP
(T1) JONATHAN CLARK
0900 PREP FOR MISSION CAPABILITIES
BRIEF AND DEMONSTRATION
0930 MEET WITH THE PM AND THE
CLIENT.
0945 ESCORT CLIENT TO MEC BOMB
IN GRID L800. EXPLAIN WHY IT
IS MEC.
1000 ESCORT CLIENT TO EMPTY 500 LB
BOMB
1100 CONDUCT UXO SWEEP DEMONSTRATION
1200 DEPART SITE FOR EQUIPMENT
MAINTENANCE, CLEANUP, AND PACK UP

EA
TINIAN 10

TUESDAY 12-13-2016
1400 COMPLETED MAINTENANC
1430 EQUIPMENT PACKOUT/LOADOUT
1500 ADMIN REPORTS
1600 REPORTS COMPLETE

NEETP

Jerry Bartolo

UXOQCS-UXOSO Log

UXOQCS/UXOSO LOG
MASAlog AMMO Depot
Pena, TINIAN

Forestry Suppliers, Inc.
1-800-647-5368
#49352 Field Book

CONTENTS

PAGE NO.	REFERENCE	DATE
	Roger Perkins	
	UX0SW/UX0QCS	

12-5-16 ①

0600	Conducted SSHP brief and Review of work plan.
0700	SUXOS & Geo conducted Operations brief.
0745	Load Equipment.
0800	Depart for MRS. Conduct Equipment checks in IVS. No discrepancies. Tailgate brief
0830	Begin Surface operations in Grid A100.
	** ALL QC CHECKS WILL BE CONDUCTED IN CONJUNCTION WITH SWEEP OPERATIONS **
1200	Lunch
1300	Continue sweep ops.
1400	Break
1415	Resume sweep ops.
1500	Sweep Ops complete. Depart Grids. Clean & Store Equipment.
1530	Debrief. Depart MRS
1600	EOD.

Grids QC'D: 18

A100 – A900

B100 – B900

Safety observations 12-5-16

- Heat & Humidity: Hydration is a must.
- UXO TECH I Jamie Hupp was mildly dehydrated at end of day. Stated he had sinus infection prior to arrival.
- Slips, Trip & Fall hazards are high due to thick vegetation.
- Trees in transects were cut at an angle causing a potential puncture hazard.
- Port-A-John delivered on site.

12-6-16 (2)

0600	Safety brief; Ops brief
0630	Load Equip; Depart for MRS.
0630	IVS Checks; Gear prep. Tailgate brief.
0658	Begin sweep ops in Grid C100.
0915	Break
0930	Resume sweep Ops. Resume DATA Collection
1145	Lunch
1215	Resume Ops
1300	Sweep team slightly disorganized due to heavy veg. Recommended marking grid line prior to beginning sweep.
1415	Break
1430	Resume sweep ops. Data Collection Halted (See Safety Concerns)
1515	Sweep ops complete. Depart Grids
1530	Stow equip. Debrief.
1600	EOD

Grids QC'd: RBP ~~28~~ 26

C-100 – C900

D 100 – D900

E 600 – E900 (Possibly mislabeled.)

F600 – F900

Safety Observations 12-6-15

- Mike Kelly reported mild heat exhaustion.
- Jonathan Clark reported numerous bug bites from prior day.
- James Hipp stung by wasp. No Allergic Sympt.
- Trevor Barlow stung by wasp. No Allergic Sympt.

** All personnel briefed to continue hydrating before & after work **

12-7-16 (3)

0600 Safety & Ops brief.
0630 Load equip & depart for MRS.
0640 Equip checks. Tailgate brief.
~~0700 Begin re-sweep of B~~
~~0730 Verification of grid lines J&K. Possibility of K being incorrect.~~
Correction: Incorrect entries lined out RBP
~~0730~~ 0700 Begin G900 - J900. No J900 grid stake identified. Grid I ended @ grid K. QC checks
0800 Begin E-F500. QC checks in-conjunction with H.
0930 Break.
0945 Resume sweep ops.
1200 Lunch
1230 Resume sweep ops in E-F 200. QC checks in conjunction with sweep ops.
1415 Break
1430 Resume sweep ops in E-F 100. QC checks in conjunction with.
1515 E-F grids complete. Depart grids.
1530 Stow equip. Debrief.
1550 Depart MRS.
1600 End.

Grids complete: 14
~~E-F 500-100~~ RBP E000-E400
G, H, I, J ~~400~~ RBP 800 F000-F400

RBP

Safety Observations 12-7-16

- Shannon Cimmanes reported mild heat exhaustion.
- All personnel reporting they are continuing to hydrate after & before work.
- No reaction to personnel being stung by wasps reported.
- Jonathon Clark reported rash & itching on arms. Treating w/ alcohol & hydrocortizone.
- Site cleaned at end of day.

RBP

12-8-16 (4)

0600 Safety & Ops brief. Load equip.
0630 Depart for MRS.
0640 Equip checks, Tailgate brief.
0700 Resweep B~~100~~ 000. QC checks.
0730 Investigation of possible grid errors.
At the ~~900~~ 800 line I is 100' from K.
0800 Begin Sweep Ops in I-K 200. QC checks.
0945 Break. Bob Shambach on site.
1030 Safety brief for PM. Resume operations
1200 Lunch
1230 Resume Operations
1430 Break
1445 Resume Ops
1530 Ops Complete. Return to vehicles.
Stow gear. Debrief.
1600 EOD.

Grids complete & QC'D: 14
G000-G400
H000-H400
I000-I100
J000-J100

Safety observations 12-8-16

- No heat exhaustion reports.
- Several wasp nests were identified.
- Personnel still utilizing alcohol to treat rashes.
- UXO60 has heat rash on back from carrying pack.
- Port o Johns were serviced.
- Jonathan Clare continues to utilize Alcohol & Hydrocortizone to treat rash. No worsening symptoms.
- Site cleaned at end of day.

12-9-16 (5)

0600	Safety, Ops brief. Load equipment.
0630	Depart for MRS.
0640	Arrive MRS. Equipment Checks. Tailgate brief.
0700	Begin Sweep & Data Collection. QC
0930	Break
0945	Resume observation & QC of operations.
1200	Lunch
1230	Resume Ops & QC checks.
1400	Break.
1415	Resume Ops & QC checks.
1530	Ops complete. Depart Grids. Stow equip.
1545	Debrief. Depart MRS.
1600	EOD.

Grids Complete & QC'd: 18

G-500 - G700

H500 - H700

~~E600 - I~~ I 200 - I 700

J200 - J700

Safety Observations 12-9-16

- All personnel have acclimated to the region.
- All personnel wore appropriate PPE at all Times.
- Jonathan Clarks rash is subsiding.
- All personnel continuing to adequately hydrate before and after work.
- Site cleaned at end of day.

12-10-16 ⑥

0600	Safety & Ops brief. Load equipment.
0630	Depart for MRS.
0640	Arrive MRS. Equip checks. Tailgate brief.
0655	Resume Sweep & Data Collection Ops. QC checks.
0945	Break.
1000	Resume Ops. QC checks.
1300	Lunch
1330	Resume Ops. QC checks.
1515	Depart Grids. Stow equipment.
1530	Debrief. Depart MRS.
1600	EOD. Julie Duany (EA Eng) onsite.
1615	DPS & XRT notified of MEC item located in Grid L

Grids complete & QC'd:
K000 - K800
L000 - L800

Late Entry MEC (Incendiary Bomb, 500 lb) located and marked. Data collected in Trimble to be annotated in Final Report.

Safety Observations. 12-10-16

- All personnel are utilizing the appropriate PPE at all times.
- Adequate water supplies are on hand to facilitate hydration.
- Adequate breaks are taken throughout the day.
- Site was cleaned prior to departing MRS.
- SSHP conducted for Julie Duany.

12-11-16

0600 Safety brief. Soil Sample brief.
Load Equipment.
0630 Depart for MRS.
0640 Arrive MRS. Equip checks. Equip preps.
0720 Begin soil sampling activities.
0930 Break
0945 Resume Soil Sample Activities.
1130 Lunch. Personnel change for UXO escort.
1200 Resume Soil Sampling Activities.
1400 Break
1415 Resume Activities.
1530 Activities complete. Stow gear.
1600 EOD

Decision Units Complete: 3 of 5
DU1, DU2, DU3

RS

Safety Observations 12-11-16

- SSHP brief for Julie Dolan, EA Eng.
- Hydration stressed.
- Proper PPE worn at all times.

RS

12-12-16 ⑧

0600 Safety, Ops & Sampling brief.
Load Equip.
0630 Depart for MRS.
0640 Arrive MRS. Equip checks & Preps. Tailgate brief
0700 Begin Sweep & Sampling Ops.
0900 Break. Sampling team to store for Supplies.
0915 Return to sweep operations.
1045 Sampling team returns.
1100 Return to Sampling Activities.
1130 UXO team lunch.
1200 Return to sweep Ops.
1230 Sweep Ops complete.
1430 Sampling Activities complete. Stow gear.
1445 Depart MRS
1500 EOD

DU's Completed: DU4, DU5
DU's Complete: 5 of 5
Grids Completed: M000-M800; N000-N900
Grids Complete: 126-126

RB [signature]

Safety Observations 12-12-16

- Rain all day - Slips, Trips & Falls a big consideration.
- Hydrate
- Nigel Harman was stung by a wasp on the arm. No allergic reaction.

RB [signature]

APPENDIX D

AFTER ACTION REPORT, MUNITIONS OF EXPLOSIVE CONCERN ANOMALLY AVOIDANCE AND SURFACE CLEARANCE

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EA Engineering, Science, and Technology, Inc., PBC
1001 Army Drive, Suite 103,
Barrigada, 96913-1402
Telephone: (671) 646-5231
Facsimile: (671) 646-5230

AFTER ACTION REPORT
MUNITIONS AND EXPLOSIVES OF CONCERN
ANOMALY AVOIDANCE AND SURFACE CLEARANCE

Figure D-1
Vicinity Map

Date: 03/04/16	Drawn By: JSoriano	EA Project No. 63019.

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COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

Legend

Site Boundary

N

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1001 Army Drive, Suite 103,
Barrigada, 96913-1402
Telephone: (671) 646-5231
Facsimile: (671) 646-5230

AFTER ACTION REPORT
MUNITIONS AND EXPLOSIVES OF CONCERN
ANOMALY AVOIDANCE AND SURFACE CLEARANCE

Figure D-2
General Location

Date: 03/04/16 | Drawn By: JSoriano | EA Project No. 63019.

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COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

EA Engineering, Science, and Technology, Inc., PBC
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AFTER ACTION REPORT
MUNITIONS AND EXPLOSIVES OF CONCERN
ANOMALY AVOIDANCE AND SURFACE CLEARANCE

Figure D-3
Site Grid and
Transect Lines

Date: 01/27/17	Drawn By: RKinchla	EA Project No. 63019

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COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

0 150 300 600 Feet

N

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Barrigada, 96913-1402
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AFTER ACTION REPORT
MUNITIONS AND EXPLOSIVES OF CONCERN
ANOMALY AVOIDANCE AND SURFACE CLEARANCE

Figure D-4
Grid Identification

Date: 01/27/17 | Drawn By: RKinchla | EA Project No. 63019

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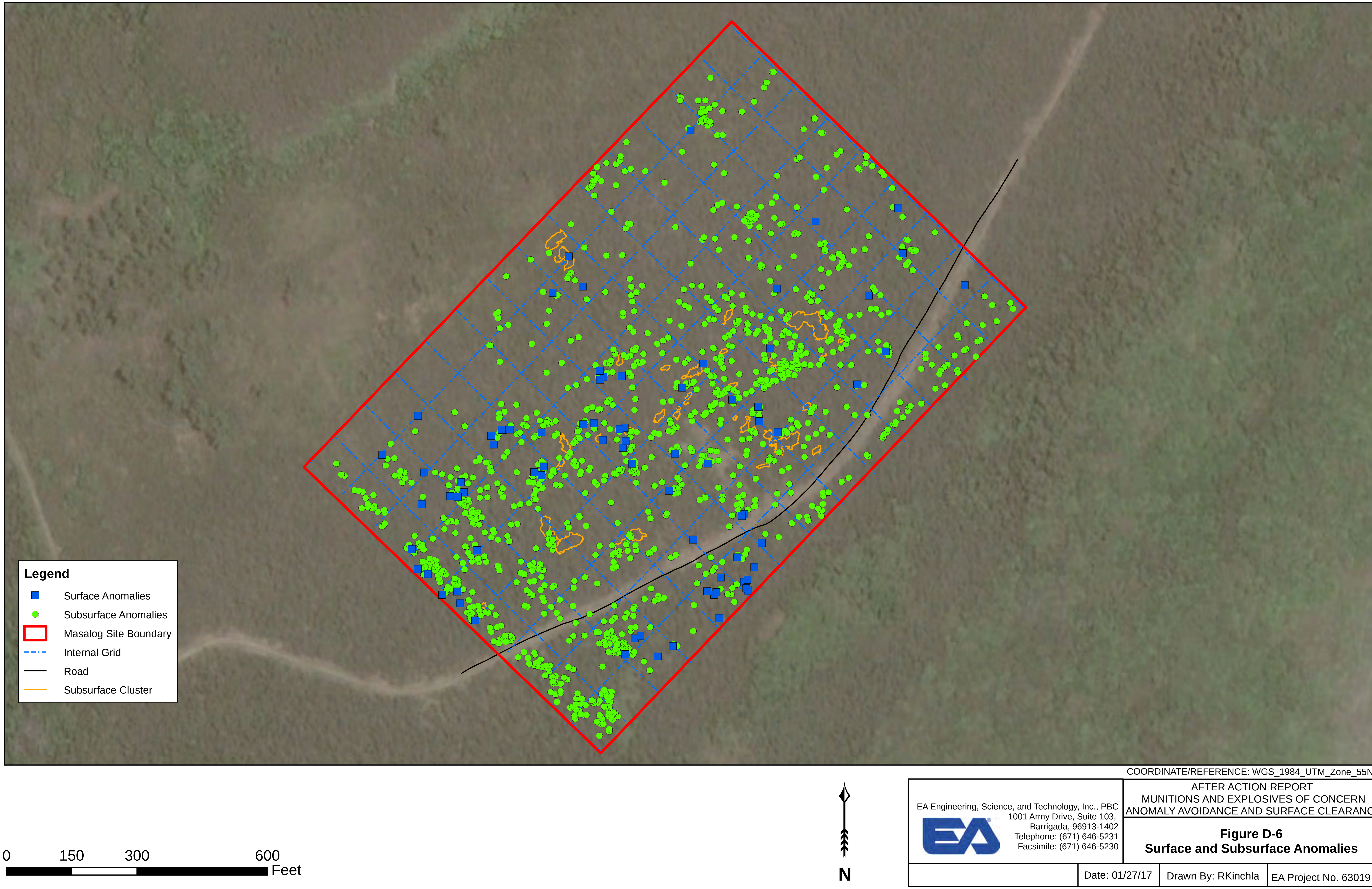

COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

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AFTER ACTION REPORT
MUNITIONS AND EXPLOSIVES OF CONCERN
ANOMALY AVOIDANCE AND SURFACE CLEARANCE

Figure D-6
Surface and Subsurface Anomalies

Date: 01/27/17 | Drawn By: RKinchla | EA Project No. 63019

COORDINATE/REFERENCE: WGS_1984_UTM_Zone_55N

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1001 Army Drive, Suite 103,
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AFTER ACTION REPORT
MUNITIONS AND EXPLOSIVES OF CONCERN
ANOMALY AVOIDANCE AND SURFACE CLEARANCE

Figure D-6
MEC Locations

Date: 01/27/17	Drawn By: RKinchla	EA Project No. 63019

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APPENDIX E

ANALYTICAL REPORTS
AND CHAIN-OF-CUSTODY RECORDS

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RTI LABORATORIES, INC.

Analytical Report

Level IV Data Package

Work Order #: 1612702

Project: Guam Samples

Eurofins Lancaster Laboratories, Inc.
Kathy Binkley
2425 New Holland Pike
Lancaster, PA 17601

Reviewed & Approved By: ______________________ Date: 1/12/2017

Charles O`Bryan, Director, Quality Management

RTI Laboratories
31628 Glendale St.
Livonia, MI 48150

TEL: (734) 422-8000
FAX: (734) 422-5342
Website: www.rtilab.com

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10 CLP-Like Inorganic

10.1 Balance

10.1.1 Percent Moisture - PMOIST

10.1.1.1 FormI 140

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RTI Laboratories, Inc. **Date:** *12-Jan.-17*

CLIENT: Eurofins Lancaster Laboratories, Inc.

Project Name: Guam Samples

Work Order: 1612702

CASE NARRATIVE

SAMPLE RECEIPT:
Samples were received at the RTI Laboratory, Livonia, MI via commercial delivery on 12/22/2016. Samples were received on wet ice and sample blank temperatures are recorded on the chain of custody and sample receiving documents. Sample preservation is checked on receipt (where applicable) and noted on the chain of custody. Adjustments required for sample preservation (when performed) are recorded for the affected samples. The sample set consisted of 7 soil samples.

SAMPLE ANALYSIS:
Samples were analyzed at the RTI Livonia Laboratory for:
White Phosphorus - EPA Method 7580
Percent Moisture - ASTM-D2216

QUALITY CONTROL:

White Phosphorus Analyses:

All sample analyses included a Method Blank, LCS, LCSD and MS/MSD where applicable. All QC parameters were within established control limits except where noted on the QC summary forms or below. Initial and continuing calibration results were within method specifications.

Surrogate recoveries were within control limits.

Wet Chemistry Analysis:

All sample analysis included the method specified quality control samples.

No other problems were noted during the analytical events associated with this report.

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 has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Celsto Hotash

Signed:________________________for________________________Date: January 12, 2017
Charles O'Bryan, Director, Quality Management

DEFINITIONS:

DF: Dilution factor; the dilution factor applied to the prepared sample.

DL: Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.

DUP: Duplicate; aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently, used to calculate Precision (%RPD).

LCS: Laboratory Control Sample; prepared by adding a known amount of target analytes to a specified amount of clean matrix and prepared with the batch of samples, used to calculate Accuracy (%REC).

LCSD: A duplicate LCS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

LOD: Limit of Detection; a laboratory verified concentration that can be detected at three times greater than the noise level. This concentration is equal to or greater than the DL.

LOQ: Limit of Quantitation; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below the LOQ are reported with a “J” qualifier.

MBLK: Method Blank; a sample of similar matrix that does not contain target analytes or interference that may impact the analytical results and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedure, used to assess and verify that the analytical process is free of contamination.

Mg/Kg or mg/L: Units of part per million (PPM) – milligram per Kilogram (W/W) or milligram per Liter (W/V).

MS: Matrix Spike; prepared by adding a known amount of target analytes to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available, used to calculate Accuracy (%REC)

MSD: A duplicate MS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

% REC: Percent Recovery of a known spike (SPK); a measure of accuracy expressed as a percentage of a measured (recovered) concentration compared to the known concentration (SPK) added to the sample. This is compared to the Low Limit and High Limit.

% RPD: Relative Percent Difference; a measure of precision expressed as a percentage of the difference between two duplicates relative to the average concentration. This is compared to the RPD Limit.

Qual: Qualifier that applies to the analyte reported

SPK: Spike; used in the QC section for both SPK Value and SPK Ref Val

Ug/Kg or ug/L: Units of part per billion (PPB) – microgram per Kilogram (W/W) or microgram per Liter (W/V).

QUALIFIERS:

*: Reported value exceeds the maximum allowed concentration by regulation or permit.

B: Analyte detected in the associated Method Blank at a concentration greater than 1/2 the LOQ

G: ICB/CCB result is greater than the MDL

H: Holding time for preparation or analysis has been exceeded

J: Estimated result. Greater uncertainty is associated with this result and data reported is estimated.

M: Manual Integration used to determine area response

P: Second column RPD exceeds 40%

Q: % REC exceeded control limits. When applied to sample analytes - denotes an associated LCS recovery that exceeded control limits.

R: % RPD exceeds control limits

T: MBLK result is greater than 1/2 of the LOQ

U: The analyte concentration is less than the DL. The result is reported as less than the LOD

X: Matrix spike recovery for the noted analyte exceeded control limits. Applied to the MS/MSD parent sample.

Y: Percent Difference/Drift in the associated CCV exceeded acceptance criteria.

Z: Percent Difference/Drift in the associated ICV exceeded acceptance criteria.

eurofins | Lancaster Laboratories

1612702

Analysis Request / Environmental Services Subcontracting Form

For Lancaster Laboratories Use Only

Date: 12/21/16

Acct: ______ Group No.: 1746738 Sample Nos.: 8755030-36

Subcontractor: RTI LABORATORIES

LLI P.O.# : ______ Courier: Fed Ex

Submit report to: Kathy Binkley Ext.: 1393

Submit invoice to: Kathy Binkley

State where samples were collected: Guam

Matrix: Grab / Composite / Soil / Water (☐ Potable ☐ NPDES) / Other

Analyses Requested / Preservation Codes

Preservation Codes: H=HCl T=Thiosulfate N=HNO_3 B=NaOH S=H_2SO_4 O=Other

Comments:Reference Proposal # DH041715 and request Level IV data package.

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total # of Containers	Method 7580 for White Phosphorus.										Temperature of samples upon receipt (if requested)
MAD-DU01	12/11/16	11:05		X	X			1	X									8755030	
MAD-DU02	12/11/16	13:30		X	X			1	X									8755031	
MAD-DU03	12/11/16	15:20		X	X			1	X									8755032	
MAD-DU04	12/11/16	09:00		X	X			1	X									8755033	
MAD-DU05	12/11/16	14:15		X	X			1	X									8755034	
MAD-DU06	12/11/16	10:30		X	X			1	X									8755035	
MAD-DU07	12/11/16	12:30		X	X			1	X									8755036	

Turnaround Time Requested (TAT): Standard Rush

Date Results are Needed: TAT is 10 business days

Email invoice to: kbinkley@lancasterlabs.com

COMMENTS:RTI Laboratories: Dry weight reporting would be appropriate for the White Phosphorus as these soil samples will not be dried.

Relinquished by:	Date	Time	Received by:	Date	Time
Kathy Binkley	12-21-16	1550	[signature]	12-22-16	14:02

Data Package Options (circled when required)

Type I (validation/NJ Reg) Type VI(Raw Data)

Type II (Tier II) Type III (Reduced NJ)

Type IV (CLP SOW) TX TRRP-13

MA MCP

CT RCP

SDG Complete? Yes No

Site-specific QC Required (MS/MSD/DUP)? Yes No

Internal Chain of Custody Required? Yes No

ORIGIN ID:LNSA (717) 656-2300
SHIPPING & RECEIVING
EUROFINS LANCASTER LABS INC
2425 NEW HOLLAND PIKE

LANCASTER, PA 17601
UNITED STATES US

SHIP DATE: 21DEC16
ACTWGT: 14.65 LB
CAD: 814137/DAPI3601
DIMS: 14x14x11 IN

BILL SENDER

TO SAMPLE RECEIVING
RTI LABORATORIES, INC.
31628 GLENDALE AVENUE

LIVONIA MI 48150
(734) 422-8000
DEPT: 40

FedEx
Express
E

J161016072601uv

THU - 22 DEC 10:30A
PRIORITY OVERNIGHT

TRK# 0201 5035 4242 7560

48150
MI-US DTW

ET CFAA

Part # 156148V-434 RIT2 EXP 05/17

Temp Blank: 3.0°C

Client Cooler: K0909Z

RTI LABORATORIES, INC.

RTI Laboratories
31628 Glendale St.
Livonia, MI 48150
TEL: (734) 422-8000
Website: www.rtilab.com

Sample Receipt Checklist

Client Name:	**EUR02**			Work Order Number:	**1612702**
RCPNo:	**1**	Date and Time Received:	**12/22/2016 2:02:00 PM**	Received by:	**Armando Flores**
Completed By:		Reviewed By:	Rachel Dean		
Completed Date:	**12/27/2016 5:30:39 PM**	Reviewed Date:	**12/28/2016 11:55 AM**		

Carrier Name: FedEx

1.	Chain of custody present?	Yes [x]	No [ ]	
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]	
3.	Chain of custody agrees with sample labels?	Yes [x]	No [ ]	Not Present [ ]
4.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]	
5.	Is it clear what analyses were requested?	Yes [x]	No [ ]	
6.	Custody seals intact on sample bottles?	Yes [ ]	No [ ]	Not Present [x]
7.	Samples in proper container/bottle?	Yes [x]	No [ ]	
8.	Were correct preservatives used and noted?	Yes [x]	No [ ]	NA [ ]
9.	Sample containers intact?	Yes [x]	No [ ]	
10.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]	
11.	Were container lables complete (ID, Pres, Date)?	Yes [x]	No [ ]	
12.	All samples received within holding time?	Yes [x]	No [ ]	
13.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]
14.	All samples received at a temp. of > 0° C to 6.0° C?	Yes [x]	No [ ]	NA [ ]
15.	Sample Temp. taken and recorded upon receipt?	Yes [ ]	No [x]	3 To ºC
16.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]
17.	Water - Was there Chlorine Present?	Yes [ ]	No [ ]	NA [x]
18.	Water - pH acceptable upon receipt?	Yes [ ]	No [ ]	No Water [x]
19.	Are Samples considered acceptable?	Yes [x]	No [ ]	
20.	Custody Seals present?	Yes [ ]	No [x]	
21.	Traffic Report or Packing Lists present?	Yes [ ]	No [x]	
22.	Airbill or Sticker?	Air Bill [x]	Sticker [ ]	Not Present [ ]
23.	Airbill No:	503542427560		
24.	Sample Tags Present?	Yes [ ]	No [x]	
25.	Sample Tags Listed on COC?	Yes [ ]	No [x]	
26.	Tag Numbers:			
27.	Sample Condition?	Intact [x]	Broken [ ]	Leaking [ ]
28.	Response when temperature is outside of range:			
29.	Preservative added to bottles:			

Case Number: SDG: SAS:

Adjusted? ______________ Checked by ______________

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client Name: **EUR02** Work Order Number: **1612702**

Comment: +++FOREIGN/RESTRICTED SOIL+++
Client sent us their permit to receive foreign soil (samples are from Guam). Client did not have RTI's permit to receive foreign soil.

Client Contacted: Yes ☐ No ☒ NA ☐ Person Contacted:

Contact Mode: Phone ☐ Fax: ☐ Email: ☐ In Person: ☐

Date Contacted: Contacted By:

Regarding:

Client Instructions:

CorrectiveAction: Sent client copy of RTI's permit to receive foreign soil for future samples.

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
K09092	3.0	Good	Not Present			

SampleID	ContainerID	Type	Vacuum Read (inch Hg)	Orig pH	Adj pH	Req Min pH	Req Max pH
1612702-001A	Cont-01 of 01	Bottle					
1612702-002A	Cont-01 of 01	Bottle					
1612702-003A	Cont-01 of 01	Bottle					
1612702-004A	Cont-01 of 01	Bottle					
1612702-005A	Cont-01 of 01	Bottle					
1612702-006A	Cont-01 of 01	Bottle					
1612702-007A	Cont-01 of 01	Bottle					

RTI Laboratories, Inc. - Workorder Sample Summary

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples

Lab Sample ID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
1612702-001A	MAD-DU01		12/11/2016 11:05 AM	12/22/2016 2:02 PM	Restricted Soil
1612702-002A	MAD-DU02		12/11/2016 1:30 PM	12/22/2016 2:02 PM	Restricted Soil
1612702-003A	MAD-DU03		12/11/2016 3:20 PM	12/22/2016 2:02 PM	Restricted Soil
1612702-004A	MAD-DU04		12/11/2016 9:00 AM	12/22/2016 2:02 PM	Restricted Soil
1612702-005A	MAD-DU05		12/11/2016 2:15 PM	12/22/2016 2:02 PM	Restricted Soil
1612702-006A	MAD-DU06		12/11/2016 10:30 AM	12/22/2016 2:02 PM	Restricted Soil
1612702-007A	MAD-DU07		12/11/2016 12:30 PM	12/22/2016 2:02 PM	Restricted Soil

RTI Laboratories, Inc. - DATES REPORT

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1612702-001A	MAD-DU01	12/11/2016 11:05 AM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 1:40 PM
1612702-002A	MAD-DU02	12/11/2016 1:30 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 1:59 PM
1612702-003A	MAD-DU03	12/11/2016 3:20 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 2:19 PM
1612702-004A	MAD-DU04	12/11/2016 9:00 AM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 2:38 PM
1612702-005A	MAD-DU05	12/11/2016 2:15 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 2:57 PM
1612702-006A	MAD-DU06	12/11/2016 10:30 AM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 3:17 PM
1612702-007A	MAD-DU07	12/11/2016 12:30 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 4:15 PM

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 11:05:00 AM
Project:	Guam Samples		
Lab ID:	1612702-001	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU01		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.1	U	0.44	1.1	1.6	µg/Kg-dry	1	1/5/2017 1:40 PM
Surr: Tripropylphosphate	33.2			27-112		%Rec	1	1/5/2017 1:40 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	34		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 1:30:00 PM
Project:	Guam Samples		
Lab ID:	1612702-002	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU02		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.42	1.0	1.5	µg/Kg-dry	1	1/5/2017 1:59 PM
Surr: Tripropylphosphate	29.3			27-112		%Rec	1	1/5/2017 1:59 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	30		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 3:20:00 PM
Project:	Guam Samples		
Lab ID:	1612702-003	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU03		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	0.91	U	0.37	0.91	1.4	µg/Kg-dry	1	1/5/2017 2:19 PM
Surr: Tripropylphosphate	37.3			27-112		%Rec	1	1/5/2017 2:19 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	22		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 9:00:00 AM
Project:	Guam Samples		
Lab ID:	1612702-004	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU04		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.41	1.0	1.5	µg/Kg-dry	1	1/5/2017 2:38 PM
Surr: Tripropylphosphate	38.3			27-112		%Rec	1	1/5/2017 2:38 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	30		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 2:15:00 PM
Project:	Guam Samples		
Lab ID:	1612702-005	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU05		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.42	1.0	1.5	µg/Kg-dry	1	1/5/2017 2:57 PM
Surr: Tripropylphosphate	39.9			27-112		%Rec	1	1/5/2017 2:57 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	31		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 10:30:00 AM
Project:	Guam Samples		
Lab ID:	1612702-006	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU06		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.1	U	0.43	1.1	1.6	µg/Kg-dry	1	1/5/2017 3:17 PM
Surr: Tripropylphosphate	39.7			27-112		%Rec	1	1/5/2017 3:17 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	32		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 12:30:00 PM
Project:	Guam Samples		
Lab ID:	1612702-007	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU07		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.42	1.0	1.6	µg/Kg-dry	1	1/5/2017 4:15 PM
Surr: Tripropylphosphate	46.3			27-112		%Rec	1	1/5/2017 4:15 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	31		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - QC SUMMARY REPORT

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples **Batch ID:** 42082

Sample ID: **MB-42082**	Samp Type: **MBLK**		Test Code: **SW_7580S**	Units: **µg/Kg**	Prep Date:		**1/4/2017**	RunNo:	**91424**	
Client ID: **PBS**	Batch ID: **42082**		TestNo: **SW7580**		Analysis Date:		**1/5/2017**	SeqNo:	**1787143**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
White Phosphorus	0.72	1.1									U
Surr: Tripropylphosphate	69		250.0		27.6	27	112				

Sample ID: **LCS-42082**	Samp Type: **LCS**		Test Code: **SW_7580S**	Units: **µg/Kg**	Prep Date:		**1/4/2017**	RunNo:	**91424**	
Client ID: **LCSS**	Batch ID: **42082**		TestNo: **SW7580**		Analysis Date:		**1/5/2017**	SeqNo:	**1787144**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
White Phosphorus	9.1	1.1	10.73	0	84.4	75	125				
Surr: Tripropylphosphate	100		249.9		41.6	27	112				

Sample ID: **LCSD-42082**	Samp Type: **LCSD**		Test Code: **SW_7580S**	Units: **µg/Kg**	Prep Date:		**1/4/2017**	RunNo:	**91424**	
Client ID: **LCSS02**	Batch ID: **42082**		TestNo: **SW7580**		Analysis Date:		**1/5/2017**	SeqNo:	**1787145**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
White Phosphorus	9.6	1.1	10.73	0	89.5	75	125	9.055	5.81	25	
Surr: Tripropylphosphate	110		249.9		43.1	27	112		0	25	

RTI Laboratories, Inc. - QC SUMMARY REPORT

WO#: 1612702

Date Reported: 1/6/2017
Revision v1

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples **Batch ID:** **R91282**

Sample ID: **1612665-001ADUP** Samp Type: **DUP** Test Code: **PMOIST** Units: **wt%** Prep Date: **12/27/2016** RunNo: **91282**

Client ID: **ZZZZZZ** Batch ID: **R91282** TestNo: **D2216** Analysis Date: **12/27/2016** SeqNo: **1784653**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	19	1.0						17.30	7.17	20	

Sample ID: **1612702-007ADUP** Samp Type: **DUP** Test Code: **PMOIST** Units: **wt%** Prep Date: **12/27/2016** RunNo: **91282**

Client ID: **MAD-DU07LR1** Batch ID: **R91282** TestNo: **D2216** Analysis Date: **12/27/2016** SeqNo: **1784666**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	32	1.0						31.20	2.33	20	

Form I

CLIENT SAMPLE NO.

MAD-DU01

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-001A

Sample wt/vol: 40.05g Lab File ID: 517npd13.D

Level: (low/med) LOW Date Collected: 12/11/2016 11:05 AM

% Moisture: 33.9869 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 1:40 PM

Seq Number: 1787146 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	1.1	U	0.44	1.1	1.6

SW7580

Form I

CLIENT SAMPLE NO.

MAD-DU02

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-002A

Sample wt/vol: 40.02g Lab File ID: 517npd14.D

Level: (low/med) LOW Date Collected: 12/11/2016 1:30 PM

% Moisture: 30.2986 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 1:59 PM

Seq Number: 1787147 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	1.0	U	0.42	1.0	1.5

SW7580

Form I

CLIENT SAMPLE NO.

MAD-DU03

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-003A

Sample wt/vol: 40.08g Lab File ID: 517npd15.D

Level: (low/med) LOW Date Collected: 12/11/2016 3:20 PM

% Moisture: 21.5143 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 2:19 PM

Seq Number: 1787148 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	0.91	U	0.37	0.91	1.4

SW7580

Form I

CLIENT SAMPLE NO.

MAD-DU04

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-004A

Sample wt/vol: 40.06g Lab File ID: 517npd16.D

Level: (low/med) LOW Date Collected: 12/11/2016 9:00 AM

% Moisture: 29.9291 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 2:38 PM

Seq Number: 1787149 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	1.0	U	0.41	1.0	1.5

SW7580

Form I

CLIENT SAMPLE NO.

MAD-DU05

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-005A

Sample wt/vol: 40g Lab File ID: 517npd17.D

Level: (low/med) LOW Date Collected: 12/11/2016 2:15 PM

% Moisture: 30.5258 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 2:57 PM

Seq Number: 1787150 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	1.0	U	0.42	1.0	1.5

SW7580

Form I

CLIENT SAMPLE NO.

MAD-DU06

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-006A

Sample wt/vol: 40.03g Lab File ID: 517npd18.D

Level: (low/med) LOW Date Collected: 12/11/2016 10:30 AM

% Moisture: 32.059 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 3:17 PM

Seq Number: 1787151 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	1.1	U	0.43	1.1	1.6

SW7580

Form I

CLIENT SAMPLE NO.

MAD-DU07

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Restricted Soil Lab Sample ID: 1612702-007A

Sample wt/vol: 40.02g Lab File ID: 517npd21.D

Level: (low/med) LOW Date Collected: 12/11/2016 12:30 PM

% Moisture: 31.2007 Date Received: 12/22/2016 2:02 PM

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 4:15 PM

Seq Number: 1787154 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg-dry	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	1.0	U	0.42	1.0	1.6

SW7580

Form I

CLIENT SAMPLE NO.

MB-42082

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Solid Lab Sample ID: MB-42082

Sample wt/vol: 40g Lab File ID: 517npd10.D

Level: (low/med) LOW Date Collected:

% Moisture: N/A Date Received:

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 12:42 PM

Seq Number: 1787143 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	0.72	U	0.29	0.72	1.1

SW7580

Form I

CLIENT SAMPLE NO.

LCS-42082

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Solid Lab Sample ID: LCS-42082

Sample wt/vol: 40.01g Lab File ID: 517npd11.D

Level: (low/med) LOW Date Collected:

% Moisture: N/A Date Received:

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 1:02 PM

Seq Number: 1787144 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	9.1		0.29	0.71	1.1

SW7580

Form I

CLIENT SAMPLE NO.

LCSD-42082

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Matrix: Solid Lab Sample ID: LCSD-42082

Sample wt/vol: 40.01g Lab File ID: 517npd12.D

Level: (low/med) LOW Date Collected:

% Moisture: N/A Date Received:

Extract Volume: 10000(µl) Date Analyzed: 1/5/2017 1:21 PM

Seq Number: 1787145 Dilution Factor: 1.00

GC Column: OP Pesticides Batch ID: 42082

Column ID: OPPesticides(mm)

CAS NO.	COMPOUND	CONC. UNITS: µg/Kg	Q	DL	LOD	LOQ
7723-14-0	White Phosphorus	9.6		0.29	0.71	1.1

SW7580

FORM II B

SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RTI Laboratories, Inc. Contract: EUR02

Lab Code: GLEN01 Client No: EUR02

SAS No.: SDG No.: 1612702 Level(low/med): low

GC Column(1): OP Pesticides ID: OPPesticides(mm)

GC Column(2): ID: (mm)

	Client SAMPLE NO.	TOT OUT	SMC #
01	MB-42082	0	27.6
02	LCS-42082	0	41.6
03	LCSD-42082	0	43.1
04	MAD-DU01	0	33.2
05	MAD-DU02	0	29.3
06	MAD-DU03	0	37.3
07	MAD-DU04	0	38.3
08	MAD-DU05	0	39.9
09	MAD-DU06	0	39.7
10	MAD-DU07	0	46.3

		QC Limit
SMC1	=Tripropyl phosphate	27-112

Column to be used to flag recovery values

* Values outside of contract required QC limits

FORM III

SYSTEM MONITORING SPIKE/DUPLICATE RECOVERY

Lab Name: RTI Laboratories, Inc. Contract: EUR02

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Sample ID: LCSD-42082 Level:(low/med) LOW

COMPOUND	SPIKE ADDED Units (µg/Kg)	SAMPLE CONC. Units (µg/Kg)	LCS CONC. Units (µg/Kg)	LCS % REC #	QC LIMITS REC	SPIKE ADDED Units (µg/Kg)	LCSD CONC. Units (µg/Kg)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
White Phosphorus	11	0	9.1	84.4	75-125	11	9.6	89.5	5.81	25	75-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

FORM IV

METHOD BLANK SUMMARY

Client SAMPLE NO.

MB-42082

Lab Name: RTI Laboratories, Inc. Contract: EUR02

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

Lab File ID: 517npd10.D Lab Sample ID: MB-42082

Date/Time Analyzed: 1/5/2017 12:42 PM Instrument ID: GC-DUAL-NPD

GC Column: OP Pesticides Matrix: S

Column ID: OPPesticides(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING: SAMPLES, LCS, LCSD, MS AND MSD

	CLIENT SAMPLE NO.	LAB SAMPLE ID	FILE ID	DATE ANALYZED
01	LCS-42082	LCS-42082	517npd11.D	1/5/2017 1:02 PM
02	LCSD-42082	LCSD-42082	517npd12.D	1/5/2017 1:21 PM
03	MAD-DU01	1612702-001A	517npd13.D	1/5/2017 1:40 PM
04	MAD-DU02	1612702-002A	517npd14.D	1/5/2017 1:59 PM
05	MAD-DU03	1612702-003A	517npd15.D	1/5/2017 2:19 PM
06	MAD-DU04	1612702-004A	517npd16.D	1/5/2017 2:38 PM
07	MAD-DU05	1612702-005A	517npd17.D	1/5/2017 2:57 PM
08	MAD-DU06	1612702-006A	517npd18.D	1/5/2017 3:17 PM
09	MAD-DU07	1612702-007A	517npd21.D	1/5/2017 4:15 PM
10	ZZZZZ	LOD-42082	517npd22.D	1/5/2017 4:34 PM
11	ZZZZZ	LOQ-42082	517npd23.D	1/5/2017 4:53 PM

FORM VI

White Phosphorus in Soil INITIAL CALIBRATION DATA

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 Workorder: 1612702 Calibration ID: 91424

Instrument ID: GC-DUAL-NPD Calibration Begin Date/Time: 1/5/2017 10:08 AM

GC Column: OPPesticides Calibration End Date/Time: 1/5/2017 11:44 AM

Column ID: OP Pesticides(mm)

LAB FILE ID:

ICAL1-010517NPD010517npd02.D ICAL2- 010517NPD010517npd03.D ICAL5- 010517NPD010517npd06.D ICAL6- 010517NPD010517npd07.D ICAL5- 010517NPD010517npd06.D

ICAL6- 010517NPD010517npd07.D

COMPOUND	ICAL1-010517NPD	ICAL2-010517NPD	ICAL3-010517NPD	ICAL4-010517NPD	ICAL5-010517NPD	ICAL6-010517NPD					CF	% RSD	R^2	Curve Type
Tripropyl phosphate	922.88	907.00	1203.5	1311.8	1233.8	1287.4	0	0	0	0			0.996889	QUAD
White Phosphorus	12582	14611	14027	15655	16285	16019	0	0	0	0			0.998300	QUAD

* Compounds with required minimum RRF and maximum %RSD values.

All other compounds must meet a minimum RRF of 0.010.

FORM VI C

White Phosphorus in Soil INITIAL CALIBRATION DATA - RETENTION TIMES

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 Workorder: 1612702 Calibration ID: 91424

Instrument ID: GC-DUAL-NPD Calibration Begin Date/Time: 1/5/2017 10:08 AM

GC Column: OPPesticides Calibration End Date/Time: 1/5/2017 11:44 AM

Column ID: OP Pesticides(mm)

LAB FILE ID:

ICAL1-010517NPD 010517npd02.D ICAL2- 010517NPD 010517npd03.D ICAL5- 010517NPD 010517npd06.D ICAL6- 010517NPD 010517npd07.D ICAL5- 010517NPD 010517npd06.D

ICAL6- 010517NPD 010517npd07.D

COMPOUND	ICAL1-010517NPD	ICAL2-010517NPD	ICAL3-010517NPD	ICAL4-010517NPD	ICAL5-010517NPD	ICAL6-010517NPD					Mean RT	Lower RT Limit	Upper RT Limit	
Tripropyl phosphate	12.808	12.806	12.805	12.804	12.805	12.805	0	0	0	0	12.81	12.76	12.86	
White Phosphorus	1.946	1.947	1.947	1.946	1.946	1.946	0	0	0	0	1.95	1.90	2.00	

FORM VII B

CONTINUING CALIBRATION CHECK

Lab Name: RTI Laboratories, Inc. Contract: EUR02 Client No: EUR02

Lab Code: GLEN01 SAS No.: SDG No.: 1612702

Instrument ID: GC-DUAL-NPD Lab File ID: 517npd08.D Sample ID: ICV- 010517NPD

GC Column: OP Pesticides GC Column ID: OPPesticides(mm)

Cal. Begin Date: 1/5/2017 10:08 AM Cal. End Date: 1/5/2017 11:44 AM

COMPOUND	CURVE TYPE	ICAL Avg RRF	minRRF	RRF	%D	MAX %D	THEO CONC	RCVR CONC	%Drift	MAX $\%D^2$
White Phosphorus	QUAD	0	0	13780			42.9	38.0	12.3	
Tripropyl phosphate	QUAD	0	0	1255.6			2000	2000	0.633	

FORM VII B

CONTINUING CALIBRATION CHECK

Lab Name: RTI Laboratories, Inc. Contract: EUR02 Client No: EUR02

Lab Code: GLEN01 SAS No.: SDG No.: 1612702

Instrument ID: GC-DUAL-NPD Lab File ID: 517npd20.D Sample ID: CCV-010517NPD-1

GC Column: OP Pesticides GC Column ID: OPPesticides(mm)

Cal. Begin Date: 1/5/2017 10:08 AM Cal. End Date: 1/5/2017 11:44 AM

COMPOUND	CURVE TYPE	ICAL Avg RRF	minRRF	RRF	%D	MAX %D	THEO CONC	RCVR CONC	%Drift	MAX %D²
White Phosphorus	QUAD	0	0	13384			42.9	37.0	14.8	
Tripropyl phosphate	QUAD	0	0	721.77			2000	1200	42.2	

FORM VII B

CONTINUING CALIBRATION CHECK

Lab Name: RTI Laboratories, Inc. Contract: EUR02 Client No: EUR02

Lab Code: GLEN01 SAS No.: SDG No.: 1612702

Instrument ID: GC-DUAL-NPD Lab File ID: 517npd25.D Sample ID: CCV-010517NPD-2

GC Column: OP Pesticides GC Column ID: OPPesticides(mm)

Cal. Begin Date: 1/5/2017 10:08 AM Cal. End Date: 1/5/2017 11:44 AM

COMPOUND	CURVE TYPE	ICAL Avg RRF	minRRF	RRF	%D	MAX %D	THEO CONC	RCVR CONC	%Drift	MAX %D²
White Phosphorus	QUAD	0	0	14039			42.9	38.0	10.7	
Tripropyl phosphate	QUAD	0	0	712.03			2000	1100	42.9	

FORM VIII PEST1

PESTICIDE ANALYTICAL SEQUENCE

Lab Name: RTI Laboratories, Inc. Contract: EUR02

Lab Code: GLEN01 ClientID: EUR02 SAS No.: SDG No.: 1612702

GC Column: OP Pesticides ID: OPPesticides(mm)

Init. Calib. Date(s): 1/5/2017 1/5/2017 Instrument ID: GC-DUAL-NPD

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES ,BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

SURROGATE RT FROM CONTINUING CALIBRATION : 12.81

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	RT #	RT #
01	ICV- 010517NPD	ICV- 010517NPD	1/5/2017	12:03	12.81	
02	CRQL-010517NPD	CRQL-010517NPD	1/5/2017	12:23	12.81	
03	MB-42082	MB-42082	1/5/2017	12:42	12.82	
04	LCS-42082	LCS-42082	1/5/2017	13:02	12.81	
05	LCSD-42082	LCSD-42082	1/5/2017	13:21	12.81	
06	MAD-DU01	1612702-001A	1/5/2017	13:40	12.81	
07	MAD-DU02	1612702-002A	1/5/2017	13:59	12.81	
08	MAD-DU03	1612702-003A	1/5/2017	14:19	12.81	
09	MAD-DU04	1612702-004A	1/5/2017	14:38	12.81	
10	MAD-DU05	1612702-005A	1/5/2017	14:57	12.81	
11	MAD-DU06	1612702-006A	1/5/2017	15:17	12.81	
12	CCB-010517NPD-1	CCB-010517NPD-1	1/5/2017	15:36	12.81	
01	CCV-010517NPD-1	CCV-010517NPD-1	1/5/2017	15:55	12.81	
02	MAD-DU07	1612702-007A	1/5/2017	16:15	12.82	
03	ZZZZZ	LOD-42082	1/5/2017	16:34	12.82	
04	ZZZZZ	LOQ-42082	1/5/2017	16:53	12.81	
05	CCB-010517NPD-2	CCB-010517NPD-2	1/5/2017	17:12	12.81	
01	CCV-010517NPD-2	CCV-010517NPD-2	1/5/2017	17:32	12.81	

QC LIMITS

= Tripropyl phosphate (± 0.00 MINUTES)

Column used to flag values outside QC limits with an asterisk. * Values outside of QC limits.

Injection Log

Data Directory: C:\msdchem\2\data\010517WPHOS\

SampleName	MiscInfo	Vial	Multiplier	Injection Time
1) 010517npdA.D Prime102816NPD			1.000	05 Jan 2017 8:12 am
2) 010517npdB.D Prime102816NPD			1.000	05 Jan 2017 8:32 am
3) 010517npdC.D Prime102816NPD			1.000	05 Jan 2017 8:51 am
4) 010517npdE.D Prime102816NPD			1.000	05 Jan 2017 9:10 am
5) 010517npdG.D Prime102816NPD			1.000	05 Jan 2017 9:30 am
6) 010517npd01.D ICB-010517NPD			1.000	05 Jan 2017 9:49 am
7) 010517npd02.D ICAL1-010517NPD			1.000	05 Jan 2017 10:08 am
8) 010517npd03.D ICAL2- 010517NPD			1.000	05 Jan 2017 10:28 am
9) 010517npd04.D ICAL3- 010517NPD			1.000	05 Jan 2017 10:46 am
10) 010517npd05.D ICAL4- 010517NPD			1.000	05 Jan 2017 11:05 am
11) 010517npd06.D ICAL5- 010517NPD			1.000	05 Jan 2017 11:25 am
12) 010517npd07.D ICAL6- 010517NPD			1.000	05 Jan 2017 11:44 am
13) 010517npd08.D ICV- 010517NPD			1.000	05 Jan 2017 12:03 pm
14) 010517npd09.D CRQL-010517NPD			1.000	05 Jan 2017 12:23 pm
15) 010517npd10.D MB-42082			1.000	05 Jan 2017 12:42 pm
16) 010517npd11.D LCS-42082			1.000	05 Jan 2017 13:02 pm
17) 010517npd12.D LCSD-42082			1.000	05 Jan 2017 13:21 pm
18) 010517npd13.D 1612702-001A			1.000	05 Jan 2017 13:40 pm
19) 010517npd14.D 1612702-002A			1.000	05 Jan 2017 13:59 pm
20) 010517npd15.D 1612702-003A			1.000	05 Jan 2017 14:19 pm
21) 010517npd16.D 1612702-004A			1.000	05 Jan 2017 14:38 pm

```
22) 010517npd17.D
1612702-005A                                        1.000     05 Jan 2017  14:57 pm
  ---------------------------------------------------------------------------
23) 010517npd18.D
1612702-006A                                        1.000     05 Jan 2017  15:17 pm
  ---------------------------------------------------------------------------
24) 010517npd19.D
CCB-010517NPD-1                                     1.000     05 Jan 2017  15:36 pm
  ---------------------------------------------------------------------------
25) 010517npd20.D
CCV-010517NPD-1                                     1.000     05 Jan 2017  15:55 pm
  ---------------------------------------------------------------------------
26) 010517npd21.D
1612702-007A                                        1.000     05 Jan 2017  16:15 pm
  ---------------------------------------------------------------------------
27) 010517npd22.D
LOD-42082                                           1.000     05 Jan 2017  16:34 pm
  ---------------------------------------------------------------------------
28) 010517npd23.D
LOQ-42082                                           1.000     05 Jan 2017  16:53 pm
  ---------------------------------------------------------------------------
29) 010517npd24.D
CCB-010517NPD-2                                     1.000     05 Jan 2017  17:12 pm
  ---------------------------------------------------------------------------
30) 010517npd25.D
CCV-010517NPD-2                                     1.000     05 Jan 2017  17:32 pm
  ---------------------------------------------------------------------------
```

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd01.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On   : 05 Jan 2017   9:49 am
Operator :
Sample   : ICB-010517NPD
Misc   :
ALS Vial : 0 (Sig #1); 1 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:37:28 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.   :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

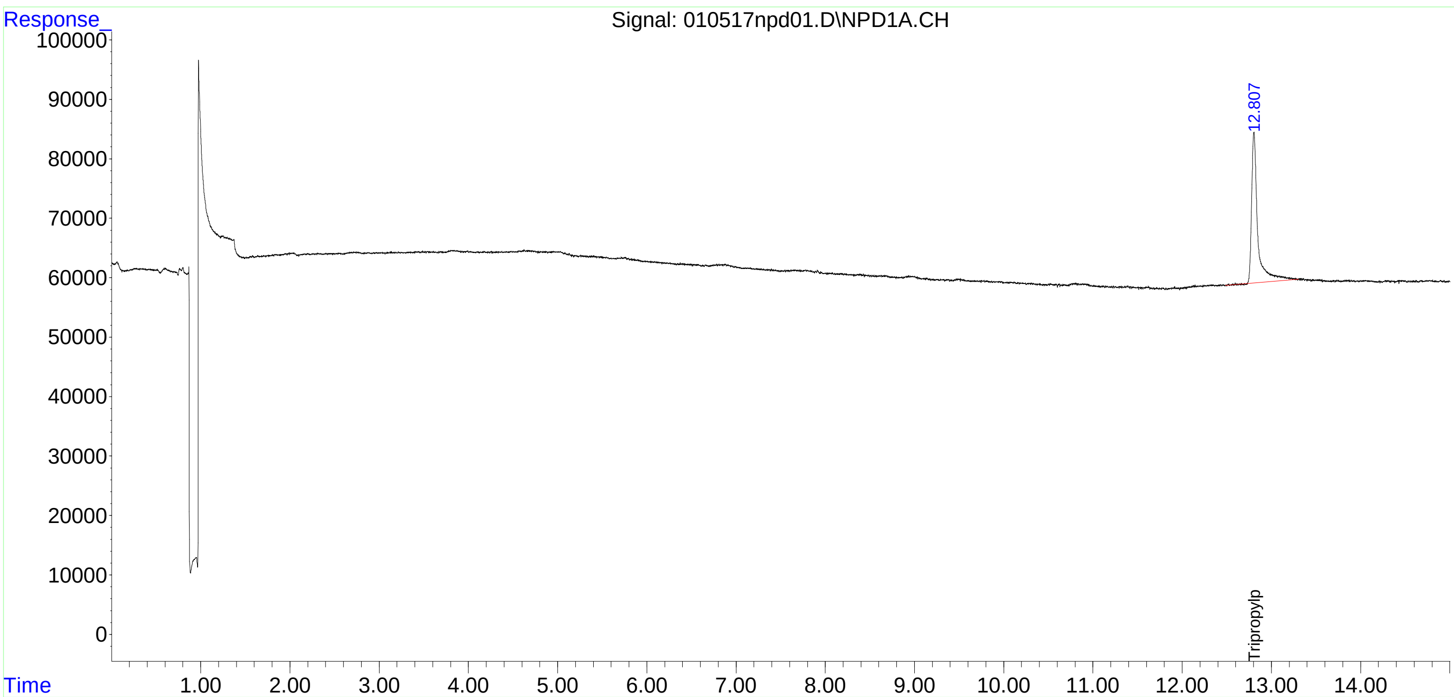
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.806	11.579	1216299	262072	974.842	1311.987m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

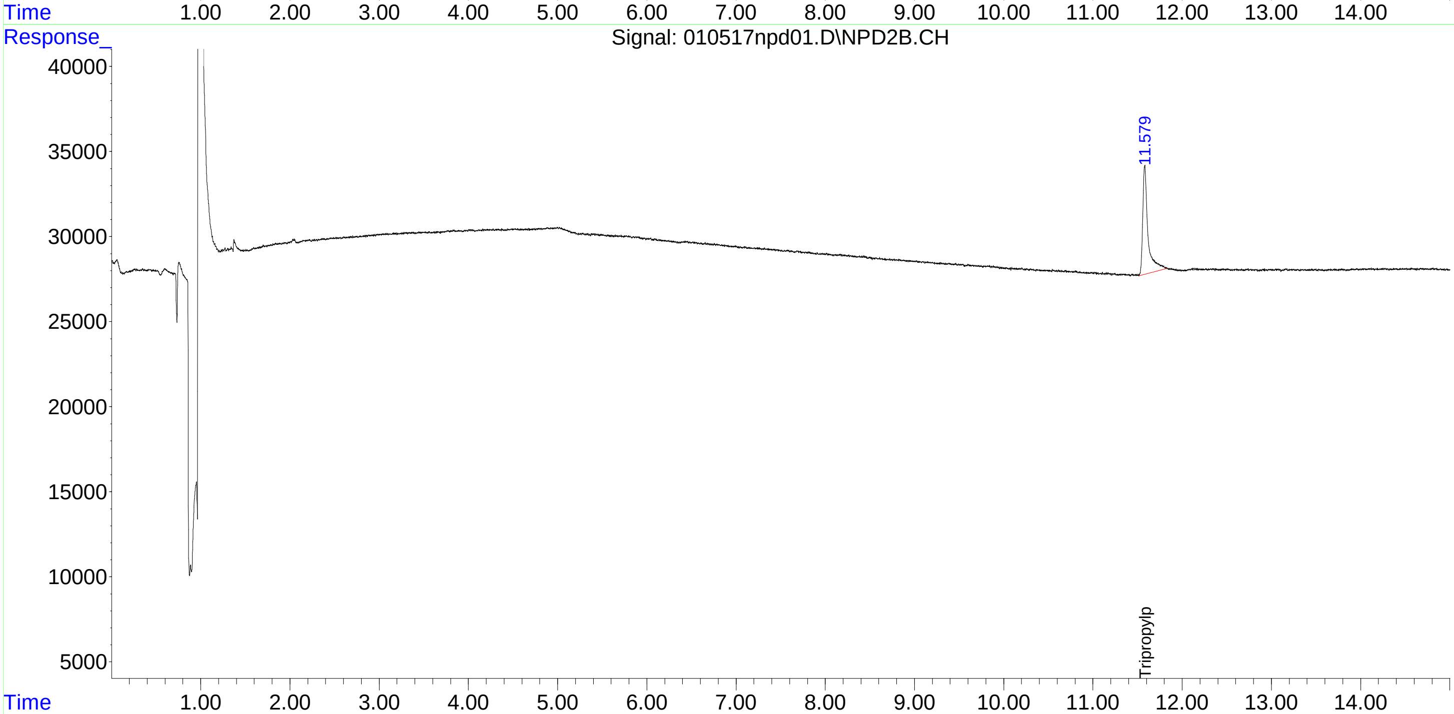
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd01.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 9:49 am
Operator :
Sample : ICB-010517NPD
Misc :
ALS Vial : 0 (Sig #1); 1 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:37:28 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

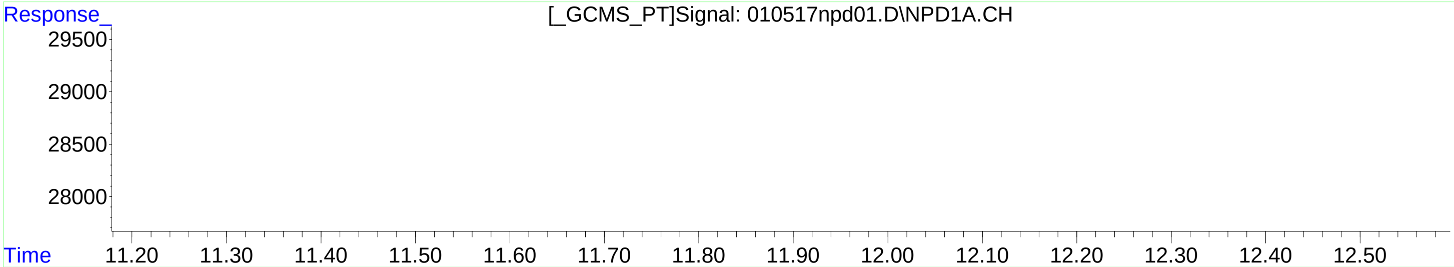
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

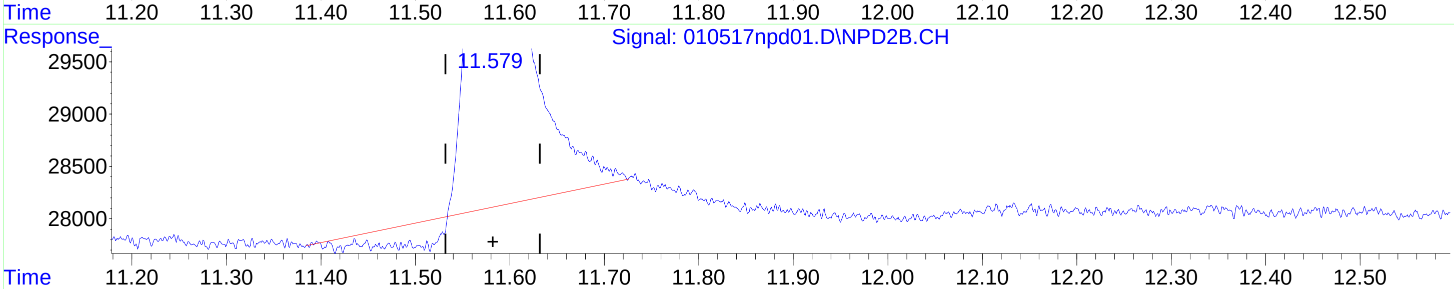




Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd01.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd01.D\NPD2B.CH
Acq On    : 05 Jan 2017   9:49 am                      Operator:
Sample    : ICB-010517NPD                              Inst     : GC-NPD
Misc      :                                            Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:13:32 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.806min 974.842 ug/L

response 1216299

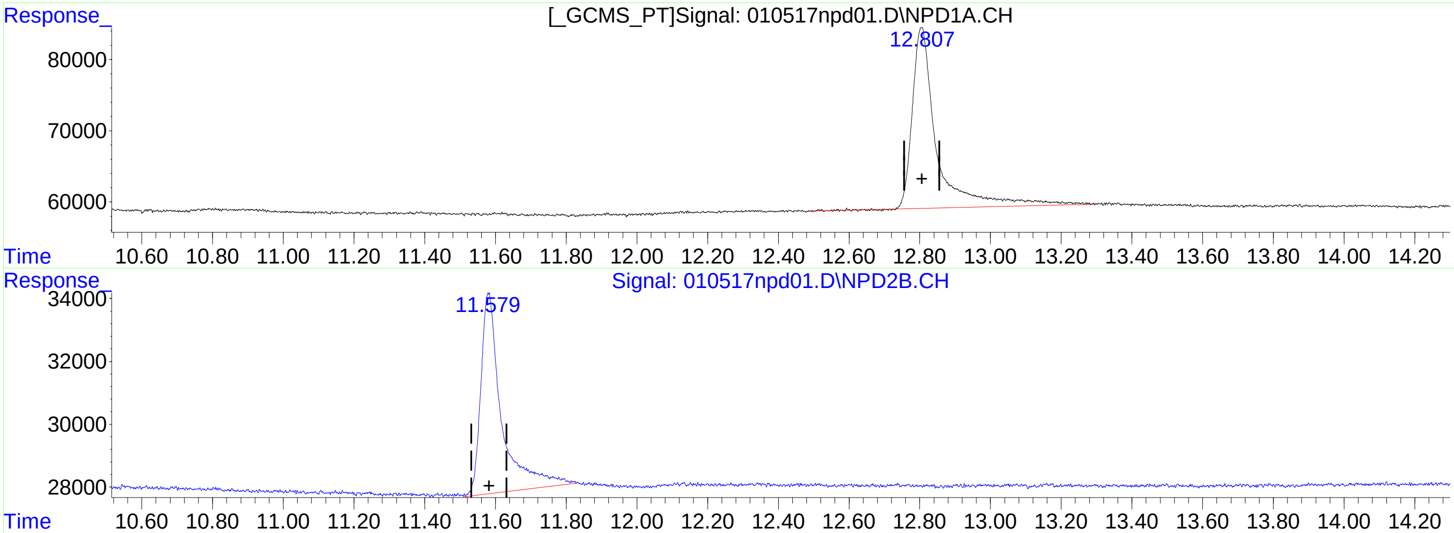
(1) Tripropylphosphate #2

11.580min 1009.285 ug/L

response 195203

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd01.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd01.D\NPD2B.CH
Acq On    : 05 Jan 2017   9:49 am                  Operator:
Sample    : ICB-010517NPD                          Inst     : GC-NPD
Misc      :                                        Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:13:32 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.806min 974.842 ug/L

response 1216299

(1) Tripropylphosphate #2

11.579min 1311.987 ug/L m

response 262072

Reason for Manual Integration, Column 2:

Software incorrectly integrated peak.
-DS

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd09.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 12:23 pm
Operator :
Sample : CRQL-010517NPD
Misc :
ALS Vial : 0 (Sig #1); 2 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:43:01 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

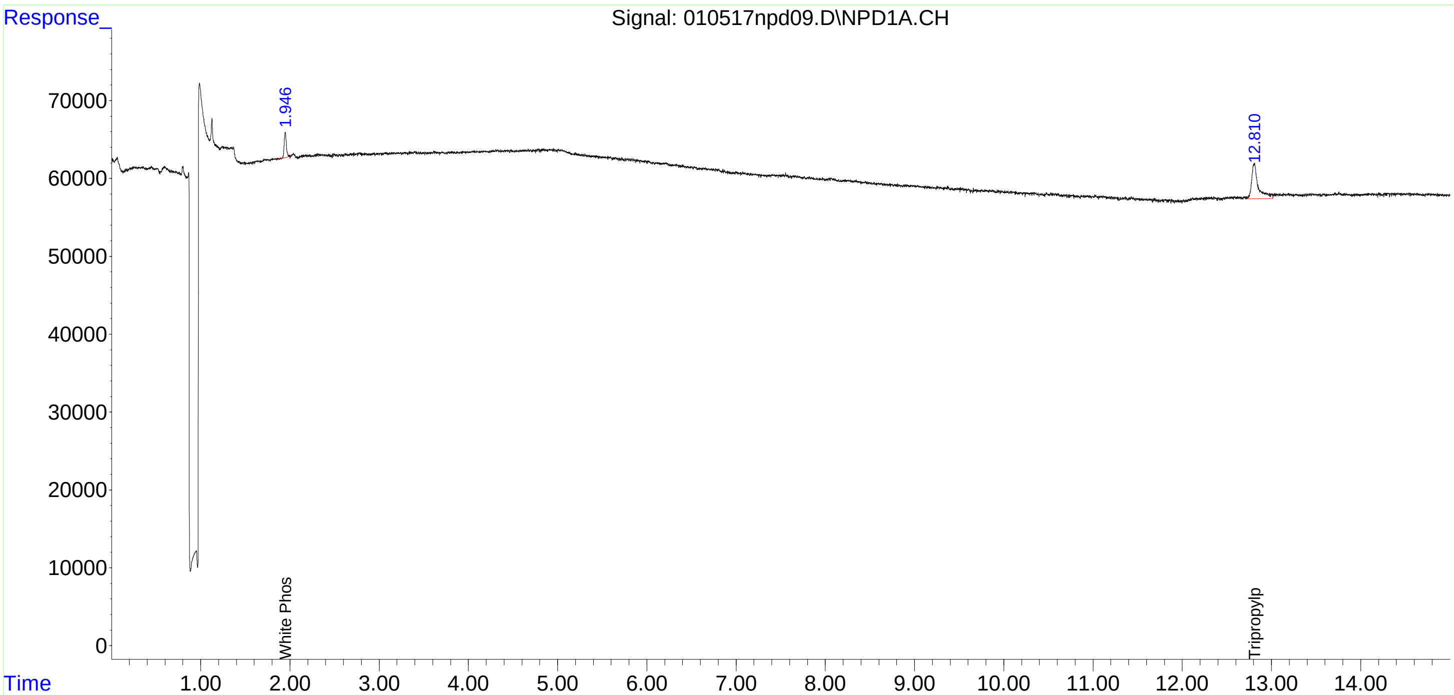
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

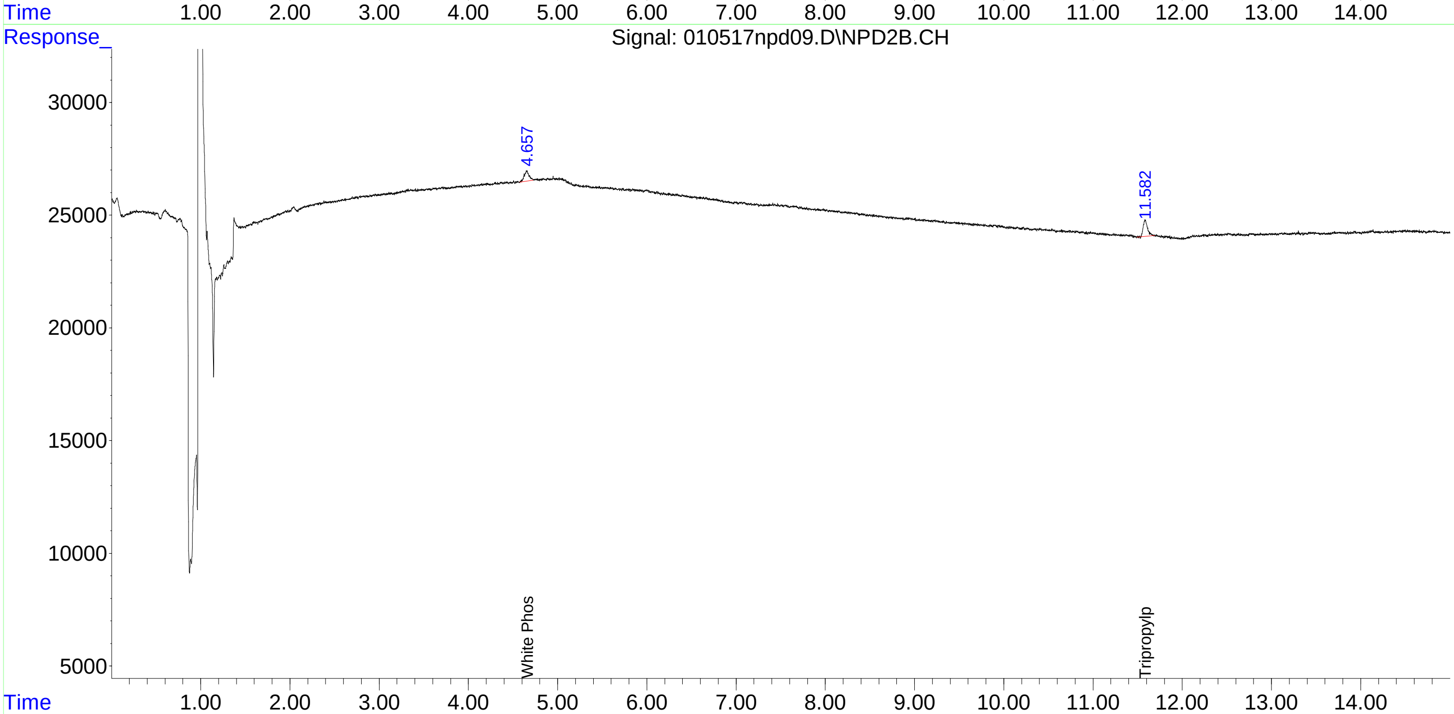
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.810	11.584	237254	24266	190.155m	200.493
2)	White Pho...	1.947	4.657	55628	17573	4.537	4.712m

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

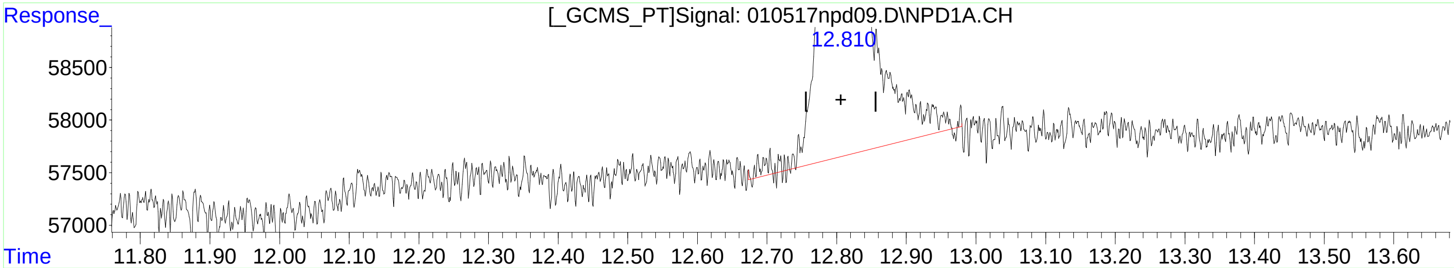
```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd09.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  12:23 pm
Operator  :
Sample    : CRQL-010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 2 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:43:01 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.      :
Signal #1 Phase  :                Signal #2 Phase:
Signal #1 Info   :                Signal #2 Info :
```

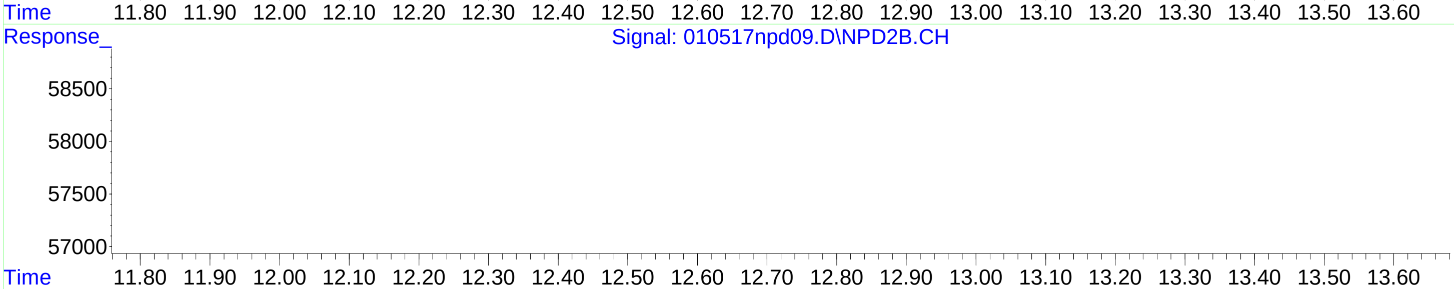




Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd09.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd09.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:23 pm                    Operator:
Sample    : CRQL-010517NPD                           Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:45:03 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.807min 144.481 ug/L

response 180267

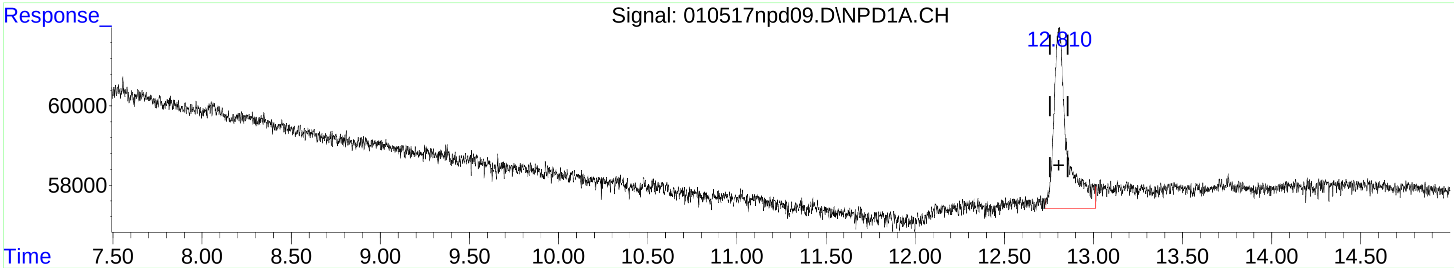
(1) Tripropylphosphate #2

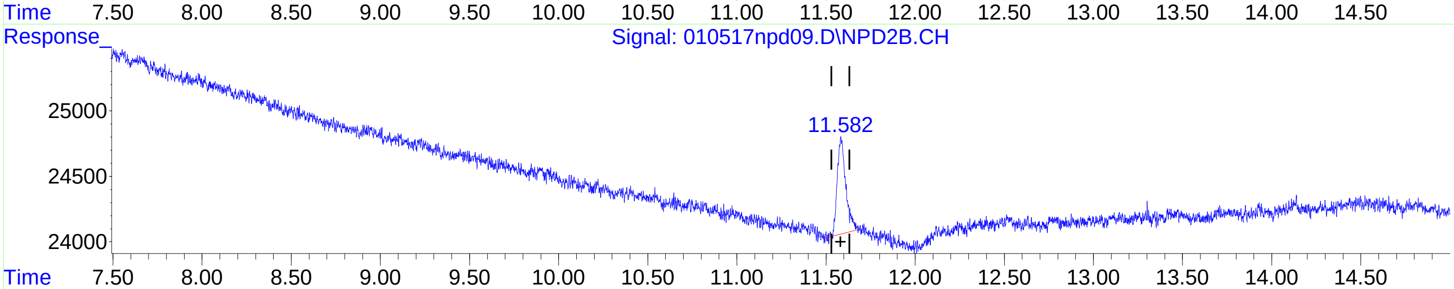
11.584min 200.493 ug/L

response 24266

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd09.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd09.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:23 pm                    Operator:
Sample    : CRQL-010517NPD                           Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:45:03 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

Reason for Manual Integration, Column 1:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate

12.810min 190.155 ug/L m

response 237254

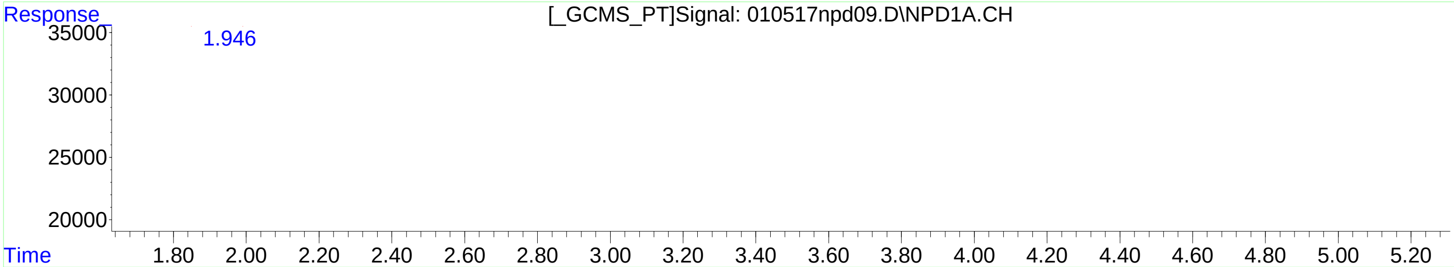
(1) Tripropylphosphate #2

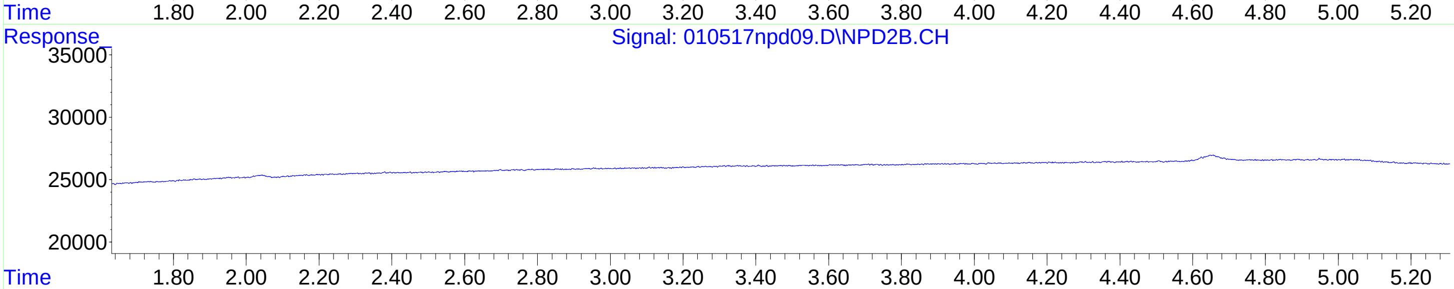
11.584min 200.493 ug/L

response 24266

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd09.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd09.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:23 pm                     Operator:
Sample    : CRQL-010517NPD                            Inst     : GC-NPD
Misc      :                                           Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:45:03 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(2) White Phosphorus

1.947min 4.537

response 55628

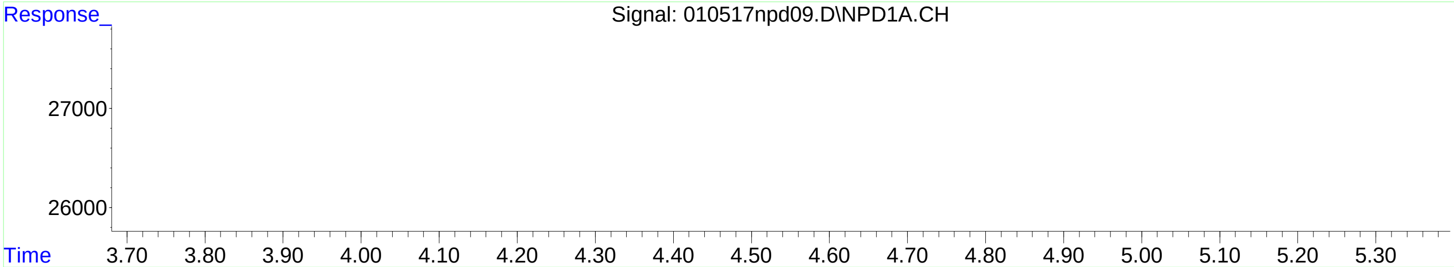
(2) White Phosphorus #2

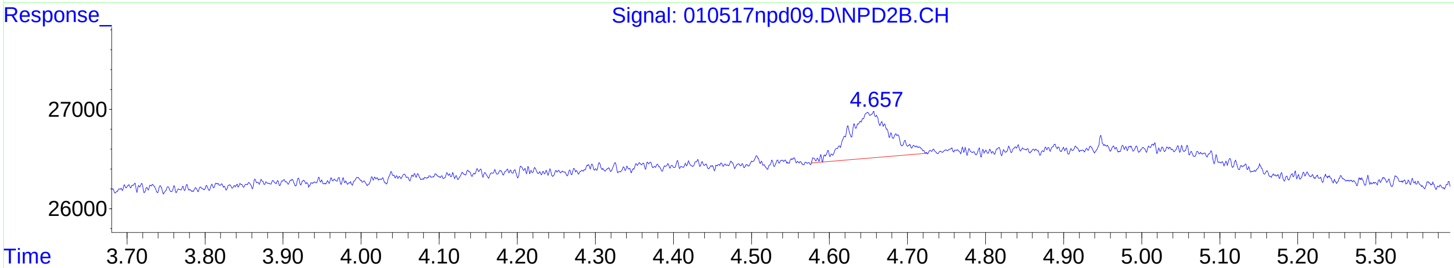
0.000min 0.000

response 0

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd09.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd09.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:23 pm                    Operator:
Sample    : CRQL-010517NPD                           Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:45:03 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(2) White Phosphorus

1.947min 4.537

response 55628

(2) White Phosphorus #2

4.657min 4.712 m

response 17573

Reason for Manual Integration, Column 2:

Software did not integrate peak.
-DS

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd10.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 12:42 pm
Operator :
Sample : MB-42082
Misc :
ALS Vial : 0 (Sig #1); 9 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:44:45 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

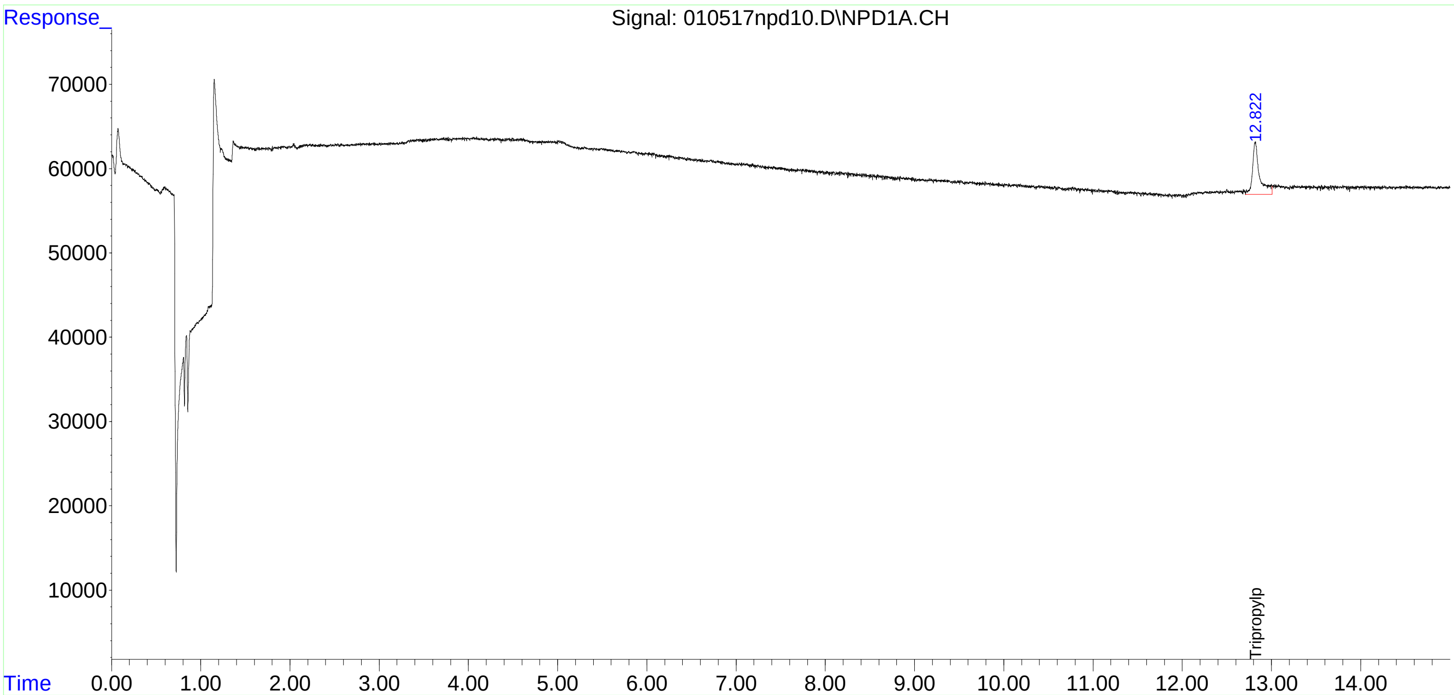
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

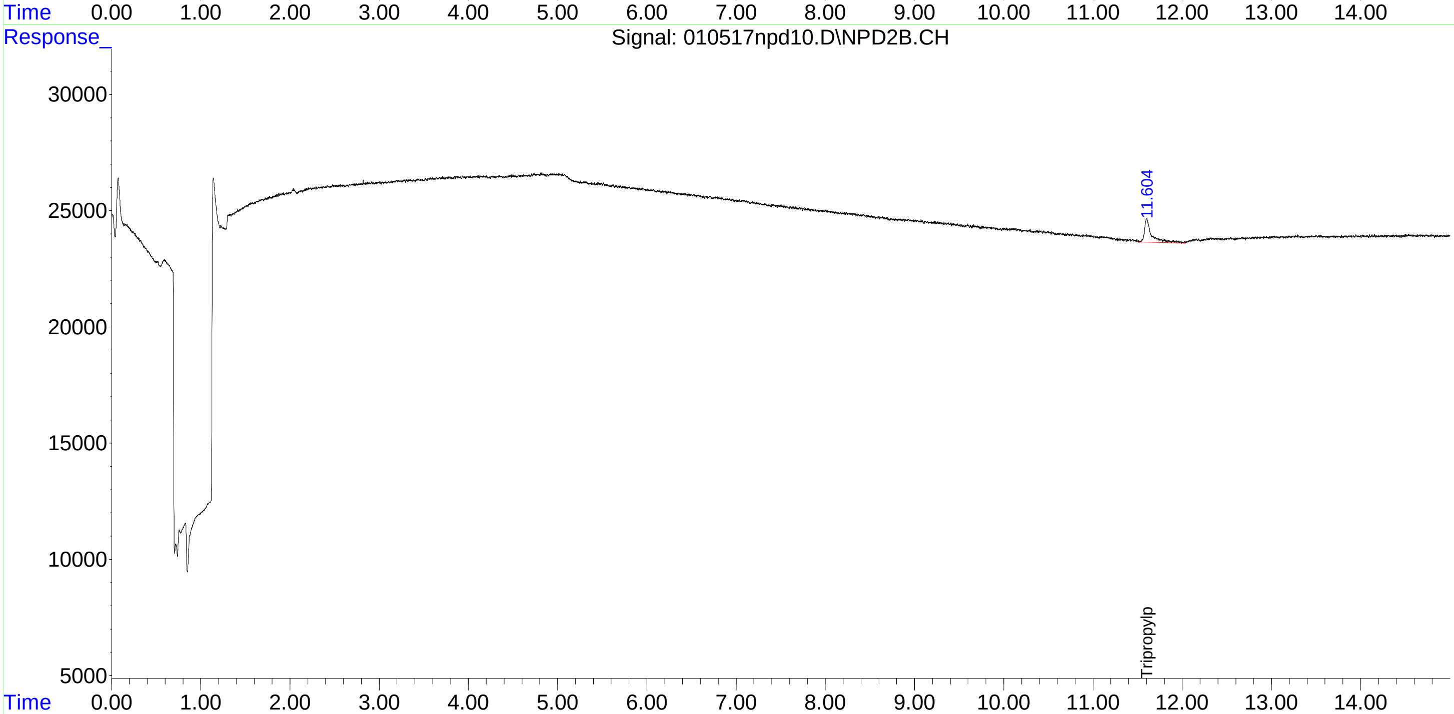
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.822	11.604	344482	58128	276.096m	365.026m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

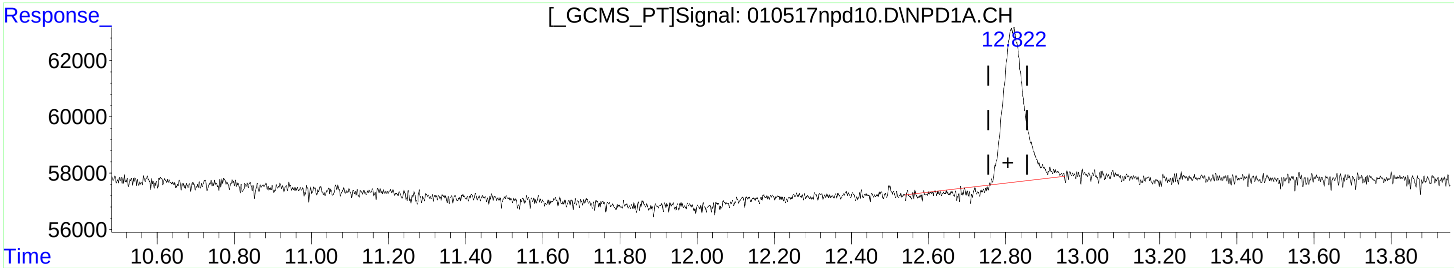
```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd10.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  12:42 pm
Operator  :
Sample    : MB-42082
Misc      :
ALS Vial  : 0 (Sig #1); 9 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:44:45 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                Signal #2 Phase:
Signal #1 Info  :                Signal #2 Info :
```

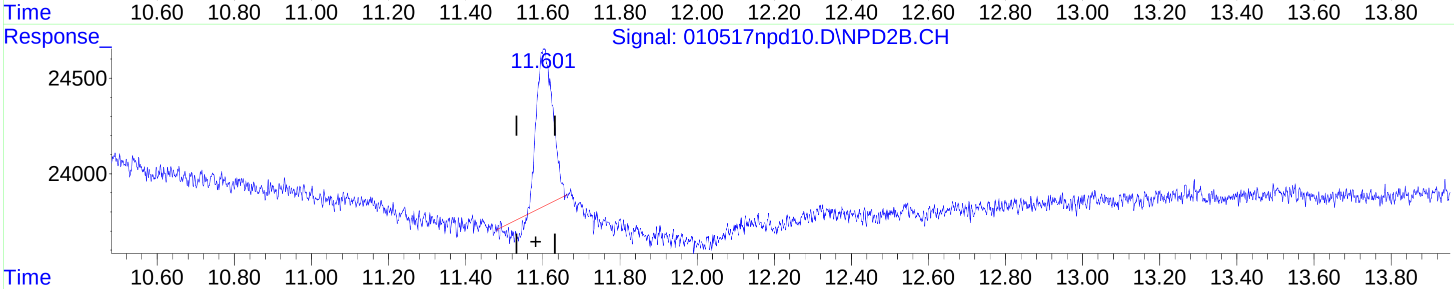




Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd10.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd10.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:42 pm                      Operator:
Sample    : MB-42082                                   Inst    : GC-NPD
Misc      :                                            Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:58:32 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.820min 152.172 ug/L

response 189863

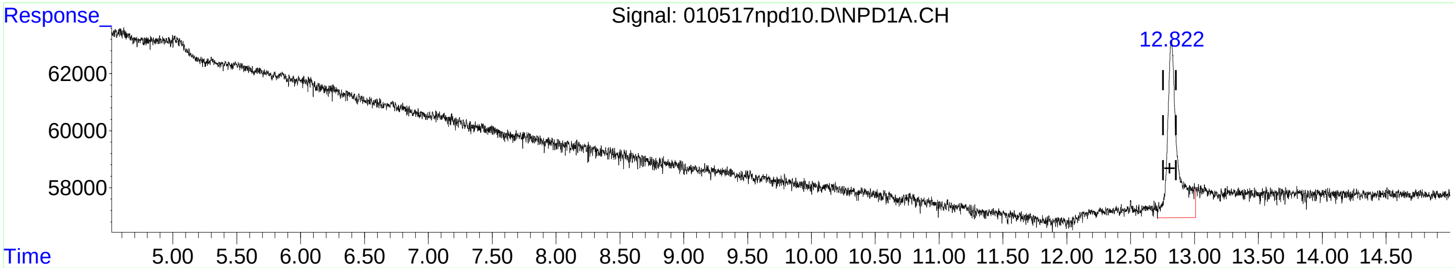
(1) Tripropylphosphate #2

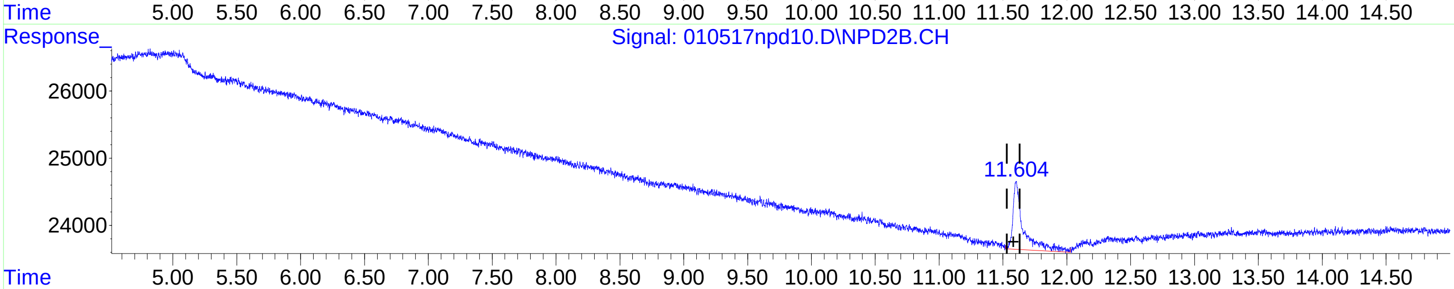
11.602min 190.318 ug/L

response 22187

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd10.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd10.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:42 pm                    Operator:
Sample    : MB-42082                                 Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:58:32 2017         Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.822min 276.096 ug/L m

response 344482

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.604min 365.026 ug/L m

response 58128

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd11.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On   : 05 Jan 2017 13:02 pm
Operator :
Sample   : LCS-42082
Misc   :
ALS Vial : 0 (Sig #1); 10 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:47:59 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.   :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

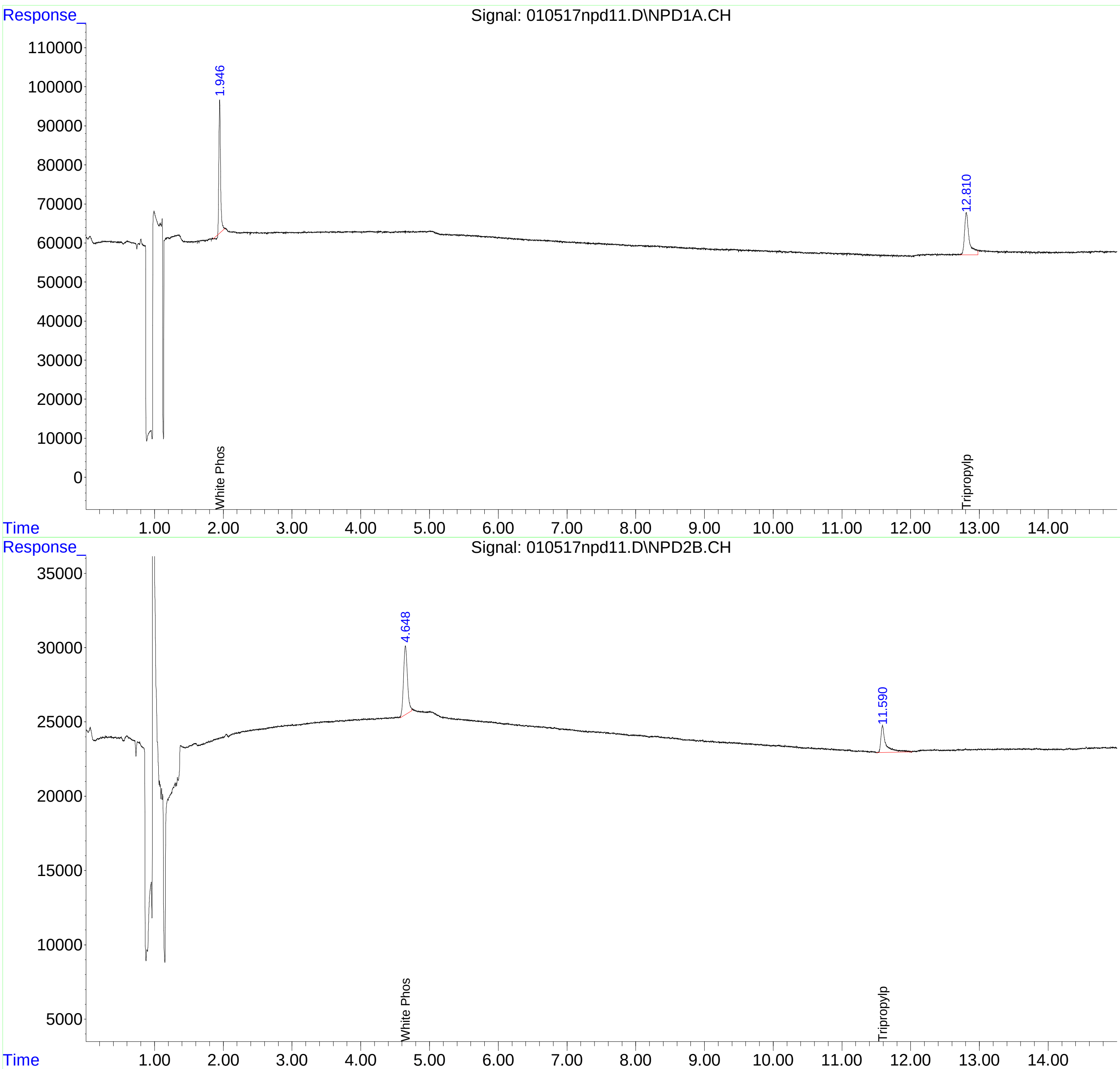
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.810	11.590	518515	92622	415.581m	530.348m
2)	White Pho...	1.946	4.648	568729	184613	36.229	33.667m

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd11.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 13:02 pm
Operator :
Sample : LCS-42082
Misc :
ALS Vial : 0 (Sig #1); 10 (Sig #2) Sample Multiplier: 1

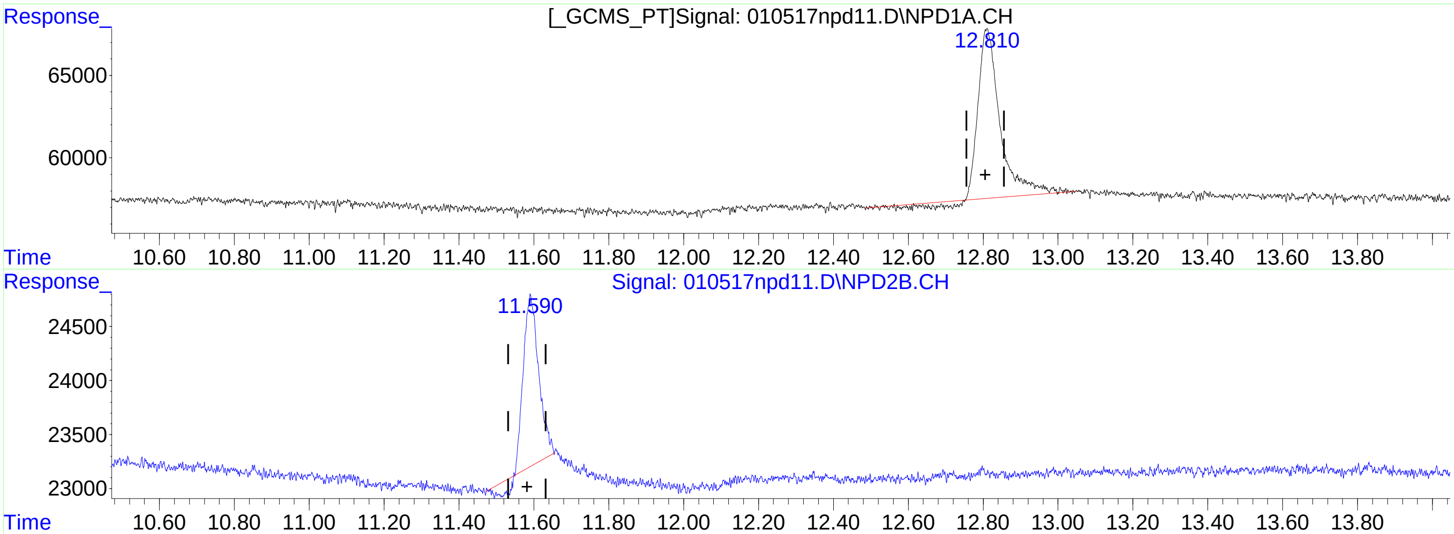
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:47:59 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd11.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd11.D\NPD2B.CH
Acq On    : 05 Jan 2017  13:02 pm                      Operator:
Sample    : LCS-42082                                  Inst     : GC-NPD
Misc      :                                            Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 13:21:41 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.811min 320.468 ug/L

response 399844

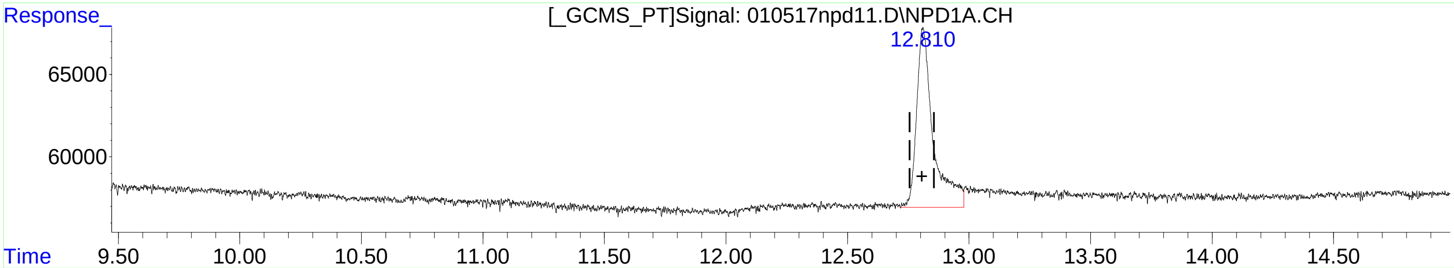
(1) Tripropylphosphate #2

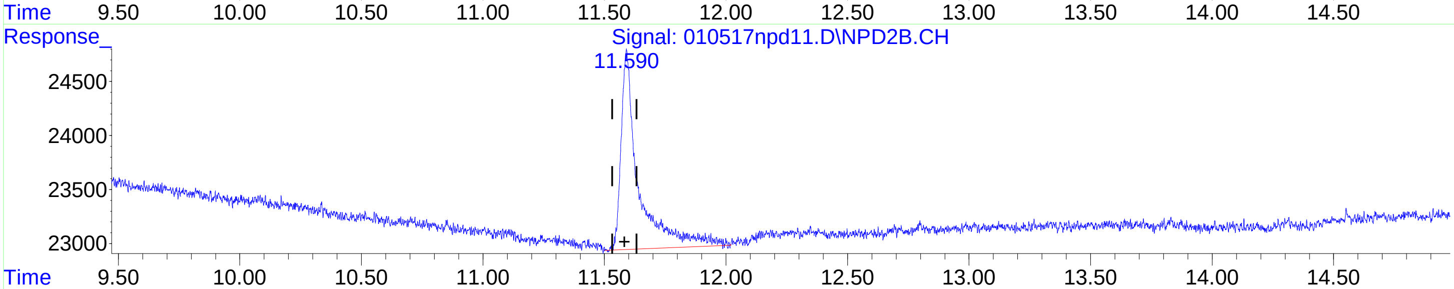
11.591min 288.031 ug/L

response 42224

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd11.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd11.D\NPD2B.CH
Acq On    : 05 Jan 2017  13:02 pm                   Operator:
Sample    : LCS-42082                               Inst     : GC-NPD
Misc      :                                         Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 13:21:41 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.810min 415.581 ug/L m

response 518515

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

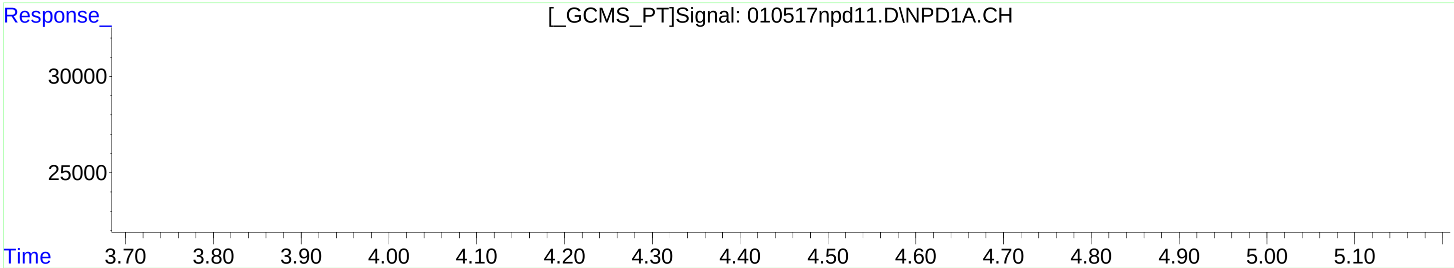
11.590min 530.348 ug/L m

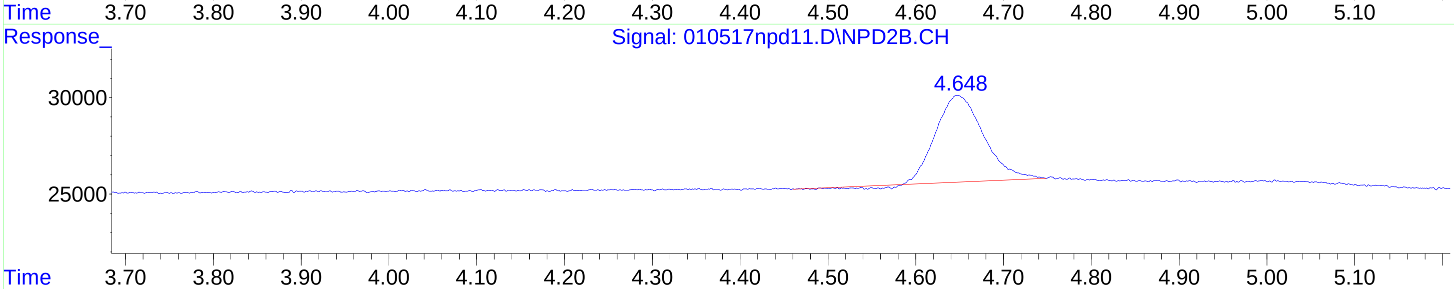
response 92622

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd11.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd11.D\NPD2B.CH
Acq On : 05 Jan 2017 13:02 pm Operator:
Sample : LCS-42082 Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 13:21:41 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration





QEdit

(2) White Phosphorus

1.946min 36.229

response 568729

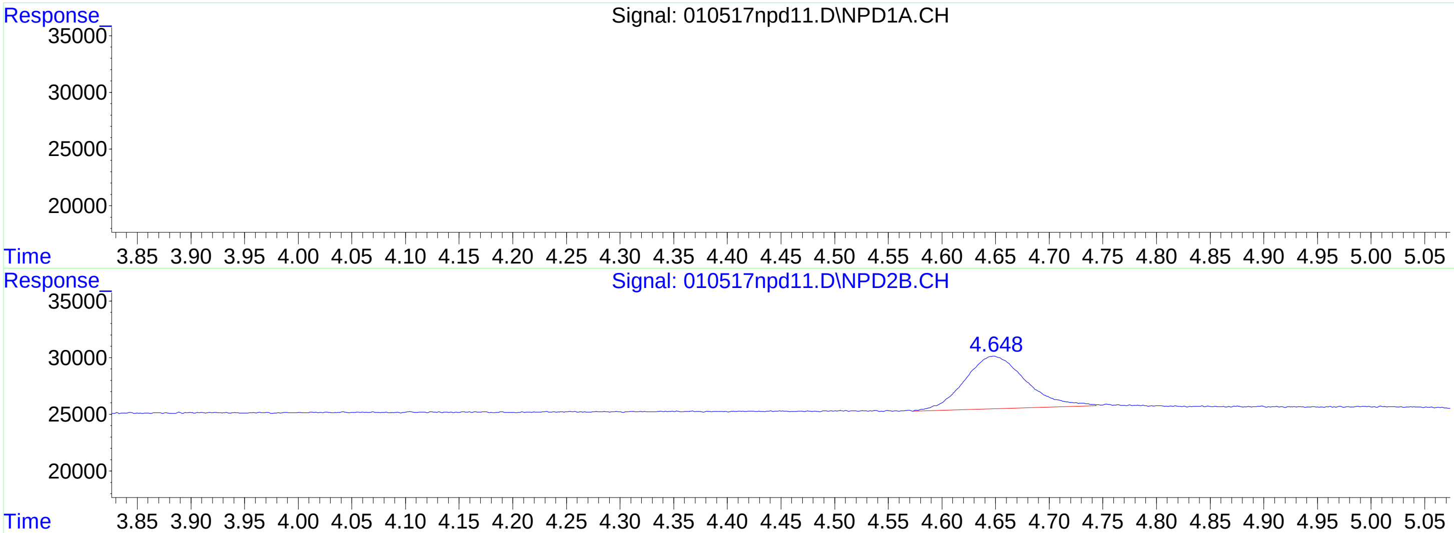
(2) White Phosphorus #2

4.648min 30.660

response 167265

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd11.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd11.D\NPD2B.CH
Acq On    : 05 Jan 2017  13:02 pm                   Operator:
Sample    : LCS-42082                               Inst     : GC-NPD
Misc      :                                         Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 13:21:41 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(2) White Phosphorus

1.946min 36.229

response 568729

(2) White Phosphorus #2

4.648min 33.667 m

response 184613

Reason for Manual Integration, Column 2:

Software incorrectly integrated peak.
-DS

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd12.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 13:21 pm
Operator :
Sample : LCSD-42082
Misc :
ALS Vial : 0 (Sig #1); 11 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:49:04 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

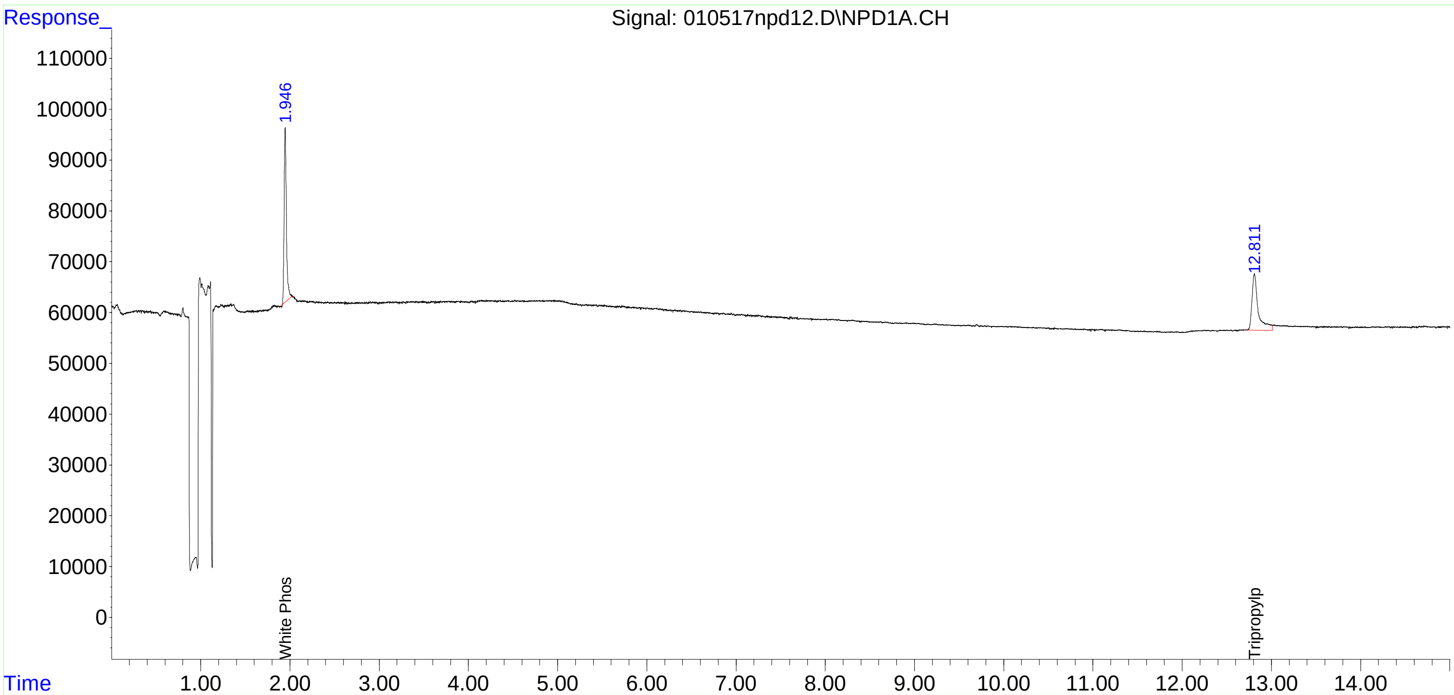
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.811	11.586	537317	93138	430.651m	532.807m
2)	White Pho...	1.946	4.649	603811	201321	38.396	36.563

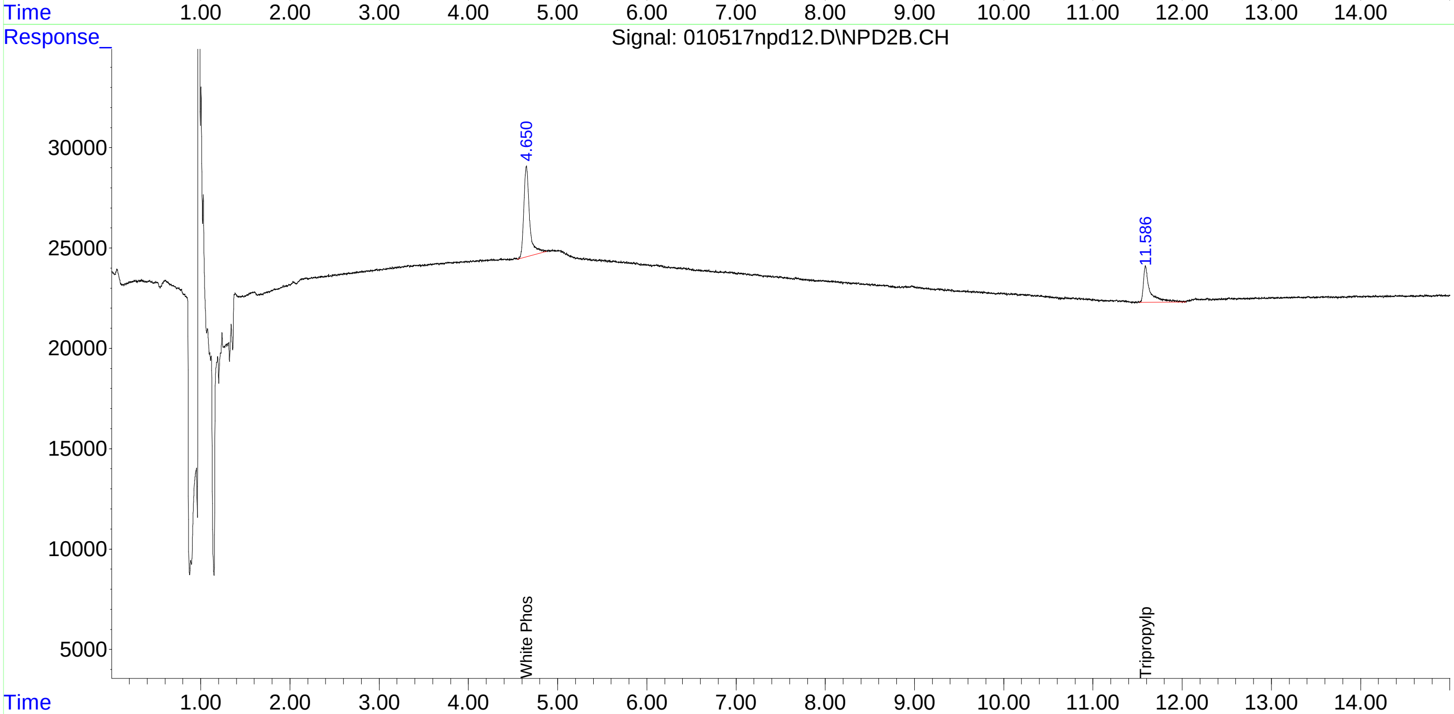
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd12.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 13:21 pm
Operator :
Sample : LCSD-42082
Misc :
ALS Vial : 0 (Sig #1); 11 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:49:04 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

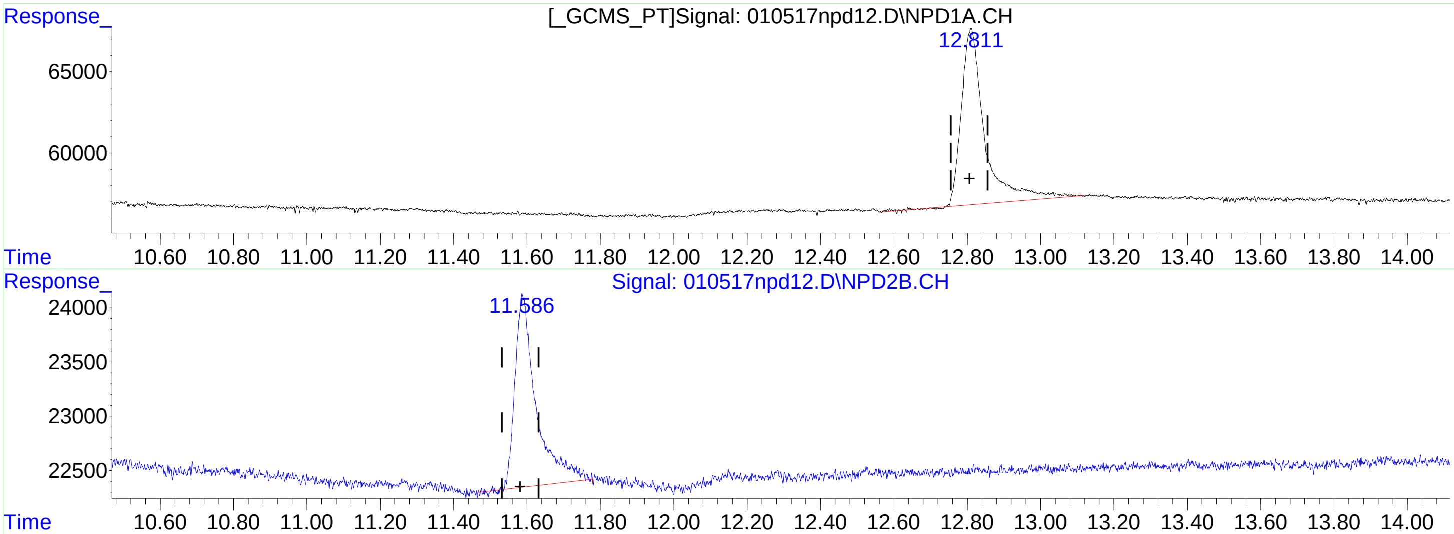
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd12.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd12.D\NPD2B.CH
Acq On    : 05 Jan 2017  13:21 pm                    Operator:
Sample    : LCSD-42082                               Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 14:00:55 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.810min 382.508 ug/L

response 477251

(1) Tripropylphosphate #2

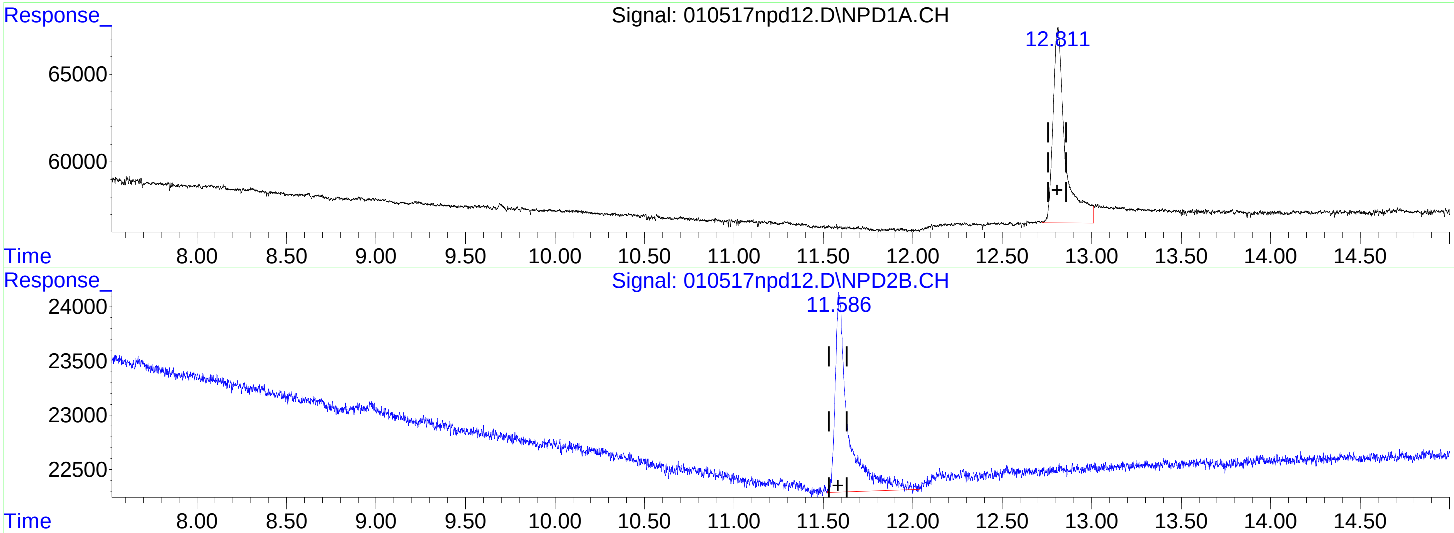
11.589min 428.771 ug/L

response 71372

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd12.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd12.D\NPD2B.CH
Acq On : 05 Jan 2017 13:21 pm Operator:
Sample : LCSD-42082 Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 14:00:55 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration



QEdit

(1) Tripropylphosphate

12.811min 430.651 ug/L m

response 537317

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.586min 532.807 ug/L m

response 93138

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd13.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 13:40 pm
Operator :
Sample : 1612702-001A
Misc :
ALS Vial : 0 (Sig #1); 12 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 14:01:13 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

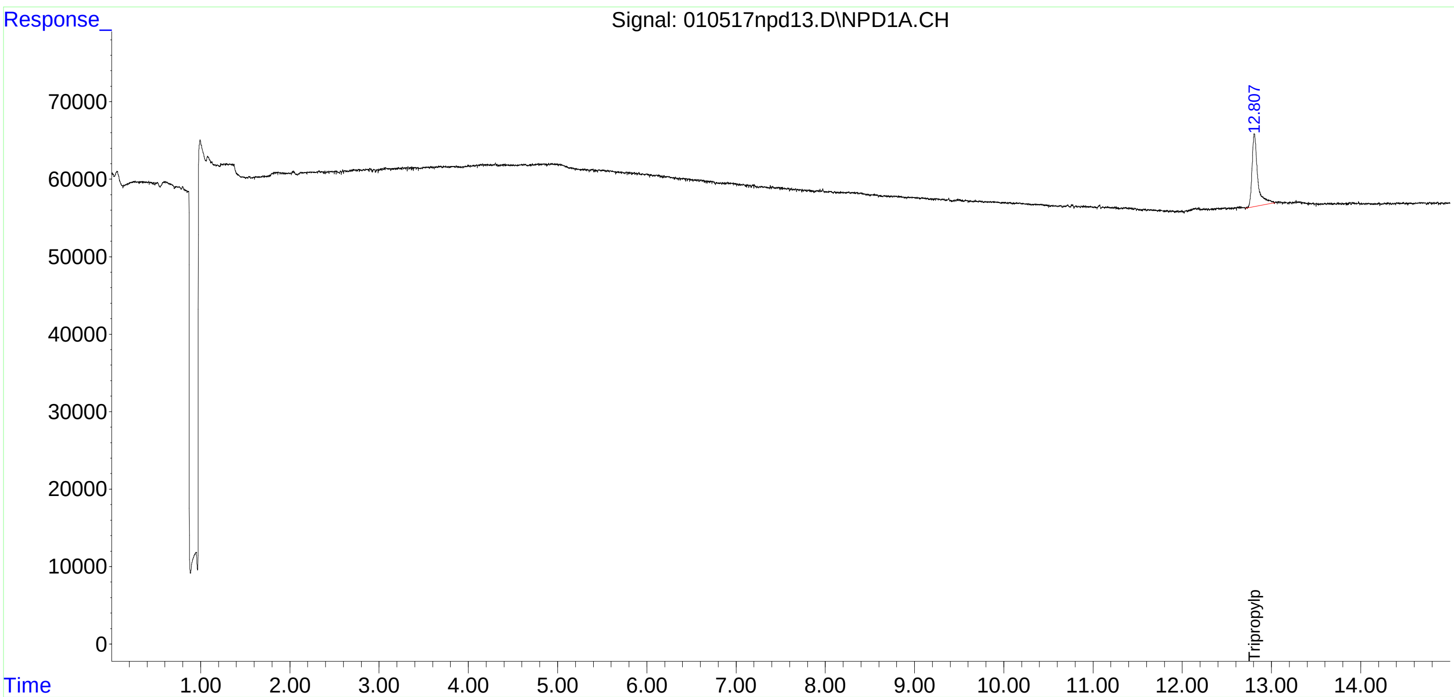
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

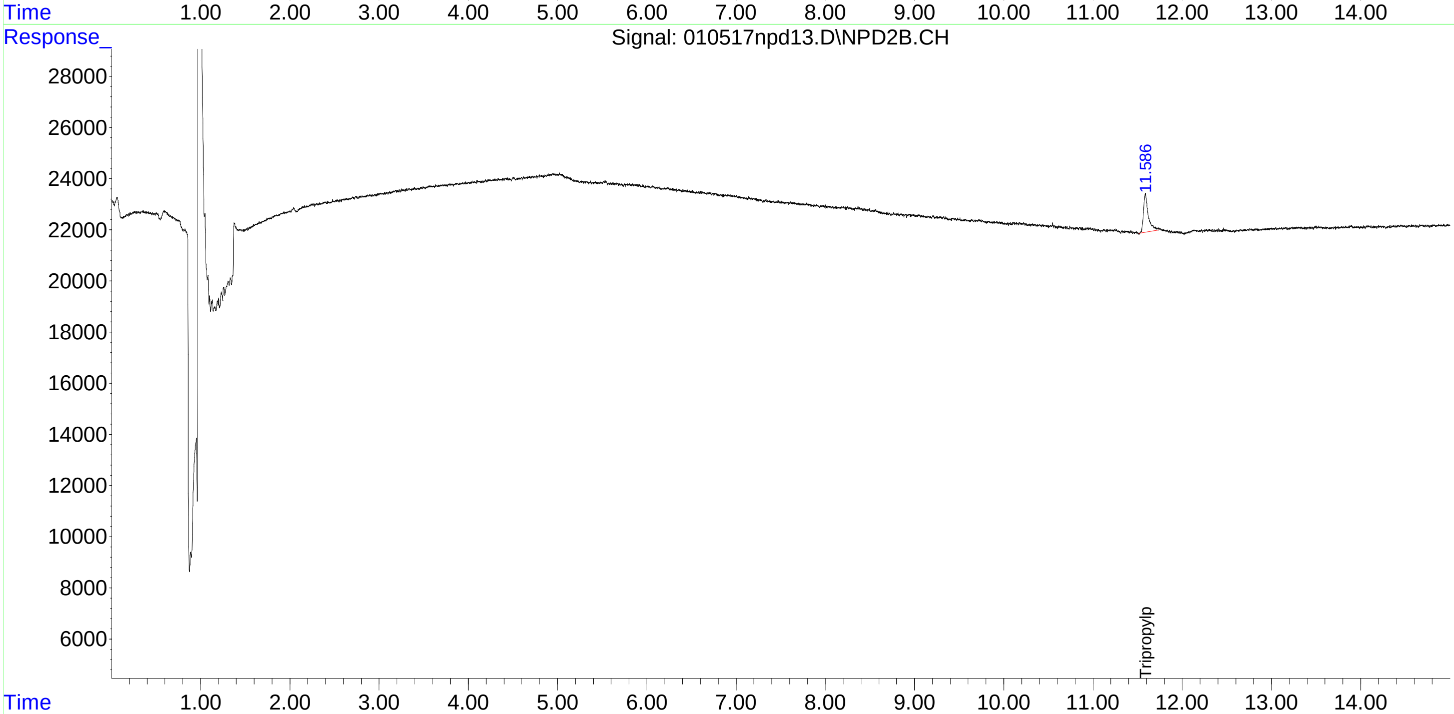
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.810	11.588	413783	56777	331.640	358.506
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd13.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  13:40 pm
Operator  :
Sample    : 1612702-001A
Misc      :
ALS Vial  : 0 (Sig #1); 12 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 14:01:13 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                Signal #2 Phase:
Signal #1 Info  :                Signal #2 Info :
```





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd14.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 13:59 pm
Operator :
Sample : 1612702-002A
Misc :
ALS Vial : 0 (Sig #1); 13 (Sig #2) Sample Multiplier: 1

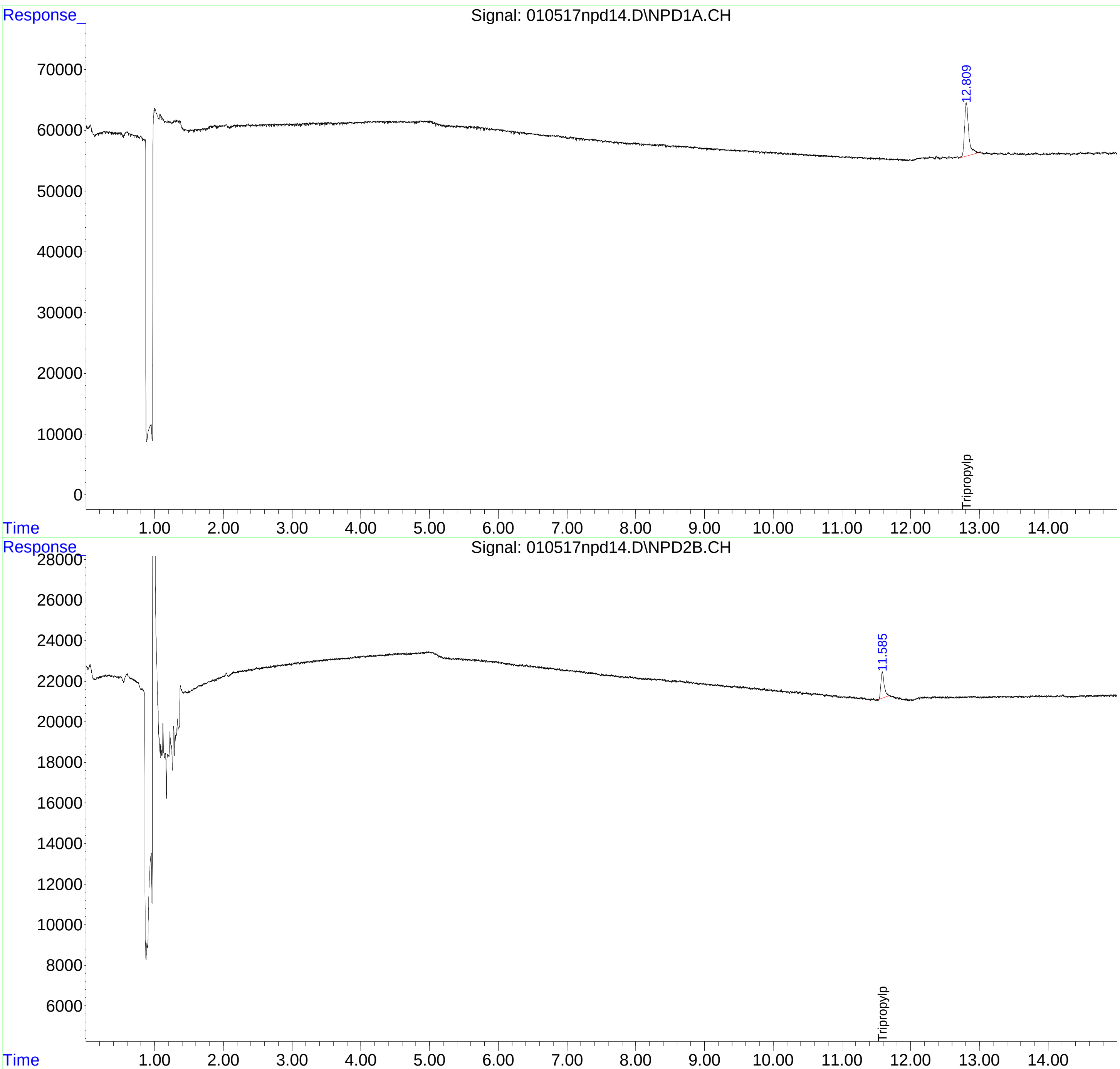
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 14:52:07 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.811	11.588	365194	43579	292.697	294.611
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd14.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  13:59 pm
Operator  :
Sample    : 1612702-002A
Misc      :
ALS Vial  : 0 (Sig #1); 13 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 14:52:07 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                    Signal #2 Phase:
Signal #1 Info  :                    Signal #2 Info :
```



Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd15.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 14:19 pm
Operator :
Sample : 1612702-003A
Misc :
ALS Vial : 0 (Sig #1); 14 (Sig #2) Sample Multiplier: 1

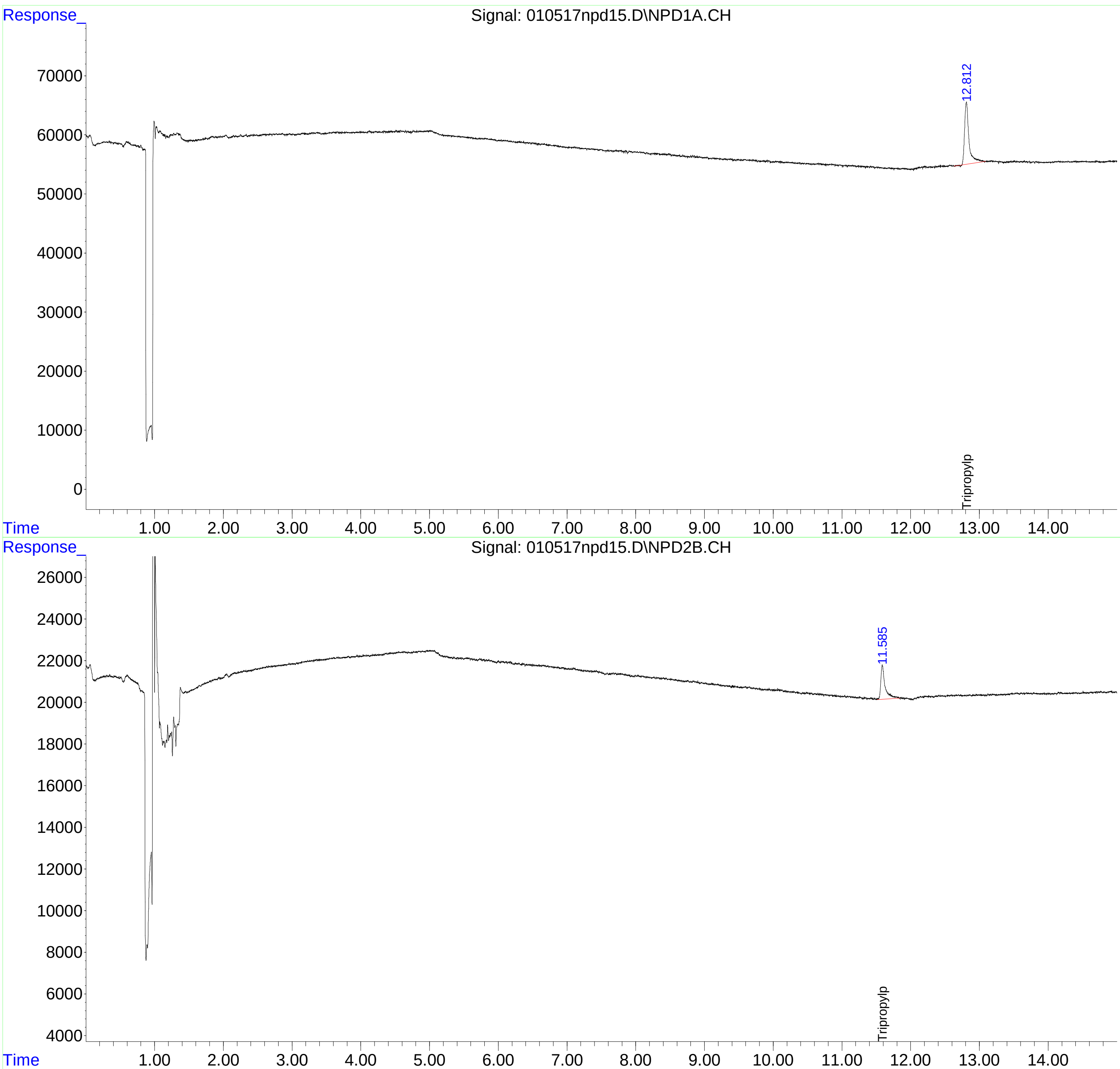
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:50:11 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.811	11.585	465177	71936	372.831	431.477m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

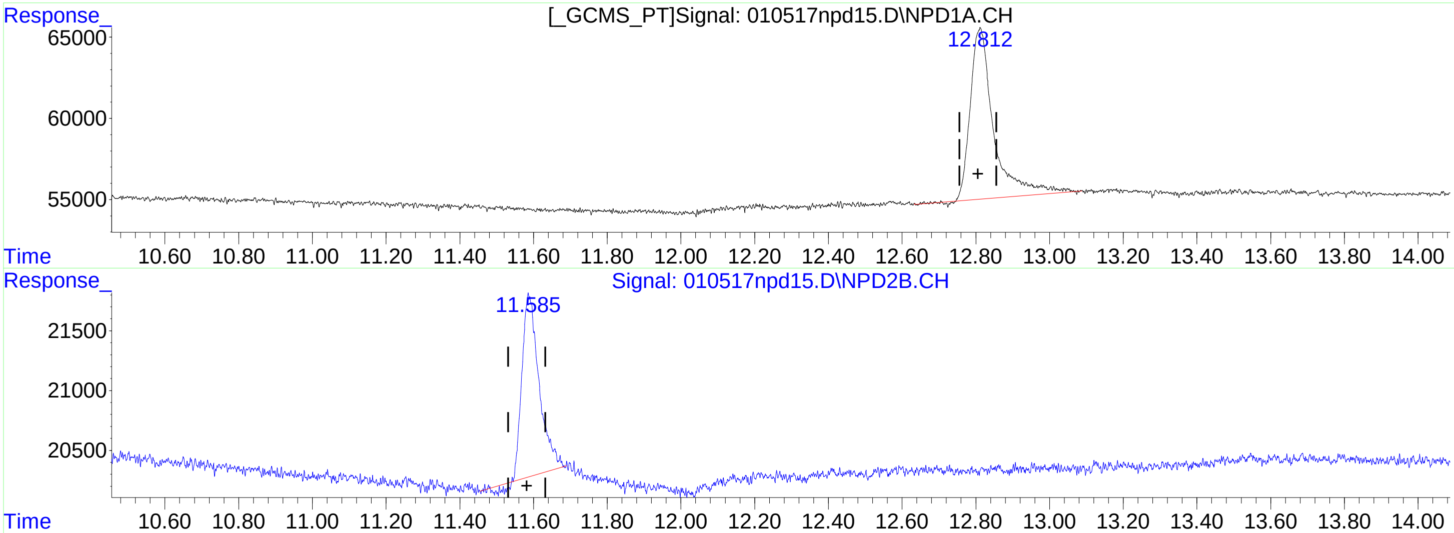
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd15.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  14:19 pm
Operator  :
Sample    : 1612702-003A
Misc      :
ALS Vial  : 0 (Sig #1); 14 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:50:11 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                     Signal #2 Phase:
Signal #1 Info  :                     Signal #2 Info :
```



Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd15.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd15.D\NPD2B.CH
Acq On    : 05 Jan 2017  14:19 pm                    Operator:
Sample    : 1612702-003A                             Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 14:52:23 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.811min 372.831 ug/L

response 465177

(1) Tripropylphosphate #2

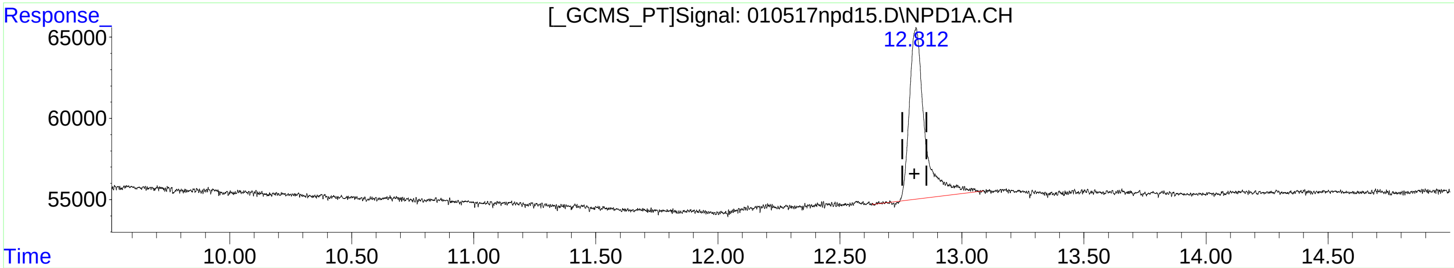
11.588min 316.622 ug/L

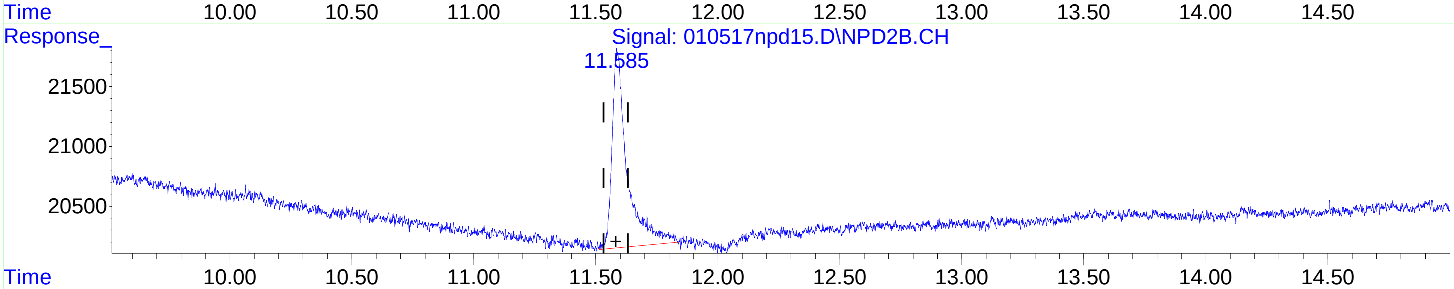
response 48118

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd15.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd15.D\NPD2B.CH
Acq On : 05 Jan 2017 14:19 pm Operator:
Sample : 1612702-003A Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 14:52:23 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration





QEdit

(1) Tripropylphosphate

12.811min 372.831 ug/L

response 465177

(1) Tripropylphosphate #2

11.585min 431.477 ug/L m

response 71936

Reason for Manual Integration, Column 2:

Software incorrectly integrated peak.
-DS

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd16.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 14:38 pm
Operator :
Sample : 1612702-004A
Misc :
ALS Vial : 0 (Sig #1); 15 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:50:56 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

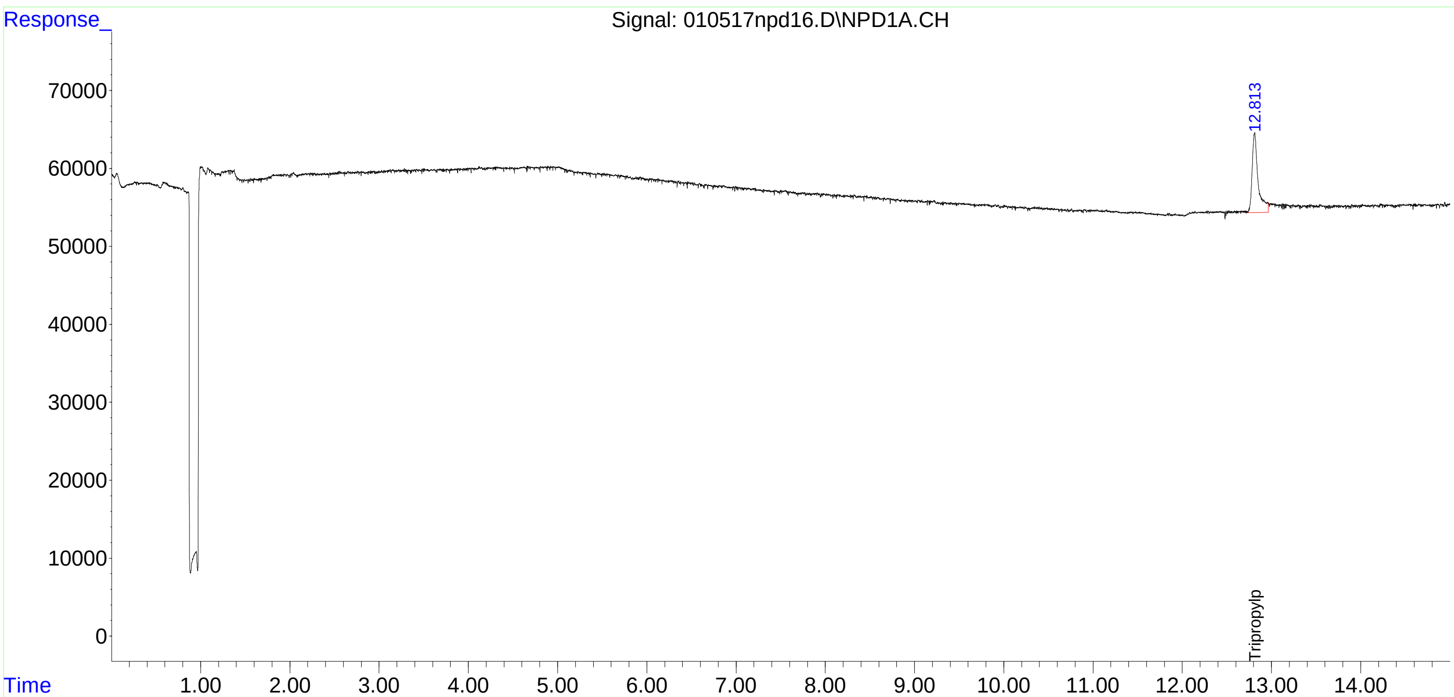
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.813	11.591	477873	70592	383.007m	425.025m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

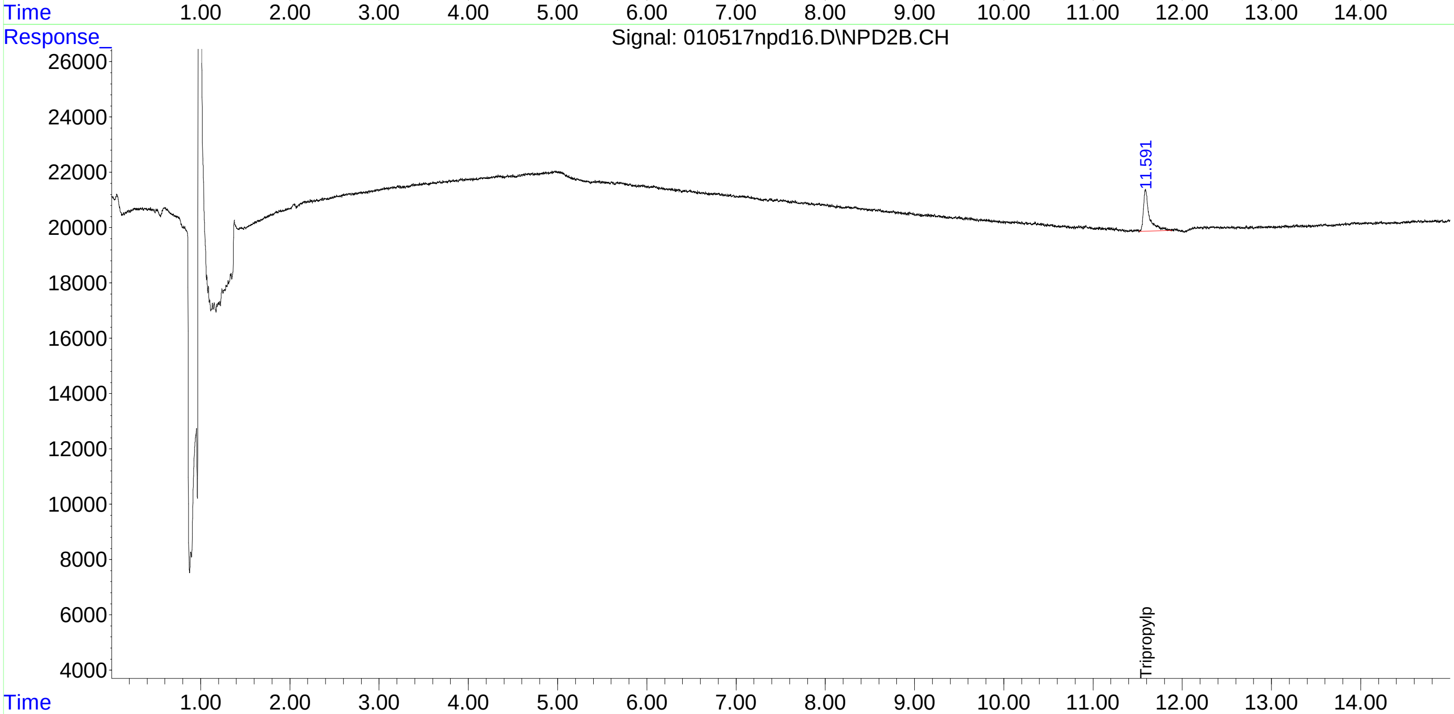
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd16.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 14:38 pm
Operator :
Sample : 1612702-004A
Misc :
ALS Vial : 0 (Sig #1); 15 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:50:56 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

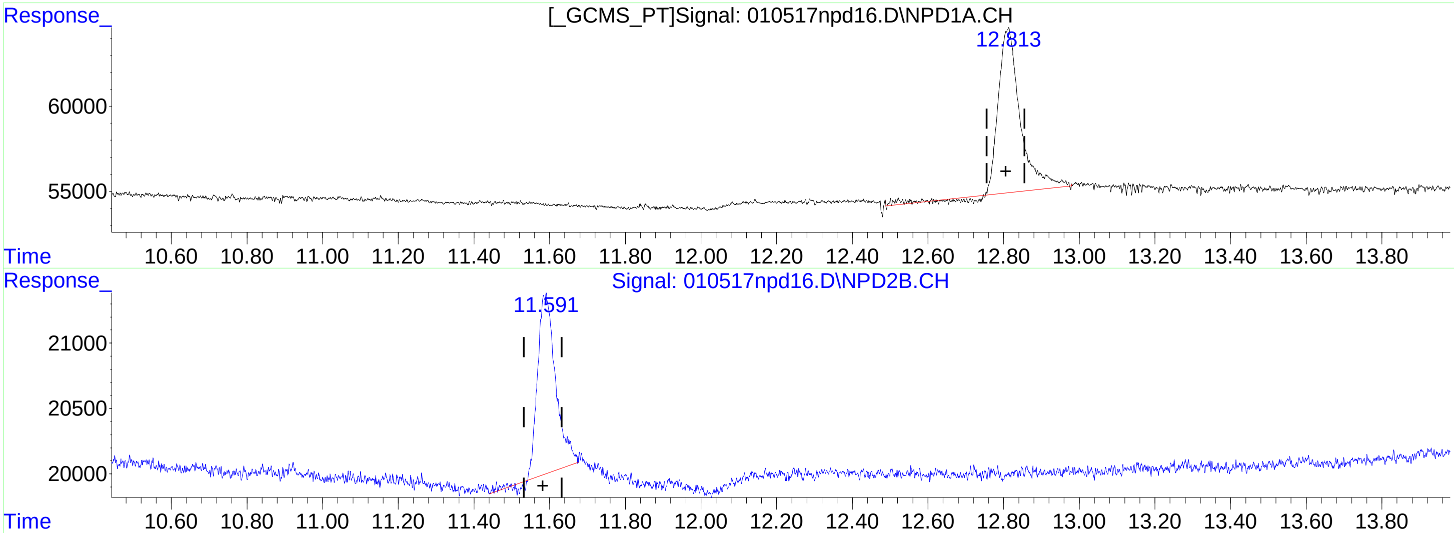
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd16.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd16.D\NPD2B.CH
Acq On    : 05 Jan 2017  14:38 pm                    Operator:
Sample    : 1612702-004A                             Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 15:10:03 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.811min 308.943 ug/L

response 385464

(1) Tripropylphosphate #2

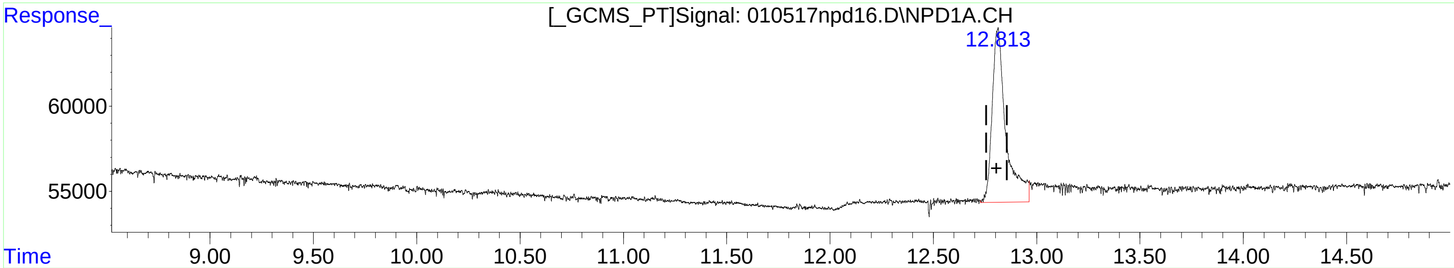
11.589min 302.244 ug/L

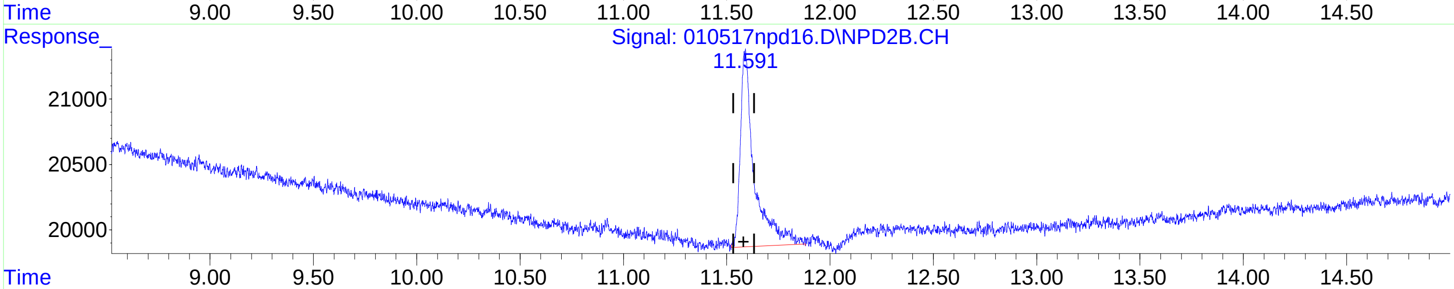
response 45152

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd16.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd16.D\NPD2B.CH
Acq On : 05 Jan 2017 14:38 pm Operator:
Sample : 1612702-004A Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 15:10:03 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration





QEdit

(1) Tripropylphosphate

12.813min 383.007 ug/L m

response 477873

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.591min 425.025 ug/L m

response 70592

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd17.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 14:57 pm
Operator :
Sample : 1612702-005A
Misc :
ALS Vial : 0 (Sig #1); 16 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:51:34 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

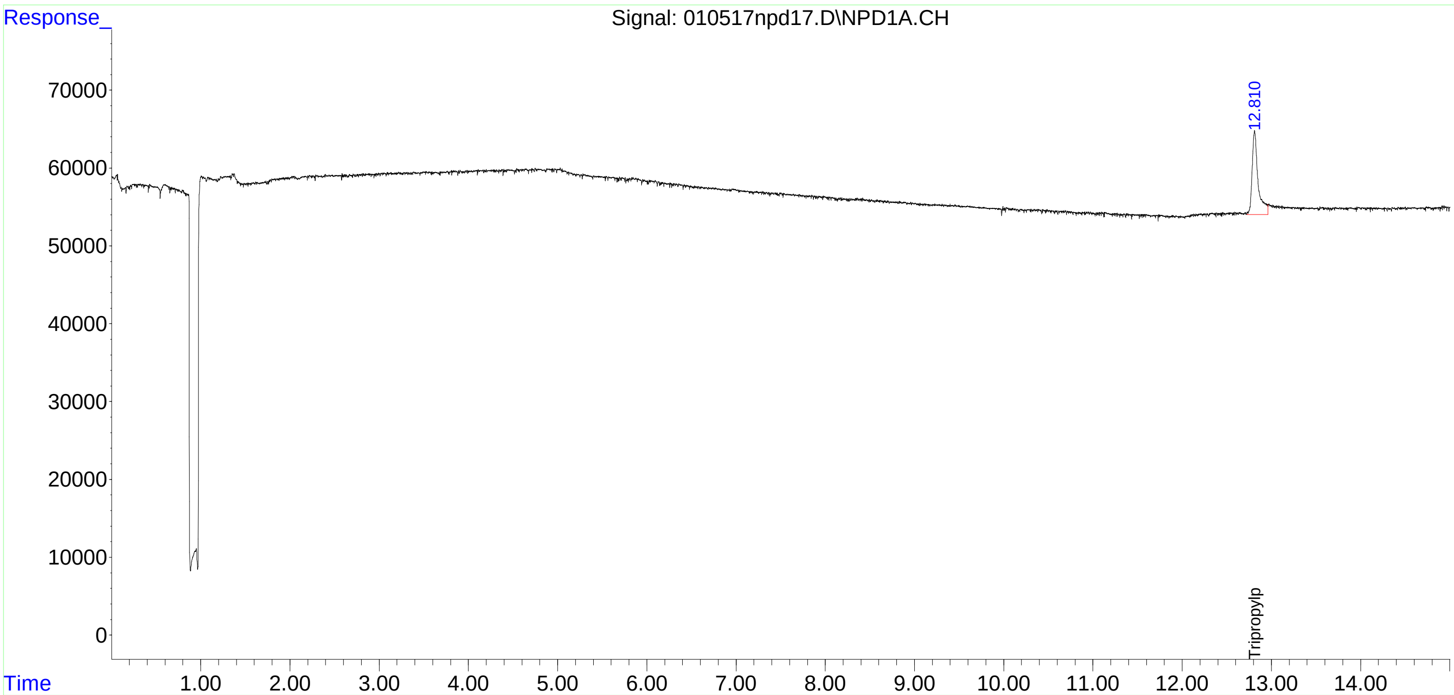
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.810	11.587	497394	82780	398.653m	483.407m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

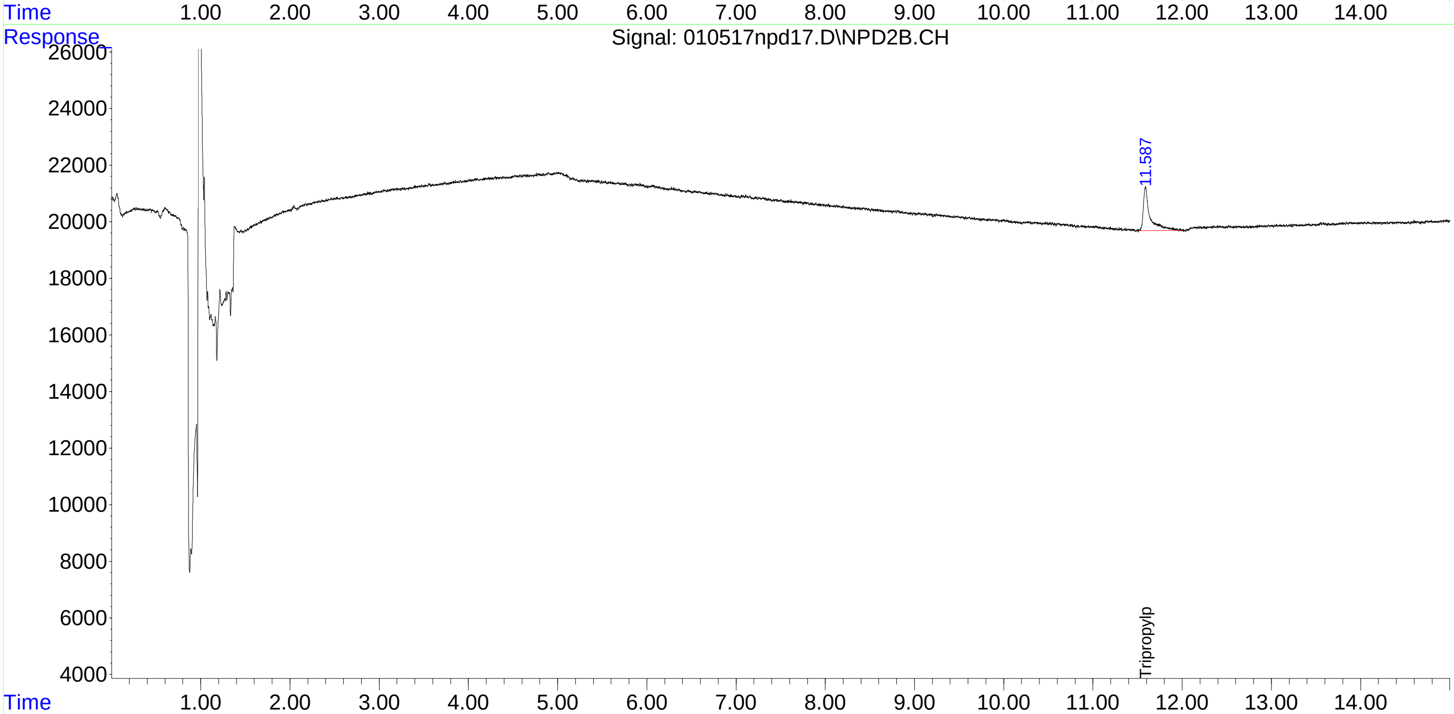
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd17.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 14:57 pm
Operator :
Sample : 1612702-005A
Misc :
ALS Vial : 0 (Sig #1); 16 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:51:34 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

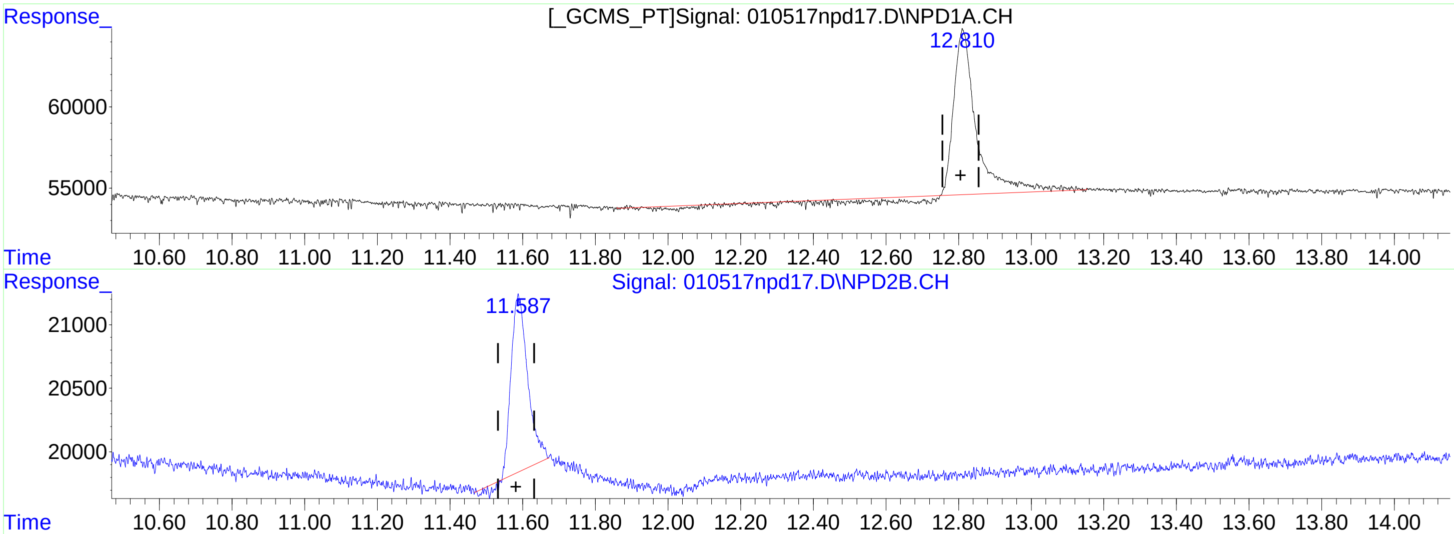




Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd17.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd17.D\NPD2B.CH
Acq On : 05 Jan 2017 14:57 pm Operator:
Sample : 1612702-005A Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 16:08:11 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration



QEdit

(1) Tripropylphosphate

12.812min 293.452 ug/L

response 366137

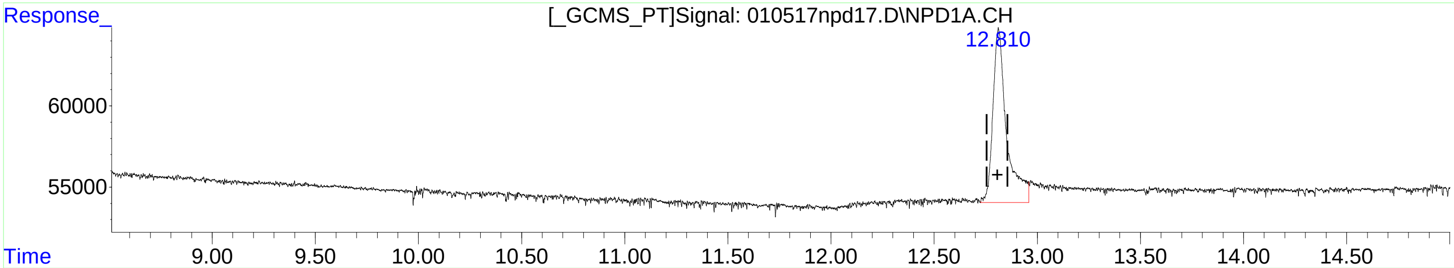
(1) Tripropylphosphate #2

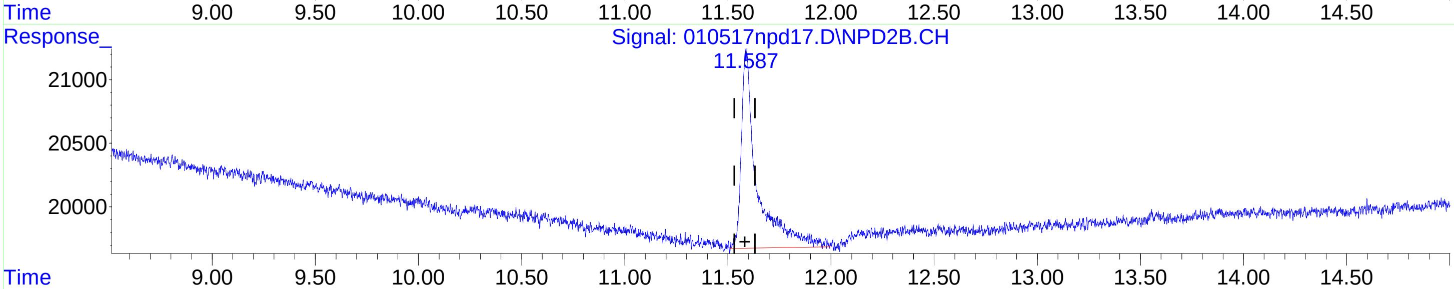
11.588min 293.016 ug/L

response 43250

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd17.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd17.D\NPD2B.CH
Acq On    : 05 Jan 2017  14:57 pm                    Operator:
Sample    : 1612702-005A                             Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:08:11 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.810min 398.653 ug/L m

response 497394

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.587min 483.407 ug/L m

response 82780

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd18.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 15:17 pm
Operator :
Sample : 1612702-006A
Misc :
ALS Vial : 0 (Sig #1); 17 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:52:10 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

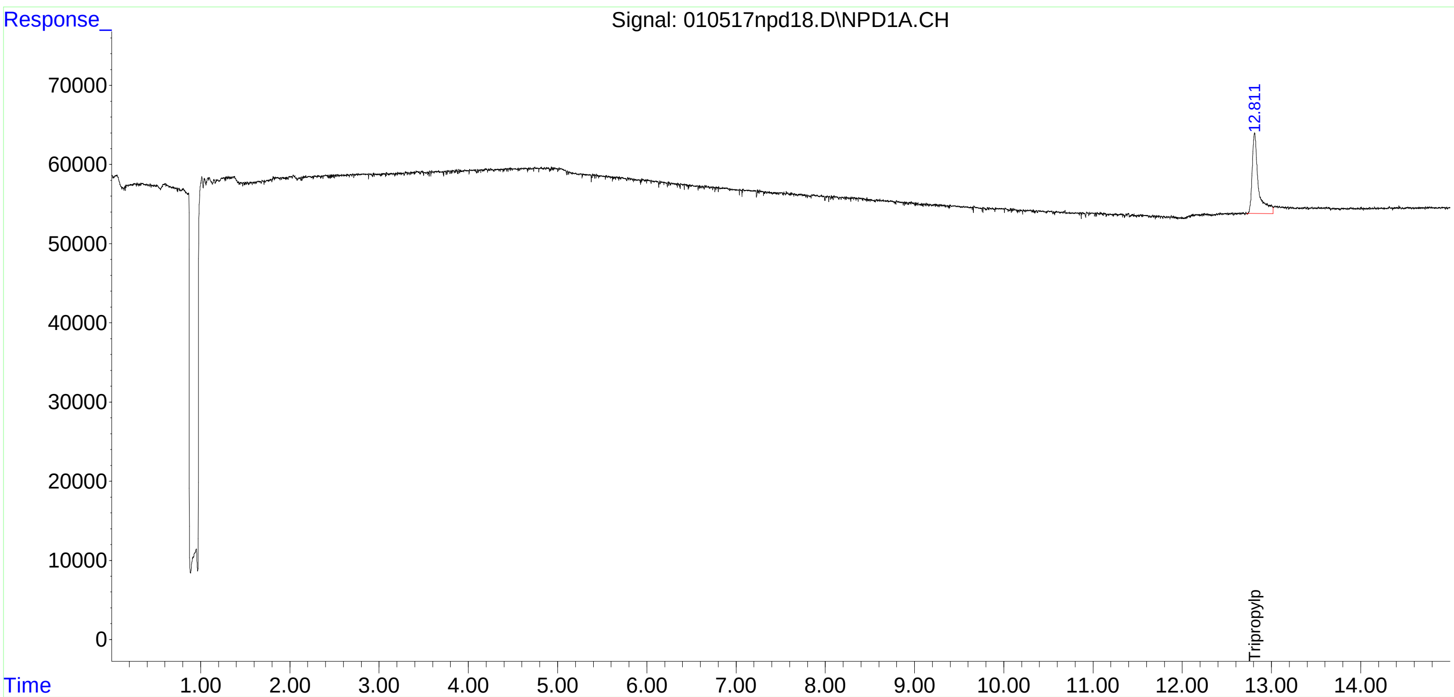
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

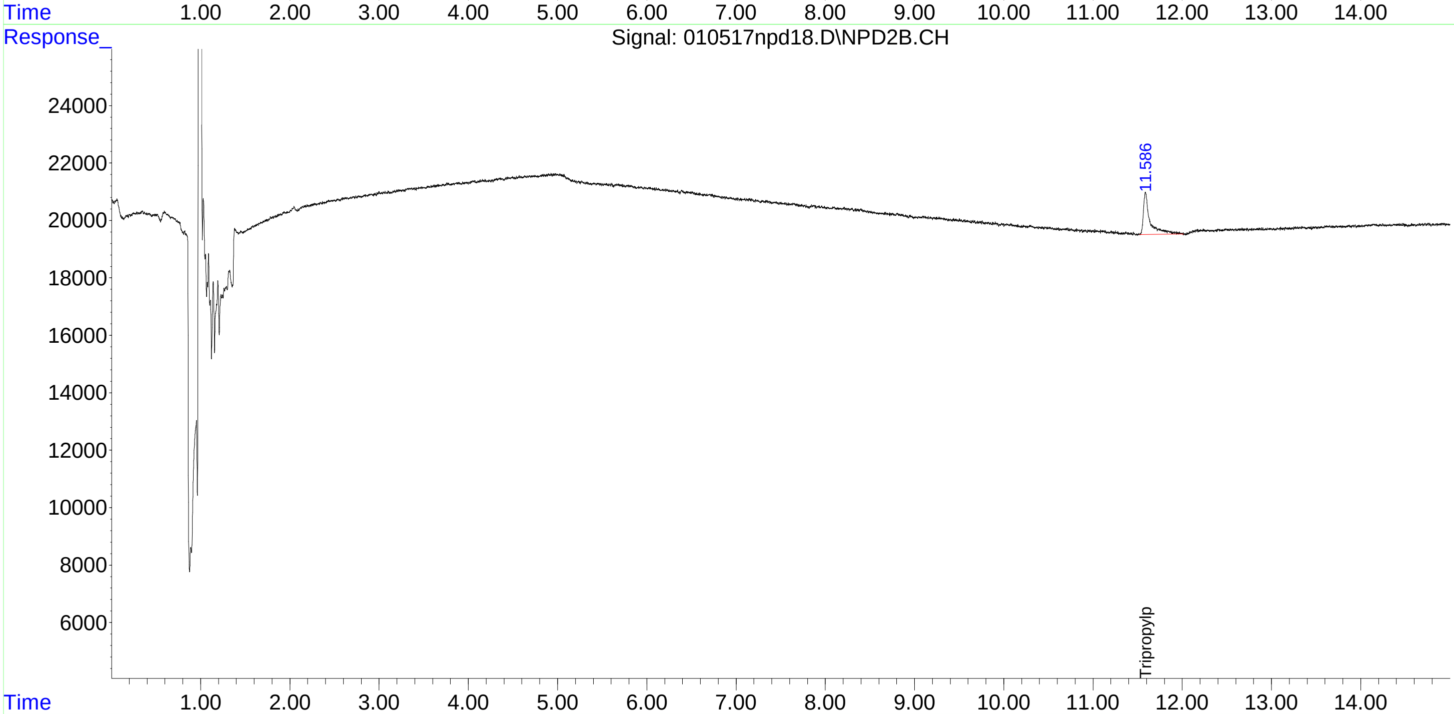
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.811	11.586	495083	77078	396.800m	456.130m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd18.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  15:17 pm
Operator  :
Sample    : 1612702-006A
Misc      :
ALS Vial  : 0 (Sig #1); 17 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:52:10 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                Signal #2 Phase:
Signal #1 Info  :                Signal #2 Info :
```

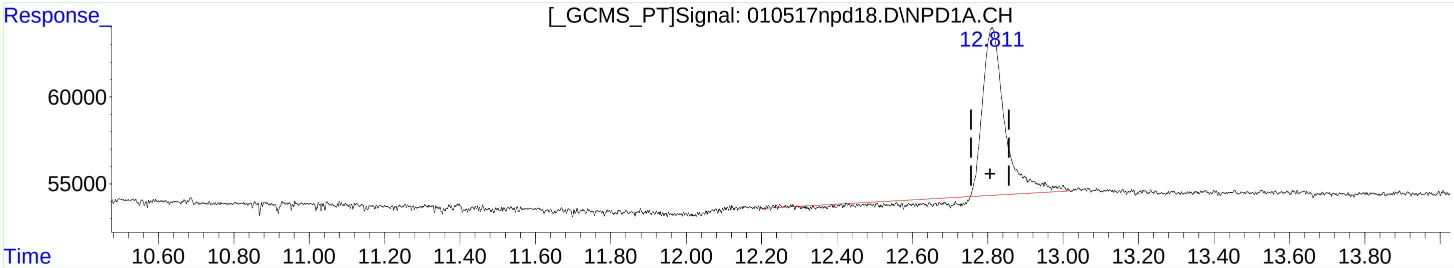


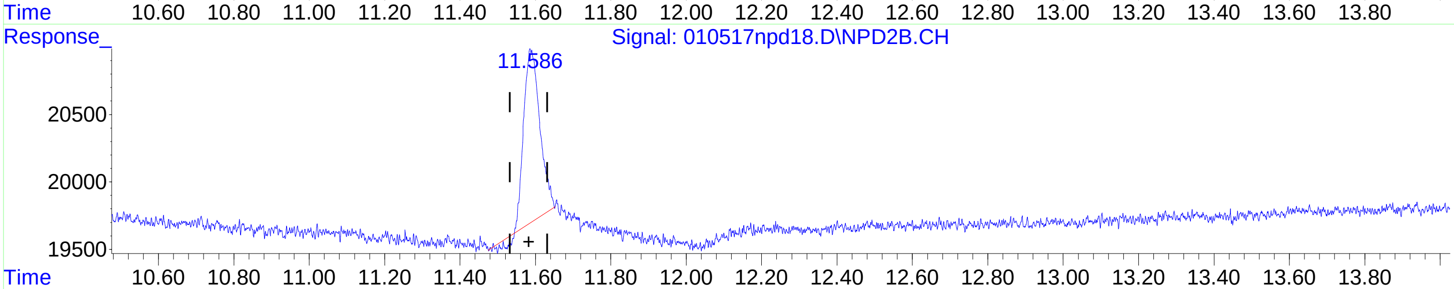


Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd18.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd18.D\NPD2B.CH
Acq On : 05 Jan 2017 15:17 pm Operator:
Sample : 1612702-006A Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 16:08:39 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration





QEdit

(1) Tripropylphosphate

12.812min 270.611 ug/L

response 337638

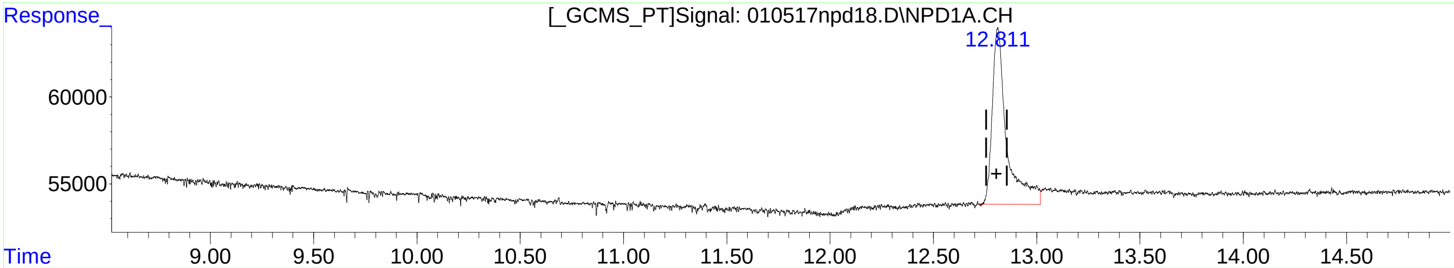
(1) Tripropylphosphate #2

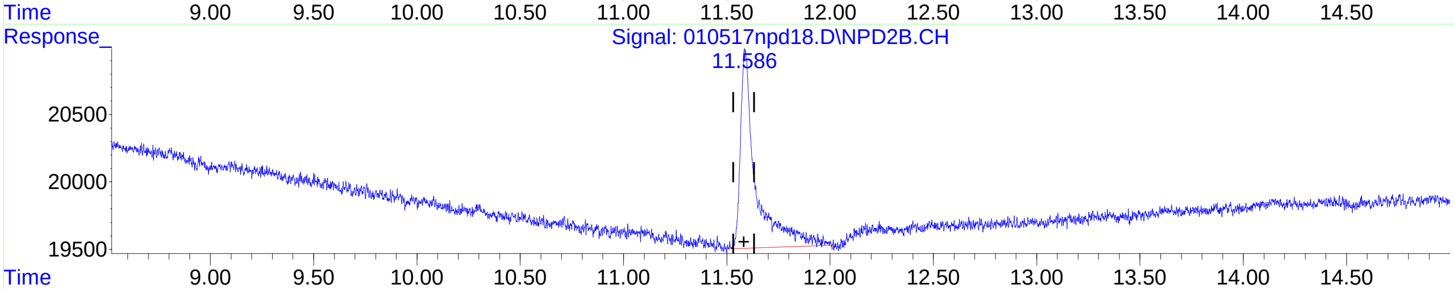
11.588min 263.277 ug/L

response 37132

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd18.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd18.D\NPD2B.CH
Acq On    : 05 Jan 2017  15:17 pm                    Operator:
Sample    : 1612702-006A                             Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:08:39 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.811min 396.800 ug/L m

response 495083

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.586min 456.130 ug/L m

response 77078

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd19.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 15:36 pm
Operator :
Sample : CCB-010517NPD-1
Misc :
ALS Vial : 0 (Sig #1); 18 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:52:52 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

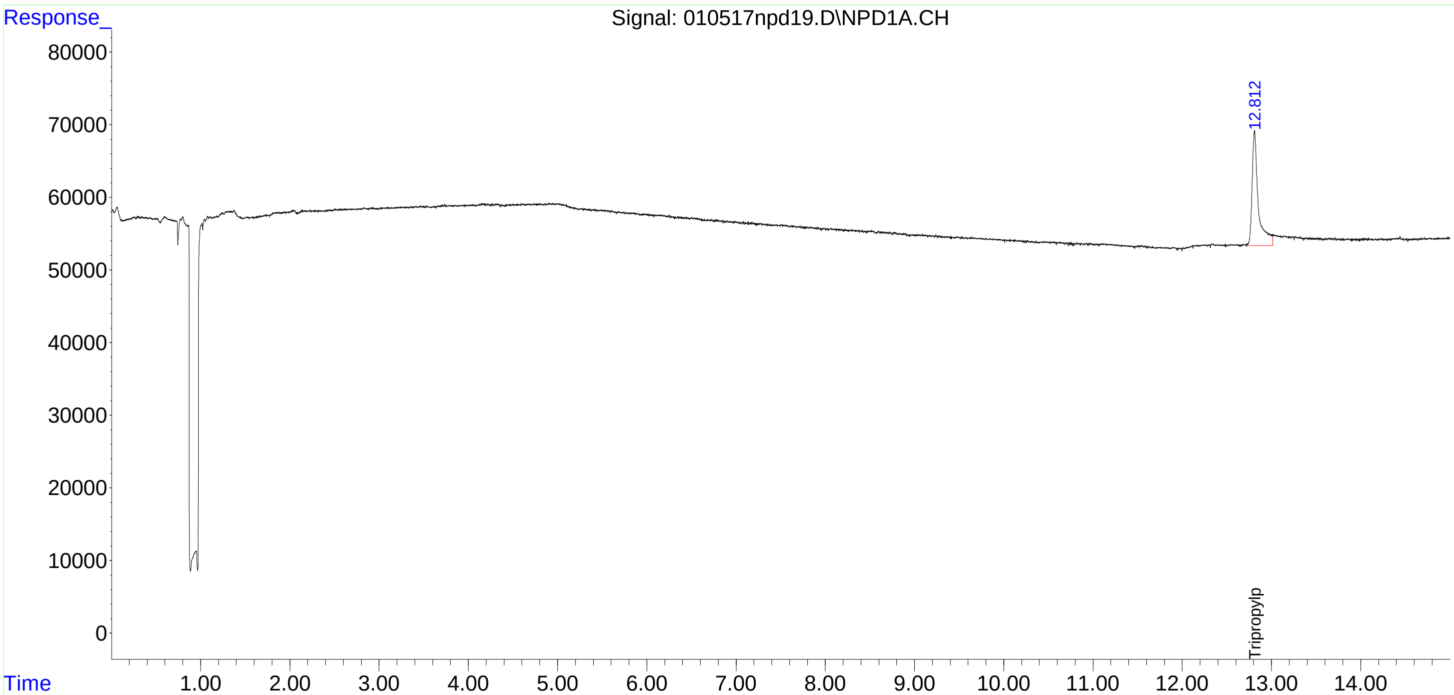
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.812	11.585	771521	123082	618.360m	674.502m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

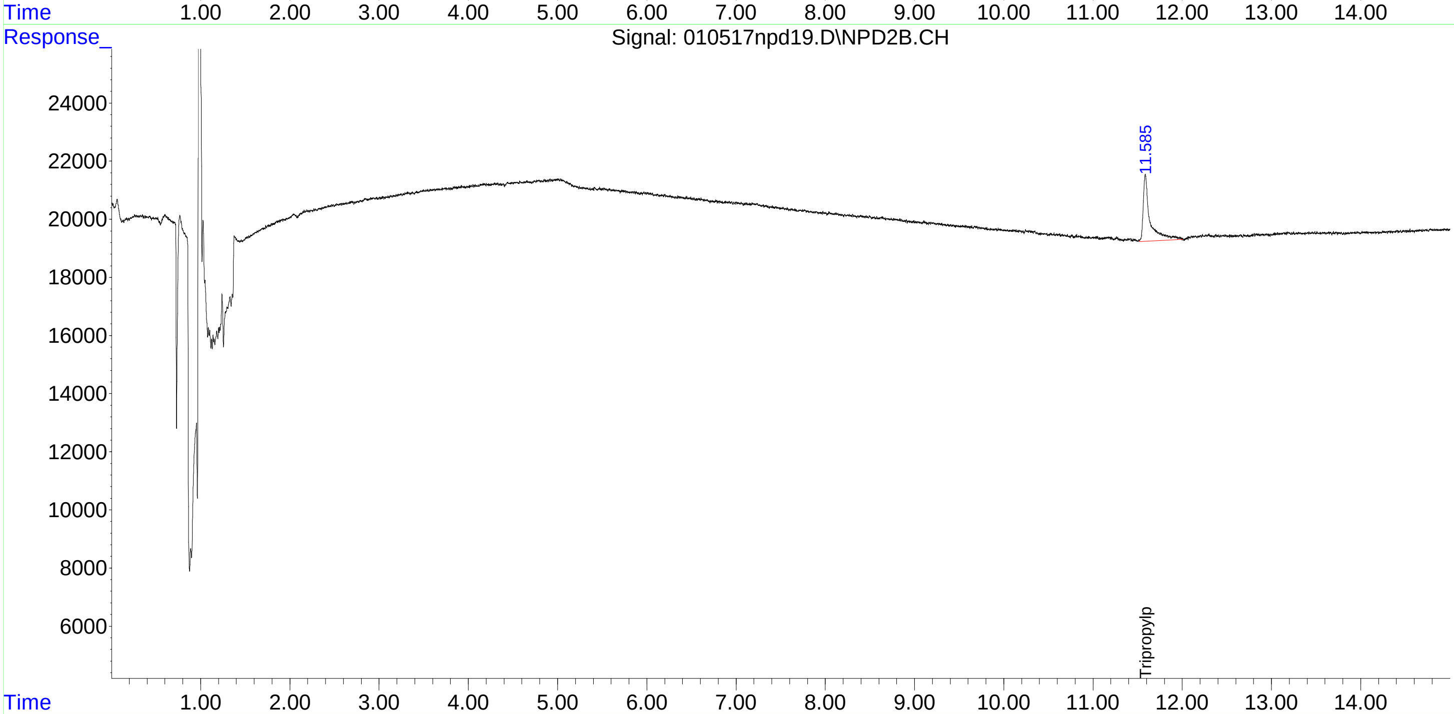
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd19.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 15:36 pm
Operator :
Sample : CCB-010517NPD-1
Misc :
ALS Vial : 0 (Sig #1); 18 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:52:52 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

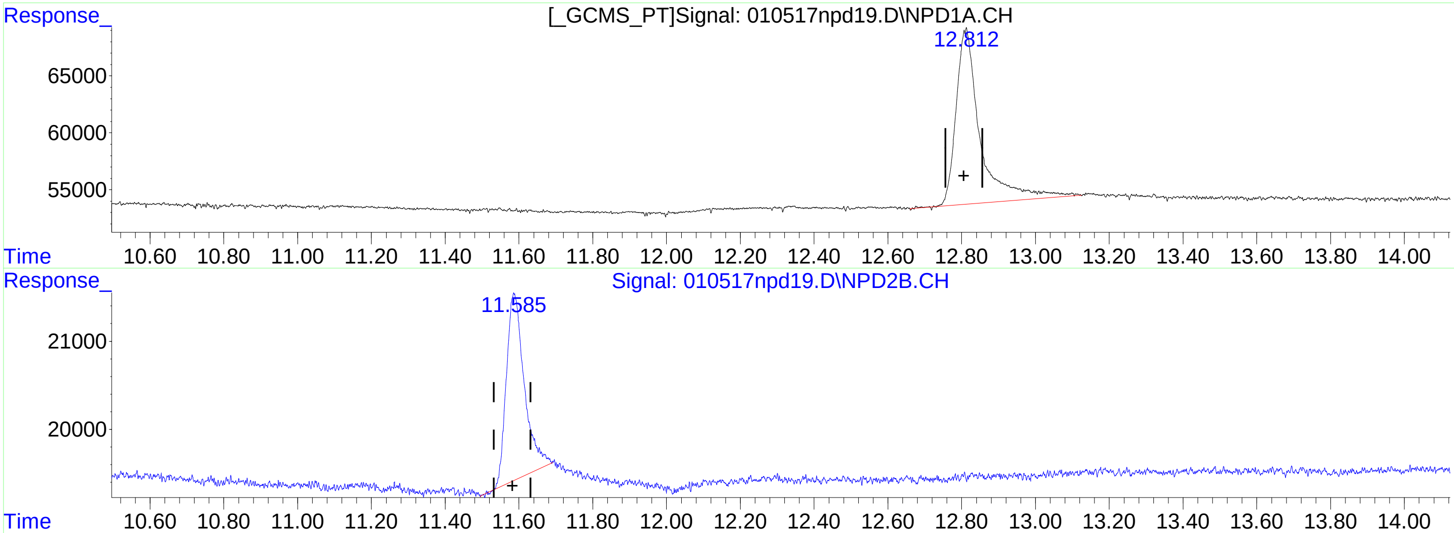
Volume Inj. :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :





Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd19.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd19.D\NPD2B.CH
Acq On    : 05 Jan 2017  15:36 pm                     Operator:
Sample    : CCB-010517NPD-1                           Inst     : GC-NPD
Misc      :                                           Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 15:54:48 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.811min 562.180 ug/L

response 701425

(1) Tripropylphosphate #2

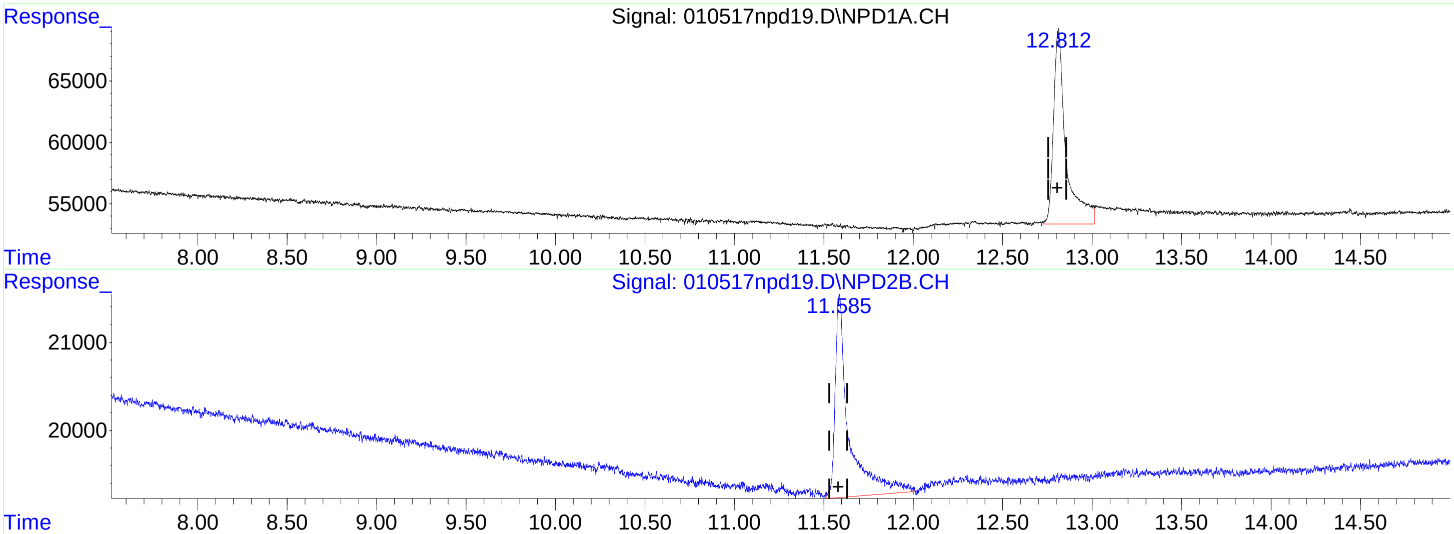
11.587min 431.063 ug/L

response 71850

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd19.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd19.D\NPD2B.CH
Acq On : 05 Jan 2017 15:36 pm Operator:
Sample : CCB-010517NPD-1 Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 15:54:48 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration



QEdit

(1) Tripropylphosphate

12.812min 618.360 ug/L m

response 771521

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.585min 674.502 ug/L m

response 123082

Evaluate Continuing Calibration Report

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd20.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On   : 05 Jan 2017 15:55 pm
Operator :
Sample   : CCV-010517NPD-1
Misc   :
ALS Vial : 0 (Sig #1); 8 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:54:29 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.   :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

Min. RRF   :   0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15%   Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	Tripropylphosphate	2000.000	1156.977	42.2#	55	0.00
2	White Phosphorus	42.920	36.582	14.8	85	0.00

Signal #2

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	Tripropylphosphate	2000.000	1175.257	41.2#	51	0.00
2	White Phosphorus	42.920	29.616	31.0#	70	0.00

Evaluate Continuing Calibration Report - Not Founds

Signal #2

(#) = Out of Range   SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd20.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 15:55 pm
Operator :
Sample : CCV-010517NPD-1
Misc :
ALS Vial : 0 (Sig #1); 8 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:54:29 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

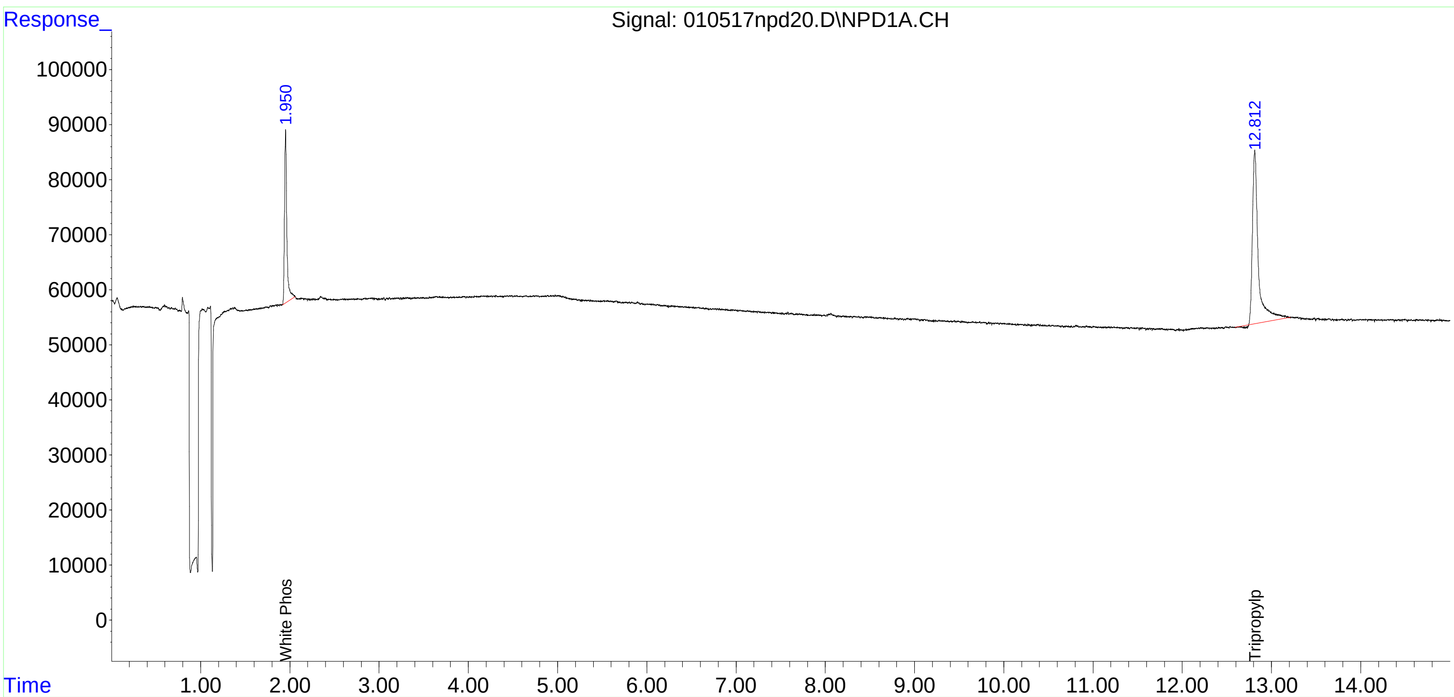
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

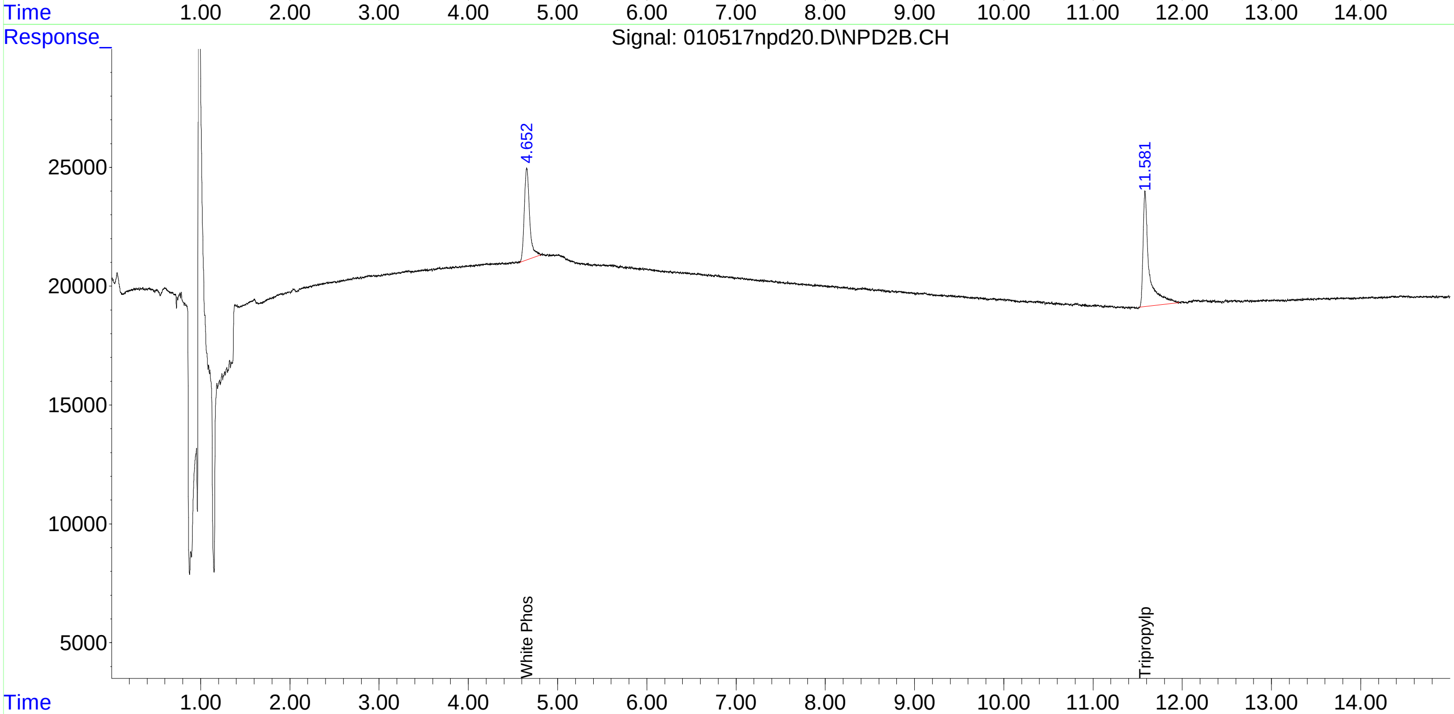
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.814	11.581	1443546	231672	1156.977	1175.257m
2)	White Pho...	1.950	4.652	574430	161242	36.582m	29.616m

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

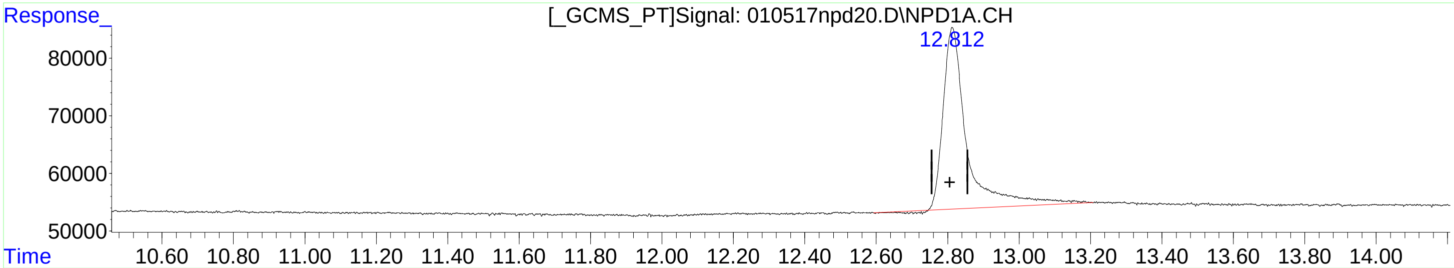
```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd20.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  15:55 pm
Operator  :
Sample    : CCV-010517NPD-1
Misc      :
ALS Vial  : 0 (Sig #1); 8 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:54:29 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                  Signal #2 Phase:
Signal #1 Info  :                  Signal #2 Info :
```

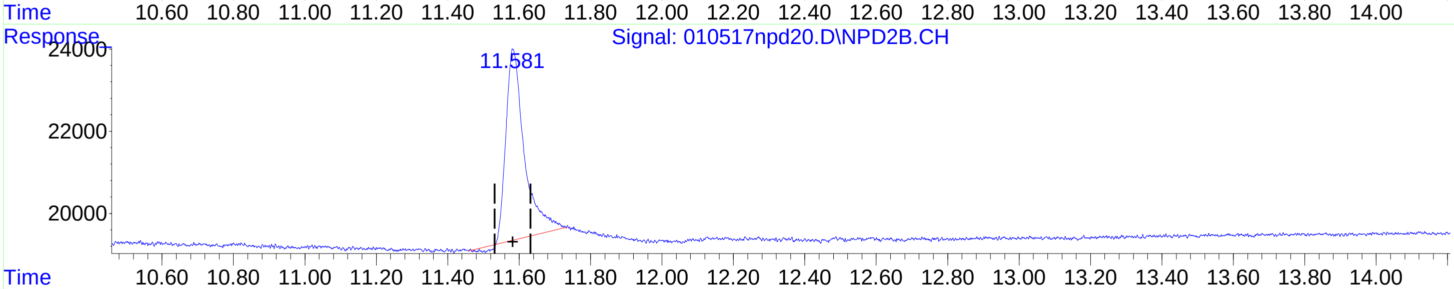




Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd20.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd20.D\NPD2B.CH
Acq On    : 05 Jan 2017  15:55 pm                    Operator:
Sample    : CCV-010517NPD-1                          Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:11:00 2017         Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.814min 1156.977 ug/L

response 1443546

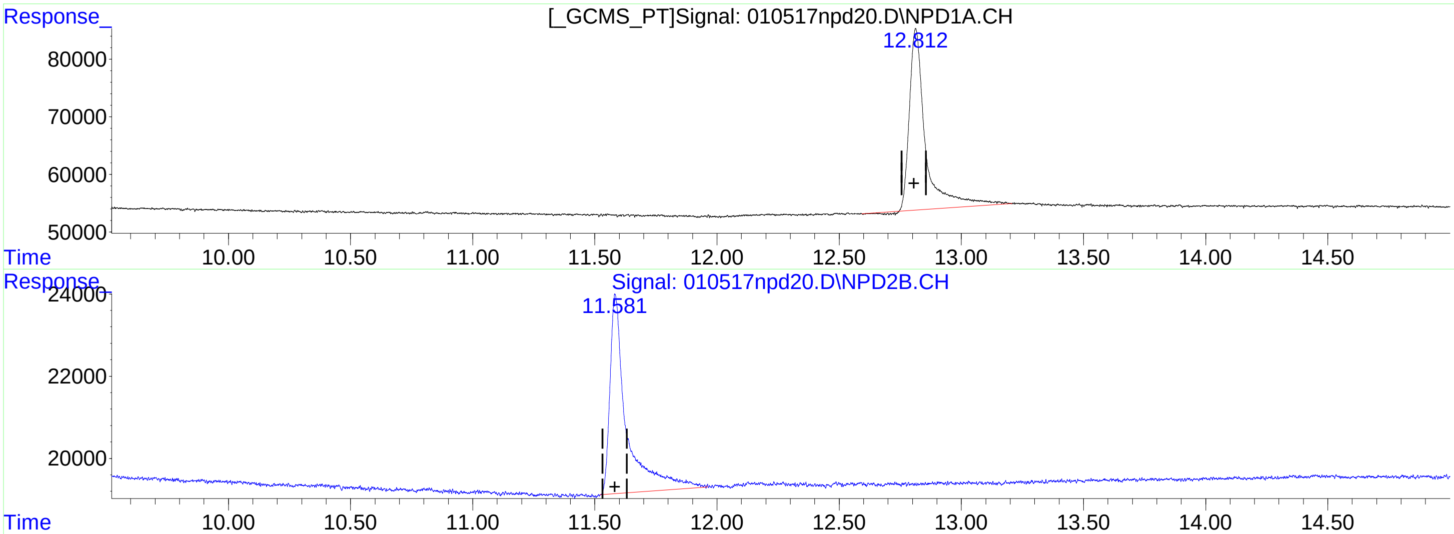
(1) Tripropylphosphate #2

11.583min 870.064 ug/L

response 164977

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd20.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd20.D\NPD2B.CH
Acq On    : 05 Jan 2017  15:55 pm                    Operator:
Sample    : CCV-010517NPD-1                          Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:11:00 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.814min 1156.977 ug/L

response 1443546

(1) Tripropylphosphate #2

11.581min 1175.257 ug/L m

response 231672

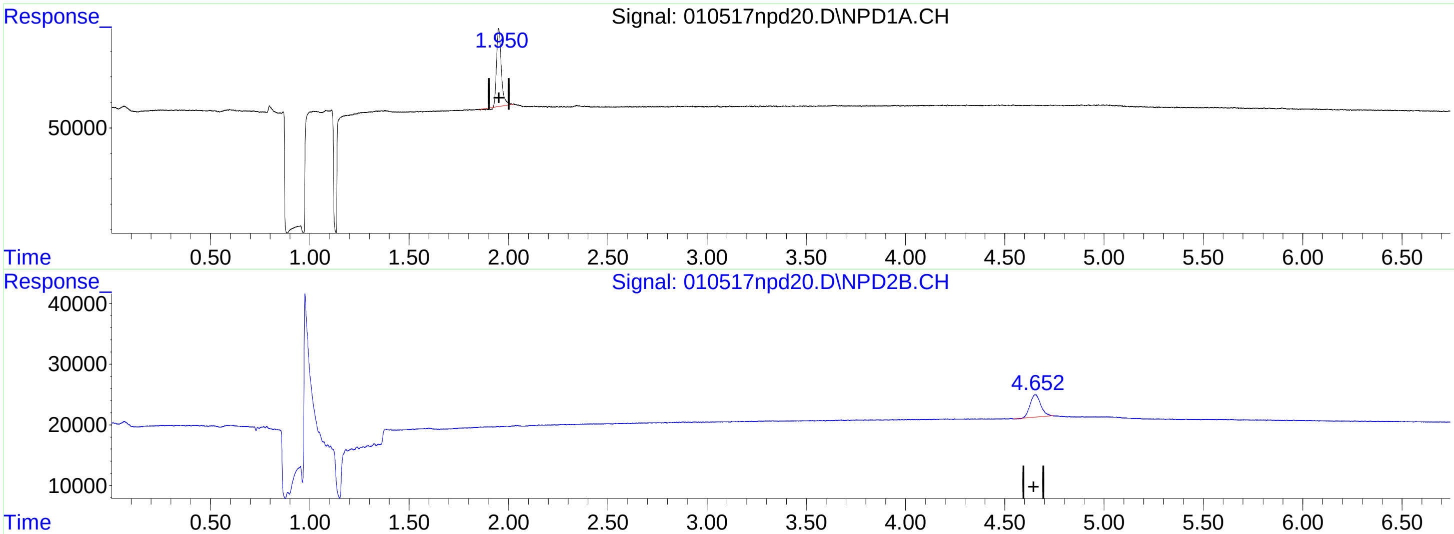
Reason for Manual Integration, Column 2:

Software incorrectly integrated peak.
-DS

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd20.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd20.D\NPD2B.CH
Acq On : 05 Jan 2017 15:55 pm Operator:
Sample : CCV-010517NPD-1 Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 16:11:00 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration



QEdit

(2) White Phosphorus

1.951min 32.016

response 500513

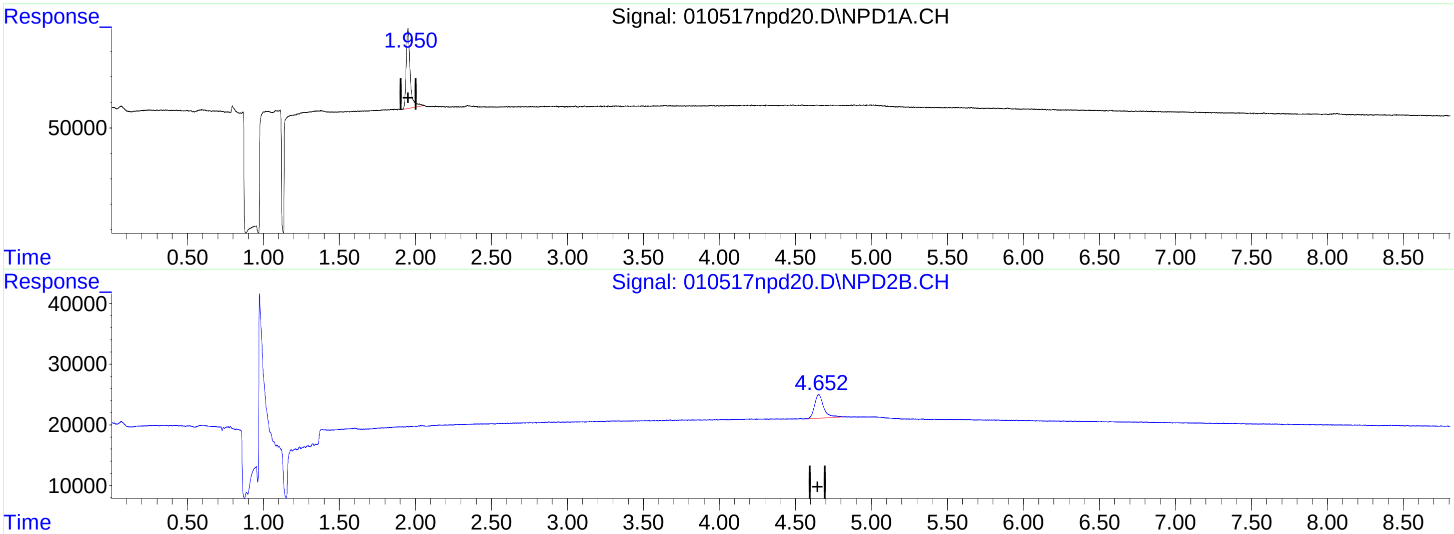
(2) White Phosphorus #2

4.653min 25.604

response 138102

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd20.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd20.D\NPD2B.CH
Acq On    : 05 Jan 2017  15:55 pm                    Operator:
Sample    : CCV-010517NPD-1                          Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:11:00 2017        Results File: 010517wphos.RES

Method        : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title         : P4 Calibration
Last Update   : Thu Jan 05 12:11:49 2017
Response via  : Multiple Level Calibration
```



QEdit

(2) White Phosphorus

1.950min 36.582 m

response 574430

```
|Reason for Manual Integration, Column 1 & 2:
|
|Software incorrectly integrated peak.
| -DS
```

(2) White Phosphorus #2

4.652min 29.616 m

response 161242

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd21.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 16:15 pm
Operator :
Sample : 1612702-007A
Misc :
ALS Vial : 0 (Sig #1); 19 (Sig #2) Sample Multiplier: 1

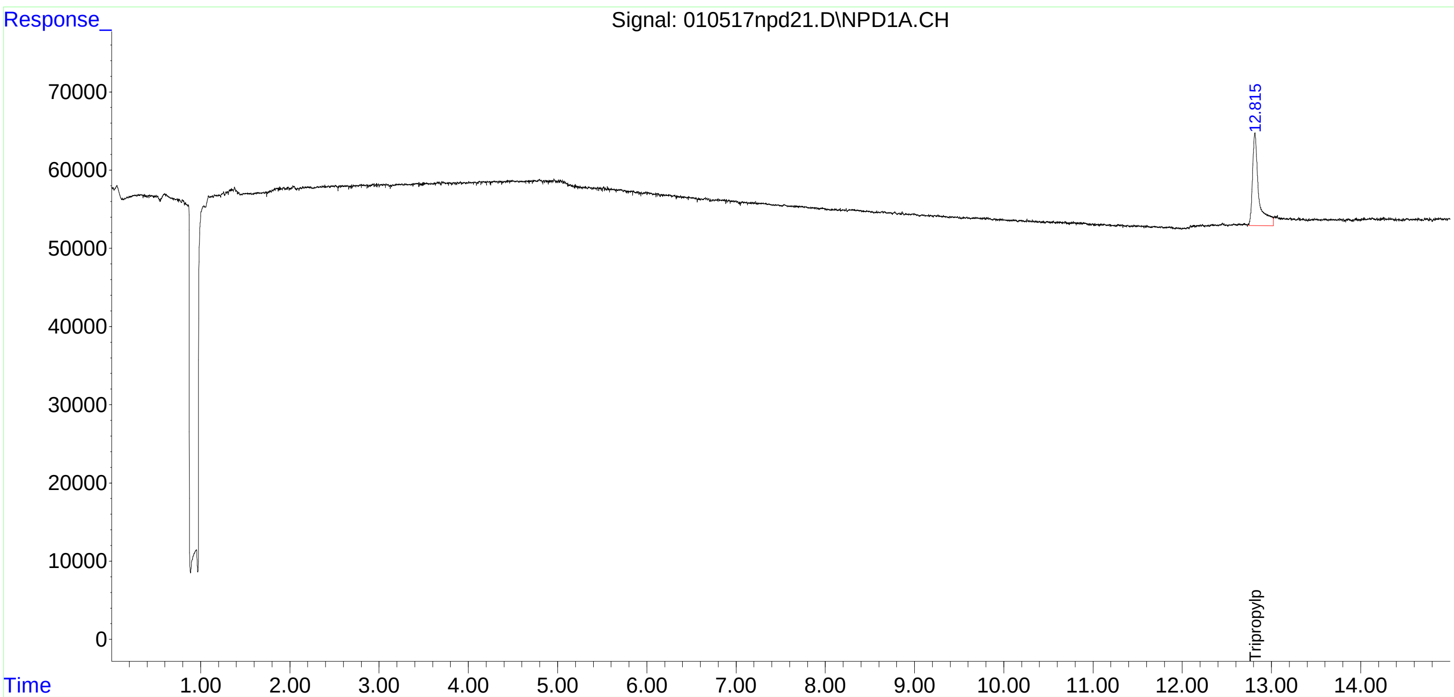
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:55:15 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

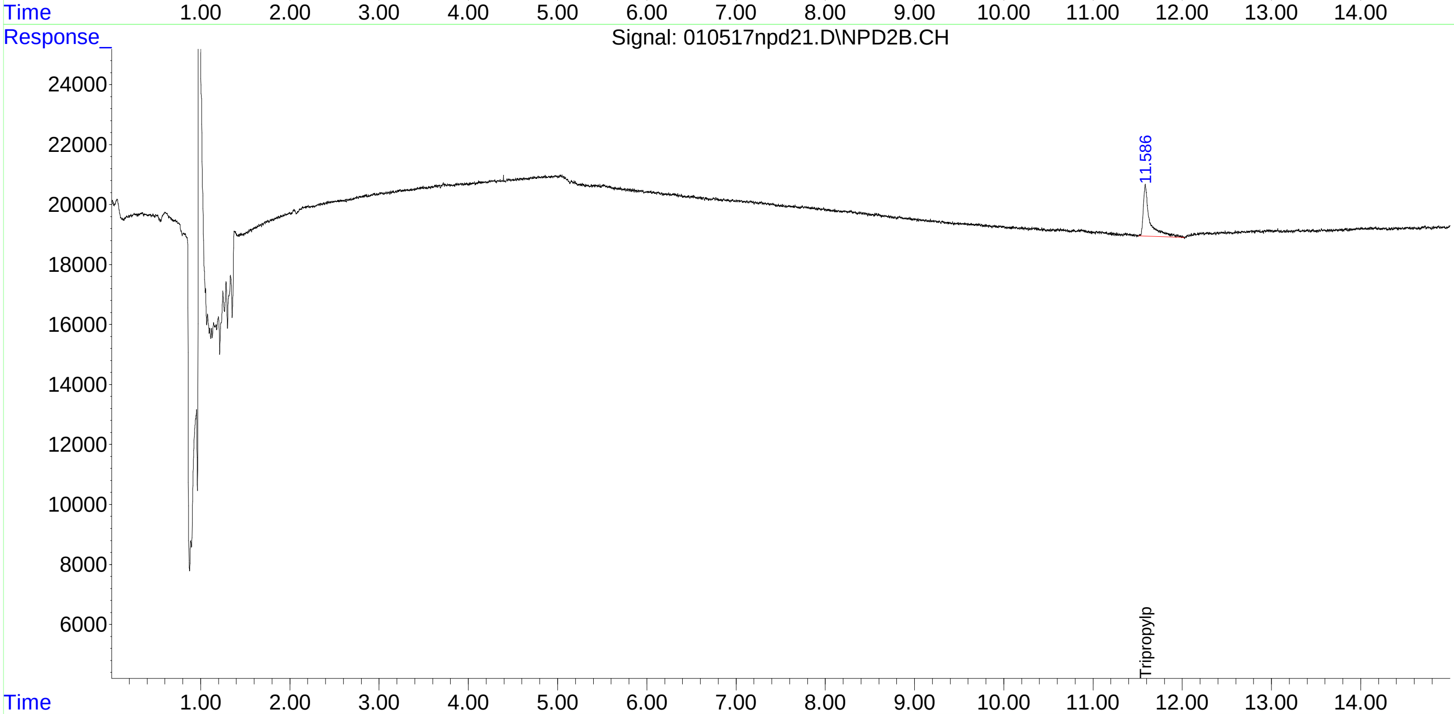
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.815	11.586	577895	86529	463.173m	501.310m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

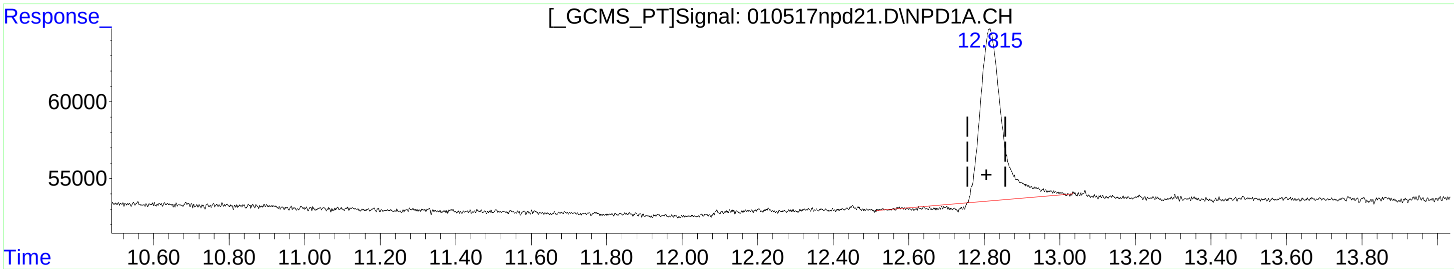
```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd21.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  16:15 pm
Operator  :
Sample    : 1612702-007A
Misc      :
ALS Vial  : 0 (Sig #1); 19 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:55:15 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                Signal #2 Phase:
Signal #1 Info  :                Signal #2 Info :
```

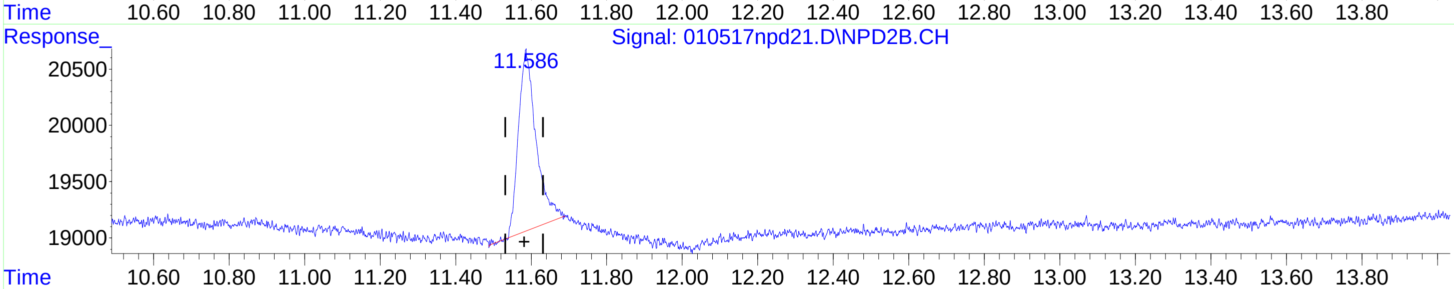




Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd21.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd21.D\NPD2B.CH
Acq On    : 05 Jan 2017  16:15 pm                    Operator:
Sample    : 1612702-007A                             Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:51:35 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.815min 344.657 ug/L

response 430024

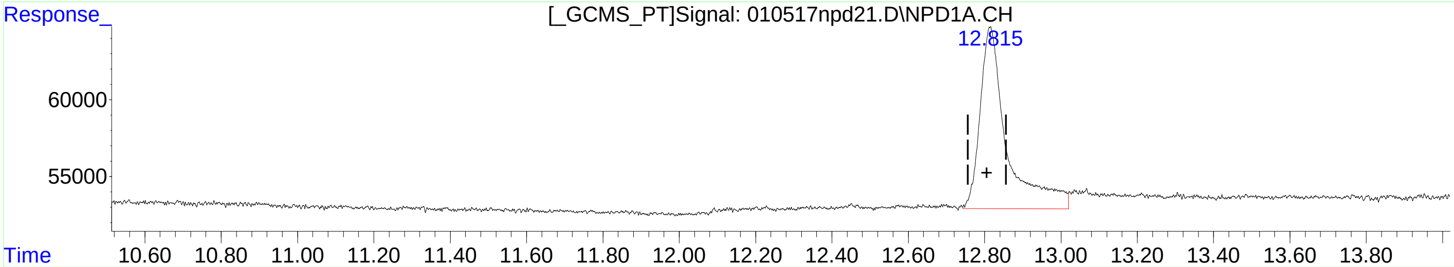
(1) Tripropylphosphate #2

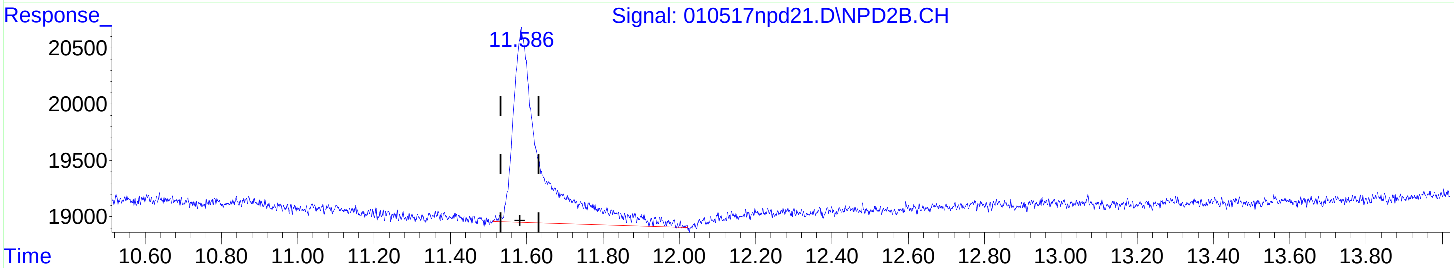
11.586min 337.292 ug/L

response 52388

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd21.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd21.D\NPD2B.CH
Acq On    : 05 Jan 2017  16:15 pm                    Operator:
Sample    : 1612702-007A                             Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 16:51:35 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.815min 463.173 ug/L m

response 577895

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.586min 501.310 ug/L m

response 86529

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd24.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 17:12 pm
Operator :
Sample : CCB-010517NPD-2
Misc :
ALS Vial : 0 (Sig #1); 18 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:58:32 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

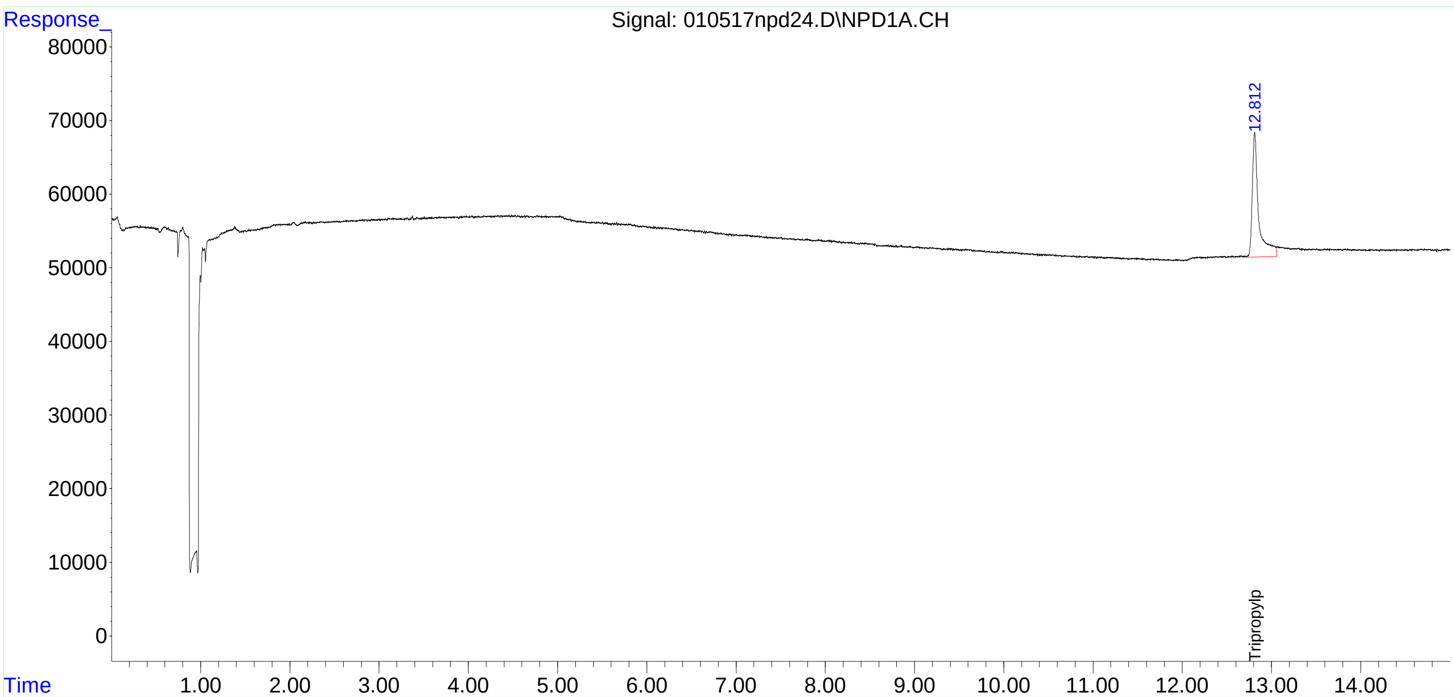
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.812	11.584	847138	125380	678.967m	685.308m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

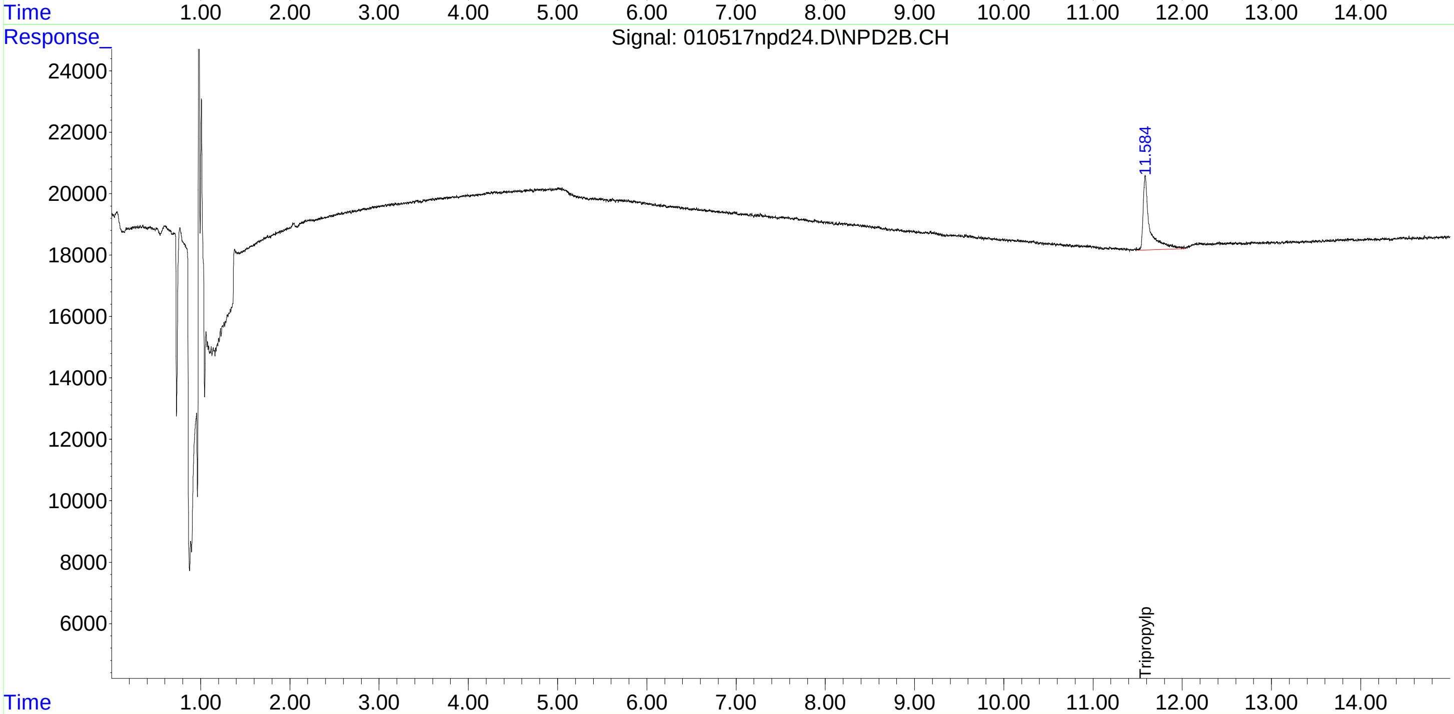
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd24.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On   : 05 Jan 2017 17:12 pm
Operator :
Sample   : CCB-010517NPD-2
Misc   :
ALS Vial : 0 (Sig #1); 18 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:58:32 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.   :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

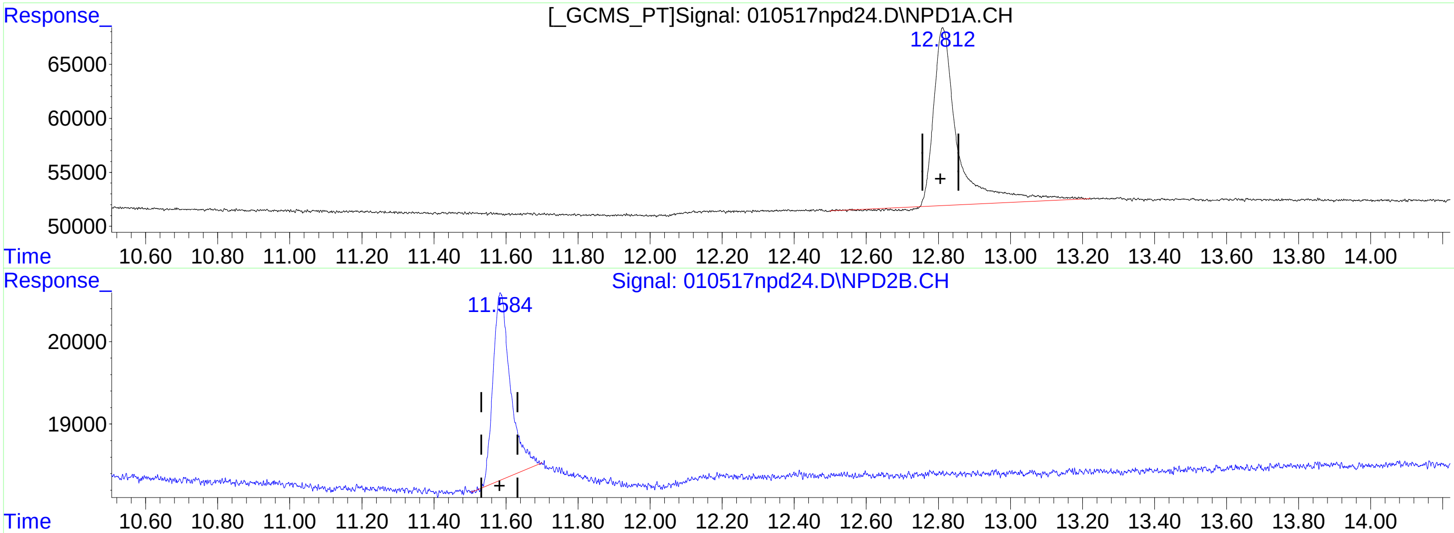




Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd24.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd24.D\NPD2B.CH
Acq On : 05 Jan 2017 17:12 pm Operator:
Sample : CCB-010517NPD-2 Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 17:37:06 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration



QEdit

(1) Tripropylphosphate

12.813min 599.509 ug/L

response 748001

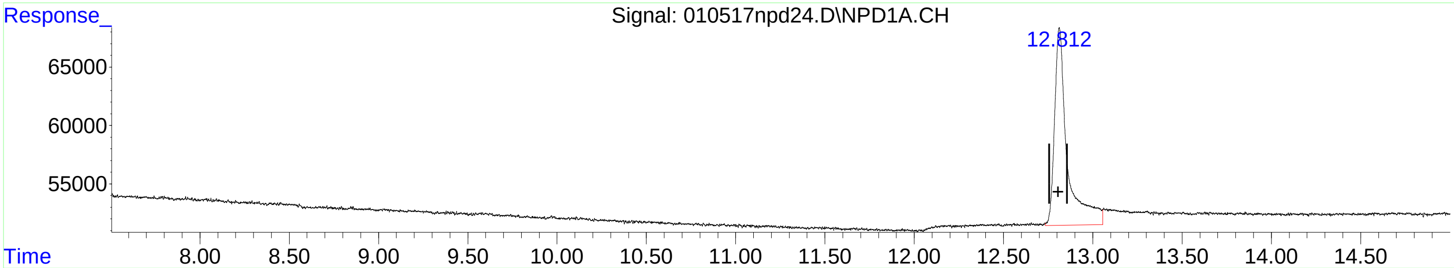
(1) Tripropylphosphate #2

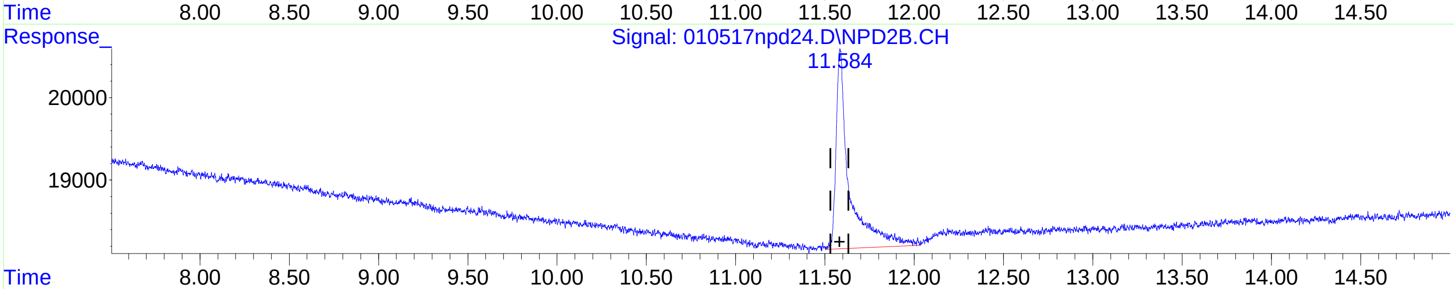
11.585min 455.048 ug/L

response 76852

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd24.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd24.D\NPD2B.CH
Acq On    : 05 Jan 2017  17:12 pm                   Operator:
Sample    : CCB-010517NPD-2                         Inst     : GC-NPD
Misc      :                                         Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 17:37:06 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.812min 678.967 ug/L m

response 847138

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate #2

11.584min 685.308 ug/L m

response 125380

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd25.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 17:32 pm
Operator :
Sample : CCV-010517NPD-2
Misc :
ALS Vial : 0 (Sig #1); 8 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 10:00:56 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	Tripropylphosphate	2000.000	1141.354	42.9#	54	0.00
2	White Phosphorus	42.920	38.318	10.7	90	0.00

Signal #2

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	Tripropylphosphate	2000.000	1000.355	50.0#	43	0.00
2	White Phosphorus	42.920	32.680	23.9#	77	0.00

Evaluate Continuing Calibration Report - Not Founds

Signal #2

(#) = Out of Range   SPCC's out = 0 CCC's out = 0

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd25.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 17:32 pm
Operator :
Sample : CCV-010517NPD-2
Misc :
ALS Vial : 0 (Sig #1); 8 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 10:00:56 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.809	11.583	1424053	193254	1141.354m	1000.355
2)	White Pho...	1.951	4.650	602536	178921	38.318m	32.680m

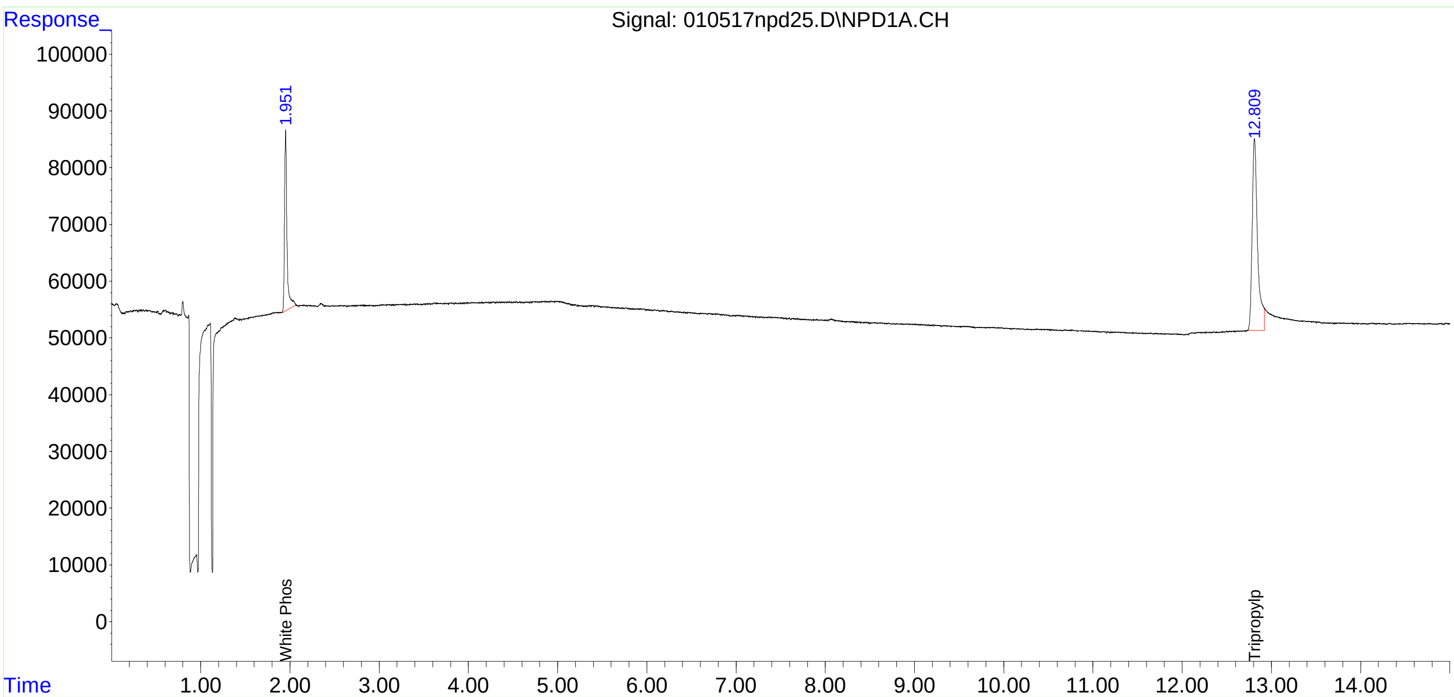
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

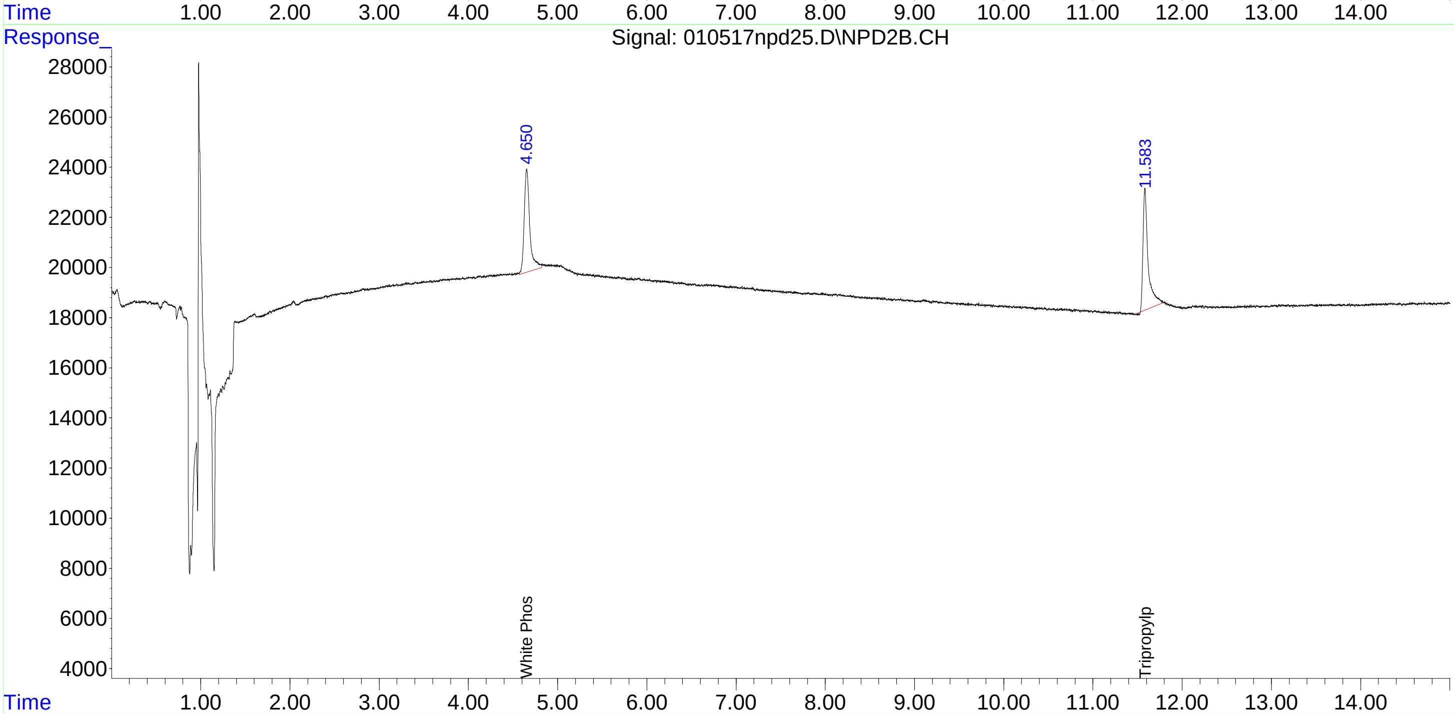
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd25.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 17:32 pm
Operator :
Sample : CCV-010517NPD-2
Misc :
ALS Vial : 0 (Sig #1); 8 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 10:00:56 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

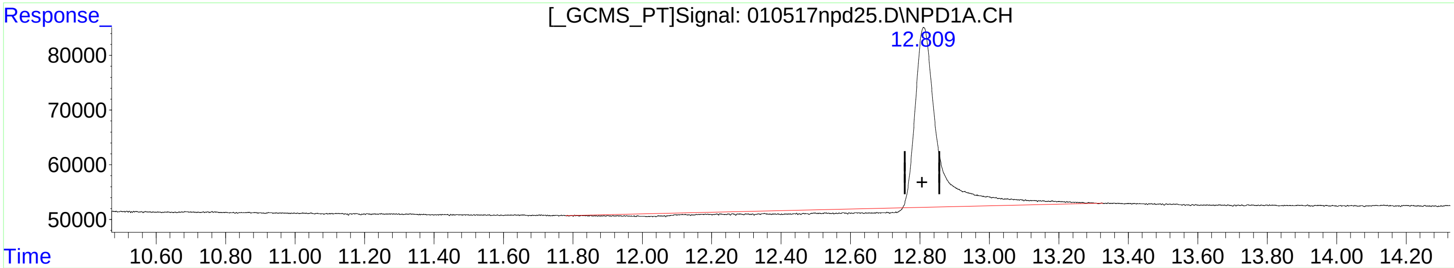
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

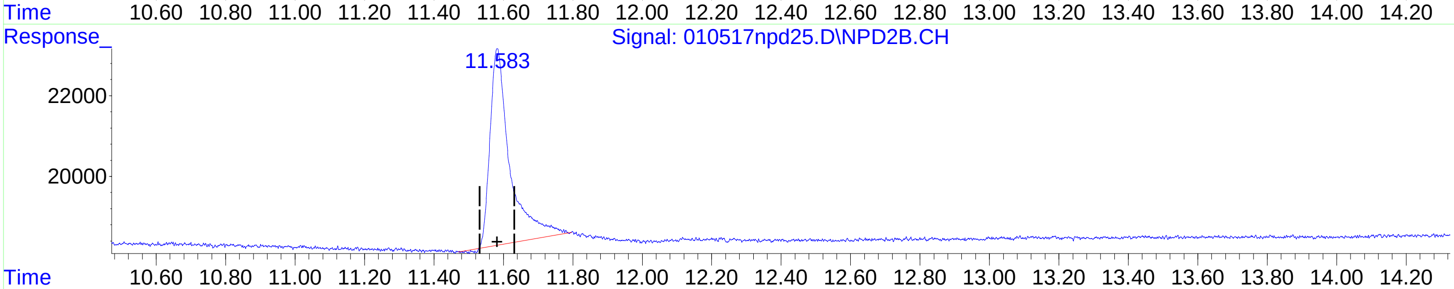




Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd25.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd25.D\NPD2B.CH
Acq On    : 05 Jan 2017  17:32 pm                     Operator:
Sample    : CCV-010517NPD-2                           Inst     : GC-NPD
Misc      :                                           Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 17:48:41 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.812min 1017.387 ug/L

response 1269381

(1) Tripropylphosphate #2

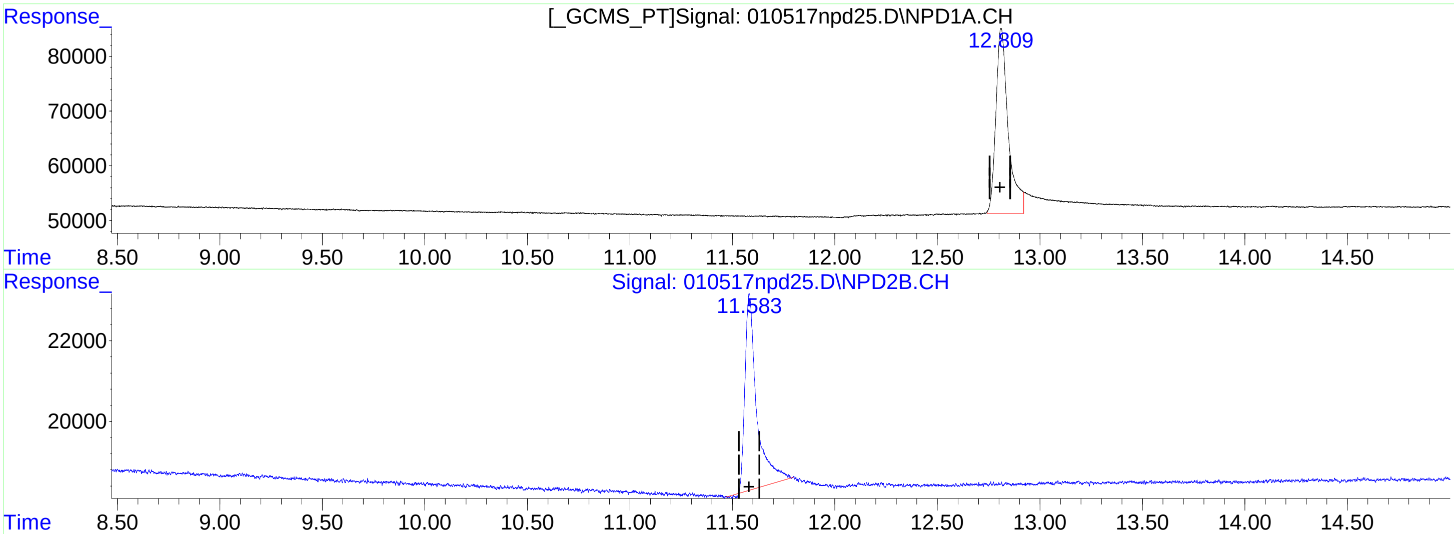
11.583min 1000.355 ug/L

response 193254

Quantitation Report (Qedit)

Signal #1 : C:\msdchem\2\data\01...10517npd25.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd25.D\NPD2B.CH
Acq On : 05 Jan 2017 17:32 pm Operator:
Sample : CCV-010517NPD-2 Inst : GC-NPD
Misc : Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e
Quant Time: Jan 05 17:48:41 2017 Results File: 010517wphos.RES

Method : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration



QEdit

Reason for Manual Integration, Column 1:

Software incorrectly integrated peak.
-DS

(1) Tripropylphosphate

12.809min 1141.354 ug/L m

response 1424053

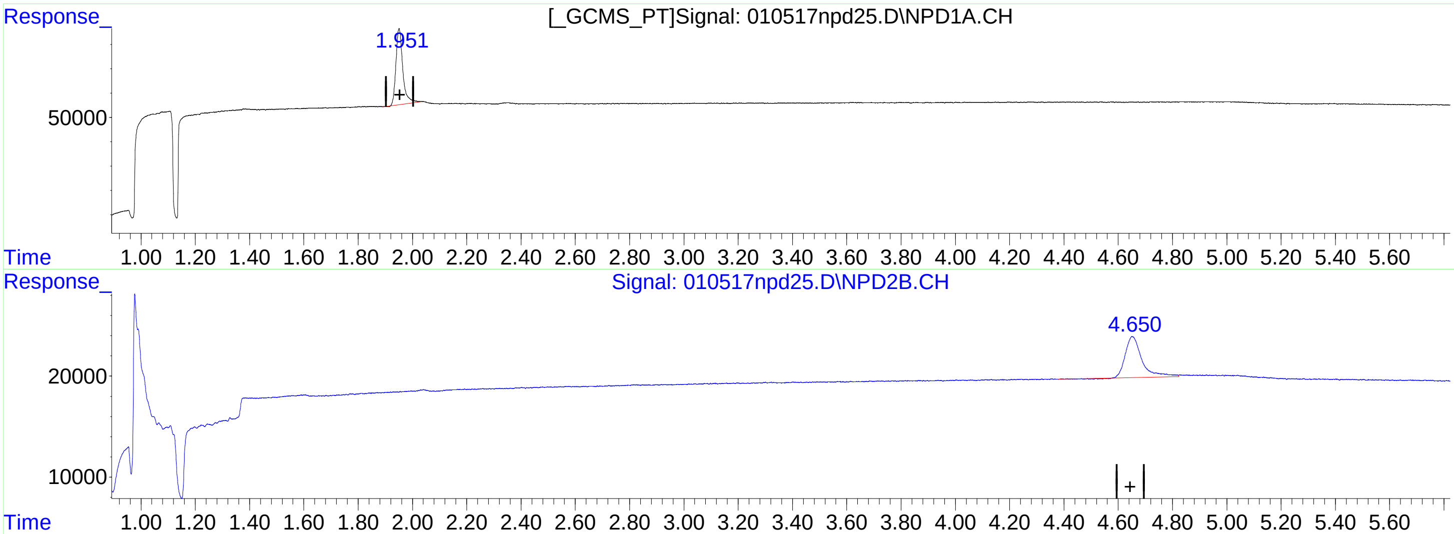
(1) Tripropylphosphate #2

11.583min 1000.355 ug/L

response 193254

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd25.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd25.D\NPD2B.CH
Acq On    : 05 Jan 2017  17:32 pm                    Operator:
Sample    : CCV-010517NPD-2                          Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 17:48:41 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(2) White Phosphorus

1.951min 34.654

response 543230

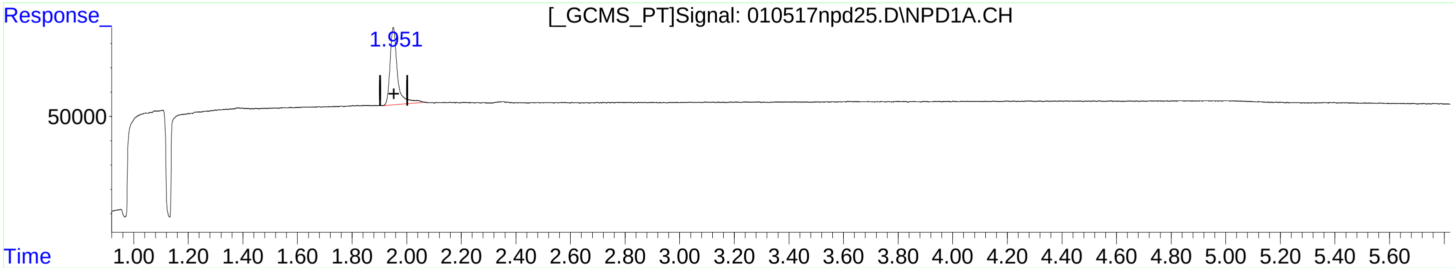
(2) White Phosphorus #2

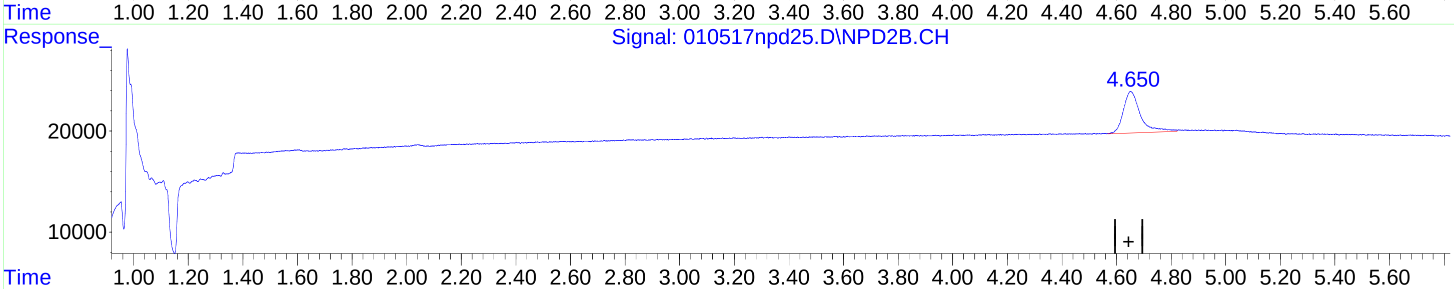
4.652min 31.965

response 174792

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd25.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd25.D\NPD2B.CH
Acq On    : 05 Jan 2017  17:32 pm                    Operator:
Sample    : CCV-010517NPD-2                          Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 17:48:41 2017         Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(2) White Phosphorus

1.951min 38.318 m

response 602536

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

(2) White Phosphorus #2

4.650min 32.680 m

response 178921

Injection Log

Data Directory: C:\msdchem\2\data\010517WPHOS\

SampleName	MiscInfo	Vial	Multiplier	Injection Time
1) 010517npdA.D Prime102816NPD			1.000	05 Jan 2017 8:12 am
2) 010517npdB.D Prime102816NPD			1.000	05 Jan 2017 8:32 am
3) 010517npdC.D Prime102816NPD			1.000	05 Jan 2017 8:51 am
4) 010517npdE.D Prime102816NPD			1.000	05 Jan 2017 9:10 am
5) 010517npdG.D Prime102816NPD			1.000	05 Jan 2017 9:30 am
6) 010517npd01.D ICB-010517NPD			1.000	05 Jan 2017 9:49 am
7) 010517npd02.D ICAL1-010517NPD			1.000	05 Jan 2017 10:08 am
8) 010517npd03.D ICAL2- 010517NPD			1.000	05 Jan 2017 10:28 am
9) 010517npd04.D ICAL3- 010517NPD			1.000	05 Jan 2017 10:46 am
10) 010517npd05.D ICAL4- 010517NPD			1.000	05 Jan 2017 11:05 am
11) 010517npd06.D ICAL5- 010517NPD			1.000	05 Jan 2017 11:25 am
12) 010517npd07.D ICAL6- 010517NPD			1.000	05 Jan 2017 11:44 am
13) 010517npd08.D ICV- 010517NPD			1.000	05 Jan 2017 12:03 pm
14) 010517npd09.D CRQL-010517NPD			1.000	05 Jan 2017 12:23 pm
15) 010517npd10.D MB-42082			1.000	05 Jan 2017 12:42 pm
16) 010517npd11.D LCS-42082			1.000	05 Jan 2017 13:02 pm
17) 010517npd12.D LCSD-42082			1.000	05 Jan 2017 13:21 pm
18) 010517npd13.D 1612702-001A			1.000	05 Jan 2017 13:40 pm
19) 010517npd14.D 1612702-002A			1.000	05 Jan 2017 13:59 pm
20) 010517npd15.D 1612702-003A			1.000	05 Jan 2017 14:19 pm
21) 010517npd16.D 1612702-004A			1.000	05 Jan 2017 14:38 pm

22) 010517npd17.D
1612702-005A 1.000 05 Jan 2017 14:57 pm

---

23) 010517npd18.D
1612702-006A 1.000 05 Jan 2017 15:17 pm

---

24) 010517npd19.D
CCB-010517NPD-1 1.000 05 Jan 2017 15:36 pm

---

25) 010517npd20.D
CCV-010517NPD-1 1.000 05 Jan 2017 15:55 pm

---

26) 010517npd21.D
1612702-007A 1.000 05 Jan 2017 16:15 pm

---

27) 010517npd22.D
LOD-42082 1.000 05 Jan 2017 16:34 pm

---

28) 010517npd23.D
LOQ-42082 1.000 05 Jan 2017 16:53 pm

---

29) 010517npd24.D
CCB-010517NPD-2 1.000 05 Jan 2017 17:12 pm

---

30) 010517npd25.D
CCV-010517NPD-2 1.000 05 Jan 2017 17:32 pm

Method Path : C:\msdchem\2\methods\
Method File : 010517wphos.m
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response Via : Initial Calibration

Calibration Files

1	=010517npd02.D	2	=010517npd03.D	3	=010517npd04.D
4	=010517npd05.D	5	=010517npd06.D	6	=010517npd07.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Tripropylphos...	0.923	0.907	1.204	1.312	1.234	1.287	1.144 E3	15.89
2)	White Phosphorus	1.258	1.461	1.403	1.566	1.629	1.602	1.486 E4	9.49

Signal #2 Calibration Files

1	=010517npd02.D	2	=010517npd03.D	3	=010517npd04.D
4	=010517npd05.D	5	=010517npd06.D	6	=010517npd07.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Tripropylphos...	1.314	1.502	1.898	2.258	2.072	2.355	1.900 E2	21.91
2)	White Phosphorus	3.701	4.509	5.481	5.403	5.282	5.947	5.054 E3	16.03

(#) = Out of Range ### Number of calibration levels exceeded format ###

Method Path : C:\msdchem\2\methods\
Method File : 010517wphos.m
Title : P4 Calibration
Last Update : Thu Jan 05 12:11:49 2017
Response Via : Initial Calibration

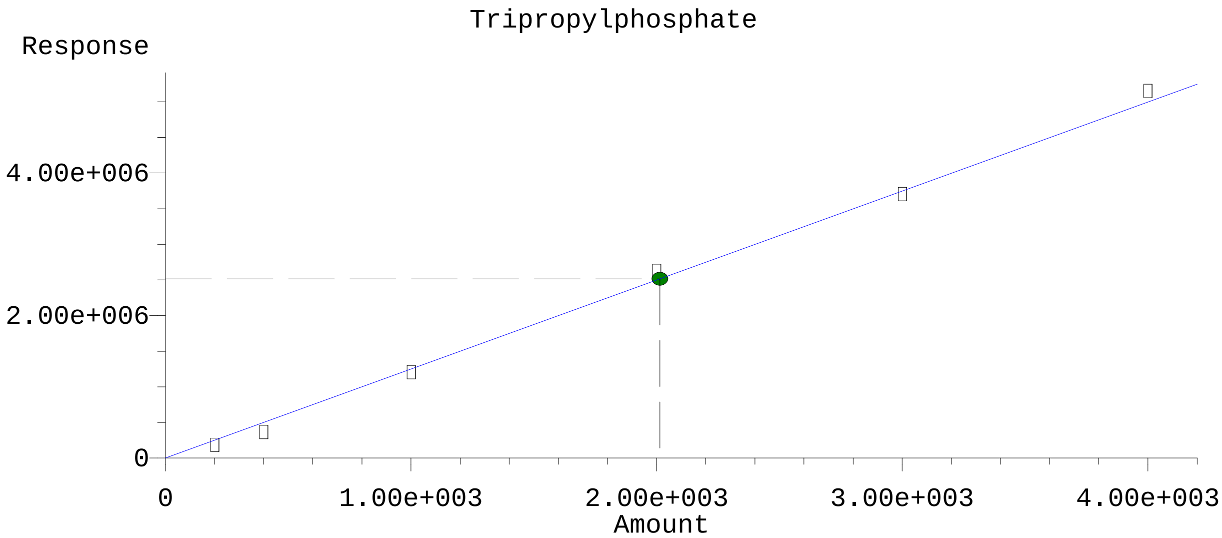
Total Cpnds : 5

PK#	Compound Name	Exp_RT	Rel_RT	Cal	A/H	ID
1	Tripropylphosphate	12.806	1.000	LO	A	R
2	White Phosphorus	1.953	1.000	L	A	R
3	Signal #2	0.000	1.000	A	A	B
4	Tripropylphosphate #2	11.582	1.000	Q	A	R
5	White Phosphorus #2	4.645	1.000	L	A	R

Cal A = Average L = Linear LO = Linear w/origin Q = Quad QO = Quad w/origin
A/H = Area or Height
ID R = R.T. B = R.T. & Q Q = Qvalue L = Largest A = All

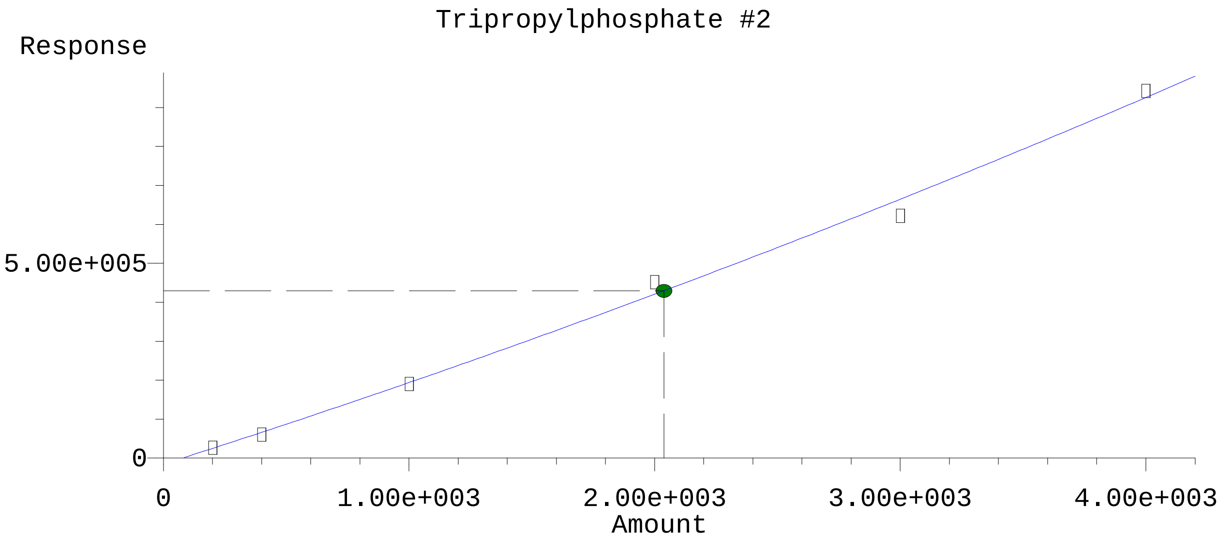
010517wphos.m Fri Jan 06 10:11:43 2017

Quadratic and Linear Equations Report
C:\msdchem\2\methods\010517wphos.m
C:\msdchem\2\data\010517WPHOS\010517npd08.D
Compound: Tripropylphosphate



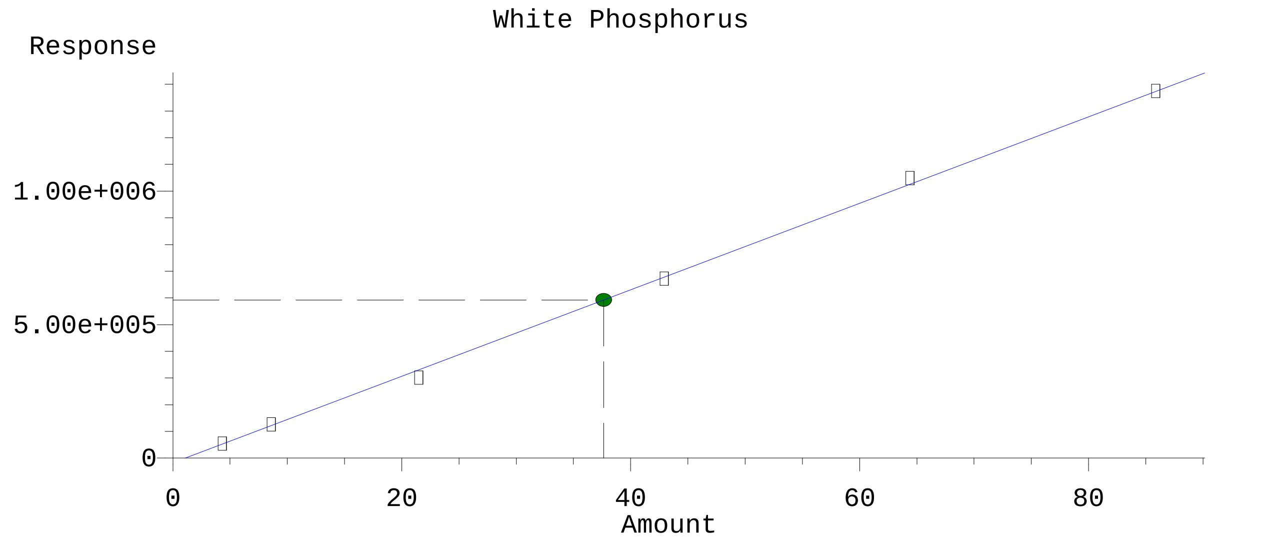
Response = 1.25e+003 * Amt
Coef of Det (r^2) = 0.998   Curve Fit: wlr(1/a)/(0,0)

Quadratic and Linear Equations Report
C:\msdchem\2\methods\010517wphos.m
C:\msdchem\2\data\010517WPHOS\010517npd08.D
Compound: Tripropylphosphate #2



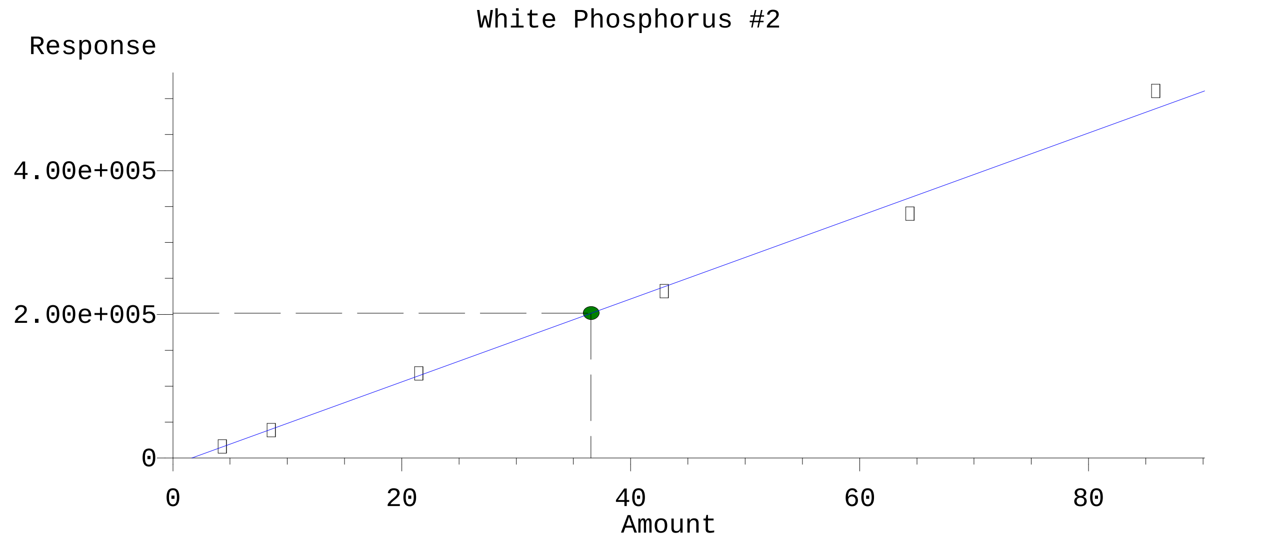
R = 8.60e-003 A*A + 2.01e+002 A - 1.64e+004
Coef of Det (r^2) = 0.997 Curve Fit: Quadratic w(1/a)
Coef of Det (r^2)= 0.9965

Quadratic and Linear Equations Report
C:\msdchem\2\methods\010517wphos.m
C:\msdchem\2\data\010517WPHOS\010517npd08.D
Compound: White Phosphorus



Response = 1.62e+004 * Amt - 1.78e+004
Coef of Det (r^2) = 0.999 Curve Fit: wlr(1/a)
Coef of Det (r^2)= 0.9987

Quadratic and Linear Equations Report
C:\msdchem\2\methods\010517wphos.m
C:\msdchem\2\data\010517WPHOS\010517npd08.D
Compound: White Phosphorus #2



Response = 5.77e+003 * Amt - 9.61e+003
Coef of Det (r^2) = 0.997 Curve Fit: wlr(1/a)
Coef of Det (r^2)= 0.9967

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd01.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 9:49 am
Operator :
Sample : ICB-010517NPD
Misc :
ALS Vial : 0 (Sig #1); 1 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:37:28 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

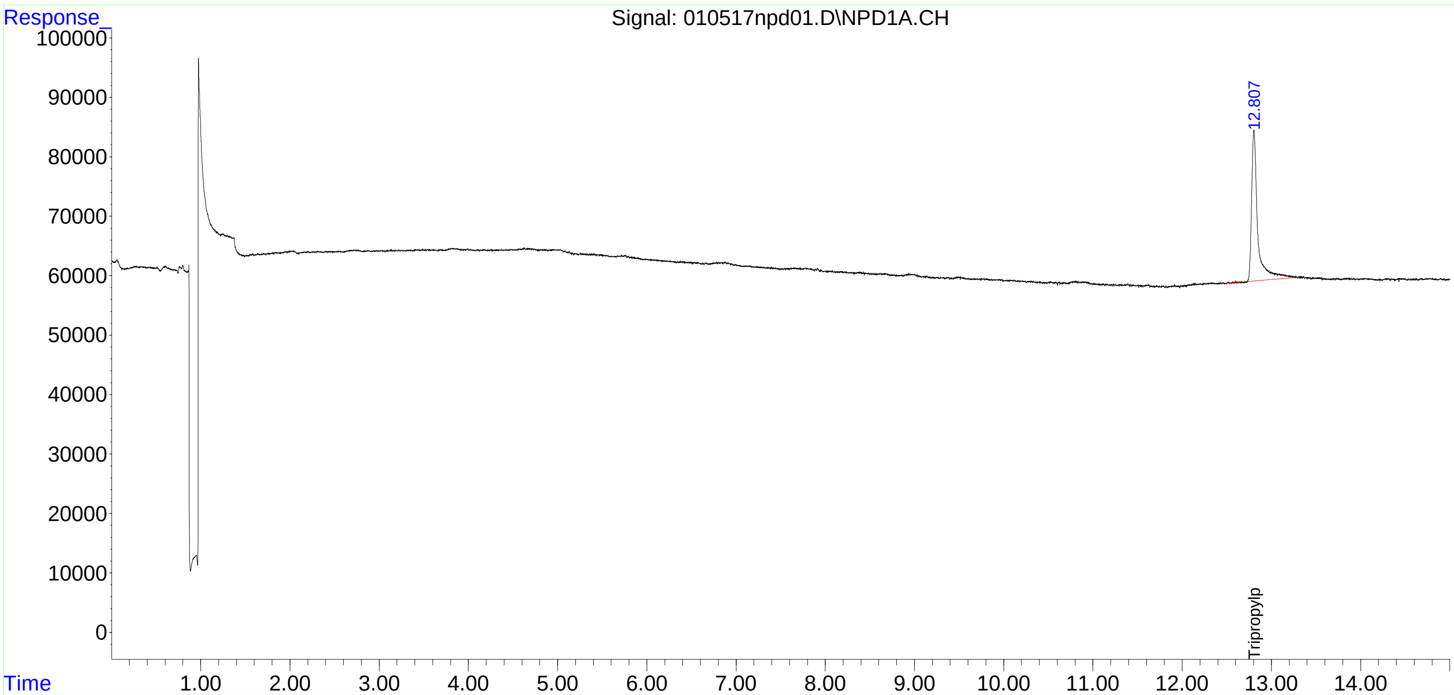
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

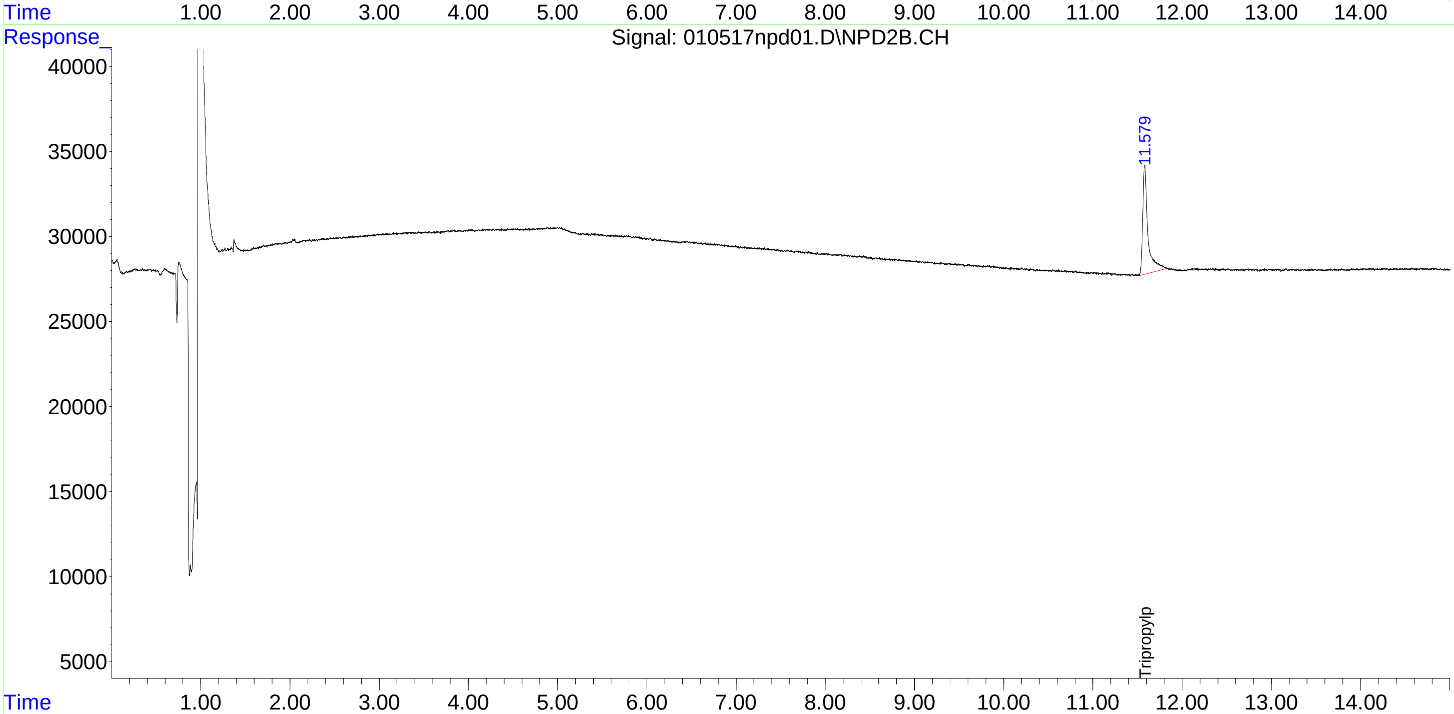
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.806	11.579	1216299	262072	974.842	1311.987m
2)	White Pho...	0.000	0.000	0	0	N.D.	N.D.

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

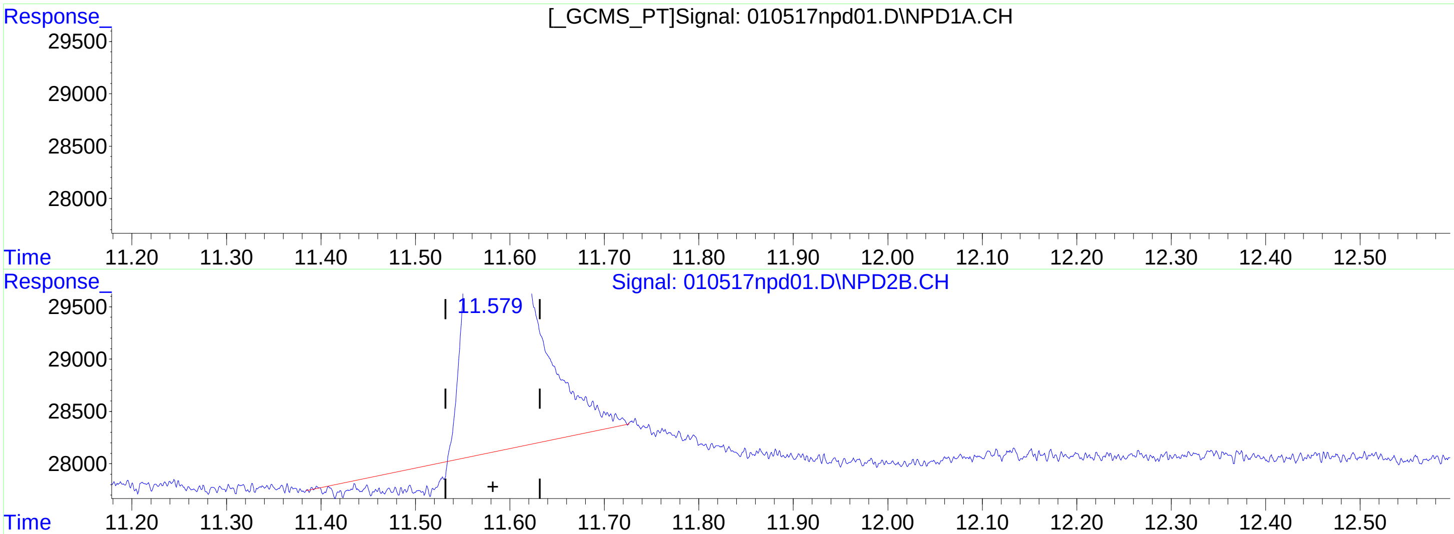
```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd01.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017   9:49 am
Operator  :
Sample    : ICB-010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 1 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:37:28 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.      :
Signal #1 Phase :              Signal #2 Phase:
Signal #1 Info  :              Signal #2 Info :
```





Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd01.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd01.D\NPD2B.CH
Acq On    : 05 Jan 2017   9:49 am                      Operator:
Sample    : ICB-010517NPD                              Inst     : GC-NPD
Misc      :                                            Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:13:32 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.806min 974.842 ug/L

response 1216299

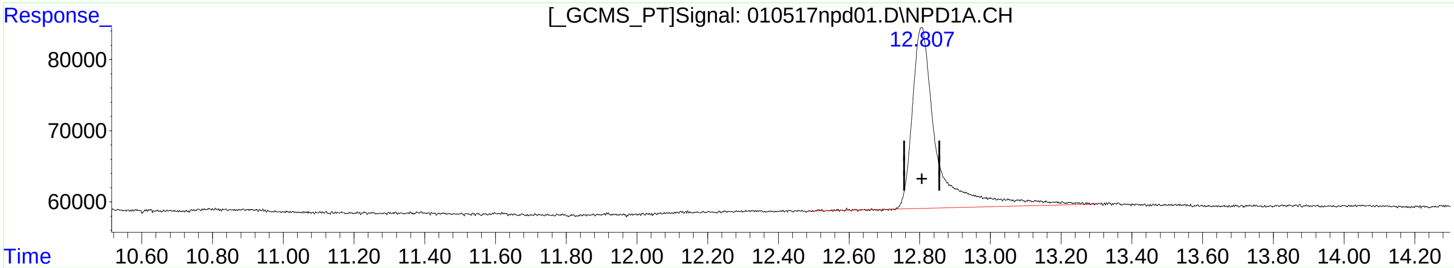
(1) Tripropylphosphate #2

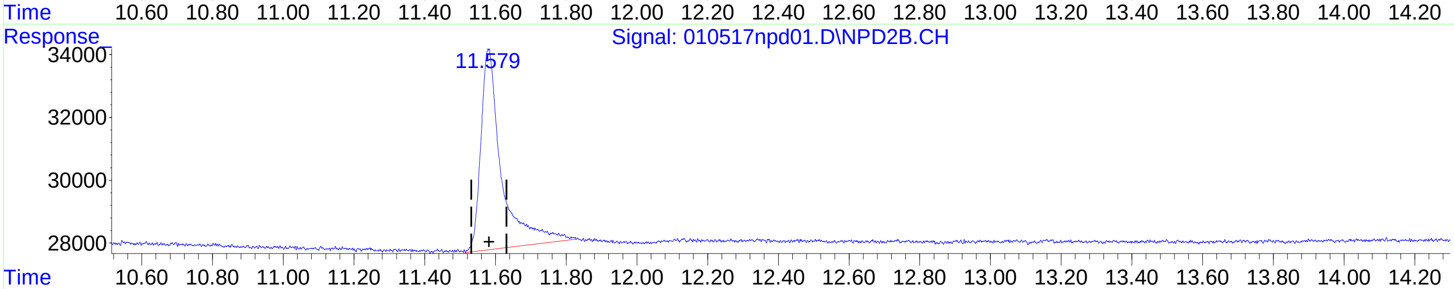
11.580min 1009.285 ug/L

response 195203

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd01.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd01.D\NPD2B.CH
Acq On    : 05 Jan 2017   9:49 am                    Operator:
Sample    : ICB-010517NPD                            Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:13:32 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(1) Tripropylphosphate

12.806min 974.842 ug/L

response 1216299

(1) Tripropylphosphate #2

11.579min 1311.987 ug/L m

response 262072

Reason for Manual Integration, Column 2:

Software incorrectly integrated peak.
-DS

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd02.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 10:08 am
Operator :
Sample : ICAL1-010517NPD
Misc :
ALS Vial : 0 (Sig #1); 2 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:08:00 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

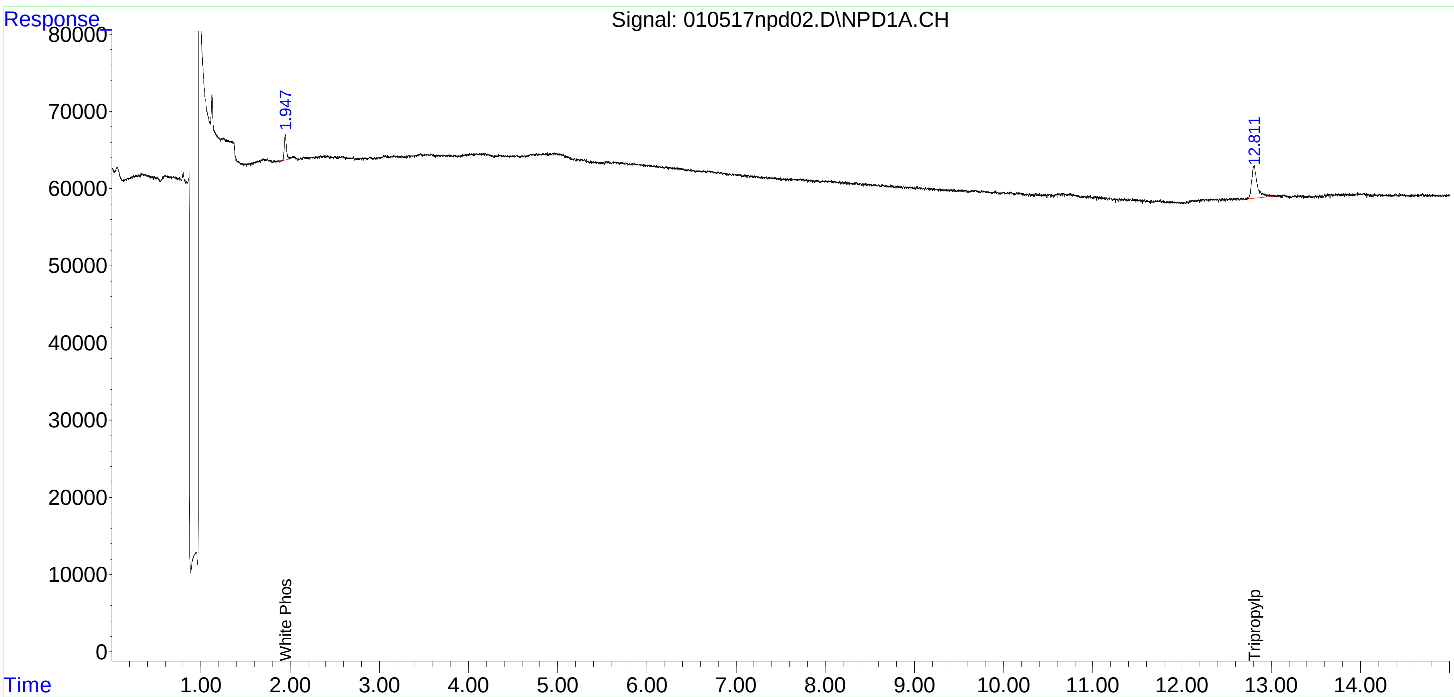
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.808	11.582	184577	26287	1.758	6.230 #
2)	White Pho...	1.946	4.648	54002	15886	2.119	1.924

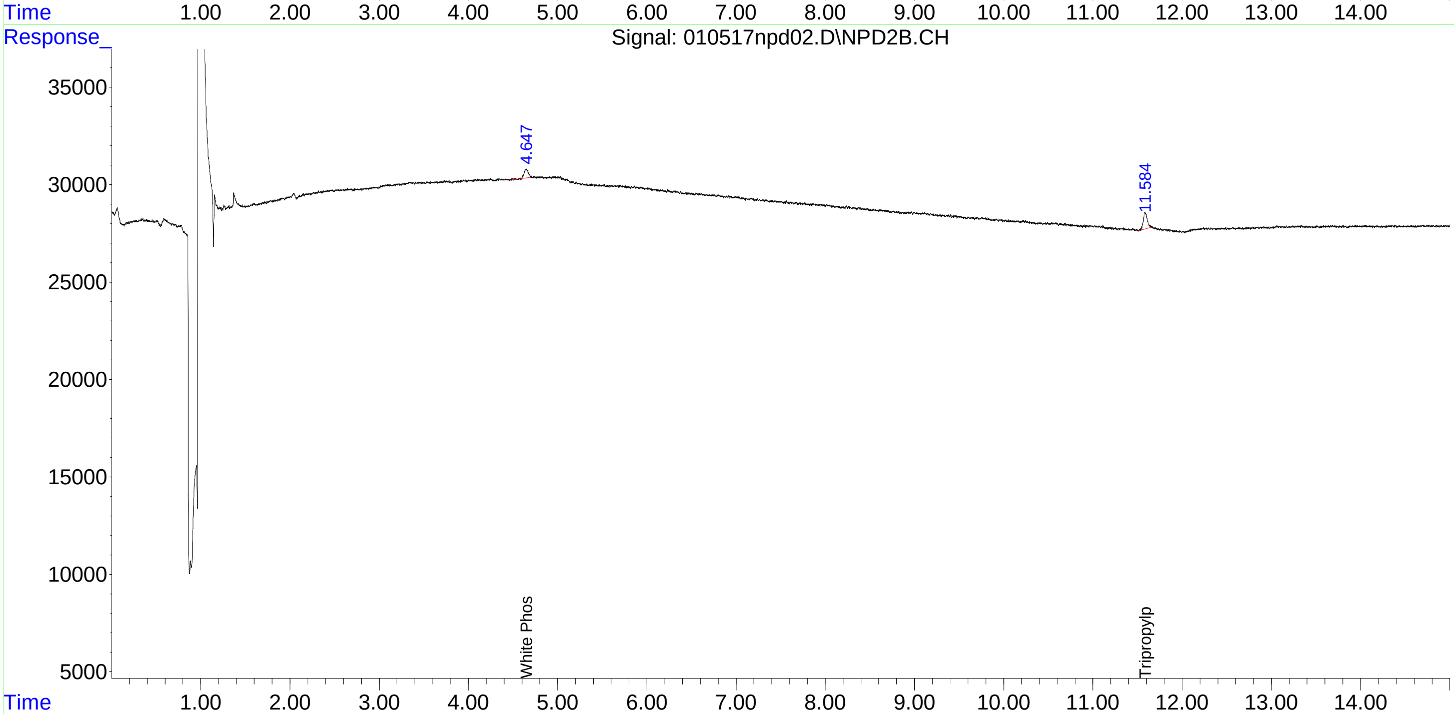
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd02.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 10:08 am
Operator :
Sample : ICAL1-010517NPD
Misc :
ALS Vial : 0 (Sig #1); 2 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:08:00 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd03.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 10:28 am
Operator :
Sample : ICAL2- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 3 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:08:37 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

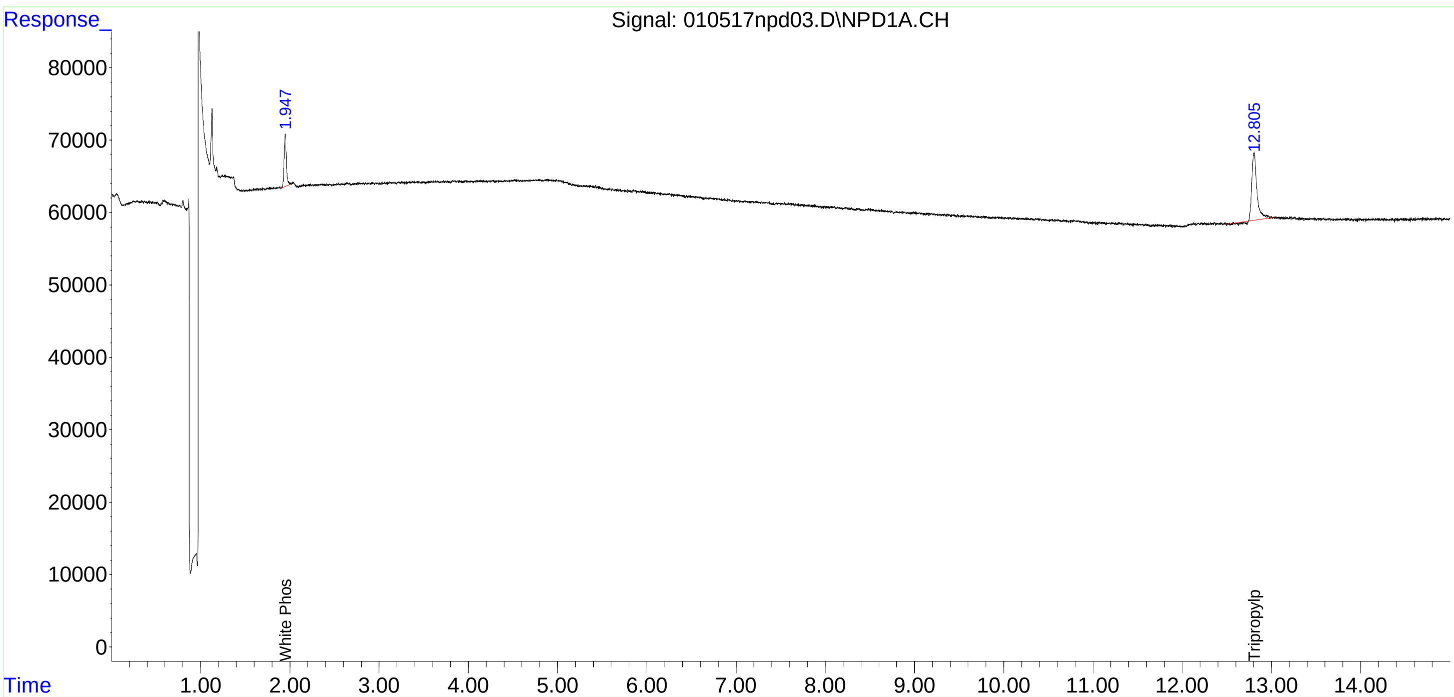
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

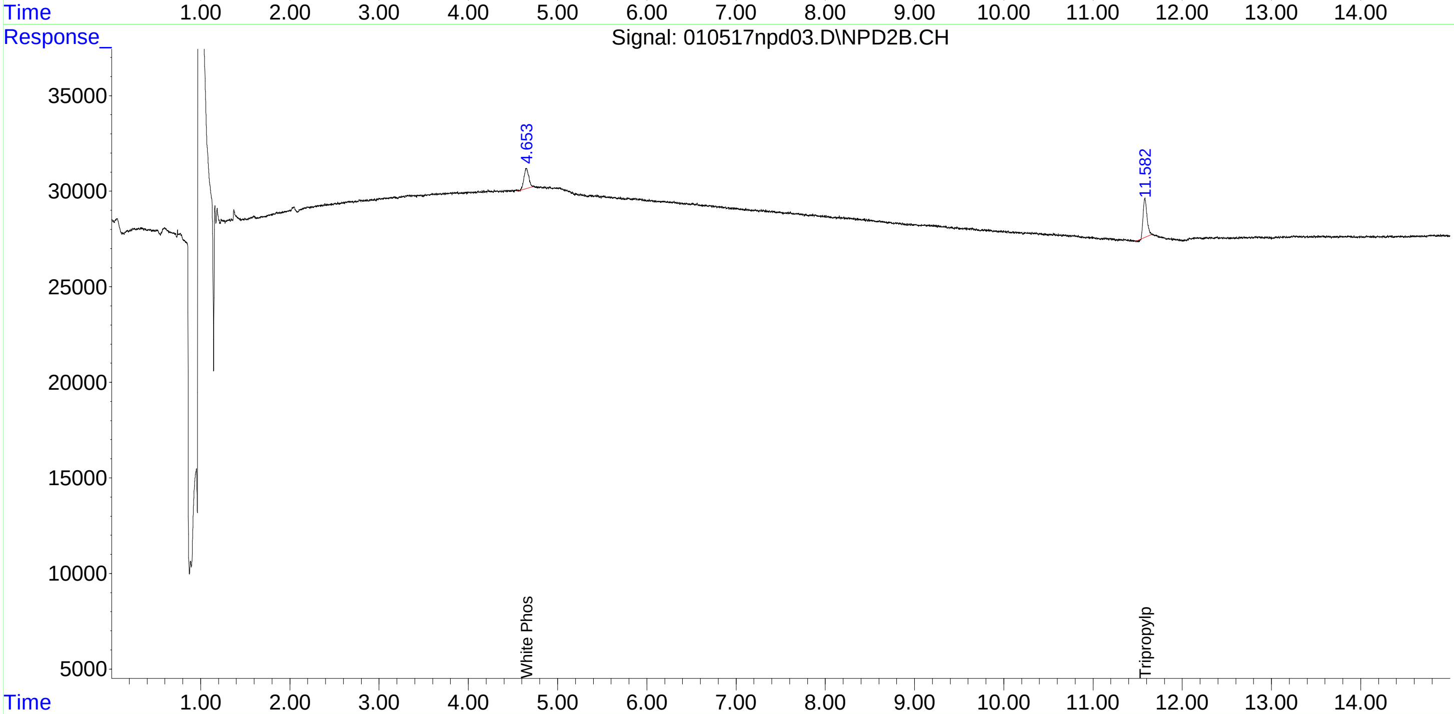
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L	
	Target Compounds							
1)	Tripropyl...	12.806	11.582	362799	60084	3.456	14.057	#
2)	White Pho...	1.947	4.650	125418	38702	2.162	2.134	

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd03.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  10:28 am
Operator  :
Sample    : ICAL2- 010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 3 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:08:37 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                Signal #2 Phase:
Signal #1 Info  :                Signal #2 Info :
```





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd04.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 10:46 am
Operator :
Sample : ICAL3- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 4 (Sig #2)   Sample Multiplier: 1

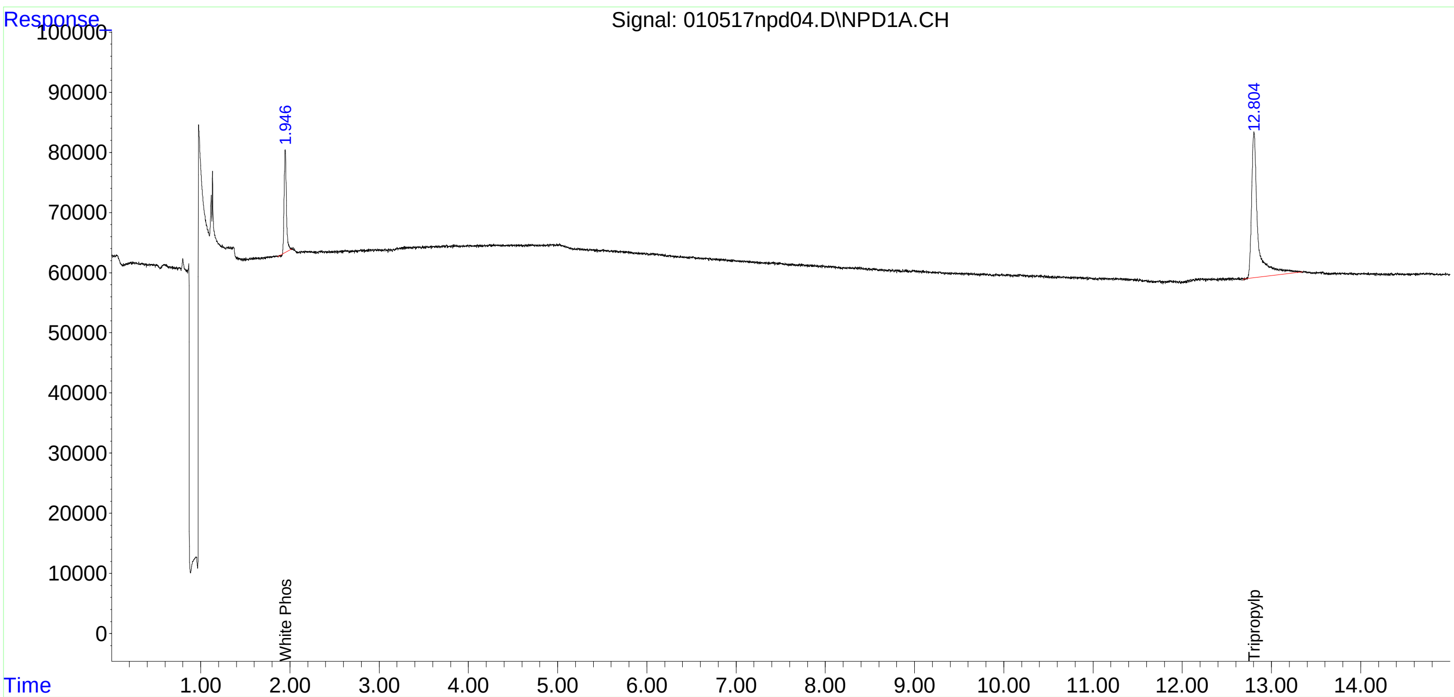
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:08:57 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

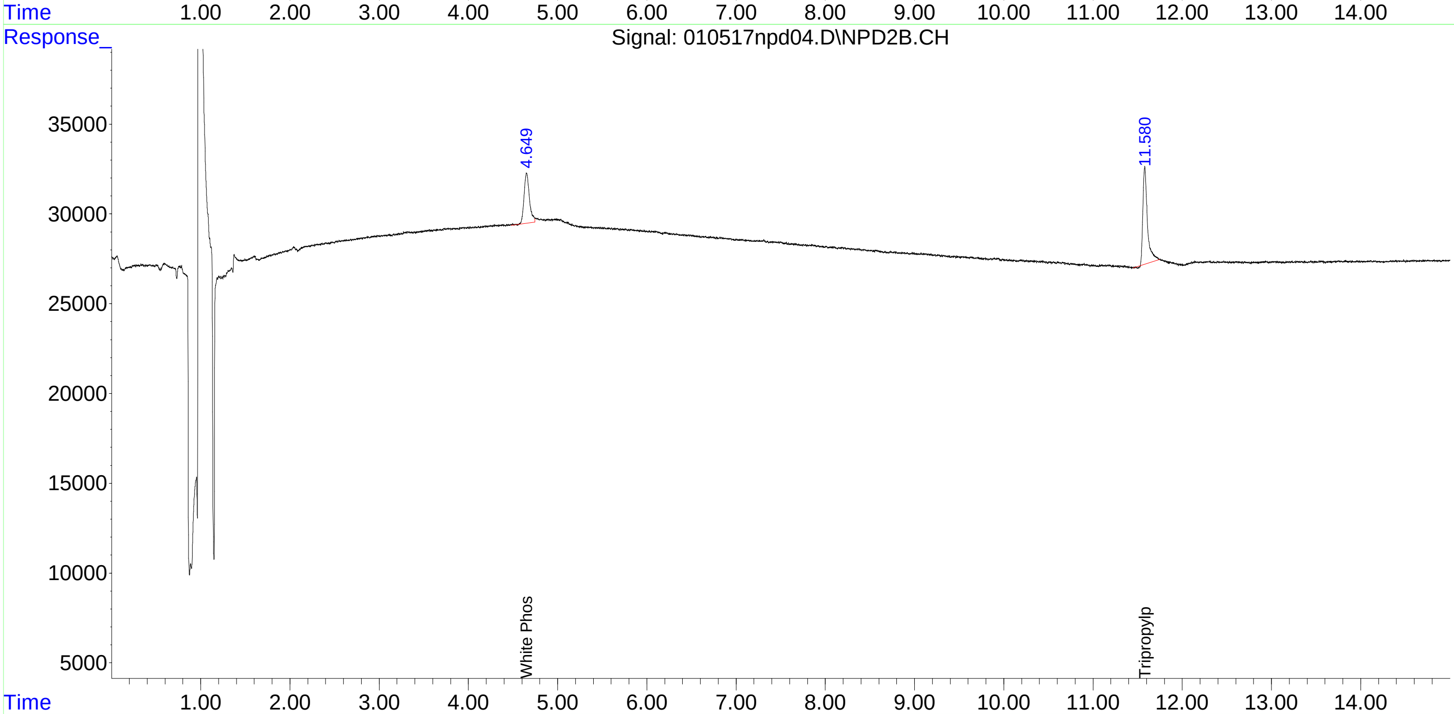
Volume Inj. :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L	
	Target Compounds							
1)	Tripropyl...	12.805	11.580	1203520	189756	11.465	43.938	#
2)	White Pho...	1.947	4.651	301015	117630	2.267	2.859	

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd04.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  10:46 am
Operator  :
Sample    : ICAL3- 010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 4 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:08:57 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.      :
Signal #1 Phase :                Signal #2 Phase:
Signal #1 Info  :                Signal #2 Info :
```





Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd05.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 11:05 am
Operator :
Sample : ICAL4- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 5 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:09:14 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

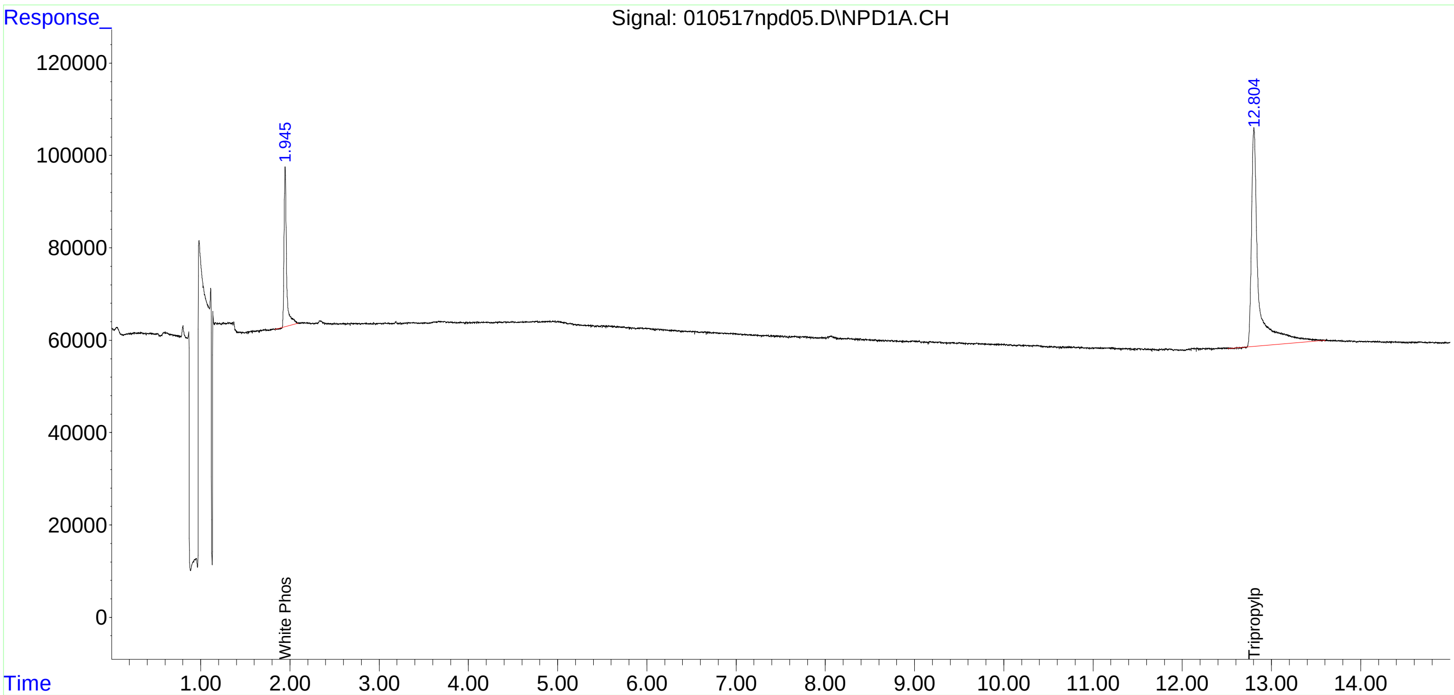
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

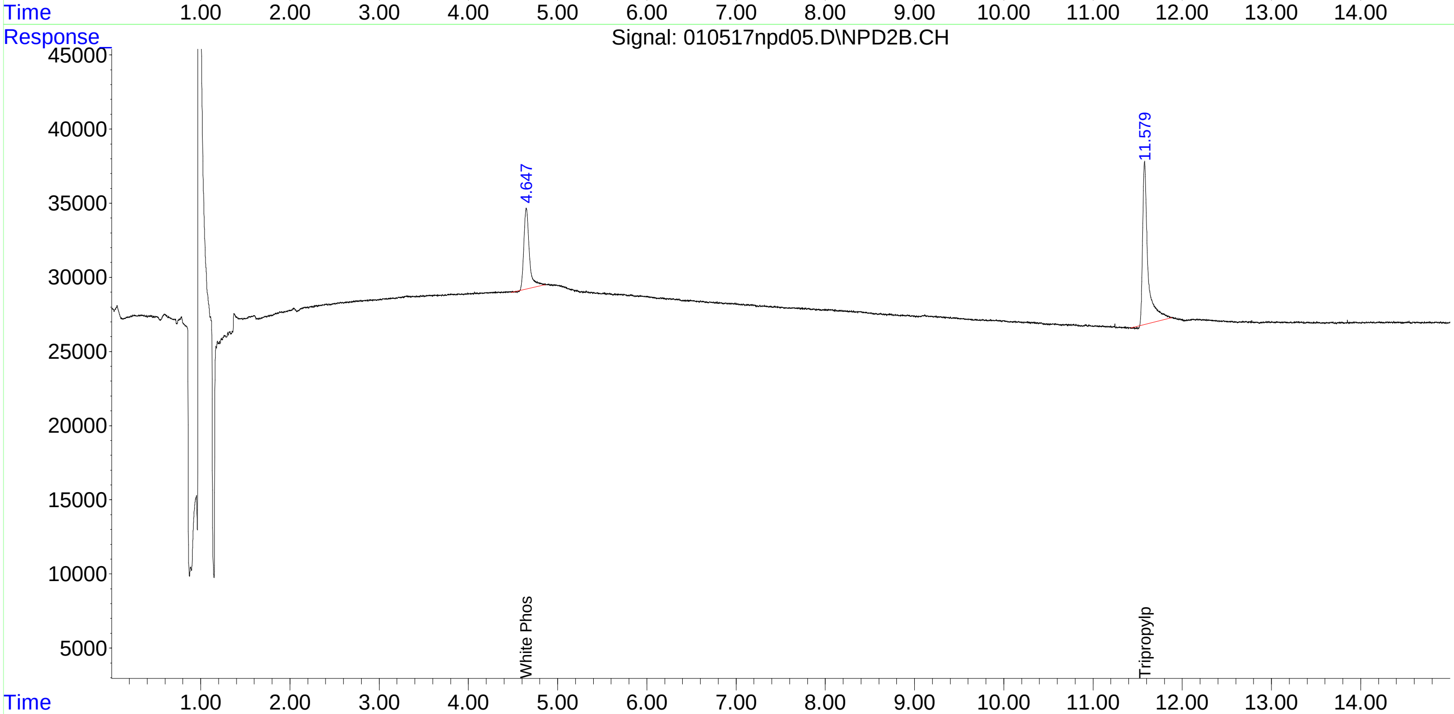
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L	
	Target Compounds							
1)	Tripropyl...	12.804	11.579	2623663	451647	24.993	103.593	#
2)	White Pho...	1.946	4.648	671926	231893	2.488	3.910	#

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report   (QT Reviewed)

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd05.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  11:05 am
Operator  :
Sample    : ICAL4- 010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 5 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:09:14 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                  Signal #2 Phase:
Signal #1 Info  :                  Signal #2 Info :
```





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd06.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 11:25 am
Operator :
Sample : ICAL5- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 6 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:09:29 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

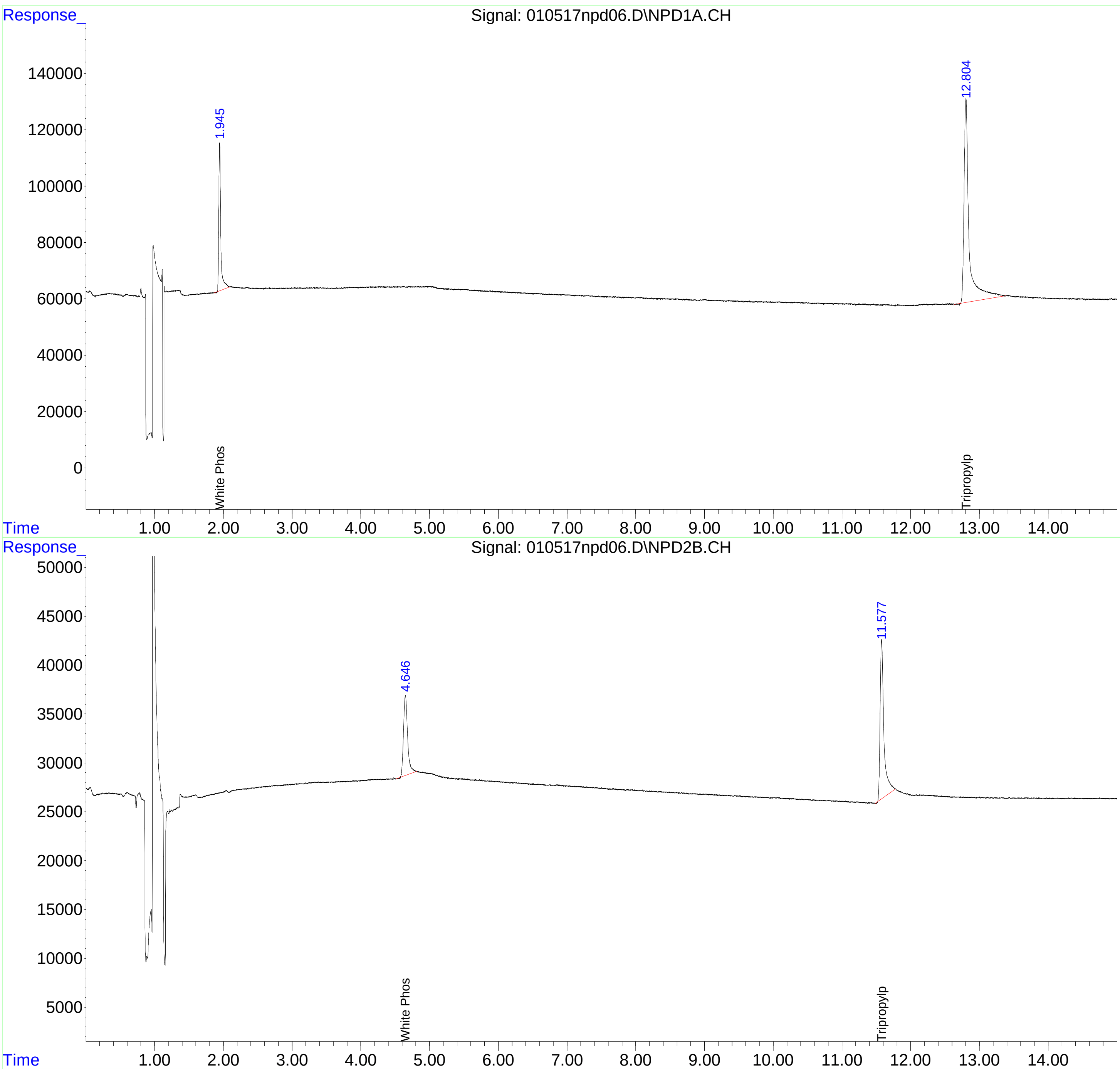
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L	
	Target Compounds							
1)	Tripropyl...	12.805	11.578	3701457	621699	35.260	141.849	#
2)	White Pho...	1.946	4.647	1048443	340065	2.714	4.904	#

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd06.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  11:25 am
Operator  :
Sample    : ICAL5- 010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 6 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:09:29 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation    6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                 Signal #2 Phase:
Signal #1 Info  :                 Signal #2 Info :
```



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd07.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 11:44 am
Operator :
Sample : ICAL6- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 7 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:09:43 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.805	11.578	5149473	942045	49.053	212.932 #
2)	White Pho...	1.946	4.647	1375082	510459	2.909	6.470 #

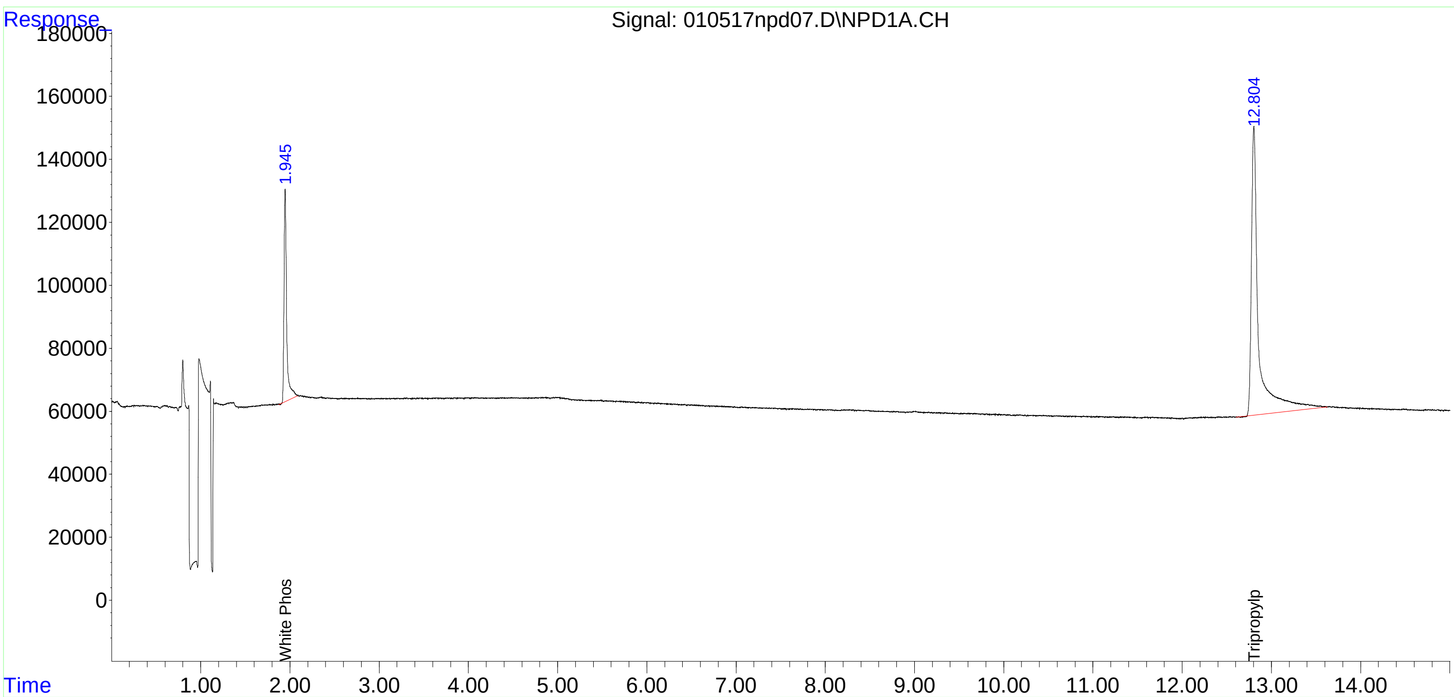
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

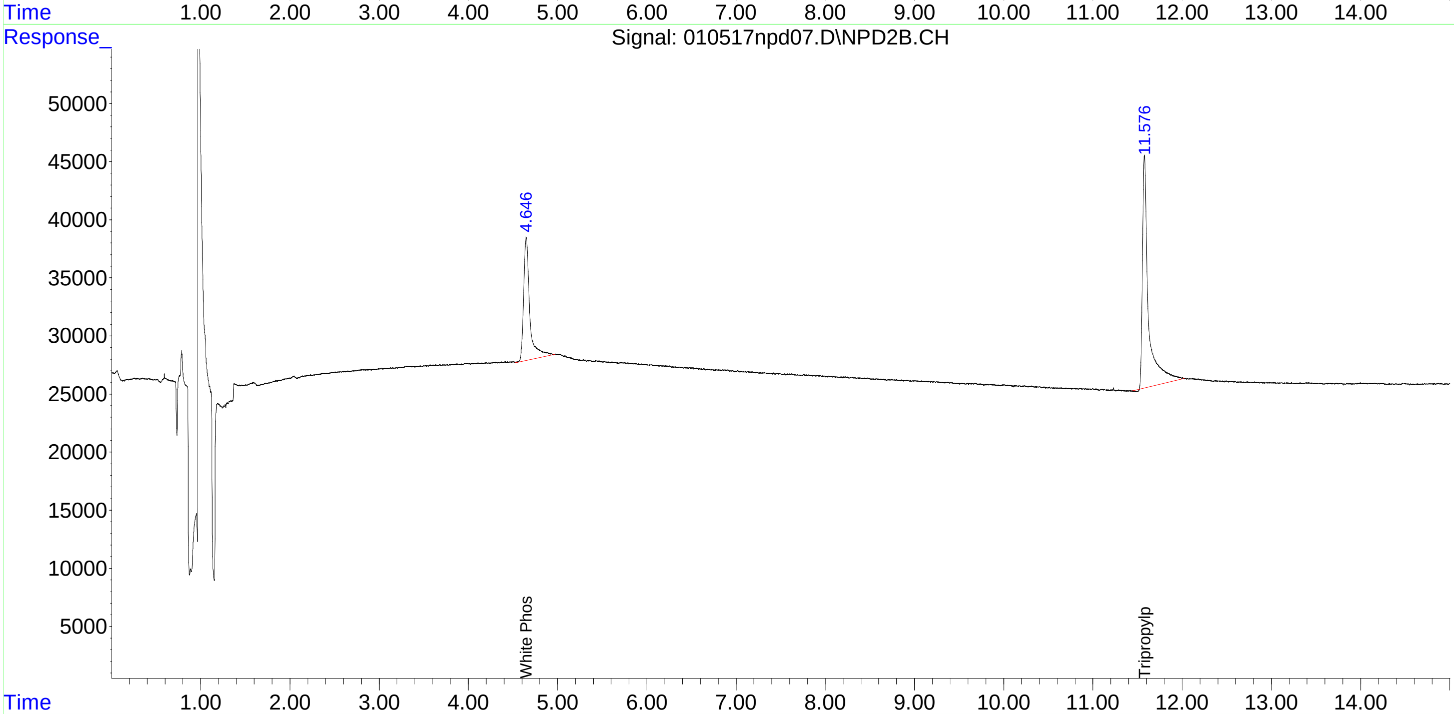
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd07.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 11:44 am
Operator :
Sample : ICAL6- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 7 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 05 12:09:43 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Fri Jan 15 21:43:44 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Evaluate Continuing Calibration Report

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd08.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 12:03 pm
Operator :
Sample : ICV- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 8 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:40:47 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase :   Signal #2 Phase:
Signal #1 Info :   Signal #2 Info :

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	Tripropylphosphate	2000.000	2012.666	-0.6	96	0.00
2	White Phosphorus	42.920	37.631	12.3	88	0.00

Signal #2

1	Tripropylphosphate	2000.000	2037.567	-1.9	95	0.00
2	White Phosphorus	42.920	36.535	14.9	87	0.00

Evaluate Continuing Calibration Report - Not Founds

Signal #2

(#) = Out of Range   SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd08.D
Signal(s) : Signal #1: NPD1A.CH  Signal #2: NPD2B.CH
Acq On    : 05 Jan 2017  12:03 pm
Operator  :
Sample    : ICV- 010517NPD
Misc      :
ALS Vial  : 0 (Sig #1); 8 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:40:47 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title  : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Large solvent peaks clipped

Volume Inj.     :
Signal #1 Phase :                    Signal #2 Phase:
Signal #1 Info  :                    Signal #2 Info :
```

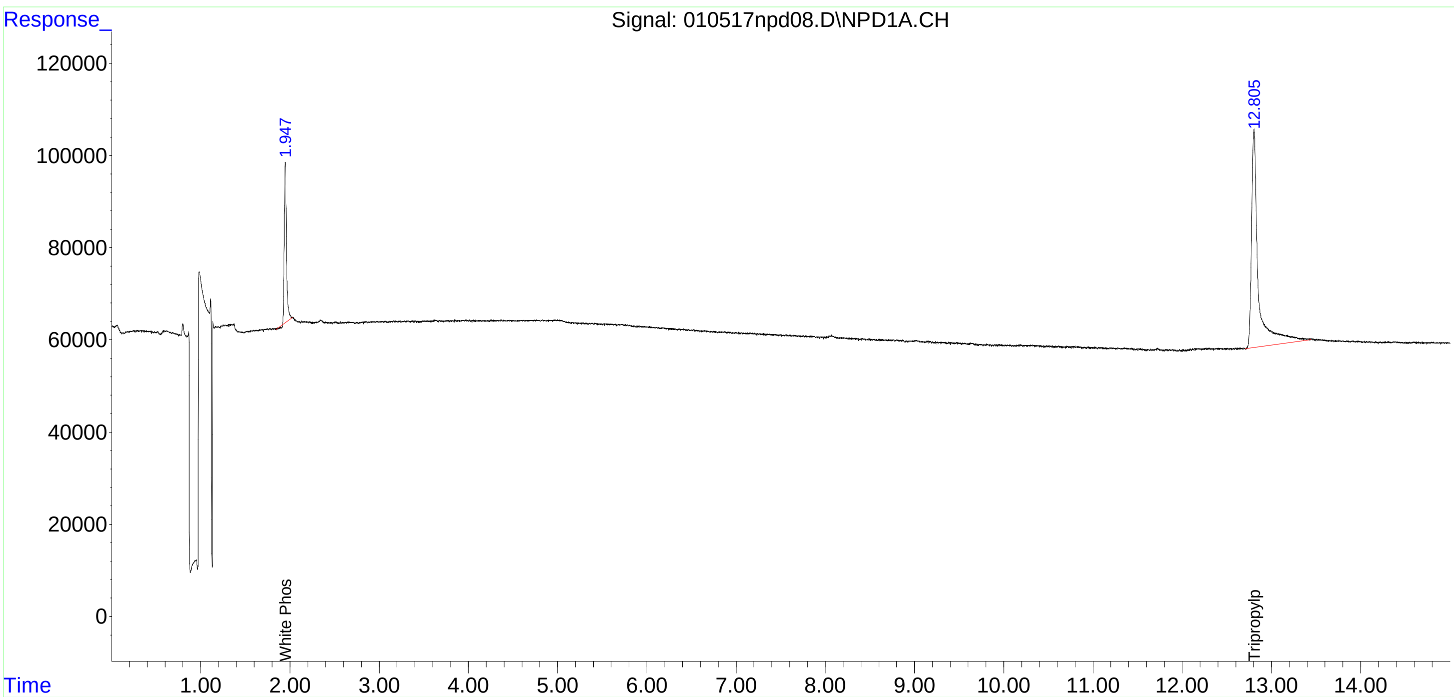
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	Target Compounds						
1)	Tripropyl...	12.805	11.577	2511179	428774	2012.666m	2037.567m
2)	White Pho...	1.947	4.650	591424	201158	37.631	36.535m

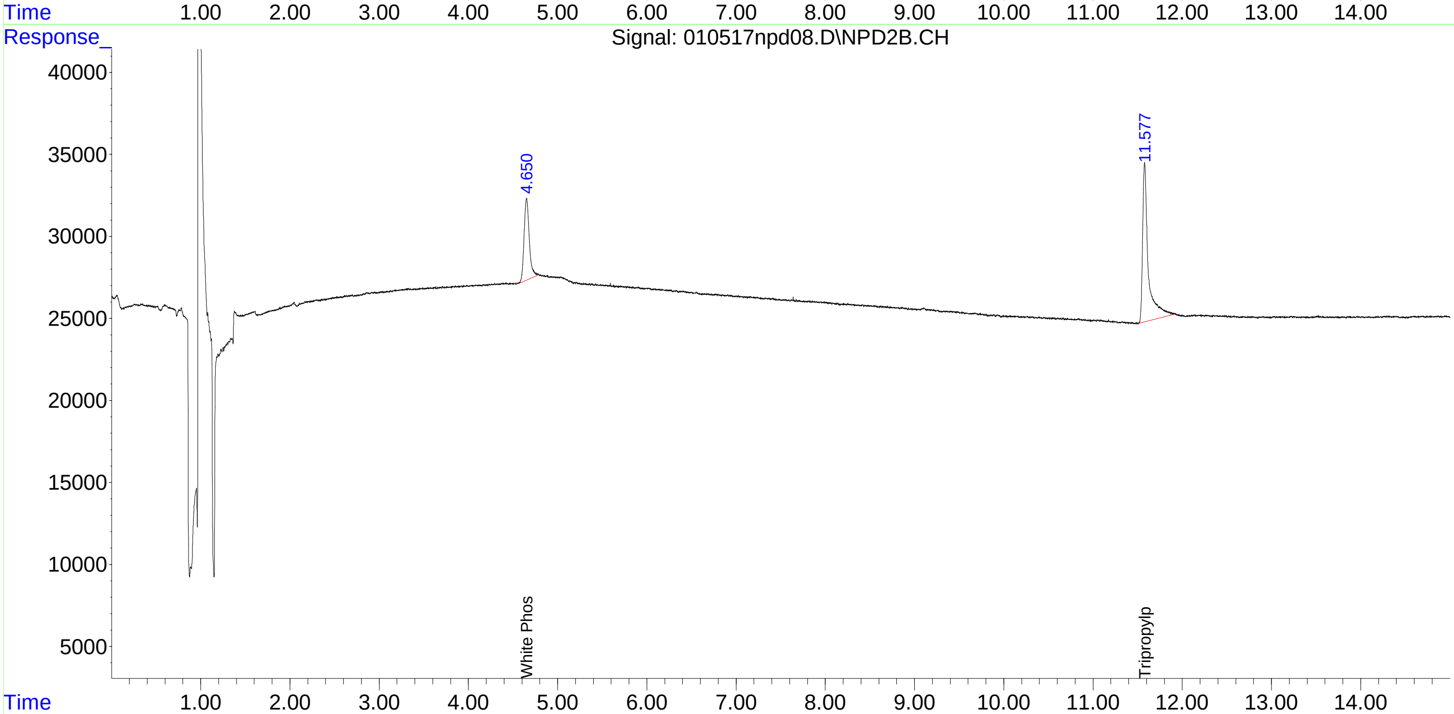
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 40% (m)=manual int.

Data Path : C:\msdchem\2\data\010517WPHOS\
Data File : 010517npd08.D
Signal(s) : Signal #1: NPD1A.CH Signal #2: NPD2B.CH
Acq On : 05 Jan 2017 12:03 pm
Operator :
Sample : ICV- 010517NPD
Misc :
ALS Vial : 0 (Sig #1); 8 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jan 06 09:40:47 2017
Quant Method : C:\msdchem\2\methods\010517wphos.m
Quant Title : P4 Calibration
QLast Update : Thu Jan 05 12:11:49 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

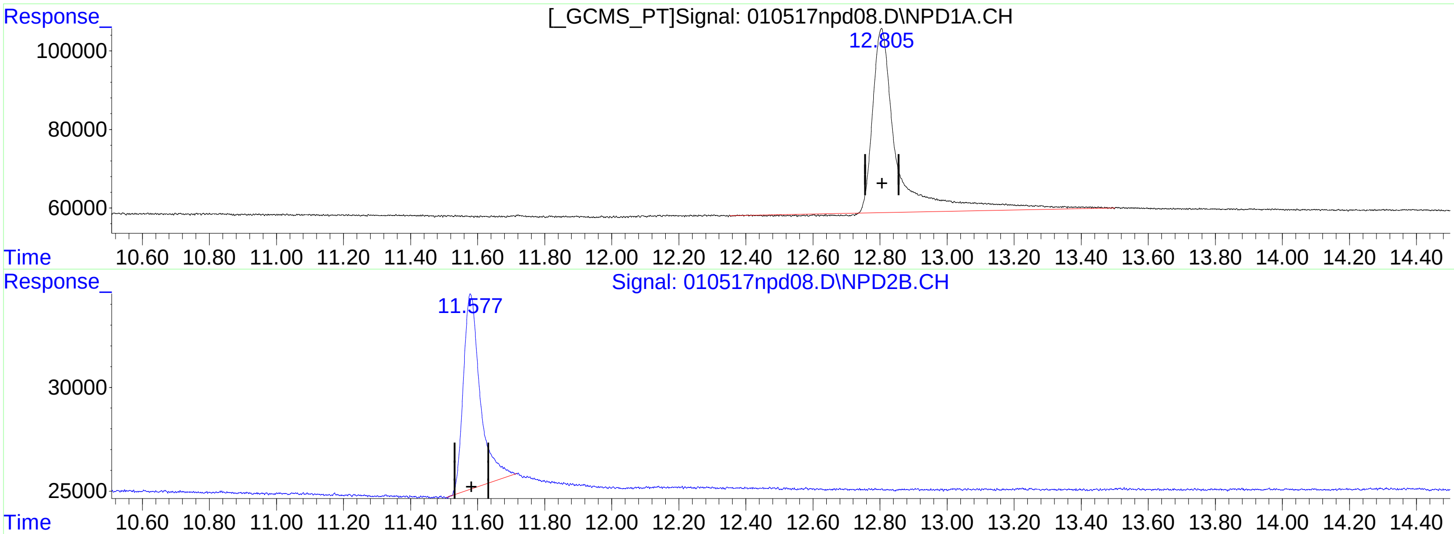
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd08.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd08.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:03 pm                    Operator:
Sample    : ICV- 010517NPD                           Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:44:15 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.805min 1897.287 ug/L

response 2367221

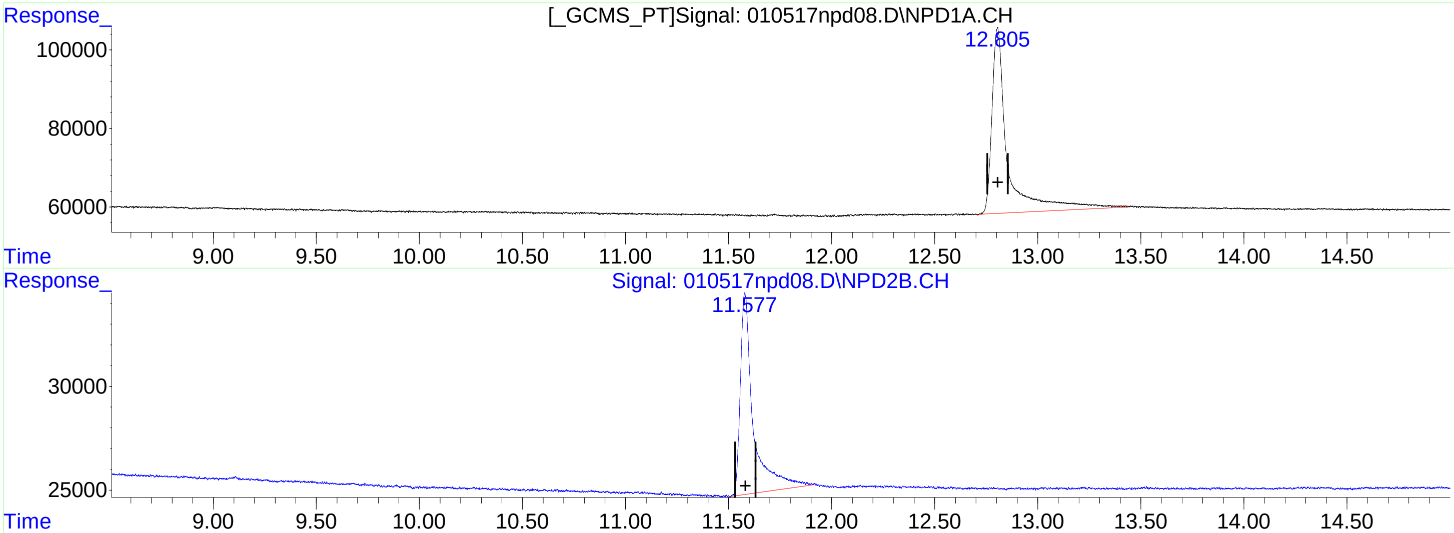
(1) Tripropylphosphate #2

11.579min 1618.810 ug/L

response 331460

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd08.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd08.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:03 pm                      Operator:
Sample    : ICV- 010517NPD                             Inst     : GC-NPD
Misc      :                                            Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:44:15 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(1) Tripropylphosphate

12.805min 2012.666 ug/L m

response 2511179

Reason for Manual Integration, Column 1 & 2:

Software incorrectly integrated peak.
-DS

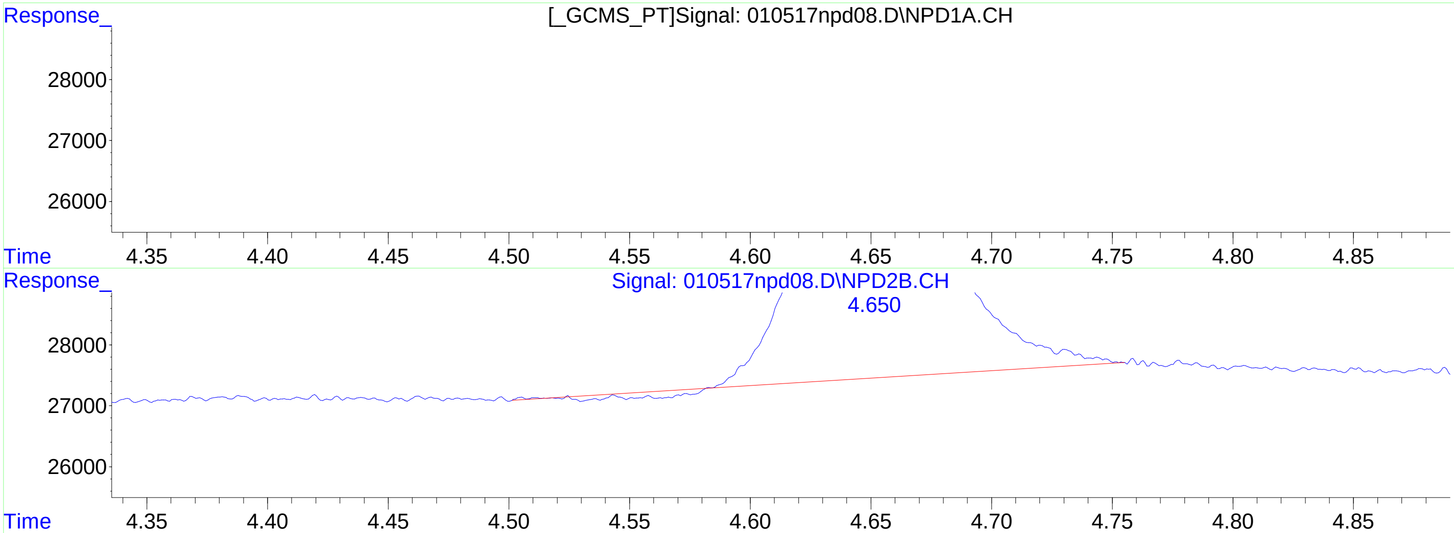
(1) Tripropylphosphate #2

11.577min 2037.567 ug/L m

response 428774

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd08.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd08.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:03 pm                    Operator:
Sample    : ICV- 010517NPD                           Inst     : GC-NPD
Misc      :                                          Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:44:15 2017         Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```



QEdit

(2) White Phosphorus

1.947min 37.631

response 591424

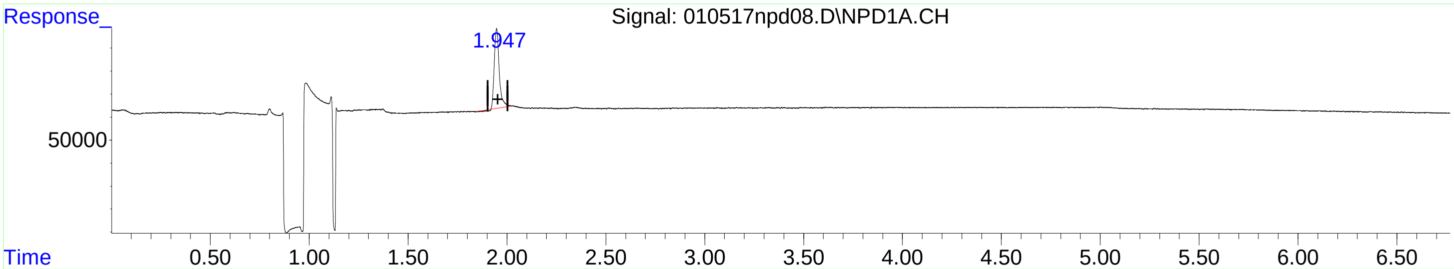
(2) White Phosphorus #2

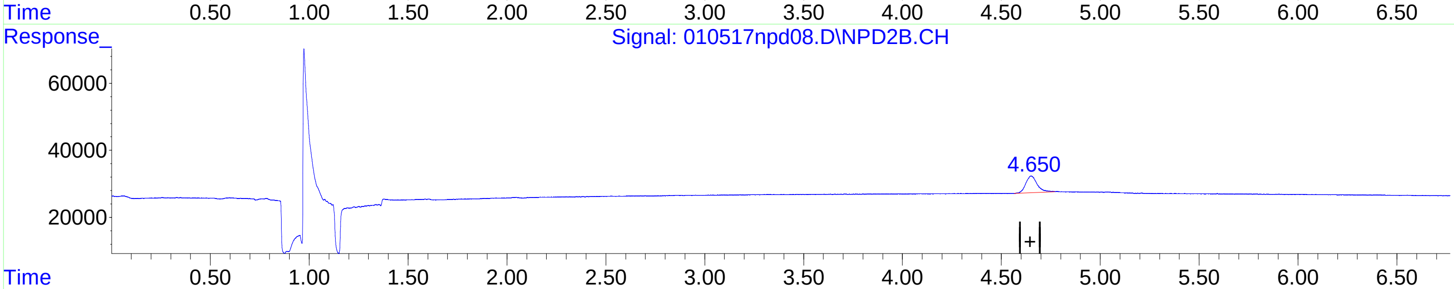
4.650min 33.623

response 184362

Quantitation Report (Qedit)

```
Signal #1 : C:\msdchem\2\data\01...10517npd08.D\NPD1A.CH Vial: 0
Signal #2 : C:\msdchem\2\data\010517WPHOS\010517npd08.D\NPD2B.CH
Acq On    : 05 Jan 2017  12:03 pm                      Operator:
Sample    : ICV- 010517NPD                             Inst     : GC-NPD
Misc      :                                            Multiplr: 1.00
IntFile Signal #1: events.e     IntFile Signal #2: events2.e
Quant Time: Jan 05 12:44:15 2017        Results File: 010517wphos.RES

Method       : C:\msdchem\2\methods\010517wphos.m (ChemStation Integrator)
Title        : P4 Calibration
Last Update  : Thu Jan 05 12:11:49 2017
Response via : Multiple Level Calibration
```





QEdit

(2) White Phosphorus

1.947min 37.631

response 591424

(2) White Phosphorus #2

4.650min 36.535 m

response 201158

Reason for Manual Integration, Column 2:

Software incorrectly integrated peak.
-DS

FORM I

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMP ID

MAD-DU01CS

Lab Name: RTI Laboratories, Inc.

Lab Code: GLEN01 ClientID: EUR02

Matrix: Restricted Soil

% Solids: 0

Concentration Units: wt%

Total/Dissolved: (Total)

Instrument ID: BAL12

Contract:

Workorder No.: 1612702

Lab Sample ID: 1612702-001A

Date Received: 12/22/2016 2:02 PM

Date Analyzed: 12/27/2016 11:30 AM

Date Collected: 12/11/2016 11:05 AM

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	34			1.0	1.0	1.0	B

FORM I

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMP ID

MAD-DU02CS

Lab Name: RTI Laboratories, Inc.

Lab Code: GLEN01 ClientID: EUR02

Matrix: Restricted Soil

% Solids: 0

Concentration Units: wt%

Total/Dissolved: (Total)

Instrument ID: BAL12

Contract:

Workorder No.: 1612702

Lab Sample ID: 1612702-002A

Date Received: 12/22/2016 2:02 PM

Date Analyzed: 12/27/2016 11:30 AM

Date Collected: 12/11/2016 1:30 PM

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	30			1.0	1.0	1.0	B

FORM I

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMP ID

MAD-DU03CS

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix: Restricted Soil

Lab Sample ID: 1612702-003A

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected: 12/11/2016 3:20 PM

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	22			1.0	1.0	1.0	B

FORM I

CLIENT SAMP ID

INORGANIC ANALYSIS DATA SHEET

MAD-DU04CS

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix: Restricted Soil

Lab Sample ID: 1612702-004A

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected: 12/11/2016 9:00 AM

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	30			1.0	1.0	1.0	B

FORM I

CLIENT SAMP ID

INORGANIC ANALYSIS DATA SHEET

MAD-DU05CS

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix: Restricted Soil

Lab Sample ID: 1612702-005A

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected: 12/11/2016 2:15 PM

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	31			1.0	1.0	1.0	B

FORM I

CLIENT SAMP ID

INORGANIC ANALYSIS DATA SHEET

MAD-DU06CS

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix: Restricted Soil

Lab Sample ID: 1612702-006A

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected: 12/11/2016 10:30 AM

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	32			1.0	1.0	1.0	B

FORM I

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMP ID: MAD-DU07CS

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix: Restricted Soil

Lab Sample ID: 1612702-007A

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected: 12/11/2016 12:30 PM

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	31			1.0	1.0	1.0	B

FORM I

CLIENT SAMP ID

INORGANIC ANALYSIS DATA SHEET

ZZZZZZ

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix:

Lab Sample ID: 1612665-001ADUP

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected:

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	19			1.0	1.0	1.0	B

FORM I

INORGANIC ANALYSIS DATA SHEET

CLIENT SAMP ID

MAD-DU07LR1

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01 ClientID: EUR02

Workorder No.: 1612702

Matrix:

Lab Sample ID: 1612702-007ADUP

% Solids: 0

Date Received: 12/22/2016 2:02 PM

Concentration Units: wt%

Date Analyzed: 12/27/2016 11:30 AM

Total/Dissolved: (Total)

Date Collected:

Instrument ID: BAL12

Batch ID: R91282

CAS No.	Analyte	Concentration	C	Q	DL	LOD	LOQ	M
7732-18-5	Percent Moisture	32			1.0	1.0	1.0	B

FORM VI

DUPLICATES

CLIENT SAMP ID

MAD-DU07

Lab Name: RTI Laboratories, Inc.

Contract:

Lab Code: GLEN01

Workorder No: 1612702

Matrix: Restricted Soil

Level (low/med): LOW

% Solids for Sample: 0

Concentration Units: wt%

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Percent Moisture	20	31		32		2.33		B

FORM VI

DUPLICATES

CLIENT SAMP ID

ZZZZZZ

Lab Name: RTI Laboratories, Inc. Contract:

Lab Code: GLEN01 Workorder No: 1612702

Matrix: Soil Level (low/med): LOW

% Solids for Sample: 0 Concentration Units: wt%

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Percent Moisture	20	17		19		7.17		B

RTI Laboratories, Inc — Livonia, Michigan
Balance - Daily Verification Log — Weight Set - K618
Balance # 12 AB204 — +/- 0.0005
* When required for FOG (HEM1664)
Int. Cal. - Internal balance calibration noted by X when performed.

Date	Time	0.002g Wt.	1.00g Wt.	10.0g Wt.	100.00g Wt.	Initials	Int. Cal.
12/16/2016	8:30	0.0019	0.9997	10.0001	99.9994	AP	
Wt. (2)*							
12/17/2016							
Wt. (2)*							
12/18/2016							
Wt. (2)*							
12/19/2016	9:00	0.0021	0.9998	10.0001	99.9992	AP	
Wt. (2)*							
12/20/2016	9:30	0.0021	0.9996	10.0001	99.9994	AP	
Wt. (2)*							
12/21/2016	12:00	0.~~0~~022 ASP	0.9998	9.9998	99.9995	AP	
Wt. (2)*							
12/22/2016	9:00	0.0019	0.9999	9.9999	99.9999	AP	
Wt. (2)*							
12/23/2016							
Wt. (2)*							
12/24/2016							
Wt. (2)*							
12/25/2016							
Wt. (2)*							
12/26/2016							
Wt. (2)*							
12/27/2016	8:15	0.0020	0.9999	9.9998	100.0000	ZK	
Wt. (2)*							
12/28/2016	8:30	0.0019	0.9999	9.9998	100.0004	AP	
Wt. (2)*							
12/29/2016	8:40	0.0019	0.9998	9.9998	100.0003	AP	
Wt. (2)*							
12/30/2016	8:00	0.0019	0.9997	10.0000	100.0003	AP	
Wt. (2)*							
12/31/2016							
Wt. (2)*							

Oven	Date/Time In	Temp C	Date/Time Out	Temp C
5	12/22/2016 9:00	105	12/22/2016 10:00	105
5	12/27/2016 12:00	105	12/28/2016 8:00	105
5	12/28/2016 9:00	105	12/28/2016 10:00	105

Analyst	Analysis Date/Time
ASP	12/27/2016 11:30

Filter #	Sample ID	Pan Tare Weight (g)	Sample + Tare Weight (g)	First Dry Weight (g)	Second Dry Weight (g)	cw	Third Dry Weight (g)	cw	Percent Moisture
1	1612555-005A	1.2900	23.4800	23.2900	23.3000				0.8112
2	1612665-001A	1.2900	23.0800	19.3100	19.3100				17.3015
3	1612665-001ADUP	1.2900	22.9700	18.9600	18.9400				18.5886
4	1612665-002A	1.2900	23.3500	19.8400	19.8400				15.9112
5	1612699-005A	1.3000	20.7500	20.6700	20.6700				0.4113
6	1612701-001D	1.3000	21.8000	15.5000	15.4800				30.8293
7	1612701-002D	1.3000	20.1400	14.5300	14.5100				29.8832
8	1612701-003D	1.3100	22.8800	19.0200	19.0100				17.9416
9	1612702-001A	1.3000	22.7200	15.4600	15.4400				33.9869
10	1612702-002A	1.3000	21.7300	15.5700	15.5400				30.2986
11	1612702-003A	1.3100	22.9700	18.3400	18.3100				21.5143
12	1612702-004A	1.3000	22.4500	16.1600	16.1200				29.9291
13	1612702-005A	1.2900	21.8300	15.5700	15.5600				30.5258
14	1612702-006A	1.3000	23.0100	16.0600	16.0500				32.0590
15	1612702-007A	1.2900	22.8600	16.1600	16.1300				31.2007
16	1612702-007ADUP	1.2900	23.4600	16.4000	16.3800				31.9350

ANALYTICAL RESULTS

Prepared by:	Prepared for:
Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601	EA Engineering, Science & Tech 615 Piikoi Street Suite 515 Honolulu HI 96814

Report Date: January 16, 2017

Project: Tinian Phase I/II ESA

Submittal Date: 12/20/2016
Group Number: 1746738
PO Number: 15167

Client Sample Description	Lancaster Labs (LL) #
MAD-DU01 Composite Soil	8755030
MAD-DU02 Composite Soil	8755031
MAD-DU03 Composite Soil	8755032
MAD-DU04 Composite Soil	8755033
MAD-DU05 Composite Soil	8755034
MAD-DU06 Composite Soil	8755035
MAD-DU07 Composite Soil	8755036

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To EA Engineering, Science & Tech Attn: Brenda Nuding

Respectfully Submitted,

Natalie R. Luciano
Senior Specialist

(717) 556-7258

Sample Description: MAD-DU01 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755030
LL Group # 1746738
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 11:05 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

**Sample Description: MAD-DU02 Composite Soil
Tinian Phase I/II ESA**

**LL Sample # SW 8755031
LL Group # 1746738
Account # 30099**

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 13:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

Sample Description: MAD-DU03 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755032
LL Group # 1746738
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 15:20 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

Sample Description: MAD-DU04 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755033
LL Group # 1746738
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 09:00 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

Sample Description: MAD-DU05 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755034
LL Group # 1746738
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 14:15 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

Sample Description: MAD-DU06 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755035
LL Group # 1746738
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 10:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

Sample Description: MAD-DU07 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755036
LL Group # 1746738
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 12:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/16/2017 10:16

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

Sample Comments

The analysis for Method 7580 White Phosphorus was subcontracted to another laboratory.
See Attached Reports.

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

Acct. # 30099 Group # 1746738 Sample # 8755030-36

Client: EA Engineering, Science, & Technology

Project Name/#: Tinian Masalol AD | Site ID #:

Project Manager: Bob Schambach | P.O. #:

Sampler: M. Kelley, J. Duay | PWSID #:

Phone #: (671) 646-5231 | Quote #:

State where sample(s) were collected: Tinian

Matrix: Sediment ☐ Soil ☒ | Water ☐ Ground ☐ Surface ☐ Potable ☐ NPDES | Other:

For Lab Use Only
SF #:
SCR #:

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	PAH SW8270CSIM	METALS SW6010B1	METALS 6020/7471A	Explosives 8330B	Phosphorus 3H L07580						Remarks
MAD-DU01	12/11/16	1105		X	X			3	X	X	X	X	X						
MAD-DU02	12/11/16	1330		X	X			3	X	X	X	X	X						
MAD-DU03	12/11/16	1520		X	X			3	X	X	X	X	X						
MAD-DU04	12/12/16	0900		X	X			3	X	X	X	X	X						
MAD-DU05	12/12/16	1415		X	X			3	X	X	X	X	X						
MAD-DU06	12/12/16	1030		X	X			3	X	X	X	X	X						
MAD-DU07	12/12/16	1230		X	X			3	X	X	X	X	X						

Turnaround Time Requested (TAT) (please check): Standard ☒ Rush ☐
(Rush TAT is subject to laboratory approval and surcharges.)

Date results are needed:

Rush results requested by (please check): E-Mail ☐ Phone ☐

E-mail Address:

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☐ MA MCP ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ TX TRRP-13 ☐
Type VI (Raw Data Only) ☐

EDD Required? Yes ☐ No ☐ If yes, format:

Relinquished by:	Date	Time	Received by:	Date	Time
Julie Anne Duay (signature)	12/15/16	1200			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by: (signature)	12-20-16	1130

Relinquished by Commercial Carrier:
UPS ____ FedEx X Other ____

Temperature upon receipt 2.6-5.4 °C

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 171275

Group Number(s): 1746738

Client: EA Eng.

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	12/20/2016 11:30
Number of Packages:	3	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Timothy Cubberley (6520) at 12:51 on 12/20/2016

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	4.6	DT	Wet	Y	Bagged	N
2	DT131	2.6	DT	Wet	Y	Bagged	N
3	DT131	5.4	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

RTI LABORATORIES, INC.

RTI Laboratories
31628 Glendale St.
Livonia, MI 48150
TEL: (734) 422-8000
Website: www.rtilab.com

Friday, January 06, 2017

Kathy Binkley
Eurofins Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601
TEL: (717) 656-2300
FAX: (717) 656-6766

RE: Guam Samples

Work Order #: 1612702

Dear Kathy Binkley:

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

This report may only be reproduced in its entirety. Individual pages, reproduced without supporting documentation, do not contain related information and may be misinterpreted by other data reviewers.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Rachel Dear

Rachel Dear
Project Manager

RTI Laboratories, Inc. - Workorder Sample Summary

WO#: 1612702

Date Reported: 1/6/2017
Original

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples

Lab Sample ID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
1612702-001A	MAD-DU01		12/11/2016 11:05 AM	12/22/2016 2:02 PM	Restricted Soil
1612702-002A	MAD-DU02		12/11/2016 1:30 PM	12/22/2016 2:02 PM	Restricted Soil
1612702-003A	MAD-DU03		12/11/2016 3:20 PM	12/22/2016 2:02 PM	Restricted Soil
1612702-004A	MAD-DU04		12/11/2016 9:00 AM	12/22/2016 2:02 PM	Restricted Soil
1612702-005A	MAD-DU05		12/11/2016 2:15 PM	12/22/2016 2:02 PM	Restricted Soil
1612702-006A	MAD-DU06		12/11/2016 10:30 AM	12/22/2016 2:02 PM	Restricted Soil
1612702-007A	MAD-DU07		12/11/2016 12:30 PM	12/22/2016 2:02 PM	Restricted Soil

RTI Laboratories, Inc. - Case Narrative

WO#: 1612702

Date Reported: 1/6/2017
Original

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples

Concentrations reported with a J flag in the Qual field are values below the reporting limit (RL) but greater than the established method detection limit (MDL). There is greater uncertainty associated with these results and data should be considered as estimated. These analytes are not routinely reviewed nor narrated below as to their potential for being laboratory artifacts.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Original

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 11:05:00 AM
Project:	Guam Samples		
Lab ID:	1612702-001	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU01		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.1	U	0.44	1.1	1.6	µg/Kg-dry	1	1/5/2017 1:40 PM
Surr: Tripropylphosphate	33.2			27-112		%Rec	1	1/5/2017 1:40 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	34		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 1:30:00 PM
Project:	Guam Samples		
Lab ID:	1612702-002	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU02		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.42	1.0	1.5	µg/Kg-dry	1	1/5/2017 1:59 PM
Surr: Tripropylphosphate	29.3			27-112		%Rec	1	1/5/2017 1:59 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	30		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 3:20:00 PM
Project:	Guam Samples		
Lab ID:	1612702-003	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU03		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	0.91	U	0.37	0.91	1.4	µg/Kg-dry	1	1/5/2017 2:19 PM
Surr: Tripropylphosphate	37.3			27-112		%Rec	1	1/5/2017 2:19 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	22		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Original

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 9:00:00 AM
Project:	Guam Samples		
Lab ID:	1612702-004	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU04		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.41	1.0	1.5	µg/Kg-dry	1	1/5/2017 2:38 PM
Surr: Tripropylphosphate	38.3			27-112		%Rec	1	1/5/2017 2:38 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	30		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Original

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 2:15:00 PM
Project:	Guam Samples		
Lab ID:	1612702-005	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU05		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.42	1.0	1.5	µg/Kg-dry	1	1/5/2017 2:57 PM
Surr: Tripropylphosphate	39.9			27-112		%Rec	1	1/5/2017 2:57 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	31		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Original

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 10:30:00 AM
Project:	Guam Samples		
Lab ID:	1612702-006	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU06		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.1	U	0.43	1.1	1.6	µg/Kg-dry	1	1/5/2017 3:17 PM
Surr: Tripropylphosphate	39.7			27-112		%Rec	1	1/5/2017 3:17 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	32		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - Analytical Report

WO#: 1612702

Date Reported: 1/6/2017
Original

Client:	Eurofins Lancaster Laboratories, Inc.	**Collection Date:**	12/11/2016 12:30:00 PM
Project:	Guam Samples		
Lab ID:	1612702-007	**Matrix:**	Restricted Soil
Client Sample ID:	MAD-DU07		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
White Phosphorus in Soil			**Method: SW7580**					**Analyst: DS**
White Phosphorus	1.0	U	0.42	1.0	1.6	µg/Kg-dry	1	1/5/2017 4:15 PM
Surr: Tripropylphosphate	46.3			27-112		%Rec	1	1/5/2017 4:15 PM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: ASP**
Percent Moisture	31		1.0	1.0	1.0	wt%	1	12/27/2016 11:30 AM

RTI Laboratories, Inc. - DATES REPORT

WO#: 1612702
Date Reported: 1/6/2017
Original

Client: Eurofins Lancaster Laboratories, Inc.
Project: Guam Samples

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1612702-001A	MAD-DU01	12/11/2016 11:05 AM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 1:40 PM
1612702-002A	MAD-DU02	12/11/2016 1:30 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 1:59 PM
1612702-003A	MAD-DU03	12/11/2016 3:20 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 2:19 PM
1612702-004A	MAD-DU04	12/11/2016 9:00 AM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 2:38 PM
1612702-005A	MAD-DU05	12/11/2016 2:15 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 2:57 PM
1612702-006A	MAD-DU06	12/11/2016 10:30 AM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 3:17 PM
1612702-007A	MAD-DU07	12/11/2016 12:30 PM	Restricted Soil				
				PMOIST-Percent Moisture		12/27/2016 11:30 AM	12/27/2016 11:30 AM
				SW_7580S-White Phosphorus in Soil		1/4/2017 8:52 AM	1/5/2017 4:15 PM

RTI Laboratories, Inc. - QC SUMMARY REPORT

WO#: 1612702
Date Reported: 1/6/2017
Original

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples **Batch ID:** 42082

Sample ID:	MB-42082	Samp Type:	MBLK	Test Code:	SW_7580S	Units:	µg/Kg	Prep Date:	1/4/2017	RunNo:	91424
Client ID:	PBS	Batch ID:	42082	TestNo:	SW7580			Analysis Date:	1/5/2017	SeqNo:	1787143

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
White Phosphorus	1.1	1.1									U
Surr: Tripropylphosphate	69		250.0		27.6	27	112				

Sample ID:	LCS-42082	Samp Type:	LCS	Test Code:	SW_7580S	Units:	µg/Kg	Prep Date:	1/4/2017	RunNo:	91424
Client ID:	LCSS	Batch ID:	42082	TestNo:	SW7580			Analysis Date:	1/5/2017	SeqNo:	1787144

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
White Phosphorus	9.1	1.1	10.73	0	84.4	75	125				
Surr: Tripropylphosphate	100		249.9		41.6	27	112				

Sample ID:	LCSD-42082	Samp Type:	LCSD	Test Code:	SW_7580S	Units:	µg/Kg	Prep Date:	1/4/2017	RunNo:	91424
Client ID:	LCSS02	Batch ID:	42082	TestNo:	SW7580			Analysis Date:	1/5/2017	SeqNo:	1787145

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
White Phosphorus	9.6	1.1	10.73	0	89.5	75	125	9.055	5.81	25	
Surr: Tripropylphosphate	110		249.9		43.1	27	112		0	25	

RTI Laboratories, Inc. - QC SUMMARY REPORT

WO#: 1612702
Date Reported: 1/6/2017
Original

Client: Eurofins Lancaster Laboratories, Inc.

Project: Guam Samples **Batch ID:** **R91282**

Sample ID:	**1612665-001ADUP**	Samp Type:	**DUP**	Test Code:	**PMOIST**	Units:	**wt%**	Prep Date:	**12/27/2016**	RunNo:	**91282**			
Client ID:	**ZZZZZZ**	Batch ID:	**R91282**	TestNo:	**D2216**			Analysis Date:	**12/27/2016**	SeqNo:	**1784653**			

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	19	1.0						17.30	7.17	20	

Sample ID:	**1612702-007ADUP**	Samp Type:	**DUP**	Test Code:	**PMOIST**	Units:	**wt%**	Prep Date:	**12/27/2016**	RunNo:	**91282**
Client ID:	**MAD-DU07LR1**	Batch ID:	**R91282**	TestNo:	**D2216**			Analysis Date:	**12/27/2016**	SeqNo:	**1784666**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	32	1.0						31.20	2.33	20	

DEFINITIONS:

DF: Dilution factor; the dilution factor applied to the prepared sample.

DL: Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.

DUP: Duplicate; aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently, used to calculate Precision (%RPD).

LCS: Laboratory Control Sample; prepared by adding a known amount of target analytes to a specified amount of clean matrix and prepared with the batch of samples, used to calculate Accuracy (%REC).

LCSD: A duplicate LCS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

LOD: Limit of Detection; a laboratory verified concentration that can be detected at three times greater than the noise level. This concentration is equal to or greater than the DL.

LOQ: Limit of Quantitation; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below the LOQ are reported with a "J" qualifier.

MBLK: Method Blank; a sample of similar matrix that does not contain target analytes or interference that may impact the analytical results and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedure, used to assess and verify that the analytical process is free of contamination.

Mg/Kg or mg/L: Units of part per million (PPM) – milligram per Kilogram (W/W) or milligram per Liter (W/V).

MS: Matrix Spike; prepared by adding a known amount of target analytes to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available, used to calculate Accuracy (%REC)

MSD: A duplicate MS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

% REC: Percent Recovery of a known spike (SPK); a measure of accuracy expressed as a percentage of a measured (recovered) concentration compared to the known concentration (SPK) added to the sample. This is compared to the Low Limit and High Limit.

% RPD: Relative Percent Difference; a measure of precision expressed as a percentage of the difference between two duplicates relative to the average concentration. This is compared to the RPD Limit.

Qual: Qualifier that applies to the analyte reported

SPK: Spike; used in the QC section for both SPK Value and SPK Ref Val

Ug/Kg or ug/L: Units of part per billion (PPB) – microgram per Kilogram (W/W) or microgram per Liter (W/V).

QUALIFIERS:

*: Reported value exceeds the maximum allowed concentration by regulation or permit.

B: Analyte detected in the associated Method Blank at a concentration greater than 1/2 the LOQ

G: ICB/CCB result is greater than the MDL

H: Holding time for preparation or analysis has been exceeded

J: Estimated result. Greater uncertainty is associated with this result and data reported is estimated.

M: Manual Integration used to determine area response

P: Second column RPD exceeds 40%

Q: % REC exceeded control limits. When applied to sample analytes - denotes an associated LCS recovery that exceeded control limits.

R: % RPD exceeds control limits

T: MBLK result is greater than 1/2 of the LOQ

U: The analyte concentration is less than the DL. The result is reported as less than the LOD

X: Matrix spike recovery for the noted analyte exceeded control limits. Applied to the MS/MSD parent sample.

Y: Percent Difference/Drift in the associated CCV exceeded acceptance criteria.

Z: Percent Difference/Drift in the associated ICV exceeded acceptance criteria.

eurofins | Lancaster Laboratories

1612702

Analysis Request / Environmental Services Subcontracting Form

For Lancaster Laboratories Use Only

Date: 12/21/16

Acct: ______ Group No.: 1746738 Sample Nos.: 8755030-36

Subcontractor: RTI LABORATORIES

LLI P.O.# : ______ Courier: Fed Ex

Submit report to: Kathy Binkley Ext.: 1393

Submit invoice to: Kathy Binkley

State where samples were collected: Guam

Matrix: ☐ Potable ☐ NPDES

Analyses Requested / Preservation Codes

Preservation Codes: H=HCl T=Thiosulfate N=HNO_3 B=NaOH S=H_2SO_4 O=Other

Comments: Reference Proposal # DH041715 and request Level IV data package.

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total # of Containers	Method 7580 for White Phosphorus.										Temperature of samples upon receipt (if requested)
MAD-DU01	12/11/16	11:05		X	X			1	X									8755030	
MAD-DU02	12/11/16	13:30		X	X			1	X									8755031	
MAD-DU03	12/11/16	15:20		X	X			1	X									8755032	
MAD-DU04	12/11/16	09:00		X	X			1	X									8755033	
MAD-DU05	12/11/16	14:15		X	X			1	X									8755034	
MAD-DU06	12/11/16	10:30		X	X			1	X									8755035	
MAD-DU07	12/11/16	12:30		X	X			1	X									8755036	

Turnaround Time Requested (TAT): Standard Rush

Date Results are Needed: TAT is 10 business days

Email invoice to: kbinkley@lancasterlabs.com

COMMENTS: RTI Laboratories: Dry weight reporting would be appropriate for the White Phosphorus as these soil samples will not be dried.

Relinquished by:	Date	Time	Received by:	Date	Time
Kathy Binkley	12-21-16	1550	[illegible signature]	12-22-16	14:02

Data Package Options (circled when required)

Type I (validation/NJ Reg) Type VI(Raw Data)
Type II (Tier II) Type III (Reduced NJ)
Type IV (CLP SOW) TX TRRP-13

SDG Complete? Yes No

MA MCP
CT RCP

Site-specific QC Required (MS/MSD/DUP)? Yes No
Internal Chain of Custody Required? Yes No

ORIGIN ID:LNSA (717) 656-2300
SHIPPING & RECEIVING
EUROFINS LANCASTER LABS INC
2425 NEW HOLLAND PIKE

LANCASTER, PA 17601
UNITED STATES US

SHIP DATE: 21DEC16
ACTWGT: 14.55 LB
CAD: 814137/[illegible]
DIMS: 14x14x17 IN

BILL SENDER

TO SAMPLE RECEIVING
RTI LABORATORIES, INC.
31628 GLENDALE AVENUE

LIVONIA MI 48150
(734) 422-8000
DEPT: 40

FedEx
Express

E

J161016072601uv

THU - 22 DEC 10:30A
PRIORITY OVERNIGHT

TRK# 0201 5035 4242 7560

48150
MI-US DTW

ET CFAA

Part # 156148V-434 RIT2 EXP 05/17

Temp Blank: 3.0°C

Client Cooler: K0909Z

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:	Prepared for:
Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601	EA Engineering, Science & Tech 615 Piikoi Street Suite 515 Honolulu HI 96814

Report Date: January 26, 2017

Project: Tinian Phase I/II ESA

Submittal Date: 12/20/2016
Group Number: 1746737
SDG: TIN01
PO Number: 15167
State of Sample Origin: GU

Client Sample Description	Lancaster Labs (LL) #
MAD-DU01 Composite Soil	8755023
MAD-DU02 Composite Soil	8755024
MAD-DU03 Composite Soil	8755025
MAD-DU04 Composite Soil	8755026
MAD-DU05 Composite Soil	8755027
MAD-DU06 Composite Soil	8755028
MAD-DU07 Composite Soil	8755029

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

1 Copy To Data Package Group

Respectfully Submitted,

Natalie R. Luciano

Natalie R. Luciano
Senior Specialist

(717) 556-7258

Sample Description: MAD-DU01 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755023
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 11:05 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0101 SDG#: TIN01-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles		**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	0.84	U	0.84	2.1	1
10725	Acenaphthylene	208-96-8	0.42	U	0.42	2.1	1
10725	Anthracene	120-12-7	2.3		0.42	2.1	1
10725	Benzo(a)anthracene	56-55-3	0.84	U	0.84	2.1	1
10725	Benzo(a)pyrene	50-32-8	0.84	U	0.84	2.1	1
10725	Benzo(b)fluoranthene	205-99-2	2.1	J	0.84	2.1	1
10725	Benzo(g,h,i)perylene	191-24-2	0.84	U	0.84	2.1	1
10725	Benzo(k)fluoranthene	207-08-9	0.84	U	0.84	2.1	1
10725	Chrysene	218-01-9	1.3	J	0.42	2.1	1
10725	Dibenz(a,h)anthracene	53-70-3	0.84	U	0.84	2.1	1
10725	Fluoranthene	206-44-0	1.1	J	0.84	2.1	1
10725	Fluorene	86-73-7	0.84	U	0.84	2.1	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	0.84	U	0.84	2.1	1
10725	1-Methylnaphthalene	90-12-0	0.84	U	0.84	2.1	1
10725	2-Methylnaphthalene	91-57-6	1.4	J	0.84	2.1	1
10725	Naphthalene	91-20-3	2.4		0.84	2.1	1
10725	Phenanthrene	85-01-8	0.84	U	0.84	2.1	1
10725	Pyrene	129-00-0	0.84	U	0.84	2.1	1
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	51	U	51	150	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	51	U	51	150	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	120	U	120	370	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	120	U	120	370	1
13413	3,5-Dinitroaniline	618-87-1	51	U	51	150	1
13413	1,3-Dinitrobenzene	99-65-0	50	U	50	150	1
13413	2,4-Dinitrotoluene	121-14-2	50	U	50	150	1
13413	2,6-Dinitrotoluene	606-20-2	140	U	140	290	1
13413	HMX	2691-41-0	260	U	260	540	1
13413	Nitrobenzene	98-95-3	120	U	120	370	1
13413	Nitroglycerin	55-63-0	1,000	U	1,000	3,000	1
13413	2-Nitrotoluene	88-72-2	93	U	93	190	1
13413	3-Nitrotoluene	99-08-1	140	U	140	270	1
13413	4-Nitrotoluene	99-99-0	140	U	140	270	1
13413	PETN	78-11-5	1,000	U	1,000	3,000	1
13413	RDX	121-82-4	50	U	50	150	1
13413	Tetryl	479-45-8	120	U	120	370	1
13413	1,3,5-Trinitrobenzene	99-35-4	50	U	50	150	1
13413	2,4,6-Trinitrotoluene	118-96-7	55	U	55	150	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.437		0.124	0.252	2
06125	Arsenic	7440-38-2	13.3		0.186	0.503	2
06127	Beryllium	7440-41-7	1.37		0.0272	0.126	2
06128	Cadmium	7440-43-9	3.27		0.0488	0.126	2
06131	Chromium	7440-47-3	160		0.149	0.503	2
06133	Copper	7440-50-8	135		0.127	0.503	2
06135	Lead	7439-92-1	18.4		0.0367	0.252	2

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: MAD-DU01 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755023
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 11:05 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0101 SDG#: TIN01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	**SW-846 6020**		**mg/kg**	**mg/kg**	**mg/kg**	
06139	Nickel	7440-02-0	31.9	0.210	0.503	2
06141	Selenium	7782-49-2	0.684	0.110	0.503	2
06142	Silver	7440-22-4	0.278	0.0297	0.126	2
06145	Thallium	7440-28-0	0.618	0.0365	0.126	2
06149	Zinc	7440-66-6	112	1.59	3.78	2
	SW-846 7471A		**mg/kg**	**mg/kg**	**mg/kg**	
00159	Mercury	7439-97-6	0.141	0.0124	0.124	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	22.1	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/29/2016 14:29	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016 16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/14/2017 18:52	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017 14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017 08:10	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017 08:10	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016 09:34	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017 17:45	Barbara A Kane	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU01 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755023
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 11:05 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0101 SDG#: TIN01-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU02 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755024
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 13:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0102 SDG#: TIN01-02

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles		**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	0.85	U	0.85	2.1	1
10725	Acenaphthylene	208-96-8	3.2		0.42	2.1	1
10725	Anthracene	120-12-7	0.42	U	0.42	2.1	1
10725	Benzo(a)anthracene	56-55-3	0.85	U	0.85	2.1	1
10725	Benzo(a)pyrene	50-32-8	0.85	U	0.85	2.1	1
10725	Benzo(b)fluoranthene	205-99-2	3.4		0.85	2.1	1
10725	Benzo(g,h,i)perylene	191-24-2	0.85	U	0.85	2.1	1
10725	Benzo(k)fluoranthene	207-08-9	0.85	U	0.85	2.1	1
10725	Chrysene	218-01-9	1.5	J	0.42	2.1	1
10725	Dibenz(a,h)anthracene	53-70-3	0.85	U	0.85	2.1	1
10725	Fluoranthene	206-44-0	1.0	J	0.85	2.1	1
10725	Fluorene	86-73-7	1.2	J	0.85	2.1	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	0.85	U	0.85	2.1	1
10725	1-Methylnaphthalene	90-12-0	0.85	U	0.85	2.1	1
10725	2-Methylnaphthalene	91-57-6	0.85	U	0.85	2.1	1
10725	Naphthalene	91-20-3	2.1		0.85	2.1	1
10725	Phenanthrene	85-01-8	1.1	J	0.85	2.1	1
10725	Pyrene	129-00-0	0.85	U	0.85	2.1	1
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	53	U	53	160	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	53	U	53	160	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	130	U	130	390	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	130	U	130	390	1
13413	3,5-Dinitroaniline	618-87-1	53	U	53	160	1
13413	1,3-Dinitrobenzene	99-65-0	52	U	52	160	1
13413	2,4-Dinitrotoluene	121-14-2	52	U	52	160	1
13413	2,6-Dinitrotoluene	606-20-2	150	U	150	300	1
13413	HMX	2691-41-0	270	U	270	560	1
13413	Nitrobenzene	98-95-3	130	U	130	390	1
13413	Nitroglycerin	55-63-0	1,000	U	1,000	3,100	1
13413	2-Nitrotoluene	88-72-2	97	U	97	190	1
13413	3-Nitrotoluene	99-08-1	140	U	140	280	1
13413	4-Nitrotoluene	99-99-0	140	U	140	280	1
13413	PETN	78-11-5	1,000	U	1,000	3,100	1
13413	RDX	121-82-4	52	U	52	160	1
13413	Tetryl	479-45-8	130	U	130	390	1
13413	1,3,5-Trinitrobenzene	99-35-4	52	U	52	160	1
13413	2,4,6-Trinitrotoluene	118-96-7	57	U	57	160	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.541		0.122	0.249	2
06125	Arsenic	7440-38-2	12.3		0.184	0.498	2
06127	Beryllium	7440-41-7	1.30		0.0269	0.125	2
06128	Cadmium	7440-43-9	3.80		0.0483	0.125	2
06131	Chromium	7440-47-3	152		0.147	0.498	2
06133	Copper	7440-50-8	137		0.126	0.498	2
06135	Lead	7439-92-1	26.2		0.0364	0.249	2

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU02 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755024
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 13:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0102 SDG#: TIN01-02

CAT No.	Analysis Name		CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals		**SW-846 6020**		**mg/kg**	**mg/kg**	**mg/kg**	
06139	Nickel		7440-02-0	30.1	0.208	0.498	2
06141	Selenium		7782-49-2	0.729	0.109	0.498	2
06142	Silver		7440-22-4	4.48	0.0294	0.125	2
06145	Thallium		7440-28-0	0.550	0.0361	0.125	2
06149	Zinc		7440-66-6	119	1.57	3.74	2
		SW-846 7471A		**mg/kg**	**mg/kg**	**mg/kg**	
00159	Mercury		7439-97-6	0.158	0.0125	0.125	1
Wet Chemistry		**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture		n.a.	22.8	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/29/2016 16:25	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016 16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/14/2017 20:59	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017 14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017 08:13	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017 08:13	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016 09:47	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017 17:45	Barbara A Kane	1

*=This limit was used in the evaluation of the final result

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Lancaster Laboratories Environmental

Analysis Report

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Sample Description: MAD-DU02 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755024
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 13:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0102 SDG#: TIN01-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU03 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755025
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 15:20 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0103 SDG#: TIN01-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles		**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	0.83	U	0.83	2.1	1
10725	Acenaphthylene	208-96-8	2.1	J	0.41	2.1	1
10725	Anthracene	120-12-7	0.41	U	0.41	2.1	1
10725	Benzo(a)anthracene	56-55-3	0.83	U	0.83	2.1	1
10725	Benzo(a)pyrene	50-32-8	0.86	J	0.83	2.1	1
10725	Benzo(b)fluoranthene	205-99-2	3.6		0.83	2.1	1
10725	Benzo(g,h,i)perylene	191-24-2	0.83	U	0.83	2.1	1
10725	Benzo(k)fluoranthene	207-08-9	1.0	J	0.83	2.1	1
10725	Chrysene	218-01-9	1.6	J	0.41	2.1	1
10725	Dibenz(a,h)anthracene	53-70-3	0.83	U	0.83	2.1	1
10725	Fluoranthene	206-44-0	1.2	J	0.83	2.1	1
10725	Fluorene	86-73-7	1.3	J	0.83	2.1	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	0.83	U	0.83	2.1	1
10725	1-Methylnaphthalene	90-12-0	0.83	U	0.83	2.1	1
10725	2-Methylnaphthalene	91-57-6	1.8	J	0.83	2.1	1
10725	Naphthalene	91-20-3	4.9		0.83	2.1	1
10725	Phenanthrene	85-01-8	1.3	J	0.83	2.1	1
10725	Pyrene	129-00-0	1.0	J	0.83	2.1	1
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	51	U	51	150	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	51	U	51	150	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	120	U	120	370	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	120	U	120	370	1
13413	3,5-Dinitroaniline	618-87-1	51	U	51	150	1
13413	1,3-Dinitrobenzene	99-65-0	50	U	50	150	1
13413	2,4-Dinitrotoluene	121-14-2	50	U	50	150	1
13413	2,6-Dinitrotoluene	606-20-2	140	U	140	280	1
13413	HMX	2691-41-0	260	U	260	530	1
13413	Nitrobenzene	98-95-3	120	U	120	370	1
13413	Nitroglycerin	55-63-0	990	U	990	3,000	1
13413	2-Nitrotoluene	88-72-2	93	U	93	190	1
13413	3-Nitrotoluene	99-08-1	140	U	140	270	1
13413	4-Nitrotoluene	99-99-0	140	U	140	270	1
13413	PETN	78-11-5	990	U	990	3,000	1
13413	RDX	121-82-4	50	U	50	150	1
13413	Tetryl	479-45-8	120	U	120	370	1
13413	1,3,5-Trinitrobenzene	99-35-4	50	U	50	150	1
13413	2,4,6-Trinitrotoluene	118-96-7	54	U	54	150	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.959		0.108	0.220	2
06125	Arsenic	7440-38-2	18.0		0.162	0.439	2
06127	Beryllium	7440-41-7	1.20		0.0237	0.110	2
06128	Cadmium	7440-43-9	4.55		0.0426	0.110	2
06131	Chromium	7440-47-3	167		0.130	0.439	2
06133	Copper	7440-50-8	156		0.111	0.439	2
06135	Lead	7439-92-1	30.9		0.0321	0.220	2

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU03 Composite Soil Tinian Phase I/II ESA

LL Sample # SW 8755025
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 15:20 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0103 SDG#: TIN01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	**SW-846 6020**		mg/kg	mg/kg	mg/kg	
06139	Nickel	7440-02-0	45.8	0.183	0.439	2
06141	Selenium	7782-49-2	0.670	0.0960	0.439	2
06142	Silver	7440-22-4	0.851	0.0259	0.110	2
06145	Thallium	7440-28-0	0.479	0.0318	0.110	2
06149	Zinc	7440-66-6	117	1.39	3.29	2
	SW-846 7471A		mg/kg	mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.165	0.0126	0.126	1
Wet Chemistry	**SM 2540 G-1997**		%	%	%	
00111	Moisture	n.a.	20.8	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/29/2016 17:03	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016 16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/14/2017 21:41	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017 14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017 08:22	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017 08:22	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016 09:54	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017 17:45	Barbara A Kane	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU03 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755025
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/11/2016 15:20 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0103 SDG#: TIN01-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU04 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755026
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 09:00 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0104 SDG#: TIN01-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	**Semivolatiles**	**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	0.93	U	0.93	2.3	1
10725	Acenaphthylene	208-96-8	4.1		0.47	2.3	1
10725	Anthracene	120-12-7	0.47	U	0.47	2.3	1
10725	Benzo(a)anthracene	56-55-3	0.93	U	0.93	2.3	1
10725	Benzo(a)pyrene	50-32-8	0.93	U	0.93	2.3	1
10725	Benzo(b)fluoranthene	205-99-2	2.4		0.93	2.3	1
10725	Benzo(g,h,i)perylene	191-24-2	0.93	U	0.93	2.3	1
10725	Benzo(k)fluoranthene	207-08-9	0.93	U	0.93	2.3	1
10725	Chrysene	218-01-9	1.0	J	0.47	2.3	1
10725	Dibenz(a,h)anthracene	53-70-3	0.93	U	0.93	2.3	1
10725	Fluoranthene	206-44-0	0.93	U	0.93	2.3	1
10725	Fluorene	86-73-7	1.6	J	0.93	2.3	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	0.93	U	0.93	2.3	1
10725	1-Methylnaphthalene	90-12-0	1.6	J	0.93	2.3	1
10725	2-Methylnaphthalene	91-57-6	3.1		0.93	2.3	1
10725	Naphthalene	91-20-3	3.0		0.93	2.3	1
10725	Phenanthrene	85-01-8	0.93	U	0.93	2.3	1
10725	Pyrene	129-00-0	0.93	U	0.93	2.3	1
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	58	U	58	170	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	58	U	58	170	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	140	U	140	420	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	140	U	140	420	1
13413	3,5-Dinitroaniline	618-87-1	58	U	58	170	1
13413	1,3-Dinitrobenzene	99-65-0	57	U	57	170	1
13413	2,4-Dinitrotoluene	121-14-2	57	U	57	170	1
13413	2,6-Dinitrotoluene	606-20-2	160	U	160	330	1
13413	HMX	2691-41-0	300	U	300	610	1
13413	Nitrobenzene	98-95-3	140	U	140	420	1
13413	Nitroglycerin	55-63-0	1,100	U	1,100	3,400	1
13413	2-Nitrotoluene	88-72-2	110	U	110	210	1
13413	3-Nitrotoluene	99-08-1	160	U	160	310	1
13413	4-Nitrotoluene	99-99-0	160	U	160	310	1
13413	PETN	78-11-5	1,100	U	1,100	3,400	1
13413	RDX	121-82-4	57	U	57	170	1
13413	Tetryl	479-45-8	140	U	140	420	1
13413	1,3,5-Trinitrobenzene	99-35-4	57	U	57	170	1
13413	2,4,6-Trinitrotoluene	118-96-7	62	U	62	170	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.389		0.122	0.248	2
06125	Arsenic	7440-38-2	14.7		0.183	0.497	2
06127	Beryllium	7440-41-7	1.52		0.0268	0.124	2
06128	Cadmium	7440-43-9	2.91		0.0482	0.124	2
06131	Chromium	7440-47-3	181		0.147	0.497	2
06133	Copper	7440-50-8	152		0.125	0.497	2
06135	Lead	7439-92-1	20.6		0.0363	0.248	2

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU04 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755026
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 09:00 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0104 SDG#: TIN01-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	**SW-846 6020**		mg/kg	mg/kg	mg/kg	
06139	Nickel	7440-02-0	35.5	0.207	0.497	2
06141	Selenium	7782-49-2	0.799	0.109	0.497	2
06142	Silver	7440-22-4	0.221	0.0293	0.124	2
06145	Thallium	7440-28-0	0.638	0.0360	0.124	2
06149	Zinc	7440-66-6	122	1.57	3.73	2
	SW-846 7471A		mg/kg	mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.171	0.0139	0.139	1
Wet Chemistry	**SM 2540 G-1997**		%	%	%	
00111	Moisture	n.a.	29.4	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/30/2016 10:07	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016 16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/14/2017 23:49	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017 14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017 08:26	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017 08:26	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016 09:57	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017 17:45	Barbara A Kane	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU04 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755026
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 09:00 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0104 SDG#: TIN01-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU05 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755027
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 14:15 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0105 SDG#: TIN01-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles		**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	0.95	U	0.95	2.4	1
10725	Acenaphthylene	208-96-8	7.1		0.47	2.4	1
10725	Anthracene	120-12-7	0.47	U	0.47	2.4	1
10725	Benzo(a)anthracene	56-55-3	0.95	U	0.95	2.4	1
10725	Benzo(a)pyrene	50-32-8	0.95	U	0.95	2.4	1
10725	Benzo(b)fluoranthene	205-99-2	4.5		0.95	2.4	1
10725	Benzo(g,h,i)perylene	191-24-2	0.95	U	0.95	2.4	1
10725	Benzo(k)fluoranthene	207-08-9	0.95	U	0.95	2.4	1
10725	Chrysene	218-01-9	2.7		0.47	2.4	1
10725	Dibenz(a,h)anthracene	53-70-3	0.95	U	0.95	2.4	1
10725	Fluoranthene	206-44-0	2.3	J	0.95	2.4	1
10725	Fluorene	86-73-7	1.5	J	0.95	2.4	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	0.95	U	0.95	2.4	1
10725	1-Methylnaphthalene	90-12-0	1.6	J	0.95	2.4	1
10725	2-Methylnaphthalene	91-57-6	2.8		0.95	2.4	1
10725	Naphthalene	91-20-3	4.3		0.95	2.4	1
10725	Phenanthrene	85-01-8	1.6	J	0.95	2.4	1
10725	Pyrene	129-00-0	2.1	J	0.95	2.4	1
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	58	U	58	170	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	58	U	58	170	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	140	U	140	430	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	140	U	140	430	1
13413	3,5-Dinitroaniline	618-87-1	58	U	58	170	1
13413	1,3-Dinitrobenzene	99-65-0	57	U	57	170	1
13413	2,4-Dinitrotoluene	121-14-2	57	U	57	170	1
13413	2,6-Dinitrotoluene	606-20-2	160	U	160	330	1
13413	HMX	2691-41-0	300	U	300	610	1
13413	Nitrobenzene	98-95-3	140	U	140	430	1
13413	Nitroglycerin	55-63-0	1,100	U	1,100	3,400	1
13413	2-Nitrotoluene	88-72-2	110	U	110	210	1
13413	3-Nitrotoluene	99-08-1	160	U	160	310	1
13413	4-Nitrotoluene	99-99-0	160	U	160	310	1
13413	PETN	78-11-5	1,100	U	1,100	3,400	1
13413	RDX	121-82-4	57	U	57	170	1
13413	Tetryl	479-45-8	140	U	140	430	1
13413	1,3,5-Trinitrobenzene	99-35-4	57	U	57	170	1
13413	2,4,6-Trinitrotoluene	118-96-7	62	U	62	170	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.482		0.138	0.281	2
06125	Arsenic	7440-38-2	12.5		0.207	0.562	2
06127	Beryllium	7440-41-7	1.18		0.0303	0.140	2
06128	Cadmium	7440-43-9	2.80		0.0545	0.140	2
06131	Chromium	7440-47-3	132		0.166	0.562	2
06133	Copper	7440-50-8	133		0.142	0.562	2
06135	Lead	7439-92-1	20.6		0.0410	0.281	2

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU05 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755027
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 14:15 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0105 SDG#: TIN01-05

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals		**SW-846 6020**		**mg/kg**		**mg/kg**	**mg/kg**	
06139	Nickel		7440-02-0	28.4		0.235	0.562	2
06141	Selenium		7782-49-2	0.753		0.123	0.562	2
06142	Silver		7440-22-4	0.201		0.0331	0.140	2
06145	Thallium		7440-28-0	0.477		0.0407	0.140	2
06149	Zinc		7440-66-6	102		1.78	4.21	2
		SW-846 7471A		**mg/kg**		**mg/kg**	**mg/kg**	
00159	Mercury		7439-97-6	0.134	J	0.0140	0.140	1
Wet Chemistry		**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture		n.a.	29.5		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/30/2016	10:43	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016	16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/15/2017	00:31	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017	14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017	08:29	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017	08:29	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016	09:59	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017	17:45	Barbara A Kane	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU05 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755027
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 14:15 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0105 SDG#: TIN01-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU06 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755028
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 10:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0106 SDG#: TIN01-06

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles		**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	0.96	U	0.96	2.4	1
10725	Acenaphthylene	208-96-8	12		0.48	2.4	1
10725	Anthracene	120-12-7	0.54	J	0.48	2.4	1
10725	Benzo(a)anthracene	56-55-3	0.96	U	0.96	2.4	1
10725	Benzo(a)pyrene	50-32-8	0.96	U	0.96	2.4	1
10725	Benzo(b)fluoranthene	205-99-2	5.0		0.96	2.4	1
10725	Benzo(g,h,i)perylene	191-24-2	0.96	U	0.96	2.4	1
10725	Benzo(k)fluoranthene	207-08-9	0.96	U	0.96	2.4	1
10725	Chrysene	218-01-9	2.4	J	0.48	2.4	1
10725	Dibenz(a,h)anthracene	53-70-3	0.96	U	0.96	2.4	1
10725	Fluoranthene	206-44-0	1.5	J	0.96	2.4	1
10725	Fluorene	86-73-7	2.2	J	0.96	2.4	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	0.96	U	0.96	2.4	1
10725	1-Methylnaphthalene	90-12-0	1.7	J	0.96	2.4	1
10725	2-Methylnaphthalene	91-57-6	3.3		0.96	2.4	1
10725	Naphthalene	91-20-3	5.6		0.96	2.4	1
10725	Phenanthrene	85-01-8	2.2	J	0.96	2.4	1
10725	Pyrene	129-00-0	1.5	J	0.96	2.4	1
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	59	U	59	170	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	59	U	59	170	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	140	U	140	430	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	140	U	140	430	1
13413	3,5-Dinitroaniline	618-87-1	59	U	59	170	1
13413	1,3-Dinitrobenzene	99-65-0	57	U	57	170	1
13413	2,4-Dinitrotoluene	121-14-2	57	U	57	170	1
13413	2,6-Dinitrotoluene	606-20-2	160	U	160	330	1
13413	HMX	2691-41-0	300	U	300	610	1
13413	Nitrobenzene	98-95-3	140	U	140	430	1
13413	Nitroglycerin	55-63-0	1,100	U	1,100	3,400	1
13413	2-Nitrotoluene	88-72-2	110	U	110	210	1
13413	3-Nitrotoluene	99-08-1	160	U	160	310	1
13413	4-Nitrotoluene	99-99-0	160	U	160	310	1
13413	PETN	78-11-5	1,100	U	1,100	3,400	1
13413	RDX	121-82-4	57	U	57	170	1
13413	Tetryl	479-45-8	140	U	140	430	1
13413	1,3,5-Trinitrobenzene	99-35-4	57	U	57	170	1
13413	2,4,6-Trinitrotoluene	118-96-7	63	U	63	170	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.494		0.138	0.280	2
06125	Arsenic	7440-38-2	13.6		0.207	0.560	2
06127	Beryllium	7440-41-7	1.30		0.0303	0.140	2
06128	Cadmium	7440-43-9	2.84		0.0544	0.140	2
06131	Chromium	7440-47-3	150		0.166	0.560	2
06133	Copper	7440-50-8	147		0.141	0.560	2
06135	Lead	7439-92-1	21.7		0.0409	0.280	2

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU06 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755028
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 10:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0106 SDG#: TIN01-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals		**SW-846 6020**	mg/kg	mg/kg	mg/kg	
06139	Nickel	7440-02-0	33.3	0.234	0.560	2
06141	Selenium	7782-49-2	0.803	0.122	0.560	2
06142	Silver	7440-22-4	0.164	0.0331	0.140	2
06145	Thallium	7440-28-0	0.589	0.0406	0.140	2
06149	Zinc	7440-66-6	107	1.77	4.20	2
		SW-846 7471A	mg/kg	mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.142	0.0140	0.140	1
Wet Chemistry		**SM 2540 G-1997**	%	%	%	
00111	Moisture	n.a.	30.7	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/30/2016 11:20	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016 16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/15/2017 01:14	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017 14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017 08:32	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017 08:32	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016 10:02	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017 17:45	Barbara A Kane	1

*=This limit was used in the evaluation of the final result

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MAD-DU06 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755028
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 10:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0106 SDG#: TIN01-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MAD-DU07 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755029
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 12:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0107 SDG#: TIN01-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles		**SW-846 8270C SIM**	**ug/kg**		**ug/kg**	**ug/kg**	
10725	Acenaphthene	83-32-9	1.1	J	1.1	2.7	1
10725	Acenaphthylene	208-96-8	14		0.53	2.7	1
10725	Anthracene	120-12-7	0.53	J	0.53	2.7	1
10725	Benzo(a)anthracene	56-55-3	1.1	U	1.1	2.7	1
10725	Benzo(a)pyrene	50-32-8	1.1	U	1.1	2.7	1
10725	Benzo(b)fluoranthene	205-99-2	4.9		1.1	2.7	1
10725	Benzo(g,h,i)perylene	191-24-2	1.1	U	1.1	2.7	1
10725	Benzo(k)fluoranthene	207-08-9	1.1	U	1.1	2.7	1
10725	Chrysene	218-01-9	1.9	J	0.53	2.7	1
10725	Dibenz(a,h)anthracene	53-70-3	1.1	U	1.1	2.7	1
10725	Fluoranthene	206-44-0	1.3	J	1.1	2.7	1
10725	Fluorene	86-73-7	2.3	J	1.1	2.7	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1.1	U	1.1	2.7	1
10725	1-Methylnaphthalene	90-12-0	1.1	U	1.1	2.7	1
10725	2-Methylnaphthalene	91-57-6	1.9	J	1.1	2.7	1
10725	Naphthalene	91-20-3	3.0		1.1	2.7	1
10725	Phenanthrene	85-01-8	1.6	J	1.1	2.7	1
10725	Pyrene	129-00-0	1.3	J	1.1	2.7	1

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and internal standard areas are again outside of the QC acceptance limits, indicating a matrix effect. The reported data is from the initial analysis of the sample.

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives		**SW-846 8330B Rev.2 Oct. 2006**	**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	64	U	64	190	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	64	U	64	190	1
13413	2,6-Diamino-4-nitrotoluene	59229-75-3	160	U	160	470	1
13413	2,4-Diamino-6-nitrotoluene	6629-29-4	160	U	160	470	1
13413	3,5-Dinitroaniline	618-87-1	64	U	64	190	1
13413	1,3-Dinitrobenzene	99-65-0	63	U	63	190	1
13413	2,4-Dinitrotoluene	121-14-2	63	U	63	190	1
13413	2,6-Dinitrotoluene	606-20-2	180	U	180	360	1
13413	HMX	2691-41-0	330	U	330	670	1
13413	Nitrobenzene	98-95-3	160	U	160	470	1
13413	Nitroglycerin	55-63-0	1,300	U	1,300	3,800	1
13413	2-Nitrotoluene	88-72-2	120	U	120	240	1
13413	3-Nitrotoluene	99-08-1	170	U	170	350	1
13413	4-Nitrotoluene	99-99-0	170	U	170	350	1
13413	PETN	78-11-5	1,300	U	1,300	3,800	1
13413	RDX	121-82-4	63	U	63	190	1
13413	Tetryl	479-45-8	160	U	160	470	1
13413	1,3,5-Trinitrobenzene	99-35-4	63	U	63	190	1
13413	2,4,6-Trinitrotoluene	118-96-7	69	U	69	190	1
Metals		**SW-846 6020**	**mg/kg**		**mg/kg**	**mg/kg**	
06124	Antimony	7440-36-0	0.419		0.143	0.291	2
06125	Arsenic	7440-38-2	13.5		0.215	0.582	2

*=This limit was used in the evaluation of the final result

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MAD-DU07 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755029
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 12:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0107 SDG#: TIN01-07

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	**SW-846 6020**		mg/kg	mg/kg	mg/kg	
06127	Beryllium	7440-41-7	1.39	0.0314	0.145	2
06128	Cadmium	7440-43-9	2.91	0.0564	0.145	2
06131	Chromium	7440-47-3	159	0.172	0.582	2
06133	Copper	7440-50-8	138	0.147	0.582	2
06135	Lead	7439-92-1	29.7	0.0425	0.291	2
06139	Nickel	7440-02-0	31.0	0.243	0.582	2
06141	Selenium	7782-49-2	0.774	0.127	0.582	2
06142	Silver	7440-22-4	0.173	0.0343	0.145	2
06145	Thallium	7440-28-0	0.605	0.0422	0.145	2
06149	Zinc	7440-66-6	106	1.84	4.36	2
	SW-846 7471A		mg/kg	mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.137 J	0.0152	0.152	1
Wet Chemistry	**SM 2540 G-1997**		%	%	%	
00111	Moisture	n.a.	37.5	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	16357SLJ026	12/30/2016 11:56	Linda M Hartenstine	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	16357SLJ026	12/23/2016 16:45	Elizabeth E Donovan	1
13413	Nitroaromatics/Amines 8330B(s)	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/15/2017 01:56	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	170040017A	01/04/2017 14:30	David V Hershey Jr	1
06124	Antimony	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06125	Arsenic	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06127	Beryllium	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06128	Cadmium	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06131	Chromium	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06133	Copper	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06135	Lead	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06139	Nickel	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06141	Selenium	SW-846 6020	1	170035708002B	01/04/2017 07:51	Scott P Cuff	2
06142	Silver	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2

*=This limit was used in the evaluation of the final result

Sample Description: MAD-DU07 Composite Soil
Tinian Phase I/II ESA

LL Sample # SW 8755029
LL Group # 1746737
Account # 30099

Project Name: Tinian Phase I/II ESA

Collected: 12/12/2016 12:30 by MK

Submitted: 12/20/2016 11:30
Reported: 01/26/2017 18:02

EA Engineering, Science & Tech
615 Piikoi Street
Suite 515
Honolulu HI 96814

T0107 SDG#: TIN01-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06145	Thallium	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
06149	Zinc	SW-846 6020	1	170035708002A	01/04/2017 07:51	Scott P Cuff	2
00159	Mercury	SW-846 7471A	1	163585711002	12/28/2016 10:04	Damary Valentin	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170035708002	01/03/2017 17:45	Barbara A Kane	1
05711	Hg-SW, 7471A - U3	SW-846 7471A	1	163585711002	12/27/2016 23:45	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	17026820001A	01/26/2017 06:44	Stephanie A Sanchez	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: EA Engineering, Science & Tech
Group Number: 1746737
Reported: 01/26/2017 18:02

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	**Result**		**MDL****	**LOQ**
	ug/kg		**ug/kg**	**ug/kg**
Batch number: 16357SLJ026	Sample number(s): 8755023-8755029			
Acenaphthene	0.67	U	0.67	1.7
Acenaphthylene	0.33	U	0.33	1.7
Anthracene	0.33	U	0.33	1.7
Benzo(a)anthracene	0.67	U	0.67	1.7
Benzo(a)pyrene	0.67	U	0.67	1.7
Benzo(b)fluoranthene	0.67	U	0.67	1.7
Benzo(g,h,i)perylene	0.67	U	0.67	1.7
Benzo(k)fluoranthene	0.67	U	0.67	1.7
Chrysene	0.33	U	0.33	1.7
Dibenz(a,h)anthracene	0.67	U	0.67	1.7
Fluoranthene	0.67	U	0.67	1.7
Fluorene	0.67	U	0.67	1.7
Indeno(1,2,3-cd)pyrene	0.67	U	0.67	1.7
1-Methylnaphthalene	0.67	U	0.67	1.7
2-Methylnaphthalene	0.67	U	0.67	1.7
Naphthalene	0.67	U	0.67	1.7
Phenanthrene	0.67	U	0.67	1.7
Pyrene	0.67	U	0.67	1.7
Batch number: 170040017A	Sample number(s): 8755023-8755029			
4-Amino-2,6-Dinitrotoluene	41	U	41	120
2-Amino-4,6-Dinitrotoluene	41	U	41	120
2,6-Diamino-4-nitrotoluene	100	U	100	300
2,4-Diamino-6-nitrotoluene	100	U	100	300
3,5-Dinitroaniline	41	U	41	120
1,3-Dinitrobenzene	40	U	40	120
2,4-Dinitrotoluene	40	U	40	120
2,6-Dinitrotoluene	110	U	110	230
HMX	210	U	210	430
Nitrobenzene	100	U	100	300
Nitroglycerin	800	U	800	2,400
2-Nitrotoluene	75	U	75	150
3-Nitrotoluene	110	U	110	220
4-Nitrotoluene	110	U	110	220
PETN	800	U	800	2,400
RDX	40	U	40	120
Tetryl	100	U	100	300
1,3,5-Trinitrobenzene	40	U	40	120
2,4,6-Trinitrotoluene	44	U	44	120
	mg/kg		**mg/kg**	**mg/kg**

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: EA Engineering, Science & Tech   Group Number: 1746737
Reported: 01/26/2017 18:02

Method Blank (continued)

Analysis Name	Result mg/kg	MDL** mg/kg	LOQ mg/kg
Batch number: 163585711002	Sample number(s): 8755023-8755029		
Mercury	0.0100 U	0.0100	0.100
Batch number: 170035708002A	Sample number(s): 8755023-8755029		
Antimony	0.0982 U	0.0982	0.200
Arsenic	0.148 U	0.148	0.400
Beryllium	0.0216 U	0.0216	0.100
Cadmium	0.0388 U	0.0388	0.100
Chromium	0.118 U	0.118	0.400
Copper	0.101 U	0.101	0.400
Lead	0.0292 U	0.0292	0.200
Nickel	0.167 U	0.167	0.400
Silver	0.0236 U	0.0236	0.100
Thallium	0.0290 U	0.0290	0.100
Zinc	1.26 U	1.26	3.00
Batch number: 170035708002B	Sample number(s): 8755023-8755029		
Selenium	0.0874 U	0.0874	0.400

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16357SLJ026	Sample number(s): 8755023-8755029								
Acenaphthene	33.33	30.82			92		72-118		
Acenaphthylene	33.33	26.95			81		68-100		
Anthracene	33.33	28.83			86		69-109		
Benzo(a)anthracene	33.33	30.09			90		65-111		
Benzo(a)pyrene	33.33	30.61			92		65-110		
Benzo(b)fluoranthene	33.33	31.76			95		63-122		
Benzo(g,h,i)perylene	33.33	29.69			89		58-109		
Benzo(k)fluoranthene	33.33	30.53			92		60-110		
Chrysene	33.33	29.31			88		62-108		
Dibenz(a,h)anthracene	33.33	32.33			97		63-114		
Fluoranthene	33.33	29.13			87		67-108		
Fluorene	33.33	30.19			91		68-113		
Indeno(1,2,3-cd)pyrene	33.33	30.83			93		58-111		
1-Methylnaphthalene	33.33	27.89			84		80-106		
2-Methylnaphthalene	33.33	28.14			84		74-110		
Naphthalene	33.33	25.29			76		64-106		
Phenanthrene	33.33	28.17			85		70-106		
Pyrene	33.33	27.6			83		64-105		
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 170040017A	Sample number(s): 8755023-8755029								

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: EA Engineering, Science & Tech   Group Number: 1746737
Reported: 01/26/2017 18:02

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
4-Amino-2,6-Dinitrotoluene	2010	1666.73	2010	1683.01	83	84	42-138	1	50
2-Amino-4,6-Dinitrotoluene	2000	1666.73	2000	1683.01	83	84	43-141	1	50
2,6-Diamino-4-nitrotoluene	1800	1904.36	1800	1802.22	106	100	80-115	6	50
2,4-Diamino-6-nitrotoluene	1790	1904.36	1790	1802.22	106	101	79-115	6	50
3,5-Dinitroaniline	2010	1700.44	2010	1736.64	85	86	47-141	2	50
1,3-Dinitrobenzene	2000	1759.56	2000	1811.38	88	91	54-140	3	50
2,4-Dinitrotoluene	2000	1799.14	2000	2040.51	90	102	52-137	13	50
2,6-Dinitrotoluene	2010	1836.02	2010	2043.12	91	102	51-138	11	50
HMX	2000	1862.32	2000	1950.85	93	98	29-148	5	50
Nitrobenzene	2010	1793.35	2010	1783.29	89	89	64-138	1	50
Nitroglycerin	22100	14667.82	22100	15146.36	66	69	45-137	3	50
2-Nitrotoluene	2010	1839.79	2010	2307.53	92	115	57-135	23	50
3-Nitrotoluene	2010	1787.39	2010	2149.93	89	107	57-135	18	50
4-Nitrotoluene	2000	1971.59	2000	2371.82	99	119	53-133	18	50
PETN	22200	13935.74	22200	14249.87	63	64	36-143	2	50
RDX	2010	1681.24	2010	1722.93	84	86	45-145	2	50
Tetryl	2000	1521.81	2000	1600.86	76	80	38-152	5	50
1,3,5-Trinitrobenzene	2010	1578.42	2010	1620.33	79	81	48-141	3	50
2,4,6-Trinitrotoluene	2010	1819.44	2010	1934.68	91	96	47-140	6	50
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 163585711002	Sample number(s): 8755023-8755029								
Mercury	0.100	0.0962			96		80-120		
Batch number: 170035708002A	Sample number(s): 8755023-8755029								
Antimony	0.600	0.613			102		80-120		
Arsenic	1.00	1.02			102		80-120		
Beryllium	0.400	0.426			106		80-120		
Cadmium	0.500	0.522			104		80-120		
Chromium	5.00	5.41			108		80-120		
Copper	5.00	5.53			111		80-120		
Lead	1.50	1.56			104		80-120		
Nickel	5.00	5.48			110		80-120		
Silver	5.00	5.34			107		80-120		
Thallium	0.200	0.226			113		80-120		
Zinc	50	53.21			106		80-120		
Batch number: 170035708002B	Sample number(s): 8755023-8755029								
Selenium	1.00	1.07			107		80-120		
	%	%	%	%					
Batch number: 17026820001A	Sample number(s): 8755023-8755029								
Moisture	89.5	89.42			100		99-101		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: EA Engineering, Science & Tech   Group Number: 1746737
Reported: 01/26/2017 18:02

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc		MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/kg		ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16357SLJ026	Sample number(s): 8755023-8755029 UNSPK: 8755023										
Acenaphthene	0.66	U	32.89	33.33	33	35.12	101	106	72-118	5	30
Acenaphthylene	0.33	U	32.89	26.25	33	27.75	80	84	68-100	6	30
Anthracene	1.78		32.89	25.95	33	26.96	73	76	69-109	4	30
Benzo(a)anthracene	0.66	U	32.89	26.88	33	28.5	82	86	65-111	6	30
Benzo(a)pyrene	0.66	U	32.89	26.24	33	28.19	80	85	65-110	7	30
Benzo(b)fluoranthene	1.61		32.89	32.5	33	34.43	94	99	63-122	6	30
Benzo(g,h,i)perylene	0.66	U	32.89	13.55	33	14.25	41*	43*	58-109	5	30
Benzo(k)fluoranthene	0.66	U	32.89	28.93	33	32.51	88	99	60-110	12	30
Chrysene	1.00		32.89	26.71	33	28.23	78	83	62-108	6	30
Dibenz(a,h)anthracene	0.66	U	32.89	17.27	33	18.42	53*	56*	63-114	6	30
Fluoranthene	0.826		32.89	26.78	33	27.7	79	81	67-108	3	30
Fluorene	0.66	U	32.89	29.1	33	30.67	88	93	68-113	5	30
Indeno(1,2,3-cd)pyrene	0.66	U	32.89	16.53	33	17.5	50*	53*	58-111	6	30
1-Methylnaphthalene	0.66	U	32.89	28.42	33	28.69	86	87	80-106	1	30
2-Methylnaphthalene	1.08		32.89	29.56	33	32.9	87	96	74-110	11	30
Naphthalene	1.88		32.89	26.88	33	28.52	76	81	64-106	6	30
Phenanthrene	0.66	U	32.89	26.98	33	28.53	82	86	70-106	6	30
Pyrene	0.66	U	32.89	24.48	33	26.22	74	79	64-105	7	30
	ug/kg		ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 170040017A	Sample number(s): 8755023-8755029 UNSPK: 8755023										
4-Amino-2,6-Dinitrotoluene	40	U	1970	1816.29	1970	1736.02	92	88	42-138	5	50
2-Amino-4,6-Dinitrotoluene	40	U	1960	1773.58	1960	1736.02	90	89	43-141	2	50
3,5-Dinitroaniline	40	U	1970	1798.74	1970	1784.77	91	91	47-141	1	50
1,3-Dinitrobenzene	39	U	1960	1886.99	1960	1844.78	96	94	54-140	2	50
2,4-Dinitrotoluene	39	U	1960	2093.79	1960	1979.1	107	101	52-137	6	50
2,6-Dinitrotoluene	110	U	1970	1816.29	1970	2037.53	92	103	51-138	11	50
HMX	210	U	1960	1627.4	1960	1761.23	83	90	29-148	8	50
Nitrobenzene	97	U	1970	1921.63	1970	1874.9	98	95	64-138	2	50
Nitroglycerin	780	U	21700	16098.65	21700	16280.5	74	75	45-137	1	50
2-Nitrotoluene	73	U	1970	2332.47	1970	2170.96	118	110	57-135	7	50
3-Nitrotoluene	110	U	1970	2173.54	1970	2087.02	110	106	57-135	4	50
4-Nitrotoluene	110	U	1960	2359.09	1960	2277.16	120	116	53-133	4	50
PETN	780	U	21800	14536.79	21800	14186.1	67	65	36-143	2	50
RDX	39	U	1970	1834.63	1970	1806.7	93	92	45-145	2	50
Tetryl	97	U	1960	1787.26	1960	1786.82	91	91	38-152	0	50
1,3,5-Trinitrobenzene	39	U	1970	2078.32	1970	2051.35	105	104	48-141	1	50
2,4,6-Trinitrotoluene	43	U	1970	1980.72	1970	1924.73	101	98	47-140	3	50
	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 163585711002	Sample number(s): 8755023-8755029 UNSPK: 8755023										
Mercury	0.110		0.167	0.279	0.167	0.281	101	102	80-120	1	20
Batch number: 170035708002A	Sample number(s): 8755023-8755029 UNSPK: 8755029										
Antimony	0.262		1.09	0.848	1.17	0.959	54*	60*	75-125	12	20

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: EA Engineering, Science & Tech Group Number: 1746737
Reported: 01/26/2017 18:02

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Arsenic	8.42	1.82	10.95	1.94	11.01	139 (2)	134 (2)	75-125	1	20
Beryllium	0.870	0.727	1.58	0.777	1.59	97	93	75-125	1	20
Cadmium	1.82	0.909	2.89	0.971	2.80	118	101	75-125	3	20
Chromium	99.21	9.09	115.69	9.71	115.61	181 (2)	169 (2)	75-125	0	20
Copper	86.27	9.09	108.7	9.71	105.81	247 (2)	201 (2)	75-125	3	20
Lead	18.58	2.73	17.11	2.91	17.48	-54 (2)	-38 (2)	75-125	2	20
Nickel	19.38	9.09	32.05	9.71	31.65	139*	126*	75-125	1	20
Silver	0.108	9.09	9.55	9.71	9.52	104	97	75-125	0	20
Thallium	0.378	0.364	0.756	0.388	0.784	104	104	75-125	4	20
Zinc	66.21	45.45	158.23	48.54	158.16	202*	189*	75-125	0	20
Batch number: 170035708002B	Sample number(s): 8755023-8755029 UNSPK: 8755029									
Selenium	0.484	1.82	2.08	1.94	2.24	88	90	75-125	7	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 163585711002	Sample number(s): 8755023-8755029 BKG: 8755023			
Mercury	0.110	0.108	2 (1)	20
Batch number: 170035708002A	Sample number(s): 8755023-8755029 BKG: 8755029			
Antimony	0.262	0.337	25* (1)	20
Arsenic	8.42	9.27	10	20
Beryllium	0.870	0.890	2	20
Cadmium	1.82	1.77	3	20
Chromium	99.21	99.78	1	20
Copper	86.27	92.08	7	20
Lead	18.58	14.3	26*	20
Nickel	19.38	20.29	5	20
Silver	0.108	0.184	52* (1)	20
Thallium	0.378	0.370	2 (1)	20
Zinc	66.21	68.11	3	20
Batch number: 170035708002B	Sample number(s): 8755023-8755029 BKG: 8755029			
Selenium	0.484	0.493	2 (1)	20
	%	%		
Batch number: 17026820001A	Sample number(s): 8755023-8755029 BKG: P796658			
Moisture	18.53	20.5	10*	5

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

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Quality Control Summary

Client Name: EA Engineering, Science & Tech   Group Number: 1746737
Reported: 01/26/2017 18:02

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOA (microwave)
Batch number: 16357SLJ026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8755023	84	86	78
8755024	87	87	63
8755025	64	64	55
8755026	76	81	71
8755027	81	88	75
8755028	81	89	74
8755029	81	88	73
Blank	93	101	85
LCS	92	97	80
MS	86	84	80
MSD	89	90	81
Limits:	50-125	50-120	52-110

Analysis Name: Nitroaromatics/Amines 8330B(s)
Batch number: 170040017A

	3,4-Dinitrotoluene
8755023	116
8755024	115
8755025	104
8755026	109
8755027	107
8755028	98
8755029	91
Blank	108
LCS	125
LCSD	120
MS	105
MSD	121
Limits:	62-133

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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Acct. # 30099 Group # 1746737 Sample # 8755023-29

Client: EA Engineering, Science, & Technology	
Project Name/#: Tinian Masalog AD	Site ID #:
Project Manager: Bob Schambach	P.O. #:
Sampler: M. Kelley, J. Duay	PWSID #:
Phone #: (671) 646-5231	Quote #:
State where sample(s) were collected: Tinian	

Matrix: Sediment ☐ / Soil ☒; Water: Ground ☐ Surface ☐ Potable ☐ NPDES ☐; Other:

Analyses Requested / **Preservation Codes**

For Lab Use Only
SF #: ____________
SCR #: ____________

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	PAH SW8270CSIM	METALS SW6010B	METALS 6020/7471A	Explosives 8330B	Phosphorus WH L07580						Remarks
MAD-DU01	12/11/16	1105		X	X			3	X	X	X	X	X						
MAD-DU02	12/11/16	1330		X	X			3	X	X	X	X	X						
MAD-DU03	12/11/16	1520		X	X			3	X	X	X	X	X						
MAD-DU04	12/12/16	0900		X	X			3	X	X	X	X	X						
MAD-DU05	12/12/16	1415		X	X			3	X	X	X	X	X						
MAD-DU06	12/12/16	1030		X	X			3	X	X	X	X	X						
MAD-DU07	12/12/16	1230		X	X			3	X	X	X	X	X						

Turnaround Time Requested (TAT) (please check): Standard ☒ Rush ☐
(Rush TAT is subject to laboratory approval and surcharges.)

Date results are needed:

Rush results requested by (please check): E-Mail ☐ Phone ☐

E-mail Address:

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☐ MA MCP ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ TX TRRP-13 ☐
Type VI (Raw Data Only) ☐

EDD Required? Yes ☐ No ☐ If yes, format: ____________

Relinquished by:	Date	Time	Received by:	Date	Time
Julie Anne Duay	12/15/16	1200			
			[signature]	12.20.16	1130

Relinquished by Commercial Carrier:
UPS ______ FedEx X Other ______

Temperature upon receipt 2.6 - 5.4 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 171275

Group Number(s): 1746137

Client: EA Eng.

Delivery and Receipt Information

Delivery Method: Fed Ex

Arrival Timestamp: 12/20/2016 11:30

Number of Packages: 3

Number of Projects: 1

Arrival Condition Summary

Shipping Container Sealed:	Yes
Custody Seal Present:	Yes
Custody Seal Intact:	Yes
Samples Chilled:	Yes
Paperwork Enclosed:	Yes
Samples Intact:	Yes
Missing Samples:	No
Extra Samples:	No
Discrepancy in Container Qty on COC:	No

Sample IDs on COC match Containers:	Yes
Sample Date/Times match COC:	Yes
VOA Vial Headspace ≥ 6mm:	N/A
Total Trip Blank Qty:	0
Air Quality Samples Present:	No

Unpacked by Timothy Cubberley (6520) at 12:51 on 12/20/2016

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	4.6	DT	Wet	Y	Bagged	N
2	DT131	2.6	DT	Wet	Y	Bagged	N
3	DT131	5.4	DT	Wet	Y	Bagged	N

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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APPENDIX F

DATA VALIDATION

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DATA VALIDATION REPORT

PROJECT NO: 6301901
PROJECT NAME: Phase II Environmental Site Assessment, Masalog Ammunition Depot, Pina, Tinian
LABORATORY: Eurofins Lancaster Laboratories Environmental, Lancaster, Pennsylvania, and RTI Laboratories, Inc., Livonia, Michigan
REVIEWER: Brenda Nuding, Project Chemist
EA Engineering, Science, and Technology, Inc., PBC (EA)
DATE: 27 February 2017

This data validation report details the findings associated with Sample Delivery Group (SDG) TIN01 including information concerning the field samples, matrix, and sampling date. Major deficiencies or quality assurance/quality control (QA/QC) issues and their impact on the associated sample data are discussed. Necessary data qualifications are addressed and the final data validation decisions as to the acceptance, rejection, or qualification of the results are presented.

Date(s) Collected	11 and 12 December 2016	
Sample Delivery Group No.	TIN01	
PARAMETERS	Soil Sample(s)	Field Replicate(s)
Polycyclic aromatic hydrocarbons by USEPA SW-846 Method (SW)8270C SIM	5	2
Metals by SW6020/7471A	5	2
Explosives by SW8330B	5	2
White phosphorus by SW7580	5	2

SIM = selected ion monitoring
USEPA = U.S. Environmental Protection Agency

The analytical data presented in SDG TIN01 were reviewed with respect to QA/QC parameters as specified in the Sampling and Analysis Plan (EA, 2016). In addition, the following guidance documents were used while assessing the validity of these data: U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review, September 2016a; the EPA CLP National Functional Guidelines for Inorganic Superfund Methods Data Review, September 2016b; as well as the referenced methodology.

As applicable to referenced methodology, QA/QC parameters reviewed include:

- Chain of custody/Sample receipt
- Holding times
- Instrument performance checks
- Initial and continuing calibrations
- Method and calibration blanks
- Interference check samples
- Serial dilutions

- Laboratory control samples
- Surrogate recovery
- Matrix spikes/matrix spike duplicates/laboratory replicates
- Field QC samples
- Internal standards
- Compound quantitation
- Data qualifiers

Chain of Custody/Sample Receipt:

The sample coolers and the samples contained within were received intact at the laboratory between 2.6 and 5.4 degrees Celsius (°C), within the recommended preservation temperature of ≤6°C. No qualification of sample data was necessary on the basis of sample condition at receipt or chain of custody.

Holding Times:

Samples were prepared and analyzed within the holding times as specified in the referenced method of analysis with the exception of the analyses of explosives by SW8330B and white phosphorus by SW7850. Results for these analyses have been flagged as estimated with “J” qualifiers if detectable and “UJ” if nondetectable.

Instrument Performance Checks:

Instrument performance checks are performed to ensure mass resolution, identification, and sensitivity for gas chromatography/mass spectroscopy (GC/MS) SIM. The instrument performance check criteria that were associated with samples from this SDG were within method-established control limits.

Initial and Continuing Calibrations:

Initial and continuing calibrations were performed at the required frequencies. Results for target analytes were within method-established QC limits.

Method and Calibration Blanks:

Method and calibration blanks were prepared and analyzed as recommended by the referenced method. Target analytes were not detected in the blanks, or the sample concentration was greater than five times the concentration detected in the associated blank.

Interference Check Samples:

The inductively coupled plasma/mass spectrometry (ICP/MS) interference check samples (ICS) verify the interelement and background correction factors. ICS sample percent recoveries (%Rs) were within method-specified QC limits.

Serial Dilutions:

The ICP serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. The established criteria were met (percent difference less than 10 percent if the original concentration was greater than 100 times the detection limit [DL]) for serial dilutions prepared with project samples with one exception. The percent difference of the copper result exceeded QC limits for the serial dilution prepared with MAD-DU07. The copper result for this sample has been flagged as estimated with the “J” qualifier.

Laboratory Control Samples:

Laboratory control samples (LCSs) were prepared and analyzed as recommended by the referenced method. The %Rs and relative percent differences (RPDs) were within the project-specified QC limits.

Surrogate Recovery:

Surrogates were added to environmental and QC samples and standards for analysis of organic compounds as required by the referenced methodology. Surrogate %Rs were within the project-specified QC limits.

Matrix Spikes/Matrix Spike Duplicates/Laboratory Replicates:

The results for matrix spike (MS) and MS duplicate (MSD) samples and laboratory replicates were reviewed. The %Rs and RPDs for these QC samples prepared with project samples were within the project- and laboratory-specified QC limits, with the following exceptions.

- %Rs for the MS and MSD prepared with MAD-DU01 were below QC limits for the following PAHs: benzo(g,h,i)perylene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. These results were nondetectable in the associated project sample and have been flagged as estimated with the "UJ" qualifier.
- %Rs for the MS and MSD prepared with MAD-DU07 were outside QC limits for antimony (low %R), nickel (high %R), and zinc (high %R). These results in the associated project sample have been flagged as estimated with the "J" qualifier.
- The RPD for results for project sample MAD-DU07 and its laboratory replicate were outside QC limits for lead. The lead result in the associated project sample has already been flagged with the "J" qualifier due to MS and MSD results.

Field QC Samples:

Field replicates were collected and identified as MAD-DU06 and MAD-DU07, and the associated original sample was MAD-DU05. The relative standard deviations (RSDs) for the results of the field replicates and associated original sample were within QC limits with one exception. The RSD for the samples analyzed for acenaphthylene is outside QC limits, and the acenaphthylene results for MAD-DU05, MAD-DU06, and MAD-DU07 have been flagged as estimated with the "J" qualifier.

Internal Standards:

Internal standards were added to environmental and QC samples and standards to monitor sensitivity and response during every analytical run. Internal standard area counts and retention times for project samples were within the project-specified QC limits with one exception.

The retention time for internal standard perylene-d12 by USEPA Method SW8270C SIM was below QC limits for MAD-DU07. The laboratory performed corrective action and re-analyzed the sample, and the internal standard result was still below QC limits, indicating a potential matrix interference. The retention time for the other five internal standards were within QC limits; therefore, no further qualification has been performed on the basis of this single outlier.

Compound Quantitation:

The reported quantitation results and reported DLs were reviewed and found to be accurate and to generally meet project requirements. Analytical results reported between the limit of quantitation and the DL have been flagged as estimated values with the "J" qualifier. No bias is inferred.

Data Qualifiers:

Appropriate data flags were used and defined in the analytical report. During data validation, additional qualifiers have been applied to data. These are defined below:

"J" indicates that the analyte was positively identified, but the quantitation is estimated.

"UJ" indicates that the analyte was not detected; however, the quantitation limit is estimated due to discrepancies in the associated quality control criteria.

The allowable final data qualifiers for definitive data and the hierarchy of data qualifiers listed in order of the most severe through the least severe are *J*, *U*, and *UJ*. For data with multiple qualifiers, the hierarchy listed above has been implemented for applying the final qualifier.

Summary:

The analytical data contained in this report have been reviewed for completeness, accuracy, and precision. The data as qualified meet the quality objectives for the intended use.