

Table 2.7-2. Landusky Mine Reclamation Alternatives Comparison

Mine Feature <i>Interim Reclamation Actions</i>	<i>Alternative L1, Existing DEQ Reclamation Plans (FEIS Alt. 3 and 1998 ROD)</i>	<i>Alternative L2, Optimize Earthwork within Bond Amount</i>	<i>Alternative L3, Improved Pit Drainage Drill Hole</i>	<i>Alternative L4, Remove & Backfill L85/86 Leach Pad (Preferred Alt.)</i>	<i>Alternative L5, Pit Backfill to Cover Sulfide Highwalls</i>	<i>Alternative L6, Pit Backfill to Restore Pre-Mine Contours</i>
General Reclamation Cover Description (see also Figure 2.4-2):						
Water Barrier Cover	Use on slopes flatter than 4H:1V over 24" neutral waste. Place a GCL, 36" NAG, 12" soil, and revegetate.	Not used except on floor of Surprise and Queen Rose pits.	Same as Alt. L2.	Same as Alt. L2.	Same as Alt. L2.	Use on slopes flatter than 4H:1V) over 24" neutral waste. Place a geosynthetic liner, 31" NAG, 15" soil, and revegetate.
Water Balance Cover	Use on slopes steeper than 4H:1V. Place 12" NAG, geotextile filter fabric, 36" soil, and revegetate.	Not used.	Not used.	Not used.	Not used.	Use on slopes steeper than 4H:1V. Place 19" NAG, geotextile filter fabric, 27" soil, and revegetate.
Soil Cover <i>Top 24" lime amended and covered with 6" tailings & 18" soil.</i>	12" NAG and 12" soil over acid generating footprints. 12" soil over non-acid generating surfaces. Revegetate cover.	6" NAG and 18" soil in pit complex. 24" NAG and 24" soil or 15" NAG and 24" soil over acid generating footprints. 12" or 24" soil over non-acid generating surfaces. Revegetate cover.	Same as Alt. L2.	24" NAG and 24" soil on most areas. NAG can be produced by lime amendment. 12" to 24" soil over non-acid generating native ground. Revegetate cover.	21" NAG and 25" soil or 24" NAG and 24" soil over acid generating footprints. 12" soil over non-acid generating surfaces. Revegetate cover.	12" or 24" soil over non-acid generating surfaces.

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Mine Pits						
August/Little Ben Pit	Cut drainage notch in SW end of pit and backfill to make free draining into Montana Gulch. Place 5' NAG on backfill. Cover fill with water barrier reclamation cover; Cover benches and notch with 0"-12" NAG, 12" soil, and revegetate.	Drain pit through artesian well WS3. Cover pit floor with 6" NAG, 18" soil, and revegetate.	Same as Alt. L2, but add a directional bore hole to ensure free draining. Cover pit floor with 6" NAG, 18" soil, and revegetate.	Drain pit through artesian well WS3 or directional bore hole. Backfill average 85 feet with L85/86 pad; Cover 900 linear feet of sulfide highwall with NAG fill. Lime amend subgrade to produce 24" NAG. Cover with 24" soil and revegetate.	Backfill the pit to be free draining. Cover sulfide highwalls with 3H:1V slopes. Place geosynthetic liner on pit floor. Cover with 21" NAG, 25" soil, and revegetate.	Backfill to pre-mine drainage with 3H:1V slopes. Place geosynthetic liner on pit floor. Cover with water barrier and water balance reclamation covers.
Suprise Pit <i>Partial backfill to make free draining (3% slope). Cover pit floor with GCL liner.</i>	Backfill to make free draining. Cover benches and backfill with water barrier cover.	Backfill benches and over liner with 24" NAG from August #2 east lobe, 18" soil, and revegetate. Backfill to cover sulfides with rubble slope.	Backfill benches and over liner with 24" NAG from August #2 east lobe, 18" soil, and revegetate. Backfill to cover sulfides with rubble slope.	Backfill benches and over liner with 24" NAG from August #2 east lobe, 18" soil, and revegetate. Backfill to cover sulfides with rubble slope.	Backfill to cover sulfide highwalls at 3H:1V slopes. Install groundwater recovery wells. Cover fill with 21" NAG, 25" soil, and revegetate.	Backfill to pre-mine drainage with 3H:1V slopes. Install groundwater recovery wells. Cover fill with water barrier and water balance reclamation covers.

Mine Feature <i>Interim Reclamation Actions</i>	Alternative L1, Existing DEQ Reclamation Plans (FEIS Alt. 3 and 1998 ROD)	Alternative L2, Optimize Earthwork within Bond Amount	Alternative L3, Improved Pit Drainage Drill Hole	Alternative L4, Remove & Backfill L85/86 Leach Pad (Preferred Alt.)	Alternative L5, Pit Backfill to Cover Sulfide Highwalls	Alternative L6, Pit Backfill to Restore Pre-Mine Contours
Queen Rose Pit <i>Place geosynthetic liner on pit floor. Backfill and grade to make free draining.</i>	Cover benches with 12"NAG, 12" soil, and revegetate. Cover pit floor with water barrier reclamation cover.	Cover pit floor backfill with 6" NAG, 18" soil, and revegetate. No bench covers.	Same as Alt. L2.	Lime amend bench to produce 24 " NAG; Cover with 24" soil. Cover pit floor with 24 " NAG and 24" soil. Revegetate.	Backfill to be free draining plus cover sulfide highwalls at 2H:1V slope. Cover fill with 21" NAG, 25" soil, and revegetate.	Backfill to pre-mine drainage with 3H:1V slopes. Cover fill with water barrier and water balance reclamation covers.
Gold Bug Pit <i>Regrade existing backfill to 3H:1V slopes. Blast highwall to cover sulfides.</i>	No cover on highwall rubble slope. Cover floor area with water barrier and water balance reclamation covers.	Cover floor with 24" NAG, 24" soil, and revegetate.	Same as Alt. L2.	Same as Alt. L2.	Import NAG fill to cover additional highwalls at 2H:1V slope. Cover fill with 21" NAG, 25" soil, and revegetate.	Backfill to the pre-mine drainage with 3H:1V slopes. Cover fill with water barrier and water balance reclamation covers.
South Gold Bug Pit <i>Reduce north and east pit wall by blasting and cover with rubble fill.</i>	Regrade backfill to 3H:1V slopes. Cover with water barrier and water balance reclamation covers	Regrade backfill to 3H:1V slopes. Cover with 24" NAG, 24" soil, and revegetate.	Same as Alt. L2.	Grade cut area, west benches and fill at 3H:1V slopes. Cover blast source area with 12" soil. Cover floor with 24" NAG, 24" soil, and revegetate.	Import NAG fill to cover sulfide highwalls at 2H:1V slopes. Cover with 21" NAG, 25" soil, and revegetate.	Backfill to the pre-mine drainage with 3H:1V slopes. Cover with water barrier and water balance reclamation covers.
Leach Pads:						
L79 Pad	Additional Revegetation.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.

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L80-82, L83, and L84 Pads plus L83 & L84 Dikes <i>Pads regraded at 3H:1V slopes. Top 24" lime amended & covered with 6" tailings & 18" soil. L84 Dike built out to 3H:1V slope.</i>	Remove interim reclamation and replace with water balance and water barrier reclamation covers. Additional revegetation on L83 dike.	Interim reclamation would be final. Additional revegetation on L83 dike.	Interim reclamation would be final. Additional revegetation on L83 dike.	Interim reclamation would be final. Additional revegetation on L83 dike.	Interim reclamation would be final. Additional revegetation on L83 dike.	Interim reclamation would be final. Additional revegetation on L83 dike.
L85/86 Pad and L85/86 Dike <i>Partial removal to build out L84 Dike and adjacent slope to the south.</i>	Regrade to 3H:1V slopes. Excavate a drainage channel along western edge to make free draining. Build out dike to a 2.5H:1V slope. Cover with water balance and water barrier reclamation covers.	3H:1V slope regrade of heap with limited drainage restoration. Build out dike to 2.5H:1V slope. Cover with 24" NAG, 24" soil, and revegetate.	Same as Alt. L1.	Complete removal of leach pad and dike for use as pit backfill: Test and lime amend native surface as required. Cover native ground with 24" soil and revegetate.	Complete removal of leach pad and dike for use as pit backfill: Test and lime amend native surface as required. Cover native ground with 12" soil and revegetate.	Same as Alt. L5.
L87 Pad	Regrade to overall 3H:1V slopes. Cap with water barrier and water balance reclamation covers.	Regrade to 2.5:1V slopes. Cover with 15" NAG, 24" soil, and revegetate.	Same as Alt. L2.	Regrade to 2.5:1V slopes. Cover with 24" NAG, 24" soil, and revegetate.	Use part for backfill of pit complex. Regrade remainder to max. 3H:1V slopes. Cover with 21"NAG, 25" soil, and revegetate.	Remove large portion for fill in pit complex. Regrade remainder to max. 3H:1V slopes. Cover with water barrier and water balance reclamation covers.

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L91 Pad and Dike <i>Extended liner into road cut to the east; Grade east side of leach pad.</i>	Regrade to overall 3H:1V slopes and cap. Build out L91 dike to 2.5H:1V slope using pad. Cover with water balance and water barrier reclamation covers.	Regrade to overall 2.5H:1V slopes on the leach pad. L91 dike left in current configuration. Additional revegetation of L91 dike. Cover with 15" NAG, 24" soil, and revegetate.	Same as Alt. L2.	Regrade to overall 2.5H:1V slopes on the leach pad. L91 dike left in current configuration. Additional revegetation of L91 dike. Cover with 24" NAG, 24" soil, and revegetate.	Remove part for backfill of pit complex. Regrade remainder to 3H:1V slopes. L91 dike left in current configuration. Additional revegetation of L91 dike. Cover with 21" NAG, 25" soil, and revegetate.	Remove large portion for backfill of pit complex. Regrade remainder to overall 3H:1V slope. L91 dike left in current configuration. Additional revegetation of L91 dike. Cover with water balance and water barrier reclamation covers.
Waste Rock Dumps:						
Mill Gulch Waste Rock Dump	Use soil stockpile on top. Extend existing water barrier reclamation cover over stockpile footprint. Additional revegetation on dump slope.	Leave soil reserve on top. Additional revegetation on dump slope.	Same as Alt. L2.	Same as Alt. L2.	Use soil stockpile on top. Extend existing liner to cover soil stockpile area. Cover with 21" NAG, 25" soil. Additional revegetation on dump slope.	Use soil stockpile on top. Cover with water balance and water barrier reclamation covers. Additional revegetation on dump slope.

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Montana Gulch Waste Rock Dump	Excavate top bench as drainage notch cut into August/Little Ben pit. Use excavation as backfill in August/Little Ben pit. Cover top with water barrier reclamation cover.	Cover dump top with 15" NAG, 24" soil, and revegetate. Existing reclamation on dump slope would be left as final.	Same as Alt. L2.	Cover dump top with 24" NAG, 24" soil, and revegetate. Existing reclamation on dump slope would be left as final.	Cover dump top with 21" NAG, 25" soil, and revegetate. Existing reclamation on dump slope would be left as final.	Cover dump top with water barrier reclamation cover. Existing reclamation on dump slope would be left as final.
August #1 Waste Rock Dump <i>Use as NAG cover and to backfill adjacent benches. Regrade footprint to 2.7H:1V slopes.</i>	Cover with 12" soil and revegetate over NAG fill.	Cover with 24" soil and revegetate over NAG fill.	Same as Alt. L2.	Same as Alt. L2.	Same as Alt. L2.	Entire area is part of pit backfill. Cap with water balance and water barrier reclamation covers.
August #2 Waste Rock Dump	Excavate east lobe as NAG cover and fill source. Cover with 12" soil and revegetate. Reclamation on west lobe would be final.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Remove east and west lobes for use as NAG. Cover with 12" soil and revegetate.

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Gold Bug Yellow Waste Rock Dump <i>Regraded to 3H:1V slope</i>	Cover with water balance and water barrier reclamation covers and cap.	Cover with 24" NAG, 24" soil, and revegetate.	Same as Alt. L2.	Same as Alt. L2.	Remove for Backfill. Grade exposed bench at 3H:1V slope. Cover footprint with 21" NAG, 25" soil, and revegetate.	Buried by pit area backfill. Cap as part of pit with water barrier and water balance reclamation covers.
Lower Gold Bug Blue Waste Rock Stockpile	Excavate for use as NAG cover source. Cover with 12" soil and revegetate.	Excavate for use as NAG cover source. Cover with 24" soil and revegetate.	Same as Alt. L2.	Same as Alt. L2.	Same as Alt. L2.	Same as Alt. L2.
Upper Gold Bug Blue Waste Rock Stockpile	Excavate for use as NAG cover source. Cover with 12" soil and revegetate.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Excavate for use as NAG cover. Cap as part of pit backfill with water barrier and water balance reclamation covers.
New Disturbance:						
Limestone Quarry	Develop two quarries to supply NAG material.	No new disturbance - quarry is not required.	Same as Alt. L2.	Same as Alt. L2.	Same as Alt. L2.	Same as Alt. L2.
Gold Bug Highwall	3.6 acres	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.
Montana Gulch Drain	2 acres	None.	2 acres	None.	None.	None.

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Seepage Capture and Water Treatment:						
Water Treatment Plant	Continue to use at current location. Upgrade with biocircuit for nitrates and selenium.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.
Capture Systems	Upgrade as indicated by monitoring to meet MPDES discharge requirements.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.	Same as Alt. L1.
Reclamation Schedule and Labor:						
Reclamation Timeframe	1999-2004	1999-2003	1999-2003	1999-2004	1999-2005	1999-2008
Direct Reclamation Employment	16-21 people	10-21 people	10-21 people	16-21 people	16-21 people	17-25 people