

Midnite Mine Superfund Site

10090 Percent Design

Appendix C – Borrow Area

June 2015~~July 31, 2014~~

Prepared for:

Dawn Mining Company
PO Box 250
Ford, Washington 990413

and

Newmont USA Limited
6363 South Fiddler's Green Circle
Greenwood Village, Colorado 80111

Prepared By:

MWH Americas, Inc.
2890 E. Cottonwood Parkway, Suite 300
Salt Lake City, UT 84121

TABLE OF CONTENTS

C1.0 INTRODUCTION.....	1
C2.0 CANDIDATE SITES.....	2
C2.1 Rhoads Property Borrow Area	2
C2.2 Ford Borrow Area	3
C2.3 Miscellaneous Material	4
C3.0 COMPLIANCE WITH PERFORMANCE STANDARDS	5
C4.0 ENGINEERING DRAWINGS	6
C5.0 GREEN AND SUSTAINABLE REMEDIATION CONSIDERATIONS	6
C5.1 Borrow Area Construction Material Considerations.....	6
C5.2 Borrow Area Construction Methods.....	7
C5.3 Borrow Area Low Impact Development/Sustainability.....	7
C6.0 REFERENCES.....	9

ATTACHMENTS

Attachment C-1 Rhoads Property Plan of ~~Operations~~Operation and Reclamation

Attachment C-2 Ford Borrow Area Plan of Operation and Reclamation

LIST OF ACRONYMS

BODR	Basis of Design Report
CD	Consent Decree
cy	cubic yard
DMC	Dawn Mining Company
DNR	Department of Natural Resources
EPA	U.S. Environmental Protection Agency
GSR	Green and Sustainable Remediation
HEP	Habitat Evaluation Procedures
HSWRP	Hillside Waste Rock Pile
MM	Midnite Mine
MT	metric tons
Newmont	Newmont USA Limited
POO	Plan of Operation
POR	Plan of Operations and Reclamation
RA	Remedial Action
RAO	Remedial Action Objective
ROD	Record of Decision
Site	Midnite Mine Superfund Site
SOW	Scope of Work
Tribe	Spokane Tribe of Indians
WCA	Waste Containment Area
WDNR	Washington Department of Natural Resources

C1.0 INTRODUCTION

This appendix to the Midnite Mine Superfund Site Basis of Design Report (BODR) summarizes the Borrow Area design information. The planned remedial actions (RAs) at the Midnite Mine (MM) Superfund Site (~~the~~ Site) will require clean soil be transported to the Site for final cover and reclamation of the ground surfaces. These ground surfaces include the backfilled and covered pits, the excavated mine waste rock and protore stockpiles (mine materials) areas, and the drainages where sediments and other materials are removed. It was estimated in the Record of Decision (ROD) that approximately 700,000 cubic yards (cy) of clean soil from an approved borrow source will be used to provide an estimated three-foot-thick cover over the mine materials disposal area where mine materials will be consolidated (i.e., the waste containment areas), and to provide a one-foot-thick cover as needed in areas where bedrock is exposed during mine waste cleanup. These clean soils will be used for final grading/contouring and re-vegetation of the overall ground-surfaces. Additional details regarding how the cover will be constructed and graded are included in Appendix D – Mine Waste Excavation and Containment to this BODR.

The main body of this appendix was revised to reflect Spokane Tribal Council approval of use of the Rhoads Property Borrow Area and relegation of the Ford Borrow Area as a reserve borrow area for RA cover materials. Attachment C-1 contains the updated Rhoads Property Plan of Operations and Reclamation, Revision 2 (Rhoads POR, MWH, 2014) that was sent to EPA and the Tribe as an interim submittal in April 2014. Attachment C-2 contains the Ford Borrow Area Plan of Operations and Reclamation (Ford POR),⁷ and was revised to be consistent with the reclamation costs in Attachment C-1, and includes long-term operation and maintenance costs. Please note that should the Rhoads Property Borrow Area use be revoked and the Ford Borrow Area become the primary borrow source for the capping at the MM, there would be a significant delay in implementation of the RA. The delay would be caused primarily by the permitting and revisions to the final design drawings that will be necessary for use of this alternate borrow area and its material. In addition, significant modifications to the Steven's County Ford-Wellpinit-Westend Road would be required to accommodate the increased truck traffic that would result from hauling soil cover material from off site.

In addition to clean soil cover, smaller quantities of miscellaneous drainage and erosion protection material materials will be required. These materials will be sourced either by processing on-site mine waste materials or from off-site commercial sources, in cases where

on-site materials do not exist for the intended purpose or these materials do not meet soil cleanup standards.

C2.0 CANDIDATE SITES

Two primary off-site borrow areas were evaluated as part of the Pre-Design Investigations. These borrow areas are the Rhoads Property Borrow area, which is adjacent to the Site, and the Ford Borrow area which is south of the Dawn Millsite. A complete discussion of the characterization of these areas is included in the *Borrow Source Design Investigation Report* (MGC, 2011).

C2.1 Rhoads Property Borrow Area

The Rhoads Property Borrow Area is an approximate 81-acre parcel located on fee land within the boundary of the Spokane Indian Reservation, immediately adjacent to and southwest of the Site. Results of the geotechnical investigations discussed in Section 3.0 of the BODR indicate that the Rhoads Property Borrow Area contains approximately 710,000 cy of clayey sand that will be suitable for soil cap and cover material, and will be suitable for a topsoil/growth medium. In addition to the soils being suitable for cover material, a key advantage to using the Rhoads Property as the borrow source is the proximity to the Site. This will allow for short haul distances and eliminates over-the-road haul-truck traffic through nearby communities. The Spokane Tribal Council conditionally authorized use of the Rhoads property during the RA in a resolution dated February ~~2111~~, 2014. The *Rhoads POR (Property Plan of Operation – Rev 1 (Rhoads POO; MWH, 20142013))* was prepared and submitted to the Tribal Council describing how site materials would be excavated, transported, and the property will be reclaimed. Due to the fee land status of the Rhoads Property, permitting with Stevens County and the State of Washington Department of Natural Resources (WDNR) is required for this borrow area. Appendix M contains additional information regarding the required borrow area permitting.

Details of how the Rhoads Property would be used to supply borrow material during the RA is presented in the *Rhoads POR – Rev 2*, which is included in Attachment C-1. The *Rhoads POR* includes an Excavation Plan, Reclamation Plan, Long-Term Monitoring and Maintenance Plan, and a Stormwater Pollution Prevention Plan in addition to several other attachments (e.g., noxious weed plan) that were added since the initial version was submitted October ~~of~~ 2012. The *Rhoads POR* also summarizes the results from previous investigations of the proposed borrow source and uses that information in various evaluations presented in the document.

C2.2 Ford Borrow Area

The Ford Borrow Area is an approximately 332-acre tract located near Ford, Washington and approximately 20 road miles east of the Site. The Ford Borrow Area is a reserve borrow area, in case there is an insufficient volume of suitable borrow material in the Rhoads Property Borrow Area or permitting of the Rhoads Property Borrow Area is unsuccessful. Results of the geotechnical investigations summarized in Section 3.0 of the BODR and in the attached *Ford ~~POR~~ Borrow Area Plan of Operations and Reclamation—Rev 1 (Ford POR)* in Appendix C-2, indicate the Ford Borrow Area contains adequate quantities for cover material of two primary soil types: clean uniform sands and broadly graded sandy gravels, with varying amounts of cobbles.

Use of this borrow area as a source of borrow material will involve transportation of the material to the Site by way of over-the-road dump trucks and trailers for a one-way distance of approximately 20 miles. If the Ford Borrow Area is used, then trucks will travel through the communities of Ford and Wellpinit via the south borrow area roadway at the Dawn Millsite, State Highway 231, the Ford-Wellpinit/McCoy Lake Road, and the new Access Road constructed at the Site.

Despite the fact that the Ford Borrow Area contains adequate quantities of borrow material, the relatively low percentage of silt and clay in these materials make them less desirable as a cover material. Specifically, the low percent of silt and clay affects the soil's ability to retain moisture, which is a key constituent for reduction of meteoric water infiltration and radon emanation. If this source is used, a six-foot thick soil cover would be required in the areas where mine materials will be consolidated in the pits (as opposed to a three-foot thick layer if the Rhoads Property borrow material is used).

If the Ford Borrow Area is used for cover material, an upper plant growth layer would be required. The top 0.5 feet of the soil cover would consist of topsoil or amended soil to promote the establishment of vegetation. The recommended amendments are provided in *Attachment ~~D-12~~—the Revegetation Plan (located in BODR to Appendix D, Attachment D-12), of the BODR*. It is proposed that this plant growth material be obtained from the *LaneLayne* Mountain processing facility in Valley Washington or a similar material source. This material is also characterized in the *Borrow Source Design Investigation Report* (MGC, 2011).

Details of how the Ford Borrow Area would be used to supply borrow material during the RA is presented in the *Ford POR*, which is included in Attachment C-2. The Ford POR also summarizes the results from previous investigations of the proposed borrow area and uses that information in various evaluations presented in the document.

C2.3 Miscellaneous Material

Additional, relatively small quantities of drainage and erosion protection material materials will required for completions of RA construction. The SDs intend, to the extent practical, is to use on site materials sourced from the Hillside Waste Rock Pile (HSWRP) for the on-site drain and liner bedding materials.

A summary of estimated quantities for earthen materials that will be obtained from off-site commercial sources are summarized in Table C-1. These quantities and considerations associated with on-site processing of Hillside Waste Rock Pile (HSWRP) materials are discussed further in Appendix D. Drain materials that are to be placed outside of the Waste Containment Area (WCA) or above the WCA geomembrane cover are required to meet soil cleanup standards and will be sourced from off-site commercial sources. Likewise, erosion protection materials (e.g. rip rap and rip rap filter layers) are required to meet soil cleanup standards and will be sourced from off-site commercial sources.

Table C-1. Summary of Estimated Offsite Material Quantities

<u>Material Description</u>	<u>Specification Section Reference</u>	<u>Estimated Quantity (Cubic Yards)</u>
<u>Crushed Aggregate Base Course</u>	<u>02200-2.2.F</u>	<u>2,148</u>
<u>Crushed Aggregate Surface Course</u>	<u>02200-2.2.G</u>	<u>9,913</u>
<u>Pea Gravel</u>	<u>02200-2.2.H</u>	<u>173</u>
<u>Clean Drain Gravel</u>	<u>02200-2.2.I</u>	<u>8,331</u>
<u>Filter Sand - Similar to 02205-2.3.B below, but must meet soil cleanup standards.</u>	<u>02200-2.2.K</u>	<u>715</u>
<u>Intermediate Filter Sand - Similar to 02205-2.3.C below, but must meet soil cleanup standards.</u>	<u>02200-2.2.L</u>	<u>1,370</u>
<u>Filter Sand - Similar to 02200-2.2.K, but is used in WCA, not required to meet soil cleanup standards.</u>	<u>02205-2.3.B</u>	<u>1,306</u>
<u>Intermediate Filter Sand - Similar to 02200-2.2.L, but is used in WCA, not required to meet soil cleanup standards.</u>	<u>02205-2.3.C</u>	<u>1,453</u>
<u>Alluvial Groundwater Control System - Drain Sand</u>	<u>02223-2.1.E</u>	<u>1,025</u>
<u>Type 0 (3-inch) Rip Rap</u>	<u>022273-2.1.B.1</u>	<u>16</u>
<u>Type I (6-inch) Rip Rap</u>	<u>022273-2.1.B.2</u>	<u>677</u>
<u>Type II (9-inch) Rip Rap</u>	<u>022273-2.1.B.3</u>	<u>4,003</u>
<u>Type III (12-inch) Rip Rap</u>	<u>022273-2.1.B.4</u>	<u>6,676</u>
<u>Type V (24-inch) Rip Rap</u>	<u>022273-2.1.B.6</u>	<u>2,873</u>
<u>Type I Rip Rap Filter</u>	<u>022273-2.3.A.1</u>	<u>2,311</u>
<u>Type II Rip Rap Filter</u>	<u>022273-2.3.A.2</u>	<u>3,404</u>
<u>Type III Rip Rap Filter</u>	<u>022273-2.3.A.3</u>	<u>599</u>

C3.0 COMPLIANCE WITH PERFORMANCE STANDARDS

The Consent Decree (CD) Scope of Work (SOW) includes the Performance Standards that were developed to define attainment of the Remedial Action Objectives (RAOs) of the Selected Remedy. The Performance Standards include both general and specific standards applicable to the Selected Remedy work elements and associated work components. All of the Performance Standards associated with the Site remedy are summarized on Table 4-6 in the BODR. That master table lists each Performance Standard, summarizes where or how each is addressed in this BODR, and the current status.

Performance Standards specific to the cover construction are discussed in Appendix D – Mine Waste Excavation and Containment. The key Performance Standard related to the geologic cover materials (Performance Standard 2.4.2.4.2 H. ii.) requires that the cover thickness be sufficient to limit radon flux from the consolidated materials. As discussed above, the clayey sand in the Rhoads Property Borrow Area is better suited to meet this Performance Standard

because these materials require a thinner cover than the sandy materials from the Ford Borrow Area.

C4.0 ENGINEERING DRAWINGS

The engineering drawings for the two proposed borrow sources are contained in Volume II of the BODR. These drawings are listed below.

Sheet Number	Description
3-101	Rhoads Property Borrow Source Location Map
3-102	Rhoads Property Borrow Area Pre-Excavation Map
3-103	Rhoads Property Temporary Haul Road Key Map
3-104	Haul Road Plan and Profile Station 0+00 to 15+00
3-105	Temporary Haul Road Plan and Profile Station 15+00 to 30+00
3-106	Temporary Haul Road Plan and Profile Station 30+00 to 45+00
3-107	Temporary Haul Road Plan and Profile Station 45+00 to 60+00
3-108	Temporary Haul Road Plan and Profile Station 60+00 to END
3-109	Rhoads Property Final Reclamation Topography Map
3-110	Reclaimed Borrow Area Sections A and B
3-111	Reclaimed Borrow Area Section C
3-112	Borrow Area Typical Details and Sections
3-201	Ford Borrow Area Location Map
3-202	Ford Borrow Area Existing Conditions
3-203	Ford Borrow Area Layout
3-204	Ford Borrow Area Cross Sections
3-205	Ford Borrow Area Reclaimed Layout

These drawings are included in the *Rhoads POR* (Attachment C-1) and the *Ford POR* (Attachment C-2).

C5.0 GREEN AND SUSTAINABLE REMEDIATION CONSIDERATIONS

The green and sustainable remediation (GSR) considerations for obtaining borrow material during the RA are summarized below. The areas where GSR principles have been evaluated are: 1) Construction Materials (characteristics and manufacturing considerations), 2) Construction Methods, and 3) Low Impact/Sustainability measures that will be used during the excavation, transport, placement, and reclamation of the potential borrow areas during the RA.

C5.1 Borrow Area Construction Material Considerations

As stated above, the characteristics of the borrow material found at the Rhoads Property Borrow Area are more suitable for use as cover and for revegetation due to its clay content. In addition,

the soils from the Rhoads Property Borrow Area will allow for a thinner cover than the sandy soils from the Ford Borrow Area. A thinner cover (less material volume) directly equates to fewer equipment hours for excavation, transport, and placement of the cover system.

C5.2 Borrow Area Construction Methods

The construction equipment used for borrow source excavation and reclamation will be appropriately sized, depending on the topography of the area, to reduce fuel consumption and greenhouse gas emissions. Construction will be sequenced to minimize stormwater erosion during these activities. Dust suppression will be utilized at the Rhoads Property Borrow Area and on the haul roads from the borrow area to the Site to decrease dust emissions. Please refer to the dust control details in Attachments C-1 and C-2.

C5.3 Borrow Area Low Impact Development/Sustainability

The primary green and sustainable considerations for the use of the Rhoads ~~Property~~ ~~property~~ over the Ford property as a cover borrow source are (1) its close proximity to the Site (approximately 150 feet southwest versus 20 miles), and (2) the smaller volume of Rhoads Property material needed for the RA cover. Because the Rhoads property is directly adjacent to the Site, it greatly reduces the truck haul distances required to transport the borrow material and eliminates haul-truck traffic through nearby communities during the three major periods of cover construction. The higher clay content in the Rhoads Property Borrow Area material results in a lower thickness and smaller volume of cover material (than Ford Borrow Area material) to meet radon emanation and infiltration control requirements. It is estimated that 2,000 metric tons (MT) of greenhouse gas emissions will be associated with the excavation, transportation, and placement of the Rhoads Property Borrow Area material, compared to approximately 10,000 MT -if the Ford Borrow Area is used as the borrow source. This use of the Rhoads Property saves an estimated 836,000 gallons of diesel fuel and 8,000 MT of greenhouse gas emissions.

Along with significant greenhouse gas savings through the use of the Rhoads ~~Property~~ ~~property~~, there are other key green and sustainable considerations directly related to its location and the much reduced haul-truck traffic. These potential GSR benefits are:

- Low potential for traffic congestion, collisions or accidents, or road damage due to no over-the-road hauling of borrow materials.
- Reduced community impacts. If the Ford Borrow Area is used, haul truck traffic will cause noticeable increases in noise, road wear, and engine exhaust along the transport

route. Use of the Rhoads Propertyproperty would essentially reduce vehicle traffic through Wellpinit to construction personnel, fuel transport, and non-borrow material transport. As a result, there would be limited effects on the character of the local communities due to construction-related traffic.

Additional green and sustainable practices that will be employed should the Rhoads Propertyproperty be used include:

- To minimize impact to the riparian corridor along Whitetail Creek, which runs north to south along the east side of the Rhoads property, no excavation will be performed within a minimum 50-foot buffer area on either side of the stream, and proper grading of the surface as it approaches the 50-foot buffer zone will be performed to prevent sediment migration to the creek.
- The upper 1 foot of excavated soil will be stockpiled near the borrow area and re-used, after excavation of the borrow material is complete, to reclaim the borrow site.
- The commercial-value timber at the Rhoads Property Borrow Area will be bid to a Tribal timber contractor for clearing and harvest. Newmont/DMC representatives will coordinate with the Tribal Council to identify potential ways to distribute timber proceeds in a manner that is beneficial to the Tribe.
- The re-vegetation plan includes the hydroseeding of a native, Tribal-approved seed mix followed by the planting of native trees and shrubs to provide habitat and food for local wildlife populations. The actual seed mix and application rates were updated following the HEP vegetation survey in 2014. Seed mix and application rates are discussed in Revegetation Plan (Appendix D, Attachment D-12)
- The plant seedlings will be native to the borrow area. Arrangements will be made with a local nursery to promulgate the seed materials from the site and grow the seedlings from these seed sources.
- After revegetation efforts are complete, noxious weed surveys will be conducted routinely as described in an attachment to the *Rhoads POR* and in the body of the *Ford POR*. These efforts will help ensure native plant populations are retained and maintained on the reclaimed land surfaces.

C6.0 REFERENCES

Miller Geotechnical Consultants (MGC), 2011. Borrow Source Design Investigation Report, Revision 2, May 6.

~~MWH Americas, Inc. (MWH), 2013. Rhoads Property Plan of Operation, Revision 1. November 12.~~

MWH Americas Inc. (MWH), 2014. Rhoads Property Plan of Operations and Reclamation, Revision 2. April 29.

Attachment C-1

Rhoads Property Plan of Operations and Reclamation

Attachment C-2

Ford Borrow Area Plan of Operations and Reclamation
