

# Midnite Mine Superfund Site

## 10090 Percent Design

### Appendix Z – Well Decommissioning Plan

*~~Note: This Well Decommissioning Plan has been prepared to a 90-percent level. Minor edits to this plan are anticipated as the Midnite Mine Remedial Design is finalized.~~*

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## ATTACHMENT

Attachment Z-1 Monitoring Well and Piezometer Completion Logs

## LIST OF ACRONYMS

|                   |   |
|-------------------|---|
| bgs               | below ground surface  |
| BODR              | Basis of Design Report  |
| CERCLA<br>Company | Comprehensive Environmental Response, Compensation, and Liability Act<br>Newmont USA Limited and Dawn Mining Company, LLC |
| EPA               | U.S. Environmental Protection Agency  |
| PE                | Professional Engineer   |
| RA<br>RCW         | Remedial Action<br>Revised Code of Washington   |
| Site<br>SMP       | Midnite Mine Superfund Site<br>Site-wide Monitoring Plan  |
| U.S.C.            | United States Code  |
| WAC<br>WDP        | Washington Administrative Codes<br>Well Decommissioning Plan  |

## Z1.0 INTRODUCTION

This Well Decommissioning Plan (WDP) presents the procedures for plugging or removing monitoring wells and piezometers during the remedial action (RA) at the Midnite Mine Superfund Site (Site) located in Wellpinit, Washington. This WDP is a component of the Midnite Mine Superfund Site Basis of Design Report (BODR), which presents the background and supporting information relevant to the Site and the planned RAs. The BODR contains the engineering drawings, plans, and specifications for the RA. The RA and the associated well decommissioning will be directed by Newmont USA, Limited and Dawn Mining Company, LLC, hereafter referred to as the Company.

### Z1.1 WELL DECOMMISSIONING PURPOSE AND SCOPE

The monitoring wells and piezometers (hereafter collectively referred to as wells) listed in this WDP will be plugged or removed because they are no longer used for groundwater monitoring at the Site. Also, many of the wells scheduled for decommissioning are located within the mine area that will be physically altered during the RA (i.e., areas where mine wastes will be excavated and/or cover material will be placed).

### Z1.2 WELL DECOMMISSIONING LOCATIONS AND WELL COMPLETION DETAILS

The locations of the wells that will be decommissioned and those that will remain for ongoing monitoring are shown on Figure Z-1. The available well completion documentation is included in Attachment Z-1. A summary of the available completion information for the wells scheduled to be decommissioned is presented on Table Z-1.

## Z2.0 APPLICABLE WELL DECOMMISSIONING RULES AND REGULATIONS

The Site RA is governed by the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). As a result, no federal, state, or local permits are required for performing RA activities, as stipulated by CERCLA under 42 U.S.C. 9621(e)(1). However, the well decommissioning activities described herein will substantially comply with Washington Administrative Codes (WAC) regulations and policy, specifically WAC Chapter 173-160-460 for the decommissioning of resource protection wells.

WAC Chapter 173-160 (Minimum Standards for Construction and Maintenance of Wells) includes the following definitions that are relevant to this WDP:

**Decommissioning** - means to fill or plug a well so that it will not produce water, serve as a channel for movement of water or pollution, or allow the entry of pollutants into the well or aquifer(s).

**Resource protection well** - means a cased boring intended or used to collect subsurface information or to determine the existence or migration of pollutants within an underground formation. Resource protection wells include monitoring wells, observation wells, piezometers, spill response wells, remediation wells, environmental investigation wells, vapor extraction wells, ground source heat pump boring, grounding wells, and instrumentation wells.

**Monitoring well** - means a well designed to obtain a representative groundwater sample or designed to measure the water level elevations in either clean or contaminated water or soil.

**Piezometer** - means a well designed to measure water level elevation at a specific depth beneath the water table.

**Grout** - is a fluid mixture of cement, bentonite, and water used to seal the annular space around or between well casings, or to decommission wells.

**Pressure grouting** - is a method of forcing grout into specific portions of a well for sealing purposes.

## **Z2.1 LICENSED WELL OPERATOR/PROFESSIONAL ENGINEER**

In accordance with WAC 173-162 (Regulation and Licensing of Well Contractors and Operators), a licensed resource protection well operator will perform all well decommissioning at the Site. A Company representative will supervise the licensed well operator. The licensed well operator will ensure that the decommissioning procedures and plugging materials comply with WAC 173-160 (Minimum Standards for Construction and Maintenance of Wells). Alternately, a Washington Professional Engineer (PE) may supervise the decommissioning activities in lieu of a licensed well operator as provided in Revised Code of Washington (RCW) 18.104.180.

## Z3.0 WELL DECOMMISSIONING PROCEDURES

Figure Z-2 presents a decision diagram for the well decommissioning procedures. The majority of resource wells will be decommissioned in accordance with the procedures in WAC Chapter 173-160-460. The exceptions are resource wells that are completed in, but do not extend through the full depth of the mine wastes that will be excavated during the RA. The resource wells that are completed in but do not extend through the mine wastes will be excavated along with the mine wastes; and the excavated well materials will be consolidated along with the mine wastes in the mine pits. Resource wells that are completed outside of the mine wastes or wells that extend through the mine wastes and are completed in native material below the mine wastes will be decommissioned in accordance with the procedures in WAC Chapter 173-160-460 as described below prior to excavating the mine wastes. Resource wells with incomplete or nonexistent well completion information will be decommissioned in accordance with the procedures in WAC Chapter 173-160-460. The relevant portions of WAC Chapter 173-160-460 are presented below:

### **WAC 173-160-460**

#### ***Decommissioning process for resource protection wells***

*(1) For resource protection wells and geotechnical soil borings that were not constructed in accordance with these regulations, or for which a drilling report required under this section is missing, remove all debris, accumulated sediment, equipment and obstructions from the well casing, except well screens and packers, and decommission in one of the following ways:*

*(a) Perforate the casing from the bottom to land surface and pressure grout the casing.*

*(i) Perforations shall be at least four equidistant cuts per row, and one row per foot. Each cut shall be at least one and one-half inches long.*

*(ii) Apply enough pressure to force the sealing material through the perforations, filling any voids on the outside of the casing.*

*(iii) The remainder of the casing shall be filled with neat cement grout, neat cement, or bentonite slurry; or*

*(b) Withdraw the casing and fill the bore hole with neat cement grout, neat cement, bentonite or bentonite slurry as the casing is being withdrawn.*

(2) For resource protection wells and geotechnical soil borings that were constructed in accordance with these regulations, remove all debris, accumulated sediment, equipment and obstructions from the well casing, except well screens and packers and then decommission in one of the following ways:

(a) Wells with an inside casing diameter equal to or greater than one inch and constructed in accordance with these regulations as verified through a field examination and review of the drilling report shall be decommissioned by filling the casing from bottom to land surface with bentonite, bentonite slurry, neat cement grout, or neat cement.

(b) Wells with an inside casing diameter less than one inch shall be decommissioned by pressure grouting the entire casing length with bentonite slurry, neat cement grout, or neat cement.

The primary difference in the above procedures is that wells with incomplete or nonexistent well completion information require that the casing be perforated and pressure grouted. Table Z-1 indicates which wells do not have adequate well completion information, and therefore require that the casings be perforated as part of the decommissioning process. If field observations made when a well is decommissioned do not match the available completion documentation (i.e., if the measured casing diameter is different than shown on the log or the measured well depth is deeper than shown on the log), the well will be perforated and pressure grouted as a conservative measure.

As discussed in Section Z2.1, all well decommissioning activities will be performed by a licensed well operator, or will be decommissioned by a construction contractor under the supervision of a Washington PE. The following are the general well decommissioning procedures based on the available well completion documentation and location of the well with respect to the mine wastes:

### **Z3.1 WELLS COMPLETED IN MINE WASTES**

Wells that are completed in mine wastes (as indicated on Table Z-1) will be decommissioned as follows:

- Measure total well depth.
- If total well depth is less than thickness of mine wastes, then excavate the well along with the mine wastes and consolidate the excavated materials in the mine pits. No grouting is necessary because the entire well will be removed and the location recontoured as part of the RA. (Note that the depth of mine waste is known at well locations that do not have completion details based on pre-mining topography and other nearby drilling logs.)

- If total well depth is greater than thickness of mine waste:
  - For wells where completion documentation indicates the well was properly constructed<sup>1</sup>:
    - Grout the section of well casing that extends from 10 feet above the bottom of the mine wastes to the bottom of the well.
    - Excavate the well materials along with the mine wastes and consolidate the excavated materials in the mine pits.
  - For wells where completion documentation is unavailable or indicates the well was not properly constructed<sup>1</sup>:
    - Perforate the section of well casing that extends from 10 feet above the bottom of the mine wastes to the bottom of the well.
    - Pressure grout the perforated section of casing.
    - Excavate the well materials along with the mine wastes and consolidate the excavated materials in the mine pits.

### **Z3.2 WELLS COMPLETED OUTSIDE OF THE MINE WASTES**

Wells that are completed outside the mine wastes (as indicated on Table Z-1) will be decommissioned as follows:

- For wells where completion documentation indicates the well was properly constructed<sup>1</sup>:
  - Grout the well casing from the well bottom to 2 feet below ground surface (ft bgs).
  - Remove the surface completion and cut or break off the well casing at least 2 ft bgs.
  - Cover the remaining hole/depression with nearby native soils.
- For wells where completion documentation is unavailable or indicates the well was not properly constructed<sup>1</sup>:
  - Perforate the well casing from the well bottom to 2 ft bgs.

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<sup>1</sup> “Properly constructed” means that the annular space between the bore hole and the permanent casing was sealed with bentonite, neat cement, or neat cement grout as described in WAC 173-160-450 (Well Sealing Requirements).

- Pressure grout the casing.
- Remove the surface completion and cut or break off the well casing at least 2 ft bgs.
- Cover the remaining hole/depression with nearby native soils.

## **Z4.0 SEQUENCING OF WELL DECOMMISSIONING ACTIVITIES**

The well decommissioning activities will begin where the Early Works RA construction phase activities are planned (see Figure Z-1). The intent is to decommission the monitoring wells in these areas of the Site before the earthwork activities begin. Because the remaining RA construction phases occur across all remaining areas of the Site, there is no specific sequencing for decommissioning the remaining wells after the wells in the Early Works area have been decommissioned.

## **Z5.0 HANDLING AND DISPOSAL OF WELL DECOMMISSIONING WASTES**

Wastes generated during the well decommissioning activities (excavated well casings, protective surface casings, bollards, concrete pads) will be removed and stockpiled on Site for eventual disposal in the pits along with the mine wastes. These well decommissioning waste materials will be temporarily stockpiled in accordance with the *Staging/Temporary Stockpiling Plan* (contained in Appendix R of the BODR) pending placement in the pits.

## **Z6.0 DOCUMENTATION**

Within 30 days of decommissioning a well, the licensed well operator or the PE who supervised the decommissioning will complete and submit a Resource Protection Well Report to the Construction Manager. The Construction Manager will prepare a Well Decommissioning Summary Report as part of the RA Completion Report for submittal to EPA and the Spokane Tribe of Indians. The Well Decommissioning Summary Report will document the decommissioned wells, decommissioning procedures, and unusual conditions or deviations from this plan.

# TABLE

# FIGURES

# Attachment Z-1

## Monitoring Well and Piezometer Completion Logs

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