



PEABODY WESTERN  
COAL COMPANY  
Kayenta Mine  
Highway 160, Navajo Route 41  
P.O. Box 650  
Kayenta, Arizona 86033  
928.280.7116

May 22, 2024

Ms. Amy Ryser  
Western Region Office  
Office of Surface Mining  
Reclamation and Enforcement  
P. O. Box 25065  
One Federal Center, Building 41  
Lakewood, CO 80225-0065

**RE: Phase I Bond Release Application; Peabody Western Coal Company;  
Kayenta Mine Permit AZ-0001F; N9 Permanent Program Area**

Dear Ms. Ryser:

Peabody Western Coal Company (PWCC) submits to the Office of Surface Mining Reclamation and Enforcement (OSMRE) the enclosed application materials in accordance with 30 CFR 800.40 for phase I release of bond on approximately 661 acres of mined and reclaimed lands in the permanent program area of N9 at Kayenta Mine. The N9 reclaimed lands described within this Bond Release Application are subject to the Permanent Program Performance Standards at 30 CFR 816 and the requirements of the OSMRE issued Kayenta Mine Permit AZ-0001F permit application package approved October 3, 2017.

Attached, please find one electronic file of the Bond Release Application. PWCC understands that OSMRE will complete a bond release application review and will provide PWCC a response that will include details of information required so that OSMRE can deem the application complete. Once OSMRE has deemed the application complete, PWCC will submit a complete official application with signed documents to OSMRE electronically on the share drive provided by OSMRE and provide one copy of the application on USB drive for Forest Lake Chapter.

Please direct any questions and correspondence to me at 928.280.7091 or by email at [mshepherd2@peabodyenergy.com](mailto:mshepherd2@peabodyenergy.com).

Respectfully,

A handwritten signature in black ink, appearing to read "Marie Shepherd", written over a large, stylized circular flourish.

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

Phase I Bond Release Application  
N9 Coal Resource Areas, Kayenta Mine

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**SECTION 1. Phase I Bond Release Supporting Information**  
**Administrative, Permit, and Bond Summary Data**

**Introduction**

Peabody Western Coal Company (PWCC) is requesting Phase I bond release on portions of lands within the N9 Coal Resource Area (CRA) of the Kayenta Mine. The bond release application included in this submittal contains required documentation and information to support Phase I bond release for 661 acres of mined and reclaimed lands in the permanent program areas within the N9 CRA as shown on Map 1.1. None of the proposed permanent ponds or a request for permanent roads are included in this release application. These features will be further evaluated in relation to the final land use and customary use areas over the entire release application areas. Information such as the public notice, affidavit of publication, and copies of letters to the Tribes, government agencies, and utilities are included in Section 1 of the application. Information for the Phase I technical portions of the application are presented in Section 2 (backfilling, grading, suitable material, and soil data) of this document.

**Permit and Bond Release Summary Information**

The N9 CRA is located within the northwestern portion of PWCC's Kayenta Mine. The Kayenta Mine operates under Permit AZ-0001F issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to PWCC Kayenta Mine on October 3, 2017. The 5-year renewal application for Permit AZ-0001F was submitted to OSMRE on February 27, 2020. On June 25, 2020, OSMRE administratively delayed their decision to renew Permit AZ-0001F due to COVID-19 pandemic closures and stay-at-home orders. Coal production at the Kayenta Mine ceased on August 26, 2019; reclamation activities continue under Permit AZ-0001F.

The Kayenta mine permit area is located approximately 18 miles south southwest of Kayenta, Arizona (USGS 7.5-minute quadrangle maps Longhouse Valley, Marsh Pass S.E., Shonto S.E., Yucca Hill, and Cliff Rose Hill). The permit area for the N9 Phase I bond release is located within the following lands of Navajo County, Arizona that are described relative to the Gila and Salt River Base Meridian as:

A total of 661 acres of mined and reclaimed land located within the N9 CRA. The computer-generated centroid location is Latitude 36° 34' 14.6" N and Longitude 110° 24' 50.7" W.

The type of bond and the amount of bond filed for Kayenta Mine Permit AZ-0001F are described in Table 1.1. The portion requested for release in the N9 CRA includes \$17,015,867 for Phase I. Justification for the release dollars is explained in the following section.

<b>Table 1.1. Bond Information for Kayenta Mine.</b>		
<b>Bond Surety</b>	<b>Bond Number</b>	<b>Bond Amount</b>
Liberty Mutual	60S003887	\$20,329,521.92
SiriusPoint America Insurance	SBP150171_003	\$27,911,895.61
Zurich American	8940860	\$22,457,881.46
Goldeman Sachs Bank, USA	Letter of Credit	\$36,471,839.00
<b>TOTAL</b>		<b>\$107,171,138.00</b>

#### **Phase I Bond Reduction Cost**

PWCC is seeking a reduction in the backfilling, grading, suitable material replacement, and soil material replacement bond for Phase I in the amount of \$17,015,867. This amount was determined using direct and indirect unit costs calculated for 661 acres in N9 as documented in Permit AZ-0001F, Chapter 24, Table 24-1-4. Reclamation cost estimates as of January 2024 ("worst case" or "highest liability" as approved in Permit AZ-0001F by OSMRE on January 23, 2024) were used and these rates were adjusted for inflation through July 2025. Reduction in bond at the N9 CRA was based upon the final pit being 100% backfilled, completion of Phase I reclamation activities including general grading on 661 acres, replacing an average of 1.6 feet of suitable plant growth material on the surface of 506 acres of final graded lands as required by the graded spoil suitability data shown on Map 2.2, and replacing four feet of suitable plant growth material including one foot of suitable soil on the surface of 155 acres of final graded lands per Chapter 22, Minesoil Reconstruction, Volume 11, Permit AZ-0001F. Additionally, Phase I bond reduction is requested for general grading and suitable plant growth material replacement for areas approved (December 19, 2022) previously by OSMRE for Phase I that are now outside of the highwall footprint shadow as described in Table 1.2.2. Suitable plant growth material replacement areas are documented for the N9 CRA on Maps 2.1 and 2.2 in Section 2 of this document.

The project categories and direct costs applicable to this Phase I bond release are listed in Tables 1.2.1 and 1.2.2 for the N9 CRA. PWCC is not requesting full release of the grading and ripping maintenance costs for the disturbed lands because these are considered by OSMRE to be Phase II reclamation activities. Similarly, no costs have been requested on the disturbed lands for the Phase III reclamation activities including surface stabilization, revegetation, and vegetation maintenance. The combined total bond reduction direct costs shown in Tables 1.2.1 and 1.2.2 is \$13,890,503.

<p align="center"><b>Table 1.2.1</b></p> <p align="center"><b>Bond Reduction of Direct Costs for Backfilling, Grading, Suitable Material Replacement, and Soil Material Replacement in the N9 CRA.</b></p>	
<b>Project Category</b>	<b>Bond Reduction Amount</b>
Cast/blast high wall (100%)	\$ 685,224
Doze high wall (100%)	\$ 356,497
Doze first two spoils (100%)	\$1,131,127
Doze back two spoils (100%)	\$ 438,697
Backfill and grade ramps (100%)	\$ 761,309
General grading (661 ac @ \$4,259.45/ac)	\$2,815,497
Suitable material replacement (506 ac @ \$1.11/yd @ 1.6')	\$1,449,832
Suitable material replacement (155 ac @ \$1.11/yd @ 2.4')	\$ 666,178
Soil material replacement (155 ac @ \$1.68/yd @ 1.6')	\$ 672,179
Total Direct Cost Category I	\$8,976,540
Inflation January 2024 thru July 2025 (9.97%)	\$894,961
<b>Total Direct Cost Category I (Inflated thru 7-2025)</b>	<b>\$9,871,501</b>

<p align="center"><b>Table 1.2.2</b></p> <p align="center"><b>Bond Reduction of Direct Costs for General Grading, Suitable Material Replacement, and Soil Material Replacement in the N9 CRA*.</b></p>	
<b>Project Category</b>	<b>Bond Reduction Amount</b>
General grading (335 ac @ \$4,259.45/ac)	\$1,426,916
Suitable material replacement (258 ac @ \$1.11/yd @ 2.4')	\$1,108,864
Soil material replacement (258 ac @ \$1.68/yd @ 1.6')	\$1,118,854
Total Direct Cost Category I	\$3,654,634
Inflation January 2024 thru July 2025 (9.97%)	\$364,368
<b>Total Direct Cost Category I (Inflated thru 7-2025)</b>	<b>\$4,019,002</b>
<ul style="list-style-type: none"> <li>Phase I OSMRE approved (December 19, 2022) bond release areas in the N9 CRA that now fall outside of the highwall footprint shadow.</li> </ul>	

Table 1.3 shows the indirect costs obtained from Permit AZ-0001F; Chapter 24 that are associated with the N9 Phase I direct cost as determined in January 2024. The total indirect cost reflects inflation through July 2025 (9.97%). An inflation rate of 9.97% for the January 2024 through July 2025 period was determined by OSMRE in April 2024 using RS Means Historical Cost Indexes and approved in Permit AZ-0001F by OSMRE. The total bond reduction indirect costs shown in Table 1.3 is \$3,125,364.

<b>Table 1.3</b> <b>Bond Reduction of Indirect Costs for Backfilling, Grading, Suitable Material Replacement, and Soil Material Replacement in the N9 CRA.</b>	
<b>Project Category</b>	<b>Bond Reduction Amount</b>
Mobilization/demobilization (1.5%)	\$208,358
Contingencies (2.0%)	\$277,810
Engineering redesign fee (2.0%)	\$277,810
Contractor profit and overhead (15.0%)	\$2,083,576
Reclamation management fee (2.0%)	\$277,810
<b>Total Indirect Cost</b>	<b>\$3,125,364</b>

The total direct, indirect, and January 2024 to July 2025 inflation costs for Phase I bond categories in the N9 CRA are \$17,015,867. This total of \$17,015,867 is about 57% of the total bond of \$29,904,894 determined for N9 through July 2025 based on costs provided in Table 24-1-8 in Chapter 24 of Permit AZ-0001F. This 57% total is within the amount allowed by a Phase I bond release (60%).

#### **Permanent Facilities**

There are no requests included in this N9 Phase I bond release application for any facilities to be retained as permanent features. None of the sediment ponds (including those proposed as permanent), roads, or Kayenta Mine support facilities located within the N9 CRA are included in this Phase I bond release application.

PUBLIC NOTICE

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for bond release on a portion of the lands in the N9 Coal Resource Area (CRA) within the Kayenta Mine Permit AZ-0001F. PWCC is seeking a release of Phase I bond liability for a portion of the N9 area currently under bond with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. PWCC is seeking a reduction in bond of \$17,015,867 under the Phase I application. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release application consists of information currently contained in the AZ-0001F permit application package (PAP) approved October 3, 2017. The PAP outlines PWCC's reclamation operations on Permanent Program Lands. The total area in N9 requested for Phase I release is 661 acres. Reclamation was completed between 2012 and 2024. Reclamation activities were completed in accordance with the approved PAP and included backfilling, grading, mitigation of unsuitable material, drainage control construction, and replacement of suitable soil or plant growth media. The Kayenta Mine permit for the release area is under Navajo Tribal Coal Lease 14-20-0603-9910 and operates pursuant to Code of Federal Regulations (CFR), Title 30; Subchapter E, Part 750; Subchapter G, Parts 773 and 774; and Subchapter K, Parts 810 and 816. This notice is hereby given that:

1. The name and business address of the applicant is:

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

2. The mine permit area is located approximately 18 miles south southwest of Kayenta, Arizona. The permit area for the Phase I bond release area is in USGS 7.5-minute quadrangle map "Long House Valley" within the following lands of Navajo County, Arizona that are described relative to the Gila and Salt River Base Meridian as:

A total of 661 acres of land located within the N9 CRA. The computer-generated centroid location is Latitude 36° 34' 14.6" N and Longitude 110° 24' 50.7" W.

3. Locations of where copies of the application and permit are available for public review and/or inspection are:

Navajo Nation Minerals Department  
Office of Surface Mining  
Window Rock Boulevard  
Window Rock, AZ 86515

Forest Lake Chapter House  
Navajo Route 41  
17 Miles North of Pinon  
Pinon, AZ 86510

Peabody Western Coal Company

Kayenta Mine

Mesa Central Warehouse Office Complex

8 Miles from Hwy 160 and Route 41 Junction

Kayenta, Arizona 86033

OSMRE Website: <https://www.osmre.gov/programs/regulating-active-coal-mines/indian-lands>

4. The name and address of the OSMRE-WRO representative where written comments, objections, requests for a public hearing, or requests for an informal conference may be submitted on or before 5:00 p.m., **June 19, 2024**, thirty (30) days after the last publication date are:

Ms. Amy Ryser

Western Region Office

Office of Surface Mining Reclamation & Enforcement

P. O. Box 25065

One Federal Center, Building 41

Lakewood, CO 80225-0065

WR Permitting Information Line, 1-866-847-7362

5. Interested persons may obtain more information concerning the bond release by contacting Marie Shepherd, Senior Manager Environmental for PWCC at 928.280.7091.
6. The application has been filed with OSMRE and will be acted upon pursuant to the Permanent Regulatory Program (30 CFR Parts 750 and 774) approved by the Secretary of the Interior under Title V of the Surface mining Control and Reclamation Act of 1977.



**PEABODY WESTERN  
COAL COMPANY**  
Kayenta Mine  
Highway 160, Navajo Route 41  
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Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Bureau of Indian Affairs  
Navajo Area Office  
Ms. Deborah Shirley, Acting Regional Director  
P.O. Box 1060  
301 West Hill Street  
Gallup, New Mexico 87305-1060

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Ms. Shirley:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northwestern portion of the PWCC lease area. PWCC is seeking a reduction of the total N9 bond amount of \$17,015,867 at this time by gaining regulatory approval for release of lands described in the application from Phase I bond liability. The total area sought for release includes 661 acres of disturbed land. Approval of Phase I will allow for Phase II and III bond release to proceed on these areas once all requirements for this phase are met. Phase III is the final bond release step and once approved will allow for the planned return of these lands to the Navajo Nation in the future. Until that time, PWCC will continue to control and manage reclaimed lands in the release areas described.

Reclamation of the Phase I release areas which includes backfilling and grading, drainage control, mitigation of unsuitable material, and topsoil replacement was completed between 2012 and 2024. All reclamation activities were conducted in accordance with the Surface Mining Control and Reclamation Act (SMCRA) and the requirements of the OSMRE Permit AZ-0001F PAP approved October 3, 2017. Reclamation activities are documented in annual reports submitted previously to OSMRE.

The application and permit are available for public review and/or inspection at:

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Office of Surface Mining  
Window Rock Boulevard  
Window Rock, AZ 86515

Forest Lake Chapter House  
Navajo Route 41  
17 miles North of Pinon  
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Ms. Deborah Shirley  
May 22, 2024  
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Kayenta, Arizona 86033

OSMRE Website: [https://www.osmre.gov/news/archive/kayentaBlack Mesa](https://www.osmre.gov/news/archive/kayentaBlack%20Mesa)

If you have questions, comments, or wish to request a hearing or informal conference regarding this bond release application, please contact:

Ms. Amy Ryser  
Western Region Office  
Office of Surface Mining Reclamation & Enforcement  
P. O. Box 25065  
One Federal Center, Building 41  
Lakewood, CO 80225-0065  
WR Permitting Information Line, 1-866-847-7362

Please direct your questions about this application to me at 928.280.7091 or email them to me at [mshepherd2@peabodyenergy.com](mailto:mshepherd2@peabodyenergy.com).

Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)





**PEABODY WESTERN  
COAL COMPANY**

Kayenta Mine  
Highway 160, Navajo Route 41  
P.O. Box 650  
Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Bureau of Land Management  
Arizona State Office  
Mr. Peter Godfrey  
Native American Minerals Lead  
One North Central Ave., Suite 800  
Phoenix, Arizona 85004

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Mr. Godfrey:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northwestern portion of the PWCC lease area. PWCC is seeking a reduction of the total N9 bond amount of \$17,015,867 at this time by gaining regulatory approval for release of lands described in the application from Phase I bond liability. The total area sought for release includes 661 acres of disturbed land. Approval of Phase I will allow for Phase II and III bond release to proceed on these areas once all requirements for this phase are met. Phase III is the final bond release step and once approved will allow for the planned return of these lands to the Navajo Nation in the future. Until that time, PWCC will continue to control and manage reclaimed lands in the release areas described.

Reclamation of the Phase I release areas which includes backfilling and grading, drainage control, mitigation of unsuitable material, and topsoil replacement was completed between 2012 and 2024. All reclamation activities were conducted in accordance with the Surface Mining Control and Reclamation Act (SMCRA) and the requirements of the OSMRE Permit AZ-0001F PAP approved October 3, 2017. Reclamation activities are documented in annual reports submitted previously to OSMRE.

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Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)



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Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Chilchinbeto Chapter  
Mr. Paul Madson, President  
P.O. Box 1681  
Kayenta, Arizona 86033

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Mr. Madson:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northwestern portion of the PWCC lease area. PWCC is seeking a reduction of the total N9 bond amount of \$17,015,867 at this time by gaining regulatory approval for release of lands described in the application from Phase I bond liability. The total area sought for release includes 661 acres of disturbed land. Approval of Phase I will allow for Phase II and III bond release to proceed on these areas once all requirements for this phase are met. Phase III is the final bond release step and once approved will allow for the planned return of these lands to the Navajo Nation in the future. Until that time, PWCC will continue to control and manage reclaimed lands in the release areas described.

Reclamation of the Phase I release areas which includes backfilling and grading, drainage control, mitigation of unsuitable material, and topsoil replacement was completed between 2012 and 2024. All reclamation activities were conducted in accordance with the Surface Mining Control and Reclamation Act (SMCRA) and the requirements of the OSMRE Permit AZ-0001F PAP approved October 3, 2017. Reclamation activities are documented in annual reports submitted previously to OSMRE.

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Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)



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Forest Lake Chapter  
Ms. Mae Gilene Begay, President  
P.O. Box 441  
Pinon, Arizona 86510

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Ms. Begay:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

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Respectfully,

Marie Shepherd  
Senior Manager Environmental  
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C: Amy Ryser (OSMRE-WRO)



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May 22, 2024

The Hopi Tribe  
Office of Mining and Minerals  
Attn: Dr. Carrie Joseph  
P.O. Box 123  
Kykotsmovi, AZ 86039

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Dr. Joseph:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northwestern portion of the PWCC lease area. PWCC is seeking a reduction of the total N9 bond amount of \$17,015,867 at this time by gaining regulatory approval for release of lands described in the application from Phase I bond liability. The total area sought for release includes 661 acres of disturbed land. Approval of Phase I will allow for Phase II and III bond release to proceed on these areas once all requirements for this phase are met. Phase III is the final bond release step and once approved will allow for the planned return of these lands to the Navajo Nation in the future. Until that time, PWCC will continue to control and manage reclaimed lands in the release areas described.

Reclamation of the Phase I release areas which includes backfilling and grading, drainage control, mitigation of unsuitable material, and topsoil replacement was completed between 2012 and 2024. All reclamation activities were conducted in accordance with the Surface Mining Control and Reclamation Act (SMCRA) and the requirements of the OSMRE Permit AZ-0001F PAP approved October 3, 2017. Reclamation activities are documented in annual reports submitted previously to OSMRE.

The application and permit are available for public review and/or inspection at:

Navajo Nation Minerals Department  
Office of Surface Mining  
Window Rock Boulevard  
Window Rock, AZ 86515

Forest Lake Chapter House  
Navajo Route 41  
17 miles North of Pinon  
Pinon, AZ 86510

Dr. Carrie Joseph  
May 22, 2024  
Page 2 of 2

Peabody Western Coal Company  
Kayenta Mine  
Mesa Central Warehouse Office Complex  
8 Miles from Hwy 160 and Route 41 Junction  
Kayenta, Arizona 86033

OSMRE Website: <https://www.osmre.gov/news/archive/kayentaBlackMesa>

If you have questions, comments, or wish to request a hearing or informal conference regarding this bond release application, please contact:

Ms. Amy Ryser  
Western Region Office  
Office of Surface Mining Reclamation & Enforcement  
P. O. Box 25065  
One Federal Center, Building 41  
Lakewood, CO 80225-0065  
WR Permitting Information Line, 1-866-847-7362

Please direct your questions about this application to me at 928.280.7091 or email them to me at [mshepherd2@peabodyenergy.com](mailto:mshepherd2@peabodyenergy.com).

Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)





**PEABODY WESTERN  
COAL COMPANY**  
Kayenta Mine  
Highway 160, Navajo Route 41  
P.O. Box 650  
Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Kayenta Chapter  
Mr. Dalton Singer, President  
P.O. Box 1088  
Kayenta, Arizona 86033

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Mr. Singer:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northwestern portion of the PWCC lease area. PWCC is seeking a reduction of the total N9 bond amount of \$17,015,867 at this time by gaining regulatory approval for release of lands described in the application from Phase I bond liability. The total area sought for release includes 661 acres of disturbed land. Approval of Phase I will allow for Phase II and III bond release to proceed on these areas once all requirements for this phase are met. Phase III is the final bond release step and once approved will allow for the planned return of these lands to the Navajo Nation in the future. Until that time, PWCC will continue to control and manage reclaimed lands in the release areas described.

Reclamation of the Phase I release areas which includes backfilling and grading, drainage control, mitigation of unsuitable material, and topsoil replacement was completed between 2012 and 2024. All reclamation activities were conducted in accordance with the Surface Mining Control and Reclamation Act (SMCRA) and the requirements of the OSMRE Permit AZ-0001F PAP approved October 3, 2017. Reclamation activities are documented in annual reports submitted previously to OSMRE.

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Mr. Dalton Singer  
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Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)



**PEABODY WESTERN  
COAL COMPANY**  
Kayenta Mine  
Highway 160, Navajo Route 41  
P.O. Box 650  
Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Navajo Nation  
Minerals Department  
Ms. Rowena L. Cheromiah  
P.O. Box 1910  
Window Rock, AZ 86515

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Ms. Cheromiah:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

The Phase I bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northwestern portion of the PWCC lease area. PWCC is seeking a reduction of the total N9 bond amount of \$17,015,867 at this time by gaining regulatory approval for release of lands described in the application from Phase I bond liability. The total area sought for release includes 661 acres of disturbed land. Approval of Phase I will allow for Phase II and III bond release to proceed on these areas once all requirements for this phase are met. Phase III is the final bond release step and once approved will allow for the planned return of these lands to the Navajo Nation in the future. Until that time, PWCC will continue to control and manage reclaimed lands in the release areas described.

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Ms. Rowena L. Cheromiah  
May 22, 2024  
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Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)



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COAL COMPANY**  
Kayenta Mine  
Highway 160, Navajo Route 41  
P.O. Box 650  
Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Navajo Tribal Utility Authority  
Mr. Walter W. Haase, P.E., General Manager  
P.O. Box 170  
Fort Defiance, Arizona 86504-0170

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Mr. Haase:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

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Mr. Walter W. Haase  
May 22, 2024  
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Please direct your questions about this application to me at 928.280.7091 or email them to me at [mshepherd2@peabodyenergy.com](mailto:mshepherd2@peabodyenergy.com).

Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)



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COAL COMPANY**  
Kayenta Mine  
Highway 160, Navajo Route 41  
P.O. Box 650  
Kayenta, Arizona 86033  
928.280.7115

May 22, 2024

Shonto Chapter  
Mr. Roland Smallcanyon, President  
P. O. Box 7800  
Shonto, AZ 86054

**RE: Notice of Application for Phase I Bond Release; N9 Coal Resource Area; Kayenta Mine**

Dear Mr. Smallcanyon:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase I bond release on portions of the N9 Coal Resource Area. The release area is in the northwestern portion of the PWCC lease area. PWCC is seeking release from Phase I bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldman Sachs Bank, USA. The total combined bond for Kayenta Mine is \$107,171,138.

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Respectfully,

Marie Shepherd  
Senior Manager Environmental  
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)





**Kayenta Complex**  
PO Box 650  
Kayenta, Arizona USA 86033

N-9 Phase I Bond Release  
**Map 1.1**  
**Permanent Program**  
**Bonded Area Summary**

Produced by  
Gary Altsisi  
Professional  
Engineer

May 21, 2024  
Revision  
1 Inch = 400 Feet  
5 foot contour interval  
Index contours at 25 feet



**Disturbed Land Status**

Phase I Bond Released	
Proposed Phase I Bond Release 661 Acres	
Fully Bonded Land	
Interim / Pre-Law Land	



**Other Features**

- Major Wash
- PWCC Permit Boundary
- Pond

ENGINEER'S CERTIFICATION



Gary Altsisi  
ARIZONA P.E. 37842

**Proposed Phase I  
Bond Release Area**

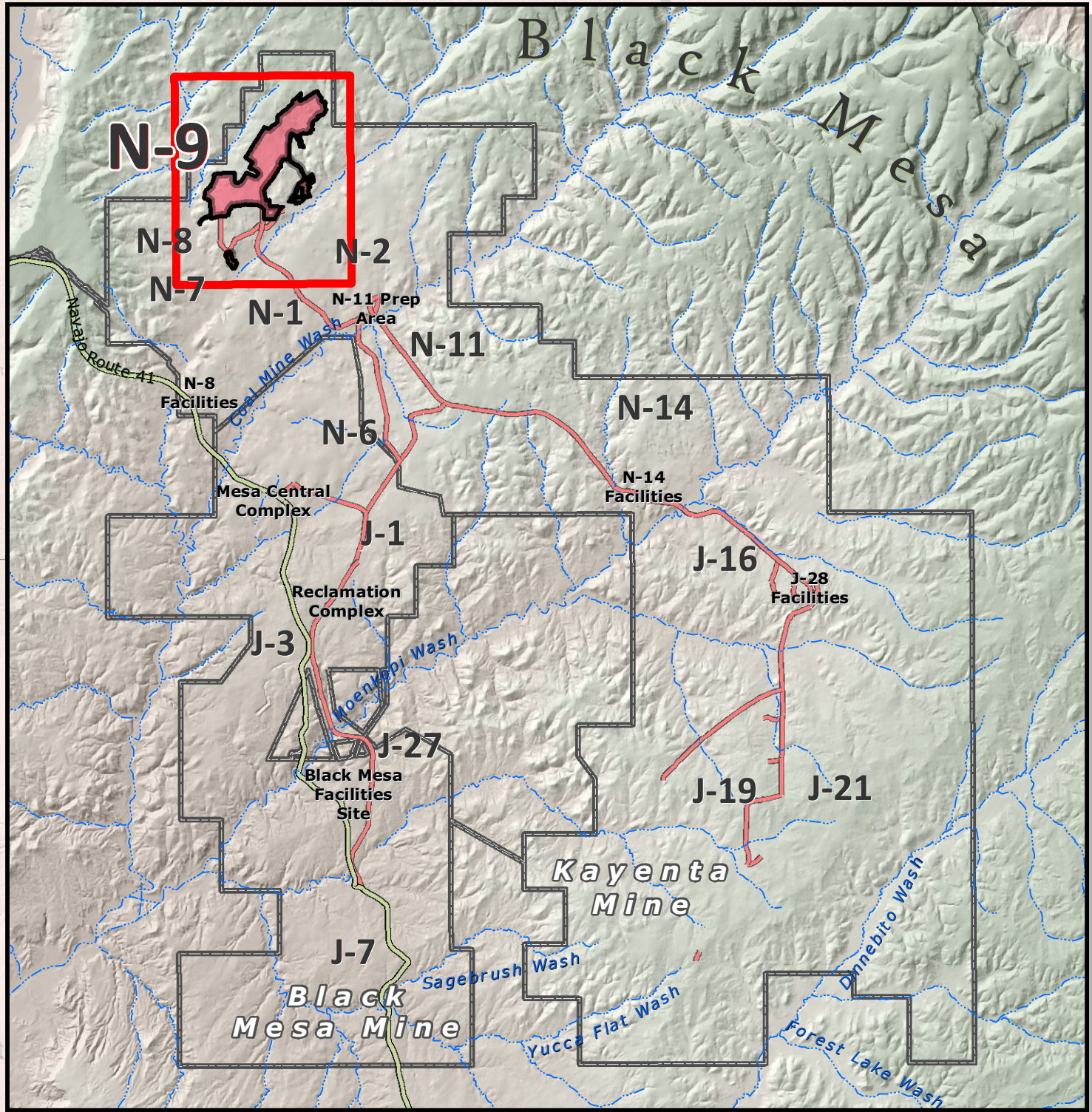
650 acres

**N - 9**

**N - 8**

**N - 7**

**N - 1**





Phase I Bond Release Application  
N9 Coal Resource Areas, Kayenta Mine

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**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 N9 Coal Resource Area (CRA) 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 N9 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 N9 areas occurred from 2012 to 2024. 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). 2013-2024. 2012-2023 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. 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 N9 reclamation areas included in this submittal. The N9 release areas included with this Phase I bond release application are all Permanent Program Lands. The N9 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 N9 reclamation areas can be found on Map 2.3 (Post-Mine) and Map 2.4 (Pre-Mine). Table 2.1 provides a summary of the area in each slope measurement classification before mining and after mining for the N9 release areas, respectively:

**Table 2.1. Pre- and Post-Mining Slope Analysis for N9 Permanent Program Reclaimed Areas.**

**POST - MINING SLOPE ANALYSIS:**

<b>RANGE</b>	<b>BEGINNING (%)</b>	<b>END (%)</b>	<b>AREA (Ac.)</b>	<b>PERCENT of TOTAL AREA</b>	<b>POST - MINING SLOPE AREA vs. PRE - MINING SLOPE AREA (%)</b>
1	0	9	246	37.2	-9.8
2	9	13	145	21.9	+0.9
3	13	18	127	19.2	+2.7
4	18	25	110	16.6	+5.7
5	25	33	27	4.0	-0.2
6	33	+	6	1.0	-0.5

**PRE - MINING SLOPE ANALYSIS:**

<b>RANGE</b>	<b>BEGINNING (%)</b>	<b>END (%)</b>	<b>AREA (Ac.)</b>	<b>PERCENT of TOTAL AREA</b>
1	0	9	311	47.0
2	9	13	139	21.0
3	13	18	101	15.3
4	18	25	72	10.9
5	25	33	28	4.2
6	33	+	10	1.5

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 N9 post-mine topography has approximately 10% less 0-9% slopes and approximately 6% more 18-25% 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 K6 and K7, Volume 29 of Permit AZ-0001F. The reclaimed surface was within +/- 20 feet of the estimated post-mine contours in more than 80% of the area as shown on Map 2.5. The outlier areas shown on Map 2.5 are less than +/-10% and are mainly related to the highwall reduction once mining and reclamation operations end. These areas all blend with the adjacent PMT and overall surface configuration.

Attachment 2.1 includes the as-built information for the N9 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 N9 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 N9 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 any pond in the N9 Phase I bond release watersheds for the period of record (2005-2024). One (1) complete water quality sample was collected from Pond N9-C1 in 2022. This was done at the request of the Navajo Nation and is/was not required as there are currently no proposed permanent impoundments envisioned for the N9 area per the approved monitoring schedule presented in Table 10, Chapter 16 of the Permit Application Package (PAP) for Permit AZ-0001F. Laboratory data for the one (1) sample collected indicate all analytes met applicable livestock water quality standards.

#### **Spoil Sampling and Suitable Material Replacement**

Final graded spoil for the N9 CRA permanent program lands was sampled during ten (10) years during 2012, 2013, 2015, 2016, 2017, 2018, 2021, 2022, 2023, and 2024 (as documented in Attachment 2.3) 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 nine (9) annual monitoring reports as referenced below and documented in Attachment 2.3. Spoil sampling results from 2024, included in Attachment 2.3, will be submitted to OSMRE in 2025.

Peabody Western Coal Company (PWCC). 2013, 2014, 2016, 2017, 2018, 2019, 2022, 2023, 2024. 2012, 2013, 2015, 2016, 2017, 2018, 2021, 2022, 2023 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 and Lakewood, Colorado.

Spoil sample laboratory data from the reports listed above that is pertinent to the Phase I bond release area is included in Attachment 2.3 for the N9 CRA. A total of 338 sites were located on final graded spoil slopes and sampled within the designated Phase I release area. The coal removal boundary which corresponds closely with the spoil grading limit is shown on Map 2.2 where needed to identify where sampling was required to ensure all final graded spoil areas were sampled per Chapter 22, Volume 11, Permit AZ-0001F. One hundred eighty-five (185) of the 338 sites sampled (55%) as listed in Attachment 2.3 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. Ninety-two (92) midpoint sample sites as listed in Attachment 2.3 and shown on Map 2.2 were sampled to verify the lateral extent of spoil suitability. Topsoil, suitable residual soils, and weathered overburden derived from mostly scoria, sandstone, and siltstone were used to bury unsuitable spoil at N9 when 2, 3, or 4 feet of suitable mitigation material was required as shown on Map 2.2. Nineteen (19) sample sites as listed in Attachment 2.3 and shown on Map 2.2 had marginally suitable test criterion(s) within threshold standards approved by OSMRE in Permit AZ-0001F. Four feet or more of suitable residual soils and weathered overburden were used in one (1) cultural planting area that totaled 21 acres. Occasionally, topsoil was used in N9 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 0.8 feet of mitigation material was required for the entire Phase I release area (661 acres) based on the comprehensive graded spoil sampling suitability analysis presented in Attachment 2.3. For the one (1) 21-acre cultural area, an average of 3.0 feet of mitigation material was required based on the comprehensive graded spoil sampling suitability analyses presented in Attachment 2.3. For the remaining areas that have had suitable plant growth material replaced (134 acres), an average of 0.5 feet of mitigation material was required based on the comprehensive graded spoil sampling suitability analysis presented in Attachment 2.3. As documented in the next section titled

Suitable Plant Growth Material Thickness, the mean thickness of mitigation material replaced for the 155-acre combined areas equaled 2.1 feet (excluding one (1) foot of topsoil, suitable soil, 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 N9 CRAs from 2012 to 2024. 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, 2023) shown on the Northwest Sheet contained in the 2023 Reclamation Status and Monitoring Report, Black Mesa and Kayenta Mines (submitted May 2024). Suitable plant growth material replacement areas for the 2024 calendar year will be submitted to the regulatory authority with the next annual report in May 2025. 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.

One (1) red rock cultural planting site and three (3) suitable soil/steep slope sites, totaling 57 acres combined as shown on Map 2.1, received an average of 4.2 feet of suitable residual soils and weathered overburden. Topsoil was not replaced at these four (4) sites that totaled 57 acres.

One suitable plant growth material thickness survey of the N9 reclaimed area included with this Phase I bond release application was completed during April 2024 as shown on Map 2.1. Personnel from Peabody Western Coal Company (PWCC) observed sites in the N9 reclaimed areas 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 13 sites within the topsoiled, cultural planting, and suitable soil/steep slope areas of N9 (155 acres) prior to going into the field. Suitable plant growth material thickness verification sites were not placed within the rock dewater, large drainage areas, and areas in N9 that have not yet been topsoiled that, when combined totaled 506 acres. A sampling density of about 1 site per 12 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 N9 soil thickness evaluations. A Trimble 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.

Thirteen (13) sample sites were randomly placed within the 155 acres of disturbed lands that received suitable plant growth material within the release area. Suitable plant growth material thickness was verified at all 13 sites. Suitable plant growth material thickness among the 13 profiles placed over the N9 release area ranged from 1.3 to 5.5 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 and suitable soil/steep slope areas noted in Table 2.2 was 2.2 feet over eight (8) sites. The mean soil and suitable material thickness of 2.2 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 (98 acres) are combined with the cultural planting and suitable soil/steep slope areas (57 acres), the mean thickness of suitable plant growth material is 3.1 feet (Table 2.2). This mean thickness of 3.1 feet exceeds the average combined topsoil and mitigation material thickness of 1.9 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 N9 Phase I release areas shown on Map 1.1.



Table 2.2. Suitable Plant Growth Material Thickness Verification Sites Sampled by PWCC at N9 During April 2024 (See Map 2.1 for Site Locations).				
Site ID <sup>(1)</sup>	Easting (feet) <sup>(2)</sup>	Northing (feet) <sup>(2)</sup>	Soil/Mitigation Thickness (feet)	Coal Resource Area
1	21115	1882	2.9/4.8 <sup>(4)</sup>	N9
2	21028	6080	3.7	N9
3	22463	6733	1.3	N9
4	26192	7556	5.5 <sup>(5)</sup>	N9
5	25334	6438	2.0 <sup>(5)</sup>	N9
6	23807	7947	2.9	N9
7	26478	11804	1.4	N9
8	26432	12168	1.4	N9
9	26617	13335	4.3 <sup>(3)</sup>	N9
10	26397	12574	4.7 <sup>(3)</sup>	N9
11	26821	13272	1.7	N9
12	25985	12884	4.3 <sup>(3)</sup>	N9
13	23260	10130	2.0	N9
<b>MEAN</b>			<b>2.2/3.1 <sup>(4)</sup></b>	
<sup>(1)</sup> For location see Map 2.1. <sup>(2)</sup> PWCC coordinate system. <sup>(3)</sup> Cultural planting area. <sup>(4)</sup> Total thickness attributed to topsoil and suitable mitigative material. <sup>(5)</sup> Suitable soil/steep slope sites.				

KAYENTA MINE  
POST MINE TOPO EXHIBIT #1  
WATERSHED & CHANNEL DESIGNS  
N9



TABLE N9-2024  
Channel Design Summary

Channel N9-1W.1C												
Typical Rip Rap Lined Channel												
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Depth Flow (ft)	Velocity (fps)	Designed			Total Depth (ft)	Rip Rap (in)	Watershed (acres)
							Free Board (ft)	Free Board (ft)	Free Board (ft)			
N9-1W.1C	62.37	2.80	19	3	0.6	5.35	1			1.6	N/A	143.6
												0.303
												85
												B

Design Flow: 10-year, 6-hour Storm



# **N9-1W.1C WATERSHED DESIGN (10YR- 6HR)**

Kurtis Silversmith

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

## ***General Information***

### ***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

***Structure Networking:***

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-1W.1C WATERSHED

#1  
Null



***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	143.600	143.600	62.37	4.94

Structure Detail:

Structure #1 (Null)

N9-1W.1C WATERSHED

Structure #	Structure Name	Structure Type	Structure Code	Structure Status	Structure Date	Structure User
1	N9-1W.1C WATERSHED	Watershed	WATERSHED	Active	04-22-2024	Admin

### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	143.600	0.303	0.000	0.000	85.000	M	62.37	4.938
<b>Σ</b>		<b>143.600</b>						<b>62.37</b>	<b>4.938</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	5.77	52.00	901.00	3.600	0.069
		8. Large gullies, diversions, and low flowing streams	1.47	45.00	3,062.00	3.630	0.234
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.303</b>

## **N9-1W.1C GRAVEL CHANNEL (2.8%)**

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)
19.00	3.0:1	3.0:1	2.8	0.0300	1.00			5.5

	w/o Freeboard	w/ Freeboard
Design Discharge:	62.37 cfs	
Depth:	0.56 ft	1.56 ft
Top Width:	22.38 ft	28.38 ft
Velocity:	5.35 fps	
X-Section Area:	11.66 sq ft	
Hydraulic Radius:	0.517 ft	
Froude Number:	1.31	



TABLE N9-2024  
Channel Design Summary

Channel N9-1W.3C												
Typical Rip Rap Lined Channel												
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Depth Flow (ft)	Velocity (fps)	Designed			Total Depth (ft)	Rip Rap (in)	Watershed (acres)
							Free Board (ft)	Free Board (ft)	Free Board (ft)			
N9-1W.3C	83.54	2.90	26	3	0.6	5.46	1			1.6	N/A	202.1
												0.276
												84
												B

Design Flow: 10-year, 6-hour Storm



# **N9-1W.3C WATERSHED DESIGN** **(10YR-6HR)**

Kurtis Silversmith

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



***General Information***

***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

## Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-1W.3C WATERSHED

#1
Null

## ***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	202.100	202.100	83.54	6.41

## Structure Detail:

### Structure #1 (Null)

N9-1W.3C WATERSHED

Structure #	Structure Name	Structure Type	Structure Material	Structure Length (ft)	Structure Width (ft)	Structure Height (ft)	Structure Volume (cu ft)
1	N9-1W.3C WATERSHED	Watershed	Null	0.0	0.0	0.0	0.0

### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	202.100	0.276	0.000	0.000	84.000	M	83.54	6.415
<b>Σ</b>		<b>202.100</b>						<b>83.54</b>	<b>6.415</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	13.34	105.00	787.00	5.470	0.039
		8. Large gullies, diversions, and low flowing streams	3.32	155.00	4,666.00	5.460	0.237
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.276</b>

**N9-1W.3C GRAVEL CHANNEL (2.9%)**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)
26.00	3.0:1	3.0:1	2.9	0.0300	1.00			5.5

	w/o Freeboard	w/ Freeboard
Design Discharge:	83.54 cfs	
Depth:	0.55 ft	1.55 ft
Top Width:	29.32 ft	35.32 ft
Velocity:	5.46 fps	
X-Section Area:	15.30 sq ft	
Hydraulic Radius:	0.519 ft	
Froude Number:	1.33	



TABLE N9-2024  
Channel Design Summary

Channel N9-2W.1C															
Typical Rip Rap Lined Channel															
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Depth Flow (ft)	Velocity (fps)	Designed			Total Depth (ft)	Rip Rap (in)	Watershed (acres)	Time of Concentration (hr)	Curve Number	Design C
							Free Board (ft)	Free Board (ft)	Free Board (ft)						
N9-2W.1C	65.46	5.60	22	3	0.5	5.16	1			1.5	3	438.5	0.712	79	C

Design Flow: 10-year, 6-hour Storm





# **N9-2W.1C WATERSHED DESIGN (10YR- 6HR)**

Kurtis Silversmith

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

## ***General Information***

### ***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

**Structure Networking:**

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-2W.1C WATERSHED

#1

Null

***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	438.500	438.500	65.46	8.91

Structure Detail:

Structure #1 (Null)

N9-2W.1C WATERSHED

Station	Left Bank	Right Bank	Structure	Notes
1+00	100.00	100.00	0.00	Structure 1
1+05	100.00	100.00	0.00	Structure 1
1+10	100.00	100.00	0.00	Structure 1
1+15	100.00	100.00	0.00	Structure 1
1+20	100.00	100.00	0.00	Structure 1
1+25	100.00	100.00	0.00	Structure 1
1+30	100.00	100.00	0.00	Structure 1
1+35	100.00	100.00	0.00	Structure 1
1+40	100.00	100.00	0.00	Structure 1
1+45	100.00	100.00	0.00	Structure 1
1+50	100.00	100.00	0.00	Structure 1
1+55	100.00	100.00	0.00	Structure 1
1+60	100.00	100.00	0.00	Structure 1
1+65	100.00	100.00	0.00	Structure 1
1+70	100.00	100.00	0.00	Structure 1
1+75	100.00	100.00	0.00	Structure 1
1+80	100.00	100.00	0.00	Structure 1
1+85	100.00	100.00	0.00	Structure 1
1+90	100.00	100.00	0.00	Structure 1
1+95	100.00	100.00	0.00	Structure 1
2+00	100.00	100.00	0.00	Structure 1

### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	438.500	0.712	0.000	0.000	79.000	M	65.46	8.913
<b>Σ</b>		<b>438.500</b>						<b>65.46</b>	<b>8.913</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	7.00	78.00	1,114.00	2.110	0.146
		6. Grassed waterway	7.97	95.00	1,192.00	4.230	0.078
		8. Large gullies, diversions, and low flowing streams	1.88	95.00	5,051.00	4.110	0.341
		8. Large gullies, diversions, and low flowing streams	4.06	130.00	3,204.00	6.040	0.147
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.712</b>

**N9-2W.1C RIPRAP CHANNEL (5.6%)**

Material: Riprap

*Trapezoidal Channel*

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
22.00	3.0:1	3.0:1	5.6	1.00		

**PADER Method - Steep Slope Design**

	w/o Freeboard	w/ Freeboard
Design Discharge:	65.46 cfs	
Depth:	0.54 ft	1.54 ft
Top Width:	25.22 ft	31.22 ft
Velocity:	5.16 fps	
X-Section Area:	12.68 sq ft	
Hydraulic Radius:	0.499 ft	
Froude Number:	1.28	
Manning's n:	0.0430	
Dmin:	2.00 in	
D50:	3.00 in	
Dmax:	4.50 in	





TABLE N9-2024  
Channel Design Summary

Channel N9-2W.3C												
Typical Rip Rap Lined Channel												
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Depth Flow (ft)	Velocity (fps)	Designed			Total Depth (ft)	Rip Rap (in)	Watershed (acres)
							Free Board (ft)	Free Board (ft)	Free Board (ft)			
N9-2W.3C	46.07	3.00	18	3	0.5	4.98	1			1.5	N/A	240.2
												0.565
												80
												A

Design Flow: 10-year, 6-hour Storm



# **N9-2W.3C WATERSHED DESIGN** **(10YR-6HR)**

Kurtis Silversmith

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

## ***General Information***

### ***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

***Structure Networking:***

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-2W.3C WATERSHED

#1  
Null

## ***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	240.200	240.200	46.07	5.36

Structure Detail:

Structure #1 (Null)

N9-2W.3C WATERSHED

Structure ID	Structure Name	Structure Type	Structure Material	Structure Size	Structure Location	Structure Status
1	N9-2W.3C WATERSHED	Watershed	Concrete	1000' x 1000'	1000' x 1000'	Active



### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	240.200	0.565	0.000	0.000	80.000	M	46.07	5.360
<b>Σ</b>		<b>240.200</b>						<b>46.07</b>	<b>5.360</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	7.00	78.00	1,114.00	2.110	0.146
		6. Grassed waterway	7.97	95.00	1,192.00	4.230	0.078
		8. Large gullies, diversions, and low flowing streams	1.88	95.00	5,051.00	4.110	0.341
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.565</b>

**N9-2W.3C 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)
18.00	3.0:1	3.0:1	3.0	0.0300	1.00			5.0

	w/o Freeboard	w/ Freeboard
Design Discharge:	46.07 cfs	
Depth:	0.48 ft	1.48 ft
Top Width:	20.86 ft	26.86 ft
Velocity:	4.98 fps	
X-Section Area:	9.25 sq ft	
Hydraulic Radius:	0.440 ft	
Froude Number:	1.32	



TABLE N9-2024  
Channel Design Summary

Channel N9-3W.2C												
Typical Rip Rap Lined Channel												
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Designed			Total Depth (ft)	Rip Rap (in)	Watershed (acres)	Time of Concentration (hr)	Curve Number
					Flow (ft)	Depth (ft)	Velocity (fps)					
N9-3W.2C	14.73	8.40	15	3	0.2	0.2	4.76	1.2	N/A	17.6	0.056	84
												A

Design Flow: 10-year, 6-hour Storm



# **N9-3W.2C WATERSHED DESIGN (10YR- 6HR)**

Kurtis Silversmith

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

***General Information***

***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-3W.2C WATERSHED





## ***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	17.600	17.600	14.73	0.69

**Structure Detail:**

Structure #1 (Null)

N9-3W.2C WATERSHED

### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	17.600	0.056	0.000	0.000	84.000	M	14.73	0.694
<b>Σ</b>		<b>17.600</b>						<b>14.73</b>	<b>0.694</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	7.64	35.00	458.00	4.140	0.030
		8. Large gullies, diversions, and low flowing streams	13.17	135.00	1,025.00	10.880	0.026
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.056</b>

**N9-3W.2C 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)
15.00	3.0:1	3.0:1	8.4	0.0300	1.00			5.0

	w/o Freeboard	w/ Freeboard
Design Discharge:	14.73 cfs	
Depth:	0.20 ft	1.20 ft
Top Width:	16.19 ft	22.19 ft
Velocity:	4.76 fps	
X-Section Area:	3.09 sq ft	
Hydraulic Radius:	0.190 ft	
Froude Number:	1.92	



TABLE N9-2024  
Channel Design Summary

Channel N9-4W.1C												
Typical Rip Rap Lined Channel												
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Designed		Velocity (fps)	Depth Flow (ft)	Total Depth (ft)	Rip Rap (in)	Watershed (acres)	Time of Concentration (hr)
					Free Board (ft)	Free Board (ft)						
N9-4W.1C	14.11	2.30	17	3	0.3	0.3	3.00	1	1.3	N/A	31.0	0.132
											83	A

Design Flow: 10-year, 6-hour Storm



# **N9-4W.1C WATERSHED DESIGN** **(10YR-6HR)**

Kurtis Silversmith

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



***General Information***

***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-4W.1C WATERSHED

#1  
Null

## ***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	31.000	31.000	14.11	0.92

Structure Detail:

Structure #1 (Null)

N9-4W.1C WATERSHED

### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	31.000	0.132	0.000	0.000	83.000	M	14.11	0.918
<b>Σ</b>		<b>31.000</b>						<b>14.11</b>	<b>0.918</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	9.27	105.00	1,133.00	4.560	0.069
		8. Large gullies, diversions, and low flowing streams	2.55	28.00	1,100.00	4.780	0.063
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.132</b>

**N9-4W.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	2.3	0.0300	1.00			5.0

	w/o Freeboard	w/ Freeboard
Design Discharge:	14.11 cfs	
Depth:	0.26 ft	1.26 ft
Top Width:	18.58 ft	24.58 ft
Velocity:	3.00 fps	
X-Section Area:	4.70 sq ft	
Hydraulic Radius:	0.252 ft	
Froude Number:	1.05	



TABLE N9-2024  
Channel Design Summary

Channel N9-6W.2C												
Typical Rip Rap Lined Channel												
Channel	Flow (Q) (cfs)	Slope (%)	Bottom Width (ft)	Side Slope H:1 (ft)	Designed			Total Depth (ft)	Rip Rap (in)	Watershed (acres)	Time of Concentration (hr)	Curve Number
					Flow Depth (ft)	Velocity (fps)	Free Board (ft)					
N9-6W.2C	26.21	2.20	17	3	0.4	3.73	1	1.4	N/A	29.3	0.116	85
												A

Design Flow: 10-year, 6-hour Storm





# **N9-6W.2C WATERSHED DESIGN (10YR- 6HR)**

Kurtis Silversmith

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

***General Information***

***Storm Information:***

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.600 inches

## Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	N9-6W.2C WATERSHED

#1

Null

## ***Structure Summary:***

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	29.300	29.300	26.21	1.25

### Structure Detail:

### Structure #1 (Null)

*N9-6W.2C WATERSHED*

### ***Subwatershed Hydrology Detail:***

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	29.300	0.116	0.000	0.000	85.000	M	26.21	1.255
<b>Σ</b>		<b>29.300</b>						<b>26.21</b>	<b>1.255</b>

### ***Subwatershed Time of Concentration Details:***

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	6.81	77.00	1,130.00	3.910	0.080
		8. Large gullies, diversions, and low flowing streams	1.85	10.00	542.00	4.070	0.036
<b>#1</b>	<b>1</b>	<b>Time of Concentration:</b>					<b>0.116</b>

**N9-6W.2C 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	2.2	0.0300	1.00			5.0

	w/o Freeboard	w/ Freeboard
Design Discharge:	26.21 cfs	
Depth:	0.39 ft	1.39 ft
Top Width:	19.32 ft	25.32 ft
Velocity:	3.73 fps	
X-Section Area:	7.02 sq ft	
Hydraulic Radius:	0.361 ft	
Froude Number:	1.09	





2024

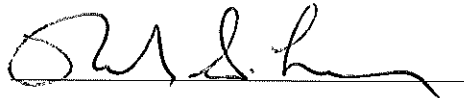
CERTIFICATION

PEABODY WESTERN COAL COMPANY  
KAYENTA MINE, N9 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 N9 Coal Resource Areas dated May 22, 2024, 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:

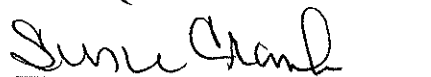
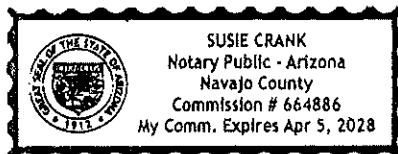


Randy Lehn  
Director Operations Support - Kayenta Mine

STATE OF ARIZONA

NAVAJO COUNTY

Signed or attested before me this 22<sup>nd</sup> day of /May 2024, by Randy Lehn, Director Operations Support of Kayenta Mine owned by Peabody Western Coal Company, a Delaware Corporation, on behalf of said Kayenta Mine.



Notary Public

My commission expires:

April 5, 2024

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
24-4323	2016	2017	4	2016-1
25-4340	2016	2017	1	2016-1
25-4341	2016	2017	1	2016-1
25-4373	2016	2017	1	2016-1
25-4374	2016	2017	3	2016-1
25-4412	2016	2017	1	2016-1
25-4413	2016	2017	2	2016-1
25-4576	2015	2016	1	2015-1
25-4901	2016	2017	1	2016-1
26-2644 (3122-N9)	2012	2013	2	2012-1
26-2658 (N9-3120)	2013	2014	1	2013-1
26-4747	2015	2016	1	2015-2
26-4777	2015	2016	2	2015-2
3552	2017	2018	3	2017-1
4158	2022	2023	1	2022-1
4332	2024	(3)	3	2024-3
4332 A <sup>(2)</sup>	2024	(3)	1	2024-7
4332 B <sup>(2)</sup>	2024	(3)	1	2024-7
4332 C <sup>(2)</sup>	2024	(3)	1	2024-7
4332 D <sup>(2)</sup>	2024	(3)	1	2024-7
4333	2024	(3)	1	2024-9
4335	2023	2024	3	2023-1
4336	2023	2024	3	2023-13
4337	2023	2024	3	2023-1
4338	2023	2024	1	2023-1
4339	2023	2024	1	2023-13
4363	2024	(3)	1	2024-3
4364	2024	(3)	4	2024-3
4364 A <sup>(2)(4)</sup>	2024	(3)	2	2024-7
4364 B <sup>(2)</sup>	2024	(3)	1	2024-7
4364 C <sup>(2)</sup>	2024	(3)	1	2024-7
4364 D <sup>(2)</sup>	2024	(3)	2	2024-7
4365	2024	(3)	1	2024-3
4366	2024	(3)	1	2024-3
4367	2024	(3)	1	2024-3
4368	2024	(3)	1	2024-11
4369	2024	(3)	3	2024-11
4370	2024	(3)	1	2024-11
4371	2024	(3)	3	2024-11
4372	2024	(3)	1	2024-11

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
4401	2024	(3)	1	2024-11
4402	2024	(3)	1	2024-3
4403	2024	(3)	1	2024-3
4404	2024	(3)	1	2024-3
4405	2024	(3)	3	2024-3
4405 A <sup>(2)</sup>	2024	(3)	1	2024-7
4405 B <sup>(2)</sup>	2024	(3)	1	2024-7
4405 C <sup>(2)</sup>	2024	(3)	1	2024-7
4405 D <sup>(2)</sup>	2024	(3)	4	2024-7
4406	2021	2022	1	2021-1
4407	2021	2022	1	2021-1
4408 <sup>(4)</sup>	2021	2022	3	2021-1
4409	2024	(3)	1	2024-11
4410	2018	2019	1	2018-1
4411	2018	2019	1	2018-1
4459	2018	2019	2	2018-2
4460	2018	2019	1	2018-2
4461	2018	2019	2	2018-2
4483	2023	2024	1	2023-25
4484	2023	2024	1	2023-27
4485	2023	2024	1	2023-27
4486	2024	(3)	4	2024-3
4486 A <sup>(2)</sup>	2024	(3)	1	2024-7
4486 B <sup>(2)</sup>	2024	(3)	1	2024-7
4486 C <sup>(2)</sup>	2024	(3)	2	2024-7
4486 D <sup>(2)</sup>	2024	(3)	1	2024-7
4487	2024	(3)	1	2024-3
4488	2024	(3)	1	2024-3
4489	2021	2022	1	2021-1
4490	2021	2022	1	2021-1
4491	2021	2022	1	2021-1
4492	2018	2019	2	2018-3
4497	2018	2019	2	2018-2
4498	2018	2019	2	2018-2
4499	2018	2019	2	2018-2
4500	2018	2019	1	2018-2
4520	2023	2024	3	2023-27
4521	2023	2024	1	2023-27
4522	2023	2024	1	2023-27
4523 <sup>(4)</sup>	2023	2024	3	2023-27
4524	2023	2024	1	2023-27

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
4525	2024	(3)	1	2024-3
4526	2024	(3)	1	2024-3
4527 <sup>(4)</sup>	2021	2022	1	2021-1
4528	2021	2022	4	2021-1
4528 A <sup>(2)</sup>	2024	(3)	1	2024-1
4528 B <sup>(2)</sup>	2024	(3)	1	2024-1
4528 C <sup>(2)</sup>	2024	(3)	3	2024-1
4528 D <sup>(2)</sup>	2024	(3)	2	2024-1
4529	2021	2022	1	2021-1
4530	2018	2019	4	2018-4
4537	2018	2019	1	2018-2
4538	2018	2019	1	2018-2
4539	2018	2019	1	2018-2
4559	2023	2024	1	2023-25
4560	2023	2024	1	2023-25
4561	2023	2024	1	2023-25
4562	2023	2024	3	2023-27
4563	2023	2024	1	2023-27
4564	2023	2024	1	2023-27
4565	2023	2024	1	2023-27
4566	2021	2022	1	2021-1
4567	2016	2017	1	2016-2
4577	2018	2019	2	2018-2
4595	2023	2024	1	2023-5
4596	2023	2024	4	2023-5
4597	2023	2024	4	2023-5
4598	2023	2024	1	2023-5
4599	2023	2024	1	2023-5
4600	2023	2024	1	2023-5
4601	2023	2024	1	2023-5
4602	2023	2024	1	2023-25
4603	2023	2024	1	2023-25
4604	2023	2024	1	2023-24
4632	2023	2024	1	2023-5
4633	2023	2024	1	2023-5
4634	2023	2024	4	2023-5
4635	2023	2024	1	2023-5
4636	2022	2023	1	2022-6
4637	2023	2024	1	2023-7
4638	2023	2024	1	2023-7
4639	2023	2024	1	2023-7
4640	2023	2024	1	2023-27
4641	2022	2023	1	2022-1

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
4642	2018	2019	1	2018-4
4669	2023	2024	1	2023-5
4670	2023	2024	4	2023-7
4671	2023	2024	4	2023-5
4672	2023	2024	4	2023-5
4673	2022	2023	4	2022-6
4674	2022	2023	1	2022-6
4675	2023	2024	1	2023-21
4676	2022	2023	1	2022-1
4680 C <sup>(2)</sup>	2022	2023	1	2022-2
4681 A <sup>(2)</sup>	2023	2024	1	2023-23
4689	2017	2018	1	2017-2
4705	2023	2024	1	2023-5
4706	2023	2024	1	2023-5
4707	2023	2024	4	2023-1
4708	2023	2024	4	2023-5
4709	2023	2024	4	2023-13 <sup>(5)</sup>
4710	2022	2023	4	2022-6
4710 A <sup>(2)</sup>	2023	2024	4	2023-23
4710 B <sup>(2)</sup>	2023	2024	4	2023-23
4710 C <sup>(2)</sup>	2023	2024	4	2023-23
4710 D <sup>(2)</sup>	2023	2024	4	2023-23
4711	2022	2023	4	2022-6
4711 A <sup>(2)</sup>	2023	2024	4	2023-23
4711 B <sup>(2)</sup>	2023	2024	4	2023-23
4711 C <sup>(2)</sup>	2023	2024	2	2023-23
4711 D <sup>(2)</sup>	2023	2024	3	2023-23
4715 C <sup>(2)</sup>	2023	2024	1	2023-23
4721	2017	2018	1	2017-2
4722	2017	2018	3	2017-2
4723	2017	2018	1	2017-2
4738	2023	2024	1	2023-5
4739	2022	2023	4	2022-6
4740	2022	2023	4	2022-6
4741 <sup>(4)</sup>	2022	2023	2	2022-6
4742 <sup>(4)</sup>	2022	2023	1	2022-6
4743	2022	2023	2	2022-6
4744	2024	<sup>(3)</sup>	1	2024-3 <sup>(5)</sup>
4751	2017	2018	4	2017-3
4754	2017	2018	4	2017-2
4766	2023	2024	4	2023-5

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
4767	2022	2023	4	2022-4
4768	2022	2023	4	2022-4
4769	2022	2023	1	2022-6
4770	2022	2023	2	2022-6
4771	2022	2023	1	2022-6
4772	2022	2023	1	2022-4
4773	2022	2023	1	2022-1
4778	2017	2018	2	2017-2
4779	2018	2019	4	2018-3
4780	2018	2019	2	2018-3
4781	2017	2018	1	2017-3
4782	2017	2018	2	2017-2
4794	2022	2023	4	2022-4
4795	2022	2023	4	2022-4
4796	2022	2023	4	2022-6
4797	2022	2023	4	2022-6
4798	2022	2023	4	2022-3
4799	2022	2023	1	2022-3
4800	2022	2023	1	2022-1
4807 A <sup>(2)</sup>	2022	2023	1	2022-2
4819	2022	2023	4	2022-4
4820	2022	2023	4	2022-4
4821	2022	2023	1	2022-6
4822 <sup>(4)</sup>	2022	2023	2	2022-6
4823	2022	2023	4	2022-3
4824	2022	2023	3	2022-3
4840	2022	2023	1	2022-4
4841	2022	2023	4	2022-4
4842	2022	2023	4	2022-4
4843	2022	2023	4	2022-3
4844	2022	2023	4	2022-3
4854	2022	2023	4	2022-3
4855	2022	2023	4	2022-3
4856	2022	2023	4	2022-3
4893	2024	<sup>(3)</sup>	1	2024-9
4895 <sup>(4)</sup>	2024	<sup>(3)</sup>	1	2024-9
4896	2023	2024	1	2023-13
4897	2023	2024	1	2023-1
4898	2023	2024	3	2023-1
4899	2023	2024	1	2023-13
4900	2023	2024	1	2023-1
4925	2024	<sup>(3)</sup>	1	2024-11
4926	2024	<sup>(3)</sup>	1	2024-9

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
4927	2023	2024	1	2023-1
4928	2023	2024	1	2023-1
4929	2023	2024	2	2023-13
4930	2023	2024	1	2023-13
4931	2017	2018	1	2017-3
4954	2024	(3)	1	2024-9
4955	2024	(3)	1	2024-9
4956	2024	(3)	1	2024-9
4957	2023	2024	1	2023-1
4958 <sup>(4)</sup>	2023	2024	2	2023-13
4958 A <sup>(2)</sup>	2023	2024	2	2023-17
4958 B <sup>(2)</sup>	2023	2024	1	2023-17
4958 C <sup>(2)</sup>	2023	2024	1	2023-17
4958 D <sup>(2)</sup>	2023	2024	2	2023-17
4959	2017	2018	1	2017-3
4983	2024	(3)	2	2024-9
4984	2023	2024	1	2023-13
4985	2023	2024	1	2023-13
4986	2023	2024	1	2023-1
5010	2023	2024	4	2023-27 <sup>(5)</sup>
5011	2024	(3)	1	2024-5 <sup>(5)</sup>
5012	2023	2024	2	2023-1
5012 A <sup>(2)</sup>	2023	2024	1	2023-17
5012 B <sup>(2)</sup>	2023	2024	1	2023-17
5012 C <sup>(2)</sup>	2023	2024	1	2023-17
5012 D <sup>(2)</sup>	2023	2024	1	2023-17
5013	2023	2024	1	2023-9
5014	2023	2024	1	2023-13
5033	2023	2024	1	2023-15
5034	2023	2024	1	2023-13
5035	2023	2024	1	2023-9
5036 <sup>(4)</sup>	2023	2024	3	2023-9
5036 A <sup>(2)</sup>	2023	2024	1	2023-19
5036 B <sup>(2)</sup>	2023	2024	3	2023-19
5036 C <sup>(2)</sup>	2023	2024	3	2023-19
5036 D <sup>(2)</sup>	2023	2024	4	2023-19
5040	2023	2024	1	2023-1
5041	2023	2024	1	2023-13
5042	2017	2018	3	2017-2
5043	2017	2018	1	2017-2



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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
5047	2017	2018	4	2017-1
5055	2023	2024	1	2023-1
5056	2023	2024	1	2023-13
5057	2023	2024	1	2023-1
5058	2023	2024	2	2023-1
5058 A <sup>(2)</sup>	2023	2024	2	2023-19
5058 B <sup>(2)</sup>	2023	2024	2	2023-19
5058 C <sup>(2)</sup>	2023	2024	4	2023-19
5058 D <sup>(2)</sup>	2023	2024	4	2023-19
5059	2023	2024	4	2023-9
5059A <sup>(2)</sup>	2024	<sup>(3)</sup>	2	2024-7
5059B <sup>(2)</sup>	2024	<sup>(3)</sup>	4	2024-7
5059 C <sup>(2) (4)</sup>	2024	<sup>(3)</sup>	2	2024-7
5059 D <sup>(2)</sup>	2024	<sup>(3)</sup>	2	2024-7
5060	2023	2024	1	2023-9
5061 <sup>(4)</sup>	2023	2024	1	2023-9
5061 A <sup>(2) (4)</sup>	2023	2024	1	2023-21
5061 B <sup>(2) (4)</sup>	2023	2024	1	2023-21
5061 C <sup>(2) (4)</sup>	2023	2024	1	2023-21
5061 D <sup>(2) (4)</sup>	2023	2024	1	2023-21
5062	2023	2024	1	2023-9
5063	2023	2024	1	2023-13
5064	2017	2018	1	2017-3
5078	2023	2024	1	2023-13
5079	2023	2024	4	2023-9
5079 A <sup>(2)</sup>	2024	<sup>(3)</sup>	1	2024-5
5079 B <sup>(2)</sup>	2024	<sup>(3)</sup>	1	2024-5
5079 C <sup>(2)</sup>	2024	<sup>(3)</sup>	3	2024-5
5079 D <sup>(2)</sup>	2024	<sup>(3)</sup>	1	2024-5
5080	2023	2024	2	2023-9
5080 A <sup>(2)</sup>	2023	2024	2	2023-19
5080 B <sup>(2)</sup>	2023	2024	3	2023-19
5080 C <sup>(2)</sup>	2023	2024	4	2023-19
5080 D <sup>(2)</sup>	2023	2024	2	2023-19
5081	2023	2024	4	2023-9
5081 A <sup>(2)</sup>	2024	<sup>(3)</sup>	3	2024-9
5081 B <sup>(2)</sup>	2024	<sup>(3)</sup>	2	2024-9
5081 C <sup>(2)</sup>	2024	<sup>(3)</sup>	4	2024-9
5081 D <sup>(2) (4)</sup>	2024	<sup>(3)</sup>	1	2024-9

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**Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)**

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
5082	2023	2024	4	2023-9
5082 A <sup>(2)</sup>	2024	(3)	3	2024-9
5082 B <sup>(2)</sup>	2024	(3)	4	2024-9
5082 C <sup>(2)</sup>	2024	(3)	4	2024-9
5082 D <sup>(2)</sup>	2024	(3)	4	2024-9
5083	2023	2024	2	2023-9
5084	2023	2024	1	2023-9
5085	2023	2024	1	2023-1
5086 <sup>(4)</sup>	2023	2024	1	2023-13
5087	2018	2019	1	2018-2
5101	2023	2024	1	2023-9
5102	2023	2024	1	2023-1
5103	2023	2024	4	2023-9
5103 A <sup>(2)</sup>	2024	(3)	4	2024-5
5103 B <sup>(2)</sup>	2024	(3)	4	2024-5
5103C <sup>(2)</sup>	2024	(3)	4	2024-5
5103D <sup>(2)</sup>	2024	(3)	3	2024-5
5104 <sup>(4)</sup>	2023	2024	3	2023-13
5105	2023	2024	4	2023-1
5105 A <sup>(2)</sup>	2024	(3)	4	2024-5
5105 B <sup>(2)</sup>	2024	(3)	4	2024-5
5105 C <sup>(2)</sup>	2024	(3)	4	2024-5
5105 D <sup>(2)</sup>	2024	(3)	4	2024-5
5106	2023	2024	2	2023-1
5107	2023	2024	4	2023-9
5107 A <sup>(2)</sup>	2023	2024	4	2023-25
5107 B <sup>(2)</sup>	2023	2024	4	2023-25
5107 C <sup>(2)</sup>	2023	2024	1	2023-25
5107 D <sup>(2)</sup>	2023	2024	1	2023-25
5108	2023	2024	4	2023-9
5108 A <sup>(2)</sup>	2023	2024	1	2023-25
5108 B <sup>(2)</sup>	2023	2024	4	2023-25
5108 C <sup>(2)</sup>	2023	2024	4	2023-25
5108 D <sup>(2)</sup>	2023	2024	1	2023-25
5109	2018	2019	1	2018-2
5120	2023	2024	1	2023-9
5121	2023	2024	4	2023-9
5121 A <sup>(2)</sup>	2024	(3)	4	2024-5
5121 B <sup>(2)</sup>	2024	(3)	4	2024-5

## ATTACHMENT 2.3 TABLE OF CONTENTS

### Laboratory Data Used to Evaluate Spoil Suitability and Determine Mitigation Thickness Values for the N-9 Coal Resource Area (May 2024)

Sample Site as Shown on Map 2.2	Year Sampled	Year Reported to OSMRE	Mitigation Thickness (feet) <sup>(1)</sup>	Attachment Page for Laboratory Data
5121 C <sup>(2)</sup>	2024	<sup>(3)</sup>	1	2024-5
5121 D <sup>(2)</sup>	2024	<sup>(3)</sup>	4	2024-5
5122	2023	2024	1	2023-9
5126	2018	2019	3	2018-3
5141	2018	2019	4	2018-3
5155	2018	2019	1	2018-3
5261	2018	2019	1	2018-3
5277	2024	<sup>(3)</sup>	3	2024-9
N9 4615	2016	2017	1	2016-3
N9 4987	2016	2017	1	2016-3
N9 5015	2016	2017	3	2016-3
N94568	2016	2017	1	2016-4

<sup>(1)</sup> Per the Sampling Results and Redistribution Thickness section of the annual reports (2012 thru 2024), suitable plant growth material (spoil and overburden) was used as subsoil to bury unsuitable spoil prior to topsoil replacement and for areas requiring erosion resistant material. <sup>(2)</sup> These Phase 2 midpoint sample sites were placed between 330-foot grid locations to verify spoil suitability per procedures defined in Chapter 22 of Permit AZ-0001F. <sup>(3)</sup> To be submitted May 2025. <sup>(4)</sup> These sites had marginally suitable test criterion(s) within threshold standards approved by OSMRE in Chapter 22 of Permit AZ-0001F. <sup>(5)</sup> Most recent spoil sample site after the topography was regraded. The outdated historical sites are not shown on Map 2.2 nor used in mitigation thickness evaluations in Section 2.



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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine

**Project:** N9

**Workorder:** H24010380

**Report Date:** 01/29/24

**Date Received:** 01/16/24

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste		Mg-SatPst-Sat Paste		Na-SatPst-Sat Paste		SAR
		Units	Low	%	%	%		s_u	%	mmhos/cm	meq/L	Results	meq/L	Results	meq/L	Results	
H24010380-001	4528 D	0	1	34	36	30	CL	5.2	46.9	6.0	19.3	49.2	24.9	4.2			
H24010380-002	4528 D	1	3	32	40	28	CL	5.5	46.9	7.9	18.4	64.7	39.8	5.9			
H24010380-003	4528 C	0	1	30	38	32	CL	5.0	48.3	7.6	18.5	50.8	46.0	7.4			
H24010380-004	4528 C	1	3	28	40	32	CL	3.7	57.2	13.2	16.0	79.4	107	14.5			
H24010380-005	4528 B	0	1	32	40	28	CL	6.9	48.2	4.5	20.3	27.4	17.5	3.4			
H24010380-006	4528 B	1	3	32	40	28	CL	6.9	49.3	5.7	16.2	35.3	31.3	5.6			
H24010380-007	4528 A	0	1	30	42	28	CL	7.3	42.9	5.8	20.1	27.2	39.8	8.2			
H24010380-008	4528 A	1	3	30	42	28	CL	7.3	43.9	7.8	19.4	29.3	68.2	13.8			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9  
**Workorder:** H24010380

**Report Date:** 01/29/24  
**Date Received:** 01/16/24

Sample ID	Client Sample ID	Analysis			Units	Neut Potential		Acid Potential		Acid/Base Potential		AP, Pyritic S		ABP, Pyritic S		Sulfur, Total		Sulfur, Sulfate		Sulfur, Pyritic		Sulfur, Organic	
		Up		Low		t/kt		t/kt		t/kt		t/kt		t/kt		%		%		%		%	
		Results	Results	Results		Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H24010380-001	4528 D	0	1			6	33	-27	9.1	-3	1.06	0.64	0.29	0.13									
H24010380-002	4528 D	1	3			7	41	-34	10	-3	1.32	0.85	0.34	0.14									
H24010380-003	4528 C	0	1			7	27	-20	9.2	-2	0.86	0.45	0.29	0.13									
H24010380-004	4528 C	1	3			2	37	-35	8.8	-7	1.17	0.70	0.28	0.19									
H24010380-005	4528 B	0	1			18	17	0			0.56												
H24010380-006	4528 B	1	3			18	27	-9	12	6	0.86	0.38	0.37	0.11									
H24010380-007	4528 A	0	1			29	14	16			0.43												
H24010380-008	4528 A	1	3			25	12	13			0.37												

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H24010479

**Report Date:** 02/06/24  
**Date Received:** 01/22/24

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units	Low	%	%	%		s_u	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
H24010479-001	4402	0	1	40	34	26	L	7.0	48.3	6.6	18.1	26.7	47.3	9.2
H24010479-002	4402	1	3	40	34	26	L	6.6	46.3	7.5	18.4	37.4	48.4	9.2
H24010479-003	4403	0	1	34	34	32	CL	6.8	48.0	6.6	16.1	31.9	42.7	8.7
H24010479-004	4403	1	3	32	37	31	CL	6.7	50.2	7.3	20.0	39.0	48.3	8.9
H24010479-005	4404	0	1	30	38	32	CL	6.8	46.9	4.6	20.4	15.2	21.3	5.0
H24010479-006	4404	1	3	38	33	29	CL	6.8	44.4	4.5	19.4	20.6	18.7	4.2
H24010479-007	4405	0	1	30	36	34	CL	6.4	56.2	8.4	15.5	27.4	65.5	14.1
H24010479-008	4405	1	3	40	32	28	CL	4.6	43.2	20.6	16.6	123	177	21.2
H24010479-009	4363	0	1	42	32	26	L	6.3	41.3	7.4	18.6	42.0	41.3	7.5
H24010479-010	4363	1	3	38	35	27	CL	6.5	44.3	5.7	15.8	25.9	34.5	7.6
H24010479-011	4364	0	1	36	34	30	CL	5.4	47.4	6.9	18.0	64.5	27.9	4.4
H24010479-012	4364	1	3	34	37	29	CL	4.8	47.6	6.9	18.0	67.0	26.1	4.0
H24010479-013	4365	0	1	48	29	23	L	6.6	39.7	6.3	18.4	37.6	35.0	6.6
H24010479-014	4365	1	3	48	30	22	L	6.6	41.6	5.4	18.0	25.4	27.8	6.0
H24010479-015	4366	0	1	46	30	24	L	6.7	41.1	5.5	20.2	33.9	27.4	5.3
H24010479-016	4366	1	3	32	40	28	CL	6.6	40.9	4.3	20.1	29.8	10.1	2.0
H24010479-017	4367	0	1	38	33	29	CL	6.2	45.2	5.4	20.5	45.5	17.0	3.0
H24010479-018	4367	1	3	32	38	30	CL	6.4	45.9	4.7	20.9	30.1	15.6	3.0
H24010479-019	4332	0	1	52	28	20	L	6.0	38.3	5.1	17.4	27.3	24.1	5.1
H24010479-020	4332	1	3	42	32	26	L	5.2	44.9	7.2	17.0	61.0	36.5	5.8
H24010479-021	4486	0	1	34	38	28	CL	6.4	44.2	8.8	15.8	31.2	64.4	14.9
H24010479-022	4486	1	3	32	42	26	L	5.3	43.9	7.2	18.2	61.6	39.2	5.9
H24010479-023	4487	0	1	32	38	30	CL	6.4	45.6	8.8	18.0	31.8	80.8	15.0
H24010479-024	4487	1	3	32	38	30	CL	6.0	45.2	9.4	19.1	34.9	85.4	15.4
H24010479-025	4488	0	1	26	40	34	CL	7.0	44.6	9.1	17.7	37.5	78.6	13.8
H24010479-026	4488	1	3	28	39	33	CL	7.0	63.1	9.4	17.3	33.4	86.0	15.2
H24010479-027	4525	0	1	38	33	29	CL	6.9	53.0	7.6	16.7	32.1	60.7	11.4
H24010479-028	4525	1	3	40	33	27	CL	6.8	46.4	7.6	17.0	34.1	56.9	10.5
H24010479-029	4526	0	1	42	32	26	L	6.8	45.1	9.2	15.5	35.4	75.5	14.6
H24010479-030	4526	1	3	48	27	25	SCL	7.0	40.0	9.8	14.7	38.5	92.0	16.7
H24010479-031	4744	0	1	46	28	26	L	6.7	45.9	3.9	19.3	27.8	9.47	1.9
H24010479-032	4744	1	3	46	28	26	L	6.5	60.5	4.1	18.6	29.5	9.56	1.9

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H24010479

**Report Date:** 02/06/24  
**Date Received:** 01/22/24

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic	
		Units	Up						Low	Results		t/kt	Results	t/kt	Results
				Results	%	Results	%	Results			%				
H24010479-001	4402	0	1	17	30	-13	17	0	0.97		0.28	0.55		0.14	
H24010479-002	4402	1	3	15	32	-16	15	0	1.01		0.37	0.48		0.16	
H24010479-003	4403	0	1	16	27	-11	13	3	0.88		0.36	0.43		0.08	
H24010479-004	4403	1	3	16	30	-14	13	3	0.96		0.44	0.43		0.10	
H24010479-005	4404	0	1	14	20	-5	8.3	6	0.63		0.29	0.27		0.08	
H24010479-006	4404	1	3	17	24	-7	9.0	8	0.76		0.39	0.29		0.08	
H24010479-007	4405	0	1	11	23	-12	7.9	3	0.72		0.40	0.25		0.07	
H24010479-008	4405	1	3	4	29	-25	2.5	2	0.94		0.82	0.08		0.04	
H24010479-009	4363	0	1	12	28	-16	12	0	0.91		0.41	0.39		0.11	
H24010479-010	4363	1	3	14	29	-16	12	2	0.93		0.46	0.38		0.09	
H24010479-011	4364	0	1	8	40	-32	14	-7	1.28		0.70	0.46		0.12	
H24010479-012	4364	1	3	6	41	-35	14	-8	1.30		0.73	0.45		0.12	
H24010479-013	4365	0	1	17	22	-5	9.5	7	0.71		0.33	0.30		0.07	
H24010479-014	4365	1	3	14	18	-5	7.3	6	0.59		0.29	0.23		0.07	
H24010479-015	4366	0	1	14	24	-11	12	2	0.78		0.33	0.39		0.06	
H24010479-016	4366	1	3	15	33	-18	20	-5	1.06		0.33	0.83		0.10	
H24010479-017	4367	0	1	13	35	-22	13	0	1.13		0.62	0.41		0.10	
H24010479-018	4367	1	3	15	29	-14	10	5	0.92		0.51	0.32		0.08	
H24010479-019	4332	0	1	10	26	-16	12	-2	0.82		0.31	0.40		0.11	
H24010479-020	4332	1	3	6	36	-30	14	-8	1.16		0.59	0.45		0.12	
H24010479-021	4486	0	1	12	49	-36	29	-16	1.56		0.42	0.92		0.22	
H24010479-022	4486	1	3	9	41	-31	20	-11	1.30		0.50	0.64		0.16	
H24010479-023	4487	0	1	17	28	-11	13	4	0.89		0.38	0.42		0.10	
H24010479-024	4487	1	3	15	30	-14	13	2	0.95		0.43	0.43		0.09	
H24010479-025	4488	0	1	12	30	-19	13	-1	0.97		0.48	0.40		0.09	
H24010479-026	4488	1	3	11	30	-18	12	-1	0.96		0.47	0.40		0.09	
H24010479-027	4525	0	1	15	28	-13	14	1	0.89		0.34	0.43		0.12	
H24010479-028	4525	1	3	14	29	-16	11	2	0.94		0.48	0.37		0.09	
H24010479-029	4526	0	1	19	29	-10	15	4	0.94		0.35	0.49		0.11	
H24010479-030	4526	1	3	19	24	-4	9.0	10	0.76		0.38	0.29		0.09	
H24010479-031	4744	0	1	14	13	1			0.42						
H24010479-032	4744	1	3	14	14	0	4.0	10	0.44		0.25	0.13		0.06	

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H24020280

**Report Date:** 03/04/24  
**Date Received:** 02/13/24

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPat	Percent Sat		Cond-SatPat	Ca-SatPat-Sat Paste		Mg-SatPat-Sat Paste		Na-SatPat-Sat Paste		SAR
		Up	Low	%	Results	%	Results	s_u	Results	%	mmhos/cm	Results	meq/L	Results	meq/L	Results	meq/L	
H24020280-001	5105 A	0	1	28	43	29	CL	3.7	47.6	7.5	7.5	20.0	111	2.49	0.3			
H24020280-002	5105 A	1	3	30	41	29	CL	3.9	58.2	9.0	9.0	19.6	147	3.10	0.3			
H24020280-003	5105 B	0	1	38	36	26	L	4.6	44.6	4.5	4.5	22.4	40.8	8.34	1.5			
H24020280-004	5105 B	1	3	40	33	27	CL	4.8	42.8	12.4	12.4	19.7	200	34.9	3.3			
H24020280-005	5105 C	0	1	32	40	28	CL	3.9	49.3	8.0	8.0	19.9	127	2.91	0.3			
H24020280-006	5105 C	1	3	36	36	28	CL	3.1	50.4	10.2	10.2	18.8	110	1.01	0.1			
H24020280-007	5105 D	0	1	28	42	30	CL	3.4	52.2	8.4	8.4	18.8	128	1.24	0.1			
H24020280-008	5105 D	1	3	30	41	29	CL	3.5	54.7	9.2	9.2	18.9	143	1.76	0.2			
H24020280-009	5121 A	0	1	40	36	24	L	4.2	43.5	5.3	5.3	20.0	56.7	7.46	1.2			
H24020280-010	5121 A	1	3	40	36	24	L	3.3	49.1	7.9	7.9	18.7	105	6.63	0.8			
H24020280-011	5121 B	0	1	52	27	21	SCL	2.7	38.4	7.1	7.1	16.6	56.0	2.71	0.4			
H24020280-012	5121 B	1	3	54	28	18	SL	2.7	42.2	5.8	5.8	15.8	29.7	7.11	1.5			
H24020280-013	5121 C	0	1	34	40	26	L	6.6	50.6	6.6	6.6	18.9	51.5	34.0	5.7			
H24020280-014	5121 C	1	3	36	37	27	CL	6.8	48.9	7.7	7.7	18.9	48.1	52.6	9.1			
H24020280-015	5121 D	0	1	42	34	24	L	3.6	40.2	7.8	7.8	18.4	106	10.8	1.4			
H24020280-016	5121 D	1	3	40	34	26	L	4.1	42.2	9.0	9.0	18.1	143	9.03	1.0			
H24020280-017	5103 A	0	1	30	42	28	CL	3.7	49.9	5.8	5.8	19.0	64.1	5.08	0.8			
H24020280-018	5103 A	1	3	28	42	30	CL	3.2	50.9	9.7	9.7	17.2	127	3.86	0.4			
H24020280-019	5103 B	0	1	42	33	25	L	3.5	51.5	5.9	5.9	17.0	60.4	6.34	1.0			
H24020280-020	5103 B	1	3	62	18	20	SCL	3.1	54.0	6.9	6.9	20.1	51.5	18.4	3.1			
H24020280-021	5103 C	0	1	30	44	26	L	3.4	48.4	5.8	5.8	19.3	64.6	2.49	0.4			
H24020280-022	5103 C	1	3	38	37	25	L	3.4	51.6	5.4	5.4	18.9	53.9	4.57	0.8			
H24020280-023	5103 D	0	1	42	34	24	L	4.7	50.3	4.0	4.0	21.9	30.8	5.99	1.2			
H24020280-024	5103 D	1	3	40	35	25	L	4.3	48.1	4.2	4.2	23.6	29.1	6.48	1.3			
H24020280-025	5079 A	0	1	40	34	26	L	7.5	48.4	4.7	4.7	20.7	46.0	10.8	1.9			
H24020280-026	5079 A	1	3	32	38	30	CL	7.6	47.5	3.9	3.9	20.5	32.5	6.76	1.3			
H24020280-027	5079 B	0	1	32	42	26	L	5.6	52.1	4.7	4.7	20.0	58.3	3.95	0.6			
H24020280-028	5079 B	1	3	38	38	24	L	5.8	51.4	4.7	4.7	19.8	58.8	2.64	0.4			
H24020280-029	5079 C	0	1	34	41	25	L	5.6	45.2	4.5	4.5	19.4	57.2	2.81	0.4			
H24020280-030	5079 C	1	3	40	36	24	L	3.7	44.1	11.8	11.8	18.4	236	1.32	0.1			
H24020280-031	5079 D	0	1	36	36	28	CL	7.0	48.0	5.4	5.4	22.1	62.9	7.07	1.1			
H24020280-032	5079 D	1	3	40	35	25	L	6.8	44.4	6.6	6.6	22.3	93.1	7.53	1.0			
H24020280-033	4937 B	0	1	60	24	16	SL	7.5	36.8	3.3	3.3	20.1	22.9	5.75	1.2			
H24020280-034	4937 B	1	3	60	26	14	SL	7.1	40.5	4.8	4.8	19.6	46.5	13.4	2.3			
H24020280-035	4937 C	0	1	52	34	26	L	7.2	43.3	1.8	1.8	15.0	8.66	1.32	0.4			
H24020280-036	4937 C	1	3	52	26	22	SCL	7.5	42.2	3.5	3.5	20.1	27.1	6.46	1.3			
H24020280-037	5011	0	1	38	36	26	L	6.1	45.0	8.2	8.2	19.4	58.0	52.1	8.4			
H24020280-038	5011	1	3	38	36	26	L	5.8	47.0	6.1	6.1	19.5	40.4	31.8	5.8			
H24020280-039	Plt 1	0	10	44	31	25	L	7.0	45.3	6.6	6.6	20.2	45.1	31.2	5.5			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H24020280

**Report Date:** 03/04/24  
**Date Received:** 02/13/24

Sample ID	Client Sample ID	Analysis		Units	Neut Potential		Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic		
		Up	Low		Results	t/kt					Results	t/kt		Results	%		Results	%
H24020280-001	5105 A	0	1	2	34	-32	8.9	-7	1.09	0.70	0.28	0.11						
H24020280-002	5105 A	1	3	3	36	-34	7.7	-5	1.16	0.82	0.25	0.10						
H24020280-003	5105 B	0	1	4	33	-29	12	-7	1.06	0.55	0.38	0.13						
H24020280-004	5105 B	1	3	5	43	-37	12	-7	1.36	0.83	0.38	0.15						
H24020280-005	5105 C	0	1	2	34	-31	7.5	-5	1.08	0.75	0.24	0.09						
H24020280-006	5105 C	1	3	-4	70	-74	16	-20	2.23	1.43	0.51	0.29						
H24020280-007	5105 D	0	1	1	37	-36	9.1	-8	1.17	0.79	0.29	0.09						
H24020280-008	5105 D	1	3	1	40	-39	8.9	-8	1.29	0.90	0.29	0.10						
H24020280-009	5121 A	0	1	3	26	-23	5.9	-3	0.83	0.54	0.19	0.10						
H24020280-010	5121 A	1	3	1	33	-32	5.6	-5	1.04	0.75	0.18	0.11						
H24020280-011	5121 B	0	1	-3	25	-28	6.0	-9	0.80	0.52	0.19	0.08						
H24020280-012	5121 B	1	3	-2	22	-25	5.2	-8	0.71	0.45	0.17	0.10						
H24020280-013	5121 C	0	1	13	29	-16	13	0	0.94	0.43	0.42	0.09						
H24020280-014	5121 C	1	3	17	29	-12	14	3	0.92	0.39	0.44	0.08						
H24020280-015	5121 D	0	1	1	30	-28	5.8	-4	0.95	0.67	0.19	0.09						
H24020280-016	5121 D	1	3	2	32	-30	5.9	-4	1.03	0.72	0.19	0.12						
H24020280-017	5103 A	0	1	2	29	-27	5.6	-4	0.93	0.67	0.18	0.08						
H24020280-018	5103 A	1	3	-1	40	-41	8.7	-10	1.28	0.92	0.28	0.09						
H24020280-019	5103 B	0	1	2	36	-34	7.3	-5	1.15	0.73	0.24	0.19						
H24020280-020	5103 B	1	3	0	45	-45	7.9	-8	1.43	0.79	0.25	0.39						
H24020280-021	5103 C	0	1	0	35	-35	9.3	-9	1.13	0.70	0.30	0.12						
H24020280-022	5103 C	1	3	1	38	-37	8.9	-8	1.22	0.77	0.28	0.17						
H24020280-023	5103 D	0	1	8	26	-18	7.1	1	0.83	0.50	0.23	0.11						
H24020280-024	5103 D	1	3	6	29	-23	7.5	-1	0.94	0.57	0.24	0.13						
H24020280-025	5079 A	0	1	17	21	-4	4.4	12	0.66	0.47	0.14	0.05						
H24020280-026	5079 A	1	3	21	21	1			0.67									
H24020280-027	5079 B	0	1	8	24	-17	6.4	1	0.78	0.50	0.21	0.07						
H24020280-028	5079 B	1	3	9	36	-27	9.0	0	1.15	0.75	0.29	0.11						
H24020280-029	5079 C	0	1	10	34	-24	8.8	1	1.08	0.71	0.28	0.09						
H24020280-030	5079 C	1	3	2	60	-59	14	-12	1.93	1.31	0.44	0.17						
H24020280-031	5079 D	0	1	14	27	-13	7.3	6	0.85	0.54	0.23	0.08						
H24020280-032	5079 D	1	3	12	30	-18	6.6	5	0.97	0.68	0.21	0.08						
H24020280-033	4937 B	0	1	16	4.5	12			0.14									
H24020280-034	4937 B	1	3	13	7.4	6			0.24									
H24020280-035	4937 C	0	1	18	8.9	9			0.28									
H24020280-036	4937 C	1	3	9	6.9	3			0.22									
H24020280-037	5011	0	1	10	24	-13	9.1	1	0.75	0.36	0.29	0.10						
H24020280-038	5011	1	3	10	21	-11	8.4	2	0.68	0.29	0.27	0.11						
H24020280-039	Pit 1	0	10	14	21	-7	7.9	6	0.69	0.35	0.25	0.08						

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H24030015

Report Date: 03/18/24

Date Received: 03/01/24

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste		Mg-SatPst-Sat Paste		Na-SatPst-Sat Paste		SAR
		Units	Up	Low	Results	Results	Results	s_u_L	%	mmhos/cm	Results	Results	Results	Results	Results	Results	unitless
H24030015-001	4364 A	0	1	38	36	26	L	5.6	45.6	6.8	20.3	54.3	33.7	33.7	5.5		
H24030015-002	4364 A	1	3	34	38	28	CL	5.2	46.9	8.2	20.6	72.5	43.4	43.4	6.4		
H24030015-003	4364 B	0	1	40	34	26	L	6.7	46.9	6.4	19.8	30.5	43.1	43.1	8.6		
H24030015-004	4364 B	1	3	34	38	28	CL	6.8	49.6	5.6	18.9	22.3	39.0	39.0	8.6		
H24030015-005	4364 C	0	1	42	32	26	L	6.4	39.3	8.1	21.1	101	23.3	23.3	3.0		
H24030015-006	4364 C	1	3	50	28	22	L	5.5	37.2	8.6	20.7	89.2	37.8	37.8	5.1		
H24030015-007	4364 D	0	1	40	34	26	L	5.9	43.8	6.9	18.3	54.2	37.2	37.2	6.2		
H24030015-008	4364 D	1	3	38	36	26	L	6.4	48.0	7.4	19.2	46.3	50.0	50.0	8.7		
H24030015-009	4486 A	0	1	34	38	28	CL	6.9	48.6	5.9	16.9	20.2	43.3	43.3	10.0		
H24030015-010	4486 A	1	3	46	32	22	L	7.2	45.9	7.3	19.6	11.8	68.8	68.8	17.4		
H24030015-011	4486 B	0	1	38	36	26	L	6.2	50.3	8.7	18.9	57.6	61.6	61.6	10.4		
H24030015-012	4486 B	1	3	36	38	26	L	6.6	49.4	7.2	20.4	45.0	49.2	49.2	8.6		
H24030015-013	4486 C	0	1	58	26	16	SL	6.7	38.3	7.2	19.3	19.2	63.8	63.8	14.5		
H24030015-014	4486 C	1	3	76	18	6	SL	7.5	38.2	6.3	9.3	1.36	68.5	68.5	29.7		
H24030015-015	4486 D	0	1	38	36	26	L	6.5	44.4	6.1	15.4	23.9	47.6	47.6	10.7		
H24030015-016	4486 D	1	3	38	34	28	CL	6.3	48.1	7.5	14.5	37.9	61.9	61.9	12.1		
H24030015-017	4332 A	0	1	46	30	24	L	6.2	39.4	8.3	19.3	46.4	62.8	62.8	11.0		
H24030015-018	4332 A	1	3	44	32	24	L	6.2	39.2	7.8	18.6	39.8	57.5	57.5	10.6		
H24030015-019	4332 B	0	1	52	28	20	L	6.2	41.3	5.5	19.7	36.0	27.1	27.1	5.1		
H24030015-020	4332 B	1	3	48	32	20	L	6.0	39.1	6.7	19.0	38.0	46.9	46.9	8.8		
H24030015-021	4332 C	0	1	58	24	18	SL	6.6	40.2	4.6	21.6	24.4	24.5	24.5	5.1		
H24030015-022	4332 C	1	3	52	28	20	L	6.1	40.2	5.5	20.8	33.2	31.6	31.6	6.1		
H24030015-023	4332 D	0	1	42	34	24	L	6.7	40.9	5.4	21.4	34.5	29.5	29.5	5.6		
H24030015-024	4332 D	1	3	44	32	24	L	5.9	43.8	8.8	20.4	58.7	66.4	66.4	10.6		
H24030015-025	4405 A	0	1	44	32	24	L	6.6	46.3	8.6	20.7	49.2	68.6	68.6	11.6		
H24030015-026	4405 A	1	3	28	40	32	CL	6.2	49.4	8.1	19.6	25.0	74.2	74.2	15.7		
H24030015-027	4405 B	0	1	30	40	30	CL	6.6	51.2	5.8	20.2	29.3	39.6	39.6	8.0		
H24030015-028	4405 B	1	3	28	40	32	CL	6.0	51.1	7.7	18.1	41.1	58.4	58.4	10.7		
H24030015-029	4405 C	0	1	46	32	22	L	6.9	44.4	5.6	20.3	23.7	37.5	37.5	8.0		
H24030015-030	4405 C	1	3	54	26	20	SOL	6.8	46.1	5.1	20.4	16.7	35.2	35.2	8.2		
H24030015-031	4405 D	0	1	44	30	26	L	2.8	44.4	9.8	15.8	69.1	46.4	46.4	7.1		
H24030015-032	4405 D	1	3	48	29	23	L	3.2	47.3	10.6	17.6	82.8	60.8	60.8	8.6		
H24030015-033	5059 A	0	1	32	39	29	CL	5.4	45.3	8.4	18.2	82.5	42.6	42.6	6.0		
H24030015-034	5059 A	1	3	38	34	28	CL	5.8	45.2	8.2	18.7	53.2	56.1	56.1	9.4		
H24030015-035	5059 B	0	1	40	35	25	L	3.6	44.0	14.1	18.7	276	4.36	4.36	0.4		
H24030015-036	5059 B	1	3	50	30	20	L	3.4	40.6	22.4	21.0	564	10.4	10.4	0.6		
H24030015-037	5059 C	0	1	38	38	24	L	5.4	43.5	8.2	18.6	116	12.0	12.0	1.5		
H24030015-038	5059 C	1	3	38	38	24	L	5.2	42.3	13.0	19.0	247	33.8	33.8	2.9		
H24030015-039	5059 D	0	1	32	39	29	CL	4.7	50.5	11.6	18.4	167	48.2	48.2	5.0		

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H24030015

Report Date: 03/18/24

Date Received: 03/01/24

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic	
		Units							%			%		%	
		Up	Low	Results	t/kt	Results	t/kt	Results	t/kt	Results	Results	Results	Results	Results	Results
H24030015-001	4364 A	0	1	8	36	-27	15	-6	1.14	0.53	0.47	0.14			
H24030015-002	4364 A	1	3	7	32	-25	11	-4	1.03	0.53	0.36	0.14			
H24030015-003	4364 B	0	1	15	27	-12	12	3	0.86	0.38	0.38	0.10			
H24030015-004	4364 B	1	3	13	25	-12	9.5	3	0.79	0.39	0.30	0.10			
H24030015-005	4364 C	0	1	15	43	-28	6.6	9	1.39	0.95	0.21	0.23			
H24030015-006	4364 C	1	3	9	31	-22	8.7	0	0.98	0.52	0.28	0.18			
H24030015-007	4364 D	0	1	11	34	-23	14	-3	1.08	0.48	0.44	0.15			
H24030015-008	4364 D	1	3	13	31	-18	14	0	0.99	0.41	0.44	0.14			
H24030015-009	4486 A	0	1	16	26	-10	15	2	0.84	0.22	0.47	0.15			
H24030015-010	4486 A	1	3	19	31	-13	20	-1	1.00	0.12	0.62	0.26			
H24030015-011	4486 B	0	1	13	35	-22	13	0	1.12	0.53	0.43	0.16			
H24030015-012	4486 B	1	3	22	33	-11	12	10	1.06	0.50	0.39	0.18			
H24030015-013	4486 C	0	1	9	23	-14	9.3	0	0.72	0.17	0.30	0.25			
H24030015-014	4486 C	1	3	7	19	-13	8.0	-1	0.62	0.09	0.25	0.27			
H24030015-015	4486 D	0	1	14	30	-16	15	-1	0.97	0.32	0.48	0.16			
H24030015-016	4486 D	1	3	13	31	-18	12	1	1.00	0.49	0.38	0.13			
H24030015-017	4332 A	0	1	10	18	-9	4.7	5	0.59	0.34	0.15	0.10			
H24030015-018	4332 A	1	3	11	17	-6	5.5	6	0.55	0.28	0.17	0.10			
H24030015-019	4332 B	0	1	10	21	-11	8.1	2	0.68	0.29	0.26	0.14			
H24030015-020	4332 B	1	3	11	19	-9	6.3	4	0.62	0.32	0.20	0.10			
H24030015-021	4332 C	0	1	12	16	-5	6.4	5	0.52	0.22	0.20	0.09			
H24030015-022	4332 C	1	3	11	25	-14	10	0	0.79	0.34	0.33	0.11			
H24030015-023	4332 D	0	1	14	25	-11	10	4	0.80	0.36	0.32	0.12			
H24030015-024	4332 D	1	3	11	28	-17	10	0	0.90	0.43	0.33	0.13			
H24030015-025	4405 A	0	1	13	24	-11	5.9	7	0.77	0.47	0.19	0.11			
H24030015-026	4405 A	1	3	9	22	-13	7.7	1	0.72	0.38	0.25	0.09			
H24030015-027	4405 B	0	1	13	20	-7	7.1	6	0.64	0.33	0.23	0.08			
H24030015-028	4405 B	1	3	9	28	-18	6.3	3	0.88	0.53	0.20	0.15			
H24030015-029	4405 C	0	1	18	22	-4	4.5	13	0.70	0.40	0.14	0.15			
H24030015-030	4405 C	1	3	17	20	-3	4.3	13	0.64	0.34	0.14	0.16			
H24030015-031	4405 D	0	1	-3	64	-67	23	-26	2.04	0.79	0.74	0.52			
H24030015-032	4405 D	1	3	0	63	-63	22	-22	2.02	0.80	0.69	0.53			
H24030015-033	5059 A	0	1	7	31	-23	10	-3	0.98	0.54	0.32	0.12			
H24030015-034	5059 A	1	3	8	27	-19	9.3	-2	0.87	0.46	0.30	0.11			
H24030015-035	5059 B	0	1	-1	51	-52	12	-13	1.65	1.05	0.38	0.21			
H24030015-036	5059 B	1	3	-3	58	-61	14	-16	1.87	1.06	0.43	0.38			
H24030015-037	5059 C	0	1	8	38	-30	11	-3	1.21	0.75	0.35	0.11			
H24030015-038	5059 C	1	3	11	31	-20	5.6	5	0.99	0.73	0.18	0.08			
H24030015-039	5059 D	0	1	5	34	-30	7.6	-3	1.10	0.74	0.24	0.11			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9  
**Workorder:** H24030015

**Report Date:** 03/18/24  
**Date Received:** 03/01/24

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units	Up	Low	Results	Results	Results	s_u	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
H24030015-040	5059 D	1	3	30	40	30	CL	5.3	60.8	8.4	18.0	61.1	52.2	8.3
H24030015-041	5082 A	0	1	32	42	26	L	4.5	46.7	10.5	18.7	193	3.35	0.3
H24030015-042	5082 A	1	3	36	39	25	L	4.0	45.8	11.4	19.0	216	2.73	0.2
H24030015-043	5082 B	0	1	36	38	26	L	3.8	36.3	10.6	19.1	150	5.18	0.5
H24030015-044	5082 B	1	3	34	38	28	CL	3.2	39.4	10.8	15.8	129	4.87	0.5
H24030015-045	5082 C	0	1	30	43	27	CL	3.6	40.2	10.0	18.3	143	4.53	0.5
H24030015-046	5082 C	1	3	32	42	26	L	4.2	39.5	8.3	19.8	131	2.42	0.3
H24030015-047	5082 D	0	1	30	42	28	CL	3.6	42.2	9.3	18.2	140	2.42	0.3
H24030015-048	5082 D	1	3	24	43	33	CL	3.6	41.4	5.7	18.4	54.0	3.39	0.6
H24030015-049	5081 A	0	1	38	36	26	L	5.4	44.4	8.0	19.2	51.2	47.8	8.1
H24030015-050	5081 A	1	3	40	33	27	CL	2.8	44.8	19.2	15.0	142	41.4	4.7
H24030015-051	5081 B	0	1	34	38	28	CL	4.7	45.8	9.9	18.4	156	14.6	1.5
H24030015-052	5081 B	1	3	36	39	25	L	5.6	47.4	11.1	18.5	221	7.31	0.7
H24030015-053	5081 C	0	1	32	42	26	L	3.4	46.1	9.0	18.9	152	0.89	0.1
H24030015-054	5081 C	1	3	58	25	17	SL	3.9	48.4	6.8	18.8	72.0	20.0	3.0
H24030015-055	5081 D	0	1	32	40	28	CL	6.1	44.6	5.8	22.2	64.5	7.96	1.2
H24030015-056	5081 D	1	3	34	40	26	L	4.4	42.6	4.2	20.6	42.9	2.51	0.4
H24030015-057	4926	0	1	48	30	22	L	6.2	37.6	6.7	19.1	40.2	34.6	6.2
H24030015-058	4926	1	3	52	28	20	L	6.6	39.5	5.3	19.2	27.5	27.0	5.6
H24030015-059	4333	0	1	44	32	24	L	6.3	41.7	10.6	18.5	89.7	60.8	8.1
H24030015-060	4333	1	3	42	32	28	L	6.4	47.1	7.6	20.6	47.5	45.6	7.7
H24030015-061	5277	0	1	46	31	23	L	4.6	58.0	3.8	22.7	26.7	6.14	1.3
H24030015-062	5277	1	3	56	28	16	SL	3.6	81.1	4.4	22.0	37.7	8.53	1.6
H24030015-063	4893	0	1	42	34	24	L	6.0	41.4	5.1	21.6	32.1	21.2	4.0
H24030015-064	4893	1	3	48	30	22	L	5.6	38.1	6.8	18.8	41.5	38.7	7.0
H24030015-065	4955	0	1	46	31	23	L	6.0	41.4	7.0	19.0	44.0	39.6	6.9
H24030015-066	4955	1	3	42	32	26	L	5.6	44.1	8.8	18.4	54.5	55.4	9.2
H24030015-067	4954	0	1	48	30	22	L	5.9	39.5	6.7	18.6	44.2	31.5	5.6
H24030015-068	4954	1	3	48	30	22	L	5.8	39.3	7.2	17.6	50.6	34.1	5.8
H24030015-069	4895	0	1	38	34	28	CL	6.4	46.1	8.7	19.4	61.4	51.9	8.2
H24030015-070	4895	1	3	44	30	26	L	4.4	44.1	9.0	17.6	96.4	35.4	4.7
H24030015-071	4956	0	1	36	34	30	CL	6.1	48.7	11.4	18.2	66.7	86.7	13.3
H24030015-072	4956	1	3	40	33	27	CL	6.1	45.7	9.6	18.9	59.6	65.6	10.5
H24030015-073	4983	0	1	40	36	24	L	5.0	42.4	4.6	17.4	51.8	7.54	1.3
H24030015-074	4983	1	3	48	29	23	L	5.8	38.0	7.3	18.3	48.7	39.4	6.8

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine

**Project:** N9

**Workorder:** H24030015

**Report Date:** 03/18/24

**Date Received:** 03/01/24

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Units										
		Up	Low	U/Kt	Results	U/Kt	Results	U/Kt	Results	%	Results	%
H24030015-040	5059 D	1	3	6	29	-23	7.6	-2	0.93	0.58	0.24	0.10
H24030015-041	5082 A	0	1	5	33	-28	5.9	-1	1.07	0.76	0.19	0.12
H24030015-042	5082 A	1	3	2	39	-37	7.5	-5	1.25	0.86	0.24	0.16
H24030015-043	5082 B	0	1	2	35	-33	10	-8	1.10	0.66	0.32	0.12
H24030015-044	5082 B	1	3	0	40	-40	13	-14	1.28	0.68	0.43	0.18
H24030015-045	5082 C	0	1	2	34	-32	8.2	-6	1.09	0.70	0.26	0.12
H24030015-046	5082 C	1	3	5	35	-30	7.8	-3	1.12	0.75	0.25	0.13
H24030015-047	5082 D	0	1	1	36	-35	6.5	-5	1.15	0.79	0.21	0.15
H24030015-048	5082 D	1	3	0	47	-48	11	-11	1.52	0.99	0.34	0.18
H24030015-049	5081 A	0	1	6	24	-18	8.2	-2	0.77	0.42	0.26	0.09
H24030015-050	5081 A	1	3	-8	61	-69	17	-26	1.94	1.17	0.56	0.22
H24030015-051	5081 B	0	1	4	33	-28	7.3	-3	1.04	0.72	0.23	0.09
H24030015-052	5081 B	1	3	8	35	-28	7.1	1	1.13	0.80	0.23	0.09
H24030015-053	5081 C	0	1	0	36	-35	7.1	-7	1.14	0.78	0.23	0.13
H24030015-054	5081 C	1	3	5	38	-34	7.4	-3	1.23	0.69	0.24	0.30
H24030015-055	5081 D	0	1	12	25	-13	5.2	7	0.79	0.55	0.16	0.07
H24030015-056	5081 D	1	3	6	26	-20	6.1	0	0.82	0.52	0.20	0.10
H24030015-057	4926	0	1	12	22	-10	9.0	3	0.70	0.30	0.29	0.11
H24030015-058	4926	1	3	15	16	-1	5.4	10	0.53	0.27	0.17	0.09
H24030015-059	4333	0	1	18	29	-11	8.5	9	0.92	0.51	0.27	0.14
H24030015-060	4333	1	3	11	24	-13	8.2	3	0.77	0.42	0.26	0.09
H24030015-061	5277	0	1	15	34	-19	3.8	11	1.09	0.84	0.12	0.13
H24030015-062	5277	1	3	8	52	-44	7.8	0	1.67	1.20	0.25	0.22
H24030015-063	4893	0	1	12	19	-7	8.2	4	0.60	0.23	0.26	0.10
H24030015-064	4893	1	3	9	34	-25	21	-12	1.08	0.26	0.86	0.17
H24030015-065	4955	0	1	12	23	-11	8.0	4	0.74	0.34	0.26	0.15
H24030015-066	4955	1	3	8	28	-20	12	-4	0.88	0.35	0.38	0.16
H24030015-067	4954	0	1	11	28	-17	11	0	0.89	0.38	0.36	0.15
H24030015-068	4954	1	3	11	25	-14	8.1	3	0.79	0.38	0.26	0.15
H24030015-069	4895	0	1	11	26	-15	9.3	2	0.85	0.43	0.30	0.12
H24030015-070	4895	1	3	4	33	-29	6.6	-3	1.06	0.72	0.21	0.13
H24030015-071	4956	0	1	10	26	-16	6.4	3	0.82	0.49	0.20	0.12
H24030015-072	4956	1	3	11	22	-11	7.1	4	0.71	0.37	0.23	0.11
H24030015-073	4983	0	1	8	24	-16	6.7	1	0.77	0.40	0.21	0.16
H24030015-074	4983	1	3	11	27	-16	12	-1	0.85	0.31	0.38	0.16

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils/J21 Spoils  
**Workorder:** H24040550

**Report Date:** 05/03/24  
**Date Received:** 04/17/24

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Cond-SatPst	Percent Sat	Ca-SatPst-Sat Paste		Mg-SatPst-Sat Paste		Na-SatPst-Sat Paste		SAR
		Units	Up	Low	Results	Results	Results	s_u	mmhos/cm	%	Results	Results	Results	Results	Results	Results	Results
H24040550-001	4409	0	1		64	23	13	SL	7.3	6.0	32.7	31.1	28.7	15.2			2.8
H24040550-002	4409	1	3		38	34	28	CL	4.6	10.1	39.6	24.2	95.4	36.3			4.7
H24040550-003	4925	0	1		44	29	27	CL	6.4	8.2	36.7	22.4	53.6	41.5			6.7
H24040550-004	4925	1	3		44	30	26	L	6.4	8.8	37.3	21.2	55.6	48.5			7.8
H24040550-005	4401	0	1		34	35	31	CL	7.0	5.0	43.0	28.4	12.2	2.3			2.3
H24040550-006	4401	1	3		37	34	29	CL	6.9	5.2	39.5	23.3	28.2	22.5			4.4
H24040550-007	4401 (TS)	0	24		29	39	32	CL	7.6	5.3	40.4	27.1	22.3	17.9			3.6
H24040550-008	4368	0	1		69	18	13	SL	7.6	3.4	34.6	24.4	10.7	8.38			2.0
H24040550-009	4368	1	3		69	18	13	SL	7.4	3.1	35.5	21.9	9.56	7.54			1.9
H24040550-010	4371	0	1		30	39	31	CL	5.8	11.2	42.6	20.9	67.7	77.7			11.7
H24040550-011	4371	1	3		25	39	36	CL	4.4	10.1	43.6	17.5	72.8	57.8			8.6
H24040550-012	4370	0	1		51	28	21	L	6.7	5.9	34.6	21.6	25.1	32.1			6.6
H24040550-013	4370	1	3		62	21	17	SL	6.2	6.3	35.0	21.8	29.7	35.2			7.0
H24040550-014	4372	0	1		31	39	30	CL	6.1	7.7	41.2	20.9	57.8	35.0			5.6
H24040550-015	4372	1	3		39	34	27	CL	5.9	8.8	37.7	17.7	101	26.5			3.4
H24040550-016	4369	0	1		44	32	24	L	5.8	8.3	33.5	20.2	50.2	44.2			7.4
H24040550-017	4369	1	3		42	33	25	L	5.4	8.1	33.4	18.6	48.6	40.8			7.0
H24040550-018	3576	0	1		28	38	34	CL	6.7	7.9	43.3	21.6	26.7	53.9			11.0
H24040550-019	3576	1	3		29	38	33	CL	6.9	8.4	39.5	21.4	25.1	61.8			12.8
H24040550-020	3559	0	1		14	56	30	SIOL	7.2	1.9	39.0	8.01	5.97	6.28			2.4
H24040550-021	3559	1	3		20	49	31	SIOL	6.4	2.2	39.1	10.4	7.37	5.61			1.9
H24040550-022	3626	0	1		47	30	23	L	6.0	6.8	34.9	18.8	39.7	31.6			5.8
H24040550-023	3626	1	3		67	30	3	SL	5.9	8.0	38.0	21.4	18.5	54.8			12.2
H24040550-024	3580	0	1		37	33	30	CL	4.9	6.7	38.2	20.0	62.6	13.2			2.0
H24040550-025	3580	1	3		39	32	29	CL	4.3	8.2	36.6	20.4	92.8	14.3			1.9
H24040550-026	3641	0	1		38	31	31	CL	7.5	7.3	43.3	19.6	17.4	50.5			11.7
H24040550-027	3641	1	3		30	38	32	CL	7.4	7.0	48.5	19.4	16.6	48.9			11.5
H24040550-028	3550	0	1		31	40	29	CL	4.8	9.4	37.4	19.1	58.8	51.7			8.3
H24040550-029	3550	1	3		33	37	30	CL	5.6	8.1	39.5	21.1	39.4	46.1			8.4
H24040550-030	3611	0	1		31	37	32	CL	6.9	8.4	43.9	19.6	21.6	63.4			14.0
H24040550-031	3611	1	3		29	40	31	CL	6.8	9.2	41.7	19.5	23.8	72.1			15.5
H24040550-032	3627	0	1		32	39	29	CL	7.0	8.0	43.4	19.6	21.1	62.4			13.8
H24040550-033	3627	1	3		41	32	27	CL	7.1	7.5	42.0	20.1	13.8	56.2			13.7
H24040550-034	3652	0	1		29	37	34	CL	7.3	12.2	44.5	18.7	18.9	112			25.8
H24040550-035	3652	1	3		35	33	32	CL	7.0	10.3	47.4	19.2	18.2	89.4			20.7
H24040550-036	3594	0	1		28	40	32	CL	6.4	11.2	42.3	20.2	25.7	58.7			12.3
H24040550-037	3594	1	3		32	38	30	CL	6.4	11.2	37.2	19.5	31.3	90.3			17.9
H24040550-038	3639	0	1		55	24	21	SCL	7.4	5.6	35.5	16.4	14.2	35.9			9.2
H24040550-039	3639	1	3		45	29	26	L	7.6	9.9	41.0	20.1	25.9	81.6			17.0

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Report Date: 05/03/24

Date Received: 04/17/24

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spoils/J21 Spoils

Workorder: H24040550

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Units										
		Up	Low									
H24040550-001	4409	0	1	16	4.5	11			0.15			
H24040550-002	4409	1	3	5	35	-30	8.4	-3		0.74	0.27	0.12
H24040550-003	4925	0	1	14	23	-9	7.8	6	0.75	0.40	0.25	0.10
H24040550-004	4925	1	3	15	24	-9	8.0	7	0.77	0.42	0.25	0.10
H24040550-005	4401	0	1	30	9.5	21			0.30			
H24040550-006	4401	1	3	25	15	11			0.47			
H24040550-007	4401 (TS)	0	24	26	4.0	22			0.13			
H24040550-008	4368	0	1	17	3.7	13			0.12			
H24040550-009	4368	1	3	16	2.8	13			0.09			
H24040550-010	4371	0	1	13	28	-15	8.9	4	0.88	0.48	0.29	0.12
H24040550-011	4371	1	3	4	39	-35	11	-7	1.25	0.77	0.34	0.14
H24040550-012	4370	0	1	13	15	-2	6.5	7	0.49	0.20	0.21	0.08
H24040550-013	4370	1	3	11	16	-5	4.4	6	0.51	0.30	0.14	0.07
H24040550-014	4372	0	1	14	24	-10	8.7	5	0.76	0.39	0.28	0.10
H24040550-015	4372	1	3	16	30	-14	9.9	6	0.97	0.55	0.32	0.11
H24040550-016	4369	0	1	9	27	-18	12	-3	0.87	0.36	0.38	0.13
H24040550-017	4369	1	3	9	35	-27	20	-12	1.13	0.30	0.65	0.17
H24040550-018	3576	0	1	10	19	-9	10	0	0.60	0.14	0.32	0.14
H24040550-019	3576	1	3	11	18	-7	9.3	2	0.58	0.16	0.30	0.13
H24040550-020	3559	0	1	6	13	-7	8.9	-3	0.42	0.04	0.29	0.09
H24040550-021	3559	1	3	11	8.5	3			0.27			
H24040550-022	3626	0	1	8	22	-14	8.1	0	0.71	0.29	0.26	0.17
H24040550-023	3628	1	3	7	24	-17	5.1	1	0.76	0.28	0.16	0.31
H24040550-024	3560	0	1	6	25	-19	8.3	-2	0.81	0.40	0.27	0.14
H24040550-025	3560	1	3	4	26	-22	7.9	-4	0.82	0.40	0.25	0.17
H24040550-026	3641	0	1	20	6.6	13			0.21			
H24040550-027	3641	1	3	19	7.1	12			0.23			
H24040550-028	3550	0	1	5	26	-20	8.6	-3	0.82	0.42	0.28	0.12
H24040550-029	3550	1	3	7	21	-14	7.7	-1	0.67	0.32	0.25	0.10
H24040550-030	3611	0	1	12	14	-2	5.9	7	0.45	0.15	0.19	0.11
H24040550-031	3611	1	3	12	14	-3	5.1	7	0.46	0.19	0.16	0.11
H24040550-032	3627	0	1	13	17	-4	8.6	4	0.55	0.15	0.28	0.12
H24040550-033	3627	1	3	16	14	2			0.44			
H24040550-034	3652	0	1	18	11	7			0.36			
H24040550-035	3652	1	3	12	11	1			0.34			
H24040550-036	3594	0	1	9	20	-11	9.9	-1	0.65	0.20	0.32	0.13
H24040550-037	3594	1	3	10	21	-11	8.0	1	0.67	0.25	0.26	0.16
H24040550-038	3639	0	1	17	5.0	12			0.16			
H24040550-039	3639	1	3	16	6.7	10			0.22			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spills  
**Workorder:** H23070821

**Report Date:** 08/18/23  
**Date Received:** 07/26/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste		Mg-SatPst-Sat Paste		Na-SatPst-Sat Paste		SAR
		Units	Up	Low	Results	%	Results	s_u	%	mmhos/cm	meq/L	Results	meq/L	Results	meq/L	Results	unitless
H23070821-001	5012	0	1	38	37	25	L	5.2	48.6	9.2	19.0	70.5	46.9	7.0			
H23070821-002	5012	1	3	30	41	29	CL	5.5	55.4	10.6	18.8	36.7	81.3	15.4			
H23070821-003	5105	0	1	32	41	27	CL	3.6	46.5	10.0	20.3	128	1.1	0.1			
H23070821-004	5105	1	3	34	41	25	L	6.1	45.5	5.6	21.3	55.4	1.3	0.2			
H23070821-005	5058	0	1	36	39	25	L	4.5	43.9	8.8	19.3	102	11.3	1.5			
H23070821-006	5058	1	3	38	37	25	L	4.3	40.4	7.4	18.8	89.9	3.3	0.4			
H23070821-007	4335	0	1	44	33	23	L	5.8	37.5	8.7	18.8	45.0	52.7	9.3			
H23070821-008	4335	1	3	44	33	23	L	5.6	39.6	9.4	18.7	46.4	55.6	9.8			
H23070821-009	5040	0	1	46	31	23	L	6.4	41.1	6.5	19.8	28.6	33.8	6.9			
H23070821-010	5040	1	3	44	29	27	CL	6.4	45.3	8.0	22.9	34.5	49.0	9.1			
H23070821-011	4707	0	1	38	35	27	CL	4.0	39.8	29.0	20.5	591	90.7	5.2			
H23070821-012	4707	1	3	34	35	31	CL	4.1	39.5	53.1	20.5	1330	253	10.3			
H23070821-013	4897	0	1	50	31	19	L	6.2	33.9	8.4	22.5	36.1	54.6	10.1			
H23070821-014	4897	1	3	52	29	19	L	5.8	33.4	9.5	25.5	49.8	57.7	9.4			
H23070821-015	4898	0	1	22	47	31	CL	6.8	70.5	7.3	7.77	5.00	62.5	24.8			
H23070821-016	4898	1	3	18	47	35	SiCL	7.9	95.3	4.4	1.22	0.86	40.7	40.0			
H23070821-017	4928	0	1	50	31	19	L	7.3	34.2	6.9	16.1	18.0	43.3	10.5			
H23070821-018	4928	1	3	52	27	21	SCL	7.2	35.4	10.1	19.4	23.8	78.0	16.8			
H23070821-019	5055	0	1	42	33	25	L	6.9	41.2	7.3	21.5	31.5	46.2	9.0			
H23070821-020	5055	1	3	50	29	21	L	6.8	38.5	7.6	20.0	34.2	49.3	9.5			
H23070821-021	5108	0	1	40	37	23	L	5.2	41.3	7.4	20.1	92.1	8.1	1.1			
H23070821-022	5108	1	3	40	37	23	L	5.0	38.8	8.0	19.8	95.7	12.0	1.6			
H23070821-023	4986	0	1	48	33	19	L	7.0	39.4	7.2	19.1	25.8	49.4	10.4			
H23070821-024	4986	1	3	50	29	21	L	6.4	43.1	5.6	21.3	38.3	20.9	3.8			
H23070821-025	4957	0	1	44	35	21	L	6.4	38.1	9.2	20.1	38.8	65.0	12.0			
H23070821-026	4957	1	3	40	35	25	L	6.8	43.6	8.0	19.6	37.2	52.6	9.9			
H23070821-027	5102	0	1	42	37	21	L	6.6	42.5	4.6	23.6	38.9	5.51	1.0			
H23070821-028	5102	1	3	58	29	13	SL	4.6	41.4	3.8	21.8	22.7	5.75	1.2			
H23070821-029	4927	0	1	38	35	27	CL	5.8	48.1	8.2	18.6	39.0	52.0	9.7			
H23070821-030	4927	1	3	38	35	27	CL	6.3	47.2	7.7	18.5	23.2	55.9	12.2			
H23070821-031	5057	0	1	44	33	23	L	5.7	41.8	7.4	20.5	48.6	35.2	6.0			
H23070821-032	5057	1	3	38	39	23	L	5.0	43.3	6.9	19.6	89.1	4.1	0.6			
H23070821-033	4900	0	1	38	37	25	L	6.4	43.4	6.6	19.0	40.1	32.5	6.0			
H23070821-034	4900	1	3	40	35	25	L	6.0	40.3	7.3	19.6	55.7	31.5	5.1			
H23070821-035	4337	0	1	48	31	21	L	4.7	38.8	11.7	18.8	135	36.3	4.1			
H23070821-036	4337	1	3	52	29	19	L	4.5	36.1	11.2	18.6	154	15.7	1.7			
H23070821-037	4338	0	1	44	35	21	L	7.2	36.9	7.9	21.1	34.8	54.7	10.4			
H23070821-038	4338	1	3	42	37	21	L	6.5	40.6	6.4	21.6	22.1	36.2	7.7			
H23070821-039	5085	0	1	38	39	23	L	5.7	40.3	9.6	21.6	80.6	43.3	6.1			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine

**Project:** N9 Spills

**Workorder:** H23070821

**Report Date:** 08/18/23

**Date Received:** 07/26/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic	
		Up	Low						Results	U/kt		Results	U/kt	Results	U/kt
				Results	U/kt	Results	U/kt	Results			U/kt				
H23070821-001	5012	0	1	8	31	-23	13	-5	0.99	0.42	0.43	0.14			
H23070821-002	5012	1	3	8	29	-20	13	-5	0.92	0.34	0.42	0.15			
H23070821-003	5105	0	1	2	42	-40	15	-13	1.35	0.73	0.48	0.13			
H23070821-004	5105	1	3	12	33	-20	8.4	4	1.04	0.66	0.27	0.11			
H23070821-005	5058	0	1	6	30	-24	8.2	-2	0.96	0.59	0.26	0.11			
H23070821-006	5058	1	3	5	30	-25	7.9	-3	0.97	0.62	0.25	0.10			
H23070821-007	4335	0	1	13	31	-18	16	-3	0.98	0.31	0.50	0.17			
H23070821-008	4335	1	3	11	37	-26	20	-9	1.18	0.38	0.63	0.18			
H23070821-009	5040	0	1	12	17	-5	7.5	5	0.54	0.22	0.24	0.08			
H23070821-010	5040	1	3	14	21	-8	8.8	5	0.68	0.31	0.28	0.09			
H23070821-011	4707	0	1	4	52	-48	12	-8	1.67	1.15	0.40	0.13			
H23070821-012	4707	1	3	3	87	-84	14	-11	2.80	2.22	0.44	0.13			
H23070821-013	4897	0	1	11	31	-19	12	-1	0.98	0.41	0.40	0.17			
H23070821-014	4897	1	3	10	32	-23	11	-1	1.04	0.51	0.36	0.17			
H23070821-015	4898	0	1	13	12	1			0.39						
H23070821-016	4898	1	3	13	9.0	4			0.29						
H23070821-017	4928	0	1	34	13	22			0.41						
H23070821-018	4928	1	3	27	16	11			0.50						
H23070821-019	5055	0	1	13	17	-4	7.1	6	0.54	0.24	0.23	0.08			
H23070821-020	5055	1	3	14	18	-4	6.1	7	0.57	0.27	0.20	0.10			
H23070821-021	5106	0	1	9	31	-21	12	-3	0.98	0.49	0.38	0.11			
H23070821-022	5106	1	3	8	30	-22	12	-4	0.97	0.48	0.37	0.12			
H23070821-023	4986	0	1	13	11	1			0.37						
H23070821-024	4986	1	3	12	27	-14	6.8	6	0.85	0.50	0.22	0.14			
H23070821-025	4957	0	1	13	22	-9	9.9	3	0.70	0.29	0.32	0.09			
H23070821-026	4957	1	3	18	22	-4	9.4	9	0.70	0.32	0.30	0.07			
H23070821-027	5102	0	1	13	16	-3	4.6	8	0.52	0.32	0.15	0.05			
H23070821-028	5102	1	3	6	23	-17	4.1	2	0.72	0.38	0.13	0.21			
H23070821-029	4927	0	1	12	25	-13	9.6	3	0.81	0.37	0.31	0.13			
H23070821-030	4927	1	3	15	23	-8	9.8	5	0.74	0.30	0.31	0.13			
H23070821-031	5057	0	1	11	22	-11	8.9	2	0.69	0.33	0.28	0.08			
H23070821-032	5057	1	3	9	30	-21	11	-2	0.95	0.49	0.36	0.11			
H23070821-033	4900	0	1	15	24	-9	8.0	7	0.76	0.40	0.26	0.10			
H23070821-034	4900	1	3	21	29	-7	8.3	13	0.92	0.53	0.26	0.13			
H23070821-035	4337	0	1	6	32	-26	10	-4	1.03	0.52	0.33	0.18			
H23070821-036	4337	1	3	5	35	-30	12	-7	1.13	0.55	0.39	0.19			
H23070821-037	4338	0	1	27	16	11			0.50						
H23070821-038	4338	1	3	18	16	2			0.50						
H23070821-039	5085	0	1	10	24	-15	8.4	1	0.78	0.42	0.27	0.09			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23070821

**Report Date:** 08/18/23  
**Date Received:** 07/26/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR			
		Up	Low														
		Units		%		%		s_u		mmhos/cm		meq/L		meq/L		unitless	
		Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H23070821-040	5085	1	3	34	41	25	L	5.4	40.8	7.4	19.3	61.1	26.9	4.2			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23070821

**Report Date:** 08/18/23  
**Date Received:** 07/26/23

Sample ID	Client Sample ID	Analysis		Units	Up	Low	Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Results	Results												
H23070821-040	5085	1	3	8	22	-14	6.8	1	0.71	0.43	0.22	0.07			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23050107

**Report Date:** 05/18/23  
**Date Received:** 05/03/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	Percent Sat	pH-Sat/Pst	Cond-Sat/Pst	Ca-Sat/Pst-Sat Paste		Mg-Sat/Pst-Sat Paste		Na-Sat/Pst-Sat Paste		SAR
		Units	Up	Low	Results	%	Results	%	s_u	mmhos/cm	meq/L	Results	meq/L	Results	meq/L	Results	unitless
H23050107-001	4709	0	1	36	38	26	L	48.3	4.7	13.5	18.4	178	43.2	178	43.2	4.4	
H23050107-002	4599	0	1	42	34	24	L	46.1	7.2	3.0	24.4	14.1	2.00	14.1	2.00	0.5	
H23050107-003	4599	1	3	44	32	24	L	46.2	7.1	4.0	23.3	26.2	6.67	26.2	6.67	1.3	
H23050107-004	4632	0	1	38	36	26	L	47.0	6.7	7.4	22.1	68.6	24.7	68.6	24.7	3.7	
H23050107-005	4632	1	3	50	28	22	L	45.1	6.2	6.7	21.8	78.3	7.98	78.3	7.98	1.1	
H23050107-006	4669	0	1	38	30	32	CL	54.5	7.4	2.5	24.3	9.31	0.95	9.31	0.95	0.2	
H23050107-007	4669	1	3	46	26	28	SCL	61.3	7.1	2.7	25.4	9.40	1.30	9.40	1.30	0.3	
H23050107-008	4671	0	1	52	28	20	L	40.7	5.1	4.7	16.9	34.3	12.1	34.3	12.1	2.4	
H23050107-009	4671	1	3	46	32	22	L	48.0	4.7	7.1	16.8	59.2	25.0	59.2	25.0	4.0	
H23050107-010	4709	1	3	40	34	26	L	45.8	4.4	5.0	18.4	41.4	10.8	41.4	10.8	2.0	
H23050107-011	4706	0	1	38	36	26	L	49.3	5.9	4.1	20.3	26.2	9.15	26.2	9.15	1.9	
H23050107-012	4706	1	3	44	34	22	L	48.6	5.5	9.2	17.6	86.0	40.0	86.0	40.0	5.6	
H23050107-013	4633	0	1	44	32	24	L	43.9	6.2	4.3	18.9	38.4	6.05	38.4	6.05	1.1	
H23050107-014	4633	1	3	46	30	24	L	45.1	6.2	11.9	17.7	192	23.8	192	23.8	2.3	
H23050107-015	4595	0	1	42	30	28	CL	45.6	7.2	3.3	22.8	17.0	4.10	17.0	4.10	0.9	
H23050107-016	4595	1	3	42	32	26	L	46.2	7.1	4.0	22.8	28.2	6.03	28.2	6.03	1.2	
H23050107-017	4596	0	1	46	32	22	L	41.0	6.3	3.6	21.3	21.9	5.44	21.9	5.44	1.2	
H23050107-018	4596	1	3	46	32	22	L	43.6	6.3	4.5	20.2	35.0	8.81	35.0	8.81	1.7	
H23050107-019	4672	0	1	52	28	20	L	40.0	4.4	4.6	18.1	36.3	7.74	36.3	7.74	1.5	
H23050107-020	4672	1	3	74	24	2	LS	44.1	7.0	11.5	18.2	185	17.2	185	17.2	1.8	
H23050107-021	4635	0	1	58	22	20	SCL	37.8	6.5	4.4	21.4	37.9	6.18	37.9	6.18	1.1	
H23050107-022	4635	1	3	54	26	20	SCL	38.4	6.5	4.6	18.4	37.9	8.32	37.9	8.32	1.6	
H23050107-023	4598	0	1	40	34	26	L	47.4	7.3	3.9	21.8	26.1	6.53	26.1	6.53	1.3	
H23050107-024	4598	1	3	50	30	20	L	45.5	7.3	4.5	20.3	24.8	14.0	24.8	14.0	3.0	
H23050107-025	4634	0	1	44	34	22	L	44.0	4.7	8.0	17.5	74.4	28.2	74.4	28.2	4.2	
H23050107-026	4634	1	3	42	36	22	L	45.3	4.3	11.3	17.0	119	40.8	119	40.8	5.0	
H23050107-027	4597	0	1	48	32	20	L	44.1	5.1	5.9	19.1	44.9	20.7	44.9	20.7	3.6	
H23050107-028	4597	1	3	50	28	22	L	45.2	3.6	9.0	17.0	48.7	55.2	48.7	55.2	9.6	
H23050107-029	4601	0	1	36	34	30	CL	46.7	7.3	3.8	20.4	16.8	12.6	16.8	12.6	2.9	
H23050107-030	4601	1	3	38	34	28	CL	49.7	6.9	7.0	17.8	30.9	47.5	30.9	47.5	9.6	
H23050107-031	4600	0	1	36	36	28	CL	43.8	7.1	3.9	20.2	15.1	15.0	15.1	15.0	3.6	
H23050107-032	4600	1	3	36	36	28	CL	45.7	7.1	5.9	19.5	28.3	31.5	28.3	31.5	6.4	
H23050107-033	4766	0	1	64	18	18	SL	50.8	2.8	5.2	19.7	24.3	0.22	24.3	0.22	<0.1	
H23050107-034	4766	1	3	50	28	22	L	46.7	2.3	11.0	11.6	52.0	0.14	52.0	0.14	<0.1	
H23050107-035	4738	0	1	40	32	28	CL	49.4	6.3	3.9	27.3	18.8	8.23	18.8	8.23	1.7	
H23050107-036	4738	1	3	42	32	26	L	49.5	6.8	3.4	23.0	15.3	7.34	15.3	7.34	1.7	
H23050107-037	4705	0	1	28	42	30	CL	39.4	6.2	3.5	24.9	19.3	2.26	19.3	2.26	0.5	
H23050107-038	4705	1	3	28	44	28	CL	38.7	6.8	3.5	25.7	20.9	2.21	20.9	2.21	0.5	
H23050107-039	4708	0	1	38	34	28	CL	43.3	4.5	4.1	19.7	25.9	8.02	25.9	8.02	1.7	

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23050107

**Report Date:** 05/18/23  
**Date Received:** 05/03/23

Sample ID	Client Sample ID	Analysis		Units	Neut Potential		Acid Potential	Acid/Base Potential		AP, Pyritic S		ABP, Pyritic S		Sulfur, Total		Sulfate		Sulfur, Pyritic		Sulfur, Organic	
		Up	Low		Results	t/kt	Results	Results	t/kt	Results	t/kt	Results	t/kt	Results	%	Results	%	Results	%	Results	%
H23050107-001	4709	0	1		5		42	-37		15		-10		1.34		0.73		0.47		0.13	
H23050107-002	4599	0	1		27		28	-1		16		11		0.88		0.22		0.50		0.16	
H23050107-003	4599	1	3		21		29	-8		13		8		0.91		0.35		0.41		0.15	
H23050107-004	4632	0	1		20		42	-22		13		7		1.36		0.77		0.42		0.17	
H23050107-005	4632	1	3		23		61	-38		16		7		1.96		1.25		0.51		0.20	
H23050107-006	4669	0	1		54		11	43						0.35							
H23050107-007	4669	1	3		63		13	50						0.42							
H23050107-008	4671	0	1		6		40	-34		16		-10		1.28		0.53		0.50		0.25	
H23050107-009	4871	1	3		4		45	-41		18		-14		1.45		0.65		0.58		0.21	
H23050107-010	4709	1	3		4		37	-33		13		-9		1.18		0.84		0.42		0.12	
H23050107-011	4706	0	1		14		21	-7		8.4		6		0.68		0.27		0.27		0.14	
H23050107-012	4706	1	3		9		33	-25		11		-2		1.07		0.57		0.34		0.16	
H23050107-013	4633	0	1		10		36	-26		13		-3		1.14		0.60		0.41		0.13	
H23050107-014	4633	1	3		11		45	-34		14		-3		1.44		0.82		0.44		0.18	
H23050107-015	4595	0	1		23		28	-4		13		10		0.89		0.32		0.42		0.15	
H23050107-016	4595	1	3		18		31	-14		12		6		1.00		0.44		0.38		0.18	
H23050107-017	4596	0	1		11		35	-24		19		-8		1.13		0.38		0.60		0.14	
H23050107-018	4596	1	3		10		41	-30		19		-8		1.30		0.54		0.59		0.17	
H23050107-019	4672	0	1		4		37	-32		13		-8		1.18		0.52		0.40		0.26	
H23050107-020	4672	1	3		10		41	-31		5.6		5		1.32		0.66		0.18		0.48	
H23050107-021	4635	0	1		16		33	-17		18		-2		1.04		0.30		0.58		0.16	
H23050107-022	4635	1	3		14		35	-21		18		-4		1.12		0.37		0.59		0.16	
H23050107-023	4598	0	1		24		34	-10		15		9		1.10		0.48		0.48		0.14	
H23050107-024	4598	1	3		22		30	-8		11		10		0.97		0.44		0.36		0.16	
H23050107-025	4634	0	1		5		37	-32		12		-7		1.17		0.60		0.37		0.19	
H23050107-026	4634	1	3		3		37	-34		13		-10		1.20		0.62		0.41		0.16	
H23050107-027	4597	0	1		7		39	-33		15		-8		1.26		0.50		0.48		0.28	
H23050107-028	4597	1	3		2		57	-55		24		-22		1.82		0.61		0.77		0.44	
H23050107-029	4601	0	1		26		20	6						0.64							
H23050107-030	4601	1	3		15		29	-14		12		3		0.91		0.41		0.38		0.12	
H23050107-031	4600	0	1		18		25	-7		14		3		0.79		0.20		0.45		0.14	
H23050107-032	4600	1	3		20		27	-7		10		10		0.87		0.41		0.33		0.13	
H23050107-033	4766	0	1		3		49	-46		19		-16		1.58		0.52		0.61		0.45	
H23050107-034	4766	1	3		-4		41	-41		7.9		-12		1.31		0.80		0.25		0.27	
H23050107-035	4738	0	1		22		9.3	13						0.30							
H23050107-036	4738	1	3		20		7.4	13						0.24							
H23050107-037	4705	0	1		13		14	-1		3.2		10		0.46		0.26		0.10		0.09	
H23050107-038	4705	1	3		22		8.7	14				-10		0.28		0.48		0.45		0.15	
H23050107-039	4708	0	1		4		34	-30		14		-10		1.09							

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine

**Project:** N9 Spoils

**Workorder:** H23050107

**Report Date:** 05/18/23

**Date Received:** 05/03/23

Sample ID	Client Sample ID	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	Units	%	%	%		%	s_u_	mmhos/cm	meq/L	meq/L	meq/L	unitless
H23050107-040	4708	1	3	34	36	30	CL	48.0	5.4	14.0	16.8	177	60.2	6.1
H23050107-041	4709	0	1	28	42	30	CL	46.3	4.1	5.1	21.0	31.4	13.4	2.6
H23050107-042	4709	1	3	38	34	28	CL	42.0	5.9	8.0	18.5	47.6	39.9	6.9
H23050107-043	4637	0	1	36	38	26	L	49.4	7.6	3.4	22.3	18.1	4.42	1.0
H23050107-044	4637	1	3	26	44	30	CL	56.7	7.5	5.4	23.0	39.5	13.1	2.3
H23050107-045	4639	0	1	52	12	36	SC	35.7	8.0	0.6	3.51	2.20	0.73	0.4
H23050107-046	4639	1	3	64	14	22	SCL	36.3	7.9	1.1	7.32	3.10	1.04	0.5
H23050107-047	4670	0	1	38	44	18	L	44.9	4.8	6.9	19.0	60.6	18.5	2.9
H23050107-048	4670	1	3	36	36	28	CL	44.9	5.6	12.9	18.5	139	48.5	5.4
H23050107-049	4638	0	1	50	26	24	SCL	43.1	7.0	0.4	1.94	0.59	0.40	0.4
H23050107-050	4638	1	3	58	20	22	SCL	46.5	7.0	0.3	1.77	0.56	0.38	0.4

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23050107

**Report Date:** 05/18/23  
**Date Received:** 05/03/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic	
		Up	Low										
													Units
Sample ID	Client Sample ID	Up	Low	Results	t/kt	Results	t/kt	Results	t/kt	Results	%	Results	%
H23050107-040	4708	1	3	6	45	-40	16	-10	1.45	0.79	0.50	0.17	
H23050107-041	4709	0	1	1	28	-27	11	-11	0.88	0.40	0.36	0.12	
H23050107-042	4709	1	3	8	26	-18	7.8	0	0.82	0.46	0.25	0.10	
H23050107-043	4637	0	1	51	7.8	43			0.25				
H23050107-044	4637	1	3	37	15	22			0.47				
H23050107-045	4639	0	1	69	1.5	67			0.05				
H23050107-046	4639	1	3	37	0.60	37			0.02				
H23050107-047	4670	0	1	5	37	-32	12	-7	1.19	0.64	0.40	0.15	
H23050107-048	4670	1	3	7	45	-38	14	-7	1.43	0.83	0.44	0.16	
H23050107-049	4638	0	1	13	4.2	9			0.14				
H23050107-050	4638	1	3	16	5.1	11			0.16				

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spoils

Workorder: H23070822

Report Date: 08/18/23

Date Received: 07/26/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst		Mg-SatPst		Na-SatPst		SAR
		Units	Units	Results	Results	Results	Results	s_u	Results	Results	Results	Results	Results	Results	Results	Results	Results
H23070822-001	5083	0	1	38	41	21	L	4.9	43.2	7.9	19.5	88.7	14.6	2.0	2.0	2.0	2.0
H23070822-002	5083	1	3	44	31	25	L	5.7	40.3	7.2	18.4	64.3	28.2	4.4	4.4	4.4	4.4
H23070822-003	5036	0	1	38	35	27	CL	5.4	44.0	7.4	17.6	33.9	52.0	10.2	10.2	10.2	10.2
H23070822-004	5036	1	3	30	49	21	L	4.0	49.4	7.7	17.2	25.8	55.5	12.0	12.0	12.0	12.0
H23070822-005	5108	0	1	44	35	21	L	5.7	39.5	9.2	18.5	52.4	61.3	10.3	10.3	10.3	10.3
H23070822-006	5108	1	3	46	27	27	SCL	6.0	40.9	8.5	18.4	46.6	55.8	9.8	9.8	9.8	9.8
H23070822-007	5080	0	1	42	31	27	CL	6.9	42.5	8.9	19.5	39.3	67.0	12.3	12.3	12.3	12.3
H23070822-008	5080	1	3	42	33	25	L	6.8	43.0	10.1	19.2	42.1	81.6	14.7	14.7	14.7	14.7
H23070822-009	5082	0	1	30	47	23	L	4.8	35.4	6.7	20.0	83.1	5.2	0.7	0.7	0.7	0.7
H23070822-010	5103	1	3	38	41	21	L	5.5	36.4	6.2	18.9	75.8	3.5	0.5	0.5	0.5	0.5
H23070822-011	5103	0	1	46	33	21	L	4.3	44.3	3.9	26.5	19.4	4.18	0.9	0.9	0.9	0.9
H23070822-012	5103	1	3	48	31	21	L	3.9	46.1	3.9	23.8	20.0	3.45	0.7	0.7	0.7	0.7
H23070822-013	5079	0	1	48	31	21	L	4.5	35.9	11.6	17.8	193	3.0	0.3	0.3	0.3	0.3
H23070822-014	5079	1	3	40	37	23	L	5.4	38.1	11.0	18.5	185	5.9	0.6	0.6	0.6	0.6
H23070822-015	5120	0	1	52	29	19	L	7.3	39.8	4.3	21.1	23.8	9.79	2.1	2.1	2.1	2.1
H23070822-016	5120	1	3	50	25	25	SCL	6.1	51.0	5.4	24.2	25.9	13.6	2.7	2.7	2.7	2.7
H23070822-017	5061	0	1	34	39	27	CL	6.5	42.7	8.5	18.4	44.0	54.9	9.8	9.8	9.8	9.8
H23070822-018	5081	1	3	34	37	29	CL	5.7	43.1	13.3	18.4	98.3	85.4	11.2	11.2	11.2	11.2
H23070822-019	5013	0	1	42	35	23	L	6.3	38.6	7.7	17.2	38.4	48.2	9.1	9.1	9.1	9.1
H23070822-020	5013	1	3	40	35	25	L	5.4	44.3	8.5	15.8	62.0	42.7	6.8	6.8	6.8	6.8
H23070822-021	5080	0	1	46	26	28	SCL	4.8	32.9	9.1	22.0	142	3.2	0.4	0.4	0.4	0.4
H23070822-022	5080	1	3	48	24	28	SCL	5.1	39.0	7.2	21.5	96.9	3.9	0.5	0.5	0.5	0.5
H23070822-023	5122	0	1	46	28	26	L	6.4	35.6	8.0	21.3	44.0	41.8	7.3	7.3	7.3	7.3
H23070822-024	5122	1	3	48	26	26	SCL	6.4	37.0	7.1	20.0	46.1	30.2	5.2	5.2	5.2	5.2
H23070822-025	5082	0	1	30	44	26	L	7.0	34.0	8.9	21.4	39.2	56.0	10.2	10.2	10.2	10.2
H23070822-026	5082	1	3	24	46	30	CL	7.5	32.8	8.2	15.0	34.0	59.6	12.0	12.0	12.0	12.0
H23070822-027	5084	0	1	36	34	30	CL	6.2	37.3	7.5	14.5	56.7	38.7	6.5	6.5	6.5	6.5
H23070822-028	5084	1	3	36	36	28	CL	6.2	36.6	8.1	14.0	63.4	38.9	6.2	6.2	6.2	6.2
H23070822-029	5107	0	1	50	28	22	L	4.3	28.3	14.4	18.0	149	64.5	7.1	7.1	7.1	7.1
H23070822-030	5107	1	3	50	28	22	L	5.0	31.9	12.4	17.5	127	57.1	6.7	6.7	6.7	6.7
H23070822-031	5059	0	1	40	32	28	CL	4.8	38.5	8.6	14.6	115	16.2	2.0	2.0	2.0	2.0
H23070822-032	5059	1	3	38	32	30	CL	4.4	41.2	10.6	16.4	182	18.0	1.9	1.9	1.9	1.9
H23070822-033	5081	0	1	46	34	20	L	4.0	39.4	5.7	17.9	49.4	13.8	2.4	2.4	2.4	2.4
H23070822-034	5081	1	3	50	34	16	L	3.9	37.8	4.8	16.9	27.7	17.8	3.8	3.8	3.8	3.8
H23070822-035	5101	0	1	44	28	28	CL	7.5	40.0	5.1	23.2	40.4	10.5	1.9	1.9	1.9	1.9
H23070822-036	5101	1	3	38	34	28	CL	7.1	38.6	6.1	20.3	57.4	11.2	1.8	1.8	1.8	1.8
H23070822-037	5035	0	1	42	28	30	CL	6.5	42.5	6.6	16.9	32.0	40.4	8.2	8.2	8.2	8.2
H23070822-038	5035	1	3	30	40	30	CL	5.9	43.1	6.8	16.8	34.8	38.4	7.6	7.6	7.6	7.6
H23070822-039	5121	0	1	36	36	28	CL	4.2	43.7	4.9	20.7	45.8	3.1	0.5	0.5	0.5	0.5

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spolis

Workorder: H23070822

Report Date: 08/18/23

Date Received: 07/26/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic	
		Units	Low	Up	Results	U/Kt	Results	U/Kt	Results	%	Results	%	Results	%	Results
H23070822-001	5083	0	1	7	33	-26	10	-3	1.07	0.60	0.33	0.33	0.13		
H23070822-002	5083	1	3	10	26	-17	8.5	1	0.84	0.43	0.27	0.27	0.14		
H23070822-003	5036	0	1	10	24	-14	8.6	1	0.76	0.35	0.27	0.27	0.14		
H23070822-004	5036	1	3	5	24	-19	8.7	-4	0.75	0.33	0.28	0.28	0.14		
H23070822-005	5108	0	1	10	34	-24	17	-7	1.10	0.40	0.53	0.53	0.17		
H23070822-006	5108	1	3	11	35	-24	18	-7	1.12	0.35	0.59	0.59	0.18		
H23070822-007	5060	0	1	20	28	-8	8.5	11	0.89	0.50	0.27	0.27	0.11		
H23070822-008	5060	1	3	19	30	-11	8.1	11	0.97	0.57	0.26	0.26	0.14		
H23070822-009	5082	0	1	8	63	-54	39	-31	2.00	0.62	1.25	1.25	0.14		
H23070822-010	5082	1	3	10	27	-17	9.8	0	0.87	0.50	0.31	0.31	0.06		
H23070822-011	5103	0	1	8	34	-26	13	-5	1.08	0.50	0.43	0.43	0.15		
H23070822-012	5103	1	3	6	38	-32	12	-6	1.22	0.70	0.37	0.37	0.15		
H23070822-013	5079	0	1	8	57	-48	16	-8	1.82	1.16	0.52	0.52	0.13		
H23070822-014	5079	1	3	15	41	-26	8.0	7	1.32	0.98	0.26	0.26	0.08		
H23070822-015	5120	0	1	25	8.1	17			0.26						
H23070822-016	5120	1	3	22	13	9			0.41						
H23070822-017	5061	0	1	20	12	7			0.39						
H23070822-018	5061	1	3	10	36	-26	11	-1	1.16	0.72	0.35	0.35	0.09		
H23070822-019	5013	0	1	12	18	-6	7.0	5	0.59	0.29	0.22	0.22	0.07		
H23070822-020	5013	1	3	8	33	-25	13	-5	1.07	0.52	0.43	0.43	0.12		
H23070822-021	5080	0	1	11	34	-23	9.8	1	1.07	0.66	0.31	0.31	0.09		
H23070822-022	5080	1	3	9	33	-24	9.4	0	1.06	0.66	0.30	0.30	0.10		
H23070822-023	5122	0	1	12	14	-2	5.4	7	0.46	0.23	0.17	0.17	0.06		
H23070822-024	5122	1	3	11	14	-4	4.8	6	0.46	0.26	0.15	0.15	0.05		
H23070822-025	5062	0	1	13	17	-4	6.5	6	0.54	0.29	0.21	0.21	0.05		
H23070822-026	5062	1	3	14	20	-6	6.0	8	0.62	0.38	0.19	0.19	0.05		
H23070822-027	5084	0	1	11	27	-16	10	1	0.87	0.46	0.32	0.32	0.09		
H23070822-028	5084	1	3	11	29	-18	10	1	0.92	0.49	0.33	0.33	0.09		
H23070822-029	5107	0	1	7	32	-25	12	-4	1.03	0.49	0.38	0.38	0.16		
H23070822-030	5107	1	3	8	32	-24	11	-3	1.02	0.51	0.34	0.34	0.17		
H23070822-031	5059	0	1	8	41	-33	14	-7	1.31	0.73	0.46	0.46	0.12		
H23070822-032	5059	1	3	6	42	-36	12	-6	1.34	0.82	0.40	0.40	0.13		
H23070822-033	5081	0	1	3	25	-21	5.8	-3	0.79	0.45	0.19	0.19	0.16		
H23070822-034	5081	1	3	2	24	-21	5.6	-3	0.76	0.44	0.18	0.18	0.15		
H23070822-035	5101	0	1	25	8.1	16			0.26						
H23070822-036	5101	1	3	12	17	-4	4.0	8	0.54	0.37	0.13	0.13	0.04		
H23070822-037	5035	0	1	13	20	-7	8.1	5	0.65	0.30	0.26	0.26	0.09		
H23070822-038	5035	1	3	9	19	-10	6.5	2	0.61	0.33	0.21	0.21	0.07		
H23070822-039	5121	0	1	4	24	-19	6.7	-3	0.75	0.43	0.21	0.21	0.11		

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spills  
**Workorder:** H23070822

**Report Date:** 08/18/23  
**Date Received:** 07/26/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Up	Low	%	%	%		s_u_	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
H23070822-040	5121	1	3	36	34	30	CL	5.7	39.2	4.6	18.7	37.3	9.1	1.7

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23070822

**Report Date:** 08/18/23  
**Date Received:** 07/26/23

Sample ID	Client Sample ID	Analysis		Units	Up	Low	Neut Potential U/kt	Acid Potential U/kt	Acid/Base Potential U/kt	AP, Pyritic S U/kt	ABP, Pyritic S U/kt	Sulfur, Total %	Sulfur, Sulfate %	Sulfur, Pyritic %	Sulfur, Organic %
		Results	Results												
H23070822-Q40	5121	1	3	9	19	-10	5.0	4	0.61	0.37	0.16	0.07			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spills

Workorder: H23070824

Report Date: 08/18/23

Date Received: 07/26/23

Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	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
Up	Low	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
0	1	38	35	27	CL	6.3	38.9	6.1	17.3	37.1	31.7	6.3
1	3	40	33	27	CL	6.4	39.3	5.4	19.0	41.2	21.1	3.9
0	1	34	37	29	CL	4.6	36.9	7.7	18.5	113	2.7	0.3
1	3	32	39	29	CL	4.3	34.8	9.1	19.0	138	2.6	0.3
0	1	44	31	25	L	6.6	35.1	8.2	19.3	46.2	54.3	9.6
1	3	40	33	27	CL	6.5	39.7	8.7	18.0	48.2	58.8	10.1
0	1	34	37	29	CL	6.3	39.8	6.8	20.7	75.6	14.6	2.2
1	3	34	37	29	CL	6.3	36.8	5.4	20.7	52.0	8.9	1.5
0	1	38	33	29	CL	6.0	40.4	7.9	16.6	39.5	51.3	9.6
1	3	44	29	27	CL	6.2	38.3	7.8	19.4	41.3	47.7	8.6
0	1	36	31	33	CL	6.7	38.5	6.8	20.0	35.2	40.4	7.6
1	3	30	37	33	CL	6.3	40.4	7.9	17.8	41.1	51.3	9.6
0	1	34	37	29	CL	5.9	42.1	8.1	18.9	49.3	47.0	7.9
1	3	32	39	29	CL	6.1	40.2	8.1	19.1	51.9	44.2	7.4
0	1	40	31	29	CL	6.7	38.7	6.1	20.1	33.4	33.8	6.5
1	3	36	31	33	CL	6.4	41.0	7.1	16.1	29.1	50.0	10.6
0	1	42	31	27	CL	5.8	36.1	5.7	18.7	51.3	10.5	1.7
1	3	38	35	27	CL	3.6	37.6	11.9	19.0	198	6.7	0.7
0	1	30	41	29	CL	6.3	38.5	4.6	22.1	28.0	14.1	2.8
1	3	36	35	29	CL	5.9	36.2	5.0	19.7	42.3	11.6	2.2
0	1	30	41	29	CL	3.5	41.1	8.1	18.9	70.3	24.5	3.8
1	3	26	45	29	CL	5.3	40.9	19.1	19.0	149	132	15.0
0	1	48	29	23	L	6.5	36.8	8.5	22.4	38.5	55.4	10.2
1	3	38	35	27	CL	6.2	45.1	9.2	20.0	45.5	61.1	11.0
0	1	44	31	25	L	6.5	40.2	6.9	20.9	69.0	19.9	3.0
1	3	48	29	23	L	5.0	36.5	9.3	22.7	110	21.3	2.7
0	1	42	29	29	CL	6.5	47.6	9.3	18.4	39.8	67.6	12.9
1	3	40	29	31	CL	6.6	49.3	9.9	18.6	40.7	73.0	13.7
0	1	40	33	27	CL	4.9	39.2	9.1	19.0	52.2	53.0	9.2
1	3	32	37	31	CL	5.5	48.1	8.7	17.9	51.0	53.1	9.1
0	1	28	39	33	CL	6.0	49.2	9.8	18.4	33.8	73.8	15.0
1	3	24	41	35	CL	6.2	56.7	8.7	18.5	31.1	63.4	13.2
0	1	38	33	29	CL	5.9	43.8	7.7	19.7	42.8	43.4	7.9
1	3	40	33	27	CL	5.7	38.1	9.1	23.2	47.3	57.1	9.7
0	1	44	33	23	L	5.4	33.2	13.0	19.2	64.8	92.5	14.3
1	3	48	29	23	L	6.2	37.3	10.5	19.6	54.8	70.9	11.7

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spoils

Workorder: H23070824

Report Date: 08/18/23

Date Received: 07/26/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Units										
		Up	Low	U/kt	Results	U/kt	Results	U/kt	Results	%	Results	%
H23070824-001	5078	0	1	11	19	-7	7.0	4	0.60	0.30	0.23	0.07
H23070824-002	5078	1	3	12	21	-9	7.3	4	0.66	0.36	0.23	0.07
H23070824-003	5104	0	1	6	31	-25	12	-6	0.99	0.52	0.39	0.08
H23070824-004	5104	1	3	5	34	-28	13	-7	1.08	0.57	0.41	0.10
H23070824-005	4984	0	1	14	19	-5	7.8	6	0.62	0.29	0.25	0.08
H23070824-006	4984	1	3	14	21	-6	8.1	6	0.66	0.32	0.26	0.08
H23070824-007	4339	0	1	17	32	-15	8.1	9	1.02	0.67	0.26	0.09
H23070824-008	4339	1	3	14	28	-15	6.9	7	0.91	0.60	0.22	0.09
H23070824-009	5014	0	1	12	20	-8	7.6	4	0.65	0.34	0.24	0.07
H23070824-010	5014	1	3	10	14	-4	3.6	6	0.45	0.27	0.12	0.06
H23070824-011	4930	0	1	20	29	-9	9.7	11	0.93	0.51	0.31	0.11
H23070824-012	4930	1	3	14	32	-17	12	2	1.01	0.50	0.40	0.12
H23070824-013	5086	0	1	11	29	-18	12	-1	0.93	0.44	0.39	0.10
H23070824-014	5086	1	3	12	29	-16	12	1	0.92	0.44	0.37	0.11
H23070824-015	5041	0	1	16	18	-2	7.0	9	0.57	0.27	0.22	0.07
H23070824-016	5041	1	3	14	25	-12	12	2	0.80	0.34	0.37	0.09
H23070824-017	4336	0	1	9	35	-26	8.5	0	1.12	0.77	0.27	0.09
H23070824-018	4336	1	3	3	44	-42	11	-8	1.42	0.93	0.34	0.14
H23070824-019	5056	0	1	13	18	-4	5.2	8	0.56	0.33	0.17	0.06
H23070824-020	5056	1	3	11	22	-11	6.6	5	0.70	0.42	0.21	0.07
H23070824-021	4709	0	1	3	31	-28	11	-9	0.99	0.51	0.36	0.12
H23070824-022	4709	1	3	8	45	-37	24	-16	1.44	0.51	0.77	0.16
H23070824-023	4985	0	1	16	19	-3	7.1	9	0.61	0.32	0.23	0.07
H23070824-024	4985	1	3	11	21	-10	8.6	2	0.66	0.31	0.28	0.08
H23070824-025	5063	0	1	10	18	-8	5.2	5	0.58	0.35	0.17	0.06
H23070824-026	5063	1	3	7	21	-14	6.4	1	0.68	0.41	0.20	0.07
H23070824-027	5034	0	1	11	20	-9	6.6	4	0.64	0.34	0.21	0.08
H23070824-028	5034	1	3	12	20	-8	6.3	6	0.65	0.36	0.20	0.09
H23070824-029	4929	0	1	7	30	-24	10	-3	0.97	0.50	0.32	0.15
H23070824-030	4929	1	3	9	28	-19	9.1	0	0.89	0.48	0.29	0.12
H23070824-031	4899	0	1	14	25	-11	11	3	0.79	0.32	0.36	0.12
H23070824-032	4899	1	3	12	25	-13	11	1	0.79	0.33	0.35	0.11
H23070824-033	4896	0	1	12	26	-14	10	2	0.82	0.36	0.33	0.12
H23070824-034	4896	1	3	14	21	-6	7.4	7	0.67	0.35	0.24	0.08
H23070824-035	4958	0	1	9	29	-20	12	-4	0.93	0.43	0.40	0.10
H23070824-036	4958	1	3	9	22	-12	7.3	2	0.70	0.39	0.23	0.08

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23090130

**Report Date:** 10/13/23  
**Date Received:** 09/06/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units	Up											
				%	%	%		s_u_	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
		Up	Low	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H23090130-001	5010	0	1	40	38	22	L	4.5	51.1	3.5	22.5	19.6	2.34	0.5
H23090130-002	5010	1	3	62	22	16	SL	3.6	54.0	4.9	20.1	36.2	8.52	1.6
H23090130-003	5011	0	1	46	32	22	L	5.1	43.4	3.8	21.0	25.4	3.27	0.7
H23090130-004	5011	1	3	40	34	26	L	6.1	47.7	6.3	18.0	38.6	27.3	5.1
H23090130-005	5033	0	1	38	36	26	L	7.5	49.1	2.6	19.7	7.25	3.22	0.9
H23090130-006	5033	1	3	38	40	22	L	7.1	55.1	0.9	6.20	2.00	0.87	0.4

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23090130

**Report Date:** 10/13/23  
**Date Received:** 09/06/23

Sample ID	Client Sample ID	Analysis		Units	Neut Potential t/kt	Acid Potential t/kt	Acid/Base Potential t/kt	AP, Pyritic S t/kt	ABP, Pyritic S t/kt	Sulfur, Total %	Sulfur, Sulfate %	Sulfur, Pyritic %	Sulfur, Organic %
		Up	Low										
H23090130-001	5010	0	1		10	18	-8	8.4	2	0.58	0.15	0.27	0.16
H23090130-002	5010	1	3		2	37	-35	12	-9	1.18	0.38	0.38	0.43
H23090130-003	5011	0	1		9	23	-15	8.6	0	0.75	0.27	0.27	0.21
H23090130-004	5011	1	3		10	21	-12	8.3	1	0.68	0.31	0.27	0.11
H23090130-005	5033	0	1		30	7.5	23			0.24			
H23090130-006	5033	1	3		29	18	11			0.57			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23090232

**Report Date:** 10/18/23  
**Date Received:** 09/11/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste		Mg-SatPst-Sat Paste		Na-SatPst-Sat Paste		SAR
		Units	Up	Low	Results	Results	Results	s_u	%	mmhos/cm	Results	Results	Results	Results	Results	Results	unitless
H23090232-001	25-4375A	0	1	38	34	28	CL	6.8	48.3	3.5	22.6	18.3	6.17	1.4			
H23090232-002	25-4375A	1	3	40	30	30	CL	7.1	48.4	7.0	19.8	37.9	39.4	7.3			
H23090232-003	25-4375B	0	1	44	28	30	CL	6.0	44.1	3.5	20.6	20.5	6.08	1.3			
H23090232-004	25-4375B	1	3	60	20	20	SCL	4.4	49.2	9.2	17.3	53.3	55.5	9.3			
H23090232-005	25-4375C	0	1	40	30	30	CL	6.2	45.5	4.8	20.6	25.9	18.9	3.9			
H23090232-006	25-4375C	1	3	42	30	28	CL	5.6	48.4	9.5	17.8	63.3	59.7	9.4			
H23090232-007	25-4375D	0	1	42	32	26	L	6.8	45.5	4.0	21.8	20.1	11.3	2.5			
H23090232-008	25-4375D	1	3	40	32	28	CL	5.7	52.1	9.2	18.3	60.3	49.8	8.0			
H23090232-009	5012 A	0	1	40	32	28	CL	6.2	46.8	9.1	19.1	38.1	62.3	11.6			
H23090232-010	5012 A	1	3	44	30	26	L	6.1	47.5	8.2	17.6	32.8	53.7	10.7			
H23090232-011	5012 B	0	1	40	32	28	CL	6.3	49.8	8.3	17.9	44.5	52.3	9.4			
H23090232-012	5012 B	1	3	40	34	26	L	5.5	44.3	8.0	18.4	60.9	38.7	6.2			
H23090232-013	5012 C	0	1	46	30	24	L	6.1	44.7	7.8	17.8	41.1	45.6	8.4			
H23090232-014	5012 C	1	3	46	30	24	L	6.0	47.1	8.0	17.4	43.6	46.4	8.4			
H23090232-015	5012 D	0	1	42	32	26	L	6.1	49.4	7.8	17.1	31.9	49.9	10.1			
H23090232-016	5012 D	1	3	42	32	26	L	6.1	46.3	8.1	18.6	35.2	51.2	9.9			
H23090232-017	25-4377 A	0	1	32	38	30	CL	6.4	51.6	6.6	18.7	39.0	32.6	6.1			
H23090232-018	25-4377 A	1	3	32	38	30	CL	5.8	57.0	10.6	17.3	68.4	65.8	10.0			
H23090232-019	25-4377 B	0	1	44	30	26	L	6.6	42.5	3.6	22.0	20.0	6.36	1.4			
H23090232-020	25-4377 B	1	3	40	34	28	L	6.2	42.0	5.7	20.0	33.7	25.5	4.9			
H23090232-021	25-4377 C	0	1	34	36	30	CL	6.4	46.7	4.4	19.3	25.9	13.3	2.8			
H23090232-022	25-4377 C	1	3	42	30	28	CL	7.1	55.0	8.6	15.1	20.9	67.7	16.0			
H23090232-023	25-4377 D	0	1	32	36	32	CL	5.5	51.7	4.6	20.2	28.3	13.6	2.8			
H23090232-024	25-4377 D	1	3	34	36	30	CL	6.3	52.3	5.7	19.8	35.5	20.6	3.9			
H23090232-025	4958 A	0	1	48	30	22	L	5.4	41.1	10.3	20.6	58.8	64.0	10.2			
H23090232-026	4958 A	1	3	48	28	24	L	5.8	43.9	11.0	18.8	59.7	72.1	11.5			
H23090232-027	4958 B	0	1	52	26	22	SCL	6.1	42.1	7.4	21.0	40.5	40.2	7.2			
H23090232-028	4958 B	1	3	68	20	12	SL	7.1	34.2	5.0	29.3	5.77	27.1	6.5			
H23090232-029	4958 C	0	1	54	28	18	SL	6.4	37.0	7.5	22.8	24.8	47.8	9.8			
H23090232-030	4958 C	1	3	74	14	12	SL	6.9	34.5	5.2	32.9	9.56	25.9	5.6			
H23090232-031	4958 D	0	1	46	32	22	L	5.4	43.2	9.8	18.7	51.2	64.8	11.0			
H23090232-032	4958 D	1	3	50	28	22	L	6.0	43.4	7.8	21.3	41.0	46.5	8.3			

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spills  
**Workorder:** H23090232

**Report Date:** 10/18/23  
**Date Received:** 09/11/23

Sample ID	Client Sample ID	Analysis		Units	Up	Low	Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Results	Results		Results	Results	U/kt	U/kt	U/kt	U/kt	U/kt	%	%	%	%
H23090232-001	25-4375A	0	1	16	19	-3	9.1	7	0.60	0.22	0.29	0.09	0.09	0.09	0.09
H23090232-002	25-4375A	1	3	15	25	-10	8.0	7	0.81	0.47	0.26	0.09	0.09	0.09	0.09
H23090232-003	25-4375B	0	1	11	18	-7	6.8	4	0.57	0.18	0.22	0.17	0.17	0.17	0.17
H23090232-004	25-4375B	1	3	3	42	-39	7.8	-5	1.34	0.81	0.25	0.28	0.28	0.28	0.28
H23090232-005	25-4375C	0	1	9	18	-9	6.5	2	0.58	0.29	0.21	0.09	0.09	0.09	0.09
H23090232-006	25-4375C	1	3	6	35	-28	6.7	0	1.11	0.80	0.21	0.10	0.10	0.10	0.10
H23090232-007	25-4375D	0	1	14	14	-1	6.7	7	0.46	0.17	0.22	0.08	0.08	0.08	0.08
H23090232-008	25-4375D	1	3	7	31	-24	6.8	0	0.99	0.67	0.22	0.10	0.10	0.10	0.10
H23090232-009	5012 A	0	1	8	21	-14	7.7	0	0.68	0.34	0.25	0.09	0.09	0.09	0.09
H23090232-010	5012 A	1	3	8	21	-12	7.8	1	0.68	0.32	0.25	0.09	0.09	0.09	0.09
H23090232-011	5012 B	0	1	10	24	-14	9.6	0	0.75	0.36	0.31	0.08	0.08	0.08	0.08
H23090232-012	5012 B	1	3	7	29	-21	9.1	-2	0.91	0.52	0.29	0.10	0.10	0.10	0.10
H23090232-013	5012 C	0	1	6	20	-14	7.3	-1	0.84	0.32	0.23	0.09	0.09	0.09	0.09
H23090232-014	5012 C	1	3	7	21	-14	6.3	1	0.67	0.39	0.20	0.08	0.08	0.08	0.08
H23090232-015	5012 D	0	1	7	21	-14	6.8	0	0.66	0.35	0.22	0.09	0.09	0.09	0.09
H23090232-016	5012 D	1	3	7	21	-14	6.9	0	0.67	0.35	0.22	0.10	0.10	0.10	0.10
H23090232-017	25-4377 A	0	1	10	25	-15	9.3	1	0.80	0.41	0.30	0.09	0.09	0.09	0.09
H23090232-018	25-4377 A	1	3	8	39	-31	11	-3	1.24	0.78	0.34	0.12	0.12	0.12	0.12
H23090232-019	25-4377 B	0	1	11	13	-2	5.5	6	0.42	0.18	0.17	0.06	0.06	0.06	0.06
H23090232-020	25-4377 B	1	3	11	22	-11	7.0	4	0.71	0.40	0.22	0.09	0.09	0.09	0.09
H23090232-021	25-4377 C	0	1	18	22	-6	6.9	9	0.71	0.39	0.22	0.10	0.10	0.10	0.10
H23090232-022	25-4377 C	1	3	24	15	9	3.4	21	0.47	0.21	0.11	0.15	0.15	0.15	0.15
H23090232-023	25-4377 D	0	1	8	29	-21	8.8	-1	0.94	0.55	0.28	0.11	0.11	0.11	0.11
H23090232-024	25-4377 D	1	3	11	30	-19	9.6	2	0.96	0.51	0.31	0.14	0.14	0.14	0.14
H23090232-025	4958 A	0	1	7	26	-19	11	-4	0.83	0.40	0.35	0.08	0.08	0.08	0.08
H23090232-026	4958 A	1	3	7	24	-16	9.3	-2	0.75	0.39	0.30	0.07	0.07	0.07	0.07
H23090232-027	4958 B	0	1	13	20	-6	9.4	4	0.63	0.25	0.30	0.08	0.08	0.08	0.08
H23090232-028	4958 B	1	3	10	9.0	1	2.6	8	0.29	0.16	0.08	0.04	0.04	0.04	0.04
H23090232-029	4958 C	0	1	9	15	-6	7.5	2	0.49	0.18	0.24	0.07	0.07	0.07	0.07
H23090232-030	4958 C	1	3	8	5.7	2	1.8	6	0.18	0.08	0.06	0.04	0.04	0.04	0.04
H23090232-031	4958 D	0	1	7	24	-17	11	-5	0.76	0.30	0.37	0.10	0.10	0.10	0.10
H23090232-032	4958 D	1	3	6	17	-11	6.1	0	0.54	0.28	0.20	0.08	0.08	0.08	0.08

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23090233

**Report Date:** 10/18/23

**Date Received:** 09/11/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units	Low	Results	Results	Results	Results	s_u	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
H23090233-001	5036 A	0	1	42	30	28	CL	6.4	49.9	7.0	19.0	36.3	37.3	7.0
H23090233-002	5036 A	1	3	36	34	30	CL	5.9	49.8	6.4	19.2	31.5	32.3	6.4
H23090233-003	5036 B	0	1	38	34	28	CL	4.8	48.1	7.1	19.8	78.3	14.1	2.0
H23090233-004	5036 B	1	3	44	28	26	CL	4.3	47.8	6.6	19.9	76.2	7.93	1.1
H23090233-005	5036 C	0	1	40	34	26	L	5.9	46.8	8.5	19.0	67.0	38.9	5.9
H23090233-006	5036 C	1	3	40	32	28	CL	5.1	50.3	10.4	18.4	105	41.1	5.3
H23090233-007	5036 D	0	1	36	30	34	CL	4.4	50.0	12.1	16.3	84.8	75.4	10.6
H23090233-008	5036 D	1	3	44	28	28	CL	3.9	46.1	10.1	18.1	109	35.1	4.4
H23090233-009	5058 A	0	1	38	32	30	CL	5.7	46.6	8.1	17.0	54.3	39.6	6.6
H23090233-010	5058 A	1	3	40	34	26	L	5.2	48.8	6.0	17.8	46.2	21.6	3.8
H23090233-011	5058 B	0	1	40	32	28	CL	5.9	50.4	7.5	18.5	48.7	39.0	6.7
H23090233-012	5058 B	1	3	38	32	30	CL	5.6	52.2	7.4	19.1	55.8	37.6	6.1
H23090233-013	5058 C	0	1	38	34	28	CL	4.0	46.0	5.0	17.8	47.3	6.74	1.1
H23090233-014	5058 C	1	3	38	34	28	CL	3.5	46.8	4.8	17.3	42.3	2.93	0.5
H23090233-015	5058 D	0	1	34	36	30	CL	4.7	51.5	7.0	18.8	69.3	19.6	3.0
H23090233-016	5058 D	1	3	34	38	28	CL	3.3	49.5	10.2	17.7	126	1.0	0.1
H23090233-017	5080 A	0	1	46	28	26	L	4.8	61.4	4.4	23.2	26.2	6.92	1.4
H23090233-018	5080 A	1	3	32	38	30	CL	4.9	50.4	5.9	20.7	60.9	4.8	0.8
H23090233-019	5080 B	0	1	36	38	26	L	5.2	45.7	5.2	19.4	58.8	4.4	0.7
H23090233-020	5080 B	1	3	48	28	24	L	4.4	47.2	5.8	19.7	68.9	3.2	0.5
H23090233-021	5080 C	0	1	18	50	32	SiCL	3.6	46.0	8.8	16.5	120	4.1	0.5
H23090233-022	5080 C	1	3	20	48	32	SiCL	3.2	47.6	8.7	17.6	103	4.7	0.6
H23090233-023	5080 D	0	1	36	36	28	CL	5.3	51.1	4.5	21.0	37.4	4.38	0.8
H23090233-024	5080 D	1	3	40	34	26	L	5.6	46.4	3.9	22.8	28.4	3.11	0.6
H23090233-025	25-4376 A	0	1	34	36	30	CL	5.9	50.8	5.6	18.7	34.8	24.4	4.7
H23090233-026	25-4376 A	1	3	38	32	30	CL	6.4	51.8	9.3	16.7	47.5	62.3	11.0
H23090233-027	25-4376 B	0	1	34	40	26	L	7.2	45.7	5.7	18.0	31.6	27.2	5.5
H23090233-028	25-4376 B	1	3	36	38	26	L	4.4	47.8	7.2	18.0	49.7	33.0	5.7
H23090233-029	25-4376 C	0	1	46	30	24	L	7.1	40.9	3.8	20.4	20.1	8.04	1.8
H23090233-030	25-4376 C	1	3	44	30	26	L	7.1	45.9	5.0	19.3	22.7	22.1	4.8
H23090233-031	25-4376 D	0	1	40	36	24	L	4.4	41.2	6.9	17.7	34.1	38.5	7.6
H23090233-032	25-4376 D	1	3	50	28	22	L	5.7	41.6	8.5	17.4	42.5	55.9	10.2

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spoils

Workorder: H23090233

Report Date: 10/18/23

Date Received: 09/11/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic	
		Units											
		Up	Low	Results	U/kt	Results	U/kt	Results	U/kt	Results	%	Results	%
H23090233-001	5036 A	0	1	5	19	-14	7.2	-2	0.60	0.30	0.23	0.07	
H23090233-002	5036 A	1	3	5	21	-16	8.5	-4	0.66	0.30	0.27	0.08	
H23090233-003	5036 B	0	1	5	31	-26	8.8	-4	1.00	0.57	0.28	0.15	
H23090233-004	5036 B	1	3	2	39	-37	11	-8	1.26	0.72	0.34	0.20	
H23090233-005	5036 C	0	1	5	27	-21	11	-6	0.85	0.38	0.36	0.11	
H23090233-006	5036 C	1	3	-3	45	-47	15	-17	1.43	0.77	0.47	0.18	
H23090233-007	5036 D	0	1	-6	29	-35	6.4	-12	0.93	0.61	0.20	0.11	
H23090233-008	5036 D	1	3	-8	33	-40	9.9	-18	1.04	0.58	0.32	0.15	
H23090233-009	5068 A	0	1	8	29	-21	12	-5	0.93	0.44	0.40	0.10	
H23090233-010	5058 A	1	3	5	28	-23	9.6	-5	0.90	0.49	0.31	0.10	
H23090233-011	5058 B	0	1	9	25	-16	11	-2	0.80	0.38	0.34	0.09	
H23090233-012	5058 B	1	3	7	29	-22	9.8	-3	0.92	0.50	0.31	0.11	
H23090233-013	5058 C	0	1	3	34	-31	17	-14	1.09	0.40	0.55	0.14	
H23090233-014	5058 C	1	3	2	37	-35	19	-17	1.17	0.39	0.61	0.17	
H23090233-015	5058 D	0	1	4	33	-28	13	-9	1.04	0.53	0.42	0.09	
H23090233-016	5058 D	1	3	-1	46	-47	15	-16	1.48	0.85	0.48	0.15	
H23090233-017	5080 A	0	1	20	28	-8	9.6	10	0.91	0.39	0.31	0.21	
H23090233-018	5080 A	1	3	7	36	-29	11	-4	1.15	0.71	0.35	0.09	
H23090233-019	5080 B	0	1	7	28	-20	8.4	-1	0.89	0.55	0.27	0.07	
H23090233-020	5080 B	1	3	3	45	-42	19	-16	1.46	0.61	0.60	0.24	
H23090233-021	5080 C	0	1	1	80	-79	51	-50	2.56	0.76	1.63	0.16	
H23090233-022	5080 C	1	3	1	100	-100	77	-76	3.21	0.48	2.45	0.27	
H23090233-023	5080 D	0	1	10	30	-20	11	-1	0.95	0.52	0.35	0.08	
H23090233-024	5080 D	1	3	12	20	-8	6.6	5	0.64	0.37	0.21	0.06	
H23090233-025	25-4376 A	0	1	14	38	-24	9.4	5	1.21	0.79	0.30	0.12	
H23090233-026	25-4376 A	1	3	15	41	-26	9.6	5	1.30	0.85	0.31	0.14	
H23090233-027	25-4376 B	0	1	28	14	14	4.4	23	0.44	0.24	0.14	0.06	
H23090233-028	25-4376 B	1	3	4	36	-32	9.2	-5	1.15	0.72	0.30	0.14	
H23090233-029	25-4376 C	0	1	17	13	4	7.3	10	0.41	0.11	0.24	0.07	
H23090233-030	25-4376 C	1	3	18	16	1	5.3	12	0.52	0.24	0.17	0.11	
H23090233-031	25-4376 D	0	1	4	32	-28	8.7	-5	1.02	0.52	0.28	0.22	
H23090233-032	25-4376 D	1	3	7	32	-26	6.5	0	1.04	0.66	0.21	0.17	

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spills  
**Workorder:** H23100975

**Report Date:** 11/20/23  
**Date Received:** 10/27/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units	Up	Low	Results	Results	Results	s_u	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
H23100975-001	5061 A	0	1	42	30	28	CL	6.8	49.5	5.8	19.5	32.1	21.7	4.5
H23100975-002	5061 A	1	3	36	36	28	CL	6.7	48.0	5.5	22.5	36.4	14.0	2.6
H23100975-003	5061 B	0	1	38	34	28	CL	6.3	49.8	10.0	18.1	48.5	59.3	10.5
H23100975-004	5061 B	1	3	38	34	28	CL	6.9	50.8	9.1	17.8	24.3	64.1	13.3
H23100975-005	5061 C	0	1	58	28	14	SL	7.0	33.1	5.8	20.7	34.1	15.9	3.1
H23100975-006	5061 C	1	3	42	40	18	L	7.7	32.3	6.7	21.8	34.2	22.9	4.4
H23100975-007	5061 D	0	1	34	40	26	L	6.1	46.3	6.7	18.1	49.7	22.4	3.6
H23100975-008	5061 D	1	3	32	40	28	CL	5.6	49.5	8.4	18.2	72.6	26.9	4.0
H23100975-009	4675	0	1	38	34	28	CL	6.5	47.5	6.7	21.3	52.5	20.6	3.3
H23100975-010	4675	1	3	36	34	30	CL	6.8	46.8	6.5	20.2	44.7	22.2	3.5

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Peabody Western Coal Co. Kayenta Mine  
**Project:** N9 Spoils  
**Workorder:** H23100975

**Report Date:** 11/20/23  
**Date Received:** 10/27/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Up	Low									
H23100975-001	5061 A	0	1	15	20	-5	7.2	8	0.63	0.33	0.23	0.07
H23100975-002	5061 A	1	3	12	20	-8	8.8	3	0.65	0.30	0.28	0.07
H23100975-003	5061 B	0	1	11	30	-18	12	-1	0.95	0.44	0.40	0.11
H23100975-004	5061 B	1	3	25	34	-9	11	14	1.07	0.56	0.36	0.15
H23100975-005	5061 C	0	1	12	14	-2	2.5	10	0.45	0.33	0.08	0.04
H23100975-006	5061 C	1	3	14	7.5	7			0.24			
H23100975-007	5061 D	0	1	10	26	-16	10	0	0.83	0.43	0.33	0.07
H23100975-008	5061 D	1	3	7	28	-21	8.7	-2	0.88	0.53	0.28	0.07
H23100975-009	4675	0	1	21	38	-17	16	5	1.22	0.57	0.51	0.13
H23100975-010	4675	1	3	23	44	-21	20	3	1.40	0.65	0.63	0.12

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H23120111

Report Date: 12/27/23

Date Received: 12/05/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units	Up	Low	Results	Results	Results	s_u	%	mmhos/cm	meq/L	meq/L	meq/L	unitless
H23120111-001	4710 A	0	1	34	34	32	CL	3.1	43.9	12.2	15.4	174	1.80	0.2
H23120111-002	4710 A	1	3	34	36	30	CL	3.5	50.3	16.0	18.6	304	45.2	3.6
H23120111-003	4710 B	0	1	42	32	26	L	5.4	50.6	7.2	18.2	75.7	27.8	4.1
H23120111-004	4710 B	1	3	34	36	30	CL	6.2	49.6	7.3	18.8	66.7	33.2	5.1
H23120111-005	4710 C	0	1	34	38	28	CL	5.2	48.3	8.1	17.5	82.9	34.1	4.8
H23120111-006	4710 C	1	3	40	34	26	L	4.1	50.1	10.4	17.2	91.4	62.1	8.4
H23120111-007	4710 D	0	1	32	40	28	CL	3.9	46.1	12.7	17.7	196	45.4	4.4
H23120111-008	4710 D	1	3	34	38	28	CL	6.1	49.6	8.6	19.2	52.2	59.3	9.9
H23120111-009	4715 A	0	1	14	50	36	SiCL	7.3	56.4	4.5	24.1	39.3	7.10	1.3
H23120111-010	4715 A	1	3	14	52	34	SiCL	7.6	54.3	3.6	24.0	22.6	7.23	1.5
H23120111-011	4715 B	0	1	40	34	26	L	3.9	42.0	10.4	18.1	198	9.36	0.9
H23120111-012	4715 B	1	3	38	36	26	L	3.6	43.3	8.4	16.9	126	7.72	0.9
H23120111-013	4715 C	0	1	44	32	24	L	6.6	43.1	3.9	24.4	31.5	5.46	1.0
H23120111-014	4715 C	1	3	52	34	14	L	6.8	38.4	4.3	23.3	38.8	6.12	1.1
H23120111-015	4715 D	0	1	36	36	28	CL	3.8	49.3	5.1	20.7	62.1	6.04	0.9
H23120111-016	4715 D	1	3	40	32	28	CL	4.0	51.5	6.6	19.7	84.1	12.1	1.7
H23120111-017	4711 A	0	1	34	36	30	CL	4.7	47.3	7.3	18.4	90.7	16.7	2.3
H23120111-018	4711 A	1	3	36	36	28	CL	4.3	50.7	8.4	18.9	106	21.7	2.8
H23120111-019	4711 B	0	1	32	40	28	CL	4.8	47.2	7.3	20.6	86.3	15.4	2.1
H23120111-020	4711 B	1	3	38	36	26	L	3.9	44.9	7.3	18.4	90.2	15.0	2.0
H23120111-021	4711 C	0	1	34	38	28	CL	5.9	46.3	7.0	20.0	69.0	28.7	4.2
H23120111-022	4711 C	1	3	36	36	28	CL	5.8	46.6	7.7	16.6	68.3	35.2	5.1
H23120111-023	4711 D	0	1	36	36	28	CL	5.6	46.6	6.3	18.7	65.7	17.0	2.5
H23120111-024	4711 D	1	3	52	28	20	L	3.4	47.7	6.1	20.4	57.1	8.18	1.3
H23120111-025	4746 B	0	1	36	36	28	CL	2.7	38.3	9.5	18.2	78.6	0.14	<0.1
H23120111-026	4746 B	1	3	52	30	18	L	2.9	42.2	3.1	24.2	11.3	0.34	<0.1
H23120111-027	4746 C	0	1	36	34	30	CL	3.3	45.1	5.6	20.1	65.5	0.85	0.1
H23120111-028	4746 C	1	3	38	36	26	L	4.1	44.4	4.8	24.6	48.8	6.16	1.0
H23120111-029	4746 D	0	1	16	56	28	SiCL	7.8	44.7	5.2	20.7	46.3	15.2	2.6
H23120111-030	4746 D	1	3	16	50	34	SiCL	7.9	51.0	5.3	21.8	53.2	15.2	2.5
H23120111-031	4681 A	0	1	32	40	28	CL	6.7	50.5	4.5	25.6	43.3	11.9	2.0
H23120111-032	4681 A	1	3	34	38	28	CL	6.4	46.0	4.6	23.7	53.2	7.56	1.2
H23120111-033	4681 B	0	1	44	34	22	L	7.3	42.6	4.0	23.3	24.9	12.9	2.6
H23120111-034	4681 B	1	3	32	38	30	CL	6.8	50.5	5.3	21.7	38.3	23.3	4.3
H23120111-035	4681 D	0	1	44	34	22	L	7.3	40.6	4.3	23.5	21.5	19.1	4.0
H23120111-036	4681 D	1	3	26	44	30	CL	7.3	51.5	4.9	20.8	26.3	28.7	5.9

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H23120111

Report Date: 12/27/23

Date Received: 12/05/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic				
		Units	Low						Results	t/kt		Results	t/kt		Results	%	Results	%
H23120111-001	4710 A	0	1	-1	61	-61	14	-14	1.95	1.36	0.44	0.15						
H23120111-002	4710 A	1	3	1	69	-67	14	-13	2.19	1.52	0.45	0.22	0.15					
H23120111-003	4710 B	0	1	8	43	-35	14	-7	1.36	0.69	0.46	0.21	0.11					
H23120111-004	4710 B	1	3	13	35	-22	10	3	1.11	0.66	0.32	0.13	0.21					
H23120111-005	4710 C	0	1	9	55	-46	22	-13	1.75	0.77	0.69	0.30	0.11					
H23120111-006	4710 C	1	3	3	55	-53	21	-18	1.77	0.81	0.68	0.29	0.11					
H23120111-007	4710 D	0	1	2	50	-47	16	-13	1.59	0.94	0.50	0.15	0.11					
H23120111-008	4710 D	1	3	9	49	-40	24	-14	1.57	0.71	0.75	0.11	0.11					
H23120111-009	4715 A	0	1	58	12	46			0.40									
H23120111-010	4715 A	1	3	58	2.7	55			0.09									
H23120111-011	4715 B	0	1	2	38	-36	9.1	-7	1.20	0.81	0.29	0.10	0.10					
H23120111-012	4715 B	1	3	0	36	-36	8.9	-9	1.15	0.75	0.29	0.11	0.11					
H23120111-013	4715 C	0	1	14	19	-5	5.8	8	0.62	0.36	0.19	0.06	0.06					
H23120111-014	4715 C	1	3	11	14	-3	2.9	8	0.43	0.29	0.09	0.05	0.05					
H23120111-015	4715 D	0	1	2	40	-38	6.9	-5	1.29	0.95	0.22	0.12	0.12					
H23120111-016	4715 D	1	3	3	42	-38	7.3	-4	1.34	0.98	0.23	0.12	0.12					
H23120111-017	4711 A	0	1	5	43	-38	13	-8	1.38	0.84	0.40	0.13	0.13					
H23120111-018	4711 A	1	3	4	49	-45	12	-9	1.56	1.04	0.39	0.13	0.13					
H23120111-019	4711 B	0	1	5	40	-35	13	-8	1.28	0.76	0.40	0.12	0.12					
H23120111-020	4711 B	1	3	2	44	-42	14	-12	1.42	0.82	0.43	0.16	0.16					
H23120111-021	4711 C	0	1	14	39	-25	14	-1	1.24	0.59	0.46	0.19	0.19					
H23120111-022	4711 C	1	3	13	46	-33	17	-4	1.48	0.74	0.55	0.19	0.19					
H23120111-023	4711 D	0	1	12	39	-27	13	0	1.26	0.69	0.41	0.17	0.17					
H23120111-024	4711 D	1	3	1	43	-42	13	-12	1.38	0.73	0.41	0.23	0.23					
H23120111-025	4746 B	0	1	-5	40	-40	8.2	-8	1.28	0.92	0.26	0.09	0.09					
H23120111-026	4746 B	1	3	-1	30	-30	12	-12	0.95	0.31	0.39	0.25	0.25					
H23120111-027	4746 C	0	1	0	33	-33	8.3	-8	1.05	0.67	0.27	0.12	0.12					
H23120111-028	4746 C	1	3	4	31	-27	6.3	-2	0.99	0.70	0.20	0.09	0.09					
H23120111-029	4746 D	0	1	23	9.5	13			0.30									
H23120111-030	4746 D	1	3	15	98	-82	3.6	12	3.13	2.63	0.12	0.38	0.38					
H23120111-031	4681 A	0	1	16	34	-18	12	4	1.08	0.61	0.38	0.09	0.09					
H23120111-032	4681 A	1	3	17	35	-18	10	7	1.13	0.69	0.33	0.11	0.11					
H23120111-033	4681 B	0	1	49	9.5	39	3.4	46	0.30	0.17	0.11	0.03	0.03					
H23120111-034	4681 B	1	3	27	31	-4	12	15	1.00	0.51	0.39	0.09	0.09					
H23120111-035	4681 D	0	1	55	8.0	47			0.26									
H23120111-036	4681 D	1	3	130	9.6	120			0.31									

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H23120713

Report Date: 01/15/24

Date Received: 12/27/23

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Cond-SatPst	Ca-SatPst-Sat Paste		Mg-SatPst-Sat Paste		Na-SatPst-Sat Paste		SAR							
		Units									meq/L		meq/L		meq/L									
		Up	Low								%	Results	%	Results	s_u	%		mmhos/cm	Results	Results	Results	Results	Results	Results
H23120713-001	5107 A (0-1)	0	1	48	30	22	L	5.2	38.8	13.2	19.6	190	59.2	58	5.8									
H23120713-002	5107 A	1	3	50	30	20	L	4.4	35.0	14.1	22.2	157	77.6	8.2										
H23120713-003	5107 B	0	1	44	32	24	L	5.1	38.0	11.2	21.5	135	52.3	5.9										
H23120713-004	5107 B	1	3	44	33	23	L	4.8	34.8	12.2	20.7	145	54.8	6.0										
H23120713-005	5107 C	0	1	30	38	32	CL	7.4	46.5	3.6	21.2	29.0	5.43	1.1										
H23120713-006	5107 C	1	3	32	39	29	CL	6.7	47.3	6.7	22.3	49.6	34.7	5.8										
H23120713-007	5107 D	0	1	30	38	32	CL	7.6	49.6	3.4	21.9	25.2	4.99	1.0										
H23120713-008	5107 D	1	3	24	45	31	CL	7.4	50.5	4.6	22.0	47.6	7.94	1.4										
H23120713-009	5108 A	0	1	40	33	27	CL	6.7	42.1	6.1	22.5	51.3	27.3	4.5										
H23120713-010	5108 A	1	3	34	36	30	CL	6.1	43.1	5.4	18.0	47.2	18.9	3.3										
H23120713-011	5108 B	0	1	36	35	29	CL	4.2	44.3	7.3	17.6	81.0	22.6	3.2										
H23120713-012	5108 B	1	3	36	36	28	CL	5.0	42.8	7.5	16.9	89.6	35.9	5.5										
H23120713-013	5108 C	0	1	38	35	27	CL	5.2	41.7	9.2	16.1	63.3	63.2	10.0										
H23120713-014	5108 C	1	3	38	36	26	L	5.3	44.9	9.3	17.6	63.2	68.1	10.7										
H23120713-015	5108 D	0	1	32	38	30	CL	7.4	47.1	4.2	18.8	34.7	8.65	1.7										
H23120713-016	5108 D	1	3	34	36	30	CL	7.2	47.6	3.9	19.8	28.4	8.49	1.7										
H23120713-017	4558 T	0	12	42	28	30	CL	6.8	44.7	3.7	22.0	21.2	8.40	1.9										
H23120713-018	4558	0	1	34	35	31	CL	6.8	43.3	3.6	20.4	22.9	6.84	1.5										
H23120713-019	4558	1	3	36	37	27	CL	6.7	44.0	4.5	18.8	30.0	18.5	3.8										
H23120713-020	4559	0	1	34	36	30	CL	7.0	44.2	3.1	22.2	18.9	4.42	1.0										
H23120713-021	4559	1	3	40	34	26	L	6.2	45.0	6.0	20.4	50.8	24.8	4.1										
H23120713-022	4560	0	1	40	30	30	CL	6.8	45.8	3.6	21.3	20.1	12.9	2.9										
H23120713-023	4560	1	3	42	30	28	CL	6.9	44.3	4.9	20.6	24.2	28.2	6.4										
H23120713-024	4561	0	1	32	36	32	CL	6.4	44.3	4.1	18.2	23.9	18.1	4.2										
H23120713-025	4561	1	3	34	34	32	CL	7.0	47.6	4.3	20.5	19.8	22.8	5.2										
H23120713-026	4400 T	0	14	24	42	34	CL	7.7	43.2	3.6	17.8	27.2	7.63	1.8										
H23120713-027	4400	0	1	36	36	28	CL	6.9	50.1	3.9	22.9	28.4	8.95	1.9										
H23120713-028	4400	1	3	24	43	33	CL	7.4	44.3	3.9	19.9	32.8	8.46	1.9										
H23120713-029	4602	0	1	30	39	31	CL	6.7	53.4	5.9	17.6	30.8	37.3	7.9										
H23120713-030	4602	1	3	30	40	30	CL	6.5	48.0	6.7	18.6	44.8	43.0	8.2										
H23120713-031	4603	0	1	34	37	29	CL	6.6	47.1	5.6	19.4	29.4	36.4	7.7										
H23120713-032	4603	1	3	34	37	29	CL	6.9	48.7	5.8	18.8	25.5	39.7	9.0										
H23120713-033	4604	0	1	32	38	30	CL	6.7	51.9	6.5	18.1	33.4	44.2	9.3										
H23120713-034	4604	1	3	44	31	25	L	6.1	49.1	5.2	18.1	32.1	26.4	5.7										
H23120713-035	4482 T	0	8	30	41	29	CL	7.2	41.7	4.2	20.9	38.9	4.98	1.0										
H23120713-036	4482	0	1	20	45	35	SiCL	7.5	42.3	3.9	18.1	43.7	1.95	0.4										
H23120713-037	4482	1	3	18	49	33	SiCL	7.4	41.5	3.9	19.9	39.6	2.34	0.5										
H23120713-038	4483	0	1	46	31	23	L	6.5	46.7	4.4	33.0	25.3	4.00	0.8										
H23120713-039	4483	1	3	46	29	25	L	6.6	47.9	4.2	29.5	24.6	4.54	0.9										

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H23120713

Report Date: 01/15/24

Date Received: 12/27/23

Analysis		Units		Sample ID	Client Sample ID	Neut Potential		Acid Potential		Acid/Base Potential	AP, Pyritic S		ABP, Pyritic S	Sulfur, Total		Sulfur, Sulfate	Sulfur, Pyritic		Sulfur, Organic	
Up	Low	Results	t/kt			Results	t/kt	Results	t/kt		Results	t/kt		Results	%		Results	%	Results	%
H23120713-001	0	1	6	38	-32	12	-6	1.23	0.66	0.38	0.19									
H23120713-002	1	3	7	42	-36	15	-8	1.36	0.62	0.48	0.25									
H23120713-003	0	1	5	36	-30	12	-7	1.14	0.57	0.39	0.18									
H23120713-004	1	3	6	36	-29	12	-6	1.14	0.59	0.38	0.18									
H23120713-005	0	1	36	7.0	29	1.6	35	0.22	0.14	0.05	0.03									
H23120713-006	1	3	16	26	-10	8.1	8	0.82	0.49	0.26	0.08									
H23120713-007	0	1	46	5.0	41			0.16												
H23120713-008	1	3	34	12	23			0.37												
H23120713-009	0	1	14	27	-12	9.0	5	0.85	0.45	0.29	0.11									
H23120713-010	1	3	12	30	-18	8.2	4	0.95	0.59	0.26	0.10									
H23120713-011	0	1	4	37	-33	12	-7	1.17	0.66	0.37	0.14									
H23120713-012	1	3	6	34	-28	12	-6	1.09	0.55	0.39	0.14									
H23120713-013	0	1	6	42	-36	20	-13	1.35	0.53	0.63	0.19									
H23120713-014	1	3	7	42	-35	21	-14	1.35	0.49	0.68	0.19									
H23120713-015	0	1	28	11	16			0.36												
H23120713-016	1	3	28	12	16			0.39												
H23120713-017	0	12	29	18	12			0.57												
H23120713-018	0	1	25	29	-5	14	11	0.94	0.37	0.45	0.12									
H23120713-019	1	3	16	34	-19	13	2	1.10	0.55	0.42	0.12									
H23120713-020	0	1	37	25	12			0.81												
H23120713-021	1	3	12	38	-26	14	-2	1.23	0.62	0.45	0.15									
H23120713-022	0	1	24	34	-10	17	7	1.07	0.38	0.54	0.15									
H23120713-023	1	3	18	41	-23	19	-1	1.31	0.47	0.61	0.23									
H23120713-024	0	1	13	29	-16	14	-1	0.94	0.36	0.45	0.13									
H23120713-025	1	3	22	22	0	9.2	12	0.70	0.30	0.29	0.11									
H23120713-026	0	14	130	2.2	130			0.07												
H23120713-027	0	1	130	15	120			0.47												
H23120713-028	1	3	210	12	400			0.19												
H23120713-029	0	1	15	29	-14	12	3	0.92	0.42	0.39	0.11									
H23120713-030	1	3	13	35	-22	13	-1	1.11	0.57	0.43	0.11									
H23120713-031	0	1	13	29	-16	11	1	0.92	0.44	0.36	0.12									
H23120713-032	1	3	15	29	-14	12	3	0.94	0.41	0.39	0.13									
H23120713-033	0	1	11	29	-17	13	-1	0.92	0.39	0.40	0.12									
H23120713-034	1	3	9	36	-27	13	-4	1.16	0.59	0.42	0.15									
H23120713-035	0	8	26	8.9	17			0.28												
H23120713-036	0	1	28	6.7	21			0.21												
H23120713-037	1	3	12	9.7	2			0.31												
H23120713-038	0	1	25	24	1			0.76												
H23120713-039	1	3	25	23	2			0.74												

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Report Date: 01/15/24

Date Received: 12/27/23

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H23120713

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	pH-SatPst	Percent Sat	Conc-SatPst	Ca-SatPst-Sat Paste	Mg-SatPst-Sat Paste	Na-SatPst-Sat Paste	SAR
		Units												
		Up	Low	%	Results	%	Results	s_u	%	mmhos/cm	meq/L	Results	Results	Results
H23120713-040	4484	0	1	34	35	31	CL	7.0	46.0	5.6	18.2	26.2	37.5	8.1
H23120713-041	4484	1	3	36	33	31	CL	5.7	50.8	6.9	22.3	65.4	24.0	4.1
H23120713-042	4485	0	1	34	33	33	CL	6.4	50.9	8.2	19.9	44.0	56.4	10.0
H23120713-043	4485	1	3	36	31	33	CL	6.7	53.3	8.6	20.5	39.5	69.1	12.6
H23120713-044	4524	0	1	28	38	34	CL	6.7	54.9	6.6	19.2	27.5	44.7	9.2
H23120713-045	4524	1	3	28	39	33	CL	6.7	54.7	7.3	18.7	31.3	56.3	11.3
H23120713-046	4640	0	1	42	29	29	CL	6.2	46.1	4.4	20.1	35.0	14.3	2.7
H23120713-047	4640	1	3	24	33	43	C	7.6	48.2	3.6	9.21	30.7	12.4	2.8
H23120713-048	4744	0	1	44	27	29	CL	6.7	46.7	4.3	21.9	31.7	11.3	2.2
H23120713-049	4744	1	3	46	25	29	SCL	6.4	49.0	4.0	20.9	34.0	11.2	2.1
H23120713-050	5010	0	1	36	37	27	CL	4.0	46.9	3.8	22.5	37.6	2.70	0.5
H23120713-051	5010	1	3	30	35	35	CL	3.6	56.5	9.0	17.4	117	20.5	2.5
H23120713-052	4523	0	1	32	35	33	CL	5.7	49.5	7.7	16.6	39.0	48.5	9.2
H23120713-053	4523	1	3	36	31	33	CL	4.9	48.4	9.0	17.7	68.6	59.1	9.0
H23120713-054	4522	0	1	32	35	33	CL	6.5	57.1	7.8	18.5	34.4	57.5	11.2
H23120713-055	4522	1	3	30	37	33	CL	6.4	50.8	7.7	19.4	33.6	60.5	11.8
H23120713-056	4520	0	1	36	34	30	CL	6.6	52.2	4.9	24.8	24.6	24.0	4.8
H23120713-057	4520	1	3	30	39	31	CL	6.1	55.7	7.4	16.6	32.9	49.5	10.0
H23120713-058	4521	0	1	30	37	33	CL	6.4	53.3	5.2	22.4	37.4	23.3	4.3
H23120713-059	4521	1	3	32	37	31	CL	5.9	52.6	6.0	18.8	46.6	29.0	5.1
H23120713-060	4562	0	1	36	35	29	CL	6.3	51.3	6.7	19.4	27.3	52.9	11.0
H23120713-061	4562	1	3	38	35	27	CL	6.8	48.8	7.9	16.5	15.0	78.5	19.1
H23120713-062	4563	0	1	28	37	35	CL	6.7	50.7	6.4	17.8	34.6	36.6	7.2
H23120713-063	4563	1	3	30	33	37	CL	7.1	50.0	5.5	21.8	31.9	32.6	6.3
H23120713-064	4564	0	1	26	39	35	CL	7.0	49.3	7.1	20.2	17.6	58.5	13.5
H23120713-065	4564	1	3	32	35	33	CL	6.7	53.1	6.2	21.0	16.3	47.3	11.0
H23120713-066	4565	0	1	34	35	31	CL	7.2	46.2	6.0	18.6	22.5	38.5	8.5
H23120713-067	4565	1	3	36	35	29	CL	7.0	45.3	6.7	18.8	23.2	51.5	11.2

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9

Workorder: H23120713

Report Date: 01/15/24

Date Received: 12/27/23

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic
		Units										
		Up	Low	U/kt	Results	U/kt	Results	U/kt	Results	%	Results	%
H23120713-040	4484	0	1	22	30	-8	14	8	0.96	0.40	0.44	0.12
H23120713-041	4484	1	3	9	36	-27	13	-4	1.16	0.62	0.42	0.13
H23120713-042	4485	0	1	12	35	-23	16	-4	1.11	0.46	0.51	0.14
H23120713-043	4485	1	3	13	33	-20	13	0	1.04	0.47	0.42	0.15
H23120713-044	4524	0	1	13	28	-15	15	-2	0.91	0.32	0.47	0.11
H23120713-045	4524	1	3	14	29	-16	14	-1	0.94	0.36	0.46	0.13
H23120713-046	4640	0	1	13	20	-8	5.8	7	0.65	0.35	0.18	0.12
H23120713-047	4640	1	3	43	2.8	40			0.09			
H23120713-048	4744	0	1	15	12	3			0.40			
H23120713-049	4744	1	3	12	16	-4	4.4	7	0.50	0.29	0.14	0.07
H23120713-050	5010	0	1	6	31	-25	13	-7	0.99	0.40	0.41	0.19
H23120713-051	5010	1	3	2	25	-23	6.9	-5	0.80	0.37	0.22	0.21
H23120713-052	4523	0	1	9	36	-27	15	-6	1.17	0.52	0.50	0.15
H23120713-053	4523	1	3	6	39	-34	15	-9	1.26	0.62	0.48	0.16
H23120713-054	4522	0	1	12	34	-22	13	0	1.09	0.56	0.40	0.12
H23120713-055	4522	1	3	13	33	-20	13	0	1.05	0.50	0.42	0.13
H23120713-056	4520	0	1	21	30	-9	13	8	0.95	0.40	0.42	0.13
H23120713-057	4520	1	3	10	42	-32	19	-8	1.34	0.61	0.60	0.14
H23120713-058	4521	0	1	14	30	-16	10	4	0.97	0.53	0.33	0.11
H23120713-059	4521	1	3	9	35	-26	13	-3	1.13	0.58	0.40	0.14
H23120713-060	4562	0	1	11	31	-20	13	-3	0.99	0.38	0.42	0.18
H23120713-061	4562	1	3	15	44	-29	25	-10	1.40	0.34	0.79	0.28
H23120713-062	4563	0	1	12	24	-12	6.9	5	0.77	0.47	0.22	0.08
H23120713-063	4563	1	3	18	16	2			0.51			
H23120713-064	4564	0	1	14	26	-11	12	3	0.82	0.33	0.37	0.12
H23120713-065	4564	1	3	15	29	-14	13	2	0.94	0.39	0.42	0.13
H23120713-066	4565	0	1	30	28	2			0.90			
H23120713-067	4565	1	3	22	33	-11	14	8	1.07	0.50	0.44	0.13

2023-28

QAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MMHCOH	% SAT	CALCIUM MGCAL	MAGNESIUM MGCAL	SODIUM MGCAL	SAR	% SAND	% SILT	% CLAY	CLASS	% CaCO3	TOT S %	SULFATE %	PIR S %	ORG %	ACID POT TN/100TN	NET POT TN/100TN	AS POT TN/100TN	PIR A POT TN/100TN	PYS A-B TN/100TN
1212-078-01	3123-N9	12/12/12	0-1	3.73	4.20	53.0	25.3	18.3	12.0	2.56	55.00	25.00	20.00	SL/SCL	-2.37	0.38	0.14	0.01	0.23	11.8	-23.7	-35.5	0.25	-23.9
1212-078-02	3123-N9	12/12/12	1-3	3.56	4.30	57.7	24.8	18.4	12.8	2.76	57.50	23.75	18.75	SL	-1.96	0.68	0.36	<0.01	0.34	21.2	-19.6	-40.9	<0.01	-19.6
1212-078-03	3127-N9	12/12/12	0-1	6.11	3.80	40.7	27.8	31.5	15.7	2.88	32.50	35.00	32.50	CL	0.05	0.44	0.28	<0.01	0.16	13.6	0.53	-13.1	<0.01	0.53
1212-078-04	3127-N9	12/12/12	1-3	5.28	7.35	40.9	21.3	55.6	62.9	10.15	35.00	32.50	32.50	CL	-0.25	1.07	0.74	0.06	0.27	33.3	-2.50	-35.8	1.84	-4.34
1212-078-05	3331-N9	12/12/12	0-1	5.28	3.80	40.0	23.9	40.1	14.8	2.62	36.25	33.75	30.00	CL	0.76	0.76	0.55	<0.01	0.23	23.7	7.59	-16.1	<0.01	7.59
1212-078-06	3331-N9	12/12/12	1-3	4.71	4.60	38.4	22.8	97.1	9.53	1.23	40.00	33.75	26.25	L	-0.55	1.27	0.93	0.04	0.30	39.7	-5.52	-45.2	1.31	-6.83
1212-078-07	3122-N9	12/12/12	0-1	5.15	3.90	38.9	21.9	34.1	19.8	3.75	38.75	31.25	30.00	CL	-0.35	0.66	0.43	0.05	0.17	20.5	-3.51	-24.0	1.56	-5.07
1212-078-08	3122-N9	12/12/12	1-3	6.17	3.80	41.0	33.0	35.2	8.70	1.49	37.50	32.50	30.00	CL	0.46	0.69	0.52	<0.01	0.17	21.5	4.56	-17.0	<0.01	4.57
1212-078-08R	3122-N9	12/12/12	1-3	6.15	3.65	41.4	31.3	34.6	7.70	1.34	37.50	32.50	30.00	CL	0.36	0.65	0.48	<0.01	0.18	20.4	3.56	-16.9	<0.01	3.56
QC-29															0.76	0.21	0.10	0.01	0.10	6.57	7.59	1.02	0.44	7.15
QC-45				8.18	3.50	50.1	4.63	2.44	37.4	19.9	32.50	30.00	37.50	CL										

2012-1



QAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH	UNIT	EC	MMHCHN	% SAT	CALCIUM MG/L	MAGNESIUM MG/L	SODIUM MG/L	BAR	% BAND	% SILT	% CLAY	GLASS	% CACOS	TOT S %	SULFATE %	PVR %	ORG %	ACID POT TH1000	NEUT POT TH1000	AS POT TH1000	PVR A.D TH1000	PVR A.D TH1000
1304-084-01	J19 1894	4/11/13	0-1	3.38	9.84	19.3	37.5	37.5	19.3	139	9.78	1.10	31.25	41.25	27.50	CL	-0.61	1.66	0.89	0.20	0.57	51.9	-8.15	-58.1	6.22	-12.4
1304-084-02	J19 1894	4/11/13	1-3	2.83	14.2	19.3	40.3	40.3	19.3	213	5.92	0.55	31.25	41.00	28.75	CL	-0.91	1.52	0.81	0.14	0.57	47.5	-9.06	-56.5	4.25	-13.3
1304-084-03	J19 1897	4/11/13	0-1	3.84	14.4	20.1	31.6	31.6	20.1	285	14.6	1.22	47.50	35.00	17.50	L	-0.71	2.03	1.30	0.11	0.62	63.5	-7.12	-70.6	3.53	-10.6
1304-084-04	J19 1957	4/11/13	1-3	3.21	21.8	28.2	31.0	31.0	28.2	288	12.5	1.00	56.25	27.50	16.25	SL	-1.39	2.42	1.45	0.26	0.72	75.7	-13.9	-89.6	8.00	-21.9
1304-084-05	J19 1957	4/11/13	0-1	3.48	7.6	34.6	34.6	34.6	34.6	101	4.83	0.82	31.00	41.25	28.75	CL	-0.61	1.89	1.16	0.11	0.62	59.1	-8.15	-85.3	3.44	-9.68
1304-084-06	J19 1956	4/11/13	1-3	4.00	6.4	39.0	39.0	39.0	39.0	78.6	7.86	0.99	36.25	33.75	30.00	CL	-0.32	1.27	0.97	-0.03	0.33	39.6	-3.24	-42.8	-1.06	-2.17
1304-084-07	J19 1955	4/11/13	0-1	2.72	11.8	38.6	38.6	38.6	38.6	21.2	153	0.24	30.00	42.50	27.50	CL	-0.61	1.28	0.76	0.11	0.40	39.9	-8.09	-48.0	3.44	-11.5
1304-084-08	J19 1955	4/11/13	1-3	3.80	7.73	43.1	43.1	43.1	43.1	195	11.0	0.77	25.00	43.75	31.25	CL	-0.52	1.09	0.41	0.07	0.62	34.1	-5.18	-39.3	2.09	-7.27
1304-084-09	J19 1923	4/11/13	0-1	3.85	6.91	40.9	40.9	40.9	40.9	93.8	4.07	0.84	33.75	36.25	30.00	CL	-0.52	1.18	0.72	0.05	0.41	37.0	-5.18	-42.2	1.68	-6.83
1304-084-10	J19 1923	4/11/13	1-3	3.82	7.77	40.9	40.9	40.9	40.9	115	4.61	0.56	35.00	36.25	28.75	CL	-0.61	1.30	0.77	0.12	0.41	40.5	-6.15	-46.7	3.75	-9.90
1304-084-11	J19 1923	4/11/13	0-1	3.82	8.04	40.5	40.5	40.5	40.5	118	4.70	0.57	36.25	36.25	27.50	CL	-0.61	1.25	0.72	0.14	0.40	39.1	-6.15	-45.3	4.22	-10.4
1304-084-12	J19 1964	4/11/13	0-1	3.56	15	35.3	35.3	35.3	35.3	21.1	189	0.34	41.25	36.25	22.50	L	-0.61	1.34	0.89	0.14	0.32	42.0	-6.15	-48.1	4.25	-10.4
1304-084-13	J19 1964	4/11/13	1-3	5.89	7.68	39.1	39.1	39.1	39.1	67.3	30.3	4.80	42.50	33.75	23.75	L	-0.16	0.79	0.52	0.07	0.20	24.6	1.62	-23.0	2.19	-0.57
1304-084-14	J19 1893	4/11/13	0-1	3.72	6.44	42.6	42.6	42.6	42.6	80.1	3.54	0.50	30.00	40.00	30.00	CL	-0.61	1.27	0.77	0.06	0.43	39.7	-6.15	-45.9	2.00	-8.15
1304-084-15	J19 1893	4/11/13	1-3	3.66	8.75	44.4	44.4	44.4	44.4	196	13.0	0.59	35.00	35.00	30.00	CL	-0.81	1.34	0.85	0.07	0.42	41.9	-8.09	-50.0	2.19	-10.3
1304-084-16	J19 236	4/11/13	0-1	7.10	8.33	42.2	42.2	42.2	42.2	31.3	57.8	11.6	35.00	31.25	33.75	CL	-0.45	0.50	0.35	0.01	0.14	15.7	4.53	-11.2	0.22	4.31
1304-084-17	J19 236	4/11/13	1-3	7.15	11.92	44.9	44.9	44.9	44.9	39.3	93.4	17.9	32.50	31.25	36.25	CL	-0.28	0.61	0.44	0.02	0.15	19.1	2.59	-16.6	0.75	1.84
1304-084-18	J19 1897	4/11/13	0-1	3.68	7.3	32.9	32.9	32.9	32.9	17.9	94.0	2.22	46.25	38.25	27.50	L	-0.32	1.38	0.65	0.32	0.40	43.0	-3.24	-46.2	10.1	-13.3
1304-084-19	J19 1897	4/11/13	1-3	3.62	12.9	34.6	34.6	34.6	34.6	17.1	190	2.04	43.75	35.00	21.25	L	-0.81	1.64	0.94	0.18	0.51	51.1	-8.09	-59.2	6.06	-14.1
1304-084-20	J19 238	4/11/13	0-1	6.41	5.08	41.3	41.3	41.3	41.3	20.2	61.0	6.22	28.75	37.50	33.75	CL	1.23	1.22	0.73	0.06	0.44	38.2	12.3	-25.9	1.72	10.6
1304-084-21	J19 238	4/11/13	1-3	6.16	5.21	44.2	44.2	44.2	44.2	18.9	61.9	1.05	30.00	35.00	35.00	CL	1.23	1.96	1.30	0.07	0.58	61.1	12.3	-48.8	2.22	10.1
1304-084-22	J19 238	4/11/13	0-1	6.10	5.41	42.0	42.0	42.0	42.0	18.5	63.1	1.06	31.25	33.75	35.00	CL	1.23	1.87	1.20	0.07	0.60	58.5	12.3	-46.2	2.22	10.1
1304-084-23	J19 230	4/11/13	0-1	7.42	6.48	48.1	48.1	48.1	48.1	18.1	46.1	11.0	30.00	33.00	33.00	CL	0.94	0.52	0.23	0.11	0.18	16.2	9.38	-6.84	3.34	6.04
1304-084-24	J19 2026	4/11/13	0-1	2.55	7.46	51.1	51.1	51.1	51.1	15.8	94.1	15.4	17.50	42.50	23.75	L	-0.91	1.17	0.70	0.10	0.38	36.6	-9.06	-45.7	3.06	-12.1
1304-084-25	J19 2047	4/11/13	0-1	5.30	6.6	39.9	39.9	39.9	39.9	17.6	42.0	0.10	32.50	45.00	22.50	L	-0.81	1.52	0.90	0.10	0.53	47.4	-8.09	-55.5	3.00	-11.1
1304-084-26	J19 2047	4/11/13	1-3	6.21	7.79	41.3	41.3	41.3	41.3	17.0	34.1	51.2	32.50	40.00	27.50	CL	-0.03	1.10	0.69	0.17	0.24	34.3	-0.32	-34.7	5.22	-5.54
1304-084-27	J19 1896	4/11/13	0-1	3.51	10.41	34.3	34.3	34.3	34.3	17.2	118	28.3	44.25	41.25	25.00	L	-0.52	1.43	0.87	0.25	0.20	36.5	1.62	-34.9	7.81	-6.19
1304-084-28	J19 1896	4/11/13	1-3	3.48	19.94	32.3	32.3	32.3	32.3	21.0	270	49.9	47.50	35.00	17.50	L	-0.81	1.57	1.24	0.12	0.31	44.6	-5.18	-49.8	7.78	-13.0
1304-084-29	J19 1899	4/11/13	0-1	4.04	6.9	38.3	38.3	38.3	38.3	18.1	93.5	1.29	37.50	40.00	22.50	L	-0.42	1.54	0.68	0.38	0.46	48.1	-4.21	-52.3	11.8	-16.0
1304-084-30	J19 1899	4/11/13	1-3	3.98	8.74	37.5	37.5	37.5	37.5	17.8	134	0.96	35.00	40.00	25.00	L	-0.32	1.49	0.84	0.17	0.49	46.6	-3.24	-49.9	5.34	-8.58
1304-084-31	J19 1899	4/11/13	0-1	3.96	8.46	37.9	37.9	37.9	37.9	17.5	128	8.05	36.25	38.75	25.00	L	-0.32	1.47	0.87	0.15	0.45	46.0	-3.24	-49.2	4.75	-7.98
1304-084-32	J19 1895	4/11/13	1-3	3.82	11.23	38.7	38.7	38.7	38.7	18.2	108	36.6	40.00	45.00	25.00	L	-0.71	1.81	0.96	0.42	0.44	56.7	-7.12	-63.8	13.0	-20.1
1304-084-33	J19 1892	4/11/13	0-1	7.15	4.61	41.6	41.6	41.6	41.6	18.6	31.7	10.4	21.25	47.50	31.25	CL	-0.32	1.33	0.33	0.70	0.30	41.4	-3.24	-44.7	21.7	-26.0
1304-084-34	J19 1982	4/11/13	1-3	7.18	5.2	35.7	35.7	35.7	35.7	28.0	27.1	6.85	36.25	36.25	27.50	CL	-0.74	1.44	0.44	0.19	0.08	11.2	6.47	-47.2	4.44	2.03
1304-084-35	J19 2027	4/11/13	0-1	5.74	6.14	37.5	37.5	37.5	37.5	19.2	40.6	29.3	37.50	36.25	26.25	L	-0.03	1.16	0.57	0.26	0.33	36.1	-0.32	-36.5	8.12	-8.45
1304-084-36	J19 2027	4/11/13	1-3	6.00	8.05	37.2	37.2	37.2	37.2	17.6	48.7	8.25	37.50	35.00	27.50	CL	-0.16	1.09	0.64	0.22	0.23	34.0	1.62	-32.4	6.81	-5.19
1304-084-37	J19 1974	4/11/13	0-1	3.65	7.69	38.5	38.5	38.5	38.5	16.2	85.6	3.45	37.50	38.75	23.75	L	-0.52	1.48	0.71	0.39	0.38	46.2	-5.18	-51.4	12.2	-17.4
1304-084-38	J19 1974	4/11/13	1-3	3.50	9.85	35.5	35.5	35.5	35.5	15.3	96.1	6.00	36.25	40.00	23.75	L	-0.61	1.70	0.78	0.50	0.41	53.0	-6.15	-59.1	15.7	-21.9
1304-084-39	J19 1991	4/11/13	0-1	4.70	7.72	39.3	39.3	39.3	39.3	19.9	31.9	5.80	32.50	40.00	27.50	CL	-0.13	1.30	0.75	0.17	0.38	40.6	-1.30	-41.9	5.28	-6.58
1304-084-40	J19 1991	4/11/13	1-3	3.68	10.5	35.5	35.5	35.5	35.5	18.7	131	27.4	37.50	40.00	22.50	L	-0.52	1.86	0.78	0.62	0.45	58.0	-5.18	-63.2	19.4	-24.6
1304-084-41	J19 191	4/11/13	0-1	6.28	4.19	41.4	41.4	41.4	41.4	21.5	29.3	3.27	36.25	40.00	23.75	L	-0.52	1.86	0.82	0.61	0.44	58.0	-5.18	-63.2	18.9	-24.1
1304-084-42	N9 3330	4/11/13	0-1	6.04	4.14	39.6	39.6	39.6	39.6	19.9	31.9	1.93	37.50	36.25	26.25	L	-0.45	0.66	0.44	0.01	0.22	20.8	4.53	-19.2	0.19	4.34
1304-084-43	N9 3120	4/11/13	1-3	6.02	3.46	46.1	46.1	46.1	46.1	21.7	13.0	10.7	32.50	35.00	32.50	CL	0.36	0.73	0.51	0.02	0.20	22.8	3.56	-15.2	0.99	2.87
1304-084-44	N9 3120	4/11/13	0-1	7.20	3.17	45.8	45.8	45.8	45.8	23.8	13.1	7.74	32.50	35.00	32.50	CL	0.65	0.14	0.14	0.00	0.00	7.44	2.59	-4.86	-0.03	2.62
1304-084-45	N9 3126	4/11/13	0-1	4.69	7.01	44.8	44.8	44.8	44.8	18.2	80.0	19.4	32.50	37.50	30.00	CL	-0.13	0.86	0.62	0.02	0.22	26.7	-1.30	-28.0	0.83	-1.83
1304-084-46	N9 3126	4/11/13	1-3	5.23	6.33	41.6	41.6	41.6	41.6	19.6	32.9	6.89	35.00	35.00	30.00	CL	0.06	0.63	0.60	0.05	0.17	25.8	0.65	-25.2	1.89	-1.04
1304-084-47	N9 3121	4/11/13	0-1	8.27	4.64	42.6	42.6	42.6	42.6	0.93	45.0	41.2	16.25	41.25	42.50	SIC	0.36	0.17	0.17	0.						

GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC DMH/CM	% SAT	CALCIUM MEOL	MAGNESIUM MEOL	SODIUM MEOL	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT % S	SULFATE %	PIR %	ORP %	ACID POT TIT/100TN	NEUT POT TIT/100TN	AS POT TIT/100TN	PIR A.B TIT/100TN	PIR B.T TIT/100TN
1507-047-01	25-4613	7/3/15	0-1	7.42	9.84	61.0	24.6	28.0	70.5	13.8	40.00	28.75	31.25 CL	31.25 CL	0.821	0.533	0.254	0.128	0.152	16.6	8.21	-8.43	4.00	4.2
1507-047-02	25-4613	7/3/15	1-3	7.76	10.6	55.9	23.9	27.3	87.0	17.2	38.75	30.00	31.25 CL	31.25 CL	1.610	0.593	0.296	0.146	0.141	18.2	16.1	-2.11	4.56	11.5
1507-047-03	26-4720	7/3/15	0-1	7.90	12.0	45.9	25.9	22.2	110	22.3	37.50	31.25	31.25 CL	31.25 CL	2.792	0.352	0.352			11.0	18.2	16.9		
1507-047-04	26-4720	7/3/15	1-3	7.97	14.5	50.1	27.8	24.8	134	26.1	38.25	33.75	30.00 CL	30.00 CL	1.807	0.322				10.1	18.1	8.00		
1507-047-05	26-4687	7/3/15	0-1	7.05	11.2	49.1	25.2	27.6	88.3	17.2	35.00	33.75	31.25 CL	31.25 CL	1.117	0.492	0.286	0.059	0.135	15.4	11.2	-4.19	1.84	9.32
1507-047-06	26-4687	7/3/15	1-3	8.60	7.18	46.5	22.3	2.94	70.9	44.1	41.25	33.75	25.00 L	25.00 L	1.708	0.119				3.70	17.1	13.4		
1507-047-07	26-4650	7/3/15	0-1	7.18	10.6	53.4	26.2	31.5	92.8	17.2	38.75	30.00	31.25 CL	31.25 CL	1.412	0.575	0.324	0.167	0.184	21.1	14.1	-8.96	5.22	8.91
1507-047-08	26-4650	7/3/15	1-3	7.63	12.4	51.2	23.2	21.3	113	24.0	37.50	34.80	27.70 CL	27.70 CL	1.610	1.004	0.448	0.354	0.203	31.4	16.1	-15.3	11.06	5.04
1507-047-09	26-4645	7/3/15	0-1	7.38	10.3	49.6	23.6	39.6	72.8	12.9	37.50	34.80	27.70 CL	27.70 CL	2.299	0.946	0.236	0.391	0.218	26.4	23.0	-3.43	12.21	10.8
1507-047-10	26-4645	7/3/15	1-3	7.72	11.2	40.0	24.2	34.8	88.6	16.0	40.00	32.50	27.50 CL	27.50 CL	2.299	0.946	0.236	0.391	0.218	26.4	23.0	-3.43	12.21	10.8
1507-047-11	26-4645	7/3/15	0-1	7.72	11.2	46.4	25.3	38.4	90.9	16.4	40.00	31.25	28.75 CL	28.75 CL	2.201	0.830	0.350	0.288	0.214	25.9	22.0	-3.91	8.28	13.7
1507-047-12	26-4646	7/3/15	0-1	7.47	9.28	48.9	26.9	25.7	62.2	12.1	33.75	36.25	30.00 CL	30.00 CL	1.412	0.831	0.166	0.288	0.214	19.7	14.1	-5.59	9.00	5.13
1507-047-13	26-4646	7/3/15	1-3	7.00	11.3	53.3	20.3	31.2	92.2	18.2	41.25	32.50	26.25 L	26.25 L	0.723	1.437	0.522	0.539	0.378	44.9	7.23	-37.7	16.84	-9.81
1507-047-14	26-4685	7/3/15	0-1	7.29	7.61	47.1	23.1	24.5	61.3	12.6	47.50	28.75	23.75 L	23.75 L	1.708	0.717	0.282	0.206	0.230	22.4	17.1	-5.32	8.44	10.6
1507-047-15	26-4685	7/3/15	1-3	6.60	11.9	55.0	20.4	29.0	100	20.2	52.50	23.75	23.75 SCL	23.75 SCL	0.821	0.845	0.375	0.250	0.220	26.4	8.21	-13.9	4.19	4.02
1507-047-16	26-4685	7/3/15	0-1	7.10	10.5	47.8	20.2	29.0	80.9	16.3	41.25	31.25	27.50 CL	27.50 CL	0.821	0.708	0.422	0.134	0.152	16.1	20.0	-13.9	4.19	4.02
1507-047-17	26-4685	7/3/15	1-3	7.60	9.17	52.4	19.4	29.6	63.9	12.9	52.50	25.00	22.50 SCL	22.50 SCL	2.004	0.515				16.1	17.1	3.95		
1507-047-18	26-4688	7/3/15	0-1	7.37	33.3	30.3	75.3	182.9	90.5	8.29	58.75	22.50	16.75 SCL	16.75 SCL	1.708	0.245				7.67	20.0	9.41		
1507-047-19	26-4649	7/3/15	1-3	7.51	10.0	53.8	20.1	23.7	74.8	16.0	46.25	27.50	26.25 SCL	26.25 SCL	1.314	0.434	0.155	0.131	0.148	13.6	13.1	-0.41	4.09	9.05
1507-047-20	26-4649	7/3/15	0-1	7.56	10.8	55.4	19.7	23.0	75.3	16.3	47.50	27.50	25.00 SCL	25.00 SCL	1.283	0.428	0.155	0.139	0.134	13.4	12.9	-0.43	4.34	8.99
1507-047-21	26-4648	7/3/15	0-1	7.19	8.38	47.8	26.5	28.5	53.1	10.2	42.50	28.75	28.75 CL	28.75 CL	1.190	0.479	0.194	0.115	0.170	15.0	11.9	-3.06	3.59	8.31
1507-047-22	26-4648	7/3/15	1-3	7.08	11.4	51.7	23.1	24.2	91.8	18.9	48.75	25.00	26.25 SCL	26.25 SCL	1.785	0.505				15.8	17.9	2.06		
1507-047-23	26-4647	7/3/15	0-1	7.83	14.0	42.8	25.4	25.4	119	23.5	43.75	31.25	25.00 L	25.00 L	1.888	0.399				12.4	16.9	4.41		
1507-047-24	26-4608	7/3/15	1-3	7.30	12.4	40.0	26.6	35.2	97.9	17.6	35.00	35.25	28.75 CL	28.75 CL	1.989	0.731	0.359	0.119	0.254	22.8	16.9	-5.97	3.72	13.1
1507-047-25	26-4608	7/3/15	0-1	7.50	11.4	45.7	24.7	23.9	94.0	19.1	38.75	33.75	27.50 CL	27.50 CL	1.587	0.628	0.137	0.345	0.144	19.5	15.9	-3.88	10.78	5.09
1507-047-26	26-4608	7/3/15	1-3	7.61	11.2	44.2	22.2	19.5	94.8	20.8	47.50	28.25	26.25 SCL	26.25 SCL	1.388	0.492	0.163	0.184	0.146	15.4	13.9	-1.48	5.75	8.14
1507-047-27	26-4810	7/3/15	0-1	8.80	8.91	52.9	22.8	31.3	62.8	12.1	35.00	33.75	31.25 CL	31.25 CL	0.894	0.862	0.416	0.240	0.208	26.9	6.94	-20.0	7.50	-0.56
1507-047-28	26-4810	7/3/15	1-3	6.98	11.3	53.0	23.1	26.1	94.0	19.0	33.75	35.00	31.25 CL	31.25 CL	0.892	0.784	0.398	0.202	0.183	24.5	8.92	-15.8	6.31	2.61
1507-047-29	26-4811	7/3/15	0-1	7.19	10.6	47.3	23.6	18.0	91.8	20.1	43.75	31.25	25.00 L	25.00 L	0.992	0.698	0.292	0.128	0.246	20.8	9.92	-10.9	4.00	5.92
1507-047-30	26-4811	7/3/15	1-3	7.17	8.81	48.2	24.2	24.8	59.6	12.2	50.00	28.25	23.75 SCL	23.75 SCL	1.587	0.765	0.388	0.140	0.238	23.9	15.9	-8.03	4.37	11.5
1507-047-31	26-4812	7/3/15	0-1	7.20	9.03	47.6	24.9	28.4	63.1	12.5	48.75	27.50	23.75 SCL	23.75 SCL	1.686	0.763	0.362	0.139	0.263	23.6	16.9	-8.99	4.34	12.5
1507-047-32	26-4812	7/3/15	1-3	7.17	10.9	50.4	25.0	41.8	77.4	13.4	38.25	32.50	31.25 CL	31.25 CL	0.992	0.733	0.395	0.170	0.167	22.9	9.92	-13.0	5.31	4.60
1507-047-33	26-4812	7/3/15	0-1	7.43	12.1	54.7	20.7	28.4	104	21.0	30.00	35.25	33.75 CL	33.75 CL	0.892	0.525	0.303	0.080	0.142	16.4	8.92	-7.49	2.50	6.42
1507-047-34	26-4812	7/3/15	1-3	7.51	10.0	56.5	18.8	14.0	87.4	21.3	32.50	35.00	32.50 CL	32.50 CL	1.587	0.738	0.301	0.216	0.222	23.1	15.9	-7.18	6.75	9.12
1507-047-35	26-4812	7/3/15	0-1	7.43	9.98	56.1	21.5	14.5	87.4	20.6	33.75	32.50	32.50 CL	32.50 CL	1.388	0.760	0.258	0.264	0.238	23.8	13.9	-9.87	6.25	5.64
1507-047-36	26-4573	7/3/15	1-3	6.56	9.33	53.0	21.7	38.4	66.1	12.3	41.25	31.25	27.50 CL	27.50 CL	0.396	0.087				2.70	3.96	1.26		
1507-047-37	26-4573	7/3/15	0-1	5.17	13.7	54.6	21.7	56.5	108	17.3	42.50	30.00	27.50 CL	27.50 CL	-0.001	0.933	0.529	0.140	0.265	29.2	0.00	-29.2	4.37	-4.37
1507-047-38	26-4574	7/3/15	1-3	4.29	5.82	53.9	21.2	13.8	29.8	6.43	40.00	33.75	26.25 L	26.25 L	-0.001	0.659	0.272	0.156	0.229	20.6	-2.98	-23.6	4.94	-7.92
1507-047-39	26-4574	7/3/15	0-1	6.73	5.83	50.1	20.4	21.8	38.5	9.30	52.50	27.50	20.00 SCL	20.00 SCL	1.091	0.593	0.225	0.125	0.242	18.6	10.9	-7.60	3.91	7.00
1507-047-40	26-4575	7/3/15	1-3	6.96	12.1	48.0	22.3	51.5	87.9	14.5	40.00	28.75	31.25 CL	31.25 CL	1.785	1.283	0.812	0.227	0.245	40.1	17.9	-22.2	7.09	10.8
1507-047-41	26-4575	7/3/15	0-1	7.18	12.1	45.4	24.3	42.0	91.8	16.0	45.00	27.50	27.50 CL	27.50 CL	2.480	1.156	0.660	0.179	0.262	36.1	24.8	-11.3	6.59	19.2
1507-047-42	26-4575	7/3/15	1-3	7.15	11.9	48.4	23.7	40.8	90.0	15.9	43.75	27.50	28.75 CL	28.75 CL	2.480	1.120	0.661	0.136	0.249	35.0	24.8	-10.2	4.25	20.5
1507-047-43	26-4576	7/3/15	0-1	6.91	11.5	47.6	19.9	49.0	88.7	15.1	42.50	27.50	30.00 CL	30.00 CL	1.984	0.781	0.450	0.196	0.195	24.4	19.8	-4.57	4.2	15.6
1507-047-44	26-4576	7/3/15	1-3	7.09	12.4	42.7	21.6	44.1	101	17.6	47.50	26.25	26.25 SCL	26.25 SCL	1.091	0.796	0.534	0.129	0.133	24.9	10.91	-14.0	4.34	6.87

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GAL #	LOCATION	SAMPLE DEPTH	PH UNITS	EC MH/CM	% SAT	CALCIUM MECL	MAGNESIUM MECL	SODIUM MECL	BAR	% SAND	% SILT	% CLAY	CLASS	% OACOP	TOT % S	SULFATE %	PTF % S	ORG %	ACID POT TITR/00TH	HEUT POT TITR/00TH	AR POT TITR/00TH	PYR A-B TITR/00TH	PYR A-B TITR/00TH
1510 298-01	26-4607	10/27/15	0-1	6.90	10.9	46.8	21.4	35.3	15.1	40.00	30.00	30.00	CL	0.68	0.74	0.28	0.20	0.26	23.2	6.79	-16.4	6.37	0.42
1510 298-02	26-4607	10/27/15	1-3	6.49	12.13	42.0	20.4	41.4	16.3	41.25	26.25	32.50	CL	0.68	0.94	0.40	0.17	0.27	29.5	6.79	-22.7	5.22	1.58
1510 298-03	26-4681	10/27/15	0-1	7.35	7.49	45.8	24.6	28.8	8.29	42.50	27.50	30.00	CL	2.89	1.11	0.40	0.44	0.27	39.5	6.79	-5.7	13.6	15.4
1510 298-04	26-4681	10/27/15	1-3	6.65	12.5	44.7	20.7	16.9	22.9	37.50	33.75	28.75	CL	2.19	2.05	<0.010	1.80	0.34	64.1	21.9	-42.2	56.2	-34.3
1510 298-05	26-4715	10/27/15	0-1	3.93	15.0	34.8	24.0	179	23.2	45.00	31.25	28.75	L	<0.010	1.79	1.08	0.16	0.53	55.9	-5.3	-61.1	5.75	-11.0
1510 298-06	26-4715	10/27/15	1-3	4.63	14.6	31.9	21.5	191	27.2	50.00	25.00	25.00	SCL	<0.010	1.56	1.04	0.00	0.52	48.8	-5.29	-54.1	0.03	-5.32
1510 298-07	26-4715	10/27/15	0-1	6.23	10.4	37.5	32.1	77.4	17.3	48.75	25.00	28.25	SCL	0.78	0.68	0.32	0.09	0.27	21.1	7.80	-13.3	2.72	5.08
1510 298-08	26-4747	10/27/15	1-3	6.74	5.15	33.1	28.2	42.0	1.39	58.75	20.00	21.25	SCL	0.48	0.21	0.13	0.01	0.07	6.62	4.78	-1.84	0.25	4.63
1510 298-09	26-4747	10/27/15	0-1	4.04	7.98	40.6	22.5	97.9	1.16	45.00	27.50	27.50	CL/SCL	<0.010	1.13	0.71	-0.02	0.44	35.4	-3.28	-38.7	-0.82	-2.65
1510 298-10	26-4777	10/27/15	1-3	4.48	8.38	40.3	23.1	91.3	2.84	33.75	35.00	31.25	CL	<0.010	1.03	0.70	0.00	0.33	32.1	-2.27	-34.4	-0.03	-2.43
1510 298-11	26-4777	10/27/15	1-3	4.50	8.42	41.7	23.3	89.7	2.11	31.25	36.25	32.50	CL	<0.010	0.96	0.65	0.01	0.31	30.0	-2.27	-32.3	0.16	
1510 298-12	26-3477	10/27/15	0-1	7.56	9.10	46.2	23.6	21.8	68.3	42.50	26.25	31.25	CL	1.08	0.20				6.83	10.8	4.00		
1510 298-13	26-3478	10/27/15	1-3	7.38	7.69	42.7	21.5	19.3	55.2	42.50	27.50	31.25	CL	1.18	0.22				6.35	11.8	5.48		
1510 298-14	26-3478	10/27/15	0-1	7.51	8.36	41.0	16.9	15.8	16.4	43.75	23.75	32.50	CL	0.68	0.19				5.84	7.8	1.96		
1510 298-15	26-3478	10/27/15	1-3	7.51	8.68	42.3	18.7	16.2	68.7	42.50	25.00	32.50	CL	0.78	0.19				6.50	10.8	4.32		
1510 298-16	26-3479	10/26/15	0-1	7.91	8.26	49.3	17.2	14.8	65.2	38.75	26.25	35.00	CL	1.08	0.21				6.01	18.9	12.9		
1510 298-17	26-3479	10/26/15	1-3	8.08	8.42	50.5	17.0	14.6	70.0	31.25	32.50	39.25	CL	1.89	0.19				6.58	10.8	2.98		
1510 298-18	26-3480	10/26/15	0-1	6.43	7.05	41.8	38.0	37.9	28.4	46.0	27.50	31.25	CL	1.08	0.26				6.58	14.8	8.27		
1510 298-19	26-3480	10/26/15	1-3	6.80	8.30	40.9	29.3	27.8	10.3	42.50	26.25	31.25	CL	1.48	0.21				6.28	11.8	5.55		
1510 298-20	25-3481	10/26/15	0-1	7.64	7.45	47.1	19.2	18.6	55.2	37.50	27.50	35.00	CL	1.18	0.20				6.09	15.9	9.78		
1510 298-21	25-3481	10/26/15	1-3	7.57	8.30	45.4	18.4	19.9	62.2	40.00	27.50	35.00	CL	1.48	0.21				6.41	14.8	8.44		
1510 298-22	38-3506	10/26/15	0-1	7.80	8.08	40.6	12.5	15.2	66.1	43.75	25.00	31.25	CL	1.69	0.15				4.58	16.9	12.3		
1510 298-23	38-3506	10/26/15	1-3	7.94	8.89	37.2	10.0	14.7	77.9	51.25	18.75	30.00	SCL	1.48	0.12				3.62	14.8	11.2		
1510 298-24	38-3571	10/26/15	0-1	6.79	9.71	46.5	20.8	21.6	78.6	40.00	26.25	33.75	CL	0.96	0.46				14.3	9.81	-4.51		6.63
1510 298-25	38-3571	10/26/15	1-3	7.08	8.14	42.7	20.3	22.0	80.0	47.50	22.50	30.00	SCL	1.08	0.39				12.1	10.8	-1.28		9.20
1510 298-26	38-3572	10/26/15	0-1	6.59	5.43	38.2	24.1	9.71	16.1	32.50	36.25	31.25	CL	0.10	0.59				18.4	0.99	-17.4		-5.29
1510 298-27	38-3572	10/26/15	1-3	7.71	3.80	39.8	17.1	8.71	20.3	37.50	32.50	30.00	CL	1.50	0.10				3.26	15.0	11.8		
1510 298-28	38-3572	10/26/15	0-1	7.34	10.3	43.3	20.7	21.9	80.0	43.75	26.25	30.00	CL	1.00	0.39				12.1	10.0	-2.12		7.32
1510 298-29	26-3545	10/26/15	1-3	7.19	10.4	43.1	21.7	21.5	81.8	45.00	23.75	31.25	CL/SCL	0.90	0.34				10.7	9.01	-1.70		7.10
1510 298-30	38-3559	10/26/15	0-1	7.30	7.03	37.4	24.7	25.3	39.5	53.75	21.25	25.00	SCL	2.50	0.22				7.24	30.0	22.8		
1510 298-31	38-3559	10/26/15	1-3	7.36	6.09	36.3	22.4	20.6	35.5	56.25	20.00	23.75	SCL	2.80	0.26				6.81	25.0	18.2		
1510 298-32	38-3559	10/26/15	0-1	7.33	6.50	36.1	23.6	21.7	38.0	57.50	18.75	23.75	SCL	2.50	0.22				6.82	26.0	17.8		
1510 298-33	26-3544	10/26/15	1-3	7.67	6.43	38.6	24.7	25.1	35.4	45.00	28.75	26.25	L	1.10	0.21				6.68	11.0	4.34		2.87
1510 298-34	38-3546	10/26/15	0-1	7.23	9.45	45.8	21.7	24.4	69.6	42.50	25.00	32.50	CL	0.40	0.34				10.7	4.00	-8.68		1.12
1510 298-35	38-3546	10/26/15	1-3	6.20	6.45	44.4	22.8	38.7	29.9	35.00	30.00	35.00	CL	0.80	0.44				13.6	8.01	-5.83		2.76
1510 298-36	38-3546	10/26/15	0-1	6.80	6.87	42.6	23.6	51.8	27.4	4.46	37.50	33.75	CL	0.90	0.43				13.5	9.01	-4.47		8.91
1510 298-37	26-3543	10/26/15	1-3	7.80	5.46	33.7	23.4	23.4	27.2	53.75	25.00	21.25	SCL	1.20	0.11				3.56	12.0	8.45		
1510 298-38	26-3543	10/26/15	0-1	7.76	4.56	31.7	11.8	16.8	29.1	53.75	25.00	21.25	SCL	1.30	0.12				3.71	13.0	9.30		
1510 298-39	38-3528	10/26/15	1-3	6.81	6.85	40.3	23.9	16.8	47.8	43.75	22.50	28.75	CL	1.70	0.18				5.76	17.0	11.3		
1510 298-40	38-3528	10/26/15	0-1	6.79	5.89	35.1	20.9	52.3	10.8	57.50	22.50	20.00	SCL	2.70	0.49				15.4	27.0	11.7		
1510 298-41	38-3547	10/26/15	1-3	6.81	4.99	37.7	24.5	26.8	15.6	31.25	35.00	33.75	CL	0.70	0.49				15.3	7.00	-8.30		4.89
1510 298-42	38-3547	10/26/15	0-1	6.70	4.53	38.0	23.8	25.8	14.7	30.00	32.50	32.50	CL	0.50	0.47				14.6	5.00	-8.65		2.32
1510 298-43	38-3570	10/26/15	1-3	6.90	6.72	31.6	24.3	40.6	33.2	5.89	21.25	28.75	CL	0.80	0.45				14.0	6.00	-7.98		1.00
1510 298-44	38-3570	10/26/15	0-1	7.32	6.90	33.2	23.0	37.7	25.3	4.55	37.50	32.50	CL	0.60	0.45				5.83	7.00	-7.98		2.66
1510 298-45	38-3570	10/26/15	1-3	7.45	6.10	33.2	24.3	37.7	25.3	4.55	37.50	32.50	CL	0.70	0.19				5.83	6.00	1.17		
1510 298-46	25-3796	10/26/15	0-1	4.43	6.22	37.9	20.3	53.0	10.6	46.25	27.50	26.25	SCL	0.50	0.57				5.42	12.0	6.59		0.56
1510 298-47	25-3796	10/26/15	1-3	4.37	4.63	39.8	21.1	32.2	7.74	1.50	57.50	20.00	SCL	0.20	0.65				5.42	17.7	-12.7		4.44
1510 298-48	25-3871	10/26/15	0-1	6.59	7.70	40.9	29.0	40.0	29.7	5.08	41.25	32.50	L	0.90	0.63				16.4	8.01	-11.6		1.87
1510 298-49	25-3871	10/26/15	1-3	6.39	7.31	38.7	28.0	37.8	30.6	5.43	41.25	28.75	SCL	0.40	0.53				16.4	4.00	-12.4		6.13
1510 298-50	25-3772	10/26/15	0-1	7.59	5.94	36.8	28.2	35.3	19.9	3.58	53.75	22.50	SCL	0.26	0.26				8.15	26.8	18.6		3.47
1510 298-51	25-3772	10/26/15	1-3	7.49	6.14	38.1	28.1	40.4	17.6	3.05	52.50	25.00	SCL	2.58	0.28				9.02	24.9	15.8		
1510 298-52	25-3821	10/26/15	0-1	6.21	6.29	36.5	26.3	40.7	18.6	46.25	27.50	25.00	SCL	0.50	0.57				8.88	25.8	16.8		
1510 298-53	25-3870	10/26/15	1-3	7.51	7.15	37.9	27.6	53.9	15.8	2.47	30.00	32.50	CL	0.65	0.48				15.0	51.7	-8.50		4.92
1510 298-54	25-3870	10/26/15	0-1	6.08	8.24	43.7	26.6	37.4	26.8	51.25	27.50	21.25	SCL	0.55	0.48				15.0	5.48	-8.50		
1510 298-55	25-3796	10/26/15	1-3	7.49	7.23	39.9	28.1	37.4	26.8	43.75	31.25	25.00	L	1.61	0.35				11.0	16.1	5.13		0.59
1510 298-56	25-3796	10/26/15	0-1	7.99	1.70	37.5	11.6	4.89	4.06	55.00	23.75	21.25	SCL	5.97	0.04				1.15	59.7	58.6		11.7
1510 298-57	25-3796	10/26/15																					



GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC CMH/CMH	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	BAR	% SAND	% SILT	% CLAY	CLASS	% CACOS	TOT S %	SULFATE %	PVR S %	ORG S %	ACID POT TN/100TN	NEUT POT TN/100TN	A3 POT TN/100TN	PVR A3 POT TN/100TN	PYR A3 TN/100TN
1604-089-01	24-4323	4/6/16	0-1	4.82	5.69	41.4	20.1	60.8	9.48	1.49	35.00	30.00	35.00	CL	<0.001	0.888	0.513	0.019	0.307	26.2	-31.5	-57.7	0.59	-32.1
1604-089-02	24-4323	4/6/16	1-3	5.28	7.06	40.8	19.8	83.9	16.8	2.3	38.75	27.50	33.75	CL	0.38	0.919	0.621	0.133	0.164	28.7	-8.76	-25.14	4.15	-0.58
1604-089-03	24-4287	4/6/16	0-1	4.71	6.28	47.7	20.2	80.9	16.7	2.940	33.75	32.50	33.75	CL	<0.001	0.894	0.493	0.111	0.290	27.9	-8.76	-37	3.47	-12.2
1604-089-04	24-4287	4/6/16	1-3	6.02	6.52	38.2	20.7	73.1	18.1	2.64	35.00	33.75	31.25	CL	0.17	0.792	0.397	0.098	0.287	24.4	1.68	-22.7	3.08	-1.39
1604-089-05	24-4321	4/6/16	0-1	5.66	5.54	36.4	22.2	55.2	6.79	1.67	45.00	37.50	27.50	CL	0.45	0.565	0.319	0.077	0.169	17.6	4.52	-13.1	2.41	2.11
1604-089-06	24-4321	4/6/16	1-3	6.41	4.98	35.1	24.0	43.0	8.87	1.63	50.00	23.75	26.25	CL	0.74	0.347	0.198	0.044	0.105	10.8	7.36	-3.48	1.37	5.99
1604-089-07	24-4322	4/6/16	0-1	5.83	5.35	40.7	20.5	52.7	5.87	0.97	38.75	38.75	42.50	C	0.55	0.866	0.420	0.138	0.308	27.0	5.47	-21.6	4.31	1.16
1604-089-08	24-4322	4/6/16	1-3	6.55	9.78	43.5	16.7	89.7	48.7	6.68	16.25	40.00	43.75	CL	0.55	0.753	0.596	0.032	0.125	23.5	5.47	-18.1	1.00	4.47
1604-089-09	24-3493	4/6/16	0-1	7.00	3.38	39.9	24.1	22.9	1.74	0.36	40.00	26.25	33.75	CL	2.44	0.593				17.6	17.6	6.84		
1604-089-10	24-3493	4/6/16	1-3	7.67	5.85	54.7	19.2	72.6	6.35	0.94	13.75	36.25	50.00	C	1.86	0.321				10.0	18.6	8.61		
1604-089-11	24-3493	4/6/16	0-1	6.54	10.3	49.4	21.3	19.6	11.9	26.3	33.75	35.00	51.25	C	1.77	0.355	0.152	0.171	0.284	11.1	17.7	6.59	5.34	2.02
1604-089-12	25-4413	4/6/16	1-3	7.00	8.83	45.5	19.3	20.8	78.7	17.6	27.50	33.75	38.75	CL	1.40	0.637	0.120	0.253	0.284	19.9	14.0	-5.89	7.90	6.10
1604-089-13	25-4412	4/6/16	0-1	6.77	7.45	40.9	19.2	10.2	63.9	16.0	41.25	27.50	31.25	CL	0.64	0.597	0.078	0.165	0.354	18.6	6.42	-12.2	5.15	1.26
1604-089-14	25-4412	4/6/16	1-3	6.73	5.47	39.3	20.7	35.2	22.8	4.31	37.50	28.75	33.75	CL	2.16	0.819	0.347	0.212	0.260	25.6	21.8	-4.0	6.62	15.0
1604-089-15	25-4373	4/6/16	0-1	6.45	6.12	35.6	18.0	17.3	43.3	10.3	51.25	27.50	31.25	CL	0.74	0.744	0.226	0.262	0.257	23.2	7.38	-15.9	8.18	-0.82
1604-089-16	25-4373	4/6/16	1-3	6.13	5.21	38.9	21.9	44.4	12.6	2.19	38.75	31.25	30.00	CL	0.74	0.840	0.376	0.157	0.307	26.2	7.38	-18.9	4.90	2.46
1604-089-17	25-4374	4/6/16	0-1	6.77	6.78	39.6	18.2	33.7	40.8	8.00	31.25	33.75	35.00	CL	1.21	1.160	0.420	0.399	0.342	36.2	12.1	-24.1	12.5	-0.36
1604-089-18	25-4374	4/6/16	1-3	7.06	5.76	41.1	18.4	17.9	38.0	8.81	52.50	23.75	23.75	CL	1.02	0.842	0.148	0.541	0.253	29.4	10.2	-19.2	16.9	-8.69
1604-089-19	25-4535	4/6/16	0-1	7.35	7.19	40.5	17.9	8.90	59.6	16.3	42.50	30.00	27.50	CL	1.87	0.849	0.148	0.419	0.275	26.5	18.7	-7.78	13.1	5.85
1604-089-20	25-4535	4/6/16	1-3	7.38	7.22	39.5	19.9	9.71	61.3	16.2	48.25	25.00	28.75	CL	2.06	0.846	0.142	0.417	0.286	26.4	21.8	-4.84	13.0	8.66
1604-089-21	25-4535	4/6/16	1-3	7.39	6.94	38.2	17.5	8.97	57.4	15.8	41.25	26.25	32.50	CL	2.06	0.860	0.140	0.401	0.298	28.9	20.8	-6.25	14.4	6.21
1604-089-22	25-4341	4/6/16	0-1	7.06	6.20	37.4	24.2	32.4	49.6	9.32	43.75	27.50	28.75	CL	1.68	0.663	0.217	0.286	0.179	20.7	16.8	-3.88	8.31	8.54
1604-089-23	25-4340	4/6/16	1-3	7.33	6.31	37.0	21.2	23.8	37.0	7.82	41.25	27.50	31.25	CL	2.92	0.515	0.140	0.284	0.207	19.7	17.8	-1.93	8.87	8.92
1604-089-24	25-4340	4/6/16	0-1	7.53	6.23	34.0	21.6	20.2	39.8	8.49	47.50	22.50	30.00	CL	1.78	0.631	0.140	0.284	0.207	19.7	17.8	-1.93	8.87	8.92
1604-089-25	25-4375	4/6/16	1-3	7.69	10.2	38.5	21.3	22.5	106	22.8	30.00	31.25	38.75	CL	1.50	0.526	0.198	0.154	0.174	16.4	15.0	-1.48	4.81	10.1
1604-089-26	25-4375	4/6/16	0-1	6.88	9.00	43.6	18.4	34.1	70.0	13.7	33.75	30.00	36.25	CL	1.12	0.788	0.261	0.297	0.246	24.6	11.2	-13.5	7.18	3.97
1604-089-27	25-4342	4/6/16	1-3	6.14	13.1	38.5	22.0	76.8	14.0	20.0	31.25	32.50	36.25	CL	0.83	1.230	0.460	0.441	0.329	38.4	8.31	-30.1	13.8	-5.46
1604-089-28	25-4342	4/6/16	0-1	6.52	9.58	38.6	17.1	42.2	78.7	14.5	40.00	25.00	35.00	CL	1.02	0.894	0.319	0.369	0.206	27.9	10.2	-17.7	11.5	-1.32
1604-089-29	25-4301	4/6/16	1-3	7.75	6.92	30.8	12.1	9.87	55.7	16.8	48.75	25.00	26.25	CL	3.58	0.221	0.197	0.226	0.154	6.16	22.8	-2.88	2.12	5.24
1604-089-30	25-4901	4/6/16	1-3	8.08	5.54	28.4	7.49	6.98	43.9	18.3	46.25	27.50	26.25	CL	2.28	0.197	0.108	0.088	0.154	10.3	7.36	-2.88	2.12	5.24
1604-089-31	25-4901	4/6/16	0-1	8.09	5.84	28.2	7.76	7.84	44.8	16.5	46.25	27.50	26.25	CL	2.38	0.181	0.239	0.226	0.204	18.1	20.6	-0.09	7.08	10.7
1604-089-32	25-4902	4/6/16	1-3	7.36	7.86	37.4	15.1	15.1	63.9	16.5	51.25	20.00	28.75	CL	1.12	0.579	0.155	0.220	0.204	18.1	11.2	-6.82	6.97	4.28
1604-089-33	25-4932	4/6/16	0-1	7.35	7.85	37.9	17.7	18.8	61.8	14.5	52.50	20.00	27.50	CL	1.12	0.579	0.155	0.220	0.204	18.1	11.2	-6.82	6.97	4.28
1604-089-34	25-4932	4/6/16	1-3	7.08	5.69	38.5	18.6	16.1	34.9	8.38	55.00	20.00	25.00	CL	2.06	0.643	0.206	0.226	0.154	17.9	17.8	-0.09	7.08	10.7
1604-089-35	24-4888	4/6/16	0-1	6.80	5.75	36.8	18.4	16.4	37.1	9.15	52.50	21.25	28.75	CL	1.78	0.572	0.079	0.226	0.267	17.9	17.8	-0.09	7.08	10.7
1604-089-36	24-4989	4/6/16	1-3	6.70	4.79	36.6	17.3	19.6	23.1	5.37	38.75	27.50	33.75	CL	1.21	0.204	0.108	0.088	0.154	10.3	7.36	-2.88	2.12	5.24
1604-089-37	24-5017	4/6/16	0-1	7.35	10.2	34.2	20.8	16.8	11.1	23.6	48.75	25.00	26.25	CL	2.73	0.798	0.331	0.215	0.252	23.1	27.3	4.22	6.72	10.1
1604-089-38	24-5017	4/6/16	1-3	7.19	9.20	33.8	18.9	19.8	87.0	20.3	50.00	23.75	26.25	CL	1.68	0.798	0.331	0.215	0.252	23.1	27.3	4.22	6.72	10.1
1604-089-39	24-5044	4/6/16	0-1	7.65	4.80	36.3	19.4	31.9	14.1	2.79	42.50	26.25	31.25	CL	2.82	0.213	0.168	0.215	0.252	23.1	27.3	4.22	6.72	10.1
1604-089-40	24-5044	4/6/16	1-3	7.30	5.15	35.4	19.3	31.2	19.7	3.91	50.00	22.50	27.50	CL	2.44	0.525	0.213	0.215	0.252	23.1	27.3	4.22	6.72	10.1
1604-089-41	24-5044	4/6/16	0-1	7.30	5.18	35.8	18.8	30.9	20.1	4.02	48.75	23.75	27.50	CL	2.44	0.580	0.279	0.187	0.319	24.5	13.1	-11.5	5.84	7.21
1604-089-42	24-5018	4/6/16	1-3	7.00	9.09	43.2	20.1	22.6	73.9	16.0	45.00	22.50	32.50	CL	1.31	0.785	0.329	0.187	0.319	24.5	13.1	-11.5	5.84	7.21
1604-089-43	24-5018	4/6/16	0-1	7.14	8.09	43.3	20.1	27.1	67.9	14.0	41.25	25.00	33.75	CL	1.40	0.785	0.329	0.187	0.319	24.5	13.1	-11.5	5.84	7.21
1604-089-44	24-4980	4/6/16	1-3	6.13	7.17	36.7	19.2	32.7	44.4	8.72	42.50	26.25	31.25	CL	0.64	0.620	0.329	0.086	0.225	19.4	6.42	-12.8	2.06	4.35
1604-089-45	24-4980	4/6/16	0-1	6.77	8.99	36.6	21.8	49.4	66.6	11.1	48.75	23.75	27.50	CL	0.83	0.462	0.282	0.047	0.133	14.4	8.31	-6.13	1.47	6.84
1604-089-46	24-4286	4/7/16	0-1	6.89	5.57	35.9	24.4	57.8	14.0	2.18	45.00	28.75	26.25	CL	1.02	0.785	0.510	0.019	0.256	34.5	10.2	-14.3	0.58	9.62
1604-089-47	24-3464	4/7/16	0-1	6.27	5.55	38.7	20.1	46.8	14.5	2.51	35.00	31.25	33.75	CL	0.83	0.677	0.834	0.044	0.213	21.1	8.31	-12.8	1.37	6.94
1604-089-48	24-3464	4/7/16	1-3	4.09	8.18	43.5	24.1	89.7	39.5	5.24	52.50	22.50	35.00	CL	0.28	1.124	0.506	0.145	0.474	35.1	2.62	-32.5	6.00	-1.91
1604-089-49	56-2877	4/7/16	0-1	6.03	9.61	37.9	15.7	42.9	70.5	13.0	33.75	31.25	35.00	CL	0.45	1.023	0.556	0.192	0.275	32.0	4.52	-27.4	6.00	-1.48
1604-089-50	56-2877	4/7/16	1-3	7.48	6.92	39.4	22.2	36.3	53.9	10.0	33.75	32.50	33.75	CL	1.78	0.620								



QAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MINHOOM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	BAR	% BAND	% SILT	% CLAY	CLASS	% CAGOS	TOT %	SULFATE %	PYR %	ORG %	ACID POT TH1000TH	NEUT POT TH1000TH	A-S POT TH1000TH	PYR A POT TH1000TH	PYR A-B TH1000TH
1606-237-01	3872	6/16/16	0-1	4.92	5.61	43.0	29.6	49.0	13.7	2.18	37.50	32.50	30.00	CL	0.51	0.57	0.421	0.027	0.124	17.9	5.10	-12.8	0.84	4.26
1606-237-02	3872	6/16/16	1-3	4.72	5.18	51.9	31.4	34.0	10.2	1.78	28.75	30.00	41.25	C	0.70	0.36	0.228	0.003	0.132	11.3	6.95	-4.38	0.09	6.86
1606-237-03	3849	6/16/16	0-1	5.06	5.35	35.2	20.9	54.4	16.1	2.63	51.25	25.00	23.75	SCL	0.42	0.62	0.472	0.020	0.132	19.5	4.18	-15.3	0.62	3.55
1606-237-04	3849	6/16/16	1-3	4.60	6.76	37.8	19.6	89.7	23.5	3.18	41.25	33.75	25.00	L	0.23	0.86	0.591	0.053	0.249	27.0	2.33	-24.7	1.66	0.67
1606-237-05	3848	6/16/16	0-1	5.03	5.04	37.9	20.7	53.1	13.9	2.29	51.25	23.75	25.00	SCL	0.42	0.67	0.459	0.091	0.124	21.0	4.18	-16.9	2.84	1.33
1606-237-06	3848	6/16/16	1-3	5.21	5.05	36.3	20.7	49.6	13.4	2.27	50.00	26.25	23.75	SCL	0.60	0.62	0.427	0.019	0.175	19.4	6.03	-13.4	0.59	5.43
1606-237-07	3847	6/16/16	0-1	6.77	6.08	44.8	30.1	39.7	23.3	3.94	35.00	33.75	31.25	CL	1.25	0.54	0.299	0.062	0.182	17.0	12.5	-4.46	1.94	10.6
1606-237-08	3847	6/16/16	1-3	7.03	5.83	44.8	29.8	38.8	21.0	3.58	38.75	30.00	31.25	CL	1.53	0.63	0.429	0.044	0.155	19.6	16.3	-4.32	1.37	13.9
1606-237-09	3822	6/16/16	0-1	7.59	3.59	54.8	11.3	13.6	24.1	6.82	40.00	30.00	30.00	CL	0.97	0.27				8.36	9.73	1.36		
1606-237-10	3822	6/16/16	1-3	7.60	3.90	46.7	13.1	13.9	26.6	7.24	40.00	31.25	28.75	CL	1.07	0.22				6.75	10.7	3.90		
1606-237-10R	3822	6/16/16	1-3	7.64	3.79	48.4	12.6	13.5	26.1	7.22	40.00	31.25	28.75	CL	1.16	0.27				8.45	11.6	3.12		
1606-237-11	3823	6/16/16	0-1	7.35	4.83	42.9	19.6	18.7	32.8	7.71	50.00	22.50	27.50	SCL	1.16	0.37				11.4	11.6	0.13		
1606-237-12	3823	6/16/16	1-3	7.40	5.19	37.5	18.6	14.3	38.7	9.54	36.25	32.50	31.25	CL	1.90	0.38				12.0	19.0	7.02		
1606-237-13	3798	6/16/16	0-1	7.41	4.53	48.0	19.5	18.8	27.1	6.21	40.00	30.00	30.00	CL	1.16	0.33				10.2	11.6	1.42		
1606-237-14	3798	6/16/16	1-3	7.39	4.58	45.7	20.4	21.1	25.1	5.50	38.75	30.00	31.25	CL	1.44	0.36				11.3	14.4	3.05		
1606-237-15	3774	6/16/16	0-1	5.28	6.35	41.3	18.5	13.3	58.3	14.6	50.00	23.75	25.25	SCL	0.33	1.35	<0.010	0.956	0.538	42.1	3.25	-38.9	29.9	-26.6
1606-237-16	3774	6/16/16	1-3	5.81	5.98	42.0	17.6	16.9	48.3	11.6	42.50	32.50	25.00	L	0.80	1.39	0.257	0.694	0.470	43.5	6.03	-37.4	20.7	-14.7
1606-237-17	3773	6/16/16	0-1	7.39	3.35	38.2	21.6	20.9	12.9	2.80	53.75	21.25	25.00	SCL	2.36	0.28				8.26	23.6	15.3		
1606-237-18	3773	6/16/16	1-3	7.41	4.44	36.5	20.3	37.1	19.5	3.65	52.50	23.75	23.75	SCL	2.45	0.33				10.4	24.5	14.1		
1606-237-19	3750	6/16/16	0-1	7.27	4.95	35.2	19.6	34.8	28.2	5.41	50.00	26.25	23.75	SCL	2.45	0.38				12.0	24.5	12.6		
1606-237-20	3750	6/16/16	1-3	7.40	4.19	36.1	20.8	38.1	17.7	3.32	60.00	17.50	22.50	SCL	2.82	0.36				11.2	26.2	17.0		
1606-237-20R	3750	6/16/16	1-3	7.40	4.43	36.0	21.1	37.4	19.6	3.62	58.75	18.75	22.50	SCL	2.73	0.36				11.3	27.3	16.0		
1606-237-21	3751	6/16/16	0-1	7.25	4.36	41.9	21.3	26.4	25.1	5.14	48.75	23.75	27.50	SCL	2.55	0.41				12.8	25.5	12.7		
1606-237-22	3751	6/16/16	1-3	7.08	4.55	43.9	19.3	23.7	28.3	6.11	45.00	26.25	28.75	CL/SCL	2.08	0.52				16.1	20.8	4.68		
1606-237-23	3590	6/16/16	0-1	7.34	5.45	39.9	19.5	18.8	42.0	9.47	51.25	22.50	26.25	SCL	2.92	0.38				12.0	29.2	17.1		
1606-237-24	3590	6/16/16	1-3	7.52	5.00	38.0	19.0	16.0	38.9	9.32	61.25	16.25	22.50	SCL	2.73	0.25				8.65	27.3	18.6		
1606-237-25	3608	6/16/16	0-1	7.34	7.77	37.8	18.4	15.4	55.7	13.5	40.00	28.75	31.25	CL	2.36	0.35				11.0	23.6	12.6		
1606-237-26	3608	6/16/16	1-3	7.49	7.18	37.3	18.6	16.1	50.9	12.2	48.75	21.25	30.00	SCL	2.38	0.34				10.7	23.6	12.9		
1606-237-27	3607	6/16/16	0-1	7.35	7.18	35.8	15.9	9.71	51.3	14.4	50.00	23.75	26.25	SCL	2.55	0.20				6.11	25.5	19.3		
1606-237-28	3607	6/16/16	1-3	7.54	8.12	35.2	17.2	9.71	62.2	17.0	51.25	22.50	26.25	SCL	1.99	0.25				7.92	19.9	12.0		
1606-237-29	3608	6/16/16	0-1	7.42	6.91	32.3	17.3	10.3	47.0	12.6	58.75	20.00	18.75	SL	3.01	0.12				3.95	30.1	28.4		
1606-237-30	3608	6/16/16	1-3	7.52	6.91	32.3	17.3	10.3	47.0	12.6	58.75	20.00	18.75	SL	2.84	0.18				5.55	26.4	20.8		
1606-237-30R	3608	6/16/16	1-3	7.49	6.89	33.8	17.6	10.3	46.1	12.3	58.75	18.75	22.50	SCL	2.73	0.17				5.17	27.3	22.1		
1606-237-31	3609	6/16/16	0-1	7.36	7.79	35.2	3.05	0.72	0.76	0.56	43.75	28.75	27.50	CL	1.99	0.25				7.76	19.9	12.1		
1606-237-32	3609	6/16/16	1-3	7.21	8.64	35.9	19.2	13.5	55.2	13.7	52.50	21.25	26.25	SCL	2.27	0.34				10.7	22.7	12.0		
1606-237-33	3592	6/16/16	0-1	7.10	5.48	33.5	22.1	20.8	23.9	5.17	52.50	23.75	23.75	SCL	1.34	0.20				6.34	13.4	7.08		
1606-237-34	3592	6/16/16	1-3	7.51	4.90	34.0	20.6	20.8	17.6	3.86	53.75	22.50	23.75	SCL	1.71	0.11				3.33	17.1	13.8		
1606-237-35	3058	6/16/16	0-1	7.48	3.20	28.1	21.0	6.70	6.48	1.74	68.75	25.00	6.25	SL	0.51	0.06				1.94	5.10	3.16		
1606-237-36	3058	6/16/16	1-3	7.72	1.32	34.8	6.74	1.58	1.48	0.73	60.00	21.25	18.75	SL	1.44	0.06				1.80	14.4	12.5		
1606-237-37	3075	6/16/16	0-1	7.39	5.50	40.8	20.9	24.1	21.7	4.57	33.75	31.25	35.00	CL	1.07	0.34				10.7	10.7	-0.01	1.00	9.95
1606-237-38	3075	6/16/16	1-3	6.48	5.01	38.5	18.9	30.8	13.8	2.77	35.00	31.25	33.75	CL	0.60	0.92				19.2	6.03	-13.2	1.59	4.43
1606-237-39	3076	6/16/16	0-1	6.92	7.44	39.9	18.8	16.0	48.7	11.4	43.75	27.50	28.75	CL	0.79	0.82				16.6	7.88	-8.68	3.75	4.13
1606-237-40	3076	6/16/16	1-3	6.60	7.77	37.6	19.8	25.3	46.7	10.3	43.75	28.75	27.50	CL	0.79	0.82				19.5	7.88	-1.6	6.22	1.66
1606-237-41	4533	6/16/16	0-1	6.55	7.31	36.0	17.9	23.0	44.8	9.92	43.75	28.75	27.50	CL	0.60	0.88				21.3	6.03	-15.3	5.12	0.90
1606-237-42	4533	6/16/16	1-3	4.37	8.99	35.2	17.3	76.4	40.0	5.84	36.25	27.50	36.25	CL	<0.010	1.14	0.812	0.122	0.402	35.5	-1.38	-36.9	3.81	-5.19
1606-237-43	4570	6/16/16	0-1	4.25	13.8	35.8	16.9	14.9	79.2	8.70	36.25	32.50	31.25	CL	0.14	1.45	0.897	0.179	0.370	45.2	1.40	-43.8	5.59	-4.19
1606-237-44	4609	6/16/16	1-3	7.08	10.3	41.9	19.6	18.8	81.8	18.7	38.75	23.75	37.50	CL	1.16	0.56	0.086	0.191	0.289	17.6	11.6	-6.07	5.97	5.61
1606-237-45	4609	6/16/16	0-1	7.21	8.24	43.3	15.3	13.8	61.8	16.2	40.00	23.75	36.25	CL	0.88	0.46	0.099	0.237	0.146	15.1	8.80	-6.28	7.40	1.40
1606-237-46	4609	6/16/16	1-3	6.73	7.46	35.4	18.2	30.7	43.5	8.80	38.75	31.25	32.50	CL	1.16	0.79	0.233	0.307	0.252	24.7	11.6	-13.2	9.59	1.98
1606-237-47	4608	6/16/16	0-1	6.07	15.9	42.8	14.7	81.2	140	10.3	41.25	26.25	32.50	CL	1.99	1.33	0.646	0.382	0.304	27.6	8.80	-18.8	5.94	2.86
1606-237-48	4608	6/16/16	1-3	6.94	10.6	31.9	16.3	24.0	87.0	19.4	42.50	26.25	31.25	CL	2.64	0.79				24.6	19.9	-21.7	11.9	7.97
1606-237-49	4567	6/16/16	0-1	7.21	8.17	40.9	16.9	18.7	57.4	13.4	31.25	32.50	36.25	CL	1.71	0.85	0.101	0.289	0.463	26.7	17.1	-9.53	9.03	8.10
1606-237-50	4567	6/16/16	1-3	6.96	9.15	41.3	17.1	23.9	68.7	15.2	30.00	32.50	37.50	CL	1.44	0.98	0.310	0.346	0.319	30.5	14.4	-16.1	10.8	3.54
1606-237-51	4605	6/16/16	0-1	6.93	8.54	40.6	16.2	21.9	63.9	14.7	30.00	32.50	37.50	CL	1.53	0.95	0.358	0.410	0.183	29.7	15.3			

OAL #	LOCATION	SAMPLE DEPTH	PH UNITS	EC MIN/CM	% SAT	CALCIUM MG/L	MAGNESIUM MG/L	SODIUM MG/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACOS	TOT S %	SULFATE %	PYR S %	ORG %	ACID POT TNU/000TN	NEUT POT TNU/000TN	AB POT TNU/000TN	PYR A POT TNU/000TN	PYR A B TNU/000TN
1811-119-0	N9 4815	0-1	6.09	9.24	37.7	17.9	51.3	85.3	14.5	51.25	23.75	25.00	SCL	0.24	0.72	0.43	0.04	0.26	22.6	2.37	-20.18	1.12	1.25
1811-119-0	N9 4815	1-3	6.16	7.24	38.3	18.8	33.8	60.5	11.8	41.25	31.25	27.50	CL	0.48	0.59	0.18	0.06	0.35	18.4	4.77	-13.7	2.00	2.77
1811-119-0	N9 4814	0-1	6.73	8.20	42.1	20.3	18.3	90.9	20.7	50.00	21.25	28.75	SCL	0.86	0.48	0.00	0.16	0.36	14.9	9.56	-5.4	4.97	4.60
1811-119-0	N9 4814	1-3	6.17	9.24	47.7	20.6	16.0	115	27.0	42.50	22.50	36.00	CL	0.56	0.53	0.00	0.17	0.58	19.7	5.57	-14.2	5.40	0.16
1811-119-0	N9 5015	0-1	6.29	8.34	34.8	19.5	33.9	79.6	15.4	52.50	26.25	21.25	SCL	0.48	0.86	0.29	0.17	0.40	26.9	4.77	-22.1	5.26	-0.48
1811-119-0	N9 5015	1-3	6.97	5.54	33.6	19.4	16.0	43.5	10.3	55.00	26.25	18.75	SL	<0.001	0.24	<0.01	0.14	0.11	7.5	-31.2	-38.6	4.50	-35.7
1811-119-0	N9 4719	0-1	7.30	7.03	43.2	21.2	23.3	58.7	12.5	50.00	23.75	26.25	SCL	3.35	0.39				12.2	33.5	21.4		
1811-119-0	N9 4719	1-3	7.11	6.69	44.2	18.4	20.0	60.5	13.8	31.25	35.00	33.75	CL	2.87	0.74				23.2	28.7	5.51		
1811-119-0	N9 4987	0-1	6.81	6.21	37.8	18.7	25.4	49.6	10.6	52.50	25.00	22.50	SCL	0.48	0.45	0.23	<0.01	0.25	14.2	4.77	-9.44	<0.01	4.77
1811-119-1	N9 4987	1-3	5.77	6.91	38.8	17.1	31.5	57.4	11.6	55.00	21.25	23.75	SCL	0.56	0.58	0.13	<0.01	0.59	18.2	5.57	-12.7	<0.01	5.57
1811-119-1	N9 4987	1-3	5.77	6.69	38.7	16.3	30.4	54.4	11.3	56.25	21.25	22.50	SCL	0.56	0.60	0.28	<0.01	0.38	18.8	5.57	-13.3	<0.01	5.57
1811-119-1	N9 4987	1-3	6.68	6.34	39.5	19.4	17.0	56.5	13.3	60.00	17.50	22.50	SCL	1.04	0.40	0.11	0.05	0.24	12.5	10.4	-2.13	1.50	8.66
1811-119-1	N9 4988	0-1	6.86	5.75	38.6	20.6	20.0	46.1	10.2	57.50	17.50	25.00	SCL	0.86	0.28				8.8	9.86	0.72		
1811-119-1	N9 5016	1-3	6.63	7.66	37.4	19.4	17.9	79.2	18.4	63.75	16.25	20.00	SL/SCL	0.96	0.48	0.14	0.06	0.28	14.9	7.97	-6.91	1.94	6.03
1811-119-1	N9 5016	1-3	6.46	8.45	40.4	19.4	22.5	88.7	19.4	55.00	21.25	23.75	SCL	1.12	0.73	0.17	0.16	0.41	22.8	11.16	-11.7	4.84	6.32
1811-119-1	N9 4960	0-1	5.93	4.77	43.0	21.2	26.1	27.9	5.74	45.00	26.25	28.75	CL/SCL	0.72	0.41	0.10	0.07	0.24	12.7	7.17	-5.51	2.09	5.07
1811-119-1	N9 4960	1-3	6.37	6.53	38.7	20.5	25.8	54.4	11.3	56.25	21.25	22.50	SCL	0.88	0.59	0.21	0.14	0.24	18.5	8.76	-9.78	4.44	4.33

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MH/CM	% SAT	CALCIUM MEQL	MAGNESIUM MEQL	SODIUM MEQL	SAR	% SAND	% SILT	% CLAY	CLASS	% CACCS	TOT S %	SULFATE 8%	PHR S %	ORG S%	ACID POT TN/1000TN	NEUT POT TN/1000TN	A-B POT TN/1000TN	PYR A POT TN/1000TN	PYR B TN/1000TN
1608-155-01	J19 4420	8/12/16	0-1	5.45	4.66	43.7	22.0	37.9	12.7	2.33	37.50	30.00	32.50	CL	<0.001	0.704	0.477	<0.01	0.233	22.0	-4.91	-25.9	<0.01	-4.91
1608-155-02	J19 4420	8/12/16	1-3	5.03	8.28	49.6	20.9	86.4	51.3	7.01	35.00	32.50	32.50	CL	<0.001	0.772	0.489	0.023	0.249	24.1	-4.91	-25.0	0.72	-6.63
1608-155-03	J21 3042	8/12/16	0-1	6.74	6.79	36.1	20.3	69.8	26.1	3.88	61.25	18.75	20.00	SL/SCL	<0.001	0.443	0.353	0.015	0.074	13.8	-0.30	-14.1	0.47	-0.77
1608-155-04	J21 3042	8/12/16	1-3	6.09	6.64	38.2	21.9	71.5	22.8	3.34	61.25	17.50	21.25	SCL	0.062	0.591	0.382	0.101	0.109	18.4	0.62	-17.8	3.16	-2.53
1608-155-05	J21 3055	8/12/16	0-1	5.93	9.68	38.3	20.1	185	19.1	1.88	56.25	21.25	22.50	SCL	<0.001	0.584	0.474	0.005	0.085	17.6	-0.30	-17.9	0.16	-0.46
1608-155-06	J21 3055	8/12/16	1-3	2.52	17.8	37.9	11.7	145	16.0	1.80	52.50	21.25	26.25	SCL	<0.001	1.36	1.224	<0.01	0.146	42.4	-15.1	-57.5	<0.01	-15.1
1608-155-07	J21 3484	8/12/16	0-1	6.84	5.33	46.1	21.2	25.3	29.5	6.12	38.75	26.25	35.00	CL	0.708	0.340	0.233	<0.01	0.108	10.6	7.08	-3.53	<0.01	7.08
1608-155-08	J21 3484	8/12/16	1-3	7.66	3.54	38.8	17.7	16.2	8.53	1.98	53.75	20.00	26.25	SCL	1.17	0.048				1.49	11.7	10.2		
1608-155-09	J21 3515	8/12/16	0-1	7.59	6.64	52.2	16.2	14.1	45.2	13.1	41.25	25.00	33.75	CL	0.615	0.183				5.71	6.15	0.44		
1608-155-10	J21 3515	8/12/16	1-3	7.63	5.79	58.1	16.2	14.1	45.2	11.6	40.00	22.50	37.50	CL	0.708	0.210	0.077	0.008	0.125	6.54	7.08	0.53	0.25	6.83
1608-155-10R	J21 3515	8/12/16	1-3	7.65	5.91	58.0	17.3	14.8	45.2	11.3	40.00	22.50	37.50	CL	0.708	0.248	0.111	<0.01	0.142	7.75	7.08	-0.68	<0.01	7.08
1608-155-11	N9 4536	8/12/16	0-1	7.50	6.98	40.3	18.4	19.4	57.0	13.1	42.50	27.50	30.00	CL	3.01	0.541				16.9	30.1	13.2		
1608-155-12	N9 4536	8/12/16	1-3	7.41	7.29	42.7	18.2	24.4	57.0	12.4	41.25	28.75	30.00	CL	2.37	0.720				22.5	23.7	1.18		
1608-155-13	N9 4568	8/12/16	0-1	6.39	6.27	45.3	19.3	35.0	38.1	7.33	36.25	31.25	32.50	CL	0.523	1.13	0.327	0.278	0.525	35.3	5.23	-30.1	8.68	-3.45
1608-155-14	N9 4568	8/12/16	1-3	7.22	7.17	43.9	19.4	26.2	55.2	11.6	35.00	31.25	33.75	CL	1.45	0.825	0.039	0.292	0.463	25.8	14.5	-11.3	9.12	5.33
1608-155-15	N9 4568	8/12/16	0-1	5.77	9.96	42.6	17.6	30.7	94.0	19.1	38.75	26.25	35.00	CL	<0.001	0.832	0.051	0.349	0.432	26.0	-2.15	-28.1	10.9	-13.1
1608-155-16	N9 4568	8/12/16	1-3	3.37	7.25	45.5	20.3	74.0	21.9	3.19	50.00	22.50	27.50	SCL	<0.001	1.73	1.159	0.109	0.466	54.2	-4.91	-59.1	3.41	-8.32
1608-155-17	N9 4568	8/12/16	0-1	4.14	6.57	44.9	20.0	70.2	24.4	3.63	41.25	26.25	32.50	CL	<0.001	0.788	0.352	0.089	0.347	24.6	-5.84	-30.5	2.78	-8.62
1608-155-18	N9 4269	8/12/16	1-3	3.66	8.47	41.5	19.2	100	34.1	4.41	41.25	26.25	32.50	CL	<0.001	1.02	0.551	0.105	0.359	31.7	-5.84	-37.5	3.28	-9.12
1608-155-19	N9 4270	8/12/16	0-1	5.79	4.31	46.4	27.5	33.4	6.00	1.09	37.50	28.75	33.75	CL	0.062	0.507	0.281	<0.01	0.250	15.8	0.62	-15.2	<0.01	0.62
1608-155-20	N9 4270	8/12/16	1-3	5.95	5.31	40.8	22.3	38.5	18.4	3.33	43.75	27.50	28.75	CL	<0.001	0.695	0.444	0.046	0.205	21.7	-0.30	-22.0	1.44	-1.74
1608-155-20R	N9 4270	8/12/16	0-1	5.97	5.54	40.4	23.8	41.3	19.7	3.46	42.50	28.75	28.75	CL	<0.001	0.684	0.442	0.024	0.198	20.8	-0.30	-21.1	0.75	-1.05
1608-155-21	J21 3527	8/12/16	1-3	6.84	6.69	35.8	19.6	18.7	51.3	11.7	46.25	26.25	27.50	SCL	0.431	0.244	0.014	0.017	0.213	7.63	4.31	-3.32	0.53	3.78
1608-155-22	J21 3527	8/12/16	0-1	6.89	6.23	35.8	18.5	16.7	44.8	10.5	46.25	25.00	28.75	SCL	0.154	0.199	0.037	<0.01	0.162	6.20	1.54	-4.66	<0.01	1.54
1608-155-23	J21 3727	8/12/16	0-1	7.26	5.82	41.5	24.4	32.7	23.4	4.39	51.25	20.00	28.75	SCL	1.72	0.250				7.81	17.2	9.41		
1608-155-24	J21 3727	8/12/16	1-3	7.33	6.40	42.7	23.9	45.7	26.2	4.44	48.75	22.50	28.75	SCL	2.09	0.299				9.35	20.9	11.6		

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MICROHM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLAS	% CaCO3	TOT S %	SULFATE %	PYR S %	ORG %	ACID POT TITR/100TH	NEUT POT TITR/100TH	AS POT TITR/100TH	PYR A POT TITR/100TH	PYR S AS TITR/100TH
1708296-01	3067-A	8/24/17	0-1	6.77	9.58	49.2	22.8	37.0	65.7	12.0	35.25	28.75	35.00	CL	0.798	0.940	0.655	0.069	0.208	29.4	7.98	-21.4	2.16	5.82
1708296-02	3067-A	8/24/17	1-3	6.98	9.06	50.0	22.1	34.4	63.1	11.9	36.75	27.50	33.75	CL	0.80	0.63	0.30	0.13	0.20	19.6	7.98	-11.6	3.94	4.04
1708296-03	3067-B	8/24/17	0-1	4.51	8.95	40.9	21.1	74.8	39.5	5.72	41.25	33.75	25.00	L	<0.01	0.87	0.60	0.03	0.24	27.2	-0.58	-27.7	0.91	-1.48
1708296-04	3067-B	8/24/17	1-3	5.39	7.32	42.7	22.4	53.9	31.8	5.15	33.75	38.75	27.50	CL	0.23	0.73	0.48	0.02	0.24	22.9	2.28	-20.6	0.69	1.68
1708296-05	3067-C	8/24/17	0-1	3.56	12.1	42.2	20.7	110.2	54.4	6.72	38.75	31.25	30.00	CL	<0.01	1.28	0.91	0.01	0.36	39.8	-1.53	-41.4	0.41	-1.93
1708296-06	3067-C	8/24/17	1-3	4.73	10.9	47.2	20.6	55.5	73.9	12.0	36.25	30.00	33.75	CL	0.80	0.89	0.65	0.02	0.23	27.9	7.98	-20.0	0.47	7.51
1708296-07	2904-C	8/24/17	0-1	6.17	11.3	42.1	20.3	55.2	76.6	12.5	41.25	31.25	27.50	CL	0.80	0.95	0.25	0.42	0.29	29.8	7.98	-21.8	13.0	-5.02
1708296-08	2904-C	8/24/17	1-3	6.56	11.5	39.5	18.9	58.4	76.6	12.2	41.25	31.25	27.50	CL	0.89	0.90	0.42	0.21	0.28	28.1	8.93	-19.2	6.56	2.37
1708296-09	3052-C	8/24/17	0-1	4.36	11.6	39.3	19.7	51.3	81.3	13.6	43.75	28.75	27.50	CL	<0.01	1.03	0.39	0.32	0.33	32.3	-0.58	-32.8	9.97	-10.5
1708296-10	3052-C	8/24/17	1-3	6.00	10.8	37.8	19.3	18.7	87.4	20.1	41.25	33.75	25.00	L	0.23	0.86	0.13	0.48	0.25	26.9	2.28	-24.6	14.9	-12.7
1708296-10R	3052-C	8/24/17	1-3	6.02	10.8	37.8	19.8	18.8	89.2	20.3	42.50	32.50	25.00	L	0.32	0.83	0.19	0.40	0.25	26.0	3.23	-22.7	12.4	-9.15
1708296-11	5020	8/25/17	0-1	2.16	12.2	38.5	30.9	110	0.13	0.01	26.25	46.25	27.50	CL	<0.01	1.57	1.00	-0.04	0.62	49.2	-6.28	-55.5	-1.37	-4.91
1708296-12	5020	8/25/17	1-3	1.94	23.9	37.4	28.0	178	0.26	0.03	26.25	46.25	27.50	CL	<0.01	2.06	1.04	0.02	1.00	64.4	-12.0	-76.4	0.66	-12.5
1708296-13	5069	8/25/17	0-1	7.07	13.4	33.4	22.0	71.2	87.4	12.8	50.00	30.00	20.00	L	0.89	0.59	0.38	0.05	0.16	18.5	8.93	-8.60	1.56	7.37
1708296-14	5069	8/25/17	1-3	5.32	13.4	40.5	20.0	40.8	108	19.6	41.25	31.25	27.50	CL	0.23	1.05	0.36	0.46	0.23	32.9	2.28	-30.6	14.3	-12.0
1708296-15	5068	8/25/17	0-1	7.12	2.69	41.2	25.2	11.2	3.81	0.89	36.25	33.75	30.00	CL	2.13	0.51	0.49	0.25	0.29	15.9	21.3	5.41	3.91	
1708296-16	5068	8/25/17	1-3	6.54	5.17	38.9	24.5	35.2	19.1	3.50	42.50	28.75	28.75	CL	1.18	1.04	0.49	0.25	0.29	32.3	11.8	-20.6	7.87	3.91
1708296-17	5045	8/25/17	0-1	4.29	9.10	36.9	24.1	90.5	32.8	4.33	41.25	31.25	27.50	CL	0.13	1.01	0.74	0.03	0.23	31.4	1.32	-30.1	1.00	0.32
1708296-18	5045	8/25/17	1-3	6.41	6.03	38.7	29.6	51.4	11.5	1.80	50.00	26.25	23.75	SCL	0.51	1.07	0.70	0.02	0.35	33.4	5.13	-28.3	0.89	4.44
1708296-19	5047	8/25/17	0-1	3.26	9.73	38.0	29.7	155	24.0	2.50	48.25	26.25	27.50	SCL	<0.01	1.19	0.85	0.00	0.33	37.2	-6.28	-43.5	0.09	-6.37
1708296-20	5047	8/25/17	1-3	5.89	6.81	41.0	23.2	81.2	18.8	2.50	41.25	28.75	30.00	CL	0.42	1.09	0.76	0.11	0.22	33.9	4.18	-29.8	3.37	0.80
1708296-20R	5047	8/25/17	1-3	5.69	6.99	40.4	23.5	82.3	19.0	2.61	42.50	28.75	28.75	CL	0.61	1.13	0.86	0.06	0.21	35.3	6.08	-29.3	2.00	4.08
1708296-21	3552	8/25/17	0-1	6.34	10.8	41.8	23.3	154	35.1	3.73	41.25	28.75	30.00	CL	0.80	1.56	1.15	0.17	0.24	48.7	7.98	-40.8	5.34	2.84
1708296-22	3552	8/25/17	1-3	5.79	12.7	40.2	20.8	157	49.2	5.21	42.50	28.75	28.75	CL	0.32	1.24	0.95	0.09	0.20	38.8	3.23	-35.5	2.91	0.32
1708296-23	3052-A	8/24/17	0-1	5.41	6.91	34.0	24.2	35.3	33.4	8.13	55.00	22.50	22.50	SCL	0.23	0.41	0.25	0.07	0.10	13.0	2.28	-10.7	2.09	0.18
1708296-24	3052-A	8/24/17	1-3	5.23	12.1	27.1	29.5	51.4	62.2	9.78	51.25	25.00	23.75	SCL	0.23	0.86	0.41	0.11	0.16	21.2	0.37	-20.8	3.34	-2.97
1708296-25	3052-B	8/24/17	0-1	7.09	8.07	50.5	25.8	27.2	46.5	9.05	33.75	28.75	37.50	CL	1.08	0.40	0.22	0.02	0.17	12.6	10.8	-1.80	0.59	10.2
1708296-26	3052-B	8/24/17	1-3	7.19	7.78	48.8	26.0	26.2	45.2	8.85	38.75	28.75	32.50	CL	3.40	0.66	0.46	0.03	0.16	14.5	21.3	8.80	0.91	12.8
1708296-27	2838	8/24/17	0-1	7.44	9.52	42.1	22.3	31.9	57.0	10.9	36.25	31.25	32.50	CL	2.13	0.46	0.45	0.03	0.16	20.0	13.7	-6.34	0.91	12.8
1708296-28	2838	8/24/17	1-3	7.10	10.9	43.3	21.8	42.9	62.2	10.9	36.25	30.00	33.75	CL	1.37	0.64	0.45	0.03	0.16	20.0	13.7	-6.34	0.91	12.8
1708296-29	2856	8/24/17	0-1	7.24	9.22	42.6	29.0	45.2	66.6	10.9	36.25	31.25	32.50	CL	1.84	0.58	0.34	0.07	0.13	16.0	18.4	0.46	2.16	13.4
1708296-30	2856	8/24/17	1-3	7.23	10.4	43.1	27.2	40.7	76.1	13.1	36.00	32.50	32.50	CL	1.56	0.54	0.34	0.07	0.13	17.0	15.6	-1.39	2.16	13.4
1708296-30R	2856	8/24/17	1-3	7.24	10.5	42.1	25.1	37.9	71.8	12.8	38.75	28.75	32.50	CL	1.75	0.51	0.51	0.07	0.13	16.0	17.5	1.53	2.16	13.4
1708296-31	5021	8/25/17	0-1	7.10	3.32	43.6	24.5	24.2	1.67	0.34	28.75	33.75	37.50	CL	1.84	0.23	0.45	0.03	0.16	20.0	13.7	-6.34	0.91	12.8
1708296-32	5021	8/25/17	1-3	7.29	4.15	41.5	24.8	33.7	3.90	0.72	28.75	37.50	33.75	CL	1.84	0.32	0.45	0.03	0.16	14.5	21.3	8.80	0.91	12.8
1708296-33	2832	8/24/17	0-1	7.29	12.9	47.1	20.4	30.9	83.5	16.5	28.75	35.00	36.25	CL	1.37	0.71	0.39	0.13	0.19	22.2	13.7	-8.51	3.94	9.74
1708296-34	2832	8/24/17	1-3	7.41	10.2	46.3	21.3	25.3	65.7	13.6	36.25	31.25	32.50	CL	1.65	0.53	0.29	0.05	0.19	16.7	16.5	-0.14	1.56	15.0
1708296-35	2907-A	8/23/17	0-1	6.00	15.7	37.7	20.8	66.2	86.6	13.1	43.75	28.75	27.50	CL	<0.01	1.01	0.58	0.04	0.38	31.4	-10.1	-41.5	1.31	-11.4
1708296-36	2907-A	8/23/17	1-3	6.06	15.5	43.8	20.1	47.9	84.4	16.2	36.25	31.25	32.50	CL	0.51	1.02	0.35	0.29	0.38	31.8	5.13	-26.6	9.03	-3.90
1708296-37	2907-D	8/23/17	0-1	5.69	16.1	31.9	24.1	27.7	109	21.4	51.25	26.25	22.50	SCL	0.51	1.41	0.80	0.27	0.33	44.0	5.13	-38.8	8.56	-3.43
1708296-38	2907-D	8/23/17	1-3	6.64	14.9	31.5	33.7	11.5	100	13.1	63.75	20.00	16.25	SL	0.70	1.31	0.13	0.84	0.34	40.9	7.03	-33.9	26.3	-19.2
1708296-39	2910-A	8/23/17	0-1	6.89	15.4	44.7	23.1	28.9	120	23.6	30.00	33.75	36.25	CL	0.61	0.53	0.26	0.04	0.23	16.7	6.08	-10.6	1.37	4.70
1708296-40	2910-A	8/23/17	1-3	7.17	14.2	41.1	18.7	16.0	103	24.3	35.00	32.50	32.50	CL	0.80	0.40	0.40	0.03	0.19	12.6	7.98	-4.81	5.78	2.20
1708296-40R	2910-A	8/23/17	1-3	7.19	14.3	40.5	23.0	19.5	119	25.8	33.75	33.75	32.50	CL	0.81	0.40	0.40	0.14	0.16	12.6	6.08	-6.48	3.28	2.80
1708296-41	3023-B	8/23/17	0-1	4.55	22.1	36.1	22.7	107.0	118	14.6	43.75	30.00	26.25	L	0.23	1.23	0.67	0.25	0.30	38.3	2.28	-36.1	7.87	-5.60
1708296-42	3023-B	8/23/17	1-3	6.70	14.8	30.0	31.3	14.6	103	21.4	58.75	23.75	17.50	SL	0.89	1.21	0.58	0.28	0.35	37.7	8.9			

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QAL #	LOCATION	SAMPLE DEPTH	PH UNITS	EC MH/CM	% SAT	CALCIUM MG/L	MAGNESIUM MG/L	SODIUM MG/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE %	PYR S %	ORG %	ACID POT TM/100TN	NEUT POT TM/100TN	AS POT TM/100TN	PYR A POT TM/100TN	PYR A-B TM/100TN
1710-194-01	4721	10/18/17	0-1	6.16	8.33	39.4	33.0	59.2	11.4	36.25	30.00	33.75	CL	0.27	0.55	0.26	0.05	0.22	17.18	2.71	-14.5	1.50	1.21
1710-194-02	4721	10/18/17	1-3	6.35	11.0	42.2	46.0	99.2	16.9	45.00	25.00	30.00	CL/SCL	0.17	0.86	0.51	0.10	0.25	26.7	1.71	-25.0	3.09	-1.38
1710-194-03	4532	10/18/17	0-1	4.28	15.1	38.7	249	60.5	5.20	40.00	28.75	31.25	CL	<0.010	1.70	1.22	0.04	0.44	53.0	-5.26	-58.2	1.16	-6.42
1710-194-04	4532	10/18/17	1-3	4.45	14.7	41.3	20.7	234	65.2	5.79	42.50	28.75	CL	<0.010	2.05	1.49	0.08	0.48	63.9	-4.27	-68.2	2.62	-6.89
1710-194-05	5043	10/18/17	0-1	6.72	11.5	38.2	32.1	104	20.4	50.00	23.75	26.25	SCL	0.37	0.77	0.30	0.08	0.40	24.2	3.70	-20.5	2.34	1.36
1710-194-06	5043	10/18/17	1-3	7.13	8.90	39.0	25.4	73.9	15.6	51.25	23.75	25.00	SCL	0.27	0.76	0.35	0.20	0.21	23.9	2.71	-21.2	6.31	-3.61
1710-194-07	5042	10/18/17	0-1	6.06	9.91	39.3	38.5	84.8	15.5	48.75	23.75	27.50	SCL	0.27	0.96	0.48	0.15	0.33	29.8	2.71	-27.1	4.78	-2.07
1710-194-08	5042	10/18/17	1-3	5.32	9.83	45.0	20.8	88.3	19.6	57.50	17.50	25.00	SCL	<0.010	1.00	0.39	0.31	0.30	31.2	-0.28	-31.5	9.65	-9.93
1710-194-09	4753	10/18/17	0-1	5.93	7.59	39.4	60.7	38.3	5.94	46.25	25.00	28.75	SCL	0.27	1.06	0.68	0.09	0.30	33.1	2.71	-30.4	2.72	-0.01
1710-194-10	4753	10/18/17	1-3	7.00	7.45	42.0	57.8	39.7	6.27	46.25	26.25	27.50	SCL	0.87	1.03	0.66	0.13	0.22	32.2	8.68	-23.5	2.12	6.66
1710-194-10R	4753	10/18/17	1-3	7.02	7.41	42.1	55.5	38.3	6.16	45.00	26.25	28.75	CL/SCL	0.87	1.01	0.66	0.13	0.22	31.6	8.68	-22.9	4.00	4.68
1710-194-11	4688	10/19/17	0-1	6.72	8.63	43.2	35.5	64.8	12.2	37.50	30.00	32.50	CL	0.97	0.95	0.64	0.11	0.20	29.8	8.68	-20.1	3.34	6.33
1710-194-12	4688	10/19/17	1-3	6.70	8.35	41.0	34.6	60.9	11.6	37.50	31.25	31.25	CL	0.67	0.79	0.46	0.15	0.19	24.7	6.89	-18.0	4.65	2.03
1710-194-13	4778	10/19/17	0-1	4.37	8.90	44.2	19.9	80.0	6.59	41.25	27.50	31.25	CL	<0.010	1.22	0.81	0.02	0.39	36.2	-3.27	-41.4	0.72	-3.99
1710-194-14	4778	10/19/17	1-3	4.63	8.37	43.7	22.2	98.7	4.43	51.25	22.50	26.25	SCL	<0.010	1.65	1.22	0.06	0.37	51.6	5.16	-51.9	1.91	-2.19
1710-194-15	4716	10/19/17	0-1	5.13	7.63	37.9	19.5	43.1	7.09	41.25	28.75	30.00	CL	<0.010	1.65	0.64	0.57	0.44	51.4	-3.27	-54.7	17.7	-21.0
1710-194-16	4716	10/19/17	1-3	5.18	8.38	37.5	20.0	64.2	7.70	42.50	27.50	30.00	CL	<0.010	1.63	0.74	0.45	0.44	51.0	-5.26	-56.2	14.1	-19.3
1710-194-17	4717	10/19/17	0-1	6.24	6.85	37.5	24.4	44.8	8.63	47.50	26.25	26.25	SCL	0.87	0.98	0.29	0.35	30.6	8.68	-21.9	10.8	-2.16	
1710-194-18	4717	10/19/17	1-3	5.16	6.91	38.9	25.1	48.3	9.69	46.25	26.25	27.50	SCL	0.67	1.12	0.39	0.35	35.1	6.89	-28.4	10.8	-4.09	
1710-194-19	4718	10/19/17	0-1	5.74	8.19	36.2	20.8	54.1	8.24	47.50	26.25	26.25	SCL	0.17	0.90	0.33	0.25	34.3	28.2	-26.5	7.65	-5.94	
1710-194-20	4718	10/19/17	1-3	3.03	10.7	37.2	23.4	169	2.15	51.25	25.00	23.75	SCL	<0.010	1.77	1.18	0.15	0.44	55.3	-10.2	-65.5	4.75	-14.9
1710-194-20R	4718	10/19/17	1-3	3.03	10.8	37.3	22.3	166	2.08	51.25	23.75	25.00	SCL	<0.010	1.82	1.24	0.15	0.44	57.0	-10.2	-67.2	4.72	-14.9
1710-194-21	4689	10/18/17	0-1	6.49	9.30	40.1	22.4	81.8	14.6	38.75	28.75	32.50	CL	0.17	0.68	0.36	0.08	0.24	21.3	1.71	-19.6	2.50	-0.79
1710-194-22	4689	10/18/17	1-3	6.19	9.47	41.2	23.5	58.8	77.0	35.00	31.25	33.75	CL	0.07	0.92	0.58	0.08	0.25	28.6	0.71	-27.9	2.56	-1.85
1710-194-23	4723	10/18/17	0-1	8.10	1.35	43.3	8.23	3.76	1.54	27.50	36.25	36.25	CL	17.2	0.04				1.26	172	171		
1710-194-24	4723	10/18/17	1-3	7.98	2.45	42.0	8.03	6.18	1.69	28.75	36.25	35.00	CL	16.5	0.06				1.79	165	163		
1710-194-25	4754	10/18/17	0-1	3.18	13.4	43.5	21.9	185	63.1	6.20	38.75	28.75	CL	<0.010	1.63	1.17	<0.010	0.48	50.8	-8.25	-59.0	<0.01	-8.25
1710-194-26	4754	10/18/17	1-3	3.40	11.8	46.9	20.4	145	60.5	6.85	37.50	30.00	CL	<0.010	1.69	1.04	0.07	0.58	52.9	-9.25	-62.1	2.22	-11.5
1710-194-27	4782	10/18/17	0-1	5.88	5.83	41.2	47.4	23.3	3.98	47.50	23.75	28.75	SCL	<0.010	0.99	0.62	0.06	0.32	31.0	-0.28	-31.3	1.84	-2.12
1710-194-28	4782	10/18/17	1-3	6.43	4.14	38.3	27.6	29.8	8.22	55.00	20.00	25.00	SCL	0.27	0.48	0.32	0.06	0.11	15.0	2.71	-12.3	1.78	0.92
1710-194-29	4722	10/18/17	0-1	6.32	10.2	41.2	19.3	46.6	78.3	40.00	27.50	32.50	CL	0.47	0.91	0.44	0.15	0.32	28.3	4.70	-23.6	4.75	-0.05
1710-194-30	4722	10/18/17	1-3	4.66	13.0	40.3	23.2	69.4	132	36.25	28.75	35.00	CL	<0.010	1.50	0.97	0.09	0.45	47.0	-2.28	-28.7	2.84	-5.12
1710-194-30R	4722	10/18/17	1-3	4.66	12.1	42.1	18.0	51.7	17.2	36.25	30.00	33.75	CL	<0.010	1.55	1.05	0.03	0.46	48.3	-3.27	-51.6	1.06	-4.33
1710-194-31	4651	10/18/17	0-1	6.99	8.98	39.9	20.5	73.9	14.5	37.50	28.75	33.75	CL	0.87	0.81	0.52	0.07	0.23	25.4	8.66	-16.7	2.16	6.53
1710-194-32	4651	10/19/17	1-3	7.12	8.69	40.6	31.4	69.2	13.5	36.25	31.25	32.50	CL	1.07	0.75	0.50	0.05	0.20	23.4	10.7	-12.8	1.66	9.02

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC DMH/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	GLASS	% CAC03	TOT %	SULFATE %	PVR %	ORG %	ACID POT THIN/MTN	NEUT POT THIN/MTN	AS POT THIN/MTN	PRA POT THIN/MTN	PYR AS THIN/MTN
1710-195-01	5066	10/18/17	0-1	6.52	8.67	38.0	20.1	55.3	56.1	9.14	47.50	22.50	30.00	SCL	1.07	0.76	0.45	0.08	0.24	23.9	10.7	-13.2	2.41	8.27
1710-195-02	5066	10/18/17	1-3	7.12	9.74	40.9	18.1	18.8	90.0	21.0	45.00	22.50	32.50	CL/SCL	0.77	0.71	0.00	0.31	0.42	22.3	7.69	-14.6	2.41	8.27
1710-195-03	4831	10/18/17	0-1	6.83	9.21	40.1	19.6	15.4	85.7	20.5	50.00	25.00	25.00	SCL	<0.010	0.71	0.09	0.17	0.45	22.1	-3.27	-25.4	5.373	-1.87
1710-195-04	4531	10/18/17	1-3	6.80	8.82	40.6	19.8	11.8	82.6	20.8	56.25	21.25	22.50	SCL	0.07	0.76	0.09	0.23	0.44	23.8	0.71	-23.1	7.3	-6.80
1710-195-05	4652	10/18/17	0-1	6.81	7.00	38.8	21.4	28.7	47.4	9.47	45.00	23.75	31.25	CL/SCL	<0.010	0.47	0.28	0.04	0.16	14.6	-0.28	-14.9	1.12	-1.40
1710-195-06	4652	10/18/17	1-3	5.13	12.1	42.3	18.9	49.0	104	17.8	45.00	23.75	31.25	CL/SCL	<0.010	1.19	0.83	0.04	0.32	37.1	-4.27	-41.4	1.31	-5.89
1710-195-07	5064	10/18/17	0-1	7.23	6.63	39.6	19.7	24.8	45.5	8.88	48.25	25.00	28.75	SCL	0.47	0.57	0.16	0.19	0.21	17.7	4.70	-13.0	5.97	-1.27
1710-195-08	5064	10/18/17	1-3	7.17	6.85	22.3	20.1	31.6	45.7	8.98	48.75	23.75	27.50	SCL	0.27	0.67	0.31	0.12	0.25	21.0	2.71	-18.3	3.62	-0.92
1710-195-09	5065	10/18/17	0-1	6.55	5.98	34.8	20.8	42.0	27.6	4.92	57.50	21.25	21.25	SCL	1.07	0.54	0.34	0.06	0.14	16.9	10.7	-6.24	1.87	8.80
1710-195-10	5065	10/18/17	1-3	7.02	3.44	33.1	23.5	20.8	5.74	1.22	55.00	23.75	21.25	SCL	0.97	0.50	0.08	0.26	0.15	15.5	9.68	-5.79	8.12	1.55
1710-195-10R	5065	10/18/17	1-3	7.03	3.49	32.6	23.5	20.9	5.79	1.23	56.25	22.50	21.25	SCL	0.87	0.50	0.23	0.11	0.16	15.7	8.68	-9.97	3.47	5.21
1710-195-11	4931	10/18/17	0-1	6.66	7.81	38.4	20.4	37.0	54.8	10.2	41.25	25.00	33.75	CL	0.37	1.20	0.72	0.17	0.31	37.3	3.70	-33.6	5.31	-1.61
1710-195-12	4931	10/18/17	1-3	7.13	10.2	35.6	18.7	26.2	91.8	19.4	40.00	26.25	33.75	CL	0.67	0.80	0.37	0.22	0.21	24.9	6.69	-18.2	6.84	-0.16
1710-195-13	4682	10/18/17	0-1	6.59	6.93	38.4	21.3	26.6	48.3	9.87	43.75	26.25	30.00	CL	0.57	1.24	0.04	0.75	0.45	38.7	5.69	-33.0	23.5	-17.8
1710-195-14	4682	10/18/17	1-3	7.04	8.94	41.8	19.6	21.0	78.3	17.4	36.25	31.25	32.50	CL	0.67	0.76	0.13	0.30	0.33	23.9	6.69	-17.2	9.31	-2.62
1710-195-15	4683	10/18/17	0-1	7.33	9.71	40.0	18.9	39.6	80.0	14.8	36.25	30.00	33.75	CL	1.37	1.00	0.41	0.26	0.33	31.2	13.7	-17.5	8.25	5.41
1710-195-16	4683	10/18/17	1-3	7.47	10.9	41.8	18.6	34.6	95.3	18.5	37.50	27.50	35.00	CL	1.86	0.86	0.38	0.18	0.31	28.9	18.6	-8.25	5.50	13.1
1710-195-17	4781	10/18/17	0-1	6.02	8.46	39.9	19.6	61.5	51.3	8.06	42.50	23.75	33.75	CL	0.07	1.04	0.64	0.13	0.27	32.3	0.71	-31.6	3.91	-3.19
1710-195-18	4781	10/18/17	1-3	4.88	8.95	37.6	20.3	88.0	43.5	5.91	50.00	21.25	28.75	SCL	<0.010	1.15	0.72	0.01	0.43	36.0	-3.27	-39.3	0.28	-3.55
1710-195-19	4959	10/18/17	0-1	6.75	8.73	37.9	18.7	36.4	67.0	12.8	43.75	25.00	31.25	CL	0.07	0.53	0.24	0.11	0.17	16.4	0.71	-15.7	3.53	-2.82
1710-195-20	4959	10/18/17	1-3	7.00	9.84	38.0	18.7	38.1	81.3	15.3	41.25	26.25	32.50	CL	0.17	0.64	0.28	0.15	0.21	18.9	1.71	-18.2	4.72	-3.01
1710-195-20R	4959	10/18/17	1-3	7.00	9.94	37.5	18.6	37.7	82.6	15.6	41.25	26.25	32.50	CL	0.17	0.70	0.33	0.14	0.23	22.0	1.71	-20.3	4.44	-2.73
1710-195-21	4748	10/19/17	0-1	6.56	7.32	37.5	22.6	52.3	39.1	6.38	37.50	27.50	35.00	CL	0.77	1.42	0.74	0.26	0.42	44.2	7.69	-36.6	8.03	-0.34
1710-195-22	4748	10/19/17	1-3	6.8	7.15	41.3	22.8	44.7	39.6	6.32	36.25	27.50	36.25	CL	1.37	1.31	0.64	0.32	0.35	41.0	13.7	-27.3	10.0	3.66
1710-195-23	4749	10/19/17	0-1	7.46	6.54	42.5	19.0	20.9	48.3	10.8	33.75	28.75	37.50	CL	5.79	0.32	0.17	0.20	0.10	10.0	57.9	47.9	6.09	0.60
1710-195-24	4749	10/19/17	1-3	7.34	10.0	45.1	18.3	23.1	90.9	20.0	33.75	28.75	37.50	CL	0.67	0.47	0.17	0.20	0.10	14.6	6.69	-7.89	6.09	0.60
1710-195-25	4750	10/19/17	0-1	7.14	8.41	44.2	19.5	31.7	66.1	13.1	31.25	30.00	38.75	CL	1.27	0.74	0.40	0.13	0.22	23.2	12.7	-10.5	4.12	8.54
1710-195-26	4750	10/19/17	1-3	7.82	10.7	43.4	17.9	22.0	99.2	22.2	30.00	33.75	36.25	CL	1.07	0.42	0.19	<0.010	0.23	13.0	10.7	-2.35	<0.01	10.7
1710-195-27	4751	10/19/17	0-1	6.09	13.6	45.0	18.5	85.6	105	14.5	33.75	28.75	37.50	CL	<0.010	1.46	0.97	0.11	0.38	45.7	-1.28	-47.0	3.47	-4.75
1710-195-28	4751	10/19/17	1-3	6.87	11.4	54.2	18.3	30.9	102	20.6	11.25	35.00	53.75	C	<0.010	0.82	0.20	0.16	0.47	25.7	-2.28	-28.0	4.84	-7.12
1710-195-29	4752	10/19/17	0-1	7.30	8.37	42.0	19.1	23.4	67.0	14.2	30.00	30.00	40.00	CL/C	1.66	0.68	0.29	0.08	0.31	21.3	16.6	-4.69	2.56	14.1
1710-195-30	4752	10/19/17	1-3	7.36	7.93	44.0	19.0	22.5	63.5	13.9	36.25	26.25	37.50	CL	2.06	0.68	0.30	0.11	0.27	21.2	20.6	-0.58	3.44	17.2
1710-195-30R	4752	10/19/17	1-3	7.36	8.14	41.7	19.2	22.9	65.7	14.3	36.25	26.25	37.50	CL	2.06	0.69	0.36	0.01	0.31	21.4	20.6	-0.81	0.37	20.3
1710-195-31	Overland	10/19/17		7.28	1.12	39.3	8.43	2.63	0.92	0.39	52.50	20.00	27.50	SCL	0.47	0.06	0.06			1.89	4.70	2.81	0.37	20.3
1710-195-32	1st Well TS	10/19/17		7.13	1.73	33.9	13.4	4.25	1.51	0.51	65.00	15.00	20.00	SUSCL	0.27	0.07				2.14	2.71	0.56		

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QAL #	LOCATION	SAMPLE DEPTH	PH UNITS	EC MIN/MCM	% SAT	CALCIUM MEQL	MAGNESIUM MEQL	SODIUM MEQL	BAR	% SAND	% SILT	% CLAY	CLASS	% CaCO3	TOT S %	SULFATE %	PVR %	ORIG %	ACID POT THYMOH	NEUT POT THYMOH	AS POT THYMOH	PVA POT THYMOH	PVB AS THYMOH
1806-195-01	3-2391	6/19/18	0-1	6.89	35.5	30.1	11.3	4.00	0.88	51.25	26.25	22.50	SCL	1.26	0.20	0.20	0.58	0.21	6.10	12.6	6.53		
1806-195-02	3-2391	6/19/18	1-3	6.28	38.4	27.9	7.18	36.8	5.20	41.25	30.00	28.75	CL	0.27	0.82	0.82	0.04	0.21	25.7	2.72	-22.9	1.10	1.62
1806-195-03	3-1009	6/19/18	0-1	6.70	37.3	19.2	9.0	3.27	0.87	42.50	30.00	27.50	CL	0.57	0.20	0.20	0.04	0.14	6.22	5.70	-0.53	0.54	5.15
1806-195-04	3-1009	6/19/18	1-3	5.81	34.5	35.9	16.5	2.15	0.46	38.75	32.50	27.50	CL	0.74	0.43	0.43	0.18	0.07	13.3	0.74	-12.5	2.09	-1.36
1806-195-05	3-2388	6/19/18	0-1	7.03	33.4	7.98	2.8	2.55	1.10	50.00	27.50	22.50	SCL	0.52	0.15	0.15	0.31	0.01	4.62	5.20	-6.91	0.58	5.85
1806-195-06	3-2388	6/19/18	1-3	7.12	1.64	37.8	9.83	4.2	3.38	43.75	28.75	27.50	CL	0.82	0.42	0.42	0.61	0.01	13.1	6.19	-33.7	0.40	1.33
1806-195-07	3-2390	6/19/18	0-1	6.25	8.95	30.0	89.7	29.7	3.84	41.25	28.75	30.00	CL	0.17	0.81	0.81	0.74	0.04	20.3	3.23	-33.7	1.19	-4.42
1806-195-08	3-2390	6/19/18	1-3	6.12	12.2	38.6	148	33.2	3.62	40.00	28.75	31.25	CL	<0.01	0.95	0.95	0.67	0.02	29.7	-13.1	-42.8	0.66	-13.76
1806-195-09	3-2387	6/19/18	0-1	4.62	8.55	38.6	107	17.7	2.16	37.50	30.00	32.50	CL	<0.01	0.92	0.92	0.65	0.01	28.8	-5.21	-34.1	0.40	-3.61
1806-195-10	3-2387	6/19/18	1-3	4.85	11.3	38.6	141	26.8	2.99	36.25	31.25	32.50	CL	<0.01	0.92	0.92	0.64	0.02	28.8	-5.21	-34.0	0.59	-3.80
1806-195-11	3-2393	6/19/18	0-1	4.89	10.7	35.9	135	31.5	3.55	36.25	31.25	32.50	CL	<0.01	0.92	0.92	0.64	0.02	28.8	-5.21	-34.0	0.59	-3.80
1806-195-12	3-2393	6/19/18	1-3	6.26	3.58	34.2	21.9	2.72	0.57	46.25	27.50	26.25	SCL	0.17	0.36	0.36	0.18	0.00	11.3	1.73	-9.54	0.07	1.66
1806-195-13	3-2383	6/19/18	0-1	5.70	34.4	22.8	21.8	2.03	0.43	47.50	27.50	23.00	SCL	<0.01	0.42	0.42	0.26	0.01	13.3	-4.22	-17.5	0.21	-4.43
1806-195-14	4496	6/19/18	0-1	6.51	10.8	20.3	28.1	73.9	15.0	40.00	27.50	32.50	CL	0.87	1.14	1.14	1.05	0.32	35.6	9.66	-25.9	9.87	-0.21
1806-195-15	4496	6/19/18	1-3	5.09	13.9	35.8	18.0	11.8	8.72	38.75	27.50	33.75	CL	<0.01	1.81	1.81	1.05	0.36	56.6	-3.23	-58.8	11.3	-14.5
1806-195-16	4410	6/19/18	0-1	6.29	7.68	32.3	19.0	26.2	9.52	50.00	27.50	22.50	SCL	0.17	0.72	0.72	0.31	0.24	22.3	1.73	-20.6	7.35	-5.62
1806-195-17	4410	6/19/18	1-3	6.37	7.66	41.4	23.3	23.7	9.50	52.50	21.25	26.25	SCL	0.87	0.83	0.83	0.28	0.12	21.6	5.70	-15.9	3.84	1.86
1806-195-18	4495	6/19/18	0-1	6.49	10.6	34.4	21.5	44.7	79.5	38.75	28.75	32.50	CL	0.87	0.83	0.83	0.36	0.16	25.8	8.67	-17.2	5.00	3.87
1806-195-19	4495	6/19/18	1-3	6.63	11.5	32.2	17.7	35.4	15.9	35.00	31.25	33.75	CL	1.16	0.82	0.82	0.32	0.26	25.8	11.6	-14.1	8.09	3.58
1806-195-20	4534	6/19/18	0-1	6.94	4.85	38.1	22.5	18.4	6.05	68.25	22.50	11.25	SL	2.95	0.12	0.12	0.36	0.26	3.65	29.5	25.8		
1806-195-21	4534	6/19/18	1-3	6.75	5.58	40.8	19.4	22.7	4.87	50.00	27.50	22.50	SCL	7.76	0.22	0.22	0.31	0.24	6.93	77.6	70.8		
1806-195-22	4776a	6/19/18	0-1	5.33	9.02	22.6	121	12.0	1.42	56.25	21.25	22.50	SCL	<0.01	0.39	0.39	0.12	0.05	12.2	-0.25	-12.4	0.83	-1.08
1806-195-23	4776a	6/19/18	1-3	5.43	7.24	32.0	21.6	80.0	1.33	56.25	21.25	22.50	SCL	<0.01	0.24	0.24	0.12	0.05	7.43	-1.25	-8.68	1.70	-2.95
1806-195-24	4776a	6/19/18	0-1	3.81	7.97	36.3	19.7	100	0.37	30.00	33.75	36.25	CL	<0.01	1.18	1.18	0.80	0.00	37.0	-6.20	-43.2	0.00	-8.20
1806-195-25	4571	6/19/18	1-3	4.33	8.34	40.8	19.2	15.6	2.03	36.25	31.25	32.50	CL	<0.01	1.23	1.23	0.59	0.28	38.5	-3.23	-41.8	8.89	-12.12
1806-195-26	4571	6/19/18	0-1	6.42	9.16	40.3	21.8	58.3	11.6	38.75	30.00	31.25	CL	0.97	0.69	0.69	0.19	0.33	21.4	9.66	-11.8	10.3	-0.69
1806-195-27	4411	6/19/18	1-3	6.52	10.2	40.3	18.1	29.3	70.9	41.25	32.50	36.25	CL	0.67	1.11	1.11	0.56	0.35	34.6	6.69	-27.9	11.0	-4.32
1806-195-28	4411	6/19/18	0-1	6.49	11.0	38.5	20.9	38.5	76.1	40.00	31.25	33.75	CL	0.17	0.74	0.74	0.31	0.18	23.1	1.73	-21.4	4.93	-3.20
1806-195-29	4433a	6/19/18	1-3	6.55	7.93	30.1	17.4	19.6	11.8	50.00	28.75	21.25	L	0.47	0.65	0.65	0.18	0.27	20.2	4.70	-15.5	8.35	-3.64
1806-195-30	4433a	6/19/18	0-1	4.64	12.5	35.8	22.1	105	7.25	41.25	30.00	28.75	CL	<0.01	0.82	0.82	0.56	0.05	25.5	-4.22	-29.7	1.41	-5.83
1806-195-31	4433a	6/19/18	1-3	4.36	9.66	33.0	20.1	109	2.67	45.00	27.50	27.50	CL	<0.01	0.75	0.75	0.88	0.05	23.5	-2.24	-25.8	1.57	-3.81
1806-195-32	4433b	6/19/18	0-1	4.31	9.18	34.7	19.3	102	2.80	46.25	27.50	28.75	SCL	<0.01	0.76	0.76	0.60	0.02	23.8	-2.24	-26.0	0.77	-3.01
1806-195-33	4433b	6/19/18	1-3	3.80	12.1	37.7	21.2	164	15.9	41.25	30.00	28.75	CL	<0.01	0.80	0.80	0.57	0.00	25.1	-3.23	-28.3	0.77	-3.30
1806-195-34	5092	6/19/18	0-1	4.02	8.93	35.5	22.3	122	1.32	37.50	31.25	31.25	CL	<0.01	0.79	0.79	0.50	0.03	24.8	-5.21	-30.0	0.91	-6.12
1806-195-35	5092	6/19/18	1-3	6.05	6.00	38.9	24.7	40.3	3.11	36.25	31.25	32.50	CL	1.16	0.69	0.69	0.30	0.10	21.4	1.95	-9.79	3.06	8.88
1806-195-36	5114	6/19/18	0-1	6.18	5.79	37.4	24.5	40.4	2.80	36.25	30.00	33.75	CL	1.95	0.78	0.78	0.36	0.14	24.3	19.5	-4.74	4.43	15.15
1806-195-37	5093	6/19/18	0-1	6.13	12.8	38.7	20.0	75.4	10.5	46.25	25.00	28.75	SCL	0.97	1.00	1.00	0.38	0.16	31.1	6.69	-24.5	5.00	1.88
1806-195-38	5093	6/19/18	1-3	6.04	11.7	18.7	82.0	56.5	7.97	42.50	26.25	31.25	CL	0.57	1.01	1.01	0.41	0.16	31.4	5.70	-25.7	5.06	0.63
1806-195-39	5093	6/19/18	0-1	6.06	9.71	34.6	27.6	79.4	4.75	41.25	30.00	28.75	CL	0.67	1.11	1.11	0.70	0.02	34.6	6.69	-28.0	0.50	6.18
1806-195-40	5093	6/19/18	1-3	6.18	7.07	29.5	26.6	13.8	2.09	53.75	25.00	21.25	SCL	1.66	0.55	0.55	0.28	0.04	17.2	16.5	-0.56	1.21	15.4

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MH/CM	% SAT	CALCIUM INDEX	MAGNESIUM INDEX	SODIUM INDEX	SAR	% SAND	% SILT	% CLAY	CLASS	% CALCS	TOT %	SULFATE %	PTF %	ORG %	ACID POT T/1000TH	NEUT POT T/1000TH	AS POT T/1000TH	PYR A POT T/1000TH	PYR B POT T/1000TH
1808-214-01	4459	8/15/18	0-1	5.70	10.8	46.4	19.9	19.8	97.0	21.8	37.5	30.0	32.5	CL	0.073	0.640	0.201	0.188	0.251	20.0	0.73	-19.2	5.88	-5.15
1808-214-02	4459	8/15/18	1-3	5.69	10.1	45.5	19.3	25.8	83.1	17.5	36.3	30.0	33.8	CL	0.091	0.558	0.042	0.091	0.425	17.4	5.69	-11.7	2.85	2.84
1808-214-03	4460	8/15/18	0-1	5.87	9.22	42.7	19.9	37.2	68.7	12.9	36.3	33.8	30.0	CL	1.015	0.764	0.320	0.097	0.347	23.9	10.2	-13.7	3.02	7.13
1808-214-04	4460	8/15/18	1-3	5.89	7.69	43.1	19.8	41.1	48.7	8.8	35.0	33.8	31.3	CL	1.336	0.703	0.226	0.235	0.242	21.9	13.4	-8.58	7.33	6.04
1808-214-05	4461	8/15/18	0-1	5.99	9.30	48.8	19.3	28.1	73.5	16.3	28.8	35.0	36.3	CL	-0.01	0.640	0.198	0.145	0.290	20.0	-3.23	-23.2	4.54	-7.77
1808-214-06	4461	8/15/18	1-3	6.00	12.9	47.2	23.0	42.5	108	18.9	27.5	35.0	37.5	CL	0.039	0.764	0.110	0.186	0.251	23.9	-0.26	-24.1	4.38	-4.84
1808-214-07	4462	8/15/18	0-1	5.08	12.6	49.1	20.3	13.2	114	28.0	28.8	33.8	37.5	CL	1.039	0.547	0.110	0.186	0.251	17.1	10.4	-6.71	5.81	4.58
1808-214-08	4462	8/15/18	1-3	6.14	11.2	48.8	19.1	12.3	98.6	25.1	28.8	33.8	37.5	CL	0.767	0.445	0.088	0.122	0.235	13.9	7.67	-6.23	3.81	3.87
1808-214-09	4463	8/15/18	0-1	6.11	9.82	40.5	20.9	24.8	76.1	15.9	36.3	31.3	32.5	CL	1.707	0.687	0.282	0.147	0.238	20.8	17.1	-3.77	4.69	12.5
1808-214-10	4463	8/15/18	1-3	6.13	11.1	45.0	23.2	22.6	96.6	18.7	33.0	32.5	32.5	CL	1.065	0.590	0.163	0.165	0.242	18.4	10.6	-7.77	5.78	4.87
1808-214-11	4463	8/15/18	1-3	6.15	10.9	44.5	22.8	22.0	87.0	18.4	33.8	32.5	33.8	CL	1.164	0.636	0.329	0.112	0.195	19.9	11.6	-8.23	3.49	8.15
1808-214-12	4464	8/15/18	0-1	5.98	10.9	41.8	25.5	70.6	56.7	8.03	33.8	36.3	30.0	CL	1.164	0.836	0.328	0.404	0.105	26.1	11.6	-14.5	12.8	-0.97
1808-214-13	4464	8/15/18	1-3	6.06	11.6	42.0	22.4	78.0	63.5	8.97	33.8	36.3	30.0	CL	0.841	0.845	0.355	0.251	0.238	26.4	8.41	-18.0	7.85	0.85
1808-214-14	4497	8/15/18	0-1	6.42	10.6	51.7	12.1	6.59	97.4	31.9	20.0	37.5	42.5	C	0.147	0.431	0.087	0.149	0.195	13.5	1.47	-12.0	4.65	-3.19
1808-214-15	4497	8/15/18	1-3	6.15	9.03	45.1	15.6	11.5	76.8	20.8	32.5	31.3	36.3	CL	0.272	0.654	0.220	0.129	0.305	20.4	2.72	-17.7	4.02	-1.30
1808-214-16	4498	8/15/18	0-1	6.20	10.9	46.5	19.4	16.5	93.5	22.1	31.3	31.3	37.5	CL	0.371	0.703	0.091	0.350	0.261	21.9	3.71	-18.2	10.9	-7.23
1808-214-17	4498	8/15/18	1-3	6.34	9.41	42.5	12.6	6.3	85.3	27.7	36.3	30.0	33.8	CL	1.065	0.474	0.097	0.117	0.260	14.8	10.6	-4.15	3.65	7.00
1808-214-18	4499	8/15/18	0-1	5.09	5.54	38.2	20.4	33.1	24.7	4.78	60.0	23.8	16.3	SL	<0.01	0.776	0.340	0.063	0.373	24.3	-2.24	-26.5	1.97	-4.21
1808-214-19	4500	8/15/18	1-3	5.28	5.12	40.1	19.7	28.9	22.9	4.64	52.5	30.0	17.5	SL	0.073	0.661	0.220	0.080	0.361	20.7	0.73	-19.9	2.50	-1.77
1808-214-20	4500	8/15/18	0-1	5.51	9.57	41.8	19.6	38.3	70.5	13.1	32.5	33.8	33.8	CL	0.965	0.786	0.273	0.252	0.262	24.6	9.66	-14.9	7.88	1.79
1808-214-21	4500	8/15/18	1-3	5.61	15.3	38.2	12.1	45.0	53.9	10.1	41.3	30.0	28.8	CL	0.569	0.980	0.565	0.136	0.279	30.6	5.69	-24.9	4.23	1.46
1808-214-22	4501	8/15/18	0-1	5.70	10.6	37.9	17.8	59.2	72.2	11.6	41.3	28.8	30.0	CL	0.470	0.939	0.491	0.190	0.258	29.3	4.70	-24.8	5.94	-1.24
1808-214-23	4501	8/15/18	1-3	5.86	10.4	42.2	20.6	28.5	82.2	16.6	33.8	32.5	33.8	CL	1.237	0.659	0.297	0.124	0.237	20.6	12.4	-8.20	3.88	8.49
1808-214-24	4501	8/15/18	0-1	5.98	10.8	42.1	19.9	28.3	89.2	18.2	35.0	32.5	32.5	CL	1.138	0.640	0.270	0.065	0.305	20.0	11.4	-8.61	2.02	9.39
1808-214-25	4537	8/15/18	1-3	6.45	7.96	41.7	20.9	17.7	57.0	13.0	41.3	30.0	28.8	CL	1.436	0.537	0.066	0.271	0.200	18.8	14.4	-2.41	8.45	5.91
1808-214-26	4537	8/15/18	0-1	6.57	8.78	37.2	18.2	23.4	62.2	13.6	42.5	30.0	27.5	CL	1.263	0.689	0.335	0.109	0.245	21.5	12.6	-8.89	3.40	9.23
1808-214-27	4538	8/15/18	1-3	6.54	10.5	35.2	17.5	60.3	56.3	9.34	42.5	27.5	30.0	CL	0.272	0.839	0.556	0.115	0.168	26.2	2.72	-23.5	3.60	-0.88
1808-214-28	4538	8/15/18	0-1	6.49	12.0	34.6	17.8	108	56.5	7.14	42.5	28.8	28.8	CL	0.543	1.132	0.777	0.077	0.279	35.4	5.43	-29.9	2.39	3.04
1808-214-29	4539	8/15/18	1-3	6.61	10.2	34.4	16.5	32.7	74.8	15.1	50.0	25.0	25.0	SCL	1.039	0.834	0.372	0.249	0.212	26.0	10.4	-15.7	7.78	2.81
1808-214-30	4539	8/15/18	0-1	6.71	10.9	35.6	15.4	19.3	83.1	20.0	42.5	28.8	28.8	CL	1.634	0.704	0.181	0.290	0.233	22.0	16.3	-5.64	9.07	7.27
1808-214-31	4577	8/15/18	1-3	6.73	9.63	43.5	15.4	11.8	76.6	20.8	30.0	33.8	36.3	CL	1.481	0.606	0.266	0.115	0.225	18.9	14.6	-4.31	3.60	11.0
1808-214-32	4577	8/15/18	0-1	6.72	9.88	41.5	19.2	25.1	74.4	15.8	37.5	30.0	32.5	CL	1.263	0.731	0.293	0.247	0.191	22.8	12.6	-10.2	7.71	4.92
1808-214-33	4577	8/15/18	1-3	6.73	11.0	38.2	15.5	10.5	48.7	13.5	36.3	31.3	32.5	CL	1.481	0.606	0.266	0.115	0.225	18.9	14.6	-4.31	3.60	11.0
1808-214-34	4578	8/15/18	0-1	6.14	6.71	44.4	15.5	10.5	48.7	13.5	36.3	31.3	32.5	CL	0.543	0.371	0.100	0.132	0.139	11.6	5.43	-6.16	4.11	1.32
1808-214-35	4578	8/15/18	1-3	6.25	8.73	38.4	17.1	16.5	65.7	15.0	38.8	28.8	32.5	CL	1.733	0.650	0.232	0.241	0.175	20.3	17.3	-2.98	7.54	9.79
1808-214-36	4616	8/15/18	0-1	6.14	14.3	32.3	19.3	17.1	65.0	15.0	38.8	28.8	32.5	SCL	0.642	0.348	0.176	0.048	0.176	10.9	6.42	-4.45	1.50	4.92
1808-214-37	4616	8/15/18	1-3	6.24	12.3	34.2	19.3	55.0	85.3	14.0	48.8	26.3	25.0	SCL	0.345	0.666	0.297	0.251	0.118	20.8	3.45	-17.4	7.84	-4.39
1808-214-38	5087	8/15/18	0-1	5.48	5.43	33.1	23.1	39.3	13.4	2.39	53.8	23.8	22.5	SCL	0.272	0.578	0.402	0.038	0.137	18.1	2.72	-15.3	1.20	1.52
1808-214-39	5087	8/15/18	1-3	5.61	9.37	32.2	19.6	72.7	40.0	5.89	51.3	25.0	23.8	SCL	0.371	0.890	0.509	0.138	0.243	27.8	3.71	-24.1	4.31	-0.60
1808-214-40	5109	8/15/18	0-1	5.72	8.98	36.9	18.9	62.1	44.4	6.97	47.5	28.8	23.8	L	0.569	0.826	0.409	0.153	0.265	25.8	5.69	-20.1	4.78	0.91
1808-214-41	5109	8/15/18	1-3	5.78	8.83	35.1	19.8	68.5	40.0	6.01	48.8	27.5	23.8	SCL	0.470	0.833	0.378	0.221	0.235	26.0	4.70	-21.3	6.89	-2.19

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DATE	LOCATION	SAMPLE DEPTH	PH UNITS	EC IN/HOOR	% SAT	CALCIUM MED.	MAGNESIUM MED.	SODIUM MED.	BAR	% SAND	% SILT	% CLAY	CLASS	% CARBON	TOT % S	SULFATE %	PIR % S	ORG %	ACID POT. IN/1000	MEET POT. IN/1000	AS POT. IN/1000	PIR A POT. IN/1000	PIR S A B IN/1000
1804-127-01	2945	4/13/18	0-1	7.60	4.91	2.68	2.85	48.3	28.5	38.75	26.25	35.00	CL	1.19	0.14	0.14			4.25	11.9	7.65		
1804-127-02	2945	4/13/18	1-3	8.45	3.78	0.83	1.04	37.7	39.0	30.00	25.00	25.00	SCL	1.29	0.04				1.40	12.9	11.5		
1804-127-03	2946	4/13/18	0-1	7.60	5.56	3.92	3.56	53.1	27.1	42.50	26.25	31.25	CL	1.29	0.13				4.05	12.9	8.85		
1804-127-04	2946	4/13/18	1-3	7.81	5.04	4.38	4.15	54.4	27.9	37.50	31.25	31.25	CL	1.38	0.18				5.71	13.9	8.18		
1804-127-05	2952	4/13/18	0-1	7.20	6.09	37.9	20.5	28.2	74.6	15.2	28.75	26.25	SCL	0.40	0.55	0.21	0.15		17.0	3.97	-13.1	4.85	-0.88
1804-127-06	2952	4/13/18	1-3	6.70	9.51	35.4	18.9	26.7	79.2	16.6	28.75	23.75	L	0.40	0.55	0.22	0.14		17.2	3.97	-13.2	4.31	-0.34
1804-127-07	2952	4/13/18	0-1	7.23	6.30	65.7	5.89	61.3	27.3	22.50	30.00	47.50	C	0.20	0.31	0.13	0.05		9.62	1.99	-7.63	1.50	0.49
1804-127-08	2952	4/13/18	1-3	7.04	7.75	69.2	6.22	75.3	27.2	15.00	31.25	53.75	C	1.29	0.37				11.4	12.9	1.46		
1804-127-09	2953	4/13/18	0-1	7.15	8.72	44.8	12.8	76.1	22.3	31.25	30.00	38.75	CL	1.09	0.25				7.81	10.9	3.11		
1804-127-10	2953	4/13/18	1-3	7.82	6.09	41.6	3.45	53.1	29.1	37.50	25.00	37.50	CL	1.09	0.18				5.64	10.9	5.38		
1804-127-11	2953	4/13/18	1-3	7.81	6.64	42.7	4.38	57.9	28.7	37.50	33.75	38.75	CL	1.29	0.14				4.49	12.9	8.41	0.41	5.55
1804-127-12	3037	4/12/18	0-1	6.97	5.30	43.5	19.4	28.2	30.0	30.00	31.25	38.75	CL	0.69	0.24	0.08	0.01		7.55	5.96	-1.61		
1804-127-13	3043	4/12/18	1-3	6.98	6.88	44.7	20.4	46.1	9.02	31.25	31.25	37.50	CL	0.89	0.28				8.11	8.93	0.82		
1804-127-14	3043	4/12/18	0-1	7.06	7.71	45.8	16.7	23.2	60.5	32.75	30.00	36.25	CL	1.29	0.21				7.01	11.9	4.90		
1804-127-15	3044	4/12/18	0-1	7.28	9.94	45.0	17.2	25.3	85.3	16.5	28.75	38.25	CL	1.19	0.22				9.38	10.9	1.56		
1804-127-16	3044	4/12/18	1-3	7.35	6.77	45.7	15.2	53.5	12.6	32.50	30.00	37.50	CL	1.19	0.22				8.99	11.9	4.92		
1804-127-17	3056	4/12/18	0-1	6.59	6.43	41.3	19.0	25.1	43.9	9.38	28.75	30.00	SCL	1.09	0.18				4.69	10.9	7.52	2.52	1.35
1804-127-18	3056	4/12/18	1-3	6.30	7.57	37.5	18.5	52.2	10.0	43.75	26.25	30.00	CL	0.00	0.59	0.32	0.11		10.3	0.01	-16.3	3.28	-3.27
1804-127-19	3073	4/12/18	0-1	7.10	5.34	37.2	20.5	25.5	28.3	56.25	18.75	25.00	SCL	1.09	0.14				3.40	10.9	7.52		
1804-127-20	3073	4/12/18	1-3	7.28	5.15	35.3	18.9	24.7	8.01	60.00	18.75	21.25	SCL	1.09	0.11				4.32	10.9	6.59	1.16	6.78
1804-127-21	3074	4/12/18	0-1	7.02	6.04	40.1	22.2	36.7	5.99	48.25	25.00	28.75	SCL	0.79	0.26	0.12	0.04		8.09	7.94	-0.15		
1804-127-22	3074	4/12/18	1-3	7.10	6.36	37.5	22.7	35.4	6.61	48.25	23.75	27.50	SCL	0.89	0.27				8.38	8.93	0.57		
1804-127-23	3177	4/12/18	0-1	7.14	5.01	35.7	23.8	28.4	4.38	52.50	22.50	25.00	SCL	1.09	0.11				3.33	10.9	7.58	3.41	3.54
1804-127-24	3177	4/12/18	1-3	7.20	4.20	34.6	20.4	16.2	4.38	56.25	21.25	22.50	SCL	0.69	0.27	0.12	0.11		8.58	6.95	-1.63		
1804-127-25	3178	4/12/18	0-1	7.25	5.70	39.0	24.1	36.4	4.90	47.50	23.75	27.75	SCL	1.09	0.31				9.70	10.9	1.21		
1804-127-26	3178	4/12/18	1-3	7.28	5.82	37.8	23.0	27.8	13.4	40.00	26.25	33.75	CL	0.40	0.58	0.28	0.16		15.0	3.97	-14.0	5.09	-1.12
1804-127-27	3182	4/12/18	0-1	7.02	9.47	38.7	28.3	74.9	4.90	47.50	23.75	27.75	SCL	1.09	0.31				4.37	1.99	-27.8	4.37	-2.38
1804-127-28	3182	4/12/18	1-3	5.03	10.2	37.5	19.6	89.2	10.3	37.50	27.50	35.00	CL	0.20	0.96	0.59	0.14		20.8	2.98	-15.8	8.09	-1.13
1804-127-29	3183	4/12/18	0-1	6.29	9.73	34.6	18.9	20.5	19.5	37.50	27.50	35.00	CL	0.20	0.78	0.28	0.25		24.8	1.99	-22.8	7.72	-5.72
1804-127-30	3183	4/12/18	1-3	6.40	9.68	35.3	19.5	32.8	81.8	16.2	43.75	28.75	CL	0.20	0.84	0.33	0.19		28.1	2.98	-22.8	6.81	-2.83
1804-127-30R	3183	4/12/18	1-3	6.38	9.85	34.7	18.7	32.2	43.0	45.00	27.50	27.50	CL	0.30	0.84	0.30	0.17		28.1	2.98	-24.6	6.81	-2.83
1804-127-31	3202	4/12/18	0-1	6.28	6.81	20.4	23.3	33.9	7.18	43.75	27.50	28.75	CL	<0.01	0.48	0.26	0.05		15.1	15.1	-10.9	1.69	-12.6
1804-127-32	3202	4/12/18	1-3	6.56	5.81	22.3	23.8	34.5	9.65	47.50	26.25	28.25	SCL	0.60	0.67	0.27	0.02		20.8	2.98	-30.1	5.43	-0.68
1804-127-33	3202	4/12/18	0-1	5.34	9.79	21.8	73.9	87.4	12.2	61.25	30.00	16.75	SL	<0.01	0.84	0.40	0.18		26.1	3.96	-30.1	5.82	-0.68
1804-127-34	3203	4/12/18	1-3	5.16	12.9	19.0	38.1	46.1	8.34	38.75	20.00	16.75	CL	0.50	0.47	0.22	0.05		31.25	4.61	-9.68	1.59	-3.37
1804-127-35	3204	4/12/18	0-1	6.07	7.23	38.8	23.0	38.1	7.70	55.00	21.25	23.75	SCL	<0.01	1.22	0.63	0.20		36.0	6.95	-1.37	6.95	-0.96
1804-127-36	3204	4/12/18	1-3	6.02	12.4	33.3	19.9	133.3	4.22	40.00	26.25	33.75	CL	0.69	0.44	0.28	0.10		8.32	6.95	-1.37	6.95	-0.96
1804-127-37	3205	4/12/18	0-1	6.72	6.45	40.3	22.4	26.7	8.52	40.00	26.25	33.75	CL	0.30	0.44	0.28	0.10		13.8	2.98	-10.2	11.1	0.85
1804-127-38	3205	4/12/18	1-3	6.56	7.18	37.9	22.5	37.8	44.4	43.8	28.75	30.00	C	1.19	0.77	0.17	0.35		23.9	11.9	-10.8	10.8	-3.59
1804-127-39	3205	4/12/18	0-1	7.19	5.46	33.7	1.89	1.24	66.6	41.8	36.25	36.25	CL	1.09	0.92	0.33	0.46		33.1	10.8	-22.2	14.6	-3.88
1804-127-40	3205	4/12/18	1-3	6.49	6.49	32.5	3.11	1.95	42.1	37.50	26.25	37.50	CL	1.09	0.92	0.33	0.46		28.7	10.9	-17.8	15.7	-4.33
1804-127-41	3207	4/12/18	0-1	7.04	7.55	35.4	4.35	2.51	77.9	42.1	37.50	31.25	CL	1.19	0.49	0.17	0.14		15.2	11.9	-3.34	4.31	7.80
1804-127-42	3207	4/12/18	1-3	7.01	7.22	34.7	21.5	30.9	50.9	37.50	31.25	31.25	CL	1.19	0.23				7.20	11.9	4.71		
1804-127-43	3208	4/12/18	0-1	7.01	7.74	39.1	20.8	26.4	12.0	38.75	32.50	28.75	CL	0.89	0.54	0.23	0.08		17.0	8.93	-8.04	2.34	6.59
1804-127-44	3208	4/12/18	1-3	6.98	6.12	43.8	21.2	26.3	38.8	37.50	31.25	30.00	CL	0.89	0.51	0.28	0.08		16.0	9.92	-8.04	2.53	7.39
1804-127-45	3209	4/12/18	0-1	6.99	7.22	38.6	22.8	28.1	10.5	43.75	31.25	30.00	L	1.89	0.34				10.7	16.9	8.18		
1804-127-46	3209	4/12/18	1-3	7.09	6.31	41.7	21.1	27.2	39.9	41.25	28.75	27.50	CL	1.39	0.41	0.30	0.13		12.9	13.9	10.3	4.19	8.71
1804-127-47	3210	4/12/18	0-1	7.04	7.69	39.1	20.0	17.7	62.2	14.3	28.75	30.00	CL	1.29	0.58				17.4	12.9	-4.53		
1804-127-48	3211	4/12/18	1-3	7.27	8.34	37.4	13.4	9.13	76.6	22.8	36.25	32.50	CL	1.88	0.28	0.28	0.19		25.3	6.88	18.8	10.2	-3.30
1804-127-49	3211	4/12/18	0-1	6.71	9.73	35.3	20.4	28.5	92.2	18.6	36.25	36.25	CL	0.69	0.81	0.19	0.33		26.3	6.95	-18.3	10.2	-3.30
1804-127-50	3211	4/12/18	1-3	6.45	9.65	32.3	18.0	41.2	75.3	13.5	45.00	32.50	L	0.79	0.89	0.24	0.39		29.4	6.95	-22.4	12.1	-5.11
1804-127-51	3211	4/12/18	0-1	6.48	9.77	31.2	18.8	41.0	75.3	13.5	42.50	32.50	L	0.79	0.92	0.28	0.34		28.7	7.94	-20.8	10.5	-2.52
1804-127-52	4256	4/13/18	0-1	7.58	4.97	41.2	58.9	27.4	48.6	32.50	38.75	38.75	CL	0.80	0.15				4.56	4.99	0.43		
1804-127-53	4256	4/13/18	1-3	8.13	4.59	42.6	53.4	45.5	8.90	30.00	36.25	33.75	CL	0.90	0.15				4.78	8.98	4.18	3.25	-0.24
1804-127-54	4256	4/13/18	0-1	7.25	8.42	35.0	88.8	22.7	77.4	40.4	40.00	31.25	CL	0.30	0.34	0.09	0.10		10.7	3.01	-7.72	3.01	-0.84
1804-127-55	4262	4/11/18	0-1	5.88	8.44	36.7	95.8	10.7	63.5	11.4	48.75	27.50	SCL	0.50	0.29	0.19	0.03		8.99	4.99	-4.70	0.84	

QAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MH/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	CLASS	% CaCO3	TOT S %	SULFATE S %	PIR S %	ORG S %	ACID POT TN/100TN	NEUT POT TN/100TN	AS POT TN/100TN	PIR A POT TN/100TN	PIR S AB TN/100TN
1809-178-01	4642	9/21/18	0-1	6.81	7.71	37.9	19.3	31.5	53.9	10.7	40.00	27.60	32.50	CL	1.58	0.59	0.24	0.05	0.30	18.3	15.8	-2.55	1.64	14.1
1809-178-02	4642	9/21/18	1-3	6.85	10.2	37.0	18.1	38.7	73.9	13.9	37.50	28.75	33.75	CL	0.79	0.80	0.38	0.16	0.26	25.0	7.89	-17.1	5.05	2.84
1809-178-03	4530	9/21/18	0-1	3.49	9.82	38.8	19.4	162	2.58	0.3	41.25	26.25	32.50	CL	<0.01	1.09	0.72	0.01	0.35	34.0	-7.89	-41.9	0.41	-8.30
1809-178-04	4530	9/21/18	1-3	5.97	10.7	37.5	18.6	40.7	73.1	13.4	35.00	28.75	36.25	CL	1.38	1.48	0.57	0.50	0.41	46.3	13.8	-32.5	15.5	-1.69
1809-178-05	4644	9/21/18	0-1	5.51	10.6	37.6	18.4	63.3	67.4	10.5	35.00	30.00	35.00	CL	0.20	1.27	0.44	0.45	0.37	39.6	1.97	-37.7	14.2	-12.2
1809-178-06	4644	9/21/18	1-3	5.57	16.3	38.4	19.8	111	113	13.9	33.75	30.00	36.25	CL	0.20	1.33	0.72	0.26	0.35	41.5	1.97	-39.5	8.20	-8.23
1809-178-06R	4644	9/21/18	1-3	5.59	14.8	39.9	19.3	110	111	13.8	36.25	28.75	35.00	CL	0.20	1.14	0.58	0.25	0.31	35.7	1.97	-33.8	7.67	-5.69

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QAL #	LOCATION	SAMPLE DEPTH	PH UNITS	EC MH/DCM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	BAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT S %	SULFATE %	PYR S %	ORG %	ACID POT TH/1000TN	NEUT POT TH/1000TN	A-S POT TH/1000TN	PYR A POT TH/1000TN	PYR A-B TH/1000TN
112-181-0	4491	0-1	6.73	6.75	38.8	22.4	25.7	36.8	7.51	31.25	36.25	32.50	CL	1.00	0.69	0.36	0.08	0.24	21.4	10.0	-11.5	2.50	7.46
112-181-0	4491	1-3	7.13	7.59	37.6	20.8	27.4	47.8	9.75	32.50	33.75	33.75	CL	1.20	0.71	0.37	0.09	0.24	22.2	12.0	-10.3	2.94	9.02
112-181-0	4527	0-1	5.44	11.5	39.9	19.7	71.4	71.3	10.6	42.50	27.50	30.00	CL	0.30	1.34	1.06	-0.01	0.31	41.8	2.98	-38.8	-0.01	2.98
112-181-0	4527	1-3	5.54	6.99	40.5	20.8	37.3	31.8	5.88	41.25	28.75	30.00	CL	0.50	0.96	0.61	0.05	0.30	29.9	4.97	-24.9	1.53	3.44
112-181-0	4528	0-1	3.97	12.9	38.6	21.0	142	46.5	5.15	37.50	32.50	30.00	CL	-0.20	1.54	1.05	0.00	0.49	48.2	-2.01	-50.2	0.09	-2.11
112-181-0	4528	1-3	3.69	13.4	39.1	20.3	145	47.8	5.27	36.25	32.50	31.25	CL	-0.30	1.72	1.19	-0.01	0.55	53.8	-3.01	-56.8	-0.01	-3.01
112-181-0	4529	0-1	6.32	8.98	38.9	19.7	43.2	54.8	9.77	36.25	32.50	33.75	CL	1.10	1.14	0.63	0.16	0.35	35.6	11.0	-24.6	5.00	5.96
112-181-0	4529	1-3	7.11	9.45	33.3	19.6	28.9	67.4	13.7	36.25	32.50	31.25	CL	3.09	1.04	0.42	0.36	0.26	32.4	30.9	-1.51	11.2	19.8
112-181-0	4566	0-1	5.76	7.59	45.1	20.1	39.0	39.6	7.28	28.75	32.50	38.75	CL	0.60	1.00	0.59	0.04	0.37	31.3	5.97	-25.3	1.25	4.72
112-181-0	4566	1-3	5.67	10.2	44.3	19.9	42.5	63.1	11.3	32.50	30.00	37.50	CL	0.30	1.15	0.75	0.02	0.38	35.9	2.88	-32.9	0.69	2.29
112-181-1C	4566	1-3	5.64	9.77	45.2	19.9	43.3	63.1	11.3	30.00	31.25	38.75	CL	0.40	1.05	0.67	0.02	0.37	33.2	3.97	-29.2	0.72	3.26
112-181-1	4406	0-1	5.65	5.84	41.4	21.3	24.1	27.3	5.72	41.25	27.50	31.25	CL	0.40	0.70	0.35	0.06	0.29	21.9	3.97	-17.9	1.87	2.10
112-181-1	4406	1-3	5.59	6.98	41.8	19.3	24.4	39.5	8.44	41.25	28.75	30.00	CL	0.40	0.87	0.39	0.00	0.28	20.8	3.97	-16.9	0.09	3.88
112-181-1	4407	0-1	5.99	10.7	37.3	20.5	97.9	41.9	5.45	37.50	30.00	32.50	CL	0.90	1.61	1.00	0.09	0.53	50.4	8.96	-41.4	2.78	6.18
112-181-1	4407	1-3	6.63	10.5	36.5	19.8	54.7	61.8	10.1	36.25	32.50	31.25	CL	0.90	1.48	0.89	0.12	0.45	45.5	8.96	-36.6	3.72	5.25
112-181-1	4408	0-1	5.48	13.3	38.2	21.3	114.4	61.3	7.45	41.25	28.75	30.00	CL	0.60	1.03	0.71	0.03	0.29	32.1	5.97	-25.2	0.97	5.00
112-181-1	4408	1-3	5.61	14.0	40.5	18.7	116.0	69.2	8.43	42.50	27.50	30.00	CL	0.80	1.35	1.00	0.00	0.35	42.2	7.97	-34.2	0.06	7.90
112-181-1	4489	0-1	6.17	8.54	38.9	21.0	40.7	43.9	7.91	35.00	31.25	33.75	CL	1.00	0.99	0.56	0.15	0.28	31.1	10.0	-21.1	4.72	5.24
112-181-1	4489	1-3	6.53	8.95	43.6	18.1	41.0	52.2	9.60	36.25	28.75	35.00	CL	0.90	0.90	0.59	0.10	0.28	30.3	9.0	-21.4	3.22	5.75
112-181-1	4490	0-1	6.51	5.50	34.7	20.1	26.2	19.2	3.98	35.00	31.25	33.75	CL	1.69	0.79	0.32	0.18	0.29	24.7	16.9	-7.80	5.62	11.3
112-181-2	4490	1-3	7.32	8.51	30.0	18.7	32.6	48.6	9.80	37.50	33.75	28.75	CL	2.39	0.74	0.32	0.18	0.29	23.2	23.9	0.75	0.52	11.3
112-181-2C	4490	1-3	7.35	8.54	30.2	18.5	32.3	50.0	9.93	37.50	32.50	30.00	CL	2.39	0.75	0.32	0.18	0.29	23.4	23.9	0.52	0.52	11.3

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GAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MICROHM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	SAR	% SAND	% SILT	% CLAY	GLASS	% CACCS	TOT S %	SULFATE S%	PIR S %	ORG S%	ACID POT TN/100TN	NEUT POT TN/100TN	A-B POT TN/100TN	PYR A POT TN/100TN	PYR B AS TN/100TN
2202-171-01	4641	2/14/22	0-1	7.23	6.87	42.0	20.5	24.9	42.0	8.81	36.25	28.75	35.00	CL	1.20	0.14				4.44	12.0	7.58		
2202-171-02	4641	2/14/22	1-3	7.41	6.41	39.4	20.9	29.1	32.5	6.51	38.75	27.50	33.75	CL	1.10	0.15				4.78	11.0	6.24		
2202-171-03	4676	2/14/22	0-1	7.31	4.11	42.4	21.8	13.9	15.6	3.70	40.00	27.50	32.50	CL	1.70	0.08				2.43	17.0	14.6		
2202-171-04	4676	2/14/22	1-3	6.57	5.90	43.4	26.4	27.1	25.8	4.99	45.00	22.50	32.50	CL/SCL	1.30	0.14				4.34	13.0	8.69		
2202-171-05	4773	2/14/22	0-1	7.61	1.82	44.7	10.9	5.27	3.29	1.16	47.50	22.50	30.00	SCL	3.01	0.05				1.47	30.1	28.6		
2202-171-06	4773	2/14/22	1-3	7.53	0.93	40.2	7.14	2.50	0.90	0.41	55.00	17.50	27.50	SCL	1.90	0.04				1.24	19.0	17.8		
2202-171-07	4800	2/14/22	0-1	6.52	6.09	51.1	21.3	39.4	25.2	4.58	30.00	32.50	37.50	CL	2.00	0.14				4.45	20.0	15.6		
2202-171-08	4800	2/14/22	1-3	6.81	5.82	52.2	22.0	38.3	23.1	4.21	32.50	30.00	37.50	CL	1.60	0.14				4.50	16.0	11.5		
2202-171-09	4158	2/14/22	0-1	7.83	1.25	37.8	5.24	2.77	4.92	2.46	50.00	21.25	28.75	SCL	2.41	0.04				1.15	24.1	22.9		
2202-171-10	4158	2/14/22	1-3	7.86	2.89	34.1	14.6	9.38	10.4	2.99	60.00	17.50	22.50	SCL	1.90	0.04				1.37	19.0	17.7		
2202-171-10R	4158	2/14/22	1-3	7.89	3.01	33.0	15.3	9.79	10.4	2.94	60.00	17.50	22.50	SCL	2.00	0.04				1.32	20.0	18.7		

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QAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC MIN/MOON	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	BAR	% SAND	% SILT	% CLAY	CLASS	% CAC03	TOT S %	SULFATE %	PVR %	ORG %	ACID POT TH1000N	INERT POT TH1000N	AS POT TH1000N	PVR & POT TH1000N	PYLA AS TH1000N
2205-238-01	4680 C	5/16/22	0-1	7.17	5.08	41.1	25.3	17.9	21.7	4.7	41.25	31.25	27.50	CL	3.62	0.39	0.41	0.21	0.24	12.09	36.22	24.12	6.55	20.53
2205-238-02	4680 C	5/16/22	1-2	6.82	7.98	46.3	24.4	53.8	34.4	5.5	40.00	28.75	31.25	CL	2.71	0.87	0.87	0.41	0.24	27.11	27.08	-0.03	6.55	20.53
2205-238-03	4680 D	5/16/22	0-1	7.18	3.44	37.1	25.7	17.3	1.6	0.3	45.00	26.25	28.75	CL/SCL	2.10	1.18	0.88	0.03	0.25	5.99	20.98	15.29	0.84	11.00
2205-238-04	4680 D	5/16/22	1-3	6.13	6.57	44.1	25.3	67.4	8.8	1.3	42.50	27.50	30.00	CL	1.18	1.16	0.88	0.03	0.25	36.18	11.84	-24.34	0.84	11.00
2205-238-05	4714 C	5/16/22	0-1	5.71	6.14	38.5	24.7	71.2	1.6	0.2	46.25	26.25	27.50	SCL	1.29	0.86	0.51	0.00	0.34	26.93	12.85	-14.07	0.15	12.70
2205-238-06	4714 C	5/16/22	1-3	3.43	8.14	41.3	21.2	100.4	2.2	0.3	47.50	25.00	27.50	SCL	-0.34	1.52	0.97	0.00	0.55	47.52	-3.40	-50.91	0.00	-3.39
2205-238-07	4746 C	5/16/22	0-1	2.84	13.16	40.9	21.6	171.9	0.3	0.0	41.25	27.50	31.25	CL	-1.46	1.30	0.96	0.00	0.35	40.67	-14.57	-55.24	-0.07	-14.50
2205-238-08	4746 C	5/16/22	1-3	4.51	6.65	41.8	21.6	78.7	2.2	0.3	42.50	27.50	30.00	CL	0.98	1.43	0.96	0.05	0.40	44.61	9.81	-34.80	1.57	8.23
2205-238-09	4746 D	5/16/22	0-1	3.04	5.80	39.6	22.6	49.1	1.7	0.3	25.00	37.50	37.50	CL	-0.44	1.34	0.83	0.02	0.50	44.16	-4.41	-46.27	0.48	-4.89
2205-238-10	4746 D	5/16/22	1-3	3.15	7.95	42.1	21.7	93.0	3.4	0.5	18.75	41.25	40.00	SCL/SIC	-0.24	1.99	1.25	0.02	0.72	62.26	-2.38	-84.64	0.98	-3.06
2205-238-10R	4746 D	5/16/22	1-3	2.98	7.58	40.3	19.1	85.6	3.0	0.4	20.00	40.00	40.00	SCL/SIC	0.17	2.09	1.32	0.09	0.69	65.42	-2.38	-67.80	2.71	-5.10
2205-238-11	4775 B	5/16/22	0-1	4.57	5.66	41.3	22.5	44.4	7.2	1.2	37.50	30.00	32.50	CL	0.07	0.89	0.61	0.02	0.27	27.92	1.68	-26.23	0.54	1.14
2205-238-12	4775 B	5/16/22	1-3	4.67	5.80	43.7	22.7	51.4	8.3	1.4	37.50	28.75	33.75	CL	0.07	0.90	0.65	0.00	0.28	26.25	0.67	-27.59	0.00	0.67
2205-238-13	4807 A	5/16/22	0-1	6.82	5.92	46.7	21.7	17.7	43.9	9.8	28.75	30.00	41.25	C	1.29	0.84	0.35	0.05	0.23	20.01	12.85	-7.15	1.80	11.26
2205-238-14	4807 A	5/16/22	1-3	7.05	8.01	45.5	21.1	15.7	60.0	14.0	26.25	30.00	43.75	C	0.88	0.58	0.27	0.12	0.20	16.27	8.79	-9.48	3.87	5.12
QC 29	QC 29	QC 29		6.71	8.35	37.3	30.5	19.4	53.1	10.6	61.25	13.75	25.00	SCL	1.29	0.18	0.04	0.04	0.11	5.99	12.85	7.16	1.14	11.72
QC 95	QC 95	QC 95																						

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CAL #	LOCATION	SAMPLE DATE	SAMPLE DEPTH	PH UNITS	EC DMH/CM	% SAT	CALCIUM MEQ/L	MAGNESIUM MEQ/L	SODIUM MEQ/L	BAR	% SAND	% SILT	% CLAY	CLASS	% CACO3	TOT % S	SULFATE %	PYR %	ORG %	ACID POT TH100TN	NEUT POT TH100TN	AB POT TH100TN	PYR A POT TH100TN	PYR A-B TH100TN
2208148-01	4799	08/09/22	(0-1)	6.68	10.64	33.39	22.55	98.72	67.42	8.65	35	27.5	37.5	CL	1.20	1.07	0.61	0.32	0.25	33.55	11.99	-21.56	9.84	2.15
2208148-02	4799	08/09/22	(1-3)	6.71	10.53	34.28	23.25	107.77	45.24	5.99	40	27.5	32.5	CL	1.87	0.90	0.48	0.25	0.18	27.87	18.75	-9.22	7.72	11.03
2208148-03	4798	08/09/22	(0-1)	5.46	18.2	34.22	22.65	224.60	146.59	13.19	30	35	35	CL	0.33	1.50	0.91	0.19	0.40	46.98	3.31	-43.68	5.97	-2.66
2208148-04	4798	08/09/22	(1-3)	7.16	17.69	40.49	22.31	192.51	106.57	10.28	35	30	35	CL	1.78	1.06	0.69	0.19	0.18	33.11	17.78	-15.33	5.90	11.88
2208148-05	4824	08/09/22	(0-1)	6.05	11.92	47.40	22.36	97.08	67.86	8.78	32.5	32.5	35	CL	0.43	1.54	0.97	0.27	0.31	48.20	4.27	-43.93	8.34	-4.07
2208148-06	4824	08/09/22	(1-3)	5.94	16.25	36.75	25.10	166.31	91.34	9.56	32.5	32.5	35	CL	0.33	1.46	0.82	0.30	0.34	45.64	3.31	-42.34	9.28	-5.97
2208148-07	4823	08/09/22	(0-1)	5.14	16.95	33.45	22.41	259.16	39.19	3.30	25	47.5	27.5	CL	0.14	1.44	0.91	0.12	0.41	45.05	1.38	-43.67	3.87	-2.50
2208148-08	4823	08/09/22	(1-3)	3.98	28.56	24.86	30.69	617.85	52.63	2.92	40	37.5	22.5	L	-0.44	1.47	1.02	0.06	0.39	45.95	-4.42	-50.37	1.76	-8.20
2208148-09	4844	08/09/22	(0-1)	4.78	11.51	33.22	21.36	153.85	46.11	4.93	30	35	35	CL	-0.06	2.46	1.71	0.27	0.48	76.85	-0.56	-77.41	8.34	-8.90
2208148-10	4844	08/09/22	(1-3)	4.2	18.68	30.11	23.95	317.56	67.88	5.19	32.5	35	32.5	CL	-0.25	1.95	1.32	0.16	0.47	60.89	-2.49	-63.37	4.94	-7.42
148-10 dup	4844	08/09/22	(1-3)	4.21	20.63	31.65	23.00	281.24	63.51	5.07	32.5	35	32.5	CL	-0.35	1.86	1.18	0.18	0.51	58.20	-3.45	-61.65	5.50	-8.95
2208148-11	4856	08/09/22	(0-1)	5.51	9.84	34.34	20.86	134.92	14.79	1.88	35	35	30	CL	0.14	1.29	0.74	0.29	0.25	40.17	1.38	-38.80	9.03	-7.65
2208148-12	4856	08/09/22	(1-3)	5.1	9.27	37.75	20.01	139.86	13.88	1.55	32.5	35	32.5	CL	0.04	1.60	0.97	0.32	0.31	49.92	0.41	-48.51	9.97	-9.56
2208148-13	4843	08/09/22	(0-1)	5.3	8	35.32	20.86	102.84	9.92	1.26	32.5	32.5	35	CL	0.23	1.33	0.71	0.34	0.28	41.67	2.34	-39.33	10.75	-8.41
2208148-14	4843	09/09/22	(1-3)	5.83	11.69	32.79	21.61	116.00	48.28	5.82	17.5	45	37.5	SCL	0.43	1.75	0.97	0.44	0.35	54.67	4.27	-50.40	13.62	-9.35
2208148-15	4855	08/09/22	(0-1)	3.28	15.13	30.28	20.36	297.00	9.31	0.74	30	35	35	CL	-0.35	1.86	1.15	0.29	0.43	57.98	-3.45	-61.43	8.90	-12.35
2208148-16	4855	08/09/22	(1-3)	3.25	20.66	33.02	22.55	350.47	4.52	0.33	25	37.5	37.5	CL	-0.73	2.16	1.40	0.11	0.66	67.38	-7.31	-74.69	3.31	-10.62
2208148-17	4854	08/09/22	(0-1)	3.75	12.52	34.87	19.31	175.24	20.57	2.09	25	40	35	CL	-0.44	1.76	1.03	0.27	0.46	55.04	-4.42	-59.46	8.40	-12.82
2208148-18	4854	08/09/22	(1-3)	4.99	13.36	32.82	19.41	149.73	48.28	5.25	27.5	35	37.5	CL	0.04	1.80	0.92	0.46	0.42	56.33	0.41	-55.92	14.40	-13.99
148-18 dup	4854	08/09/22	(1-3)	5.07	13.29	32.97	20.86	164.54	52.63	5.47	27.5	37.5	35	CL	0.04	1.87	0.96	0.47	0.43	58.26	0.41	-57.85	14.78	-14.37

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Report Date: 11/09/22

Date Received: 10/24/22

Client: Peabody Western Coal Co. Kayenta Mine

Project: J21 Spoils N9 Spoils

Workorder: H22100693

Sample ID	Client Sample ID	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	Up	Low	Results	%	Results	%	s_u	mmhos/cm	meq/L	meq/L	meq/L	unitless
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	45.1	5.8	6.5	18.9	102	3.51	0.4
H22100693-031	2209-279-4767	0	1	40	34	26	L	42.8	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	8.6	19.3	73.6	21.5	3.2
H22100693-033	2209-279-4768	0	1	36	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

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## 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

Sample ID	Client Sample ID	Analysis		Neut Potential	Acid Potential	Acid/Base Potential	AP, Pyritic S	ABP, Pyritic S	Sulfur, Total	Sulfur, Sulfate	Sulfur, Pyritic	Sulfur, Organic	
		Units											
		Up	Low										
U/Kt	Results	U/Kt	Results	U/Kt	Results	U/Kt	Results	U/Kt	Results	U/Kt	Results	U/Kt	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	

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## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Peabody Western Coal Co. Kayenta Mine

Project: N9 Spoils

Workorder: H22120261

Report Date: 12/31/22

Date Received: 12/09/22

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture	Percent Sat	pH-Sat/Pst	Cond-Sat/Pst	Ca-Sat/Pst-Sat Paste	Mg-Sat/Pst-Sat Paste	Na-Sat/Pst-Sat Paste	SAR
		Units	Units	%	%	%		%	s_u	mmhos/cm	meq/L	meq/L	meq/L	unitless
		Up	Low	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
H22120261-001	4821	0	1	69	25	6	SL	32.3	5.9	9.7	20.7	193	5.25	0.5
H22120261-002	4821	1	3	69	29	2	SL	31.8	5.1	9.5	25.8	159	10.3	1.1
H22120261-003	4822	0	1	43	33	24	L	41.0	5.9	7.5	21.5	67.6	40.8	6.4
H22120261-004	4822	1	3	45	35	20	L	43.2	6.0	7.8	21.0	74.2	38.2	5.8
H22120261-005	4796	0	1	51	31	18	L	34.2	3.8	19.5	19.1	344	45.3	3.4
H22120261-006	4796	1	3	59	26	15	SL	33.7	1.8	34.2	24	365	78.7	5.6
H22120261-007	4797	0	1	29	42	29	CL	47.1	3.4	12.0	19.2	196	41.7	3.8
H22120261-008	4797	1	3	27	43	30	CL	48.3	5.3	6.7	19.1	71.0	28.8	4.5
H22120261-009	4769	0	1	31	39	30	CL	48.2	5.8	6.4	20.0	69.5	26.7	4.3
H22120261-010	4769	1	3	33	38	29	CL	46.4	5.8	6.6	20.4	70.0	29.4	4.7
H22120261-011	4770	0	1	27	42	31	CL	44.9	5.4	9.8	19.1	89.3	65.2	9.6
H22120261-012	4770	1	3	23	45	32	CL	47.9	6.1	9.4	20.4	83.6	65.5	10.0
H22120261-013	4771	0	1	37	35	28	CL	45.1	6.2	8.9	20.2	101	48.6	6.8
H22120261-014	4771	1	3	39	34	27	CL	43.0	5.8	8.2	20.3	91.0	39.0	5.7
H22120261-015	4739	0	1	35	36	29	CL	47.6	5.2	10.8	20.3	144	51.0	6.1
H22120261-016	4739	1	3	37	35	28	CL	47.4	5.4	10.2	19.6	120	50.9	6.5
H22120261-017	4740	0	1	37	34	29	CL	47.6	5.0	9.8	19.4	123	47.2	6.0
H22120261-018	4740	1	3	41	33	26	L	42.0	4.7	13.1	21.0	203	55.8	5.9
H22120261-019	4741	0	1	33	39	28	CL	46.3	5.0	9.9	20.2	132	45.1	5.7
H22120261-020	4741	1	3	31	40	29	CL	43.9	5.4	7.4	20.7	89.6	29.6	4.4
H22120261-021	4742	0	1	47	29	24	L	41.0	5.4	6.7	18.5	60.4	32.7	5.4
H22120261-022	4742	1	3	45	29	26	L	43.7	6.5	5.9	21.5	48.8	24.9	4.2
H22120261-023	4743	0	1	39	35	28	L	44.8	5.5	6.2	17.5	73.2	18.3	2.8
H22120261-024	4743	1	3	39	35	26	L	46.7	6.4	3.8	18.4	39.3	4.42	0.8
H22120261-025	4710	0	1	35	37	28	CL	47.4	4.6	8.8	16.8	123	34.1	4.0
H22120261-026	4710	1	3	41	35	24	L	44.2	5.2	7.7	18.0	70.8	43.5	6.3
H22120261-027	4711	0	1	39	35	26	L	45.1	4.5	6.7	16.5	74.4	20.8	3.0
H22120261-028	4711	1	3	41	33	26	L	46.0	4.8	10.6	17.0	147	47.3	5.4
H22120261-029	4673	0	1	39	33	28	CL	49.0	3.9	10.6	17.3	139	46.7	5.2
H22120261-030	4673	1	3	37	33	30	CL	49.6	3.4	11.5	17.0	145	56.1	6.2
H22120261-031	4674	0	1	37	35	28	CL	46.5	7.0	6.0	18.3	38.2	38.2	6.7
H22120261-032	4674	1	3	35	37	28	CL	48.1	6.1	7.4	17.5	69.1	44.5	6.4
H22120261-033	4636	0	1	33	39	28	CL	44.5	6.8	3.9	20.2	35.4	7.90	1.6
H22120261-034	4636	1	3	33	39	28	CL	47.7	6.8	5.0	18.6	59.5	10.0	1.6

2022-6



## LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Report Date: 12/31/22

Date Received: 12/09/22

Client: Peabody Western Coal Co. Kayenta Mine  
Project: N9 Spoils  
Workorder: H22120261

Sample ID	Client Sample ID	Analysis		Units	Neut Potential V/Kt	Acid Potential V/Kt	Acid/Base V/Kt	AP, Pyritic S V/Kt	ABP, Pyritic S V/Kt	Sulfur, Total %	Sulfur, Sulfate %	Sulfur, Pyritic %	Sulfur, Organic %
		Up	Low		Results	Results	Results	Results	Results	Results	Results	Results	Results
H22120261-001	4821	0	1		8	40	-33	7.4	0	1.27	0.61	0.24	0.43
H22120261-002	4821	1	3		8	42	-34	6.7	2	1.36	0.60	0.22	0.54
H22120261-003	4822	0	1		10	34	-25	15	-6	1.10	0.45	0.49	0.16
H22120261-004	4822	1	3		10	36	-25	14	-4	1.14	0.52	0.45	0.17
H22120261-005	4796	0	1		0	38	-38	8.2	-8	1.23	0.91	0.26	0.06
H22120261-006	4796	1	3		-17	54	-54	7.7	-8	1.73	1.44	0.25	0.04
H22120261-007	4797	0	1		2	38	-36	9.3	-7	1.21	0.78	0.30	0.13
H22120261-008	4797	1	3		7	36	-29	16	-10	1.14	0.48	0.52	0.15
H22120261-009	4789	0	1		10	29	-19	8.8	1	0.93	0.51	0.28	0.14
H22120261-010	4789	1	3		10	29	-19	8.2	2	0.93	0.56	0.26	0.11
H22120261-011	4770	0	1		8	38	-30	13	-5	1.20	0.67	0.41	0.12
H22120261-012	4770	1	3		10	41	-31	15	-5	1.32	0.66	0.49	0.17
H22120261-013	4771	0	1		11	31	-20	11	0	0.98	0.47	0.36	0.14
H22120261-014	4771	1	3		10	35	-24	15	-5	1.12	0.49	0.49	0.13
H22120261-015	4739	0	1		7	40	-34	15	-8	1.30	0.66	0.47	0.17
H22120261-016	4739	1	3		7	38	-31	12	-7	1.22	0.59	0.49	0.14
H22120261-017	4740	0	1		6	38	-32	15	-8	1.21	0.69	0.39	0.13
H22120261-018	4740	1	3		5	42	-37	15	-10	1.35	0.63	0.48	0.25
H22120261-019	4741	0	1		6	35	-29	12	-6	1.12	0.61	0.39	0.13
H22120261-020	4741	1	3		9	33	-24	7.5	2	1.06	0.68	0.24	0.14
H22120261-021	4742	0	1		11	21	-10	6.2	5	0.66	0.35	0.20	0.11
H22120261-022	4742	1	3		13	18	-5	5.8	7	0.56	0.28	0.18	0.10
H22120261-023	4743	0	1		10	33	-23	14	-4	1.06	0.42	0.44	0.20
H22120261-024	4743	1	3		21	23	-3	10	10	0.74	0.22	0.33	0.20
H22120261-025	4710	0	1		5	46	-41	16	-11	1.48	0.72	0.51	0.24
H22120261-026	4710	1	3		6	46	-40	20	-14	1.49	0.56	0.64	0.29
H22120261-027	4711	0	1		5	39	-34	12	-7	1.26	0.63	0.38	0.24
H22120261-028	4711	1	3		6	43	-37	12	-6	1.36	0.78	0.37	0.21
H22120261-029	4673	0	1		2	50	-48	16	-14	1.59	0.79	0.51	0.29
H22120261-030	4673	1	3		0	54	-53	17	-16	1.74	0.87	0.55	0.32
H22120261-031	4674	0	1		29	32	-3	13	16	1.01	0.42	0.42	0.17
H22120261-032	4674	1	3		15	41	-26	14	1	1.32	0.69	0.45	0.18
H22120261-033	4636	0	1		25	29	-4	9.4	15	0.93	0.48	0.30	0.14
H22120261-034	4636	1	3		23	41	-18	13	10	1.31	0.77	0.40	0.14

2022-7



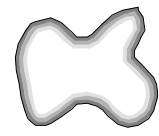


**Kayenta Complex**  
PO Box 650  
Kayenta, Arizona USA 86033

N-9 Phase I Bond Release  
**Map 2.1**  
**Soil Thickness**  
**Verification**

Produced by  
Gary Altsisi  
Professional  
Engineer

May 21, 2024  
Revision  
1 Inch = 400 Feet  
5 foot contour interval  
Index contours at 25 feet



Proposed Phase I  
Bond Release Area  
661 Acres



Randomly Generated  
Soil Thickness  
Verification Site

**Soil Status**

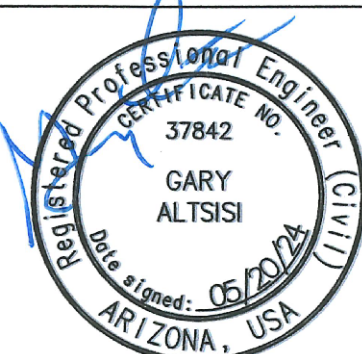
- Topsoiled 98 acres  
First Year Topsoiled: 2012, Last Year Topsoiled: 2024
- Cultural Planting 21 acres
- Suitable Soil 36 acres
- Graded (without soil) 506 acres



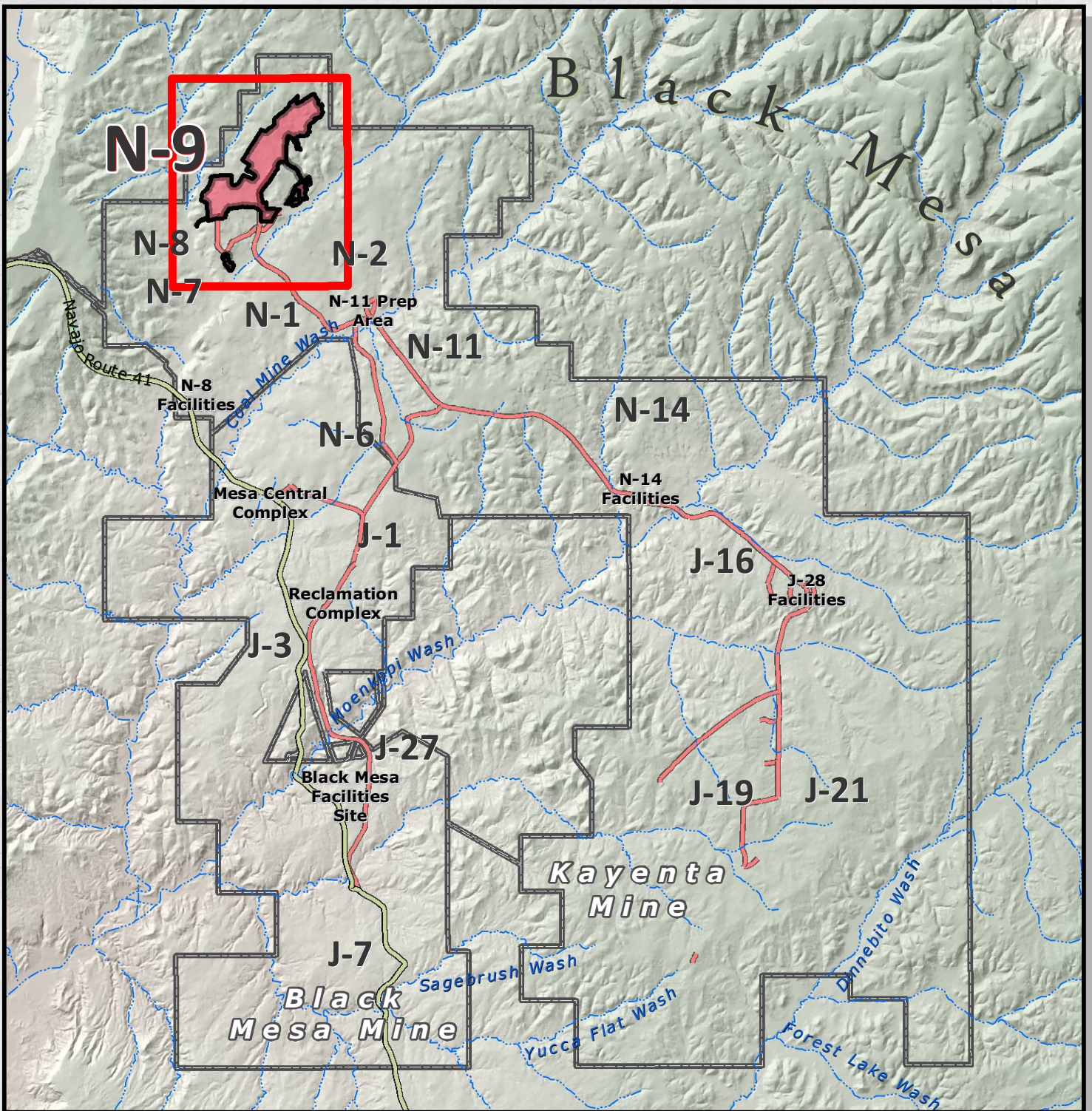
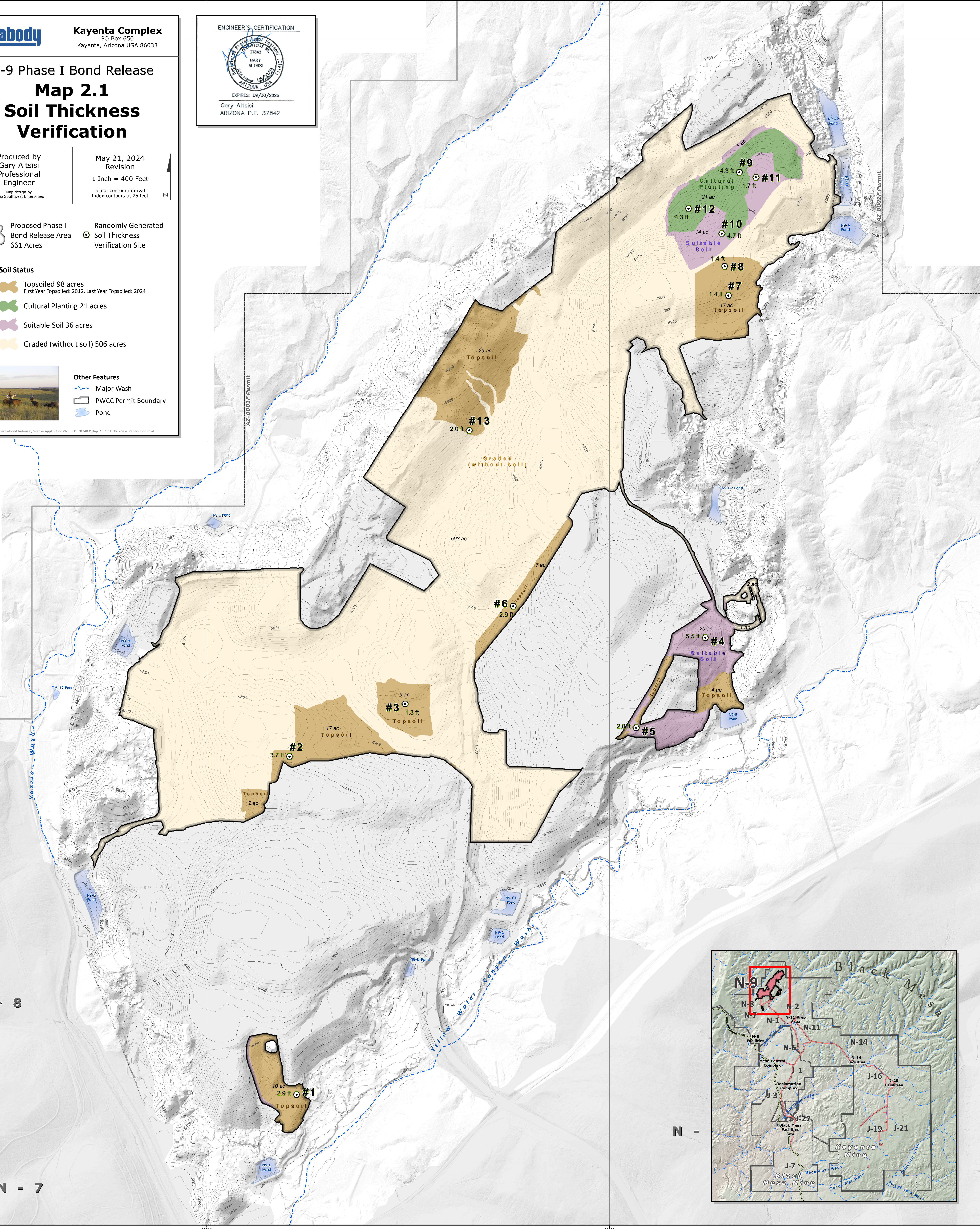
**Other Features**

- Major Wash
- PWCC Permit Boundary
- Pond

ENGINEER'S CERTIFICATION



EXPIRES: 09/30/2026  
Gary Altsisi  
ARIZONA P.E. 37842







**Kayenta Complex**  
PO Box 650  
Kayenta, Arizona USA 86033

N-9 Phase I Bond Release

# Map 2.2

## Spoil Sample Data

Produced by  
Gary Altsisi  
Professional  
Engineer

Map design by  
Deep Southwest Enterprises

May 21, 2024  
Revision

1 Inch = 400 Feet

5 foot contour interval  
Index contours at 25 feet



Proposed Phase I Bond Release Area

**Reclamation Status**

Grading activity: 2012 - 2024

- 506 acres Graded
- 77 acres Graded/Topsoiled
- 78 acres Graded/Topsoiled/Seeded

**Spoil Sample Sites (338)**

Depth Requirement Determination

- 1 foot
- 2 foot
- 3 foot
- 4 foot

Green Site Label =  
Marginally Suitable Site

Plus (+) Overlay in Point Symbol  
Indicates Midpoint Site

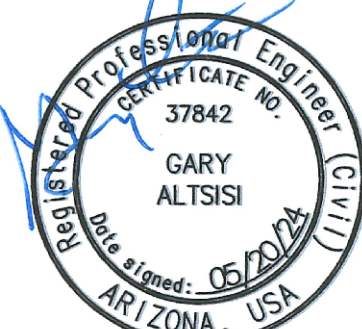
**Other Features**

- Cultural Planting
- Coal Removal Boundary
- Major Wash
- PWCC Permit Boundary
- Pond



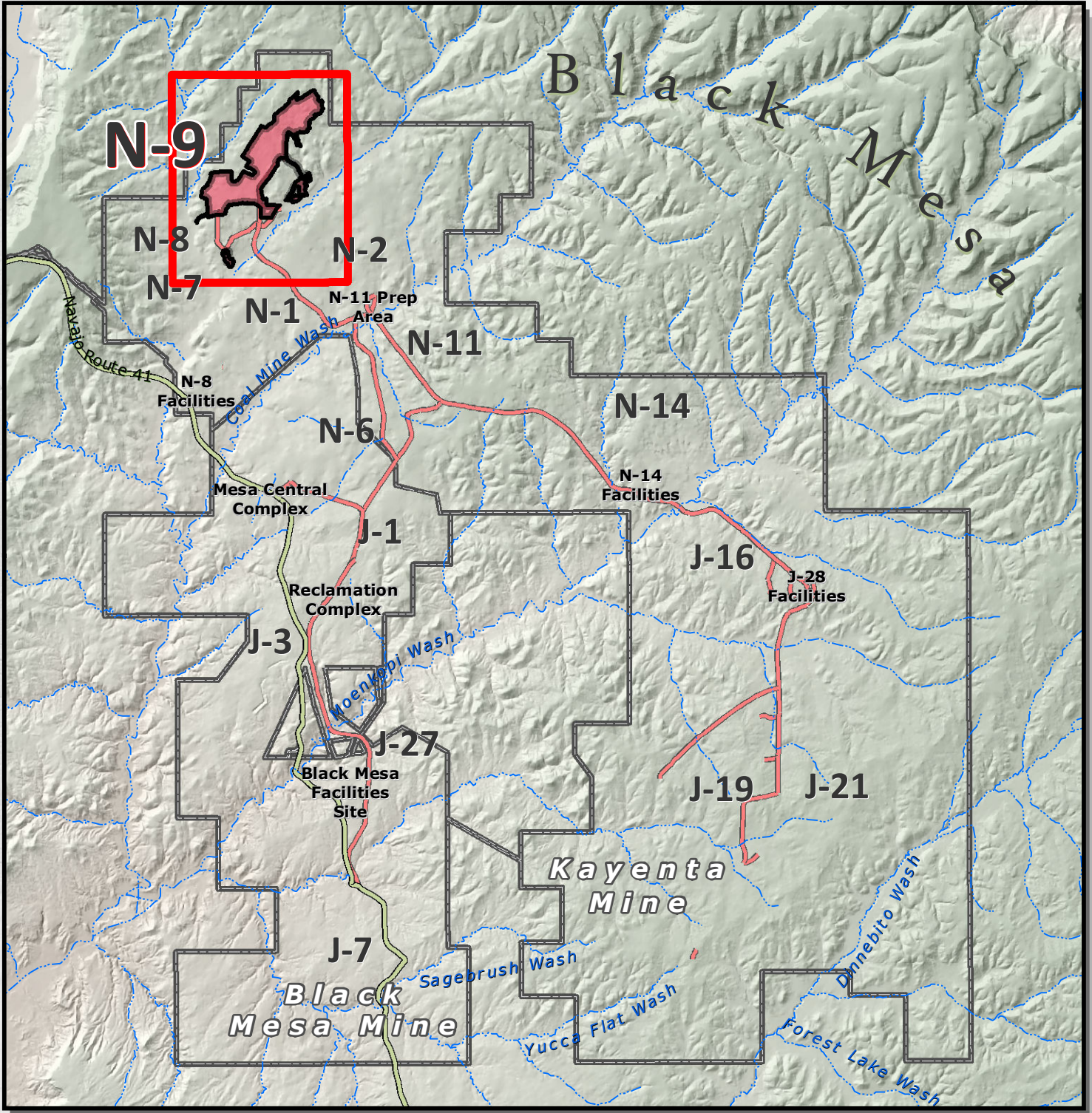
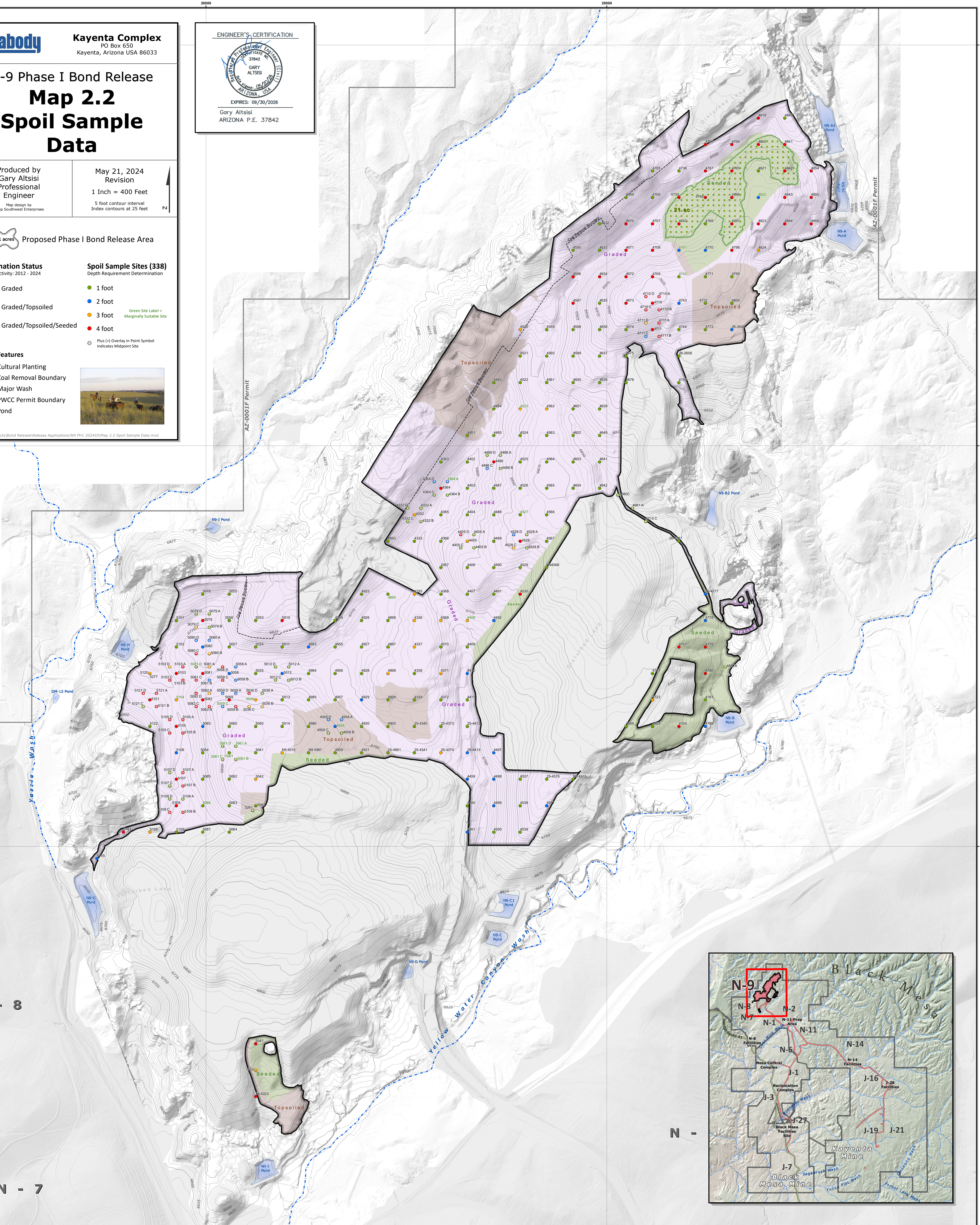
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EXPIRES: 09/30/2026

Gary Altsisi  
ARIZONA P.E. 37842





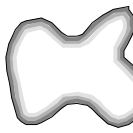


**Kayenta Complex**  
PO Box 650  
Kayenta, Arizona USA 86033

N-9 Phase I Bond Release  
**Map 2.3**  
**Post-Mine**  
**Slope Analysis**

Produced by  
Gary Altsisi  
Professional  
Engineer

May 21, 2024  
Revision  
1 Inch = 400 Feet  
5 foot contour interval  
Index contours at 25 feet



Proposed Phase I  
Bond Release Area  
661 Acres

**Post-Mine Slopes**

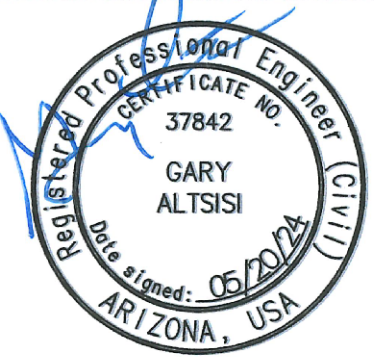
Symbol	% Slope	Acres	% of Total
	0 - 9	246	37
	9 - 13	145	22
	13 - 18	127	19
	18 - 25	110	17
	25 - 33	27	4
	33 +	6	1



**Other Features**

- Major Wash
- PWCC Permit Boundary

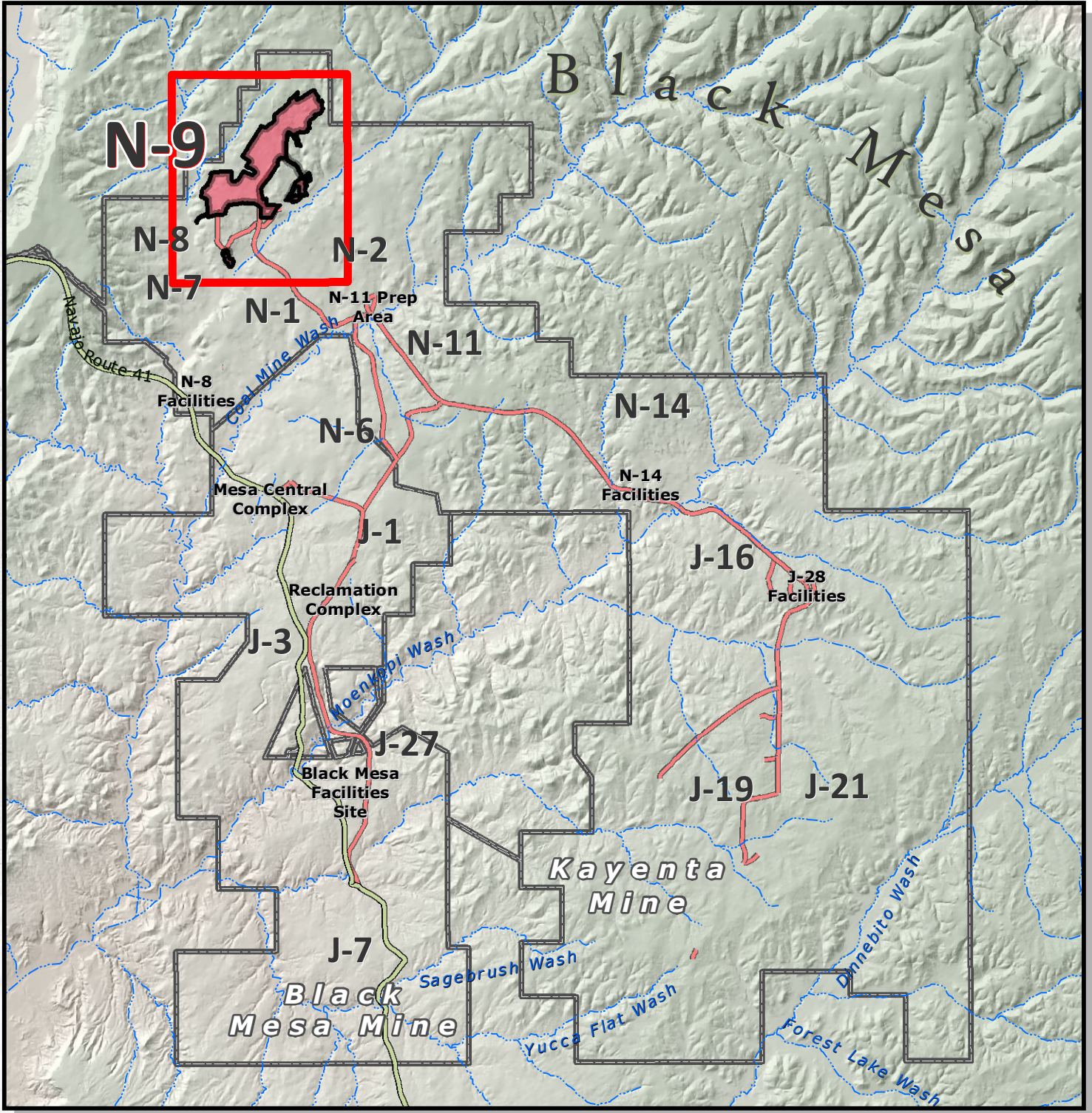
ENGINEER'S CERTIFICATION



EXPIRES: 09/30/2026  
Gary Altsisi  
ARIZONA P.E. 37842

N - 8

N - 7





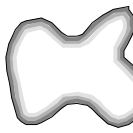


**Kayenta Complex**  
PO Box 650  
Kayenta, Arizona USA 86033

N-9 Phase I Bond Release  
**Map 2.4**  
**Pre-Mine**  
**Slope Analysis**

Produced by  
Gary Altsisi  
Professional  
Engineer

May 21, 2024  
Revision  
1 Inch = 400 Feet  
5 foot contour interval  
Index contours at 25 feet



Proposed Phase I  
Bond Release Area  
661 Acres

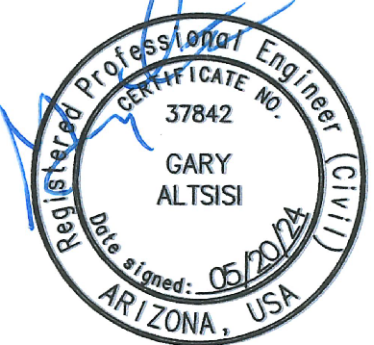
Pre-Mine Slopes			
Symbol	% Slope	Acres	% of Total
	0 - 9	311	47
	9 - 13	139	21
	13 - 18	101	15
	18 - 25	72	11
	25 - 33	28	4
	33 +	10	2



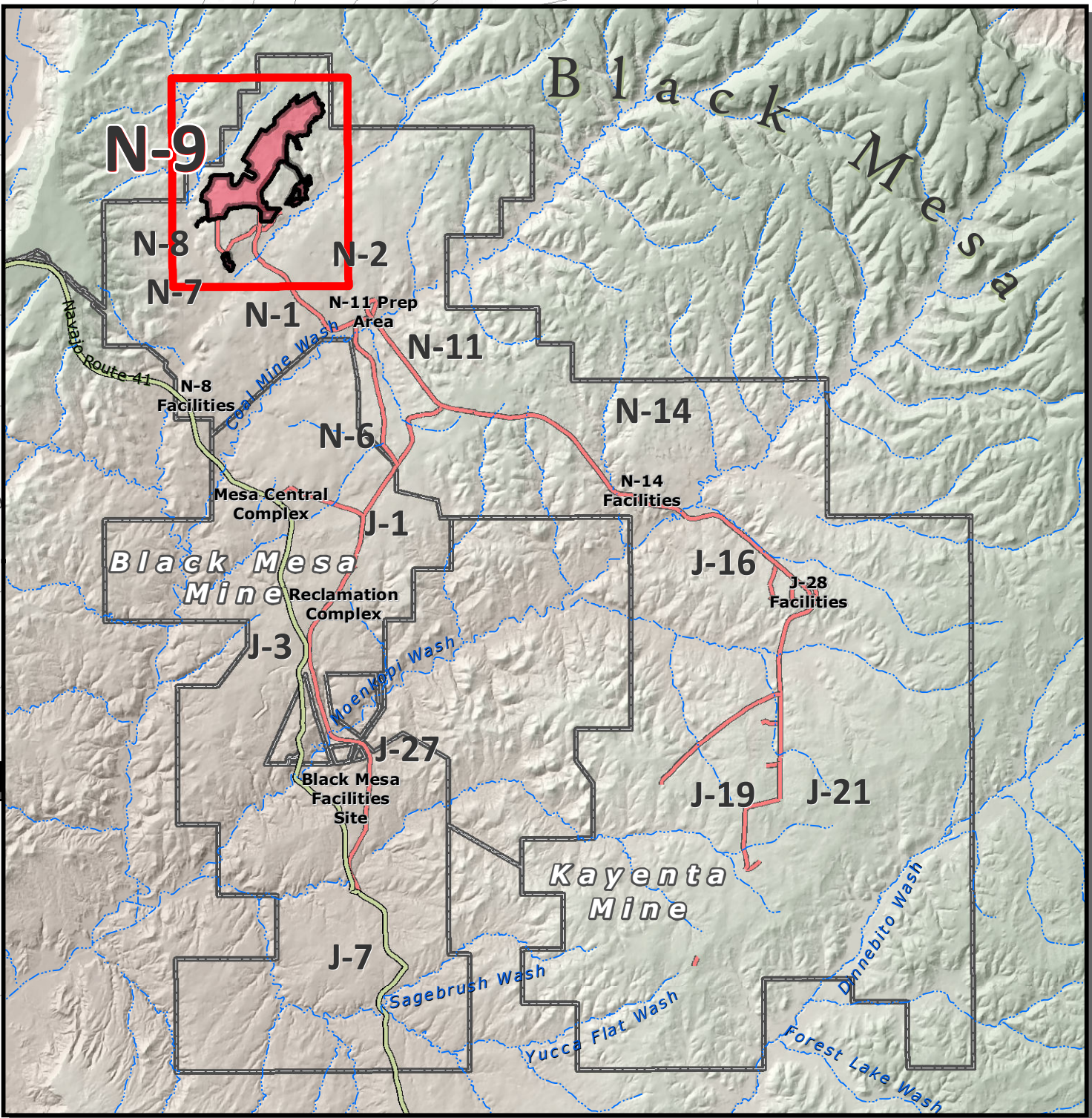
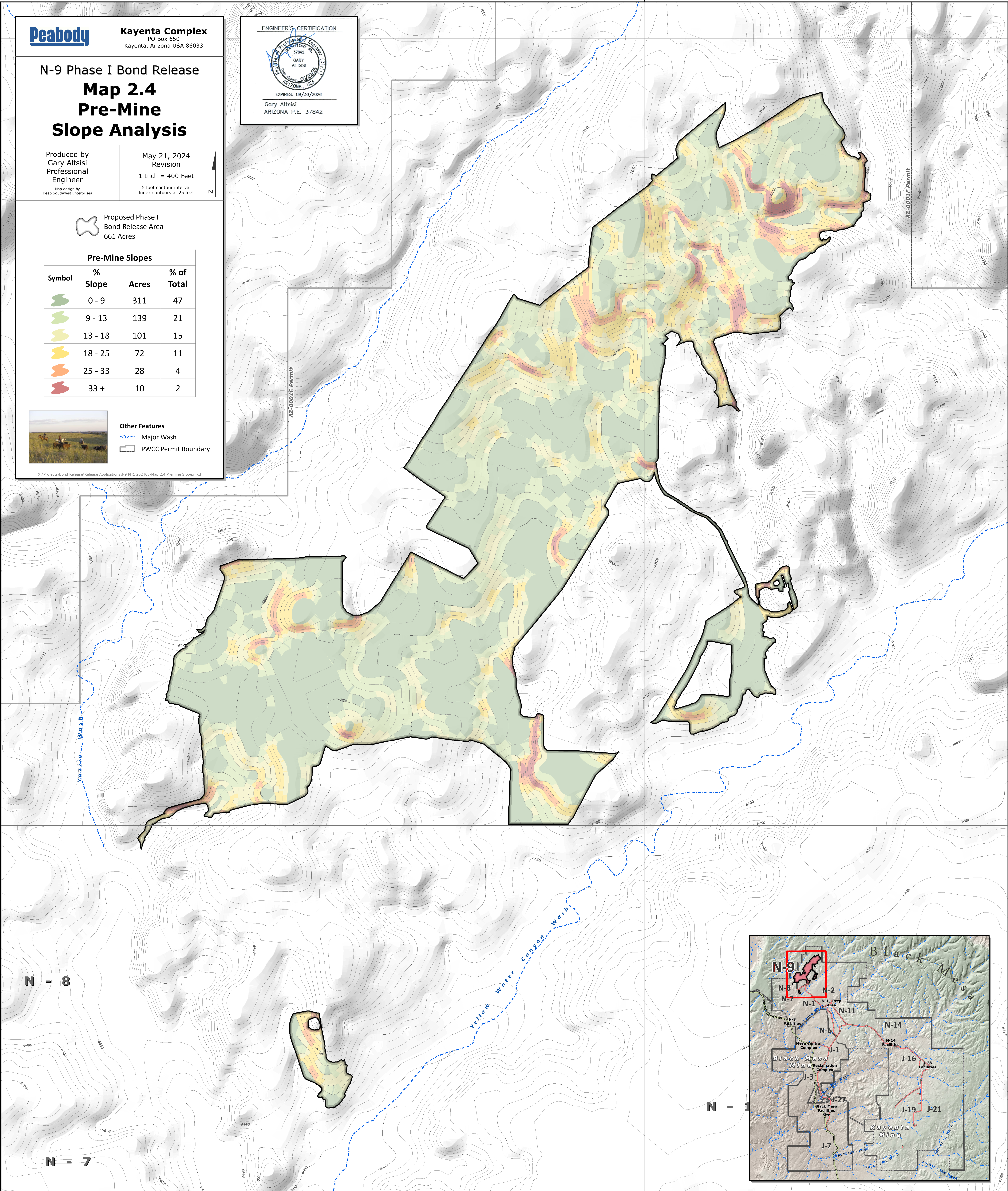
**Other Features**

- Major Wash
- PWCC Permit Boundary

ENGINEER'S CERTIFICATION



Gary Altsisi  
ARIZONA P.E. 37842







**Kayenta Complex**  
PO Box 650  
Kayenta, Arizona USA 86033

N-9 Phase I Bond Release  
**Map 2.5**  
**Post-Mine Topographic**  
**Surface Comparison**

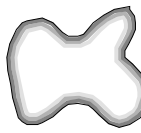
Produced by  
Gary Altsisi  
Professional  
Engineer

Map design by  
Deep Southwest Enterprises

May 21, 2024  
Revision

1 Inch = 400 Feet

5 foot contour interval  
Index contours at 25 feet



Proposed Phase I  
Bond Release Area  
661 Acres

**Final Surface Divergence From PMT**

Symbol	Divergence (feet)	Acres	% of Total
	< -40 (min -65)	5	1
	-40 to -21	45	7
	Within 20	552	83
	21 to 40	59	9
	> 40 (max 45)	0.3	0



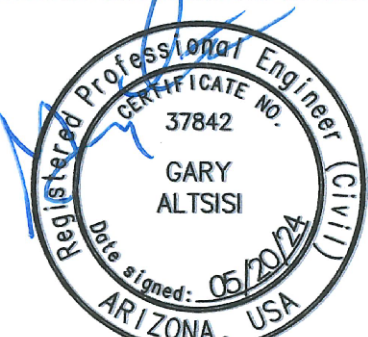
**Other Features**

Major Wash

PWCC Permit Boundary

X:\Projects\Bond Release\Release Applications\W9 PH1 2024\3\Map 2.5 Surface Comparison.mxd

ENGINEER'S CERTIFICATION

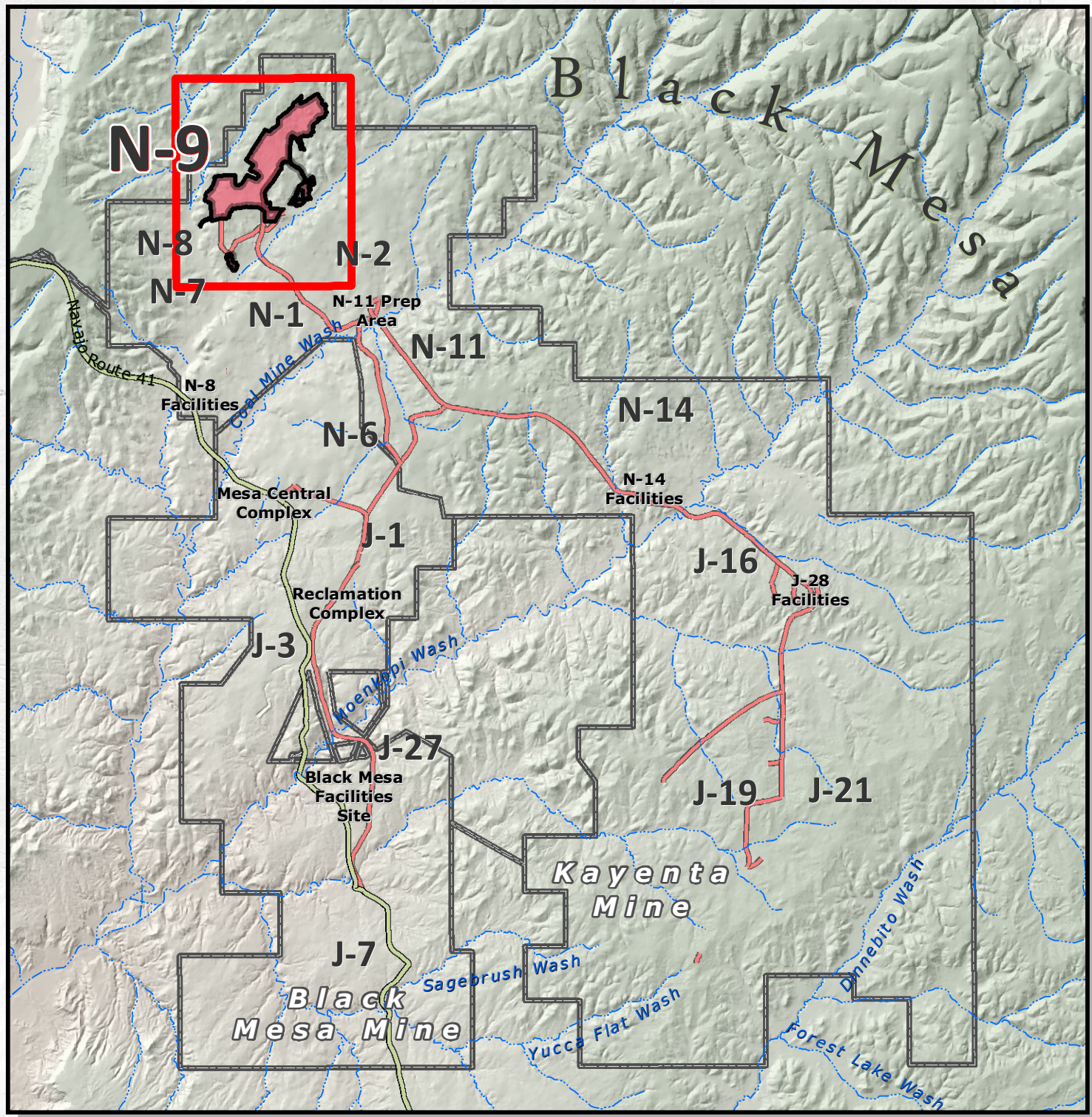


EXPIRES: 09/30/2026

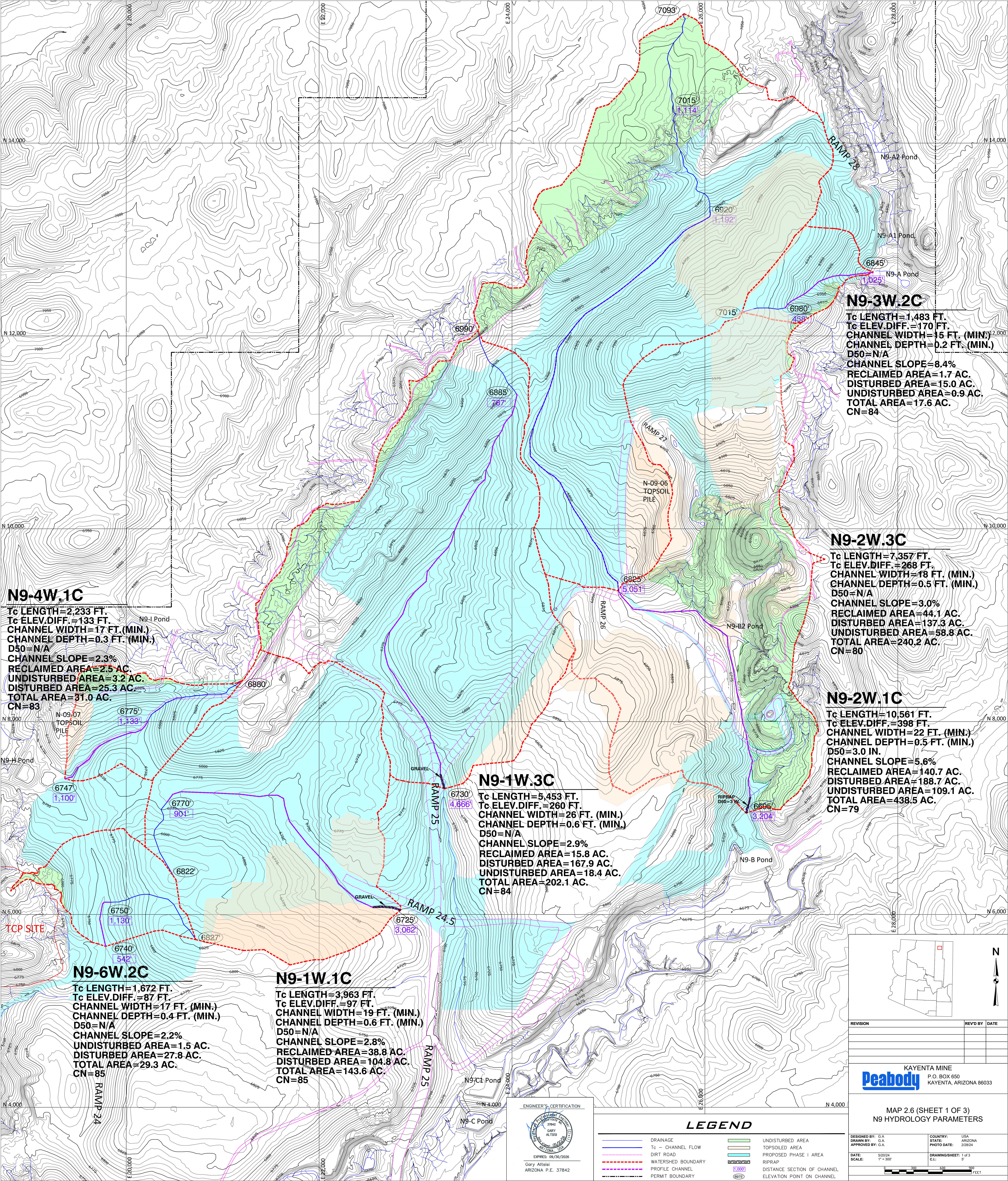
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N - 8

N - 7







### N9-4W.1C

Tc LENGTH=2,233 FT.  
Tc ELEV.DIFF.=133 FT.  
CHANNEL WIDTH=17 FT. (MIN.)  
CHANNEL DEPTH=0.3 FT. (MIN.)  
D50=N/A  
CHANNEL SLOPE=2.3%  
RECLAIMED AREA=2.5 AC.  
UNDISTURBED AREA=3.2 AC.  
DISTURBED AREA=25.3 AC.  
TOTAL AREA=31.0 AC.  
CN=83

TCP SITE

### N9-6W.2C

Tc LENGTH=1,672 FT.  
Tc ELEV.DIFF.=87 FT.  
CHANNEL WIDTH=17 FT. (MIN.)  
CHANNEL DEPTH=0.4 FT. (MIN.)  
D50=N/A  
CHANNEL SLOPE=2.2%  
UNDISTURBED AREA=1.5 AC.  
DISTURBED AREA=27.8 AC.  
TOTAL AREA=29.3 AC.  
CN=85

### N9-1W.1C

Tc LENGTH=3,963 FT.  
Tc ELEV.DIFF.=97 FT.  
CHANNEL WIDTH=19 FT. (MIN.)  
CHANNEL DEPTH=0.6 FT. (MIN.)  
D50=N/A  
CHANNEL SLOPE=2.8%  
RECLAIMED AREA=38.8 AC.  
DISTURBED AREA=104.8 AC.  
TOTAL AREA=143.6 AC.  
CN=85

### N9-1W.3C

Tc LENGTH=5,453 FT.  
Tc ELEV.DIFF.=260 FT.  
CHANNEL WIDTH=26 FT. (MIN.)  
CHANNEL DEPTH=0.6 FT. (MIN.)  
D50=N/A  
CHANNEL SLOPE=2.9%  
RECLAIMED AREA=15.8 AC.  
DISTURBED AREA=167.9 AC.  
TOTAL AREA=202.1 AC.  
CN=84

### N9-3W.2C

Tc LENGTH=1,483 FT.  
Tc ELEV.DIFF.=170 FT.  
CHANNEL WIDTH=15 FT. (MIN.)  
CHANNEL DEPTH=0.2 FT. (MIN.)  
D50=N/A  
CHANNEL SLOPE=8.4%  
RECLAIMED AREA=1.7 AC.  
DISTURBED AREA=15.0 AC.  
UNDISTURBED AREA=0.9 AC.  
TOTAL AREA=17.6 AC.  
CN=84

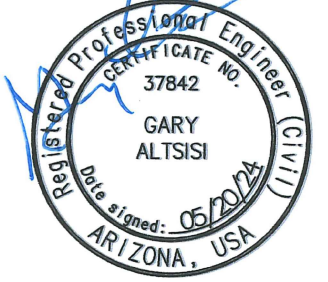
### N9-2W.3C

Tc LENGTH=7,357 FT.  
Tc ELEV.DIFF.=268 FT.  
CHANNEL WIDTH=18 FT. (MIN.)  
CHANNEL DEPTH=0.5 FT. (MIN.)  
D50=N/A  
CHANNEL SLOPE=3.0%  
RECLAIMED AREA=44.1 AC.  
DISTURBED AREA=137.3 AC.  
UNDISTURBED AREA=58.8 AC.  
TOTAL AREA=240.2 AC.  
CN=80

### N9-2W.1C

Tc LENGTH=10,561 FT.  
Tc ELEV.DIFF.=398 FT.  
CHANNEL WIDTH=22 FT. (MIN.)  
CHANNEL DEPTH=0.5 FT. (MIN.)  
D50=3.0 IN.  
CHANNEL SLOPE=5.6%  
RECLAIMED AREA=140.7 AC.  
DISTURBED AREA=188.7 AC.  
UNDISTURBED AREA=109.1 AC.  
TOTAL AREA=438.5 AC.  
CN=79

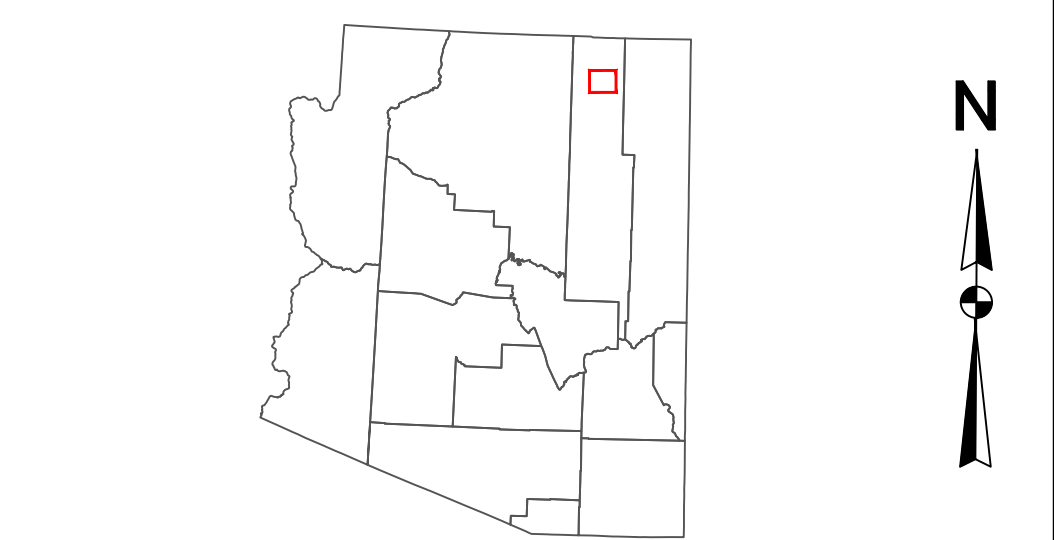
ENGINEER'S CERTIFICATION



Gary Altisi  
ARIZONA P.E. 37842

### LEGEND

	DRAINAGE		UNDISTURBED AREA
	Tc - CHANNEL FLOW		TOPSOILED AREA
	DIRT ROAD		PROPOSED PHASE I AREA
	WATERSHED BOUNDARY		RIPRAP
	PROFILE CHANNEL		DISTANCE SECTION OF CHANNEL
	PERMIT BOUNDARY		ELEVATION POINT ON CHANNEL

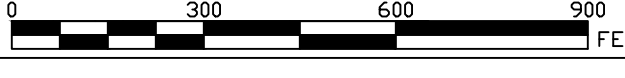


REVISION	REV'D BY	DATE

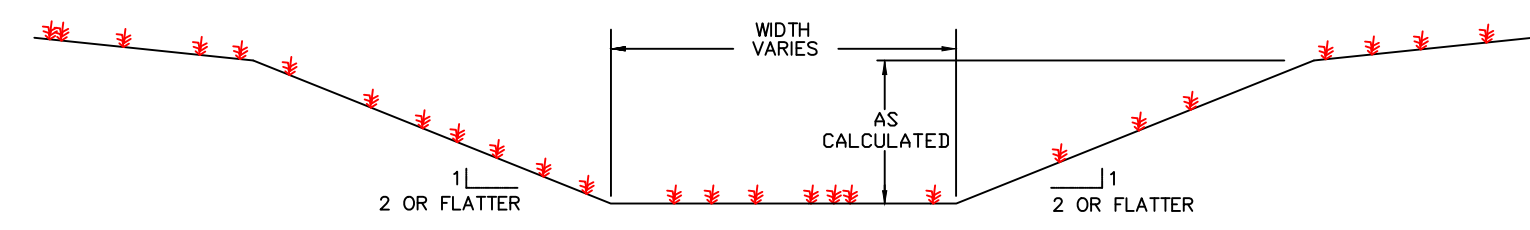
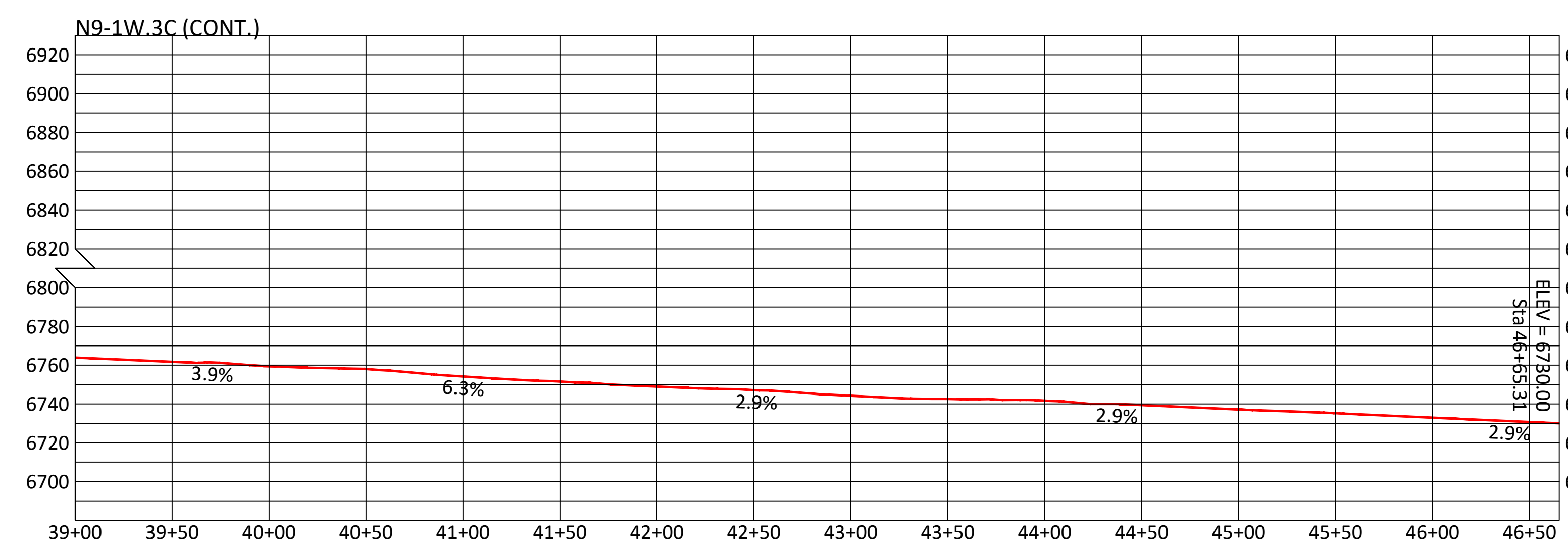
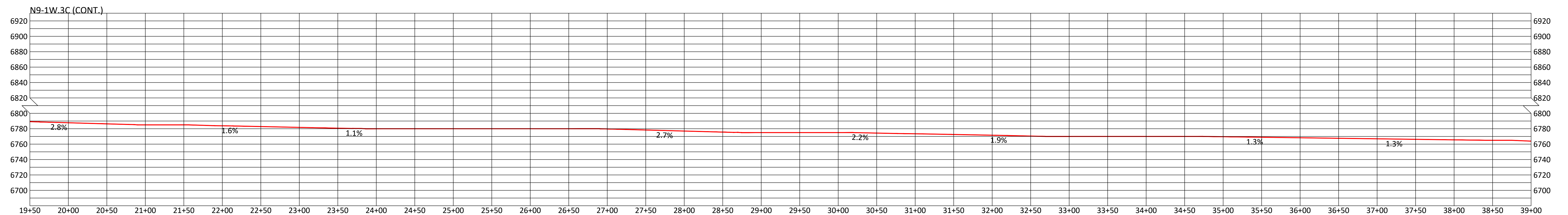
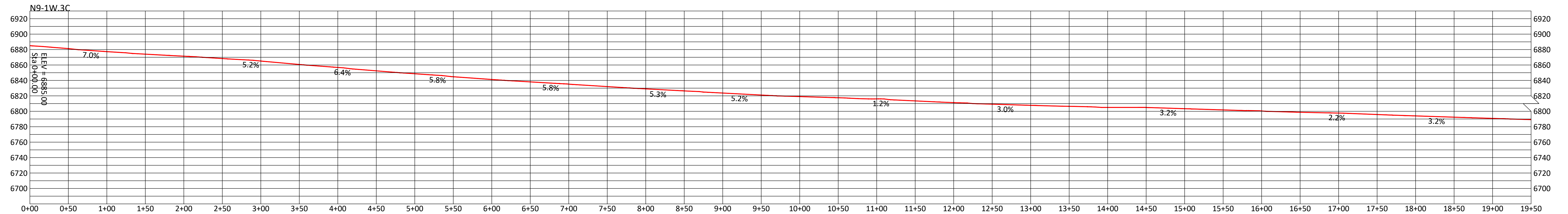
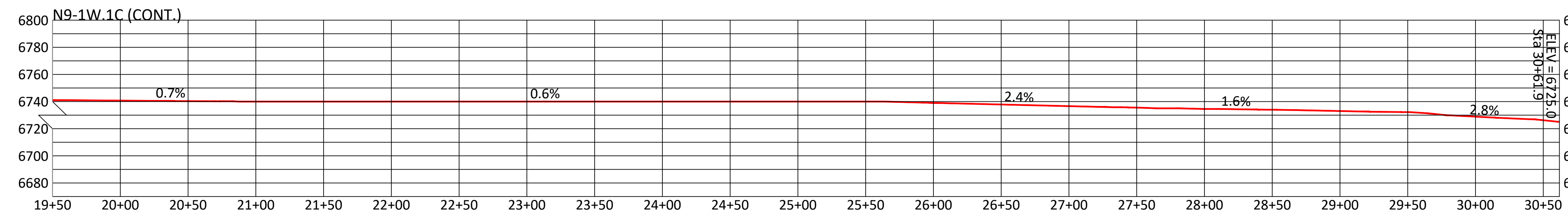
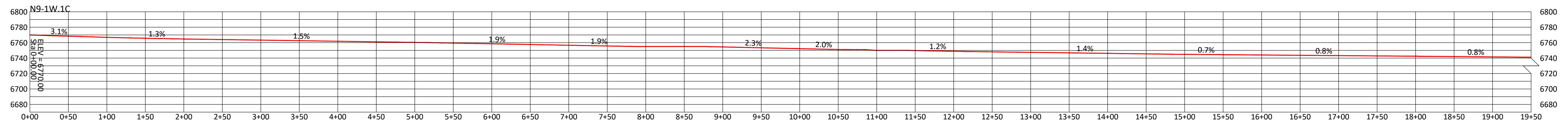
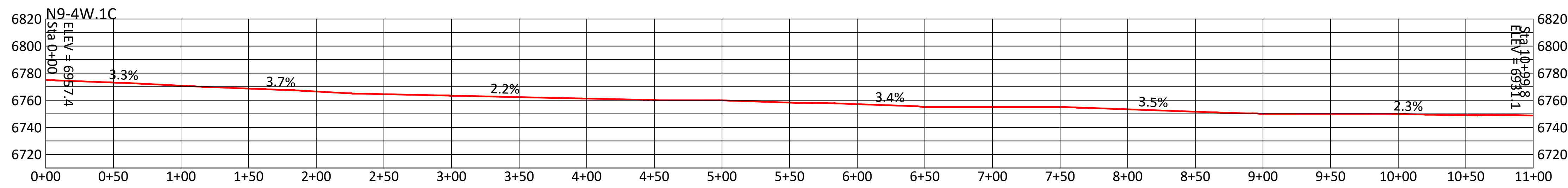
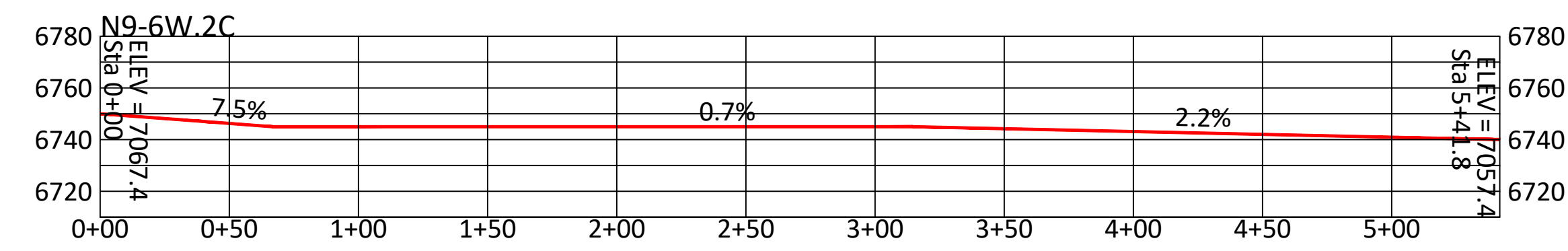
KAYENTA MINE  
**Peabody** P.O. BOX 650  
KAYENTA, ARIZONA 86033

MAP 2.6 (SHEET 1 OF 3)  
N9 HYDROLOGY PARAMETERS

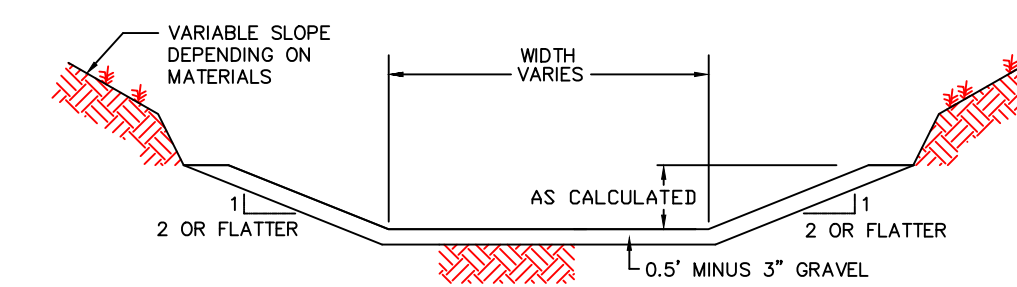
DESIGNED BY: G.A. DRAWN BY: G.A. APPROVED BY: G.A.	COUNTRY: USA STATE: ARIZONA PHOTO DATE: 2/28/24
DATE: 5/20/24 SCALE: 1" = 300'	DRAWINGSHEET: 1 of 3 Ct.: 5'



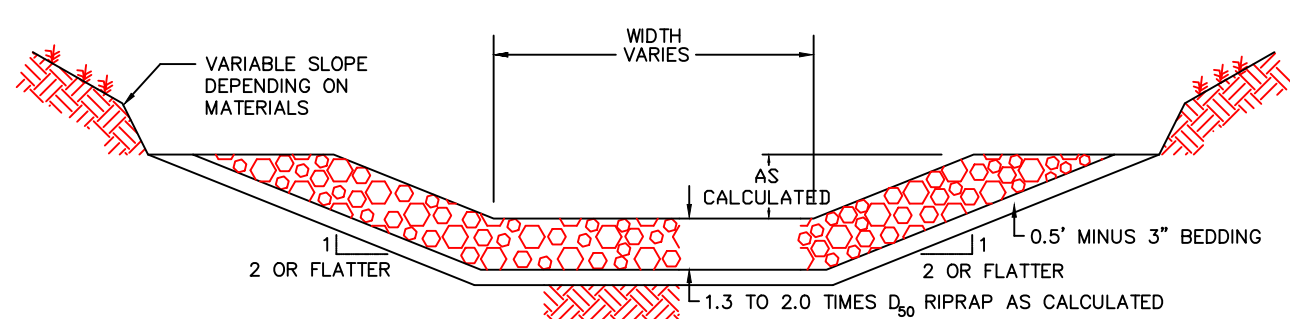




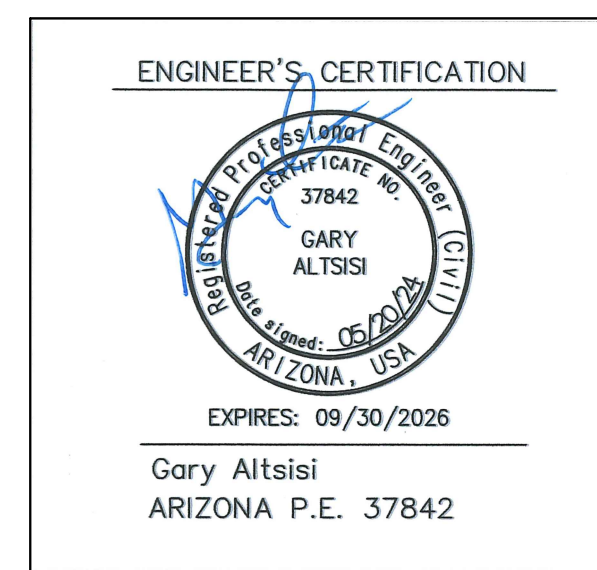
TYPICAL SECTION OF RECLAIMED TRAPEZOIDAL CHANNEL  
DESIGN A  
SPOIL/SOIL MIXED WITH VEGETATION  
(NOT DRAWN TO SCALE)



TYPICAL SECTION OF RECLAIMED TRAPEZOIDAL CHANNEL  
DESIGN B  
GRAVEL MIXED WITH VEGETATION  
(NOT DRAWN TO SCALE)



TYPICAL SECTION OF RECLAIMED TRAPEZOIDAL CHANNEL  
DESIGN C  
(NOT DRAWN TO SCALE)



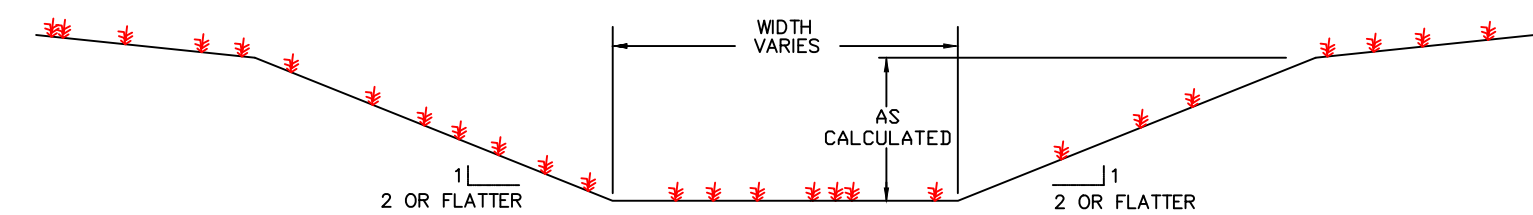
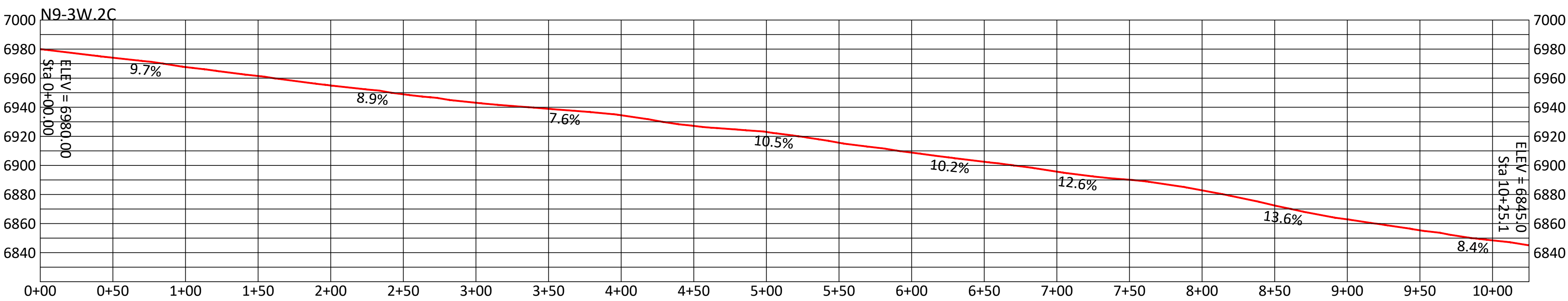
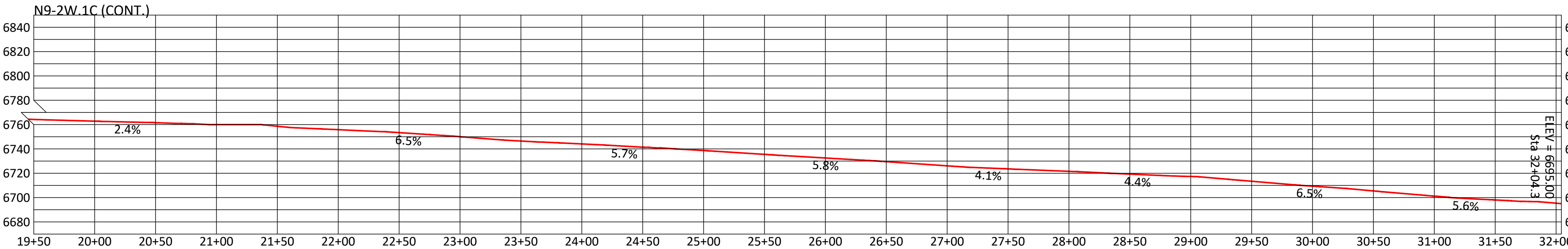
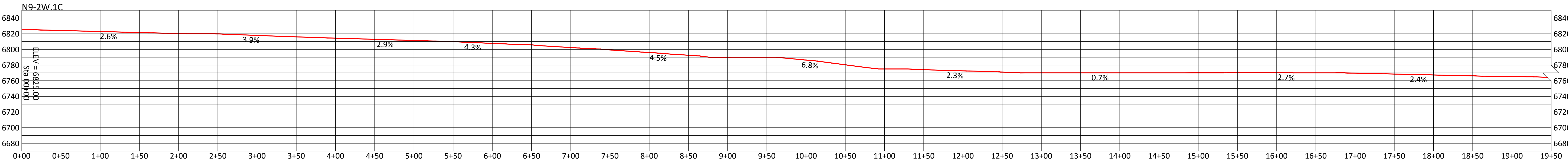
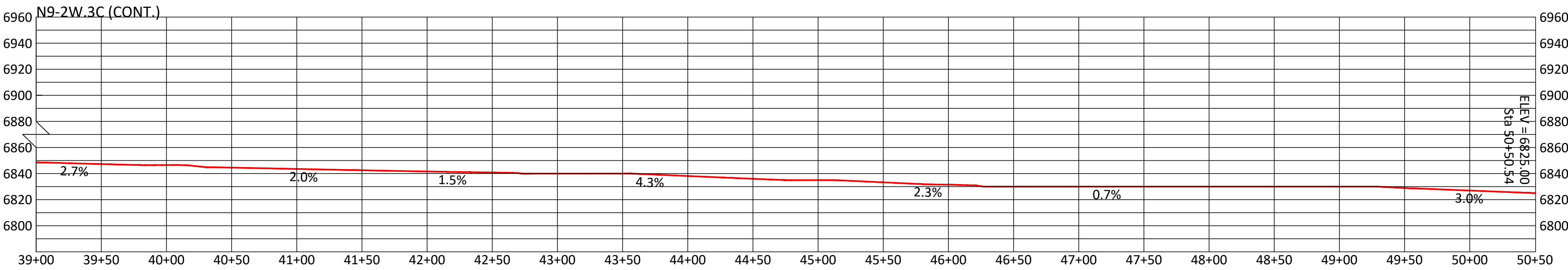
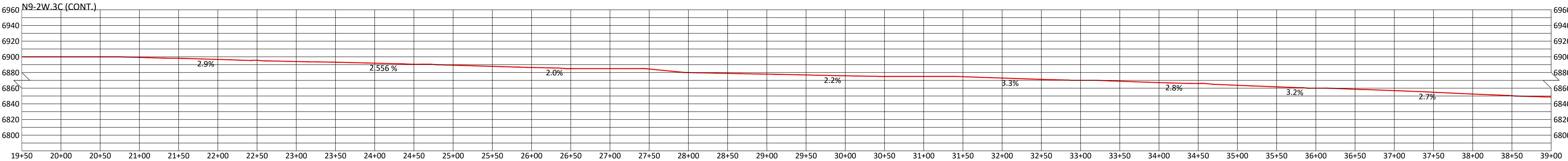
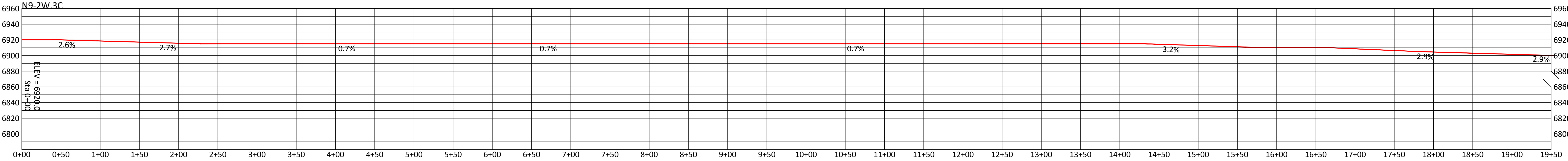
REVISION	REV'D BY	DATE

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

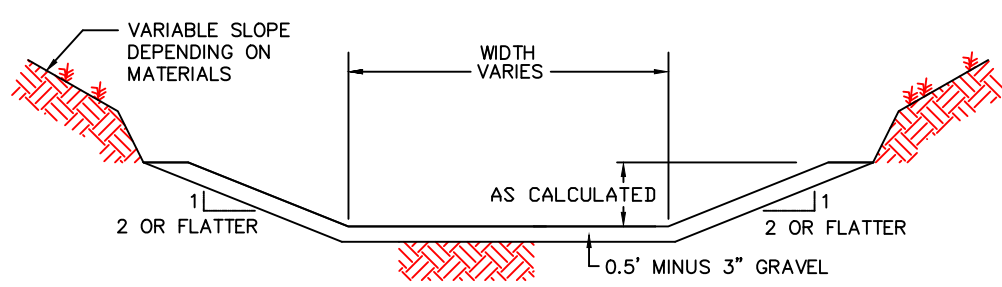
**MAP 2.6 (SHEET 2 OF 3)**  
**N9 HYDROLOGY PARAMETERS**

DESIGNED BY: G.A.	COUNTRY: USA
DRAWN BY: G.A.	STATE: ARIZONA
APPROVED BY: G.A.	PHOTO DATE: 2/28/24

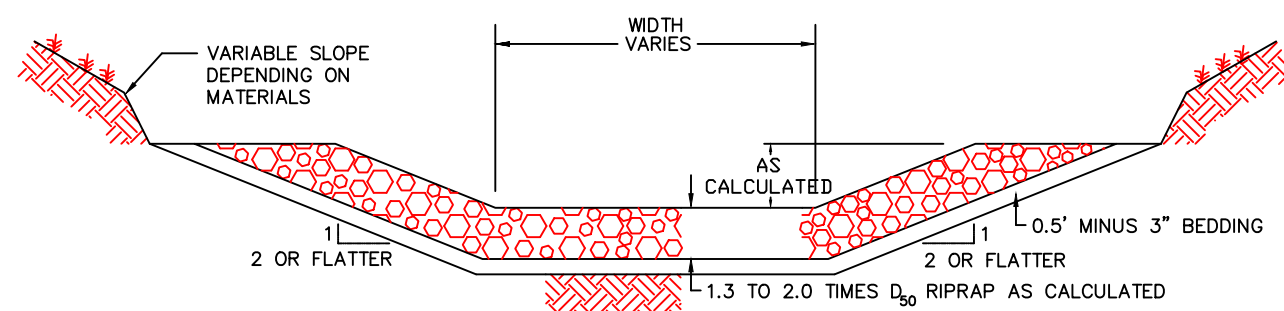
DATE: 5/20/24	DRAWING/SHEET: 2 of 3
SCALE: 1" = 50'	C.I.: 5'



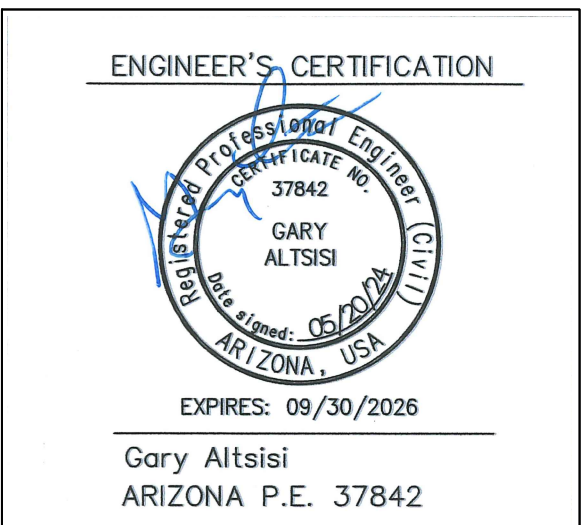
TYPICAL SECTION OF RECLAIMED TRAPEZOIDAL CHANNEL  
DESIGN A  
SPOIL/SOIL MIXED WITH VEGETATION  
(NOT DRAWN TO SCALE)



TYPICAL SECTION OF RECLAIMED TRAPEZOIDAL CHANNEL  
DESIGN B  
GRAVEL MIXED WITH VEGETATION  
(NOT DRAWN TO SCALE)



TYPICAL SECTION OF RECLAIMED TRAPEZOIDAL CHANNEL  
DESIGN C  
(NOT DRAWN TO SCALE)



REVISION	REV'D BY	DATE

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

MAP 2.6 (SHEET 3 OF 3)  
N9 HYDROLOGY PARAMETERS

DESIGNED BY: G.A. DRAWN BY: G.A. APPROVED BY: G.A.	COUNTRY: USA STATE: ARIZONA PHOTO DATE: 2/28/24
DATE: 5/20/24 SCALE: 1" = 50'	DRAWING/SHEET: 3 of 3 C.A.: 5'