Letter of Transmittal

To: Matt Plis

From: ASK Haz Waste

Date: December 10, 2014

Re: Final Proposal

Matt Plis,

Please find attached ASK Haz Wastes Final Proposal document regarding the Sonoran Desert National Monument Project. This proposal is broken down into Project Understanding, Project Scope of Services, Project Schedule, and Costs of Engineering Services.

Signed,

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Final Proposal

ASK Haz Waste

Flagstaff, Arizona
Sonoran Desert National Monument
Recreational Shooting Sites
Maricopa & Pinal Counties, Arizona

Produced for:
The United States
Bureau of Land Management

December 10, 2014

Table of Contents

1.0 Introduction

This proposal has been created by Haz Waste to document the Sonoran Desert National Monument (SDNM) Recreational Shooting Site Project. This collaborative effort between Northern Arizona University (NAU) and the Bureau of Land Management (BLM) is tasked with the creation of a PA/SI document, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Specifically, this document describes the background and existing condition of the project, the scope of project, project schedule, and the cost of engineering services.

2.0 Project Understanding

The following section will discuss the project understanding. The project understanding consists of project purpose, background, stakeholders, existing conditions, technical considerations, and potential challenges.

2.1 Project Purpose

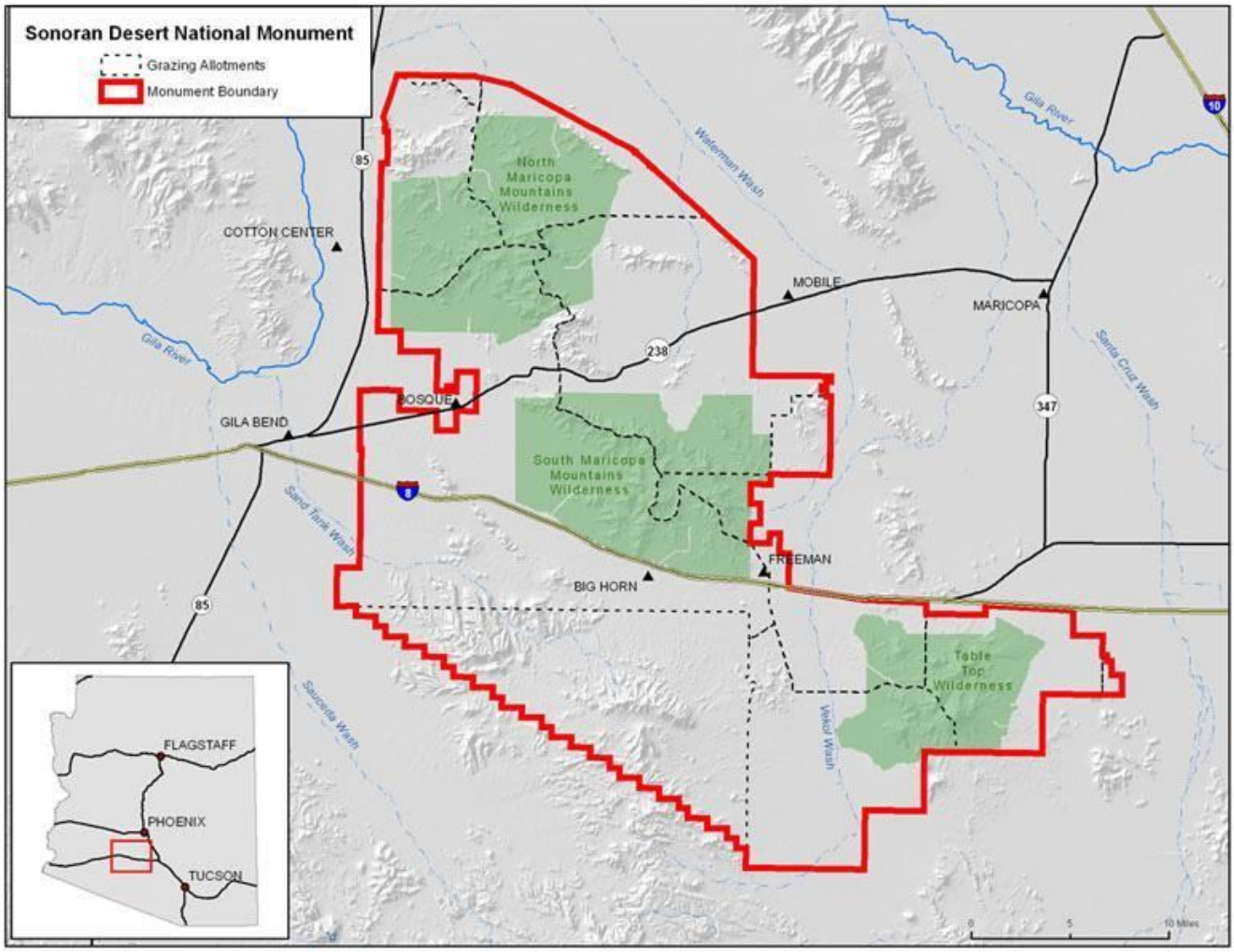
The SDMN Shooting Range Impact Study is to provide the BLM with documentation regarding a PA/SI conducted by Haz Waste. This PA/SI is with regards to contamination caused by gunshot residue (GSR) within the SDNM. These sites will be referred to as informal recreational target shooting sites (IRTSS). Through this study, Haz Waste aims to inform the BLM as to the level and extent of contamination within the area of study.

The contaminants of concern (CoC) in this study are residuals from GSR. The constituents of this residue come from: burnt and unburnt particles associated with the propulsive charge, the bullet primer, the bullet itself, and the cartridge case (Romolo). The BLM has expressed interest in knowing the concentration and extent of lead contamination in particular. However, it's plausible that bromine and antimony are present at the sites of concern. This is due to the association of these elements with GSR (Romolo).

2.2 Background

The SDNM was created by Presidential Proclamation in early 2001. The park is found within both Maricopa and Pinal Counties in Central Arizona (Figure 2.1). A diverse amount of flora and fauna is found within the monument, and includes saguaro cactus forests, rare desert grasses, bighorn sheep, and desert tortoise (Lower Sonoran/SDNM Draft). In addition the park is home to diverse archaeological resources such as: the Juan Bautista de Anza National Historic Trail and petroglyphs produced by indigenous peoples. Given these aspects the SDNM is heavily visited.

Figure 2.1 – Sonoran Desert National Monument Map



In spring of 2012 a SDNM Recreational Target Shooting Analysis, an appendix of the approved resource management plan, was published by the BLM, which addressed the suitability of recreational target shooting in the park. The analysis performed consisted of two criteria for determining the suitability of sites. The significant presence of monument objects or high natural resource sensitivity, which included but was not limited to: high diversity of vegetation, known desert tortoise burrowing sites in area, raptor nesting sites in the area, and cultural resources.

The second criteria was the presence of suitable terrain for shooting, which was defined as

existing natural backstops or berms as well as other numerical criteria (distances from varying facilities)(Lower Sonoran/sdnm Draft). Using these criteria, the conclusion was reached that two areas were highly suitable for recreational shooting. These sites were titled Gap Tank and Hidden Valley, which are not within close proximity of the sites of concern.

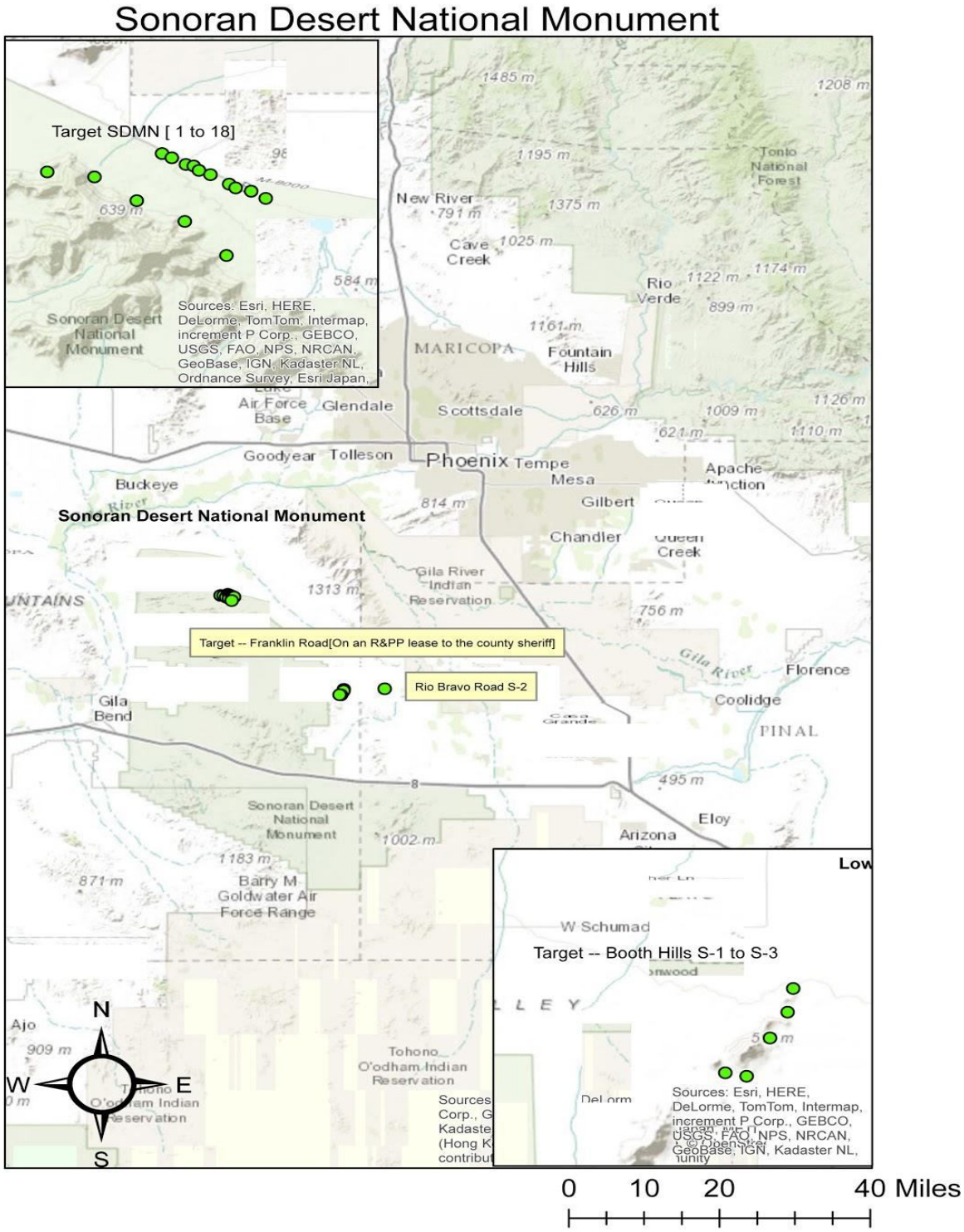
2.3 Stakeholders

The two main stakeholders for the project are the BLM, and those participating in recreational shooting. The second group is of a concern due to the direct and prolonged contact with the contaminated sites. Another group of stakeholders includes non-shooters recreating near the sites, which could consist of hikers and people operating motorized vehicles (quads, dirt bikes, sand rails, etc.). Additionally, people not recreating in the Monument could be considered stakeholders as well. This would consist of BLM employees, and those contracted by the BLM to do site investigations.

2.4 Existing Conditions

The project includes 15 sites that are located along the northern boundary of the park. These sites have been pre-selected by the BLM for ASK Haz Waste to investigate. The total area of interest is roughly 11.2 acres and can be seen in Figure 2.4 on the next page. Currently, the sites are closed to recreational shooting. Moreover, 88 miles of unmaintained dirt-surface vehicle routes are closed within the monument. A federal register notice was published in May of 2008, explaining this closure will remain in effect until off-highway vehicle damage has been restored (Notice of Temporary Route Closure). Although this closure is not directly tied to WRSS, this management decision is advantageous in controlling the contamination of the sites of concern.

Figure 2.4 - Site Map



2.5 Technical Considerations

For the SDNM project technical considerations will include sampling techniques, identification of contaminants of concern, and CERCLA procedures. Testing will be done using X-Ray Fluorescence spectrometer to analyze the onsite soils and compared to grab samples. From these tests a correlation curve can be made to ensure XRF accuracy. The team will also need to perform human health and ecological risk assessments. With lab work and the site visit being the top priority it will be important to insure that a high quality of work is completed.

2.6 Potential Challenges

There are a few potential challenges of this project. The main challenge will be maintaining the tight schedule for the project. This could be adversely affected mainly by weather issues. Weather can affect the team's site visit; resulting in a delay of testing. If testing is not done soon enough lab turnaround on the data may present an issue. Other issues might arise that affect the XRF machine. As well if the XRF machine is not available or malfunctioning this could cause problems when testing. Another issue that might arise with the site visit is people performing recreational tasks and interfering with the site visit.

3.0 Project Scope of Services

The following section will talk about the scope of services. The scope of challenges consist of Project management, Background research, site inspection plans, field work, preliminary assessment and site inspections, and exclusions.

3.1 Project Management

The project management section was broken down into 3 main tasks. These task were general project management, client and technical advisor coordination, and deliverable management.

3.1.1 General Project Management

The general project management task includes the following organizational tasks. These tasks relate to documenting the project. This includes:

- Tracking time personnel spend on the project
- Creating and updating a master project schedule
- Compiling detailed meeting minutes of what is discussed between the engineers, technical advisors, and client.

3.1.2 Client and Technical Advisor Coordination

This subtask includes the arrangement of meetings with the project's Technical Advisor. Such meetings will pertain to, but are not limited to, the review of deliverables and technical advice regarding the project. Additionally, this subtask includes the coordination of sampling events with the client (BLM).

3.1.3 Deliverable Management

Deliverable management refers to ensuring all deliverables are completed in accordance with the master project schedule. Major project deliverables, and due dates are given below.

- Background Research [Nov. 7]
  This deliverable is detailed more in the following section. Phase one will be completed Nov. 7th, while phase two will be completed in spring of 2015.

- Sampling Plan [Dec. 5]
  Consists of the Sampling Analysis Plan, Work Plan, and Health and Safety Plan. This is needed to assure fieldwork is done properly.

- 50% report [Feb. 27]
  This is the submission of the Final Report at 50% completion.

- Final Presentation [Apr. 24]
  This is the presentation to the client detailing the work done on the project.

- Final Report [May. 1]
  This is the Final submission of all work that has been done on the project.

- Website [May 1]
  The purpose of the website is to present relevant information to interested observers and will serve as a portfolio for the team members.

3.2 Background Research

The background research will consist of the following topics.

- CERCLA
  CERCLA is the Comprehensive Environmental Response, Compensation, and Liability Act. It deals with hazardous substances that may endanger the public. This will guide project documentation and the investigating of the site.

- Elements of Health and Safety plan
  This is required when completing work in the field, and is a comprehensive document

regarding safety of personnel.

- Elements of a Work Plan
  This is the outline for what protocols will be followed in the field. This is with regards to QA/QC among other things.

- Elements of a Sampling Analysis Plan
  This is an outline of how data will be obtained and reviewed.

- Sampling statistics
  Because samples are to be taken, thoroughly understanding sampling statistics is paramount. Obtaining data which meets the data quality objectives and will aid in developing a valid conclusion relates to proper sampling.

- XRF technology
  X-Ray Fluorescence or XRF is a technology that can determine elemental composition without destroying a sample, and will be an important source of data.

- Testing methods
  This includes identifying the standard testing method for onsite and laboratory testing for the contaminants of concern.

- Risk Assessment
  This is study of quantitative and qualitative value of risk for an identified hazard. Information of how a CERCLA Risk Assessment is performed is required for the project, and will be obtained via this subtask. Which also includes the following.

    - Toxicology of Contaminants of Concern
      Information is needed regarding the toxicological effects of the contaminants of concern. This information will be gathered in this subtask.

    - Biokinetic Modeling for Adults and Children
      This subtask pertains to understanding the modeling associated with the biokinetics of the contaminants of concern.

    - Ecological Toxicology
      Research will be conducted on how the contaminants of concern affect the local ecology. For example native plants or animals such as the saguaro cactus and the desert tortoise.

3.3 Site Inspection Plans

This section is focused on the site inspection (SI) plans, which are to be completed before field work begins. These plans consist of the following: Sampling & Analysis Plan, Work Plan, and Health & Safety Plan. These plans are meant to prepare the investigators (ASK Haz Waste) for

any work needing to be done in the field.

3.3.1 Sampling & Analysis Plan

3.3.1.1 Organization & Management

The organization and management subtask establishes a quality policy (objectives and commitments), project organization and responsibilities (Site-Specific Sampling and Analysis Plan Template). This subtask also involves creating documentation of the chain of command (titles & responsibilities).

3.3.1.2 Laboratory Facilities and Equipment

This subtask deals with laboratories and equipment used to obtain data, specifically, ensuring equipment is used properly. In addition, records are to be maintained for equipment used in the field. This subtask is also to include QA sample preparation in the environmental lab.

3.3.1.3 Measurement/Data Acquisition

This subtask ensures all CERCLA Sampling and Analysis Plan protocols are followed. These protocols include: sample handling and custody requirements, analytical methods required, quality objectives and criteria for measurement data, quality control requirements, instrument/equipment maintenance requirements, instrument calibration and frequency, and data management.

3.3.1.4 Assessment & Oversight

This subtask ensures the laboratory chosen for the project is current with EPA or equivalent Performance Evaluations.

3.3.1.5 Data Review & Usability

This subtask focuses on the review of analytical data, review of laboratory data reports, and how the results compare with the projects data quality objectives. Additionally, the limitations of the data are to be reviewed in this subtask.

3.3.2 Sampling Work Plan

In this subtask the protocols to be followed during the field work required for the project will be detailed. This document will pertain to: how to create sample IDs, chain of custody protocol, sample size, XRF/wet chemistry protocols, photographic log, and sample preparation.

3.3.3 Health & Safety Plan

This subtask involves the creation of a health and safety plan, which is required before the field-work section of the project commences. This document is to include (but not limited to): hazard controls, project organization & personnel, required personal protective equipment (PPE), and emergency response plans.

3.4 Field Work

This task describes fieldwork required for obtaining samples and XRF data, as described by the Sampling Work Plan. This task also includes work done with/by the NAU laboratory.

3.5 Preliminary Assessment and Site inspection (PA/SI)

This PA/SI is the final document for the project and will consist of these following sections.

3.5.1 Preliminary Assessment

The Preliminary Assessment is the assessment of the site and surrounding area in order to determine if it presents a risk to humans and the environment.

3.5.1.1 Source Characterization

Source Characterization includes identifying the contaminants of concern and a summarization of the site as it currently is, based upon sampling. These samples will be analyzed using XRF and trace metals analysis.

3.5.1.2 Pathway Analysis

This includes determining the possible groundwater, surface water, soil exposure, and air migration routes the contaminants of concern might take. It also includes the likelihood of relevance and targets that the contaminants of concern might affect. This will help compute human and ecological risk assessments in order to ascertain if further action is needed.

3.5.2 Site Inspection

SI investigations collect samples to determine what hazardous substances are present at a site. Analysis determines the amount of contaminants present and entails all the planning and fieldwork discussed in the sampling plan. This incorporates the broader impacts that might happen from contamination at this site.

3.5.3 Results of Data Analysis

This task includes the evaluation of the data received from the lab. This will include a screening of possible threats located at the site. This task will include a preliminary assessment of the risks. Also included is a human health risk analysis and an ecological risk analysis.

3.5.4 Recommendations

This task will include the team's recommendation on the site and if further work on the site should continue.

3.6 Exclusions

Exclusions are tasks that the team will not perform or will be performed by others. Exclusions are items that are not outlined in the scope of services. The main exclusion for this project is testing of contaminants beyond those related to target shooting. The second exclusion is that the team will not be testing or spending time evaluating hazards posed by items brought to the site by recreational users other than what might be included in gun powder and shell casings, such as trash.

4.0 Project Schedule

The SDNM project start date is Oct. 13, 2014, which corresponds to the commencement of the background research task. The final PA/SI Report will be delivered no later than May 1, 2015. In this time, a total of 6 deliverables (Figure 4.0), and 5 tasks need to be completed. These tasks are:

1. Project Management
2. Background Research
3. Site Inspection Plans
4. Field Work
5. PA/SI Documentation

Figure 4.0 Deliverable Description & Due Dates

Deliverables		
Deliverable ID	**Description**	**Due Date**
D1	Background Research	7-Nov
D2	Site Inspection Plans	5-Dec
D3	PA/SI Rough Draft	27-Feb
D4	PA/SI Final Draft	24-Apr
D5	Final Presentation	1-May
D6	Website	1-May

As seen in the project schedule located in Appendices A, a task has been created for project management. This task relates to NAU milestones. These milestones are indirectly related to the SDNM project, and therefore included in the master schedule. These project management tasks (in black), represent periods of time where meetings will be arranged. This could include: team meetings, meetings with other capstone teams, and meetings with the technical advisor. In addition to meetings, this task also includes document preparation.

Tasks 1-4 are simultaneous and are allotted 52 days to complete. These tasks are completed in this manner because the documents produced are required prior to starting fieldwork. Task 5 is fieldwork and begins in early January. The physical task should have the duration of two days. However, the task "fieldwork" includes more than collecting samples, such as any interaction with the samples (handling & lab interactions). The final task is documentation in the form of a Preliminary Assessment & Site Inspection report. This final report is due April 23, 2015. Early drafts of this report are to start in early march with a 3 months task allotment.

The critical path broken up into two paths. One path is dedicated to background research, which will be occurring throughout the project, which is critical to completing the project in an informed manner. The other path starts with the work plan, then fieldwork, and the path concludes with the PA/SI report. These two critical paths consist of deliverable dates that must be met in order to move to the next task. Which is outlined in blue on Figure 4.0.

5.0 Cost of Engineering Services

This part of the document identifies staffing for the Sonoran Desert National Monument (SDNM) informal recreational target shooting site (IRTSS) project, in particular: staff titles, project personnel requirements, expected staff contributions, pay rates, and subcontractors. The final section presents summary tables detailing the total cost of engineering services.

5.1 Titles & Positions

The SDNM staff includes four different titles and positions. These are listed below:

- Senior Engineer (SE)
- Two Engineers (E1 &E2)
- Laboratory Technician (LT)

These roles are not set within the team, therefore, in Figure 5.3.1 staff members are not assigned titles. Each team member will be responsible for each position throughout the extents of the project.

5.2 Tasks & Staff

The SDNM project includes 7 major tasks. These tasks are listed in Table 5.2.1 below. In this table the staff obligations, with respect to time, are shown for each project task. The Senior

Engineer has duties which include client communication, document preparation, and conduct the preliminary assessment and site inspection (PA/SI). The staff Engineers (E1 & E2) tasks are to conduct and prepare documentation of the PA/SI. The extra hours for the senior engineers represent time spent corresponding with the client and Technical Advisor, as well as document preparation. The final staff position is lab technician.

The distribution of person-hours throughout the project period will not be explicitly specified. The only requirements given are, the plans (sampling and analysis, health and safety, and work) are to be completed pre field work. The hour's breakdown can be found in the schedule in Appendices A.

Figure 5.2.1 Task Matrix

Task Matrix				
Task	Duration (Hours)			
	SE	E1	E2	LT
1.0 Project Management	13	10	10	0
2.0 Background Research	20	20	20	0
3.0 Site Inspection Plans	30	30	30	0
4.0 Field Work	48	48	48	56
5.0 PA/SI	22	22	22	0
Total	**133**	**130**	**130**	**56**

5.3 Cost of Engineering Services

The total cost of engineering services, fringe benefits, and overhead costs are shown in Figure 5.3.1 on the next page. Each category in the table below will be discussed in detail.

Figure 5.3.1 Cost of Engineering Services

Cost Summary				
Cost Categories	**Classification**	**Hours**	**Rate $/hr**	**Cost**
1.0 Personnel	SENG	133	100	$13,300.00
	ENG1	130	80	$10,400.00
	ENG2	130	80	$10,400.00
	LT	56	64	$3,584.00
2.0 Travel	Mileage	348	$.50/mi	$174.00
	Hotel	2 Rooms	$141	$282.00
	Food	4 People	$56/person/ day	$448.00
3.0 Subcontract	Lab Work			$618.75
4.0 Overhead				$50,400.00
5.0 Total				**$89,606.75**

For personnel costs the rate $/hr was determined from the Bureau of Labor Statistics from there May 2013 National Wage Estimates (4.1). They were adjusted to include fringe benefits by 40%. Travel costs were estimated by the current average gas price per mile in Arizona and multiplied by the distance from and to the ASK Haz Waste offices to the field site which is a total of 348 miles. Overnight meal costs were estimated from the United States General Services Administration. The third lowest price point was chosen for this calculation. Category 3 is the cost for sub-contracting lab work to be done on the soil samples. These samples will be done by Northern Arizona Universities Environmental Analysis Laboratory. For trace metal analysis the cost is $4.13 per sample (2). An estimated 150 samples will need to be taken giving the total cost seen above. The overhead was calculated by the company's rate of 128% of direct costs. This calculation gives a total of $50,400 in overhead costs. For there all categories were summed to bring the total cost of the project to $89,606.75.

6.0 Conclusion

This proposal summarizes the work that needs to be done to complete the Sonoran Desert National Monument Project. The proposal details project understanding, scope of services, project schedule, and cost of engineering services. ASK Haz Waste can be contacted for any further information that is needed.

7.0 References

[2.1] Figure 2.1, Patterson, Daniel. Sonoran Desert National Monument Map. Digital image. Center for Biological Diversity. Web.

[2.2] Lower Sonoran/sdnm Draft, and 1183. Appendix G. Sonoran Desert National Monument Recreational Target Shooting Analysis (n.d.): n. pag. Blm.gov. Web.

[2.3] Romolo, Francesco, and Pierre Margot. "Identification of Gunshot Residue: A Critical Review." Forensic Science International 119 (2001): 195-211. Print.

[2.4] Notice of Temporary Route Closure, Federal Register, vol. 73, no. 94, pg. 27844, May 14, 2008.

[3.1] EPA, comp. "Guidance for Performing Preliminary Assessments Under CERCLA." (n.d.): n. pag. EPA. Sept. 1991. Web. 7 Oct. 2014. <http://www.epa.gov/superfund/sites/npl/hrsres/pa/paguidance.pdf>

[3.2] "us Epa, Region 3, Hazardous Site Cleanup Division" Site - Specific Sampling and Analysis Plan Template (n.d.): n. pag. Aug. 1999. Web. 6 Oct. 2014. <http://www.epa.gov/reg3hwmd/bf-lr/granteereporting/sap_generic.pdf>

[3.3] "At a Glance March 2012." Environmental Health Perspectives 120.3 (2012): n. pag. Web. Oct. 2014. <http://www.epa.gov/region5/cleanup/amcast/pdf/amcast-hasp-201003.pdf>

[3.4] "Preliminary Assessment/Site Inspection." EPA. Environmental Protection Agency, Mar. 2010. Web. 10 Oct. 2014. <http://www.epa.gov/superfund/cleanup/pasi.htm>

[3.5] EPA. "HEALTH AND SAFETY PLAN Remedial Investigation/Feasibility Study." (n.d.): n. pag. Mar. 2010. Web. 6 Oct. 2014. <http://www.epa.gov/superfund/sites/npl/hrsres/si/siguidance.pdf>

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[4.1] "May 2013 National Occupational Employment and Wage Estimates." U.S. Bureau of Labor Statistics. U.S. Bureau of Labor Statistics, n.d. Web. 21 Nov. 2014.

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<http://nau.edu/Research/Services-Facilities/Labs-Facilities/CPAL/EAL/Services/>

[4.3] "Per Diem Rates." U.S. General Services Administration. Web. 09 Dec. 2014.

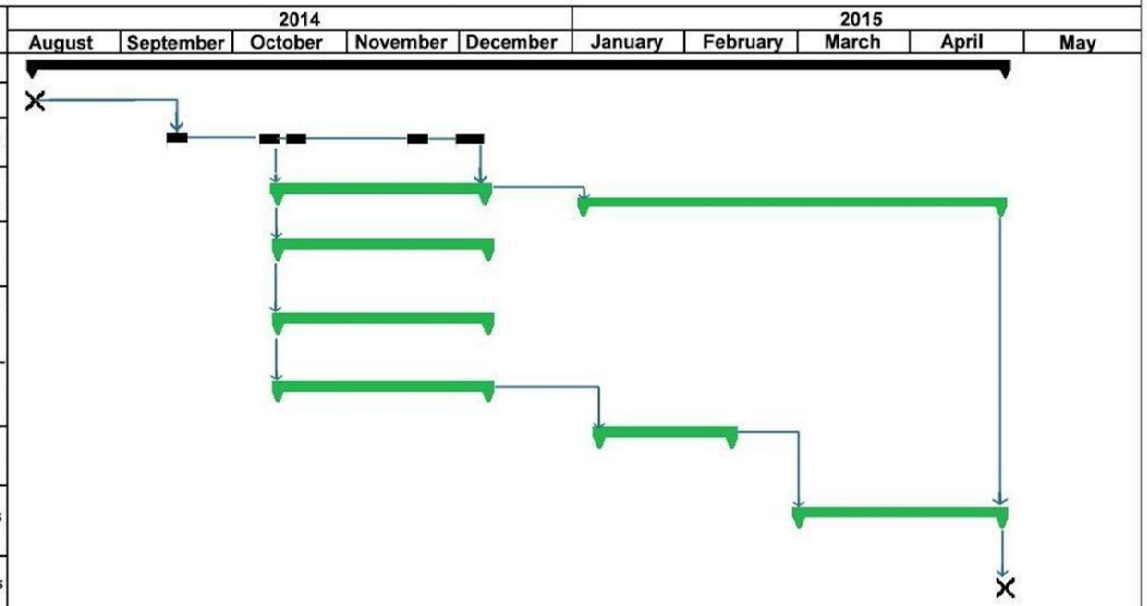
<http://www.gsa.gov/portal/content/104877>

8.0 Appendices

Preliminary Assessment/Site Inspection Sonoran Mountain Desert Monument

ASK Haz Waste

ID	Task Name	Duration	Start	Finish
1	SDNM PA / SI Schedule	243 Days	Aug. 5 2014	Apr. 23 2015
2	Notice of Award	1 Day	Aug. 1 2014	
3	Task 1 - Project Management	243 Days	Aug. 5 2014	Apr. 23 2015
4	Task 2 - Background Research	52 Days 143 Days	Oct. 13 2014 Jan. 12 2014	Dec. 4 2014 May 24 2014
5	Task 3 - Health & Safety Plan	52 Days	Oct. 13 2014	Dec. 4 2014
6	Task 3 - Sampling & Analysis Plan	52 Days	Oct. 13 2014	Dec. 4 2014
7	Task 3 - Work Plan	52 Days	Oct. 13 2014	Dec. 4 2014
8	Task 4 - Field Work	58 Days	Jan. 1 2015	Feb. 28 2015
9	Task 5 - PA/SI Report	83 Days	Mar. 2 2015	May. 1 2015
10	End of Period of Performance	1 Day	Apr. 23 2015	May. 1 2015



ASK Haz Waste Flagstaff Field Office
Flagstaff, Arizona

Time Line — Critical Path

Date: October 10, 2014

From U.S. General Services Administration

Cost Breakdown				
Total	Breakfast	Lunch	Dinner	IE
$46.00	$7.00	$11.00	$23.00	$5.00
$51.00	$8.00	$12.00	$26.00	$5.00
$56.00	$9.00	$13.00	$29.00	$5.00
$61.00	$10.00	$15.00	$31.00	$5.00
$66.00	$11.00	$16.00	$34.00	$5.00
$71.00	$12.00	$18.00	$36.00	$5.00