

Table 4.7-3, Hydrologic Monitoring Program - Data Collection and Reporting, summarizes the frequency of data collection and submittal for baseline characterization and operations and reclamation monitoring. The schedule was developed in accordance with UDOGM guidelines and meets the requirements of R645-301-731-212 and R645-301-731-223. If the analysis of any surface water or groundwater sample indicates noncompliance with the permit conditions, then CPMC shall promptly notify the Division and immediately implement accelerated or expanded monitoring to determine the nature and extent of noncompliance and results of noncompliance. Under the provisions of the Willow Creek UPDES permits, CPMC will prepare and submit quarterly UPDES compliance reports to the UDOGM and UDWQ in compliance with Part 4.05.13 (2) (ii) (b). If non-compliance with a UPDES permit effluent limitation does occur, CPMC will forward the analytical results concurrently with the written notification of non-compliance.

CPMC will continue surface and ground water monitoring activities after completion of reclamation operations to document restoration of pre-mining hydrologic characteristics. All surface and groundwater monitoring installations and associated structures and equipment will be properly installed, maintained, and operated to assure the accuracy and consistency of monitoring data. Surface water monitoring will be discontinued when untreated surface runoff meets applicable effluent limitations and the UDOGM approves removal of drainage and sediment control structures. Groundwater monitoring wells will be abandoned and removed in accordance with UDOGM guidelines following UDOGM approval to discontinue groundwater monitoring.

4.7.2.4 Acid or Toxic Forming Materials

Comprehensive discussions of the chemical characteristics of coal and other materials to be disturbed or handled in the Willow Creek Mine are presented in Section 3.6.3.2, Chemical Characteristics of Coal and Associated Strata. Evaluation of all available chemical analyses indicate no conclusive indications that the sampled materials are or will be potentially acid or toxic forming. In addition, mine dewatering flows have been monitored and there is no evidence of any significant potential for development of acidic or toxic drainage as a result of any mine water discharge or resaturation following mine abandonment and sealing. While underground mining and related operations and surface placement of mine waste and coal refuse materials may result in minor shifts in surface and ground water chemistry and limited increases in TDS levels and concentrations of specific chemical components, these changes in water quality will be localized and are not expected to result in any significant adverse impacts on surface or ground water systems or the planned postmining land use. Given these considerations, no special measures are necessary to control or mitigate potential impacts from acid or toxic forming materials although mine drainage control, controlled placement and compaction of coal refuse and mine waste materials, off-site disposal of noncoal wastes, and sealing of mine openings will certainly serve to minimize any potential minor impacts.

4.7.2.5 Discharges

The Willow Creek mine workings will progress down dip from the outcrop area and mine drainage will be controlled during active operations so there is little or no potential for direct gravity discharge of water from the mine. Upon completion of mining and related activities, however, mine drainage control operations will cease and portions of the mine workings (especially the mine workings furthest down dip) are expected to gradually fill as continuous ground water inflows discharge to the mined-out areas. To prevent any significant discharge from the mine openings following cessation of active mining operations and mine closure, CPMC will seal and backfill the mine portals. Sealing practices are discussed in Section 5.4.2.3, Reclamation Practices, and Section 5.5.2.6, Casing and Sealing of Wells and Mine Openings.

With the possible exception of process water and fine coal refuse slurry from the coal processing plant, water will not be diverted or discharged into any underground mine in conjunction with ongoing mining and reclamation operations at the Willow Creek Mine. The existing approved Castle Gate Mine Permit includes provisions for injection of process water and fine coal refuse slurry into existing abandoned underground mine workings through two existing injection wells in the vicinity of the Castle Gate coal preparation plant. Plan details are provided in Exhibit 19, Castle Gate Information.

All temporary and permanent diversions within the Willow Creek mine and loadout areas have been designed and either have been or will be constructed to maintain effective flow under all anticipated conditions. While underground mining operations may result in some ground subsidence, surface subsidence will be limited to the areas shown on the Mine Plan Maps, (Maps 19A through 19D). Subsidence is estimated to be 0.7 times the coal seam thickness and the area of subsidence will be minimal. Therefore, subsidence should not result in any significant alteration of surface flow patterns or drainage of surface water flows into underground mine workings. In addition, CPMC will take certain specific actions, including grading and revegetation of any significant surface subsidence cracks to assure that surface flows do not enter the Willow Creek Mine workings. Upon completion of mining and related activities, mine openings will be sealed and backfilled to further preclude any potential ground water discharge or surface water inflows in mine portal areas or boreholes.

**TABLE 5.3-2
PERMANENT SEED MIXTURE (UPLAND)**

Life Form/Species	# Seeds/lb	Drill Seeding Rate # PLS/acre	Broadcast Seeding Rate # PLS/acre
Grasses			
Amur Intermediate wheatgrass ¹ (<i>Agropyron intermedium</i>)	80,000	0.50	1.00
Rosana Western wheatgrass (<i>Agropyron smithii</i>)	115,000	1.00	2.00
Salina wildrye (<i>Elymus salinus</i>)	380,000	3.00	6.00
Primar slender wheatgrass (<i>Agropyron trachycaulum</i>)	135,000	1.00	2.00
Nezpar indian ricegrass (<i>Oryzopsis hymenoides</i>)	160,000	2.00	4.00
Critana Thickspike wheatgrass (<i>Agropyron dasystachyum</i>)	150,000	2.00	4.00
Great basin wildrye (<i>Elymus cinereus</i>)	150,000	1.00	2.00
Forbs			
Blueleaf aster (<i>Aster glaucodes</i>)	2,668,000	-	0.50
Western yarrow (<i>Achillea lanulosa</i>)	4,124,000	-	0.25
Lewis flax (<i>Linum lewisii</i>)	278,000	0.25	0.50
Palmer penstemon (<i>Penstemon palmeri</i>)	600,000	0.25	0.50
Yellow Sweetclover ¹ (<i>Melilotus officinalis</i>)	260,000	0.50	1.00
Shrubs			
Fourwing saltbush (<i>Atriplex canescens</i>)	50,000	3.00	6.00
Whitestem rubber rabbitbrush ² (<i>Chrysothamnus nauseosus</i>)	693,000	-	1.00
Green ephreda (<i>Ephreda viridis</i>)	24,955	2.00	2.00
Basin big sagebrush ² (<i>Artemisia tridentata tridentata</i>)	2,576,000	-	1.00
TOTAL	-	15.00	30.75
Notes: ¹ Introduced species ² Species to be broadcast seeded only			

**SUPERSEDED
EFFECTIVE:**

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