CuMo Exploration Project

Reclamation Plan

June 2011
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   Michael Clancy - Conservation Seeding & Restoration, Inc.
   Kathryn Beall - US Forest Service Boise National Forest
1.0 INTRODUCTION

Mosquito Consolidated Gold Mines, Ltd. (Mosquito) will be conducting a variety of mineral exploration activities under the Plan of Operations (PoO) anticipated to be approved by the Boise National Forest Supervisor in June, 2011 for the CuMo project. As part of its approved exploration activities, Mosquito will construct new drill pads and temporary roads. Under the mitigation requirements of the Environmental Assessment (EA) (USDA, 2011) prepared for this project, the United States Forest Service (USFS) requires that Mosquito reclaim areas disturbed by its exploration activities as well as others from previous activities that were not initiated or constructed by Mosquito.

1.1 Purpose and Scope

This Reclamation Plan describes specific procedures to reclaim those areas utilized or disturbed by exploration activities. Reclamation of disturbed areas will be completed in accordance with federal [36 CFR§228.8 (g)] and state [IDAPA 20.03.02 Section 060] regulations and requirements. Areas proposed for disturbance can be divided into the following categories: temporary access roads (existing and new), drill sites, and stream crossings. Provisions made for reclaiming these components are described in Section 3. As noted, this plan also includes reclamation of existing temporary roads that were constructed before this project and which the USFS desires to be reclaimed as a condition of approving the PoO.

1.2 Project Background

The CuMo prospect was discovered by AMAX Exploration Inc. (AMAX) in 1963. AMAX and their joint venture partners, AMOCO Minerals and Climax Molybdenum, completed multiple stages of exploration beginning in 1968 and continuing through 1982. During this time AMAX developed a number of exploration access roads. In 2005 Kobex Resources Ltd., of Vancouver, British Columbia, approached the USFS with a plan to drill 16 exploration holes at the CuMo project site. They developed a Plan of Operation (PoO) that included drilling and using the existing network of unauthorized roads. The USFS determined that the proposed action met the requirements of a Categorical Exclusion, category 3 as described in 36 CFR 220.6(e). The plan was approved and bonded. Kobex began operations in summer 2006.

In the fall of 2006, Mosquito assumed control of the CuMo program and Kobex’s bonded 2005 PoO. They began exploration drilling in summer 2007. The USFS signed a decision memo for a request to extend the 2005 PoO on June 22, 2009. This request extended the 2005 PoO through November 2009. On February 14, 2007, Mosquito submitted a new PoO to the USFS. The new plan sought to modify and replace the 2005 PoO and proposed up to 13.3 miles of new, temporary road construction, continued use of existing permitted roads, and up to 122 drill pads. The plan was accepted in a letter from the USFS dated March 5, 2007, with the stipulation...
that an Environmental Assessment (EA) would be prepared by a third party contractor. The EA was completed in 2011 analyzing three alternatives; A) Proposed Action, B) Reduced Roads, and C) No Action.

A Decision Notice and Finding of No Significant Impact was issued by the USFS on February 11, 2011, based upon Alternative B, the Reduced Roads alternative. The EA and Decision Notice included various mitigation measures and monitoring to be included as part of the project, including preparation of this Reclamation Plan.

The exploration project is located about 14 miles north of Idaho City in Boise County. A vicinity map of the CuMo project area is shown in Figure 1.

Exploration activities under the approved PoO include building up to 10.2 miles of new temporary roads, and up to 137 new temporary drill pads. From the drill pads up to 259 drill holes will be drilled for exploration purposes. This exploration phase will not extend beyond 5 years.

Concurrent reclamation is a requirement of the EA and Decision Notice. The EA allows Mosquito to keep 60-80 percent of the temporary roads open at one time. Mosquito will reclaim temporary roads and drill pads as roads and pads become unnecessary for exploration and to keep within the 60-80 percent threshold.
Figure 1 – Project Vicinity Map
1.3 Forest Service Requirements

The 2003 Forest Plan for the Boise National Forest, as amended in 2010 (USDA, July 2003), describes management directions to guide Forest personnel in achieving desired outcomes and conditions for both land stewardship and public service. Management direction goals in the Forest Plan call for appropriate mitigation and reclamation of environmental disturbance for all mineral exploration and development proposals.

The USFS does not have specific technical requirements related to reclamation plans. However, the USFS requires reclamation bonds for all proposed mineral activities that will potentially cause significant surface disturbance and require reclamation (Forest Plan Management Direction MIST06). Bond calculations are performed by the Minerals Administrator and are intended to cover the estimated cost to perform reclamation work should Mosquito fail to. The bond will be collected and held by the Forest Service in order to ensure reclamation.

Guidelines used in the bond estimate to insure that the reclamation objectives have been achieved include the following:

- Structure demolition and debris handling
- Road recontouring/reclaiming
- Drill Pad recontouring/reclaiming
- Sump reclamation
- Seeding
- Plugging open drill holes (see Section 3.2.2.2)
- Noxious weed monitoring
- Road maintenance
- Culvert maintenance

Additional standards and protocols developed herein address the mechanics of performing the reclamation work.
2.0 ANTICIPATED IMPACTS

This section describes current land uses of the project area and describes proposed exploration activities that will cause land disturbance. Prior to initiation of work and throughout the exploration project, Mosquito will implement specific measures to be protective of water quality, terrestrial and avian wildlife, aquatics, vegetation, and cultural resources in accordance with the EA. Those activities are generally not included in this Reclamation Plan, but are addressed under other provisions of the EA, PoO, and supporting documents.

2.1 Current Land Use

Current land use reflects a mixture of mining activities, wildlife habitat, and recreational use. Recreation activities include trail and ATV riders, rally racers, upland game and bird hunters, anglers, and other dispersed recreation. During the fall the Project Area is used for big-game hunting, and during the winter for snowmobiling and backcountry skiing. Other uses include cattle and sheep grazing and logging.

The activity area supports a mix of upland vegetation types including; Potential Vegetation Group (PVG) 2 (Warm, Dry Douglas-fir/Moist Ponderosa Pine), PVG 4 (Cool, Dry Douglas-fir), PVG 7 (Warm, Dry Subalpine Fir), and non-forested areas. PVGs 2 and 7 represent most of the activity area. According to the EA, riparian areas are located along Grimes Creek and several small drainages that bisect the modified Activity Area. Except for the riparian area along Grimes Creek, riparian areas are generally narrow (approximately 10-25 feet wide), represent a small portion of the modified Activity Area. As stated in the EA, riparian areas would not be measurably affected by proposed activities except at the limited number of proposed road crossings. The seed mixes utilized for revegetation of disturbed areas will be determined in consultation with USFS and are based on existing vegetation types. In discussion with the USFS Mosquito will utilize the appropriate seed mix for each vegetation type when planting disturbed areas.

2.2 Proposed Roads

Under the requirements of the EA, Mosquito may construct up to 10.2 miles of temporary access roads to provide access to drill pad sites. Mosquito will submit to the USFS for its review and approval, temporary road plans for each phase of the project. As Mosquito approaches completion of construction of the first phase of temporary roads, its need for additional roads will be evaluated and if deemed necessary, additional temporary road plans will be submitted to USFS for review and approval prior to construction. Specific equipment utilized for construction will be proposed and decided upon in consultation with USFS.

New temporary roads constructed in accordance with USFS road standards and Stormwater Best Management Practices will be implemented in accordance with the CuMo Exploration Plan.
Stormwater Pollution Prevention Plan. The roads will generally be 14 ft wide, constructed with native materials, and outsloped between 2% and 4% from the cut slope to the fill slope. Waterbars and drainage dips will be installed at intervals approved by the USFS.

During subsequent phases of construction, it may become necessary to install stream crossings for the additional temporary roads. Under the mitigation analysis and requirements of the EA and PoO, a maximum of four new stream crossings could be constructed. New temporary stream crossings would consist of a culvert, native crushed rock installed within 50 feet of each stream crossing, and waterbars within 100 feet of each stream crossing. Locations of stream crossings will be identified and approved by the USFS prior to construction. Mosquito will acquire those necessary permits and approvals that would allow working within or discharge to navigable water before commencing construction.

In addition to new temporary stream crossings, Mosquito will install native crushed rock and waterbars on existing temporary roads and on NFS road 382C.

A figure showing a typical cross section of the new temporary roads is shown in Figure 2.

![Figure 2 – Typical New Temporary Road Cross-section](image)

The general location of the NFS roads, new temporary roads, and existing temporary roads is shown in Figure 3. Actual locations of new temporary roads may vary as provided for within the EA and approved PoO. Specific locations of new temporary road plans will be approved by USFS prior to construction.
2.3 Proposed Drill Pad Sites

Under requirements of the EA, Mosquito may construct up to 137 new drill pads. Stormwater Best Management Practices will be implemented in accordance with the CuMo Exploration Stormwater Pollution Prevention Plan. A typical drill pad will be approximately 60 ft long by 25 ft wide with ends or sides contoured into the temporary access roads. Each drill pad will have a compartmentalized mud pit so that drill fluids will be retained onsite. Drill machines, light lamps, spill kits, and ancillary tools and supplies will be kept at the drill pad locations. A service pick-up truck will transport drillers, fuel, and daily drilling consumables during operations. The mud pits will generally be located on the drill pad site downgradient from drilling activities to allow drill fluids to flow into the pits. A typical drill pad configuration is shown in Figure 4.
Notes:
1. Figure represents a generalized drill pad plan. Actual dimensions will vary and will not exceed those shown.
2. “Oils” kept on-site include oil and gasoline for small equipment and drill fluid additives. Oils will be stored in 5-gal or less containers and stored in a containment area to prevent accidental release to soil or to navigable waters.
3. Stormwater BMPs to be implemented during construction.
4. Fresh water will be delivered to the Mixing Tank by hose, pumped from the creek or stand pipe, or hauled in by truck.

Figure 4 –Typical Drill Pad Layout
2.4 Acreage Affected by Surface Disturbance

This exploration project may involve construction of up to 10.2 miles of temporary access roads and up to 137 drill pad sites. The EA notes that the temporary roads and drill pads would result in a Detrimental Disturbance of up to 51.1 acres (USDA EA page 61). Total actual surface disturbance throughout the entirety of the project will depend on accumulated data collected during preceding stages of exploration and the extent of future exploration. Mosquito will not exceed the length of temporary roads and number of drill pads evaluated as Alternative B in the February 2011 Environmental Assessment.

As a part of this Reclamation Plan, Mosquito also will reclaim existing temporary roads. Those roads are identified in Figure 3.

In collaboration with USFS, vegetation of areas slated for disturbance will be characterized during each phase of construction. Mosquito will utilize Potential Vegetation Group mapping provided by the USFS to overlay onto USFS approved road alignments and drill pad locations. This will enable Mosquito to identify potential candidate species for reclamation and to plan for appropriate revegetation.

2.5 Topsoil Conservation

Topsoil is a critical component of our reclamation strategy because it is the critical medium in which each area’s pre-disturbance vegetation grew. For this reason, care will be taken to remove primarily topsoil and not “contaminate” it with subsoil. Once the topsoil is carefully removed, it will be stored in selected sites near the disturbed site and actively managed to minimize its loss through erosion and storm water runoff. Depending on site conditions, topsoil will be removed and transported with front loaders or graders.

Site specific topsoil depths will be identified prior to disturbance. Topsoil stockpiles will be identified in the field and stored outside of Riparian Conservation Areas and in areas “cleared” of noxious weeds. Topsoil stockpiles will be managed per IDEQ’s Stockpile Management Best Management Practice (BMP 9). A summary of stockpile management practices is included below.

- Stockpiles will be located a minimum of 50 feet away from concentrated flows of stormwater, drainage courses, and inlets and outside of Riparian Conservation Areas.
- Stockpiles will be protected from stormwater run-on using a temporary perimeter sediment barrier such as berms, dikes, fiber rolls, silt fences, sandbags, or gravel bags.
- If the stockpile is located in an area with high winds, wind erosion control practices will be utilized.
- Any bagged materials will be kept on pallets and under cover.
• During the rainy season, soil stockpiles will be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
• During the non-rainy season, soil stockpiles will be covered or protected with a temporary perimeter sediment barrier prior to onset of precipitation.

The full BMP for stockpile management, including installation details, is included in Appendix B and in the CuMo Exploration Stormwater Pollution Prevention Plan. An electronic copy can be found on the Idaho Department of Environmental Quality website at:

3.0 RECLAMATION

Mosquito has identified a series of actions to conform to reclamation measures in accordance with the EA and PoO and to enhance the likelihood of reclamation success. Specific reclamation actions are listed below and described in greater detail in subsequent sections.

- Chemically analyzing and assessing topsoil quality.
- Re-contouring subsoil.
- Spreading retained topsoil over the re-contoured subsoil.
- Based on soil test results, amend soil to correct noted deficiencies and optimize it for growing reclamation plants.
- Planting seeds reflective of the areas pre-disturbance flora.
- Monitoring planted areas to assess germination of desired species and the need for removing unwanted species (i.e., weeds).
- Monitoring to determine the degree to which the vegetation of the planted area matches the vegetation of the area prior to disturbance.
- Once vegetation of the restored area is similar to the area’s pre-disturbance vegetation, the site is considered restored.

It should be noted that *Lewisia Sacajaweana* (Sacajawa’s Bitterroot) is a Forest Watch species and therefore the subject of additional measures to identify, avoid, monitor, reclaim and/or mitigate it. Our primary strategy related to this plant species is avoidance. That is, Mosquito will work closely with the USFS botanists and other resource specialists to locate and conduct its activities in order to avoid *L. sacajaweana* if possible. In the event that disturbance of *L. sacajaweana* by the CuMo exploration project causes an approximate loss of 10% of plants, specific reclamation and/or mitigation measures will be utilized as identified in the *Lewisia Sacajaweana Inventory/Monitoring Plan with Reclamation /Mitigation Examples* plan prepared for this project.

3.1 Chemically Analyzing and Assessing Topsoil for Quality

Mosquito will collect representative samples and have them analyzed by a reputable soil testing lab using competent personnel, acceptable procedures, and calibrated analytical equipment. The analyses will seek to identify soil deficiencies that may be rectified by adding appropriate soil amendments. Soil deficiencies can range from infertility where crucial plant nutrients (e.g., nitrogen, phosphorus, or potassium) may be lacking to soil structure where water retention is suboptimal (e.g., a very sandy soil with little organic matter). Amendments that might be added to alleviate such identified deficiencies include fertilizers to improve fertility, elemental sulfur to lower soil pH, and organic matter to improve moisture retention.
3.2 Re-Contouring Subsoil

Re-contouring the subsoil involves reshaping the disturbed area to approximate the pre-disturbance land form and topography. Procedures for recontouring are described below:

3.2.1 Road Reclamation
Exploration roads, drill sites, and sumps will be backfilled and recontoured using a CAT 345C excavator or other suitable sized excavator. Gates off the USFS Roads C382C and C397B will be removed and properly disposed of. Soil material that is placed in road fill during construction will be replaced (backfilled) into the road cuts and on drill sites by the excavator. To reduce the risk of sloughing, soils will be placed in layers and compacted with construction equipment. The final surface of backfilled sites will be left in rough condition to hold seed and to optimize germination, and recontoured roads and drill sites will be seeded.

3.2.1.1 Roads on Slopes Less than 20%
Roads will be recontoured using a combination of partial recontouring and ripping. The toe of cut and fill slopes will be smoothed and all disturbed areas will be revegetated in accordance with this plan. Figure 5 shows approximate recontouring for moderate and shallow slopes.

3.2.1.2 Roads on Slopes Greater than 20%
Reclamation of temporary roads on slopes greater than 20% will be backfilled and recontoured to the approximate original contour and then revegetated as described in this plan. Figure 6 depicts approximate recontouring for roads on steep slopes.
3.2.1.3 Stream Crossings

Plant species within the ordinary water line of tributaries of Grimes Creek which are to be removed for the placement of culverts and crushed rock will be documented and photographed in order to facilitate subsequent reclamation. Native crushed rock, water bars, and culverts placed in stream crossings will be removed and the ground revegetated and returned back to approximate disturbance condition. Crushed gravel disposal areas will be determined in consultation with USFS resource specialists and may be off-site.

In areas where Mosquito places native crushed rock and water bars adjacent to existing culverts on USFS roads, that rock and those water bars will be left in place per USFS direction.

Before commencing operations, Mosquito will acquire all necessary permits and approvals, including 401 certifications, that would entail working within or potential discharges to navigable water.

3.2.2 Drill Pad Reclamation

Equipment, construction debris, all associated materials, and trash will be removed from the site.

3.2.2.1 Mud Pit Reclamation

Mud pits will be allowed to dry and after a period of settling that will vary depending upon weather and ground conditions, the pits will be filled in with subsoil stored from pit excavation and recontoured to approximate their original contour.
3.2.2.2 Drill Hole Abandonment Procedure

Exploration drill holes will be abandoned in compliance with applicable USFS and Idaho Department of Lands requirements (as well as Idaho Department of Water Resources, as applicable). In general, each drill hole will be abandoned upon completion of drilling and prior to demobilization of the drill rig from the hole. It is Mosquito’s intent that no more than four drill holes remain open at one time. However, in consultation with the Minerals Administrator, Mosquito may request that more than four drill holes be allowed to remain open in order to facilitate and shorten the overall exploration program. Standard procedures to abandon each drill hole will include the use of Super Plug, which is manufactured by M-I Swaco. Super Plug is a proprietary blend of bentonite, hydroxides, and silicates designed to minimize environmental impacts in hole abandonment applications. It is a 100% inorganic additive that hydrates easily and sets efficiently. The Super Plug additive will be introduced into the bottom of each drill hole with a tremie pipe, which will be withdrawn as grout fills the drill hole. This technique will minimize or avoid air gaps as the drill hole is filled. The grout will be tremmied to 5 feet below ground surface. A concrete plug will be placed from 5 feet below ground surface to the surface. Surface evidence of each drill hole will be removed when its associated drill pad is reclaimed in accord with this Reclamation Plan.

Exploration test holes are excluded from Idaho Drilling Permit Requirements (IDAPA 37.09.09 Rule 45 Subsection 045.03). Therefore, no Idaho Department of Water Resources drilling permits or completion of authorization-to-abandon forms will be necessary.

3.2.2.3 Drill Pad Site Contouring

Drill Pad sites on moderate to shallow slopes will be recontoured using a combination of partial recontouring and ripping. The toe of cut and fill slopes at the edges of the drill pad will be smoothed. Drill pads sites on steep (greater than 20%) slopes will be recontoured by means of backfilling to the original slope of the ground. To reduce the risk of sloughing, soils will be placed in layers and compacted with construction equipment. All disturbed areas will be revegetated in accordance with this plan.

3.3 Spreading Retained Topsoil Over Recontoured Subsoil

Once subsoil re-contouring is complete, retained topsoil will be spread evenly over the subsoil surface in an effort to approximate pre-disturbance conditions. Applying too little topsoil or applying it unevenly may subsequently result in poor plant growth. Provisions to prevent or minimize erosion from wind and storm water runoff will be employed as necessary.
3.4 Applying Amendment To Address Soil Deficiencies

If soil analysis reveals soil deficiencies, amendments may be added, in consultation with USFS resource specialists, to approximate local pre-disturbance conditions. Amendments may be in solid granular, solid powder, or liquid form. Such amendments may be worked into the soil using mechanical means such as disking or harrowing, but again, in consultation with USFS resource specialists.

3.5 Planting Seeds Reflective of the Area’s Pre-Disturbance Flora

Seed mixes reflective of the flora of the area in its pre-disturbance state will be a key element of this reclamation strategy. The final seed mix will be decided upon in consultation with the District Botanist. Seed and plant propagules will be reviewed and approved by USFS to verify quality standards and provenance. Furthermore, the seed mix will be tested by the Idaho State Seed Lab as source-identified seed. Figure 7, provided by the USFS botanist, denotes that four Potential Vegetation Groups (PVG) fall within the project area, i.e., PVG #2, #4, #7 and #8. However, all the drill sites and access roads requiring reclamation apparently fall within PVGs, #2 and #7.
Potential seed diversity and percentages for the project are provided in Tables 1 and 2, which have been prepared in collaboration with the USFS district botanist. If, at the time of collection or seed procurement, inadequate supplies are available, Mosquito will work with the USFS district botanist to determine an acceptable alternative mix.

### Table 1 – Seed Mixes

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calamagrostis rubescens</td>
<td>Pinegrass</td>
<td>Psuedotsuga menziesii</td>
<td>Rocky Mtn. Douglas fir</td>
</tr>
<tr>
<td>Festuca idahoensis</td>
<td>Idaho fescue</td>
<td>Acer glabrum</td>
<td>Rocky Mtn. maple</td>
</tr>
<tr>
<td>Poa wheeleri</td>
<td>Wheeler’s bluegrass</td>
<td>Amelanchier alnifolia</td>
<td>Saskatoon serviceberry</td>
</tr>
<tr>
<td>Amelanchier alnifolia</td>
<td>Saskatoon serviceberry</td>
<td>Prunus virginiana</td>
<td>Chokecherry</td>
</tr>
<tr>
<td>Pinus ponderosa</td>
<td>Ponderosa pine</td>
<td>Penstemon wilcoxii</td>
<td>Wilcox’s penstemon</td>
</tr>
<tr>
<td>Symphoricarpos albus</td>
<td>Common snowberry</td>
<td>Bromus vulgaris</td>
<td>Columbia brome</td>
</tr>
<tr>
<td>Rosa spp.</td>
<td>Various native roses</td>
<td>Calamagrostis rubescens</td>
<td>Pinegrass</td>
</tr>
<tr>
<td>Ribes cereum</td>
<td>Wax currant</td>
<td>Arabis cobrensis</td>
<td>Sagebrush rockcress</td>
</tr>
<tr>
<td>Achillea millefolium</td>
<td>Common yarrow</td>
<td>Achillea millefolium</td>
<td>Common yarrow</td>
</tr>
<tr>
<td>Arabis cobrensis</td>
<td>Sagebrush rockcress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penstemon wilcoxii</td>
<td>Wilcox’s penstemon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2 – Seed Diversity

<table>
<thead>
<tr>
<th>Common Name</th>
<th>% of Total</th>
<th>Common Name</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinegrass</td>
<td>36.8</td>
<td>Rocky Mtn. Douglas fir</td>
<td>13.8</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>9.2</td>
<td>Rocky Mtn. maple</td>
<td>11.7</td>
</tr>
<tr>
<td>Wheeler’s bluegrass</td>
<td>9.2</td>
<td>Saskatoon serviceberry</td>
<td>11.7</td>
</tr>
<tr>
<td>Saskatoon serviceberry</td>
<td>9.2</td>
<td>Chokecherry</td>
<td>17.5</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>4.6</td>
<td>Wilcox’s penstemon</td>
<td>2.9</td>
</tr>
<tr>
<td>Common snowberry</td>
<td>9.2</td>
<td>Columbia brome</td>
<td>35.0</td>
</tr>
<tr>
<td>Various native roses</td>
<td>13.8</td>
<td>Pinegrass</td>
<td>11.7</td>
</tr>
<tr>
<td>Wax currant</td>
<td>4.6</td>
<td>Sagebrush rockcress</td>
<td>2.9</td>
</tr>
<tr>
<td>Common yarrow</td>
<td>0.6</td>
<td>Common yarrow</td>
<td>0.7</td>
</tr>
<tr>
<td>Sagebrush rockcress</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wilcox’s penstemon</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The actual amount of required seed will be based on the total area disturbed during exploration and those existing temporary roads within the project boundary that will be reclaimed. The EA estimates that up to 69 acres of vegetation will be cleared as a result of temporary road and drill pad construction (EA page 75, Table 9). However, the actual area disturbed may be significantly less than 69 acres. Exploration will be completed in phases with future activities being dependent upon results from previous phases. Because the extent of future phases is unknown at this time, the total amount of disturbed land is also unknown. As exploration proceeds and future phases are defined, the areas of disturbance and required amounts of
seed will be refined. Table 3 shows the approximate seeding acreages for the first phase of activity, including reclamation of existing temporary roads.

Table 3 – Approximate Phase 1 Seeding Acreages

<table>
<thead>
<tr>
<th>Affected Area</th>
<th>Miles or Number of Drill Pads</th>
<th>Stage 1 Disturbed Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Temporary Access Roads</td>
<td>4.7</td>
<td>17.1</td>
</tr>
<tr>
<td>Stage 1 Temporary Access Roads</td>
<td>2.4</td>
<td>8.7</td>
</tr>
<tr>
<td>Existing Drill Pads</td>
<td>34</td>
<td>1.2</td>
</tr>
<tr>
<td>Stage 1 Drill Pads</td>
<td>32</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28.1</strong></td>
<td></td>
</tr>
</tbody>
</table>

Seed collection methods will be selected according to particular groups of plants. Table 4 summarizes methods that may be employed for each plant group.

Table 4 – Seed Collection Methods

<table>
<thead>
<tr>
<th>Plant Group</th>
<th>Seed Collection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasses</td>
<td>Flail</td>
</tr>
<tr>
<td>Berries</td>
<td>Hand-collected</td>
</tr>
<tr>
<td>Select forbs (e.g., Yarrow, Penstemon)</td>
<td>Vacuum sucker</td>
</tr>
<tr>
<td>Trees</td>
<td>Hand-collected</td>
</tr>
</tbody>
</table>

All collected seeds will be labeled to provide information on species identity, origin, and test status. An example label is shown in Figure 8. If seeds are supplied by a certified supplier, Mosquito will confirm that seed tags include species identity, origin and test status in accordance with this Reclamation Plan. Mosquito will forward copies of Seed Analysis Reports and certification tags to the USFS district botanist for review prior to planting.
Where drilling activities result in compaction of the soil, ripping, disking, or other means will be used in areas to be revegetated to eliminate compaction and to establish a suitable root zone in preparation for planting.

Mosquito will use the services of Conservation Seeding and Restoration, Kimberley, Idaho, or another similarly qualified contractor, to identify planting techniques to attain maximum seed germination and plant survival. These techniques may include broadcast seeding, drop seeding, drill seeding, hydroseeding, and seedling planting. Seedling planting may be used if other seeding methods do not result in adequate germination and reclamation, or if seedling planting may result in higher survival rates or quicker establishment times for certain species.

The following BMPs from the Idaho Department of Lands Best Management Practices for Mining in Idaho guidance will be utilized for planting.
Monitoring To Assess Germination And Invasive Plants

Monitoring of each replanted area will be initiated in the first spring following planting. The focus of the first monitoring effort will be to assess germination success from the recent seeding, whether or not weeds are appearing, and whether or not soils are stable. If soil erosion is apparent, actions will be taken to prevent or minimize further erosion.

Comparing Vegetation of Planted Areas to that of Nearby Areas and Records of Pre-Disturbance State

Mosquito, or a USFS-approved Mosquito consultant, will monitor each drill pad location and all access roads annually, comparing each to an adjacent reference area as well as documenting their pre-disturbance status. Comparisons may include checks for similarity in species composition and plant frequency and abundance. Quantitative plant cover data for frequency and abundance will be collected using either a modified Daubenmire or point intercept method. For drill pads, all sites will be monitored for revegetation. For access roads, revegetation will be assessed approximately every ¼ mile. These periodic monitoring events should help to verify that the plant community is self sustaining, i.e., plants are reproducing and increasing in size and abundance. Lastly, these monitoring events will include cursory reviews to document invasive species in the plant community. If found and in consultation with USFS resource specialist(s), appropriate measures will be taken to eliminate or limit growth of these invasive species.

Annual reports summarizing those areas monitored, comparisons to adjacent reference areas and records of pre-disturbance, and quantitative plant cover data will be provided to the USFS District Botanist.

Copies of these BMPs are included in Appendix B. Electronic copies can be found on the Idaho Department of Lands website at:


3.6 Monitoring To Assess Germination And Invasive Plants
3.8 Final Release of the Area and Declaring It Successfully Reclaimed

Periodic monitoring and supporting data will keep the USFS District Botanist apprised of the area’s reclamation status. Depending upon the success of reaching reclamation goals, Mosquito and the USFS botanist will seek to conclude that active reclamation is no longer necessary.

Project reclamation goals are:

- Vegetation canopy cover on the area under reclamation shall be at least 75% of that for vegetation on an adjacent reference area or of pre-disturbance condition.
- To assure comparable diversity, the area under reclamation shall have at least 50% of the number of species present on an adjacent reference area. This 50% criterion generally will apply to each of the four vegetation classes:
  1. Native grasses
  2. Native forbs
  3. Native shrubs
  4. Native trees

For those reclamation sites where any of these vegetation classes are absent in the adjacent reference area, establishment of that vegetation class will not be required. In addition, the following conditions will apply:

- The canopy cover of invasive weeds on the area under restoration shall be no greater than 10%.
- Noxious weeds will be actively fought from areas being reclaimed.

Method for determining canopy cover (quantitative method):

Vegetation will be quantitatively measured in the area under reclamation and in an adjacent reference area. For restored access roads, vegetation will be randomly sampled within the area under reclamation by establishing a 50-meter transect within the area. At least ten (10) sample points will be established at 5-meter intervals along the 50-meter transect. Cover class data will be collected at each point using a 1 m² plot frame with cover class percentages clearly marked along the edge of the plot frame. Transects will be established and data collected every ½ mile along restored access roads. For drill sites measuring roughly 60 feet long by 25 feet wide, vegetation will be monitored by ten (10) random placements of a 1 m² plot frame and cover class data will be recorded.

Qualitative method for assessing reclamation at each drill site and access road:

Photographs will be taken annually at each reclamation site, in accordance with protocols described in Technical Reference 1734-4, Sampling Vegetation Attributes, pages 31-36 (BLM, 1999). For access roads, the photo point will be the starting endpoint.
of each 50-meter transect. For drill sites, the photo point will be the center of the restoration area. GPS coordinates will be recorded for each photo point.
4.0 PROPOSED SCHEDULE FOR RECLAMATION MEASURES

Mosquito anticipates concurrent road reclamation when roads become no longer necessary for the exploration project. As roads are reclaimed, adjacent drill pads will be reclaimed as well.

Table 5 shows the estimated construction and reclamation schedule for this exploration project. Temporary road and new drill pad construction shown under Year 1 are consistent with the new temporary road plans submitted to USFS for review on April 26, 2011. Quantities of temporary road and new drill pad construction shown for subsequent years are estimates and will likely change as exploration proceeds.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Units</th>
<th>Year</th>
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<th></th>
<th></th>
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<tr>
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<td>61%</td>
<td>74%</td>
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<td>79%</td>
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<td>Drill Pads</td>
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<tr>
<td>New Drill Pad Construction per year</td>
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<td>27</td>
<td>26</td>
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<td>Reclamation of New Drill Pads per year</td>
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<tr>
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<td>-</td>
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<td>-</td>
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aIncludes 4.7 miles of existing temporary roads
bPercent open at end of operational year
cAmounts of temporary road and drill pad construction for years 2-5 are shown as estimates only

Table 5 depicts the maximum miles of temporary roads and number of drill pads that could be approved by the USFS over the maximum five year exploration timeframe. As exploration progresses, Mosquito will collect and analyze data to forecast additional roads and drill pads.
Mosquito will coordinate with the USFS Minerals Administrator, District Ranger, and resource specialists as exploration and subsequent planning progresses.

### 4.1 Annual Update Statement

As additional temporary roads are deemed necessary (if any), Mosquito will submit proposed plans to the USFS Minerals Administrator and Forest Engineer for review at least four weeks prior to desired temporary road construction. Roads will not be constructed until USFS approvals and all necessary permits are in place.

Mosquito will provide the USFS Minerals Administrator with an annual update statement. In order to apprise the Forest Service on activities that occurred during the previous operating season (April 15th to December 15th) the annual update statement will include a summary of activities including a revised estimated reclamation schedule, similar to Table 5 and maps and figures showing the following:

- stream crossing BMPs installed on existing crossings;
- stream crossing culverts and BMPs installed at new crossings;
- temporary roads that have been constructed;
- drill pad sites that have been constructed;
- temporary roads and drill pads that have been reclaimed;

The annual update statement will be provided to the Forest Service prior to commencement of the next year’s proposed activities.

### 4.2 Activity Commencement Statement

Prior to commencement of activities in the spring, Mosquito will submit to the USFS Minerals Administrator figures indicating proposed construction of temporary roads and drill pads for the upcoming operating season. The figure will be based on the USFS approved plans and modified to indicate work that has been completed in the previous season, work that is proposed for the upcoming season and, if anticipated, any proposed changes in the plans (ie. temporary road or drill pad location adjustments).
5.0 REFERENCES


Appendix A

Contact Information
Contact Information

Mosquito Contact Information

<table>
<thead>
<tr>
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<th>Telephone</th>
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</table>

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U.S. Forest Service Contact Information

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<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Telephone</th>
<th>Address</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>(208) 392-3738</td>
<td></td>
</tr>
<tr>
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<td>BNF REHLM Staff (roads engineer)</td>
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</tr>
</tbody>
</table>
Appendix B

Best Management Practices
Stockpile Management

Description
Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as Portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called “cold mix” asphalt), and pressure-treated wood.

Applications
Implement in all projects that stockpile soil and other materials.

Limitations
- Drainage area – N/A
- Minimum bedrock depth - N/A
- NRCS soil type – N/A
- Drainage/flood control – no
- Maximum slope – N/A
- Minimum water table - N/A
- Freeze/thaw – good

Targeted Pollutants
Sediment

Construction Guidelines
- General
  - Locate stockpiles a minimum of 50 ft away from concentrated flows of stormwater, drainage courses, and inlets.
  - Protect all stockpiles from stormwater run-on using a temporary perimeter sediment barrier such as berms, dikes, fiber rolls, silt fences, sandbags, or gravel bags.
  - Implement wind erosion control practices as appropriate on all stockpiled material.
  - Place bagged materials on pallets and under cover.

Protection of Non-Active Stockpiles
- Soil stockpiles: During the rainy season, soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times. During the non-rainy season, soil stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.
- Stockpiles of PCC rubble, AC, asphalt concrete rubble, aggregate base, or aggregate sub base: During the rainy season, the stockpiles should be covered or protected with a temporary sediment perimeter barrier at all times. During the non-rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix”: During the rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material at all times. During the non-rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable materials prior to the onset of precipitation.
- Stockpiles/storage of pressure-treated wood: During the rainy season, pressure-treated wood should be covered with plastic or comparable...
material at all times. During the non-rainy season, pressure-treated wood should be covered with plastic or comparable material at all times.

**Protection of Active Stockpiles**

- All stockpiles should be protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix” should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

**Maintenance**

- Inspect and verify that BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are underway, inspect weekly during the rainy season and at 2-week intervals in the non-rainy season to verify continued BMP implementation.
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
II.1 Topsoiling

Topsoiling is the placement of topsoil or other suitable plant growth material over a prepared subsoil.

Purpose: To provide a suitable soil medium for vegetative growth.

Specifications:

The practice is recommended on slopes 2:1 or flatter where the native soil is unsuitable for vegetative growth. Topsoiling may only consist of replacing topsoils that were stripped and stockpiled during initial development activities. Topsoil should be a loam consisting of varying proportions of organic matter, clay, silt, and sand. It should be free of stones, weeds, and inorganic debris. In most mining operations, the top six (6) to twelve (12) inches of soil is stockpiled as topsoil.

Care must be taken when applying topsoil so it is not laid on top of a subsoil of contrasting texture. This could cause the topsoil to slough if water flows between the topsoil and the subsoil.

The following guidelines should be considered when replacing topsoil. However, site specific conditions will have an impact on topsoil availability and application rates.

1. The existing grade of the subsoil should be maintained.

2. Lime may need to be applied to acidic soil to adjust the pH to a more neutral pH of around 7.

3. Topsoil should be uniformly distributed at a minimum compaction depth of two (2) inches (6 to 12 inches is preferred) on slopes graded 3:1 or steeper. It should reach a depth of four (4) inches on slopes flatter than 3:1.

4. Topsoil should not be applied when the subsoil is frozen or extremely wet.

5. The operator should plan on a reduction in soil volume between salvage, stockpiling, and replacement activities. This volume loss could be as much as thirty percent.
II.2 Seedbed Preparation

Seedbed preparation entails preparing the soil by ripping, discing, scarifying, and adding soil amendments to make the soil more productive and enhance revegetation efforts.

Purpose: To promote successful revegetation efforts by preparing the soil for planting and creating proper seedbed conditions.

Specifications:

Seed bed preparation is applicable for all sites to be revegetated by seeding. Seed germination and seedling establishment are enhanced by loosening the surface of the soil by hand or machine raking prior to planting and then covering the seeds by raking or scarifying the soil to a depth of 1/4 to 1/2 inch. Good seed germination and establishment is also obtained by seeding on one (1) to six (6) inches of snow.

Seedbed preparation including weed control and soil tillage are essential for successful sowing and the establishment of seedlings. Weeds must be controlled by mechanical means or by spraying.

Good seedbed preparation may be difficult to achieve. Areas to be seeded should be ripped or scarified, to a minimum depth of three (3) inches. The soil should be worked to establish suitable conditions in which the seeding equipment can be operated. Areas to be seeded by broadcasting should be tilled immediately before seeding to a depth of two (2) inches, except on benches where no additional preparation is necessary or possible.

Seeding areas can be separated into the following types:

1. Rocky areas which are untillable.
2. Benched areas need no preparation as sloughing of soil from the bench above will tend to cover seeds.
3. Very steep areas (steeper than 2:1, a 50% slope, a 27° slope) are extremely difficult to seed. Hydro seeding or broadcast seeding should be used at these sites. Dragging a cleated cat track across slope will do a satisfactory job in loosening the soil.
4. Steep areas (between 2:1 and 3:1, between a 50% and a 33% slope, or between a 27° and a 18° slope) can be cat-walked up and down in most soils. This leaves a good seedbed by firming the loose soils and loosening the hard soils. This work should be completed immediately prior to seed application. Note: Rough, loose seedbeds on all steep slopes is important to help retain water, nutrients, and promote infiltration. Roughened seedbeds also help enhance hydroseeding efforts.
5. Sloped areas (3:1 or flatter, less than a 33% slope, less than a 18° slope) can be prepared with conventional equipment such as discs, harrows, or rippers and a grader. Slopes that exceed 10° should be prepared with cleated equipment such as a sheep foot roller. Fill slopes, flatter than 3:1 may not need to be prepared before seeding, however, they should be checked for satisfactory seedbed conditions.
II.3 General Planting and Seeding Specifications

These are general guidelines that apply to all planting and seeding operations. They are designed to enhance the success of revegetation efforts. These guidelines are applicable to most revegetation and landscaping work.

The Soil Conservation Service (SCS) is a good source of information on seed and planting specifications in addition to Appendix D.

Seeding and Planting Guidelines:

1. Annual grasses and legumes are recommended for quick cover, rapid temporary soil protection, or as a nurse crop combined with slower growing perennials. Perennial grasses and legumes, shrubs and trees are for continual soil protection.

2. All grasses, legumes, shrubs, and trees used in revegetation should be certified as viable and be effective for erosion control and soil stabilization.

3. Most legumes should be inoculated with appropriate bacteria before seeding since many varieties will not germinate without being inoculated.

4. Trees and shrubs can be used to provide lasting vegetative stabilization and should protect the soil surface after the grasses and legumes decline. Trees and shrubs, however, may not survive in all climates, and species selection for reclamation should be based on site specific conditions. See appendix D.

5. Trees, shrubs, and grasses, used in revegetation, should be of a similar species to that existing prior to mining. This will assist in maintaining the biological integrity of the area being reclaimed.

Site Evaluation and Modification of Revegetation Methods:

1. Existing soil survey reports should be consulted for each revegetation site or area. All sites should be inspected and/or tested by a soil scientist for texture, organic matter content, drainage, slope, and aspect. Testing for potentially toxic elements, water holding capacity, and nutrient levels should be done by a soils lab.

2. When the pH of the soil is less than 5.5 (acidic soil), seedling establishment may be limited. Lime can be added to increase the soil pH to a more neutral pH of 7. Lime should be applied at a rate determined by soil testing and it should be tilled into the top four (4) to six (6) inches of soil. Powdered lime or waste treatment lime can be used.
3. When the frost heave potential of the site is determined to be high to moderate, the following precautions should be taken:
   
a. Planting and seeding should be conducted from May 1 to August 1. Supplemental irrigation will be required in this case for germination and seedling establishment.
   
b. Mulch rates should be increased 50 percent over those specified in chapter 1, to 3 tons of straw per acre.
   
c. Areas damaged by frost heaving (after the initial seeding season) should be repaired to original specifications, if possible. The mulch rate on the repaired area should be 50 percent greater than the original application rate.
   
d. Follow-up application of fertilizer should be made each spring for the first two (2) years following the initial seeding to help plants establish and maintain vigorous growth and develop extensive root systems which will help to stabilize the soil.

Some seeds require pretreatment prior to planting. Check with seed suppliers to ascertain the need for and/or acquire treated seed. Shrubs and trees may be seeded or planted from bare root or potted stock. Cuttings from some species can also be taken from native stock adjacent to the area and planted in moist ground. Bare root shrubs and trees should be kept bundled and in cold storage prior to receipt and before planting. Potted trees and shrubs should be stored in the shade, outdoors, and should be sprinkled periodically with water to keep the soil moist.

Season of Seeding:

Selection of the proper season for seeding is vital in ensure successful revegetation. Even if all other conditions are satisfactory, if the timing of the seeding is poor, the seedlings are likely to die. Seeding in the fall is preferable. Early spring seeding is also acceptable.

Fall seeding is most successful in Idaho. Field experience has shown that seeding on one (1) to six (6) inches of snow over freshly scarified soil produces excellent germination. Spring seeding is most successful on northern facing exposures. Generally, the greatest potential for seeding failure is from freezing of the young plants prior to establishment.

When seeding in the spring, moisture conditions may not be adequate for establishment. In this case, the seedlings may not survive dry summer weather.
II.4 Broadcast Seeding

Broadcast seeding is the process of uniformly casting seeds and fertilizer on the soil by hand or mechanical means.

Purpose: Broadcast seeding is employed when seeding grasses, shrubs, forbes, or trees on flat surfaces and slopes where other seeding methods are not appropriate. Broadcast seeding is well suited for use on steep slopes, rocky areas, abandoned roadways, sites with limited access, and where hand labor is used.

Specifications:

The following procedures are recommended for the most successful application and growth. These procedures should be followed only after the seedbed has been prepared:

1. Apply fertilizer and work it into the soil. Fertilizer can also be applied either at the same time or after the seeds have been broadcast. Check the soil analysis for fertilizer application rate.

2. Apply seed by either wet (hydroseeding) or dry broadcasting. Seeds placed in a hydroseeder should be used within 30 minutes of having been put in water. In general, broadcast seeding rates must be twice the drill seeding rate.

3. Where applicable and if mulch is not going to be applied, lightly rake over the broadcast seed. The soil cover will help protect the seed and facilitate germination. Seeds covered with 1/4 to 1/2 inch of soil will have a better germination rate than those left on the surface of the ground.

4. Apply mulch, when necessary, either by hand or with a mechanical mulcher.

5. On steep slopes that are inaccessible, and where other methods are impractical, seeding should be done with a hydromulcher or by broadcasting.
II.5 Drill Seeding

Drill seeding is the process of planting seed and fertilizer using an agricultural or rangeland drill seeder.

Purpose: This method is most effective on flat, non-rocky surfaces. Drill seeding provides the maximum possibility for successful germination and growth, with a minimum investment in fertilizer, seed, and labor because seeds are not damaged or carried away by wind, water, animals, or birds.

Specifications:

The following procedures are recommended for the most successful application and growth rate:

1. The soil must be loose enough to allow penetration of the drill disc to a depth of approximately two (2) inches. This will help ensure that seeds are not planted too deep or left on the surface of the ground.

2. Fertilizer should be applied at specified rates after soil analysis at an appropriate soil laboratory.

3. On steep slopes where drilling equipment cannot be used, broadcast seeding methods should be utilized.
II.6 Vegetative Planting

Vegetative planting means the establishment of vegetation by planting trees and shrubs from nursery stock or transplants.

Purpose: Planting vegetation is an effective means of promoting soil stability and controlling erosion; however, until establishment is complete the site is vulnerable to erosion. Trees and shrubs should be planted in conjunction with grasses and legumes to enhance the overall effectiveness of soil stabilization efforts and erosion control measures.

Specifications: (See Figure II-6)

The following procedures are recommended for the most successful establishment of vegetation:

1. Choose plant species native to the area and that match specific habitats. The type of vegetation planted may be dependent on the intended use of the site following reclamation. In this case, native vegetation might not be the preferred alternative.

2. Planting holes should be prepared as shown in Figure II-6. Seedlings should be placed in the hole so the crown of the plant is at the surface of the soil. The roots should not be folded and there should be no air space around the roots.

3. Planting should be supervised by someone skilled in revegetative techniques.

4. Fertilizer should be applied as specified by the manufacturer or in accordance with soil testing results.

5. The survival rate of vegetation will be increased if plants are irrigated regularly during the first two (2) years after planting.

Maintenance: Adequate maintenance following planting is absolutely essential for maximum success of the revegetative efforts. Fencing may be required to protect planted areas where there is livestock grazing or wildlife use.
PREPARATION OF PLANTING HOLE USING PLANTING BAR

CORRECTLY PLANTED

Air space  Roots folded  Too deep  Too shallow

INCORRECTLY PLANTED
II.7 Willow Cutting Establishment

Willow cutting establishment is the process of selecting and planting willow cuttings to help stabilize streambanks. Planting willow can also enhance fish and wildlife habitat.

Purpose: To stabilize streambanks and other reclaimed areas adjacent to water.

Specifications:

Planting of willow cuttings is recommended when completing streambank stabilization efforts or in areas adjacent to water where there is enough moisture for cuttings to take hold and grow.

The guidelines listed below should be followed when selecting and planting willow cuttings:

1. Select varieties that are indigenous to the area in which you wish to re-establish willows. Select varieties compatible with your objective and the stream size, i.e. shrubby types for outside curves, tree types for shade areas, small varieties for small streams.

2. Cuttings should have smooth bark and should come from willow stock two years or older.

3. Make cuttings at joint or at ground level so the natural appearance of the parent plant is preserved. Trim back root end to a diagonal cut, approximately one-half inch below a leaf node.

4. Cover top of cutting with pruning seal or latex paint immediately after cutting. This will help prevent damaging the cuttings and ensure they are oriented correctly when planted. Remove all leaves and side branches and keep at least the bottom one-third of the cutting emersed in water. If cuttings must be stored for more than a week, wrap bundled cuttings with burlap and store in a cool place. Soak stored cuttings in water for 24 hours before planting.

5. Cuttings must be planted in soil that will remain moist during the growing season. Cuttings need to be anchored or protected against erosion until established. Do not leave air pockets around cuttings.

6. Cuttings should be long enough so one or two bud nodes are in permanent contact with moisture. Three to four bud nodes should be above ground.
7. Plant shrubby type willows one - three feet apart. Plant in a random pattern. Avoid planting in rows. Cuttings can be planted in shallow trenches along stream banks. They can also be anchored in holes excavated below the scour line (scour - to clear, dig or remove by a powerful current of water) in the channel bottom adjacent to the bank.

For more detailed information on willow planting, contact the Aberdeen Plant Material Center, Aberdeen, Idaho, or the Idaho Department of Water Resources.
Fertilizer Use

The following guidelines can be used to select fertilizer types. The guidelines will help prevent improper or excessive use of fertilizer that may result in water quality impacts or damage vegetation. The techniques are applicable to all revegetation efforts.

Purpose: Fertilizer(s) should only be used when soils are deficient in nutrients which retard or impair vegetative growth. The use of fertilizer will promote revegetation efforts if the proper type and amounts are applied.

Specifications:

The following guidelines pertain to types of fertilizer:

1. Slow release fertilizer. This type of fertilizer is one of the most reliable methods of providing nutrients for plants. It is best adapted to application during seeding, vegetative planting and maintenance of established vegetation. Recommended application rates are usually specified on the fertilizer container.

2. Fast release fertilizer. This type of fertilizer releases nutrients rapidly, making them available for immediate use by plants, which makes it most adaptable to maintenance operations after vegetation has been established. When fast release fertilizer is applied at the same time as seeds, nutrients can be leached out of the ground before the seeds germinate. Application rates are usually specified on the fertilizer container. If fast release fertilizer is needed, choose a type that contains nitrogen, phosphorus, and sulfur. Nitrogen maintains plant growth and phosphorus aids in root establishment and initial plant growth. Sulfur should be included in the fertilizer as some soils are deficient in this nutrient.

3. If fertilizer is applied at the recommended rate and fails to promote or increase vegetative growth over that which would occur naturally, do not apply more fertilizer. Instead, have the soil tested and follow the recommendations of the test report.

4. Excessive or incorrect use of fertilizer can cause more harm than good. For example, excessive nitrogen can kill seedlings, particularly in dry areas. Fertilizer should be applied, by broadcast methods, after seeding has been completed. Operations which apply fertilizer, usually apply between four hundred (400) and one thousand (1000) pounds per acre. Note: Fertilizer type and application rate should be based on soil tests.
11.9 Maintenance of Revegetated Areas

Maintenance can include, but is not limited to, irrigating, fencing, fertilizing, and repairing revegetated areas to help ensure the success of revegetation efforts. These measures should be applied to sites revegetated within the past one (1) to five (5) years.

1. Irrigation: Provisions for irrigation, especially on dry lands, should be included in the initial reclamation plan. On areas that will require irrigation to ensure that the plants or seeds do not die, the following measures should be taken:
   a) Keep the soil moist from planting time until the seeds germinate.
   b) Water frequently during the growing season so that the soil retains enough moisture to ensure plant growth. Try to coordinate irrigation with natural precipitation so the site is not over-watered.
   c) During the second growing season, after plants are established, the frequency of watering can be reduced. This will help plants become accustomed to natural conditions but it will provide sufficient water for growth during the season.

2. Fencing: All revegetated areas that are potentially subject to heavy use by either livestock or wildlife before the plants have become established, should be fenced to ensure adequate regeneration.

3. Fertilizing: In some instances it is beneficial to apply fertilizer after the first growing season to help ensure and enhance revegetative efforts. Site specific conditions and soil testing should dictate whether fertilizer should be applied and at what application rates.

4. Repairs: Repairs could include reseeding, repairing damage caused by wind and water erosion or damages caused by animals and man. All damage should be repaired as soon as possible after it occurs. Site specific conditions will dictate what repairs are necessary.