



Signal Mill Proposal



Angelina Cruse, Anna Gorman,
Ali Husain, Wyatt La Fave

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Introduction

Client: The Bureau of Land Management (BLM)

Background: Signal Mill was a stamp mill used to process ores from the McCracken mine.

Project Purpose: To provide the BLM with a Preliminary Assessment/Site Investigation (PA/SI) report, the first step of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process to remediate Signal Mill [1].



Figure 1. Signal Mill [2]

Location

Signal Mill is located in Arizona, approximately 69 miles southeast of Kingman and 145 miles northwest of Phoenix.



Figure 2. Signal Mill Site in Arizona [3]



Figure 3. Signal Mill Site Overview [3]

★ Signal Mill ★ Kingman

Background Contaminants

- An investigation by the BLM in April 2018 showed the results of 10 X-Ray Fluorescence (XRF) samples
- **Contaminants found:**
Lead, Arsenic, Mercury, Zinc, Manganese, Vanadium, Barium, Argon, Tin

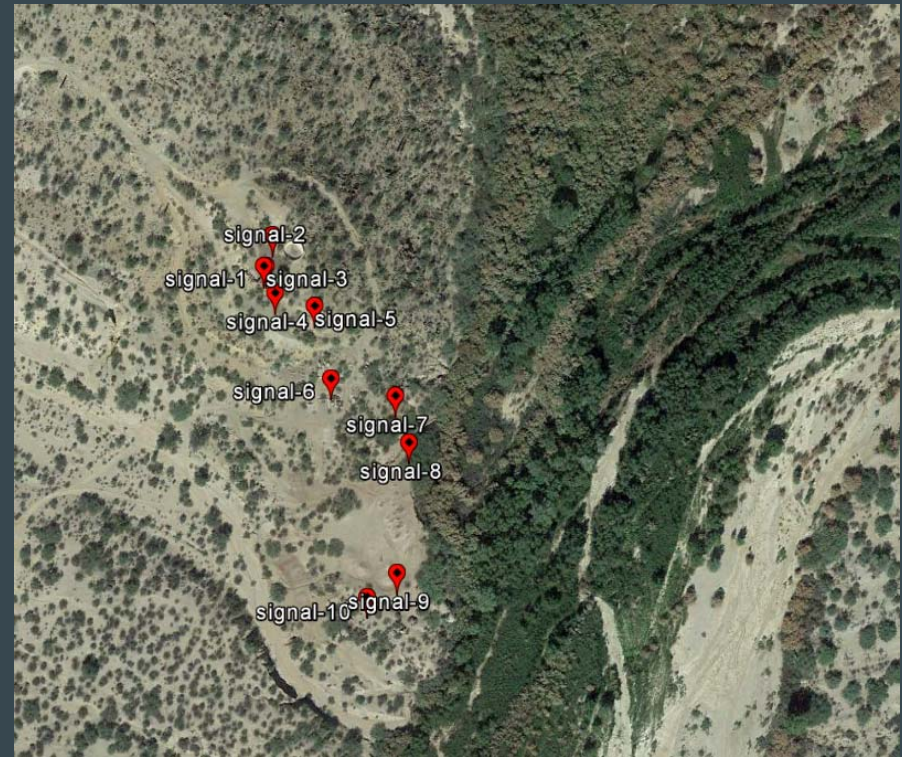


Figure 4. Signal Mill sampling locations April, 2018 [1]

Scope

1.0 Work Plan

- 1.1 Sampling and Analysis Plan (SAP)
- 1.2 Health and Safety Plan (HASP)

2.0 Field Sampling

January 18 - 20, 2019

3.0 Analysis

- 3.1 Drying and Sieve Analysis
- 3.2 X-Ray Fluorescence (XRF) Analysis
- 3.3 Acid Digestion
- 3.4 Flame Atomic Adsorption Spectroscopy (FAAS) (Subcontracted)
- 3.5 XRF and FAAS Correlation

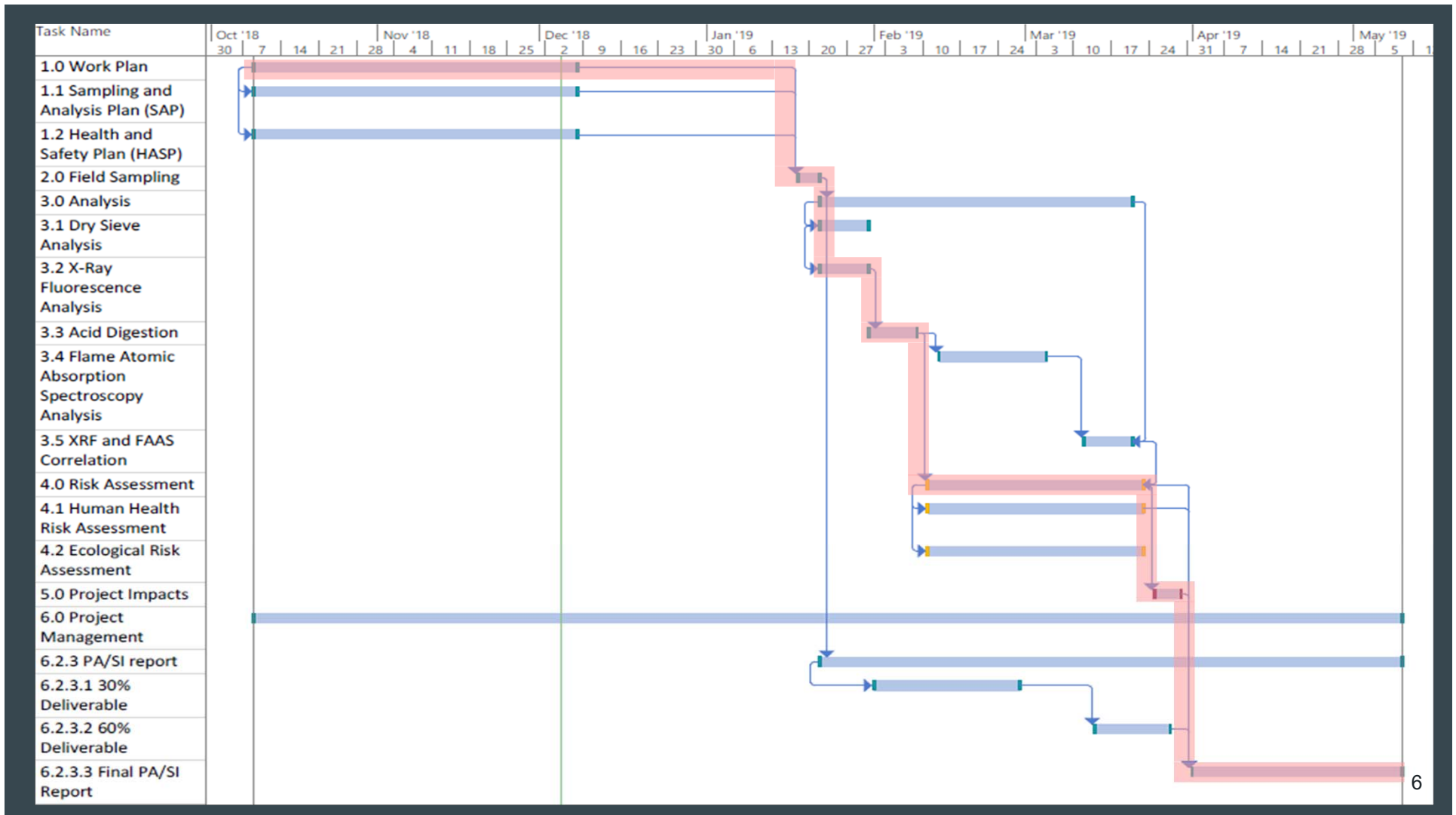
4.0 Risk Assessment

- 4.1 Human Health
- 4.2 Environmental

5.0 Project Impacts

6.0 Project Management

- 6.1 Project Coordination
- 6.2 Project Deliverables



Staffing

Table 1. Task matrix

Task	SENG Hours	ENG Hours	EIT Hours	LAB Hours
1.0 Work Plan	8	24	24	0
1.1 Sampling and Analysis Plan (SAP)	4	12	12	0
1.2 Health and Safety Plan (HASP)	4	12	12	0
2.0 Sampling	2	23	23	0
3.0 Analysis	2	23	23	120
4.0 Risk Assessment	16	48	40	0
5.0 Project Impacts	2	4	2	0
6.0 Project Management	142	116	78	16
Sum (Hours)	172	238	190	136
Total Hours	736			

SENG: Senior Engineer

ENG: Engineer

EIT: Engineer in Training

LAB: Lab Technician

Cost of Engineering Services

Table 2. Cost Breakdown By Category

Line Item	Classification	Quantity	Rate	Cost	Total Cost
1.0 Personnel	SENG	172 hr	\$147	\$25,284	\$57,064
	ENG	238 hr	\$76	\$18,088	
	LAB	136 hr	\$42	\$5,712	
	EIT	190 hr	\$42	\$7,980	
2.0 Travel	Gas	506 mi	\$0.38/mi	\$192	\$1,728
	Per Diem	6 ppl x 3 day	\$41/day	\$738	
	Vehicle	4 day	\$60/day	\$240	
	Hotel	3 room x 2 night	\$93/night	\$558	
3.0 Supplies	Lab and Sampling Supplies	100 sample	\$115/sample	\$11,500	\$17,845
	PPE	6 ppl	\$20/person	\$120	
	ENE Lab Rental	15 day	\$415/day	\$6,225	
4.0 Subcontract	Arsenic Test	20 sample	\$50/sample	\$1,000	\$2,150
	FAAS Test	20 sample	\$55/sample	\$1,100	
	Shipping	1 batch	\$50/batch	\$50	
5.0 Total Project Cost					\$78,787

References

[1] Bureau of Land Management, "Signal Mill Site Summary," Bureau of Land Management, 2018.

[2] Bureau of Land Management, Signal Photos, Bureau of Land Management, 2018.

[3] "Arizona Map" GOOGLE EARTH, [Accessed: 05-Oct-2018]