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Section 2. Phase I Bond Release Supporting Information – Backfilling, Grading, Suitable Material, Soil, and Surface Water Data

SECTION 2. Phase I Bond Release Supporting Information

Backfilling, Grading, Suitable Material, Soil, and Surface Water Data

Introduction

The Phase I Bond Release information contained in this application for the J19 and J21 Coal Resource Areas (CRAs) consists primarily of backfilling, grading, soil and suitable plant growth material replacement, drainage channel as-builts, surface water description, and slope analysis.

Backfilling and Grading

There are no permanent support facilities included in this J19 and J21 Phase I Bond Release Application. The permanent support facilities will be included in later bond release applications. Final grading of permanent program lands within the J19 and J21 areas occurred from 2002 to 2022. Final grading status for the release areas shown on Map 1.1 were previously reported and submitted with supporting maps to the regulatory authority in the following annual monitoring reports.

Peabody Western Coal Company (PWCC). 2003-2023. 2002-2022 Minesoil Reconstruction and Revegetation Activities Reports, Black Mesa and Kayenta Mines, Flagstaff and Kayenta, Arizona. Reports Prepared for: The Office of Surface Mining Reclamation and Enforcement, Western Service Center, Denver, Colorado.

The pre-mining and post-mining topography consists of rolling hills dissected by ephemeral drainage channels. The regulations require the post-mining graded slopes must approximate the pre-mining natural slopes. Approximate original contour means that surface configuration is achieved by backfilling and grading of the mined area so that the reclaimed area resembles the general surface configuration of the surrounding terrain with all final highwall and spoil piles eliminated. In order to perform a realistic comparison of the pre-mining and post-mining slope measurements, PWCC utilized ESRI ArcGIS 10 Spatial Analyst software to generate slope measurement polygons within the entire J19 and J21 reclamation areas included in this submittal. The J19 and J21 release areas included with this Phase I bond release application are all Permanent Program Lands. The J19 and J21 reclamation areas were evaluated to compare the slope stability of the pre- and post-mining landforms and general surface configuration.

The slope polygons were grouped into slope measurement ranges based on the following six slope measurement classifications:

1. <9%
2. 9% to 13%
3. 13% to 18%
4. 18% to 25%
5. 25% to 33%
6. >33%

These slope measurement classifications are like the classifications utilized in the AZ-0001F Permit, Chapter 26, Surface Stabilization. The location of the area associated with each of the pre- and post-mine slope measurement classes for the J19 and J21 reclamation areas can be found on Map 2.3 (Post-Mine) and Map 2.4 (Pre-Mine). Tables 2.1.1 and 2.1.2 provide a summary of the area in each slope measurement classification before mining and after mining for the J19 and J21 release areas, respectively:

Table 2.1.1. Pre- and Post-Mining Slope Analysis for J19 Permanent Program Reclaimed Areas.

POST - MINING SLOPE ANALYSIS:

RANGE	BEGINNING (%)	END (%)	AREA (Ac.)	PERCENT of TOTAL AREA	POST - MINING SLOPE AREA vs. PRE - MINING SLOPE AREA (%)
1	0	9	20.37	54.81	+16.83
2	9	13	13.07	35.16	+5.77
3	13	18	2.60	6.99	-2.10
4	18	25	1.10	2.96	-16.98
5	25	33	0.03	0.08	-2.95
6	33	+	0.00	0.00	-0.56

PRE - MINING SLOPE ANALYSIS:

RANGE	BEGINNING (%)	END (%)	AREA (Ac.)	PERCENT of TOTAL AREA
1	0	9	14.12	37.98
2	9	13	10.92	29.39
3	13	18	3.38	9.09
4	18	25	7.41	19.94
5	25	33	1.13	3.03
6	33	+	0.21	0.56

Table 2.1.2. Pre- and Post-Mining Slope Analysis for J21 Permanent Program Reclaimed Areas.

POST - MINING SLOPE ANALYSIS:

RANGE	BEGINNING (%)	END (%)	AREA (Ac.)	PERCENT of TOTAL AREA	POST - MINING SLOPE AREA vs. PRE - MINING SLOPE AREA (%)
1	0	9	114.97	42.93	-8.61
2	9	13	50.42	18.83	-0.67
3	13	18	49.64	18.54	+11.97
4	18	25	41.30	15.42	-3.83
5	25	33	8.52	3.18	+0.41
6	33	+	2.94	1.10	+0.73

PRE - MINING SLOPE ANALYSIS:

RANGE	BEGINNING (%)	END (%)	AREA (Ac.)	PERCENT of TOTAL AREA
1	0	9	138.02	51.54
2	9	13	52.22	19.50
3	13	18	17.59	6.57
4	18	25	51.53	19.25
5	25	33	7.43	2.77
6	33	+	0.99	0.37

As illustrated above, the post-mine topography has very similar slope gradient percentages in each of the six range categories compared with the original pre-mine topography. Overall, the J19 post-mine topography has approximately 17% less 18-25% slopes and approximately 17% more 0-9% slopes than the pre-mine topography. Overall, the J21 post-mine topography has approximately 9% less 0-9% slopes and approximately 12% more 13-18% slopes than the pre-mine topography. The as-built post-mine surface shown on Map 2.3 was compared to the Estimated Post-mining Topographic (PMT) Map, Drawing 85352, Sheets M10, M11 and N11, Volume 29 of Permit AZ-0001F. The reclaimed surface was within +/- 20 feet of the estimated post-mine contours in more that 97% of the area as shown on Map 2.5. The outlier areas shown on Map 2.5 are very small and blend with the adjacent PMT and overall surface configuration.

Attachment 2.1 includes the as-built information for the J21 reclamation drainage channels shown on Map 2.6 (Sheets 1 and 2 of 2). This is similar to the map submitted previously in the Annual Surface Stabilization Reports. Based on the information in Attachment 2.1 and a field inspection of the area, PWCC has demonstrated the post-mining reclamation drainage

structures are stable and can safely pass the design runoff. The locations of these drainage structures are shown on Map 2.6 (2 sheets).

In conclusion, the J19 and J21 reclamation areas have been graded to very similar overall slopes compared to pre-mine topography. Grading was completed to eliminate final highwalls and spoil piles, to ensure stability, to blend post-mining and undisturbed pre-mining slopes, to reestablish a positive stable drainage network, and to facilitate the livestock grazing, wildlife habitat, and cultural plant post-mining land uses. The J19 and J21 backfilling, grading, and drainage system construction was conducted in conformance with the applicable regulatory requirements and approved reclamation plans.

Surface Water Data

There have been no NPDES discharges from Pond J7-JR located in a tributary of Red Peak Valley Wash down gradient from the J19 and J21 bond release watersheds. There have been very few NPDES discharges from Ponds J21-H and J21-I located in tributaries of Dinnebito Wash down gradient from the J21 bond release watershed. A less than 10-year/24-hour rainfall discharge occurred at Pond J21-I on August 3, 2022. Monitoring of pond discharges on August 3 showed applicable effluent limitations were not exceeded. Twenty (20) complete water quality samples have been collected from two of these three ponds during the past seven (7) years per the approved monitoring schedule presented in Table 10, Chapter 16 of the Permit Application Package (PAP) for Permit AZ-0001F. Fourteen (14) water quality samples (two per year) were collected from Pond J7-JR over the past seven years and six samples from Pond J21-I. Laboratory data for all twenty samples indicate all but one analyte in four samples met livestock water quality standards. Samples collected on 7/13/18, 11/12/19, 1/9/20, and 8/27/21 at Pond J7-JR exceeded the livestock water quality standard for field pH with values of 9.18, 9.10, 9.95, and 9.42, respectively. The standard limit for livestock water pH is 9.0. Note that laboratory-determined pH for all twenty samples were less than or equal to this standard limit.

Spoil Sampling and Suitable Material Replacement

Final graded spoil for the J19 and J21 CRAs permanent program lands was sampled during eight (8) years during 2005, 2006, 2008, 2012, 2014, 2017, 2021, and 2022 (as documented in Attachments 2.3a and 2.3b) to comprehensively evaluate suitability and determine suitable plant growth material replacement requirements per Chapter 22, Volume 11, Permit AZ-0001F. All spoil sampling and data evaluations were completed using procedures and suitability criteria presented in Chapter 22, Volume 11, Permit AZ-0001F. Spoil sampling results were

previously reported and submitted with supporting maps to OSMRE in seven (7) annual monitoring reports as referenced below and documented in Attachments 2.3a and 2.3b. Spoil sampling results from 2022, included in Attachment 2.3b, will be submitted to OSMRE in 2023.

Peabody Western Coal Company (PWCC). 2006, 2007, 2009, 2013, 2015, 2018, 2022, 2023. 2005, 2006, 2008, 2012, 2014, 2017, 2021, 2022 Minesoil Reconstruction and Revegetation Activities Reports, Black Mesa and Kayenta Mines, Flagstaff and Kayenta, Arizona. Reports Prepared for: The Office of Surface Mining Reclamation and Enforcement, Western Service Center, Denver, Colorado.

Spoil sample laboratory data from the reports listed above that is pertinent to the Phase I bond release area is included in Attachment 2.3a for the J19 CRA and Attachment 2.3b for the J21 CRA. A total of 121 sites, 15 in J19 and 106 in J21 were located on final graded spoil slopes and sampled within the designated Phase I release areas. Ninety-six (96) of the 121 sites sampled (79%) as listed in Attachments 2.3a and 2.3b and shown on Map 2.2 had suitable spoil characteristics from the surface to three (3) feet and required no additional suitable subsoil and substratum material to be replaced before applying one foot of suitable surface soil. Topsoil, suitable residual soils, and weathered overburden derived from mostly scoria, sandstone, and siltstone were used to bury unsuitable spoil at J19 and J21 when 2, 3, or 4 feet of suitable mitigation material was required as shown on Map 2.2 Four feet or more of suitable residual soils and weathered overburden were used in eight (8) cultural planting areas that total 20.9 acres. Durable sandstone, siltstone, and scoria overburden were used to construct two (2) rocked downdrains and drainages (0.3 acres). Occasionally, topsoil was used in J19 and J21 as mitigation material as observed by the field supervisors during reclamation work and as noted by the suitable plant growth material thickness survey. An average of 0.5 feet of mitigation material was required for the entire Phase I release area (305 acres) based on the comprehensive graded spoil sampling suitability analysis presented in Attachments 2.3a and 2.3b. For areas that have had suitable plant growth material replaced (222 acres), an average of 0.6 feet of mitigation material was required based on the comprehensive graded spoil sampling suitability analysis presented in Attachments 2.3a and 2.3b. As documented in the next section titled Suitable Plant Growth Material Thickness, the mean thickness of mitigation material replaced for this 222-acre area equaled 1.7 feet (excluding one (1) foot of topsoil, suitable residual soils, and weathered scoria overburden at the surface).

Suitable Plant Growth Material Thickness

Four feet of suitable plant growth material as defined in Chapter 22, Volume 11, Permit AZ-001F was replaced on final graded slopes of permanent program lands within the J19 and J21

CRAs from 2009 to 2022. Suitable plant growth material replacement status for most of the release areas shown on Map 1.1 were previously reported to the regulatory authority on the Reclamation Status Map 2 (as of December 31, 2021) shown on the Southeast Sheet contained in the 2021 Reclamation Status and Monitoring Report, Black Mesa and Kayenta Mines (submitted June 2022). Suitable plant growth material replacement areas for the 2022 calendar year will be submitted to the regulatory authority with the next annual report in May 2023. Soil was redistributed on final graded slopes from stockpiles or replaced directly from soil removal areas prior to ripping and contour discing. Pursuant to Chapter 22 of Permit AZ-0001F, the thickness of soil replaced shall exceed the minimum average of 1 foot.

Eight (8) cultural planting sites, totaling 20.9 acres combined as shown on Map 2.1, received four feet or more of suitable residual soils and weathered overburden. Two (2) rocked downdrains and drainages, totaling 0.3 acres as shown on Map 2.2, received suitable overburden derived from predominantly scoria, sandstone, and siltstone. Topsoil was not replaced at these ten (10) sites that totaled 21.2 acres.

One suitable plant growth material thickness survey of the J19 and J21 reclaimed areas included with this Phase I bond release application was completed during September and December 2022 as shown on Map 2.1. Personnel from Peabody Western Coal Company (PWCC) observed sites in the J19 and J21 reclaimed areas in order to verify the suitable plant growth material replacement thickness. A stratified grid sampling scheme using a random number generator program was used for the PWCC survey to locate 16 sites within the topsoiled, cultural planting, and suitable soil areas of J19 (37 acres) and J21 (185 acres) prior to going into the field. Suitable plant growth material thickness verification sites were not placed within the rocked downdrain, large drainage areas, areas in J21 that have not yet been topsoiled, nor the grubbed area in J21 that, when combined totaled 82.6 acres. A sampling density of about 1 site per 14 acres was used; a slightly higher density than those used and approved previously at Kayenta Mine for the N1/N2, N7/N8, N9, N11, N14, J16, J19, and J21 soil thickness evaluations. A Tremble GeoXT survey grade GPS unit was used to navigate to each of the sites. At all sites, either a 3 ½-inch bucket auger or backhoe pit were used to verify the soil and mitigation material thickness by excavating to the contact with spoil. The results of the soil and mitigation material thickness verification survey are shown in Table 2.2 and Map 2.1 shows all sampled sites with corresponding thickness values.

Sixteen (16) sample sites were randomly placed within the 222 acres of disturbed lands that received suitable plant growth material within the release area. Suitable plant growth material thickness was verified at all 16 sites. Suitable plant growth material thickness among the 16 profiles placed over the J19 and J21 release areas ranged from 1.0 to more than 7.0 feet. The mean topsoil thickness value, excluding thickness attributed to suitable residual soils and suitable overburden derived from predominantly scoria and sandstone used in the cultural planting areas noted in Table 2.2 was more than 1.7 feet over twelve (12) sites. The mean soil and suitable material thickness of 1.7 feet exceeds the minimum 1-foot average topsoil thickness requirements presented in the approved reclamation plan in Chapter 22 of Permit AZ-0001F.

When the topsoiled reclamation areas (153 acres) are combined with the cultural planting and select mitigative areas (69 acres), the mean thickness of suitable plant growth material is more than 2.7 feet (Table 2.2). This mean thickness of more than 2.7 feet exceeds the average combined topsoil and mitigation material thickness of 1.6 feet as required by the spoil suitability mitigation requirements discussed in the previous section and shown on Map 2.2 In conclusion, PWCC has satisfied topsoil and suitable plant growth material thickness replacement requirements in conformance with applicable regulatory requirements and as stipulated by the approved reclamation plan for the J19 and J21 Phase I release areas shown on Map 1.1.

Table 2.2. Suitable Plant Growth Material Thickness Verification Sites Sampled by PWCC at J19 and J21 During September and December 2022 (See Map 2.1 for Site Locations).

Site ID [1]	Easting (feet) [2]	Northing (feet) [2]	Soil/Mitigation Thickness (feet)	Coal Resource Area
1	58474	-47586	1.4	J21
2	60877	-47841	1.0	J21
3	60447	-45284	1.4	J21
4	60443	-47292	1.1	J21
5	60026	-49079	4.0+	J21
6	61704	-46028	1.0	J21
7	60173	-47797	1.5	J21
8	51035	-36260	5.3[4]	J19
9	50763	-35520	4.0[4]	J19
10	51199	-35949	5.8[3]	J19
11	60412	-48257	7.0+[3]	J21

12	57149	-46536	4.0+	J21
13	56956	-46226	1.1	J21
14	64252	-44665	1.6	J21
15	59287	-46665	1.0	J21
16	57867	-47102	2.5	J21
MEAN			**1.7+/2.7+[5]**	

[1]For location see Map 2.1. [2]PWCC coordinate system. [3]Cultural planting area. [4]Suitable mitigation material replaced over spoil. [5]Total thickness attributed to topsoil and suitable mitigative material.

KAYENTA MINE
POST MINE TOPO EXHIBIT #1
WATERSHED & CHANNEL DESIGNS
J21

TABLE J21-2022
Channel Design Summary

Channel J21-16W.1C

Typical Rip Rap Lined Channel

Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Designed Depth Flow (ft)	Designed Velocity (fps)	Designed Free Board (ft)	Designed Total Depth (ft)	Designed Rip Rap (in)	Watershed (acres)	Time of Concentration (hr)	Curve Number	Design
J21-16W.1C	34.63	0.70	17	3	0.6	2.87	1	1.6	N/A	109.8	0.269	81	A

Design Flow: 10-year, 6-hour Storm

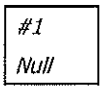
J21-16W.1C WATERSHED DESIGN (10YR-6HR)

Kurtis Silversmith

Peabody Western Coal Co.
P.O. Box 650
Kayenta, AZ 86033

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	J21-16W.1C



Structure Detail:

Structure #1 (Null)

J21-16W.1C

J21-16W.1C CHANNEL DESIGN

Material: Graded Spoil

Trapezoidal Channel

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
17.00	3.0:1	3.0:1	0.7	0.0300	1.00			5.0

	w/o Freeboard	w/ Freeboard
Design Discharge:	34.63 cfs	
Depth:	0.64 ft	1.64 ft
Top Width:	20.83 ft	26.83 ft
Velocity:	2.87 fps	
X-Section Area:	12.07 sq ft	
Hydraulic Radius:	0.574 ft	
Froude Number:	0.66	

TABLE J21-2022
Channel Design Summary

Channel J21-17W.1C

Typical Rip Rap Lined Channel

					Designed								
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Depth Flow (ft)	Velocity (fps)	Free Board (ft)	Total Depth (ft)	Rip Rap (in)	Watershed (acres)	Time of Concentration (hr)	Curve Number	Design
J21-17W.1C	60.77	0.50	25	3	0.8	2.82	1	1.8	N/A	160.6	0.166	81	A

Design Flow: 10-year, 6-hour Storm

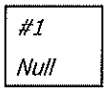
J21-17W.1C WATERSHED DESIGN (10YR-6HR)

Kurtis Silversmith

Peabody Western Coal Co.
P.O. Box 650
Kayenta, AZ 86033

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	J21-17W.1C



Structure Detail:

Structure #1 (Null)

J21-17W.1C

J21-17W.1C CHANNEL DESIGN

Material: Graded Spoil

Trapezoidal Channel

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
25.00	3.0:1	3.0:1	0.5	0.0300	1.00			5.5

	w/o Freeboard	w/ Freeboard
Design Discharge:	60.77 cfs	
Depth:	0.79 ft	1.79 ft
Top Width:	29.73 ft	35.73 ft
Velocity:	2.82 fps	
X-Section Area:	21.56 sq ft	
Hydraulic Radius:	0.719 ft	
Froude Number:	0.58	

CERTIFICATION

PEABODY WESTERN COAL COMPANY
KAYENTA MINE, J19 AND J21 COAL RESOURCE AREAS, PHASE I BOND RELEASE APPLICATION
NAVAJO COUNTY, ARIZONA

I HEREBY CERTIFY that, to the best of my knowledge and belief, all applicable reclamation activities described in the attached Phase I Bond Release Application for the J19 and J21 Coal Resource Areas dated January 26, 2023 have been accomplished in accordance with the reclamation requirements of the Act, the regulatory program, and the approved reclamation plan contained in the AZ-0001F Permit. The bond release parcel is free from enforcement actions.

Peabody Western Coal Company - Kayenta Mine

By: _____

Randy Lehn
Director Operations Support - Kayenta Mine

STATE OF ARIZONA

NAVAJO COUNTY

Signed or attested before me this 25th day of /January 2023, by Randy Lehn, Director Operations Support of Kayenta Mine owned by Peabody Western Coal Company, a Delaware Corporation, on behalf of said Kayenta Mine.

SUSIE CRANK
Notary Public - State of Arizona
NAVAJO COUNTY
Commission # 576977
Expires February 2, 2024

_____

Notary Public

My commission expires:

February 2, 2024

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Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J19 Coal Resource Area (CRA)

* Per the Sampling Results and Redistribution section of the annual reports (2012, 2014), suitable plant growth material (weathered overburden, residual soils, and spoil) was used as subsoil and substratum to bury unsuitable spoil prior to topsoil and suitable soil replacement and for areas requiring erosion resistant material.

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Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J21 Coal Resource Area (CRA)

Sample Site ID as Shown on Map 2.2*	Sample Site ID as Listed on Laboratory Data Sheet	Year Sampled	Year Reported to OSMRE	Mitigation Thickness** (feet)	Attachment Page for Laboratory Data
2216	25RG12	2005	2006	1	2005-1
2240	26RG24	2006	2007	1	2006-1
2273	26RG91	2008	2009	1	2008-1
3499	3499	2017	2018	1	2017-1
3508	J21 3508	2017	2018	1	2017-2
3509	3509	2017	2018	1	2017-1
3517	3517	2021	2022	1	2021-3
3518	3518	2021	2022	1	2021-3
3519	J21 3519	2017	2018	1	2017-2
3529*	3529	2021	2022	1	2021-3
3530*	3530	2021	2022	1	2021-3
3531	3531	2021	2022	1	2021-3
3532	J21 3532	2017	2018	1	2017-2
3538*	3538	2021	2022	1	2021-3
3539*	3539	2021	2022	1	2021-3
3540	3540	2021	2022	1	2021-3
3541	3541	2021	2022	1	2021-3
3667*	2209-280-3667	2022	2023	1	2022-5
3668*	2209-280-3668	2022	2023	1	2022-5
3674*	2209-280-3674	2022	2023	1	2022-5
3678*	3678	2022	2023	1	2022-4
3679*	3679	2021	2022	1	2021-3
3680*	3680	2021	2022	2	2021-3
3680a*	3680A	2022	2023	1	2022-7
3680b*	3680B	2022	2023	1	2022-7
3680c*	3680C	2022	2023	1	2022-7
3680d*	3680D	2022	2023	1	2022-7
3681*	3681	2021	2022	1	2021-3
3682*	3682	2021	2022	2	2021-3
3682a*	3682A	2022	2023	1	2022-7
3682b*	3682B	2022	2023	1	2022-7
3682c*	3682C	2022	2023	1	2022-7
3682d*	3682D	2022	2023	1	2022-7
3683*	3683	2022	2023	1	2022-4
3689*	2209-280-3689	2022	2023	1	2022-5
3690*	2209-280-3690	2022	2023	1	2022-5
3691*	2209-280-3691	2022	2023	1	2022-5
3692*	2209-280-3692	2022	2023	1	2022-5
3693*	3693	2021	2022	1	2021-3
3694*	3694	2021	2022	1	2021-3
3695*	3695	2022	2023	1	2022-3
3696*	3696	2022	2023	2	2022-3
3696a*	3696A	2022	2023	1	2022-7
3696b*	3696B	2022	2023	1	2022-7

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Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J21 Coal Resource Area (CRA)

Sample Site ID as Shown on Map 2.2*	Sample Site ID as Listed on Laboratory Data Sheet	Year Sampled	Year Reported to OSMRE	Mitigation Thickness** (feet)	Attachment Page for Laboratory Data
3696c*	3696C	2022	2023	1	2022-7
3696d*	3696D	2022	2023	1	2022-7
3697*	3697	2022	2023	1	2022-3
3698*	3698	2021	2022	1	2021-3
3699	3699	2021	2022	1	2021-3
3705	3705	2017	2018	1	2017-1
3706	3706	2017	2018	1	2017-1
3707*	3707	2021	2022	1	2021-3
3713	3713	2021	2022	1	2021-3
3714*	3714	2021	2022	1	2021-3
3715*	3715	2021	2022	1	2021-3
3716*	3716	2022	2023	1	2022-2
3717*	3717	2022	2023	1	2022-3
3718	3718	2022	2023	2	2022-3
3719	3719	2022	2023	1	2022-2
3720	3720	2021	2022	1	2021-3
3728	J21 3728	2017	2018	1	2017-2
3729*	3729	2021	2022	1	2021-3
3735	3735	2021	2022	1	2021-3
3736	3736	2021	2022	1	2021-3
3737*	3737	2021	2022	1	2021-3
3738*	3738	2022	2023	1	2022-2
3739	3739	2022	2023	1	2022-2
3740	3740	2022	2023	1	2022-2
3741	3741	2021	2022	1	2021-3
3752*	3752	2022	2023	2	2022-4
3753	3753	2022	2023	1	2022-4
3754	3754	2021	2022	1	2021-3
3758	3758	2021	2022	1	2021-3
3759	3759	2021	2022	1	2021-3
3760	3760	2022	2023	2	2022-2
3761	3761	2022	2023	1	2022-2
3762	3762	2022	2023	2	2022-2
3763	3763	2021	2022	1	2021-3
3775	J21 Spoil Pit 3775	2021	2022	1	2021-1
3776	J21 Spoil Pit 3776	2021	2022	1	2021-1
3777	J21 Spoil Pit 3777	2021	2022	1	2021-1
3778	J21 Spoil Pit 3778	2021	2022	1	2021-1
3779	J21 Spoil Pit 3779	2021	2022	1	2021-1
3780	3780	2021	2022	3	2021-3
3780a	3780A	2022	2023	1	2022-1
3780b	3780B	2022	2023	1	2022-1
3780d	3780D	2022	2023	1	2022-1
3781	3781	2021	2022	1	2021-3
3782	3782	2021	2022	1	2021-3

ATTACHMENT 2.3b TABLE OF CONTENTS (TOC)

Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J21 Coal Resource Area (CRA)

Sample Site ID as Shown on Map 2.2*	Sample Site ID as Listed on Laboratory Data Sheet	Year Sampled	Year Reported to OSMRE	Mitigation Thickness** (feet)	Attachment Page for Laboratory Data
3783	3783	2022	2023	1	2022-2
3799	J21 Spoil Pit 3799	2021	2022	1	2021-1
3800	J21 Spoil Pit 3800	2021	2022	1	2021-1
3801	J21 Spoil Pit 3801	2021	2022	1	2021-1
3802	J21 Spoil Pit 3802	2021	2022	1	2021-1
3803	J21 Spoil Pit 3803	2021	2022	1	2021-1
3824	J21 Spoil Pit 3824	2021	2022	1	2021-1
3825	J21 Spoil Pit 3825	2021	2022	1	2021-1
3826	J21 Spoil Pit 3826	2021	2022	1	2021-1
3827	J21 Spoil Pit 3827	2021	2022	3	2021-1
3827a	3827a	2021	2022	1	2021-2
3827b	3827b	2021	2022	1	2021-2
3827c	3827c	2021	2022	2	2021-2
3827d	3827d	2021	2022	1	2021-2
3851	J21 Spoil Pit 3851	2021	2022	1	2021-1
3852	J21 Spoil Pit 3852	2021	2022	1	2021-1
3877	J21 Spoil Pit 3877	2021	2022	1	2021-1

* Sites denoted with an asterisk (*) have not been topsoiled nor has suitable spoil or red rock been applied. ** Per the Sampling Results and Redistribution section of the annual reports (2017, 2021, 2022), suitable plant growth material (weathered overburden, residual soils, and spoil) was used as subsoil and substratum to bury unsuitable spoil prior to topsoil and suitable soil replacement and for areas requiring erosion resistant material.

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	TOT S %	PYR S %	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN	%CACO3
S-4420	25RG-10	11/29/05	0-1	6.67	5.39	47.8	21.6	25.5	26.9	5.55	26.25	33.75	40.00	CLC	0.186		5.82	9.10	3.28			0.910
S-4420R	25RG-10	11/29/05	0-1	6.64	5.32	47.8	20.7	24.1	26.5	5.61	26.25	33.75	40.00	CL/C	0.171		5.33	10.1	4.79			1.011
S-4421	25RG-10	11/29/05	1-3	6.61	5.30	48.0	22.7	26.3	23.9	4.83	27.50	32.50	40.00	CL/C	0.184		5.75	10.1	4.36			1.011
S-4422	25RG11	11/29/05	0-1	7.08	6.40	47.0	19.9	21.2	41.8	9.22	68.75	15.00	16.25	SCL	0.190		5.93	12.1	6.21			1.214
S-4423	25RG11	11/29/05	1-3	5.98	6.61	46.7	14.5	8.0	55.7	16.6	47.50	32.50	20.00	L	0.554	0.204	17.3	4.04	-13.3	6.37	-2.34	0.404
S-4424	25RG12	11/29/05	0-1	5.76	5.48	50.6	20.5	24.5	28.2	5.94	33.75	27.50	38.75	CL	0.401	0.064	12.5	5.05	-7.47	2.00	3.05	0.505
S-4425	25RG12	11/29/05	1-3	5.76	5.74	55.3	19.4	20.6	34.7	7.76	31.25	26.25	42.50	C	0.437	0.125	13.6	4.04	-9.61	3.91	0.13	0.404
S-4426	25RG13	11/29/05	0-1	6.11	4.87	41.2	23.0	41.9	6.66	1.17	47.50	25.00	27.50	SCL	0.101		3.16	32.4	29.2			3.239
S-4427	25RG13	11/29/05	1-3	4.96	5.02	40.2	24.0	47.6	6.39	1.07	52.50	25.00	22.50	SCL	0.212	0.009	6.61	1.00	-5.61	0.28	0.72	0.100
S-4428	25RG14	11/29/05	0-1	6.49	5.28	43.8	22.4	38.2	16.7	3.03	25.00	36.25	38.75	CL	0.188		5.86	11.1	5.27			1.113
S-4429	25RG14	11/29/05	1-3	5.82	5.29	43.6	22.6	28.5	23.3	4.61	28.75	31.25	40.00	CL/C	0.321	0.010	10.0	8.09	-1.93	0.31	7.78	0.809
S-4430	25RG15	11/29/05	0-1	6.06	5.36	48.2	21.6	26.7	25.1	5.11	27.50	30.00	42.50	C	0.167		5.21	7.07	1.86			0.707
S-4430R	25RG15	11/29/05	0-1	6.09	5.20	47.2	20.9	25.9	24.7	5.10	27.50	30.00	42.50	C	0.193		6.02	7.07	1.06			0.707
S-4431	25RG15	11/29/05	1-3	6.11	5.25	50.2	21.4	27.2	23.1	4.68	22.50	35.00	42.50	C	0.227	0.033	7.09	6.06	-1.02	1.03	5.03	0.606
S-4432	25RG16	11/29/05	0-1	6.17	5.33	54.0	20.8	26.2	24.2	4.99	20.00	35.00	45.00	C	0.286	0.039	8.94	7.07	-1.86	1.22	5.86	0.707
S-4433	25RG16	11/29/05	1-3	5.95	5.56	50.1	22.0	29.7	24.6	4.83	25.00	31.25	43.75	C	0.297	0.024	9.29	6.06	-3.23	0.75	5.31	0.606
S-4434	26RG18	11/29/05	0-1	6.86	6.13	48.2	14.8	13.7	44.4	11.7	27.50	35.00	37.50	CL	0.183		5.72	9.10	3.38			0.910
S-4435	26RG18	11/29/05	1-3	7.00	6.87	47.5	17.6	11.8	50.0	13.1	40.00	27.50	32.50	CL	0.199		6.23	10.1	3.88			1.011
S-4436	26RG19	11/29/05	0-1	5.90	5.04	42.4	25.0	36.3	11.4	2.05	46.25	25.00	28.75	SCL	0.182		5.67	10.1	4.44			1.011
S-4437	26RG19	11/29/05	1-3	5.86	5.01	44.6	23.1	32.7	15.6	2.96	35.00	32.50	32.50	CL	0.206		6.44	8.09	1.65			0.809
S-4438	26RG20	11/29/05	0-1	5.99	4.46	48.3	31.7	21.9	9.6	1.86	42.50	30.00	27.50	CL	0.331		10.3	11.1	0.79			1.113
S-4439	26RG20	11/29/05	1-3	7.17	3.31	42.8	16.0	16.5	10.3	2.56	35.00	35.00	30.00	CL	0.064		2.01	23.3	21.3			2.328
QC-18															0.105	0.003	3.27	11.1	7.85	0.09	11.0	1.113
QC-26				6.80	4.77	46.3	16.7	9.71	33.1	9.10	32.50	30.00	37.50	CL								
SCQ-001																						

2005-1

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	TOT S %	PYR S %	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN	%CACO3
S-4440	26RG21	01/12/06	0-1	7.20	5.64	47.4	20.0	31.7	26.1	5.13	40.00	27.50	32.50	CL	0.130		4.05	11.3	7.23			1.128
S-4440R	26RG21	01/12/06	0-1	7.19	5.30	50.5	18.3	29.2	24.5	5.03	40.00	27.50	32.50	CL	0.143		4.48	12.3	7.80			1.228
S-4441	26RG21	01/12/06	1-3	7.40	5.46	45.4	20.8	37.9	18.7	3.46	48.75	23.75	27.50	SCL	0.173		5.41	13.3	7.87			1.328
S-4442	26RG22	01/12/06	0-1	7.03	5.99	46.5	16.2	14.4	42.5	10.9	38.75	28.75	32.50	CL	0.177		5.51	22.3	16.8			2.230
S-4443	26RG22	01/12/06	1-3	6.78	5.50	48.9	18.3	15.9	35.8	8.67	40.00	27.50	32.50	CL	0.236		7.37	31.3	24.0			3.133
S-4444	26RG23	01/12/06	0-1	7.07	5.79	46.4	12.0	9.63	46.1	14.0	38.75	30.00	31.25	CL	0.257		8.04	15.3	7.25			1.529
S-4445	26RG23	01/12/06	1-3	7.14	5.03	44.8	10.9	8.72	39.6	12.6	41.25	30.00	28.75	CL	0.193		6.03	16.3	10.3			1.629
S-4446	26RG24	01/12/06	0-1	7.08	6.28	48.2	15.8	12.3	47.8	12.8	42.50	27.50	30.00	CL	0.224		7.00	17.3	10.3			1.729
S-4447	26RG24	01/12/06	1-3	7.03	6.47	47.8	15.4	12.3	50.9	13.7	37.50	28.75	33.75	CL	0.239		7.47	14.3	6.82			1.428
S-4448	26RG25	01/12/06	0-1	6.63	5.67	48.1	20.1	28.5	28.6	5.81	36.25	28.75	35.00	CL	0.324		10.1	38.3	26.2			3.634
S-4449	26RG25	01/12/06	1-3	6.67	5.87	45.5	20.7	38.7	23.7	4.34	32.50	32.50	35.00	CL	0.256		8.00	42.4	34.4			4.235
S-4450	26RG26	01/12/06	0-1	7.35	6.52	51.8	9.53	7.29	55.7	19.2	38.75	28.75	32.50	CL	0.346		10.8	11.3	0.48			1.128
S-4450R	26RG26	01/12/06	0-1	7.34	6.68	50.0	9.93	7.64	57.9	19.5	38.75	28.75	32.50	CL	0.342		10.7	11.3	0.60			1.128
S-4451	26RG26	01/12/06	1-3	7.18	5.58	48.0	5.59	4.26	51.3	23.1	41.25	28.75	30.00	CL	0.383	0.235	12.0	10.3	-1.70	7.34	2.93	1.027
S-4452	26RG27	01/12/06	0-1	7.00	6.03	47.4	13.1	10.4	47.4	13.8	40.00	27.50	32.50	CL	0.218		6.82	18.3	11.5			1.829
S-4453	26RG27	01/12/06	1-3	7.05	5.80	49.8	13.5	10.8	45.7	13.1	38.75	28.75	32.50	CL	0.245		7.66	18.3	10.6			1.829
S-4454	26RG28	01/12/06	0-1	6.29	6.93	54.8	19.2	24.8	44.4	9.47	38.75	28.75	32.50	CL	0.230		7.19	14.3	7.09			1.428
S-4455	26RG28	01/12/06	1-3	6.55	7.54	52.1	15.7	15.4	57.0	14.4	35.00	30.00	35.00	CL	0.245		7.67	12.3	4.61			1.228
S-4456	26RG29	01/12/06	0-1	6.69	6.77	47.3	11.5	9.63	56.1	17.3	42.50	28.75	28.75	CL	0.226		7.05	18.3	11.2			1.829
S-4457	26RG29	01/12/06	1-3	6.79	5.08	50.3	11.2	7.35	42.0	13.8	56.25	21.25	22.50	SCL	0.214		6.69	46.4	39.7			4.636
S-4458	26RG30	01/12/06	0-1	6.80	8.83	45.9	16.3	18.6	70.5	16.9	36.25	33.75	30.00	CL	0.203		6.35	17.3	10.9			1.729
S-4459	26RG30	01/12/06	1-3	6.78	8.11	49.6	15.8	16.4	63.5	15.8	35.00	32.50	32.50	CL	0.287		8.95	15.3	6.33			1.529
S-4460	26RG31	01/13/06	0-1	6.90	7.37	47.9	17.0	16.0	54.8	13.5	35.00	31.25	33.75	CL	0.196		6.11	15.3	9.17			1.529
S-4460R	26RG31	01/13/06	0-1	6.89	7.28	50.8	17.0	15.8	53.1	13.1	35.00	31.25	33.75	CL	0.208		6.50	14.3	7.78			1.428
S-4461	26RG31	01/13/06	1-3	6.88	7.07	50.4	16.3	14.0	53.5	13.7	35.00	30.00	35.00	CL	0.223		6.95	15.3	8.33			1.529
S-4462	26RG32	01/13/06	0-1	6.94	6.62	50.0	16.3	13.2	49.2	12.8	35.00	31.25	33.75	CL	0.219		6.83	17.3	10.5			1.729
S-4463	26RG32	01/13/06	1-3	6.98	5.70	49.7	15.5	11.4	41.9	11.4	41.25	26.25	32.50	CL	0.151		4.70	28.3	23.6			2.832
S-4464	26RG33	01/13/06	0-1	5.82	5.87	45.8	23.1	33.9	21.1	3.95	37.50	30.00	32.50	CL	0.263		8.20	12.3	4.07			1.228
S-4465	26RG33	01/13/06	1-3	5.96	5.98	47.3	24.0	33.9	22.1	4.11	37.50	32.50	30.00	CL	0.322		10.0	13.3	3.23			1.328
S-4466	26RG34	01/13/06	0-1	6.78	6.25	52.2	16.4	12.7	46.5	12.2	32.50	30.00	37.50	CL	0.316	0.182	9.88	8.27	-1.61	5.69	2.58	0.827
S-4467	26RG34	01/13/06	1-3	6.56	6.80	53.9	19.1	19.0	46.1	10.6	32.50	31.25	36.25	CL	0.299		9.33	11.3	1.95			1.128
S-4468	26RG35	01/13/06	0-1	6.73	5.96	46.7	18.0	16.7	40.3	9.67	37.50	30.00	32.50	CL	0.226		7.07	13.3	6.21			1.328
S-4469	26RG35	01/13/06	1-3	6.75	6.61	53.2	16.1	12.8	50.0	13.2	31.25	31.25	37.50	CL	0.279		8.70	11.3	2.57			1.128
S-4470	26RG36	01/13/06	0-1	6.05	7.95	48.2	19.3	27.8	51.8	10.7	37.50	30.00	32.50	CL	0.306		9.55	12.3	2.73			1.228
S-4470R	26RG36	01/13/06	0-1	6.04	7.90	50.3	19.2	27.6	50.9	10.5	37.50	30.00	32.50	CL	0.314		9.80	12.3	2.48			1.228
S-4471	26RG36	01/13/06	1-3	6.05	8.26	45.8	19.3	27.5	54.8	11.3	40.00	28.75	31.25	CL	0.291		9.10	12.3	3.18			1.228
S-4472	26RG37	01/12/06	0-1	6.49	8.32	47.2	15.2	15.6	65.2	16.6	35.00	32.50	32.50	CL	0.218		6.81	14.3	7.47			1.428
S-4473	26RG37	01/12/06	1-3	6.42	8.67	55.7	17.7	17.9	65.7	15.6	36.25	33.75	30.00	CL	0.270		8.42	12.3	3.86			1.228
QC-18															0.109	0.068	3.39	13.3	9.89	2.12	11.16	1.328
QC-27				7.54	4.60	56.1	2.07	1.03	46.1	37.1	21.25	36.25	42.50	C								
SQC-001																						

2006-1

ENERGY LABORATORIES, INC. * 3161 E. Lyndale * P.O Box 5688 * Helena, MT 59604
Toll Free 877.472.0711 * 406.442.0711 * FAX 406.442.0712 * helena@energylab.com

LABORATORY ANALYTICAL REPORT

Client: PWCC-Kayenta Mine
Project: Kayenta Mine
Workorder: H08050095

Report Date: 05/16/08
Date Received: 05/06/08

	Analysis	pH-SatPst	COND	SAR	Ca-SatPst	Mg-SatPst	Na-SatPst	Sand	Silt	Clay	Texture	Sulfur, Total	Neut Potential	Acid Potential
	Units	s_u_	mmhos/cm	unitless	meq/l	meq/l	meq/l	%	%	%	unitless	%	t/kt	t/kt
Sample ID	Client Sample ID	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H08050095-001	25RG17, 0-1'	8.1	0.37	5.0	0.11	0.25	2.11	19	43	38	SiCL	0.10	15	3.1
H08050095-002	25RG17, 1-3'	7.2	4.10	19	4.12	2.97	35.6	30	36	34	CL	0.18	17	5.6
H08050095-003	25 RG18, 0-1'	7.4	4.20	15	5.07	4.94	34.4	36	33	31	CL	< 0.01	16	0.30
H08050095-004	25RG18, 1-3'	6.8	4.16	9.1	11.7	6.53	27.4	60	19	21	SCL	< 0.01	11	0.10
H08050095-005	25RG19, 0-1'	6.1	5.74	8.9	19.7	12.8	35.9	49	25	26	SCL	0.05	14	1.5
H08050095-006	25RG19, 1-3'	7.3	4.16	14	5.06	4.83	31.1	42	31	27	CL	0.09	18	2.9
H08050095-007	26RG91, 0-1'	7.4	3.22	18	2.61	2.13	27.5	36	34	30	CL	0.04	16	1.2
H08050095-008	26RG91, 1-3'	7.1	5.16	6.9	15.3	17.8	28.2	31	37	32	CL	< 0.01	22	0.05
H08050095-009	26RG92, 0-1'	7.0	2.99	16	2.38	1.87	22.9	34	35	31	CL	0.22	11	6.9
H08050095-010	26RG92, 1-3'	7.4	2.72	22	1.29	1.01	23.4	36	31	33	CL	0.20	11	6.3
H08050095-011	26RG93, 0-1'	6.7	4.65	13	8.22	6.02	35.3	40	31	29	CL	0.05	13	1.6
H08050095-012	26RG93, 1-3'	7.2	2.97	17	2.43	1.86	25.2	38	31	31	CL	0.09	13	2.9
H08050095-013	26RG94, 0-1'	6.7	5.44	19	7.68	5.43	49.0	36	31	33	CL	0.32	10	10
H08050095-014	26RG94, 1-3'	6.8	2.25	9.4	3.33	2.16	15.5	28	36	36	CL	0.14	14	4.2
H08050095-015	26RG95, 0-1'	7.1	5.12	9.4	13.9	12.1	34.0	39	30	31	CL	0.18	15	5.5
H08050095-016	26RG95, 1-3'	7.0	5.66	11	13.7	11.3	37.3	38	32	30	CL	0.20	14	6.1
H08050095-017	26RG96, 0-1'	7.3	3.48	21	2.12	1.55	28.9	27	40	33	CL	0.22	17	6.8
H08050095-018	26RG96, 1-3'	7.1	5.79	21	7.19	4.97	52.6	40	31	29	CL	0.28	20	8.7
H08050095-019	26RG97, 0-1'	7.8	1.70	21	0.52	0.55	15.6	24	39	37	CL	0.19	17	6.1
H08050095-020	26RG97, 1-3'	7.2	4.14	21	3.10	1.97	33.8	28	35	37	CL	0.21	13	6.4
H08050095-021	26RG98, 0-1'	7.2	4.40	11	8.05	7.80	32.3	39	32	29	CL	0.05	14	1.5
H08050095-022	26RG98, 1-3'	7.0	5.33	8.1	16.7	17.8	33.8	44	29	27	CL	0.15	13	4.8
H08050095-023	26RG99, 0-1'	6.8	6.17	13	16.1	12.5	47.9	45	27	28	CL	0.28	11	8.9
H08050095-024	26RG99, 1-3'	6.6	5.54	10	15.7	12.0	37.8	42	33	25	L	0.18	8	5.5
H08050095-025	26RG100, 0-1'	7.7	2.02	24	0.63	0.55	18.8	27	37	36	CL	0.19	20	5.8
H08050095-026	26RG100, 1-3'	7.1	7.26	25	7.81	5.90	66.0	39	31	30	CL	0.24	26	7.5
H08050095-027	26RG101, 0-1'	7.0	3.38	19	2.67	1.77	29.0	31	37	32	CL	0.21	13	6.6
H08050095-028	26RG101, 1-3'	6.6	6.61	17	15.4	10.0	59.3	37	32	31	CL	0.28	17	8.9
H08050095-029	26RG102, 0-1'	7.1	5.63	20	5.79	5.51	47.1	30	40	30	CL	0.17	12	5.4
H08050095-030	26RG102, 1-3'	6.5	4.95	6.6	18.0	19.4	28.5	34	34	32	CL	0.08	19	2.6
H08050095-031	26RG103, 0-1'	6.9	4.66	18	5.58	3.95	38.3	24	43	33	CL	0.18	13	5.6
H08050095-032	26RG103, 1-3'	7.0	6.32	21	7.04	5.42	53.5	26	42	32	CL	0.20	14	6.3
H08050095-033	26RG104, 0-1'	7.2	4.93	19	5.01	4.65	41.0	31	38	31	CL	0.21	13	6.5
H08050095-034	26RG104, 1-3'	7.0	5.81	17	10.0	7.63	50.9	22	46	32	CL	0.29	14	9.1
H08050095-035	26RG105, 0-1'	7.9	1.43	19	0.52	0.47	13.1	28	36	36	CL	0.07	15	2.1
H08050095-036	26RG105, 1-3'	6.8	6.13	5.5	21.7	33.2	28.9	27	41	32	CL	< 0.01	18	< 0.01
H08050095-037	26RG106, 0-1'	7.6	2.20	19	1.08	1.02	19.5	26	42	32	CL	0.14	15	4.5
H08050095-038	26RG106, 1-3'	7.6	2.55	21	1.04	0.95	21.4	42	27	31	CL	0.12	15	3.8
H08050095-039	27RG65, 0-1'	7.5	0.73	8.9	0.45	0.41	5.83	36	42	22	L	0.18	20	5.8
H08050095-040	27RG65, 1-3'	7.5	3.11	19	2.07	1.71	26.7	36	36	28	CL	0.03	24	1.1
H08050095-041	27RG66, 0-1'	6.5	5.98	8.2	20.4	18.3	36.2	42	30	28	CL	0.29	11	9.0

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ENERGY LABORATORIES, INC. • P.O. Box 5688 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

LABORATORY ANALYTICAL REPORT

Client: PWCC-Kayenta Mine
Project: Kayenta Mine
Workorder: H08050095

Report Date: 05/16/08
Date Received: 05/06/08

Sample ID	Client Sample ID	Analysis Units Up	Low	Neut Potential t/kt Results	Acid Potential t/kt Results	Acid/Base Potential t/kt Results
H08050095-001	25RG17, 0-1'	0	0	15	3.1	12
H08050095-002	25RG17, 1-3'	0	0	17	5.6	12
H08050095-003	25 RG18, 0-1'	0	0	16	0.30	16
H08050095-004	25RG18, 1-3'	0	0	11	0.10	11
H08050095-005	25RG19, 0-1'	0	0	14	1.5	13
H08050095-006	25RG19, 1-3'	0	0	18	2.9	15
H08050095-007	26RG91, 0-1'	0	0	16	1.2	15
H08050095-008	26RG91, 1-3'	0	0	22	0.05	22
H08050095-009	26RG92, 0-1'	0	0	11	6.9	4
H08050095-010	26RG92, 1-3'	0	0	11	6.3	5
H08050095-011	26RG93, 0-1'	0	0	13	1.6	11
H08050095-012	26RG93, 1-3'	0	0	13	2.9	11
H08050095-013	26RG94, 0-1'	0	0	10	10	0
H08050095-014	26RG94, 1-3'	0	0	14	4.2	10
H08050095-015	26RG95, 0-1'	0	0	15	5.5	10
H08050095-016	26RG95, 1-3'	0	0	14	6.1	8
H08050095-017	26RG96, 0-1'	0	0	17	6.8	10
H08050095-018	26RG96, 1-3'	0	0	20	8.7	12
H08050095-019	26RG97, 0-1'	0	0	17	6.1	11
H08050095-020	26RG97, 1-3'	0	0	13	6.4	6
H08050095-021	26RG98, 0-1'	0	0	14	1.5	13
H08050095-022	26RG98, 1-3'	0	0	13	4.8	8
H08050095-023	26RG99, 0-1'	0	0	11	8.9	2
H08050095-024	26RG99, 1-3'	0	0	8	5.5	2
H08050095-025	26RG100, 0-1'	0	0	20	5.8	14
H08050095-026	26RG100, 1-3'	0	0	26	7.5	19
H08050095-027	26RG101, 0-1'	0	0	13	6.6	6
H08050095-028	26RG101, 1-3'	0	0	17	8.9	8
H08050095-029	26RG102, 0-1'	0	0	12	5.4	7
H08050095-030	26RG102, 1-3'	0	0	19	2.6	17
H08050095-031	26RG103, 0-1'	0	0	13	5.6	7
H08050095-032	26RG103, 1-3'	0	0	14	6.3	8
H08050095-033	26RG104, 0-1'	0	0	13	6.5	6
H08050095-034	26RG104, 1-3'	0	0	14	9.1	5
H08050095-035	26RG105, 0-1'	0	0	15	2.1	13
H08050095-036	26RG105, 1-3'	0	0	18	< 0.01	18
H08050095-037	26RG106, 0-1'	0	0	15	4.5	10
H08050095-038	26RG106, 1-3'	0	0	15	3.8	11
H08050095-039	27RG65, 0-1'	0	0	20	5.6	14
H08050095-040	27RG65, 1-3'	0	0	24	1.1	23
H08050095-041	27RG66, 0-1'	0	0	11	9.0	2

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Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J21 Coal Resource Area (CRA)

Sample Site ID as Shown on Map 2.2*	Sample Site ID as Listed on Laboratory Data Sheet	Year Sampled	Year Reported to OSMRE	Mitigation Thickness** (feet)	Attachment Page for Laboratory Data
2216	25RG12	2005	2006	1	2005-1
2240	26RG24	2006	2007	1	2006-1
2273	26RG91	2008	2009	1	2008-1
3499	3499	2017	2018	1	2017-1
3508	J21 3508	2017	2018	1	2017-2
3509	3509	2017	2018	1	2017-1
3517	3517	2021	2022	1	2021-3
3518	3518	2021	2022	1	2021-3
3519	J21 3519	2017	2018	1	2017-2
3529*	3529	2021	2022	1	2021-3
3530*	3530	2021	2022	1	2021-3
3531	3531	2021	2022	1	2021-3
3532	J21 3532	2017	2018	1	2017-2
3538*	3538	2021	2022	1	2021-3
3539*	3539	2021	2022	1	2021-3
3540	3540	2021	2022	1	2021-3
3541	3541	2021	2022	1	2021-3
3667*	2209-280-3667	2022	2023	1	2022-5
3668*	2209-280-3668	2022	2023	1	2022-5
3674*	2209-280-3674	2022	2023	1	2022-5
3678*	3678	2022	2023	1	2022-4
3679*	3679	2021	2022	1	2021-3
3680*	3680	2021	2022	2	2021-3
3680a*	3680A	2022	2023	1	2022-7
3680b*	3680B	2022	2023	1	2022-7
3680c*	3680C	2022	2023	1	2022-7
3680d*	3680D	2022	2023	1	2022-7
3681*	3681	2021	2022	1	2021-3
3682*	3682	2021	2022	2	2021-3
3682a*	3682A	2022	2023	1	2022-7
3682b*	3682B	2022	2023	1	2022-7
3682c*	3682C	2022	2023	1	2022-7
3682d*	3682D	2022	2023	1	2022-7
3683*	3683	2022	2023	1	2022-4
3689*	2209-280-3689	2022	2023	1	2022-5
3690*	2209-280-3690	2022	2023	1	2022-5
3691*	2209-280-3691	2022	2023	1	2022-5
3692*	2209-280-3692	2022	2023	1	2022-5
3693*	3693	2021	2022	1	2021-3
3694*	3694	2021	2022	1	2021-3
3695*	3695	2022	2023	1	2022-3
3696*	3696	2022	2023	2	2022-3
3696a*	3696A	2022	2023	1	2022-7
3696b*	3696B	2022	2023	1	2022-7

ATTACHMENT 2.3b TABLE OF CONTENTS (TOC)

Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J21 Coal Resource Area (CRA)

Sample Site ID as Shown on Map 2.2*	Sample Site ID as Listed on Laboratory Data Sheet	Year Sampled	Year Reported to OSMRE	Mitigation Thickness** (feet)	Attachment Page for Laboratory Data
3696c*	3696C	2022	2023	1	2022-7
3696d*	3696D	2022	2023	1	2022-7
3697*	3697	2022	2023	1	2022-3
3698*	3698	2021	2022	1	2021-3
3699	3699	2021	2022	1	2021-3
3705	3705	2017	2018	1	2017-1
3706	3706	2017	2018	1	2017-1
3707*	3707	2021	2022	1	2021-3
3713	3713	2021	2022	1	2021-3
3714*	3714	2021	2022	1	2021-3
3715*	3715	2021	2022	1	2021-3
3716*	3716	2022	2023	1	2022-2
3717*	3717	2022	2023	1	2022-3
3718	3718	2022	2023	2	2022-3
3719	3719	2022	2023	1	2022-2
3720	3720	2021	2022	1	2021-3
3728	J21 3728	2017	2018	1	2017-2
3729*	3729	2021	2022	1	2021-3
3735	3735	2021	2022	1	2021-3
3736	3736	2021	2022	1	2021-3
3737*	3737	2021	2022	1	2021-3
3738*	3738	2022	2023	1	2022-2
3739	3739	2022	2023	1	2022-2
3740	3740	2022	2023	1	2022-2
3741	3741	2021	2022	1	2021-3
3752*	3752	2022	2023	2	2022-4
3753	3753	2022	2023	1	2022-4
3754	3754	2021	2022	1	2021-3
3758	3758	2021	2022	1	2021-3
3759	3759	2021	2022	1	2021-3
3760	3760	2022	2023	2	2022-2
3761	3761	2022	2023	1	2022-2
3762	3762	2022	2023	2	2022-2
3763	3763	2021	2022	1	2021-3
3775	J21 Spoil Pit 3775	2021	2022	1	2021-1
3776	J21 Spoil Pit 3776	2021	2022	1	2021-1
3777	J21 Spoil Pit 3777	2021	2022	1	2021-1
3778	J21 Spoil Pit 3778	2021	2022	1	2021-1
3779	J21 Spoil Pit 3779	2021	2022	1	2021-1
3780	3780	2021	2022	3	2021-3
3780a	3780A	2022	2023	1	2022-1
3780b	3780B	2022	2023	1	2022-1
3780d	3780D	2022	2023	1	2022-1
3781	3781	2021	2022	1	2021-3
3782	3782	2021	2022	1	2021-3

ATTACHMENT 2.3b TABLE OF CONTENTS (TOC)

Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the J21 Coal Resource Area (CRA)

Sample Site ID as Shown on Map 2.2*	Sample Site ID as Listed on Laboratory Data Sheet	Year Sampled	Year Reported to OSMRE	Mitigation Thickness** (feet)	Attachment Page for Laboratory Data
3783	3783	2022	2023	1	2022-2
3799	J21 Spoil Pit 3799	2021	2022	1	2021-1
3800	J21 Spoil Pit 3800	2021	2022	1	2021-1
3801	J21 Spoil Pit 3801	2021	2022	1	2021-1
3802	J21 Spoil Pit 3802	2021	2022	1	2021-1
3803	J21 Spoil Pit 3803	2021	2022	1	2021-1
3824	J21 Spoil Pit 3824	2021	2022	1	2021-1
3825	J21 Spoil Pit 3825	2021	2022	1	2021-1
3826	J21 Spoil Pit 3826	2021	2022	1	2021-1
3827	J21 Spoil Pit 3827	2021	2022	3	2021-1
3827a	3827a	2021	2022	1	2021-2
3827b	3827b	2021	2022	1	2021-2
3827c	3827c	2021	2022	2	2021-2
3827d	3827d	2021	2022	1	2021-2
3851	J21 Spoil Pit 3851	2021	2022	1	2021-1
3852	J21 Spoil Pit 3852	2021	2022	1	2021-1
3877	J21 Spoil Pit 3877	2021	2022	1	2021-1

* Sites denoted with an asterisk (*) have not been topsoiled nor has suitable spoil or red rock been applied. ** Per the Sampling Results and Redistribution section of the annual reports (2017, 2021, 2022), suitable plant growth material (weathered overburden, residual soils, and spoil) was used as subsoil and substratum to bury unsuitable spoil prior to topsoil and suitable soil replacement and for areas requiring erosion resistant material.

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2108-150-01	J21 Spoil Pit 3775	8/13/21	0-1	7.57	5.33	32.2	23.4	31.5	15.3	2.92	60.00	20.00	20.00	SL/SCL	1.39	0.18				5.54	13.9	8.31		
2108-150-02	J21 Spoil Pit 3775	8/13/21	1-3	7.20	5.68	41.2	25.2	32.7	16.5	3.07	32.50	32.50	35.00	CL	1.19	0.19				5.92	11.9	5.95		
2108-150-03	J21 Spoil Pit 3776	8/13/21	0-1	7.26	6.133	41.7	22.6	23.8	29.3	6.08	40.00	26.25	33.75	CL	1.19	0.22				6.79	11.9	5.08		
2108-150-04	J21 Spoil Pit 3776	8/13/21	1-3	6.98	6.85	42.4	22.5	27.7	34.5	6.89	41.25	25.00	33.75	CL	0.89	0.29	0.17	0.05	0.08	9.08	8.90	-0.18	1.53	7.37
2108-150-05	J21 Spoil Pit 3777	8/13/21	0-1	7.37	6.98	45.6	20.6	24.1	38.7	8.19	38.75	26.25	35.00	CL	0.99	0.17				5.40	9.89	4.49		
2108-150-06	J21 Spoil Pit 3777	8/13/21	1-3	6.99	8.57	37.7	23.1	31.0	50.5	9.70	41.25	23.75	35.00	CL	1.19	0.21				6.69	11.9	5.18		
2108-150-07	J21 Spoil Pit 3778	8/13/21	0-1	7.62	5.82	47.2	18.7	29.1	24.0	4.91	33.75	31.25	35.00	CL	1.68	0.14				4.48	16.8	12.3		
2108-150-08	J21 Spoil Pit 3778	8/13/21	1-3	7.86	4.10	46.2	10.6	22.9	14.4	3.52	36.25	31.25	32.50	CL	1.88	0.12				3.68	18.8	15.1		
2108-150-09	J21 Spoil Pit 3779	8/13/21	0-1	7.19	7.45	46.1	22.8	27.4	39.7	7.92	35.00	30.00	35.00	CL	0.99	0.24				7.49	9.89	2.40		
2108-150-10	J21 Spoil Pit 3779	8/13/21	1-3	7.22	6.94	45.2	25.1	24.5	36.3	7.29	38.75	26.25	35.00	CL	1.88	0.17				5.41	18.8	13.4		
2108-150-10R	J21 Spoil Pit 3779	8/13/21	1-3	7.18	7.13	40.2	23.8	24.9	37.9	7.68	37.50	26.25	36.25	CL	1.58	0.18				5.55	15.8	10.3		
2108-150-11	J21 Spoil Pit 3799	8/13/21	0-1	7.39	6.92	41.8	21.9	40.4	26.3	4.71	52.50	22.50	25.00	SCL	0.69	0.14				4.27	6.92	2.65		
2108-150-12	J21 Spoil Pit 3799	8/13/21	1-3	6.83	6.47	42.7	20.7	36.7	26.3	4.91	45.00	26.25	28.75	SL/SCL	0.69	0.40	0.20	0.11	0.08	12.4	6.92	-5.48	3.47	3.45
2108-150-13	J21 Spoil Pit 3800	8/13/21	0-1	7.64	6.73	47.5	9.03	10.5	51.3	16.41	33.75	28.75	37.50	CL	1.29	0.17				5.30	12.9	7.56		
2108-150-14	J21 Spoil Pit 3800	8/13/21	1-3	7.44	5.95	43.7	7.53	9.63	44.4	15.15	35.00	25.00	40.00	CL/C	1.39	0.14				4.45	13.9	9.40		
2108-150-15	J21 Spoil Pit 3801	8/13/21	0-1	7.38	2.54	49.6	9.78	7.55	8.31	2.82	31.25	30.00	38.75	CL	0.99	0.09				2.67	9.89	7.22		
2108-150-16	J21 Spoil Pit 3801	8/13/21	1-3	7.00	3.72	53.9	14.5	15.6	12.7	3.26	32.50	28.75	38.75	CL	1.58	0.09				2.72	15.8	13.11		
2108-150-17	J21 Spoil Pit 3802	8/13/21	0-1	6.87	3.37	46.6	10.2	10.4	14.3	4.44	27.50	32.50	40.00	CL/C	0.89	0.10				3.11	8.90	5.79		
2108-150-18	J21 Spoil Pit 3802	8/13/21	1-3	6.30	7.08	42.6	22.7	37.9	29.9	5.43	60.00	17.50	22.50	SCL	0.49	0.16				4.91	4.94	0.03		
2108-150-19	J21 Spoil Pit 3803	8/13/21	0-1	7.79	1.00	62.4	2.80	3.38	3.63	2.07	25.00	28.75	46.25	C	2.87	0.03				0.84	28.7	27.9		
2108-150-20	J21 Spoil Pit 3803	8/13/21	1-3	7.59	1.06	47.6	2.91	2.53	4.39	2.66	38.75	23.75	37.50	CL	2.67	0.03				1.09	26.7	25.6		
2108-150-20R	J21 Spoil Pit 3803	8/13/21	1-3	7.69	1.12	46.1	3.36	2.88	4.92	2.78	37.50	26.25	36.25	CL	2.47	0.04				1.17	24.7	23.6		
2108-150-21	J21 Spoil Pit 3825	8/13/21	0-1	7.47	0.75	37.0	2.71	1.79	1.91	1.27	52.50	23.75	23.75	SCL	0.40	0.03				1.07	3.95	2.88		
2108-150-22	J21 Spoil Pit 3825	8/13/21	1-3	7.37	1.59	36.2	7.49	4.00	3.68	1.54	60.00	18.75	21.25	SCL	0.59	0.05				1.51	5.93	4.42		
2108-150-23	J21 Spoil Pit 3826	8/13/21	0-1	6.89	0.86	47.4	2.08	1.83	3.48	2.49	8.75	45.00	46.25	SIC	0.30	0.06				1.93	2.96	1.04		
2108-150-24	J21 Spoil Pit 3826	8/13/21	1-3	6.79	1.24	49.6	3.27	2.96	4.15	2.35	16.25	35.00	48.75	C	0.40	0.05				1.63	3.95	2.32		
2108-150-25	J21 Spoil Pit 3827	8/13/21	0-1	7.68	2.84	61.2	9.18	13.9	9.26	2.73	17.50	33.75	48.75	C	2.87	0.07				2.06	28.7	26.6		
2108-150-26	J21 Spoil Pit 3827	8/13/21	1-3	3.65	8.13	56.8	23.7	50.5	26.8	4.41	51.25	18.75	30.00	SCL	<0.010	0.20	0.06	0.03	0.11	6.21	-0.01	-6.22	0.81	-0.82
2108-150-27	J21 Spoil Pit 3851	8/13/21	0-1	7.23	0.66	35.6	4.82	0.84	0.36	0.21	70.00	12.50	17.50	SL	1.19	0.03				0.99	11.9	10.9		
2108-150-28	J21 Spoil Pit 3851	8/13/21	1-3	7.39	0.33	43.0	2.40	0.51	0.30	0.25	71.25	12.50	16.25	SL	2.38	0.03				0.88	23.8	22.9		
2108-150-29	J21 Spoil Pit 3852	8/13/21	0-1	7.92	1.38	47.2	2.38	4.86	6.09	3.20	30.00	32.50	37.50	CL	2.08	0.02				0.73	20.8	20.1		
2108-150-30	J21 Spoil Pit 3852	8/13/21	1-3	7.95	0.88	46.2	1.16	3.18	4.16	2.83	27.50	33.75	38.75	CL	2.18	0.02				0.77	21.8	21.0		
2108-150-30R	J21 Spoil Pit 3852	8/13/21	1-3	7.96	0.87	45.0	1.23	3.23	4.12	2.76	27.50	32.50	40.00	CL/C	1.88	0.02				0.67	18.8	18.1		
2108-150-31	J21 Spoil Pit 3877	8/13/21	0-1	7.31	1.97	52.4	6.74	6.91	5.44	2.08	33.75	27.50	38.75	CL	1.78	0.05				1.66	17.8	16.2		
2108-150-32	J21 Spoil Pit 3877	8/13/21	1-3	8.44	1.19	61.3	1.59	4.99	5.92	3.26	21.25	30.00	48.75	C	1.68	0.03				0.88	16.8	15.9		
2108-150-33	J21 Spoil Pit 3824	8/13/21	0-1	7.37	0.89	36.6	3.14	2.22	2.57	1.57	52.50	20.00	27.50	SCL	0.49	0.05				1.45	4.94	3.49		
2108-150-34	J21 Spoil Pit 3824	8/13/21	1-3	7.21	1.24	35.4	5.24	3.27	2.98	1.44	55.00	20.00	25.00	SCL	0.40	0.05				1.42	3.95	2.53		

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2110-090-01	3827a	10/6/21	0-1	7.42	4.32	37.3	21.1	23.2	11.2	2.38	68.75	11.25	20.00	SL/SCL	0.41	0.10				3.24	4.08	0.84		
2110-090-02	3827a	10/6/21	1-3	6.67	4.50	39.8	19.7	33.7	8.09	1.57	75.00	8.75	16.25	SL	0.71	0.40	0.36	0.00	0.04	12.5	7.14	-5.38	0.09	7.04
2110-090-03	3827b	10/6/21	0-1	7.57	1.25	36.1	5.74	3.28	3.07	1.44	62.50	17.50	20.00	SL/SCL	0.61	0.05				1.41	6.12	4.70		
2110-090-04	3827b	10/6/21	1-3	6.14	5.46	51.8	24.0	31.5	14.9	2.83	40.00	22.50	37.50	CL	1.02	0.12				3.74	10.2	6.46		
2110-090-05	3827c	10/6/21	0-1	5.27	4.50	49.4	24.3	22.4	11.4	2.35	22.50	36.25	41.25	C	0.00	1.67	1.63	0.00	0.04	52.2	0.00	-52.2	0.00	0.00
2110-090-06	3827c	10/6/21	1-3	5.98	6.26	53.1	21.7	45.2	18.4	3.18	20.00	35.00	45.00	C	0.10	1.34	1.23	0.03	0.07	41.9	1.02	-40.8	1.06	-0.04
2110-090-07	3827d	10/6/21	0-1	7.53	1.43	40.2	7.19	3.22	3.71	1.63	50.00	22.50	27.50	SCL	0.51	0.07				2.04	5.10	3.06		
2110-090-08	3827d	10/6/21	1-3	7.14	4.01	48.3	16.1	17.3	12.9	3.15	37.50	26.25	36.25	CL	0.82	0.10				3.06	8.16	5.10		
2110-090-08R	3827d	10/6/21	1-3	7.05	3.95	51.5	15.6	16.6	12.0	2.99	37.50	26.25	36.25	CL	0.71	0.09				2.91	7.14	4.23		
QC-29															0.92	0.19				6.00	9.18	3.18		
QC-55				6.33	13.9	33.7	55.9	13.4	69.2	11.7	63.75	11.25	25.00	SCL										

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2111-300-01	3696	11/22/21	0-1	7.58	6.03	48.2	7.34	6.30	51.8	19.8	32.5	31.25	36.25	CL	1.01	0.22				6.80	10.1	3.26		
2111-300-02	3696	11/22/21	1-3	7.80	7.17	45.4	8.18	7.55	62.6	22.3	36.25	28.75	35.00	CL	1.41	0.25				7.76	14.1	6.29		
2111-300-03	3699	11/22/21	0-1	8.04	0.89	37.3	1.65	0.94	5.79	5.08	45.00	25.00	30.00	CL/SCL	2.90	0.02				0.62	29.0	28.4		
2111-300-04	3699	11/22/21	1-3	7.87	1.48	34.5	3.44	2.14	6.92	4.14	58.75	17.50	23.75	SCL	3.90	0.02				0.64	39.0	38.4		
2111-300-05	3697	11/22/21	0-1	7.57	7.15	49.4	9.53	8.47	61.3	20.4	33.75	28.75	37.50	CL	1.21	0.23				7.06	12.1	5.00		
2111-300-06	3697	11/22/21	1-3	7.54	7.00	45.6	9.53	8.47	60.5	20.2	37.50	27.50	35.00	CL	1.31	0.20				6.17	13.1	6.89		
2111-300-07	3681	11/22/21	0-1	6.55	6.76	52.0	15.6	15.1	52.2	13.3	32.50	30.00	37.50	CL	1.80	0.20				6.36	18.0	11.7		
2111-300-08	3681	11/22/21	1-3	6.53	7.02	53.2	22.0	20.2	49.6	10.8	37.50	23.75	38.75	CL	2.00	0.17				5.34	20.0	14.7		
2111-300-09	3713	11/22/21	0-1	7.65	5.03	39.2	9.03	11.7	34.8	10.8	50.00	23.75	26.25	SCL	1.21	0.12				3.82	12.1	8.24		
2111-300-10	3713	11/22/21	1-3	7.64	4.91	41.1	11.4	16.1	28.6	7.7	47.50	26.25	26.25	SCL	1.31	0.08				2.35	13.1	10.7		
2111-300-10R	3713	11/22/21	1-3	7.64	4.85	41.4	11.5	16.1	28.2	7.6	50.00	23.75	26.25	SCL	1.21	0.07				2.26	12.1	9.79		
2111-300-11	3715	11/22/21	0-1	7.51	5.70	44.0	10.1	12.0	42.9	12.9	40.00	25.00	35.00	CL	1.01	0.15				4.83	10.1	5.23		
2111-300-12	3715	11/22/21	1-3	7.68	5.80	46.6	10.7	13.2	43.5	12.6	35.00	28.75	36.25	CL	1.21	0.12				3.85	12.1	8.21		
2111-300-13	3735	11/22/21	0-1	7.96	9.35	62.9	21.0	46.9	58.7	10.1	31.25	25.00	43.75	C	1.41	0.28				8.87	14.1	5.18		
2111-300-14	3735	11/22/21	1-3	8.04	9.54	63.6	20.6	44.4	63.1	11.1	38.75	17.50	43.75	C	1.11	0.28				8.63	11.1	2.43		
2111-300-15	3737	11/22/21	0-1	7.43	5.63	42.6	18.2	25.7	28.8	6.16	45.00	23.75	31.25	CL/SCL	1.11	0.12				3.61	11.1	7.45		
2111-300-16	3737	11/22/21	1-3	7.32	5.99	43.3	23.3	33.2	24.5	4.62	41.25	26.25	32.50	CL	1.01	0.14				4.25	10.1	5.81		
2111-300-17	3539	11/22/21	0-1	7.45	7.39	46.6	16.1	16.1	55.7	13.9	40.00	26.25	33.75	CL	1.21	0.14				4.50	12.1	7.55		
2111-300-18	3539	11/22/21	1-3	7.46	7.36	43.5	13.9	13.2	57.9	15.7	43.75	23.75	32.50	CL	1.21	0.16				5.14	12.1	6.92		
2111-300-19	3540	11/22/21	0-1	7.48	7.31	45.1	18.0	16.0	53.9	13.1	46.25	22.50	31.25	SCL	1.01	0.15				4.58	10.1	5.48		
2111-300-20	3540	11/22/21	1-3	7.36	8.05	45.1	16.8	17.2	61.8	15.0	45.00	21.25	33.75	CL/SCL	0.91	0.15				4.53	9.06	4.53		
2111-300-20R	3540	11/22/21	1-3	7.35	7.89	45.4	16.2	16.5	61.8	15.3	43.75	23.75	32.50	CL	0.81	0.15				4.69	8.06	3.37		
2111-300-21	3754	11/22/21	0-1	6.99	9.24	53.0	27.8	74.8	27.8	3.89	37.50	26.25	36.25	CL	0.91	0.63	0.38	0.01	0.24	19.8	9.06	-10.7	0.25	8.81
2111-300-22	3754	11/22/21	1-3	7.93	6.87	54.4	16.2	50.5	27.3	4.72	40.00	23.75	36.25	CL	1.90	0.15				4.81	19.0	14.2		
2111-300-23	3760	11/22/21	0-1	7.77	1.73	57.4	2.30	2.67	11.9	7.56	37.50	18.75	43.75	C	3.00	0.05				1.53	30.0	28.5		
2111-300-24	3760	11/22/21	1-3	8.46	3.07	72.7	2.25	4.75	23.7	12.7	27.50	22.50	50.00	C	2.60	0.04				1.26	26.0	24.8		
2111-300-25	3679	11/22/21	1-3	7.49	6.17	36.7	7.44	9.13	52.6	18.3	56.25	16.25	27.50	SCL	1.11	0.09				2.82	11.1	8.23		
2111-300-26	3680	11/22/21	0-1	7.54	6.94	42.2	6.19	5.38	64.4	26.8	43.75	20.00	36.25	CL	1.11	0.22				6.73	11.1	4.33		
2111-300-27	3680	11/22/21	1-3	7.60	7.95	47.7	14.3	12.3	66.1	18.1	52.50	15.00	32.50	SCL	1.31	0.24				7.45	13.1	5.60		
2111-300-28	3682	11/22/21	0-1	7.24	7.18	33.4	8.48	4.50	65.7	25.8	53.75	18.75	27.50	SCL	0.81	0.19				5.90	8.06	2.16		
2111-300-29	3682	11/22/21	1-3	7.81	4.39	30.4	1.60	0.79	41.4	37.8	51.25	18.75	30.00	SCL	0.61	0.14				4.43	6.07	1.64		
2111-300-30	3763	11/22/21	0-1	7.50	0.64	35.8	5.39	1.54	0.40	0.22	72.50	7.50	20.00	SL/SCL	0.71	0.02				0.62	7.07	6.44		
2111-300-30R	3763	11/22/21	0-1	7.54	0.66	34.8	5.34	1.58	0.42	0.23	71.25	8.75	20.00	SL/SCL	0.71	0.02				0.58	7.07	6.49		
2111-300-31	3763	11/22/21	1-3	7.81	0.53	32.5	2.74	1.76	1.21	0.81	70.00	10.00	20.00	SL/SCL	3.21	0.02				0.56	32.1	31.5		
2111-300-32	3781	11/22/21	0-1	6.29	6.02	53.0	16.8	37.6	25.1	4.81	31.25	25.00	43.75	C	1.60	0.19				5.94	16.0	10.1		
2111-300-33	3781	11/22/21	1-3	5.66	8.08	51.9	13.9	52.9	49.2	8.50	37.50	22.50	40.00	CL/C	0.61	0.23	0.16	<0.01	0.07	7.12	6.07	-1.05	<0.01	6.07
2111-300-34	3758	11/22/21	0-1	5.80	6.88	47.9	22.7	36.0	37.7	6.96	42.50	23.75	33.75	CL	0.41	0.22	0.10	0.01	0.11	6.90	4.07	-2.83	0.28	3.79
2111-300-35	3758	11/22/21	1-3	5.56	6.73	51.0	21.6	34.1	38.1	7.22	45.00	22.50	32.50	CL/SCL	0.61	0.22	0.11	0.00	0.11	6.92	6.07	-0.85	0.06	6.01
2111-300-36	3762	11/22/21	0-1	7.55	0.76	49.2	4.60	2.34	0.64	0.34	37.50	23.75	38.75	CL	3.61	0.05				1.48	36.1	34.6		
2111-300-37	3762	11/22/21	1-3	8.01	3.17	59.2	6.99	16.4	14.4	4.21	37.50	21.25	41.25	CL	5.11	0.07				2.04	51.1	49.0		
2111-300-38	3693	11/22/21	0-1	7.90	4.82	36.9	8.38	11.4	34.2	10.9	55.00	18.75	26.25	SCL	1.01	0.08				2.52	10.1	7.54		
2111-300-39	3693	11/22/21	1-3	7.75	5.49	40.1	13.0	18.8	33.8	8.5	53.75	18.75	27.50	SCL	1.21	0.09				2.78	12.1	9.27		
2111-300-40	3531	11/22/21	0-1	7.67	0.67	41.5	3.88	1.39	1.9	1.2	53.75	13.75	32.50	SCL	3.01	0.05				1.46	30.1	28.6		
2111-300-40R	3531	11/22/21	0-1	7.65	0.68	41.7	3.90	1.41	1.9	1.2	51.25	16.25	32.50	SCL	3.11	0.05				1.44	31.1	29.7		
2111-300-41	3531	11/22/21	1-3	7.67	7.12	42.2	20.6	17.0	50.0	11.5	50.00	21.25	28.75	SCL	1.31	0.14				4.35	13.1	8.71		
2111-300-42	3541	11/22/21	0-1	7.35	0.69	42.8	4.06	1.22	1.94	1.19	45.00	21.25	33.75	CL/SCL	2.20	0.05				1.48	22.0	20.6		
2111-300-43	3541	11/22/21	1-3	7.56	6.82	43.7	20.9	21.2	44.4	9.7	46.25	26.25	27.50	SCL	1.21	0.23				7.14	12.1	4.92		
2111-300-44	3736	11/22/21	0-1	7.64	4.00	38.7	13.6	21.3	15.1	3.6	45.00	26.25	28.75	CL/SCL	1.01	0.06				1.99	10.1	8.07		
2111-300-45	3736	11/22/21	1-3	7.66	4.10	37.0	15.1	22.1	13.9	3.2	60.00	13.75	26.25	SCL	1.11	0.06				1.82	11.1	9.24		
2111-300-46	3759	11/22/21	0-1	5.20	6.46	50.9	22.7	33.8	34.0	6.4	47.50	17.50	35.00	SCL/SC	0.51	0.20	0.06	0.02	0.12	6.17	5.07	-1.10	0.50	4.57
2111-300-47	3759	11/22/21	1-3	4.67	5.86	49.5	19.2	30.5	28.8	5.8	37.50	26.25	36.25	CL	0.31	0.18	0.07	0.01	0.10	5.53	3.08	-2.45	0.28	2.80
2111-300-48	3530	11/22/21	1-3	7.21	7.85	47.5	16.9	19.5	59.6	14.0	53.75	15.00	31.25	SCL	0.71	0.19				5.79	7.07	1.28		
2111-300-49	3707	11/22/21	0-1	7.35	8.00	44.8	18.4	19.9	61.3	14.0	48.75	21.25	30.00	SCL	1.01	0.21				6.46	10.1	3.60		
2111-300-50	3707	11/22/21	1-3	7.46	8.68	41.3	15.7	16.4	70.0	17.5	42.50	22.50	35.00	CL	1.01	0.19				5.91	10.1	4.15		
2111-300-51	3729	11/22/21	0-1	7.34	8.12	41.4	20.8	26.4	53.5	11.0	51.25	20.00	28.75	SCL	1.21	0.18				5.61	12.1	6.44		
2111-300-52	3729	11/22/21	1-3	7.11	8.57	45.3	20.7	27.4	58.7	12.0	43.75	23.75	32.50	CL	0.81	0.20				6.13	8.06	1.93		
2111-300-53	3698	11/22/21	0-1	7.82	1.58	32.1	2.34	2.80	9.48	5.92	76.25	8.75	15.00	SL	0.61	0.03				1.01	6.07	5.06		
2111-300-54	3698	11/22/21	1-3	7.71	2.52	39.3	3.13	5.65	15.35	7.33	57.50	16.25	26.25	SCL	0.81	0.04				1.17	8.06	6.90		
2111-300-55	3530	11/22/21	0-1	7.33	6.25	37.3	9.53	10.9	48.7	15.2	47.50	23.75	28.75	SCL	1.01	0.12				3.88	10.1	6.18		
2111-300-56	3529	11/22/21	0-1	7.15	7.53	39.3	11.8	12.3	59.6	17.2	51.25	18.75	30.00	SCL	0.91	0.14				4.28	9.06	4.78		
2111-300-57	3529	11/22/21	1-3	7.62	7.91	40.4	16.5	16.4	60.0	14.8	48.75	21.25	30.00	SCL	1.21	0.14				4.37	12.1	7.69		
2111-300-58	3517	11/22/21	0-1	6.30	8.79	43.0	17.4	16.1	69.2	16.9	38.75	25.00	36.25	CL	0.81	0.22				6.77	8.06	1.30		
2111-300-59	3517	11/22/21	1-3	7.24	8.40	43.4	11.6	9.4	73.5	22.7	35.00	28.75	36.25	CL	0.91	0.22				6.81	9.06	2.25		
2111-300-60	3518	11/22/21	0-1	8.06	6.73	35.1	8.48	10.4	54.8	17.9	51.25	21.25	27.50	SCL	1.11	0.09				2.68	11.1	8.38		
2111-300-60R	3518	11/22/21	0-1	8.08	6.62	35.9	7.78	9.6	53.9	18.3	50.00	21.25	28.75	SCL	1.21	0.09				2.67	12.1	9.39		
2111-300-61	3518	11/22/21	1-3	7.63	6.62	35.2	7.44	9.0	55.2	19.2	55.00	18.75	26.25	SCL	1.01	0.10				3.21	10.1	6.85		
2111-300-62	3679	11/22/21	0-1	7.52	5.60	40.8	9.33	11.3	41.1	12.8	41.25	25.00	33.75	CL	1.21	0.09				2.94	12.1	9.11		
2111-300-63	3741	11/22/21	0-1	7.10	0.481	43.3	4.03	1.08	0.3	0.2	47.50	25.00	27.50	SCL	3.51	0.03				0.96	35.1	34.1		
2111-300-64	3741	11/22/21	1-3	7.71	0.515	53.3	2.52	1.97	0.8	0.6	30.00	26.25	43.75	C	12.7	0.03				1.03	127	126		
2111-300-65	3720	11/22/21	0-1	6.82	2.28	43.8	17.2	4.53	0.5	0.2	51.25	22.50	26.25	SCL	0.71	0.03				0.97	7.07	6.09		
2111-300-66	3720	11/22/21	1-3	7.38	0.979	48.1	6.84	1.79	0.5	0.2	50.00	16.25	33.75	SCL	1.01	0.03				0.83	10.1	9.23		
2111-300-67	3538	11/22/21	0-1	8.12	5.26	46.6	16.2	26.2	23.4	5.1	40.00	30.00	30.00	CL	2.70	0.09				2.85	27.0	24.2		
2111-300-68	3538	11/22/21	1-3	8.51	8.81	53.4	21.5	81.8	29.0	4.0	32.50	31.25	36.25	CL	1.01	0.43	0.41	0.00	0.02	13.55	10.1	-3.49	0.06	10.0
2111-300-69	3714	11/22/21	0-1	7.84	4.59	38.4	13.2	22.2	19.8	4.7	50.00	22.50	27.50	SCL	1.31	0.06				2.02	13.1	11.04		
2111-300-70	3714	11/22/21	1-3	7.90	4.90	39.8	17.5	32.5	12.7	2.5	45.00	22.50	32.50	CL/SCL	1.41	0.07				2.26	14.1	11.80		
2111-300-70R	3714	11/22/21	1-3	7.87	4.64	41.9	16.3	30.5	12.1	2.5	46.25	22.50	31.25	SCL	1.41	0.07				2.29	14.1	11.76		
2111-300-73	3695	11/22/21	0-1	7.46	7.82	49.7	12.1	11.2	64.4	18.9	35.00	22.50	42.50	C	1.01	0.31				9.69	10.1	0.37		
2111-300-74	3695	11/22/21	1-3	7.46	7.56	49.8	19.9	29.7	44.8	9.0	43.75	18.75	37.50	CL	3.20	0.18				5.53	32.0	26.5		
2111-300-75	3694	11/22/21	0-1	7.58	5.73	44.0	9.9	11.4	41.8	12.8	40.00	25.00	35.00	CL	1.41	0.14				4.38	14.1	9.67		
2111-300-76	3694	11/22/21	1-3	7.70	6.25	43.0	11.5	15.0	43.4	11.9	42.50	22.50	35.00	CL	1.21	0.14				4.34	12.1	7.72		

2021-3

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2201-116-01	3780 A	1/12/22	0-1	6.05	6.10	52.8	22.9	27.9	26.8	5.32	35.00	31.25	33.75	CL	2.38	0.16				5.09	23.8	18.7		
2201-116-02	3780 A	1/12/22	1-3	7.23	1.90	43.7	10.4	5.73	3.67	1.29	47.50	25.00	27.50	SCL	2.18	0.07				2.19	21.8	19.6		
2201-116-03	3780 B	1/12/22	0-1	6.06	6.60	52.7	20.5	49.5	21.6	3.65	30.00	32.50	37.50	CL	1.26	0.27				8.34	12.6	4.24		
2201-116-04	3780 B	1/12/22	1-3	6.15	6.50	52.7	20.4	49.3	20.1	3.41	27.50	33.75	38.75	CL	1.26	0.26				8.18	12.6	4.40		
2201-116-05	3780 D	1/12/22	0-1	7.75	8.40	46.2	21.6	31.3	51.3	9.98	42.50	27.50	30.00	CL	1.87	0.22				6.81	18.7	11.9		
2201-116-06	3780 D	1/12/22	1-3	7.27	8.30	52.1	17.0	31.9	53.1	10.7	32.50	33.75	33.75	CL	1.67	0.23				7.04	16.7	9.62		
2201-116-06R	3780 D	1/12/22	1-3	7.27	8.60	52.2	16.8	32.0	54.4	11.0	33.75	33.75	32.50	CL	1.56	0.22				7.00	15.6	8.65		

2022-1

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2202-172-01	3716	2/14/22	0-1	7.69	3.60	35.9	24.8	12.8	6.13	1.42	62.50	22.50	15.00	SL	3.01	0.22				6.79	30.1	23.3		
2202-172-02	3716	2/14/22	1-3	7.10	6.19	37.0	24.0	23.2	29.0	5.98	43.75	28.75	27.50	CL	2.31	0.95	0.35	0.41	0.18	29.6	23.1	-6.56	12.9	10.1
2202-172-03	3719	2/14/22	0-1	7.87	4.64	30.9	17.8	22.1	14.7	3.30	52.50	30.00	17.50	SL	4.31	0.08				2.62	43.11	40.5		
2202-172-04	3719	2/14/22	1-3	8.02	3.01	30.2	4.17	13.6	13.4	4.51	40.00	36.25	23.75	L	1.90	0.03				0.94	19.0	18.1		
2202-172-05	3738	2/14/22	0-1	7.38	5.56	44.9	23.2	28.1	19.5	3.86	27.50	33.75	38.75	CL	9.43	0.36				11.2	94.3	83.0		
2202-172-06	3738	2/14/22	1-3	8.21	5.03	47.2	12.6	29.0	19.1	4.19	26.25	33.75	40.00	CL/C	15.0	0.08				2.61	150	148		
2202-172-07	3739	2/14/22	0-1	6.51	4.81	43.5	24.8	28.6	11.5	2.22	30.00	33.75	36.25	CL	1.30	0.57	0.22	0.06	0.30	17.9	13.0	-4.84	1.78	11.2
2202-172-08	3739	2/14/22	1-3	5.57	4.47	41.9	24.7	25.8	7.31	1.45	31.25	33.75	35.00	CL	0.30	0.30	0.17	0.01	0.12	9.28	2.99	-6.28	0.25	2.74
2202-172-09	3740	2/14/22	0-1	6.20	3.11	41.0	24.7	15.1	2.99	0.67	37.50	30.00	32.50	CL	0.70	0.30	0.16	0.03	0.11	9.23	7.01	-2.22	0.84	6.16
2202-172-10	3740	2/14/22	1-3	4.80	3.50	36.0	22.5	18.9	6.48	1.42	58.75	18.75	22.50	SCL	0.20	0.30	0.20	0.01	0.09	9.34	1.99	-7.35	0.28	1.71
2202-172-10R	3740	2/14/22	1-3	4.84	3.62	35.9	23.3	19.7	6.83	1.47	57.50	18.75	23.75	SCL	0.30	0.29	0.19	0.02	0.09	9.20	2.99	-6.21	0.56	2.43
2202-172-11	3760	2/14/22	0-1	7.99	4.79	39.2	2.80	2.67	43.0	26.0	32.50	31.25	36.25	CL	1.10	0.15				4.72	11.0	6.30		
2202-172-12	3760	2/14/22	1-3	7.47	6.45	38.9	6.59	6.21	55.2	21.8	35.00	28.75	36.25	CL	1.20	0.18				5.66	12.0	6.36		
2202-172-13	3761	2/14/22	0-1	7.31	0.63	45.4	5.44	1.50	0.60	0.32	48.75	26.25	25.00	SCL	1.30	0.03				1.03	13.0	12.0		
2202-172-14	3761	2/14/22	1-3	7.53	0.39	40.5	3.17	1.06	0.34	0.23	53.75	20.00	26.25	SCL	3.01	0.02				0.68	30.1	29.4		
2202-172-15	3762	2/14/22	0-1	7.49	5.54	52.6	5.19	4.48	47.0	21.4	32.50	30.00	37.50	CL	1.20	0.23				7.29	12.0	4.73		
2202-172-16	3762	2/14/22	1-3	7.59	6.62	47.1	7.78	5.98	57.0	21.7	36.25	27.50	36.25	CL	1.40	0.21				6.57	14.0	7.46		
2202-172-17	3783	2/14/22	0-1	7.63	5.58	46.1	10.0	11.9	40.8	12.3	25.00	35.00	40.00	CL/C	1.50	0.16				4.85	15.0	10.2		
2202-172-18	3783	2/14/22	1-3	7.71	5.32	43.4	5.44	5.10	43.9	19.1	38.75	27.50	33.75	CL	1.10	0.18				5.53	11.0	5.49		
2202-172-19	3784	2/14/22	0-1	6.61	1.74	52.8	11.5	6.28	3.04	1.02	32.50	30.00	37.50	CL	1.90	0.08				2.47	19.0	16.6		
2202-172-20	3784	2/14/22	1-3	6.61	2.14	50.0	14.2	8.47	3.58	1.06	30.00	32.50	37.50	CL	1.50	0.07				2.07	15.0	13.0		
2202-172-20R	3784	2/14/22	1-3	6.69	2.05	49.7	13.2	8.04	3.41	1.05	28.75	32.50	38.75	CL	1.50	0.07				2.10	15.0	12.9		

2022-2

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2203084-01	3718	3/7/22	0-1	7.66	6.66	42.0	7.19	5.10	62.6	25.3	31.25	33.75	35.00	CL	1.00	0.15				4.75	10.0	5.27		
2203084-02	3718	3/7/22	1-3	7.57	5.18	43.3	5.54	3.69	47.4	22.1	31.25	28.75	40.00	CL/C	1.00	0.16				4.97	10.0	5.04		
2203084-03	3717	3/7/22	0-1	6.92	7.97	46.1	20.0	17.8	61.8	14.2	36.25	27.50	36.25	CL	1.30	0.29				9.12	13.0	3.90		
2203084-04	3717	3/7/22	1-3	6.62	8.80	42.8	13.4	12.6	76.6	21.2	30.00	32.50	37.50	CL	1.00	0.33	0.13	0.04	0.16	10.4	10.0	-0.40	1.37	8.64
2203084-05	3697	3/7/22	0-1	7.20	8.23	47.6	22.0	19.0	62.2	13.7	33.75	30.00	36.25	CL	1.40	0.33				10.3	14.0	3.71		
2203084-06	3697	3/7/22	1-3	7.43	7.92	43.6	18.2	13.5	65.2	16.4	40.00	26.25	33.75	CL	1.60	0.28				8.77	16.0	7.26		
2203084-07	3696	3/7/22	0-1	7.67	7.37	46.8	12.6	11.2	62.6	18.2	33.75	28.75	37.50	CL	2.00	0.23				7.22	20.0	12.8		
2203084-08	3696	3/7/22	1-3	7.29	7.64	48.5	15.9	14.2	62.2	16.0	36.25	26.25	37.50	CL	1.50	0.28				8.65	15.0	6.39		
2203084-09	3695	3/7/22	0-1	7.68	8.37	57.6	21.1	34.0	54.4	10.4	32.50	27.50	40.00	CL/C	1.00	0.24				7.53	10.0	2.49		
2203084-10	3695	3/7/22	1-3	7.73	7.17	51.7	15.9	23.9	48.7	10.9	32.50	30.00	37.50	CL	1.20	0.17				5.26	12.0	6.76		
2203084-10R	3695	3/7/22	1-3	7.68	7.13	52.1	16.4	23.9	47.4	10.6	35.00	27.50	37.50	CL	1.10	0.16				5.12	11.0	5.90		

2022-3

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHO/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE S%	PYR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYRS A-B TN/1000TN
2204099-01	3683	4/7/22	0-1	7.25	7.67	47.6	18.0	17.1	57.9	13.8	40.00	26.25	33.75	CL	1.03	0.24				7.41	10.3	2.84		
2204099-01R	3683	4/7/22	0-1	7.25	7.82	49.4	19.9	18.4	60.9	13.9	37.50	26.25	36.25	CL	1.12	0.27				8.38	11.2	2.86		
2204099-02	3683	4/7/22	1-3	7.41	7.15	46.2	13.0	13.3	55.7	15.4	36.25	27.50	36.25	CL	1.62	0.25				7.68	16.2	8.53		
2204099-03	3678	4/7/22	0-1	7.84	9.39	40.0	13.4	21.6	77.4	18.5	47.50	25.00	27.50	SCL	0.93	0.12				3.66	9.26	5.61		
2204099-04	3678	4/7/22	1-3	7.80	10.0	38.5	15.4	25.1	81.3	18.1	52.50	22.50	25.00	SCL	0.93	0.11				3.51	9.26	5.75		
2204099-05	3753	4/7/22	0-1	7.50	3.97	52.0	15.8	14.5	16.8	4.33	35.00	27.50	37.50	CL	0.73	0.12				3.86	7.28	3.42		
2204099-06	3753	4/7/22	1-3	7.50	3.49	54.1	13.3	12.6	13.5	3.76	37.50	25.00	37.50	CL	0.83	0.10				3.01	8.27	5.26		
2204099-07	3752	4/7/22	0-1	5.67	8.68	46.7	19.5	17.7	67.4	15.6	31.25	31.25	37.50	CL	0.23	0.53	0.15	0.16	0.22	16.4	2.32	-14.1	4.97	-2.65
2204099-08	3752	4/7/22	1-3	5.57	8.24	61.4	17.7	12.4	64.8	16.7	22.50	36.25	41.25	C	0.13	0.49	0.18	0.13	0.17	15.2	1.32	-13.9	4.19	-2.86

2022-4

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine
Project: J21 Spoils N9 Spoils
Workorder: H22100693

Report Date: 11/09/22
Date Received: 10/24/22

		Analysis		Sand	Silt	Clay	Texture	Percent Sat	pH-SatPst	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units		%	%	%		%	s_u_	mmhos/cm	meq/L	meq/L	meq/L	unitless
Sample ID	Client Sample ID	Up	Low	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H22100693-001	2209-280-3668	0	1	40	30	30	CL	57.5	7.7	4.7	10.3	10.0	42.7	13.4
H22100693-002	2209-280-3668	1	3	34	36	30	CL	53.1	7.6	5.4	13.5	12.3	52.0	14.5
H22100693-003	2209-280-3667	0	1	38	32	30	CL	56.7	7.7	3.4	6.39	6.35	32.0	12.7
H22100693-004	2209-280-3667	1	3	42	30	28	CL	52.5	7.4	4.8	12.5	10.1	42.8	12.8
H22100693-005	2209-280-3666	0	1	30	38	32	CL	59.1	7.0	6.2	15.3	12.3	61.4	16.6
H22100693-006	2209-280-3666	1	3	34	36	30	CL	49.5	5.7	8.0	18.2	21.4	77.8	17.5
H22100693-007	2209-280-3677	0	1	36	48	16	L	40.8	6.8	4.4	16.4	19.3	27.7	6.6
H22100693-008	2209-280-3677	1	3	50	30	20	L	42.6	7.0	4.5	14.1	17.0	33.8	8.6
H22100693-009	2209-280-3692	0	1	48	32	20	L	42.6	7.5	5.8	18.2	20.3	49.1	11.2
H22100693-010	2209-280-3692	1	3	52	28	20	L	40.7	7.6	4.7	11.8	13.2	41.1	11.6
H22100693-011	2209-280-3691	0	1	48	30	22	L	46.2	7.4	4.5	16.1	18.4	32.8	7.9
H22100693-012	2209-280-3691	1	3	50	28	22	L	48.0	7.4	4.8	17.5	19.1	35.9	8.4
H22100693-013	2209-280-3690	0	1	48	30	22	L	47.0	7.4	4.9	16.6	17.0	38.1	9.3
H22100693-014	2209-280-3690	1	3	50	30	20	L	47.6	7.3	4.6	13.9	16.1	35.8	9.2
H22100693-015	2209-280-3689	0	1	44	30	26	L	51.5	7.4	5.5	17.5	15.2	45.0	11.1
H22100693-016	2209-280-3689	1	3	42	32	26	L	51.5	7.4	5.6	18.4	15.6	47.5	11.5
H22100693-017	2209-280-3674	0	1	52	28	20	L	41.8	7.3	4.3	19.1	21.3	24.0	5.4
H22100693-018	2209-280-3674	1	3	48	30	22	L	45.6	7.5	4.4	18.5	19.8	28.3	6.5
H22100693-019	2209-279-4794	0	1	34	38	28	CL	50.8	3.5	7.0	18.2	107	1.76	0.2
H22100693-020	2209-279-4794	1	3	34	40	26	L	44.8	3.5	6.4	18.4	92.3	1.14	0.2
H22100693-021	2209-279-4842	0	1	32	38	30	CL	47.1	3.2	9.3	15.5	139	3.70	0.4
H22100693-022	2209-279-4842	1	3	32	40	28	CL	46.3	3.2	12.1	17.9	222	6.27	0.6
H22100693-023	2209-279-4841	0	1	40	34	26	L	40.3	5.9	5.8	18.9	70.2	14.6	2.2
H22100693-024	2209-279-4841	1	3	40	34	26	L	43.2	5.9	7.4	18.2	94.2	25.6	3.4
H22100693-025	2209-279-4840	0	1	86	8	6	LS	31.0	7.7	1.5	8.96	8.86	1.60	0.5
H22100693-026	2209-279-4840	1	3	88	6	6	LS	30.3	7.7	1.6	10.9	8.52	2.28	0.7
H22100693-027	2209-279-4819	0	1	44	32	24	L	41.8	3.9	4.3	19.7	55.6	0.78	0.1
H22100693-028	2209-279-4819	1	3	82	8	10	LS	63.6	2.7	3.9	20.5	22.9	0.82	0.2
H22100693-029	2209-279-4820	0	1	38	34	28	CL	42.2	4.9	8.1	15.7	141	1.98	0.2
H22100693-030	2209-279-4820	1	3	44	32	24	L	42.8	5.8	6.5	18.9	102	3.51	0.4
H22100693-031	2209-279-4767	0	1	40	34	26	L	45.1	4.0	6.0	18.5	69.8	13.3	2.0
H22100693-032	2209-279-4767	1	3	38	34	28	CL	45.2	5.2	6.6	19.3	73.6	21.5	3.2
H22100693-033	2209-279-4768	0	1	38	36	26	L	42.0	4.1	9.2	17.6	121	27.2	3.3
H22100693-034	2209-279-4768	1	3	36	38	26	L	44.0	4.0	9.9	18.9	130	34.1	3.9
H22100693-035	2209-279-4772	0	1	34	40	26	L	41.9	6.1	6.1	19.2	52.8	29.0	4.8
H22100693-036	2209-279-4772	1	3	38	36	26	L	45.9	6.2	7.1	17.7	73.4	30.8	4.6
H22100693-037	2209-279-4795	0	1	46	32	22	L	38.1	4.2	12.9	18.9	223	36.5	3.3
H22100693-038	2209-279-4795	1	3	44	32	24	L	41.1	3.7	10.5	18.7	174	18.3	1.9

2022-5

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine
Project: J21 Spoils N9 Spoils
Workorder: H22100693

Report Date: 11/09/22
Date Received: 10/24/22

		Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Units		t/kt	t/kt	t/kt	t/kt	t/kt	%	%	%	%
Sample ID	Client Sample ID	Up	Low	Results	Results	Results	Results	Results	Results	Results	Results	Results
H22100693-001	2209-280-3668	0	1	22	4.3	18			0.14			
H22100693-002	2209-280-3668	1	3	18	6.6	12			0.21			
H22100693-003	2209-280-3667	0	1	24	3.6	21			0.11			
H22100693-004	2209-280-3667	1	3	22	5.2	17			0.17			
H22100693-005	2209-280-3666	0	1	19	9.5	9			0.31			
H22100693-006	2209-280-3666	1	3	9	23	-15	8.4	0	0.75	0.32	0.27	0.16
H22100693-007	2209-280-3677	0	1	13	3.2	9			0.10			
H22100693-008	2209-280-3677	1	3	14	2.4	11			0.08			
H22100693-009	2209-280-3692	0	1	11	2.9	9			0.09			
H22100693-010	2209-280-3692	1	3	11	2.1	9			0.07			
H22100693-011	2209-280-3691	0	1	13	2.5	11			0.08			
H22100693-012	2209-280-3691	1	3	12	2.9	9			0.09			
H22100693-013	2209-280-3690	0	1	11	3.0	8			0.10			
H22100693-014	2209-280-3690	1	3	10	3.8	6			0.12			
H22100693-015	2209-280-3689	0	1	10	4.5	6			0.14			
H22100693-016	2209-280-3689	1	3	14	5.8	8			0.19			
H22100693-017	2209-280-3674	0	1	12	3.0	9			0.10			
H22100693-018	2209-280-3674	1	3	16	4.1	12			0.13			
H22100693-019	2209-279-4794	0	1	0	29	-29	7.7	-8	0.93	0.50	0.25	0.19
H22100693-020	2209-279-4794	1	3	0	33	-33	9.2	-9	1.05	0.54	0.29	0.22
H22100693-021	2209-279-4842	0	1	-2	54	-54	14	-14	1.73	1.07	0.44	0.23
H22100693-022	2209-279-4842	1	3	-2	52	-52	13	-13	1.66	1.01	0.43	0.22
H22100693-023	2209-279-4841	0	1	7	35	-27	15	-8	1.11	0.47	0.49	0.14
H22100693-024	2209-279-4841	1	3	8	44	-36	16	-8	1.41	0.76	0.51	0.14
H22100693-025	2209-279-4840	0	1	3	0.59	3			0.02			
H22100693-026	2209-279-4840	1	3	4	0.71	3			0.02			
H22100693-027	2209-279-4819	0	1	2	26	-24	8.5	-6	0.85	0.33	0.27	0.24
H22100693-028	2209-279-4819	1	3	0	42	-42	11	-11	1.35	0.37	0.35	0.63
H22100693-029	2209-279-4820	0	1	6	51	-44	21	-15	1.62	0.74	0.69	0.20
H22100693-030	2209-279-4820	1	3	14	41	-28	16	-2	1.32	0.66	0.50	0.16
H22100693-031	2209-279-4767	0	1	2	35	-32	12	-9	1.11	0.54	0.38	0.19
H22100693-032	2209-279-4767	1	3	5	34	-29	12	-7	1.10	0.52	0.39	0.19
H22100693-033	2209-279-4768	0	1	2	43	-41	18	-16	1.38	0.63	0.57	0.18
H22100693-034	2209-279-4768	1	3	2	41	-39	14	-12	1.30	0.64	0.44	0.22
H22100693-035	2209-279-4772	0	1	12	32	-20	17	-4	1.03	0.34	0.53	0.15
H22100693-036	2209-279-4772	1	3	13	39	-25	17	-4	1.24	0.56	0.55	0.14
H22100693-037	2209-279-4795	0	1	2	55	-53	23	-21	1.75	0.74	0.75	0.25
H22100693-038	2209-279-4795	1	3	0	46	-45	14	-13	1.46	0.79	0.44	0.23

2022-6

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Revised Date: 01/04/23
Report Date: 12/31/22
Date Received: 12/09/22

Client: Peabody Western Coal Co. Kayenta Mine
Project: J21 Spoils
Workorder: H22120265

		Analysis		Sand	Silt	Clay	Texture	Percent Sat	pH-SatPst	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units		%	%	%		%	s_u_	mmhos/cm	meq/L	meq/L	meq/L	unitless
Sample ID	Client Sample ID	Up	Low	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H22120265-001	3682 A	0	1	34	39	27	CL	52.1	7.4	5.5	16.0	13.2	42.4	11.1
H22120265-002	3682 A	1	3	30	40	30	CL	54.1	7.5	4.8	12.8	10.9	37.8	11.0
H22120265-003	3682 B	0	1	32	40	28	CL	51.4	7.4	5.6	15.9	13.6	43.9	11.4
H22120265-004	3682 B	1	3	40	35	25	L	49.4	7.8	4.1	7.49	9.55	33.4	11.4
H22120265-005	3682 C	0	1	34	38	28	CL	50.0	7.4	5.8	18.0	15.0	46.6	11.5
H22120265-006	3682 C	1	3	34	42	24	L	46.2	6.7	7.0	21.5	16.6	58.9	13.5
H22120265-007	3682 D	0	1	30	42	28	CL	50.6	7.4	6.8	19.4	16.2	56.5	13.4
H22120265-008	3682 D	1	3	32	39	29	CL	49.2	7.2	5.3	13.9	12.9	42.7	11.6
H22120265-009	3680 A	0	1	36	39	25	L	46.8	7.4	5.9	10.4	8.55	56.2	18.3
H22120265-010	3680 A	1	3	38	37	25	L	44.7	7.3	6.8	17.6	13.6	63.4	16.0
H22120265-011	3680 B	0	1	28	43	29	CL	52.8	7.2	8.0	20.3	16.5	75.2	17.5
H22120265-012	3680 B	1	3	30	42	28	CL	47.9	7.5	6.6	15.2	15.9	58.6	14.8
H22120265-013	3680 C	0	1	32	39	29	CL	52.8	7.7	6.0	8.93	9.23	55.8	18.5
H22120265-014	3680 C	1	3	32	40	28	CL	47.9	7.7	5.6	6.18	6.49	56.0	22.3
H22120265-015	3680 D	0	1	24	46	30	CL	51.2	7.5	5.3	6.68	6.06	51.9	20.6
H22120265-016	3680 D	1	3	28	44	28	CL	43.0	7.4	5.8	8.33	7.36	57.7	20.6
H22120265-017	3696 A	0	1	36	38	26	L	50.0	7.3	7.2	16.7	11.7	65.9	17.5
H22120265-018	3696 A	1	3	48	30	22	L	43.8	7.6	4.8	4.73	3.17	49.5	24.9
H22120265-019	3696 B	0	1	30	38	32	CL	56.8	7.7	5.2	13.3	17.3	41.3	10.5
H22120265-020	3696 B	1	3	28	40	32	CL	62.6	7.6	5.0	17.1	27.0	30.1	6.4
H22120265-021	3696 C	0	1	34	38	28	CL	52.4	5.6	4.4	19.4	30.1	19.4	3.9
H22120265-022	3696 C	1	3	34	41	25	L	54.4	5.4	4.0	19.4	31.1	13.0	2.6
H22120265-023	3696 D	0	1	32	37	31	CL	57.9	7.3	6.3	15.5	12.3	59.4	15.9
H22120265-024	3696 D	1	3	34	39	27	CL	47.3	7.4	5.4	10.5	9.19	51.3	16.3
H22120265-025	3760 A	0	1	36	37	27	CL	47.6	7.2	4.1	19.7	15.9	22.0	5.2
H22120265-026	3760 A	1	3	38	37	25	L	47.3	7.2	4.8	18.4	19.4	30.5	7.0
H22120265-027	3760 B	0	1	42	37	21	L	42.4	7.4	3.8	18.1	23.2	15.6	3.4
H22120265-028	3760 B	1	3	44	34	22	L	45.7	7.5	3.5	13.0	17.7	18.2	4.7

2022-7

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Revised Date: 01/04/23
Report Date: 12/31/22
Date Received: 12/09/22

Client: Peabody Western Coal Co. Kayenta Mine
Project: J21 Spoils
Workorder: H22120265

		Analysis		Neut Potential	Acid Potential	Acid/Base Potential	Sulfur, Total
		Units		t/kt	t/kt	t/kt	%
Sample ID	Client Sample ID	Up	Low	Results	Results	Results	Results
H22120265-001	3682 A	0	1	18	6.6	12	0.21
H22120265-002	3682 A	1	3	24	6.5	18	0.21
H22120265-003	3682 B	0	1	19	6.7	12	0.22
H22120265-004	3682 B	1	3	24	3.0	21	0.09
H22120265-005	3682 C	0	1	16	5.8	10	0.19
H22120265-006	3682 C	1	3	15	12	3	0.39
H22120265-007	3682 D	0	1	22	6.2	16	0.20
H22120265-008	3682 D	1	3	23	4.8	18	0.15
H22120265-009	3680 A	0	1	19	6.0	13	0.19
H22120265-010	3680 A	1	3	19	7.2	12	0.23
H22120265-011	3680 B	0	1	19	9.1	10	0.29
H22120265-012	3680 B	1	3	37	5.5	32	0.18
H22120265-013	3680 C	0	1	35	5.8	29	0.19
H22120265-014	3680 C	1	3	27	5.8	21	0.18
H22120265-015	3680 D	0	1	18	6.0	12	0.19
H22120265-016	3680 D	1	3	14	6.7	8	0.22
H22120265-017	3696 A	0	1	17	8.2	9	0.26
H22120265-018	3696 A	1	3	18	4.5	13	0.14
H22120265-019	3696 B	0	1	25	5.8	19	0.19
H22120265-020	3696 B	1	3	31	6.4	24	0.21
H22120265-021	3696 C	0	1	14	13	1	0.42
H22120265-022	3696 C	1	3	15	13	2	0.40
H22120265-023	3696 D	0	1	17	7.7	9	0.25
H22120265-024	3696 D	1	3	19	6.8	12	0.22
H22120265-025	3760 A	0	1	17	4.2	13	0.13
H22120265-026	3760 A	1	3	15	5.0	10	0.16
H22120265-027	3760 B	0	1	13	3.2	10	0.10
H22120265-028	3760 B	1	3	14	2.8	12	0.09

2022-8

J-19 Proposed Bond Release Phase I
37 ac Disturbance

J-21 Proposed Bond Release Phase I
268 ac Disturbance

Approved Bond Release Phase I

Approved Bond Release Phase II

Approved Bond Release Phase III

J19 RD 30: 0.1 ac
0.5 ac
4.0'
9
1.8 ac
4.6 ac
10
5.8'
J-19W Ranch Road 0.3 mi
1.6 ac
8
5.3'
2.2 ac

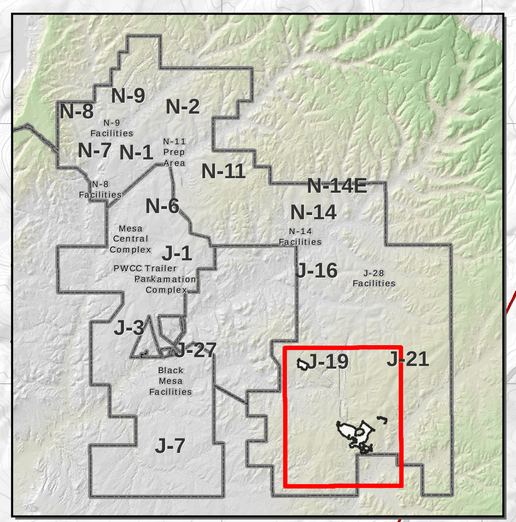
J19-RB Pond
J7-JR Pond
J21-F1 Pond
J21-G1 Pond
J21-G Pond
J21-H Pond
J21-I2 Pond

Ramp 53
Ramp 50
Ramp 54
Ramp 55
Ramp 56
Ramp Deadhead Road
Ramp 44
Ramp 39
Ramp 38
J-21 Ranch Road Loop

PWCC Lease Line
Navajo-Hopi Partition Line

14 1.6'
3 1.4'
6 1.0'
13 1.1'
12 4.0'+
2.8 ac
15 1.0'
16 2.5'
4.5 ac
4 1.1'
1 1.4'
7 1.5'
2 1.0'
11 7.0'+
2.9 ac
5 4.0'+
J21-H RD 1: 0.2 ac

Joint Use Area Tract # 2



Random Topsoil Thickness Verification Points

Topsoiled
J-19: <1 ac
J-21: 153 ac

First Year Topsoiled: 2009
Last Year Topsoiled: 2022

Suitable Soil
J-19: 26 acres
J-21: 22 acres

Cultural Planting
Rocked Downdrain
Graded (without Topsoil)
Proposed Bond Release Phase I
Approved Bond Release Phase I
Approved TOJ Boundary
Approved Bond Release Phase II
Approved Bond Release Phase III
Disturbance (Unreleased)

Ranch Road - Proposed Phase I Bond Release
Ranch Road
Ancillary Mine Road
Primary Mine Road
Mine Ramp
Secondary Mine Road
Non-PWCC 2-Lane Unpaved Road
Non-PWCC Single Track Road
50 ft Contour
10 ft Contour

Partition Line
Lease Line
Black Mesa Mine
Kayenta Mine
Cattle Guard
Gate
Fence
Major Drainages
Permanent Impoundment
Existing Pond

File: F:\GIS\Projects\BondRelease\J19W_J21_Phase1_2022\Maps\Map 2.1 Topsoil Verification.mxd

ENGINEER'S CERTIFICATION
GARY ALTSISI
37842
REGISTERED PROFESSIONAL ENGINEER
ARIZONA, U.S.A.
EXPIRES: 09/30/2023
GARY ALTSISI
ARIZONA P.E. 37842

Peabody

Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

Map 2.1
J-19 AND J-21

Phase I
Bond Release
Topsoil Thickness Verification

Produced by
Gary Altsisi
Professional
Engineer

January 24, 2023
Revision

1 inch = 600 feet

10 foot contour interval
Index contours at 50 feet

N

J-19 Proposed Bond Release Phase I
37 ac Disturbance

J-21 Proposed Bond Release Phase I
268 ac Disturbance

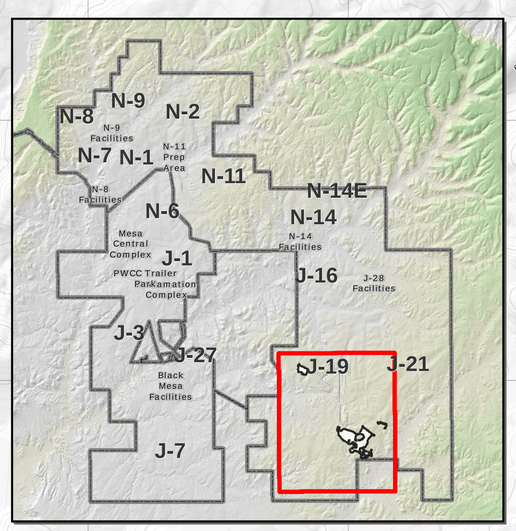
J19 RD 30: 0.1 ac
0.5 ac
1.8 ac
4.6 ac
1.6 ac
2.2 ac
1.6 ac

J19-D Pond
J19-E Pond
J19-RB Pond
J7-JR Pond
J21-G1 Pond
J21-G Pond
J21-H Pond
J21-I2 Pond
J21-H RD 1: 0.2 ac
2.8 ac
2.5 ac
2.9 ac

Approved Bond Release Phase I
Approved Bond Release Phase II
Approved Bond Release Phase III

Ramp 53
Ramp 50
Ramp 54
Ramp 56
Ramp 58
Ramp Deadfleet Road
Ramp 44
Ramp 39
Ramp 38
Ramp 37
Ramp 34

Joint Use Area Tract 1 & 2
Joint Use Area Tract 2
PWCC Lease Line
Navajo-Hopi Partition Line



Suitable Mitigation Material Required
- 1' Depth
- 2' Depth
- 3' Depth
- 4' Depth

J-19: 15 points
J-21: 106 points

- Topsoiled
- Suitable Soil

Graded (without Topsoil)
First Year Graded: 2002
Last Year Graded: 2022

Rocked
J-19: 0.1 acres
J-21: 0.2 acres

Cultural Planting
J-19: 10.7 acres
J-21:10.2 acres

- Major Drainages
- Permanent Impoundment
- Existing Pond
- Proposed Bond Release Phase I
- Approved TOJ Boundary
- Approved Bond Release Phase I
- Approved Bond Release Phase II
- Approved Bond Release Phase III
- Disturbance (Unreleased)
- Ranch Road - Proposed Phase I Bond Release
- Ranch Road
- Ancillary Mine Road
- Primary Mine Road
- Mine Ramp
- Secondary Mine Road
- Non-PWCC 2-Lane Unpaved Road
- Non-PWCC Single Track Road
- 50 ft Contour
- 10 ft Contour
- Cattle Guard
- Gate
- Fence
- Partition Line
- Lease Line
- Black Mesa Mine
- Kayenta Mine

File: F:\GIS\Projects\BondRelease\J19W_J21_Phase1_2022\Maps\Map 2.2 Spoil Sample Data.mxd

ENGINEER'S CERTIFICATION
GARY ALTSISI
37842
REGISTERED PROFESSIONAL ENGINEER
ARIZONA, U.S.A.
EXPIRES: 09/30/2023
GARY ALTSISI
ARIZONA P.E. 37842

Peabody

Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

Map 2.2
J-19 and J-21
Phase I Bond Release Spoil Sample Data

Produced by
Gary Altsisi
Professional
Engineer

January 24, 2023
Revision

1 inch = 600 feet

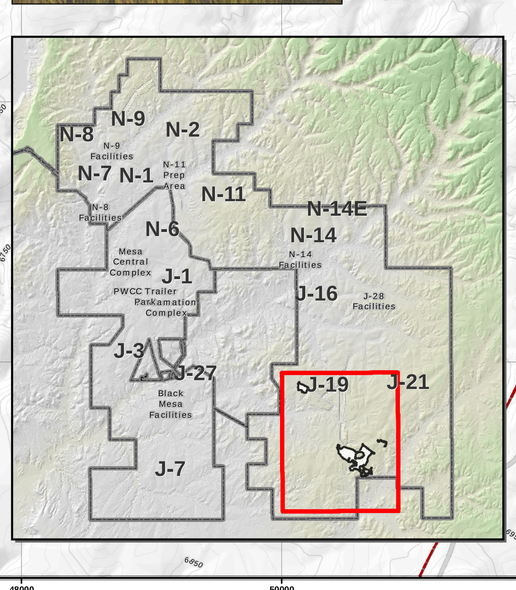
10 foot contour interval
Index contours at 50 feet

N

	% Slope	J-19 Acres	J-19 % of Total	J-21 Acres	J-21 % of Total
	0 - 9	20.4	54.8	115.0	42.9
	9 - 13	13.1	35.2	50.0	18.8
	13 - 18	2.6	6.9	49.6	18.5
	18 - 25	1.1	3.0	41.3	15.4
	25 - 33	<0.1	<0.1	8.5	3.2
	33 +	0.0	0.0	2.9	1.1
Total		37.2		267.8	

J-19 Proposed Bond Release Phase I
37 ac Disturbance

J-21 Proposed Bond Release Phase I
268 ac Disturbance



ENGINEER'S CERTIFICATION
GARY ALTSISI 37842 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.
EXPIRES: 09/30/2023
GARY ALTSISI
ARIZONA P.E. 37842

Proposed Bond Release Phase I Disturbance (Unreleased)
Major Drainages
Permanent Impoundment
Existing Pond
Ranch Road - Proposed Phase I Bond Release
Ranch Road
Ancillary Mine Road
Primary Mine Road
Mine Ramp
Secondary Mine Road
Non-PWCC 2-Lane Unpaved Road
Non-PWCC Single Track Road
50 ft Contour
10 ft Contour
Cattle Guard
Gate
Fence
Partition Line
Lease Line
Black Mesa Mine
Kayenta Mine

File: F:\GIS\Projects\BondRelease\J19NI_J21_Phase1_2022\Maps\Map 2.3 Postmine Slope.mxd

Peabody

Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

Map 2.3
J-19 and J-21
Phase I
Bond Release
Postmine Slope

Produced by
Gary Altsisi
Professional
Engineer

January 24, 2023
Revision

1 inch = 600 feet

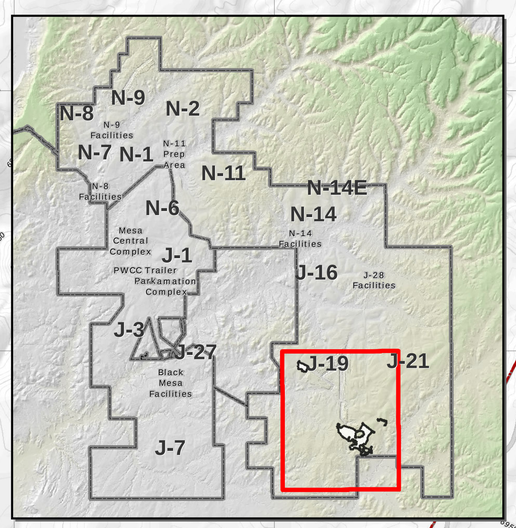
10 foot contour interval
Index contours at 50 feet

N

	% Slope	J-19 Acres	J-19 % of Total	J-21 Acres	J-21 % of Total
	0 - 9	14.1	38.0	138.0	51.5
	9 - 13	10.9	29.4	52.2	19.5
	13 - 18	3.4	9.1	17.6	6.6
	18 - 25	7.4	19.9	51.5	19.2
	25 - 33	1.1	3.0	7.4	2.8
	33 +	0.2	0.6	1.0	0.4
Total		37.2		267.8	

J-19 Proposed Bond Release Phase I
37 ac Disturbance

J-21 Proposed Bond Release Phase I
268 ac Disturbance



ENGINEER'S CERTIFICATION
GARY ALTSISI
37842
REGISTERED PROFESSIONAL ENGINEER
ARIZONA U.S.A.
EXPIRES: 09/30/2023
GARY ALTSISI
ARIZONA P.E. 37842

Peabody

Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

Map 2.4
J-19 and J-21

Phase I
Bond Release
Premine Slope

Produced by
Gary Altsisi
Professional
Engineer

January 24, 2023
Revision

1 inch = 600 feet

10 foot contour interval
Index contours at 50 feet

N

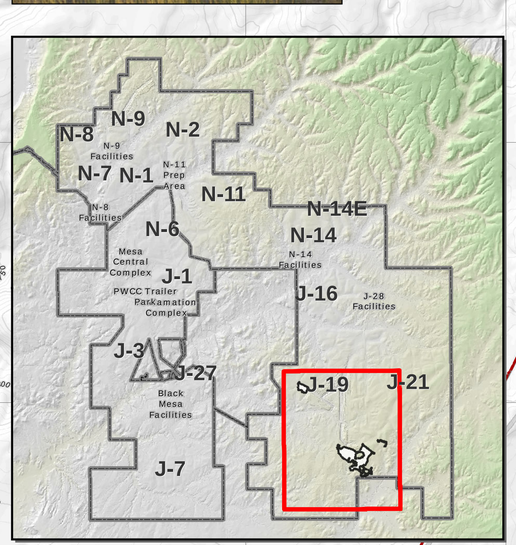
- Proposed Bond Release Phase I
- Disturbance (Unreleased)
- Major Drainages
- Permanent Impoundment
- Existing Pond
- Ranch Road - Proposed Phase I Bond Release
- Ranch Road
- Ancillary Mine Road
- Primary Mine Road
- Mine Ramp
- Secondary Mine Road
- Non-PWCC 2-Lane Unpaved Road
- Non-PWCC Single Track Road
- 50 ft Contour
- 10 ft Contour
- Cattle Guard
- Gate
- Fence
- Partition Line
- Lease Line
- Black Mesa Mine
- Kayenta Mine

File: F:\GIS\Projects\BondRelease\J19W_J21_Phase1_2023\Maps\Map 2.4 Premine Slope.mxd

	Deviation (feet)	J-19 Acres	J-19 % of Total	J-21 Acres	J-21 % of Total
	Below -40	0.0	0.0	0.0	0.0
	-40 to -20	0.0	0.0	4.8	1.8
	Within 20	37.2	100	260.6	97.3
	21 to 40	0.0	0.0	2.3	0.9
	Above 40	0.0	0.0	0.0	0.0
Total		37.2		267.8	

J-19 Proposed Bond Release Phase I
37 ac Disturbance

J-21 Proposed Bond Release Phase I
268 ac Disturbance



Proposed Bond Release Phase I Disturbance (Unreleased)
Major Drainages
Permanent Impoundment
Existing Pond
Ranch Road - Proposed Phase I Bond Release
Ranch Road
Ancillary Mine Road
Primary Mine Road
Mine Ramp
Secondary Mine Road
Non-PWCC 2-Lane Unpaved Road
Non-PWCC Single Track Road
50 ft Contour
10 ft Contour
Cattle Guard
Gate
Fence
Partition Line
Lease Line
Black Mesa Mine
Kayenta Mine

File: F:\GIS\Projects\BondRelease\J19W_J21_Phase1_BD22\Mxd\Map 2.5 Surface Comparison.mxd

ENGINEER'S CERTIFICATION
GARY ALTSISI
37842
EXPIRES: 09/30/2023
GARY ALTSISI
ARIZONA P.E. 37842

Peabody

Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

Map 2.5
J-19 and J-21
Phase I
Bond Release
Postmine Topographic Surface Comparison

Produced by
Gary Altsisi
Professional
Engineer

January 23, 2023
Revision

1 inch = 600 feet

10 foot contour interval
Index contours at 50 feet

N

E 57,000
E 58,000
E 59,000
E 60,000
E 61,000
E 62,000
N -45,000
N -46,000
N -47,000
N -48,000
N -49,000

7138'
7015'
561'
7075'
393'
7045'
921'
7138'
6947'
3,200'
6983'
3,239'

TCP - Offering Sites
TCP - Buffer Boundary
RAMP 37

J21

J21-17W.1C

AREA = 160.6 ac.
LENGTH= 4154'
ELEV. DIFF.= 191'
RECLAIMED AREA= 107.2 ac.
UNDISTURBED AREA= 41.6 ac.
DISTURBED AREA= 11.8 ac.

J21-16W.1C

AREA = 109.8 ac.
LENGTH= 4160'
ELEV. DIFF.= 155'
RECLAIMED AREA= 97.8 ac.
UNDISTURBED AREA= 12.0 ac.

× 6982.8

ENGINEER'S CERTIFICATION

Registered Professional Engineer
GARY ALTSISI
37842
ARIZONA, USA
EXPIRES: 09/30/2023

GARY ALTSISI
ARIZONA P.E. 37842

N

REVISION	REV'D BY	DATE

KAYENTA MINE
Peabody
P.O. BOX 650
KAYENTA, ARIZONA 86033

MAP 2.6 (SHEET 1 OF 2)
J21 HYDROLOGY PARAMETERS

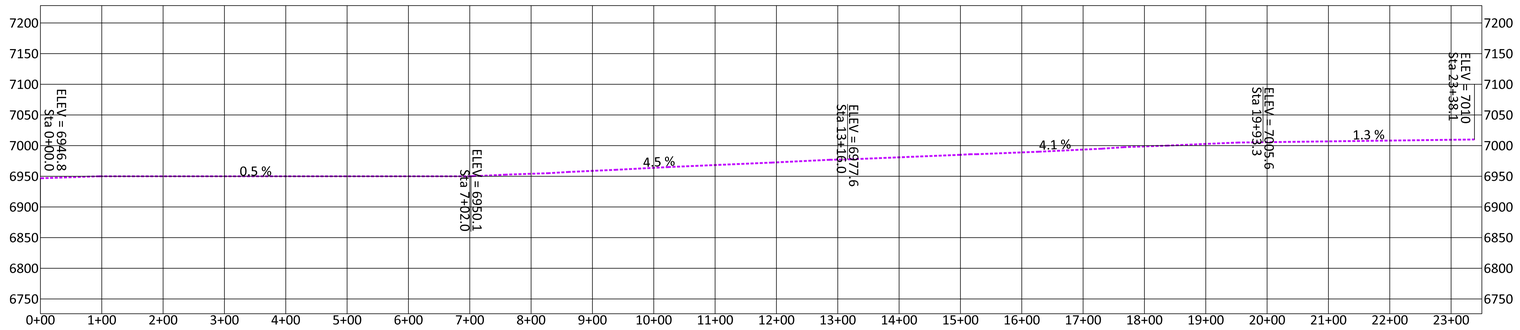
DESIGNED BY:	G.A.	COUNTRY:	USA
DRAWN BY:	G.A.	STATE:	ARIZONA
APPROVED BY:	G.A.	PHOTO DATE:	2022-06-28
DATE:	2023-01-19	DRAWING/SHEET:	1 of 2
SCALE:	1" = 150'	C.I.:	5'

0 150 300 450 FEET

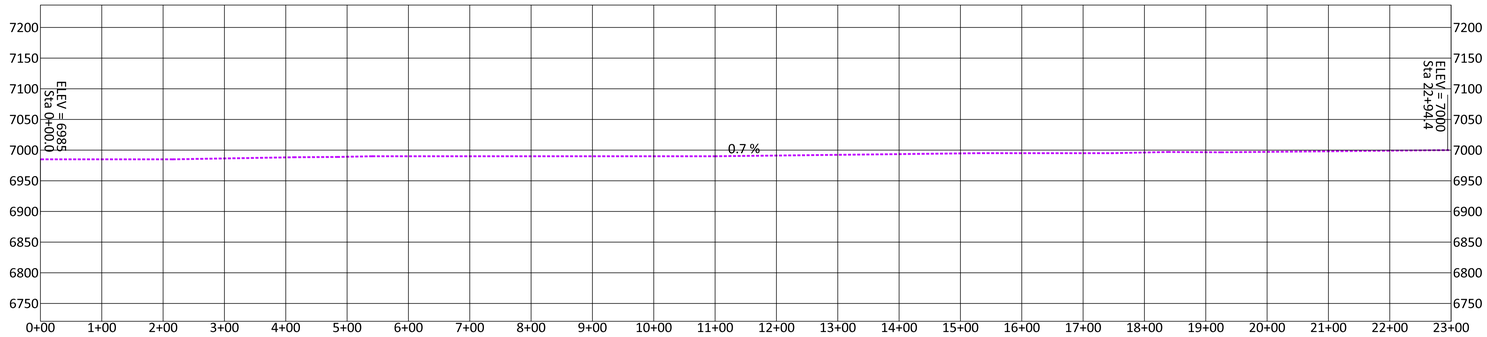
LEGEND

- DRAINAGE
- Tc – CHANNEL FLOW
- NAVAJO/HOPI BOUNDARY
- WATERSHED BOUNDARY
- PROFILE CHANNEL
- FENCE LINE
- PROPOSED BOND RELEASE AREA
- UNDISTURBED AREA
- DISTURBED AREA
- RIPRAP
- 1,000 DISTANCE SECTION OF CHANNEL
- (6979) ELEVATION POINT ON CHANNEL

J21-17W.1C Channel



J21-16W.1C Channel



N

REVISION	REV'D BY	DATE

KAYENTA MINE

Peabody

P.O. BOX 650
KAYENTA, ARIZONA 86033

ENGINEER'S CERTIFICATION

EXPIRES: 09/30/2023

GARY ALTSISI
ARIZONA P.E. 37842

MAP 2.6 (SHEET 2 OF 2)
J21 CHANNEL PROFILES

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DRAWN BY:	G.A.	**STATE:**	ARIZONA
APPROVED BY:	G.A.	**PHOTO DATE:**	2022-06-28
DATE:	2023-01-19	**DRAWING/SHEET:**	2 of 2
SCALE:	1" = 100'	**C.I.:**	5'

0 100 200 300 FEET