ATTACHMENT C
QASP

EPA Emergency Response Section (ERS) and Superfund Technical Assessment and Response Team (START)

Emergency Response and Time Critical Quality Assurance Sampling Plan for Air Sampling

Response Location: Mojave River Pyrotechnics Removal
Project # 002693-2202.01RF; TDD# TO2-09-12-10-0001

Date: 11/26/2012

Prepared by: Matthew Diener

Reviewed by: Robin Clemens

Approved by: Howard Edwards

This sampling plan was prepared and delivered to the EPA OSC (select one):
☒ Prior to Sampling ☐ Post Sampling (within one month of sampling)

This emergency sampling plan is intended to be used in conjunction with the EPA s Region 9 Emergency Response Section's Generic Data Quality Objectives (DQOs) for Emergency Responses and Time Critical Evaluations. This sampling plan has been designed to assist field responders in their preparation for collecting, analyzing, shipping, storing and handling samples collected during an emergency response. The use of this generic sampling plan will involve forethought and planning that should help direct the sampling and analytical work. It is meant to be used in the case of emergency responses or time-critical responses when sampling teams may not have the opportunity to write a more thorough sampling plan. Sampling teams should always reference standard quality procedures, standard operations procedures, standard methods for sampling and analytical guidance.

The development of this generic plan will improve the documentation, communication, planning, and overall quality associated with the sampling and analysis by:

1) encouraging field teams to consider their goals and objectives before the generation of environmental data,
2) documenting predetermined information in a standardize format,
3) increasing the communication between sampling personnel and decision makers, and
4) detailing expectations and objective before samples are collected.

1.0 Introduction and Background. ***Describe the site and specify the geographic boundaries for the site and any specific areas of concern***. *What is the problem, what precipitated the response, which agencies and other entities (e.g., contractors) are on site, who has taken the lead for the response and for environmental clean-up actions?*

In November 2012, United States Environmental Protection Agency (U.S. EPA) Region 9 Emergency Response Section Federal On-Scene Coordinators (FOSC) Will Duncan tasked the Ecology and Environment, Inc. Superfund Technical Assessment and Response Team (START) to provide technical assistance for a Removal of perchlorate contaminated soil identified during the Removal Assessment conducted at this site in 2010 and 2011 in the city of Barstow, San Bernardino County, California.

The specific properties involved are a former pyrotechnics manufacturing facility that operated in the 1980s, and the former home of the owner of the facility. According to information provided by the RWQCB, the Mojave River Pyrotechnics Company, which closed in the mid-1980s, allegedly handled perchlorate for the manufacturing of various pyrotechnic devices. The owner/ operator of the facility was James Bray, who resided at a property that is one of the subjects of the assessment. Because perchlorate contamination has been recently detected at a nearby public water supply well and in private domestic wells in the vicinity of the properties, the RWQCB suspects that chemicals containing perchlorate may have been disposed at the Bray residential property and/or at the former pyrotechnics manufacturing facility.

The RWQCB initially requested assistance solely for the investigation of the Bray residence. The U.S. EPA and START conducted four sampling events at the residential property, in December 2010, March 2011, August 2011, and April 2012. Based on perchlorate concentrations found in soil at the residence, assessment activities were expanded during the third sampling event to include the nearby former pyrotechnics manufacturing facility. The results from these assessment activities are summarized in the Mojave River Pyrotechnics Assessment Reports that were presented to U.S. EPA in December 2011 and October 2012.

The Mojave River Pyrotechnics removal site is composed of one property; the former residence of the owner of the pyrotechnics manufacturing facility.

The residential property consists of four conjoined 5-acre parcels located at 30433 Poplar Street in Barstow, San Bernardino County, California. The San Bernardino County APNs for the Poplar Street property are 0425-091-21-0-000, 0425-091-22-0-000, 0425-091-23-0-000, and 0425-091-24-0-000. The property is situated approximately 0.25 miles south of Old Highway 58 and 1 mile northwest of Interstate 15.

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The northwestern parcel of the Poplar Street property contains two residential structures and associated outbuildings in the northern portion of the parcel, with the remainder of the parcel consisting of undeveloped land. Within the northwestern parcel are two locations where significant perchlorate contamination was found during the previous START and U.S. EPA assessment activities. These two locations are designated as the "garden area" and "trash pile area." The other three of the four parcels are also undeveloped land. The Mojave River drainage channel is immediately adjacent to the parcels to the south. Adjacent to the north of the property is Poplar Street, on the other side of which is undeveloped property. Residential properties are present immediately west and northeast of the Poplar Street property, but the majority of the immediate surrounding area is undeveloped.

The site is situated at an elevation of approximately 2,000 feet above mean sea level. The topographic relief is flat with a gentle slope toward the Mojave River, which runs between the two site properties. North of the site the land slopes steeply upward due to the presence of the Mitchel Range. The site is located within the Mojave Desert Geomorphic Province. Surface and shallow subsurface soils in the site vicinity are Holocene and Pleistocene-aged alluvium derived from weathering of the surrounding mountain ranges. Based on sampling activities conducted at the site, soils at the site are generally fine to coarse-grained sands, with minor amounts of interspersed clays, silts, and gravels.

2.0 Objectives. *Brief statement on the general project objective. What is the overall goal or objective? Specific objectives are summarized in Table D.*

The two main goals of this EPA lead removal action will be to 1) remove the uppermost three feet of contaminated soil in both decision areas at the residential property that contain soil with perchlorate concentrations above the residential action level of 55mg/kg and 2) install a plastic liner at the three foot depth in both decision areas to minimize the potential for surface water to infiltrate the perchlorate impacted soils below 3'bgs that will not be addressed by EPA ERS at this time.

The EPA has tasked START to conduct perimeter dust monitoring for offsite migration during the excavation activities. START will also collect weather conditions including wind speed and wind direction information from an on-site meteorological station during dust generating activities

2.1 Data Use Objectives. (How will the data be used?)

Data that are generated will be used: (Select Appropriate Boxes)

1		To compare with site-specific action levels or risk-based action levels (e.g., EPA PRGs) to determine if a chronic health threats exist.
2		To compare with site-specific action levels or risk-based action levels (e.g., RELs or MRLs) to determine if an acute health threats exist.
3		To compare to a established background level or with collected background sample(s).
4		To assist with determining the area of impact due to a hazardous material release.
5		To assist in the identification of the potential source of an airborne contaminant or odor.
6	☒	To compare with federal or state occupational health limits (On-Site Health and Safety Assessment data).
7		As definitive confirmatory data for non-definitive (screening) data.
8		To assist in with an off-site acute exposure assessment.
9		Other objectives:

2.2 Sampling Objectives. (What are you proposing to do?)

1	☒	Air monitoring (real-time) within the area of concern to determine contamination levels.
2		Air sampling within the area of concern to determine contamination levels.
3		Perimeter air sampling to determine contaminant concentration levels
4	☒	Perimeter air monitoring (real-time) to determine contaminant concentration levels.
5		Personal air sampling of on-site personnel.
6		Personal air monitoring of on-site personnel.
7	☒	Down-wind air monitoring
8		Down-wind air sampling
9		Other objectives:

2.3 Data Type

In general, data type and data needs should be decided prior to data generation. The data can be generally divided into three categories: definitive methodology data (generally data generated using standardize methods), non-definitive methodology data (also referred to as screening data) and screening data with at least 10% definitive conformation. The generation of definitive data is preferable, however in emergency and time critical situations where definitive data is not available, non-definitive data should be generated. Note that the data type is not an indicator of precision, accuracy or documentation completeness, or quality! Reported data should be verified (by a party other than the laboratory) as meeting specific quality control and data category requirements by following a verification or validation procedure. Refer to the START or ERS Quality Assurance Plans for specific quality parameters and requirements.

Check appropriate box(es):

1 ☒ Screening data will be generated. The data by itself may not be verifiable. **Due to the time critical situation, the data must be reported and may be used to make decisions.**

2a Screening data with at least 10 percent definitive data will be generated. Data using non-definitive analytical methodologies will be generated. **Due to the time critical situation, the data must be reported and may be used to make decisions prior to generation of definitive data.** The screening data by itself may not be verifiable. Screening data will be evaluated and reported with definitive data at a later time.

2b Screening data with 10 percent definitive data will be generated. Data using non-definitive analytical methodologies will be generated. **Data will not be reported until it is evaluated against definitive data.**

3a Definitive data will be generated. The sampling and analysis must be done on an emergency basis. **Due to the time critical situation, the preliminarily data must be reported and used for comparison without validation. Analytical data packages will be required**. **However, since the data was not used or intended for decision making, validation of the data package will not be performed.** (Document generic DQO deviation in Section 4.4)

3b Definitive data will be generated. The sampling must be done on an emergency basis. **Due to the time critical situation, preliminary data must be reported and may be used to make decisions without validation. The generated analytical documentation packages will be reviewed and validated. Qualified data will be reported after validation.**

3c Definitive data will be generated. **Full documentation will be required. Analytical data packages will be reviewed and validated prior to reporting.**

2.4 Contaminants of Concern

Potential contaminants of potential concern (COPC), proposed analytical method, proposed action levels and available reporting limit are summarized in Table A.

Table A
Contaminants of Concern

Potential COC	Proposed Analytical Method	Proposed Action Level	Available Reporting Limit
Nuisance Dust (for site work and excavation outside of the exclusion zones)	Real-time dust monitor (Thermo Scientific PDR and/or DataRAM; nephelometer)	5.0mg/m^3 (half of the OSHA PEL (E&E policy) for nuisance dust (respirable); evaluate engineering controls if levels exceed 2.5mg/m^3	0.001mg/m^3
Ammonium Perchlorate (for site work and excavation within the exclusion zones)	Real-time dust monitor (Thermo Scientific PDR and/or DataRAM; nephelometer)	5.0mg/m^3 (MSDS recommended maximum worker exposure limit as respirable dust)	0.001mg/m^3
Other Data Collection Activity (non-chemical) *(circle all that apply)*	**GPS** **Visual** Interviews Magnetometer Other Geophysical **Meteorological** **Photography** File Search		

Add additional pages if necessary.

3.0 Approach and Sampling Methodologies

3.1 Sampling Approach

Indicate sampling approaches to be used (select approach)

1 Due to the lack of site information the approach will be determined in the field based on professional judgment of START.

2 Due to the lack of site information the approach will be determined in the field based on professional judgment of US EPA.

3 Due to the lack of site information the approach will be determined in the field based on professional judgment of local regulator.

4 ☒ Judgmental (Biased)
- ☒ Near a point source
- ☒ Downwind of a point source
- ☒ Up wind of a point source
- Other:

5 Random

6 Grid

3.2 Field Sampling

3.2.1 Sampling Collection Equipment

Field equipment requirements are summarized in Table B.

Table B **Field Sampling Equipment**					
Analyses	**Sampling Equipment**	**Quantity**	**Dedicated or Reusable**	**Decon Solution**	**Resource/ Contractor**
VOA	SUMMAs or Equivalent				
	Cartridges for VOAs				
	Tedlar bags for VOAs.				
SVOAs.	Cartridges of SVOAs.				
	Cartridges of PAHs				
Pesticides	Cartridges of Pesticides				
Acids	Cartridges for Acid Gas samples				
Cyanide	Cartridges for Cyanide samples				
Inorganic Particulate	Cassettes for Total Inorganic samples.				
	Cassettes for Inorganic samples (PM100 or 2.5).				
Other:	**DataRAMs and PDRs**	**11**	**Reusable**	**N/N; Zero/purge daily**	**EPA ERS**
	Davis Weather Station	**1**	**Reusable**	**N/A**	**EPA ERS**
ALL	Hand Pumps and tubing				
	Personal Sampling Pumps and tubing				
	Vac-U-Chamber				
	Pump Calibrator				

Add additional pages if necessary.

3.2.2 Sample Locations

Indicate the Sampling Location Name and describe the rationale for the each sample location chosen.

Perimeter dust monitoring will be conducted to document dust levels to determine if offsite contamination migration and or fugitive nuisance dust emission have occurred. Locations for perimeter monitoring will bracket the work zone with monitors up and down wind, and at appropriate cross wind locations (total of 4 dust monitors). The location nomenclature for perimeter dust monitors will be: PDR or DataRAM Serial Number (e.g. d793) - Date (MMDDYY) - Decision Area (T=trash pile; G=garden area) – Nearest Cardinal Coordinate (N, S, E W, NW, etc). An example of a dust monitor operating on December 5th, 2012 in the trash pile area north of the work zone would be:

d793-120512-T-N

Work zone dust monitoring will be conducted to document worker exposure to dust generated from removal activities to determine if engineering controls are adequate and/or if respiratory protection is warranted. Locations for work zone dust monitoring will include the cab of closed and/or open construction equipment operating within the exclusion zone. The location nomenclature for work zone dust monitors will be: PDR Serial Number (e.g. D268) - Date (MMDDYY) - Decision Area (T=trash pile; G=garden area) – and appropriate Equipment Identifier (e.g Caterpillar D9 Bulldozer would be CAT D9). An example of a dust monitor operating in the cab of a Caterpillar 390D excavator on December 10th, 2012 in the garden area work zone would be:

D268-121012-G- CAT 390D

Meteorological data, including wind speed and direction, will be collected from an on-scene weather station. The anemometer portion of the weather station will be mounted as high as is safely possible in a location central to both work zones. Hourly averages and peak wind speeds (24hr) will be recorded; data from the weather station will be archived weekly and saved with file nomenclature: Site Name Abbreviation (MRPR) _ (Weekly date range; MMDD-MMDD). An example of weather station data collected from 12/3 to 12/7 would be:

MRPR_1203-1207

Sketch a map of the site and any areas of concern. Indicate sampling locations or sampling areas in Figure A and included names. Use a scale that is meaningful for the sampling work covered under this plan. Sketch out where the samples will be collected and include sampling location names. Attach a local map to this plan if it is available.

Figure A
Sample Location Map

Add additional maps if necessary.

3.2.3 Sample Containers and Preservatives

Containers and preservatives are summarized in Table C.

Table C
Containers and Preservatives

Analyses and Matrix	Container Type (per sample)	Preservation Method	Holding Time
Not Required	xxx	xxx	xxx

Add additional pages if necessary.

3.2.4 Sample Labeling and Documentation

Sample Collection Media Labels

Sample labels will clearly identify the particular sample and should include the following:

1. Site name
2. Time and date samples were taken
3. Sample preservation
4. Analysis requested
5. Sample location and/or identification number

Sample labels will be securely affixed to the sample container.

Chain of Custody Record

A chain of custody record will be maintained from the time the sample is taken to its final deposition. Every transfer of custody must be noted and signed for, and a copy of this record kept by each individual who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they must be stored in a secured container sealed with a custody seal.

The chain of custody record should include (at minimum) the following:

1. Sample identification number
2. Sample information
3. Sample location
4. Sample date and time

5. Names(s) and signature(s) of sampler(s)
6. Signature(s) of any individual(s) with control over samples

Custody Seals

Custody seals demonstrate that a sample container has not been tampered with or opened. The individual in possession of the sample(s) will sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal. The name of this individual, along with a description of the samples packaging, should be noted in the field book.

All sample documents will be completed legibly in ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialing the error. These include the logbooks, the chain of custody forms, this field QASP and any other tracking forms.

Field Logbook

The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. All entries will be dated and signed by the individuals making the entries and will include the following:

1. Site name and project number
2. Names of sampling personnel
3. Dates and times of all entries (military time preferred)
4. Descriptions of all site activities, especially sampling start and ending times. Include site entry and exit times
5. Noteworthy events and discussions
6. Weather conditions
7. Site observations
8. Identification and description of samples and locations
9. Subcontractor information and names of on-site personnel
10. Date and time of sample collections, along with chain of custody information
11. Record of photographs
12. Site sketches
13. Exact times of various activities and occurrences related to sampling
14. Deviations from standard procedures or methods and the rational for the deviations.

3.3 Analysis

3.3.1 Monitoring Equipment

Specify the monitoring equipment to be used. Check the appropriate boxes.

Organic Vapor Monitor (OVM with PID)	Organic Vapor Analyzer (FID)	HCN Monitor
H_2S Monitor	CO monitor	$S0_2$ Monitor
Multiple Gas Analyzer	O_2 monitor	Combustible Gas
Combustible Gas Meter:	☒ Aerosol and Particulate Monitor	Radiation Meter Monitor
Other:	Other:	Other:

Drager sampling; check appropriate chemical tubes:

acetic acid	chloroform	hydrocarbons, halogenated	nitrous fumes
acetone	chromic acid	hydrocarbons, petroleum	perchloroethylene
alcohol	cyanide	hydrochloric acid	phenol
ammonia	ethyl benzene	hydrogen peroxide	sulfur dioxide
benzene	formaldehyde	hydrogen sulfide	trichloroethane
carbon tetrachloride	hexane	methylene chloride	vinyl chloride
chlorine	hydrocarbons	nitric acid	

other: _____

3.3.2 Analysis Procedures and Summary

Check boxes of methods used for analysis. The analytical methods per sample and sample location are presented in Table D.

NIOSH Methods:

Acids, Inorganic [7903]	Hydrocarbons, aromatic [1501]	PAHs (HPLC) [5506]
Chromium, hexavalent [7600]	Hydrocarbons, halogenated [1003]	PAHs (GC) [5515]
Elements (ICP) [7300]	Hydrogen cyanide [6010]	
Asbestos & other fibers [7400]	Trichloroethylene	

other: _____

EPA Toxic Organic Methods:

Volatile organic compounds (SUMMA Canisters, GC) [TO-14A/15]

other: _____

3.4 Analytical Methods and Procedures

The analytical methods per sample and sample location are presented in Table D. General field QC considerations and requirements are presented in Table E.

Table D **Sample Locations and Data Objective** **Summary**					
Sampling Locations and Identifiers should correspond to location indicated on Figure A					
Sample Location(s) **(should match with 3.3.1 and Figure A)**	**Sample Identifiers**	**Analytical Method** **Refer to Table A**	**Data Use Objective(s)** **Refer to Section 2.1**	**Data Category** **Refer to Section 2.3**	**Samples Matrix** **(soil or water)**
Perimeter	(Instrument S/N)-(Date)-(Decision Area)-(Cardinal Coordinate)	Real-time Dust Monitor (light scattering photometer; nephelometer)	2.1.6	2.3.1	Air (dust)
Work Zone	(Instrument S/N)-(Date)-(Decision Area)-(Equipment ID)	Real-time Dust Monitor (light scattering photometer; nephelometer)	2.1.6	2.3.1	Air (dust)
					Air (dust)

Add additional pages if necessary.

3.6 Quality Assurance and Quality Control

General field QA/QC considerations and requirements are presented in Table E.

Table E
Quality Control Samples and Data Quality Indicator Goals

QC Sample	Number/Frequency	Data Quality Indicator Goals & Evaluation Criteria	Comments/Exceptions *Site specific remarks:*
FIELD SPECIFIED QA/QC			
Background or reference sample	At least one sample should be collected from an area believed to be unaffected by source contamination.	Source samples should be at least 3 times background.	Surface soil: up-slope. Surface water: upstream. Ground water: up-gradient. *:Downwind monitoring will be performed.*
Field Blanks	1 per SDG[1], per matrix, per method	Source samples should be at least 3 times the blank.	Water only. *:Not required.*
Sampling Media	1 per SDG, per matrix, per method	Source samples should be at least 3 times the blank.	Volatile analytes, water only. *: Not required.*
Equipment Blanks	1 per SDG, per matrix, per method	Source samples should be at least 3 times the blank.	Only when the use of decontaminated non-dedicated equipment is involved. *: Not required.*
Field Duplicates or Replicates	1 per 10 sample or 10 %	35% RPD[2]	As needed by sampling objectives. The procedure for collecting duplicate samples can greatly effect the reproducibility. *: Not required.*
SELECTED LABORATORY QA/AC			
Method Blank	1 per SDG, per matrix, per method	Stds and samples should be at least 3 times the blank.	Mandatory.
Matrix Spike	1 per SDG, per matrix, per method on field designated sample.	75 -125 %R	Designate sample on COC.
Matrix Spike Duplicate or Replicate	1 per SDG, per matrix, per method on field designated sample.	$\leq$50 RPD for organics; $\leq$20 RPD for metals	Designate sample on COC.
Reference Standards	1 per SDG, per matrix, per method	75 -125 %R	If available.
Internal Standards	All samples	50 -200 %R	All GC/MS and some GC analyses only.
Laboratory Control Standards	1 per SDG, per matrix, per method	75 - 125 %R	Per method for organic analyses.

[1] SDG = Sample Delivery Group (Maximum 20 samples)
[2] RPD = Relative Percent Difference
[3] %R = Percent Recovery

4.0 Project Organization and Responsibilities

4.1 Schedule of Sampling Activities

Sampling activities are summarized in Table F.

Table F **Proposed Schedule of Work For Soil/Water Sampling Activities**		
Activity	**Start Date**	**End Date**
Removal of contaminated soil, installation of liner, and backfill.	12/03/2012	12/14/2012
Air monitoring	12/03/2012	12/14/2012

Add additional pages if necessary.

4.2 Project Laboratories

Laboratories used for this project are summarized in Table G.

Table G **Laboratories**	
Lab Name/ Location	**Methods**
START Field Personnel	Air Monitoring

Add additional pages if necessary.

4.3 Project Personnel and Responsibilities

Personnel and responsibilities are summarized in Table H.

Table H
Sample Team(s) Personnel

Personnel (Agency)	Responsibility
R. Clemens (START)	START Project Manager; field team member
M. Diener (START)	Field team member
M. Tymkow (START)	Field team member
W. Duncan (EPA)	Task Monitor; FOSC
B. Chernick (ERRS)	Removal Manager

Add additional pages if necessary.

4.4 Modification or Additions to the Generic Data Quality Objective for Emergency and Time Critical Sampling

Project specific modification to the generic DQO statements for this are summarized in Table I. Also indicate which DQO step corresponds to the addition or modification.

Table I
DQO Modifications and Additions

Additions or Modifications to the Generic DQO Output Statements	DQO Step
none	N/A

Add additional pages if necessary.