BLM

Copper Flat Copper Mine

Final
Environmental Impact Statement

Sierra County, New Mexico

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Volume 2
April 2019

APPENDICES

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APPENDIX A

EIS SIGNIFICANCE CRITERIA

APPENDIX A: EIS SIGNIFICANCE CRITERIA

IMPACT: AIR QUALITY

Term	Definition
Magnitude	
Major	Total project emissions exceed the major source thresholds or the de minimis thresholds in a nonattainment area and cannot be offset
Moderate	Total project emissions exceed the major source thresholds or the de minimis thresholds in a attainment area, or in any nonattainment area and cannot be offset
Minor	Total project emissions do not exceed the major source thresholds or the de minimis thresholds in any area
Duration	
Long Term	Ongoing or indefinitely
Medium Term	Greater than one year
Short Term	Less than one year
Extent	
Large	Regional level effects
Medium (localized)	Measurable effects localized to areas surrounding the site
Small (limited)	Measurable effects confined primarily to the permit boundary
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

Source: Clean Air Act

IMPACT: CLIMATE CHANGE AND SUSTAINABILITY

Term	Definition
Magnitude	
Major	Immediately observable impact (e.g., significant increase in GHG concentrations or significant decrease in local air quality)
Moderate	Some observable response (e.g., minimal increase in GHG emissions from project area or decrease in air quality)
Minor	No response observed
Duration	
Long Term	More than ten years
Medium Term (limited or intermittent)	Three to ten years
Short Term	Less than three years (assuming a three-year construction phase)
Extent	
Large	Extending outside of state boundaries
Medium (localized)	Extending to state/region
Small (limited)	Only surrounding project area/vicinity
Likelihood	
Probable	Occurs under typical operating condition.
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: WATER QUALITY

Term	Definition
Magnitude	
Major	Violation of applicable surface water quality standard
Minor	Effects to water quality that do not cause violation of applicable surface water quality standard
Duration (Duration is somewhat parameter-and criteria-specific and must be considered in that context)	
Long Term	Effects to water quality that will persist for foreseeable future
Medium Term (limited or intermittent)	Seasonal effects to water quality
Short Term	Short-term or temporary effects to water quality
Extent	
Large	a. Affect entire watershed or multiple watersheds, or b. Affect over 40 percent of major waterbody (e.g., over 40 percent of major lake, >40 percent width and significant length (>100) of major river, etc.)
Medium (localized)	a. Affect over 25 percent of watershed (basin), or b. Affect over 50 percent of small water body, or c. >10 percent, but <40 percent of major water body.
Small (1imited)	Affect less than 25 percent single watershed, less than 10 percent major water body. May include entire area of one to two small ponds (<five acres) or small seasonal wetland.
Likelihood	
Probable	Occurs under typical or expected conditions
Possible	Occurs under worst-case conditions or in the case of a upset or malfunction
Unlikely	Not anticipated to occur

IMPACT: SURFACE WATER USE

Term	Definition
<u>Magnitude</u>	
Major	The impact to surface water resources is substantial, with expected surface water depletion rates of greater than 20 percent
Moderate	The impact to surface water resources is measurable, with expected surface water depletion rates ranging from 5 to 20 percent
Minor	The impact to surface water resources is negligible, with expected surface water depletion rates of less than five percent
<u>Duration</u>	
Long Term	Greater than five years.
Medium Term (limited or intermittent)	One to five years or intermittent over the mine life.
Short Term	Less than one year.
<u>Extent</u>	
Large	Impacts to surface water features outside the Greenhorn Arroyo Drainage Basin (e.g., Percha and Las Animas Creeks, Rio Grande)
Medium (localized)	Impacts limited to surface water features within the Greenhorn Arroyo Drainage Basin (e.g., reaches of the Grayback and Green Arroyos outside the proposed mine permit boundary)
Small (1imited)	Impacts limited to surface water features adjacent mine facilities (e.g., seeps at the open pit)
<u>Likelihood</u>	
Probable	Occurs under typical or expected conditions
Possible	Occurs under worst-case conditions or in the case of a upset or malfunction
Unlikely	Not anticipated to occur

IMPACT: GROUNDWATER USE

Term	Definition
Magnitude	
Major	Resources completely or near completely depleted or made unusable
Moderate	A measurable and noticeable change to resources, causing partial depletion or loss of use
Minor	Little or no change to resources
Duration (Duration is somewhat parameter- and criteria-specific and must be considered in that context)	
Long Term	Permanent change to resources
Medium Term (limited or intermittent)	Resources will recover decades after project ends
Short Term	Impact lasts months to a few years
Extent	
Large	More than ten square miles impacted
Medium (localized)	Less than ten square miles impacted
Small (1imited)	Impacted area is a few to many acres
Likelihood	
Probable	Intended consequence will occur
Possible	Occurs as a worst-case only
Unlikely	Will not occur

IMPACT: MINERAL AND GEOLOGICAL RESOURCES

Term	Definition
Magnitude	
Major	Resources are completely or near completely depleted or made unusable
Moderate	A measurable and noticeable change to resources, causing partial depletion or loss of use
Minor	Little or no change to resources
Duration (Duration is somewhat parameter- and criteria-specific and must be considered in that context)	
Long Term	Permanent loss of resources
Medium Term (limited or intermittent)	Resources will recover after project ends
Short Term	Impact lasts only days or weeks
Extent	
Large	Greater than one square mile
Medium (localized)	Greater than ten acres
Small (1imited)	Less than ten acres
Likelihood	
Probable	Intended consequence will occur
Possible	Occurs as a worst-case only
Unlikely	Will not occur

IMPACT: SOIL EROSION

Term	Definition
Magnitude	
Major	Secondary effects (e.g., building damage, siltation of surface water)
Moderate	Aesthetic effects
Minor	Imperceptible changes
Duration	
Long Term	Through facility life (>30 years)
Medium Term (limited or intermittent)	Recurrent
Short Term	During critical activities only (during construction, after first test firing)
Extent	
Large	>100 square yards
Medium (localized)	~10 square yards
Small (limited)	<~1 square yard
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: SOIL CONTAMINATION

Term	Definition
Magnitude	
Major	Posing secondary (e.g., health) risks
Minor	No associated health risks
Duration	
Long Term	Cumulative over operational life
Medium Term (limited or intermittent)	Recurrent, or residues accumulating
Short Term	Easily cleared up or self-remediating (e.g., biological breakdown, volatilizing)
Extent	
Large	>100 cubic yards (or 100-square-yard surface area)
Medium (localized)	~10 cubic yards (or 10-square-yard surface area)
Small (limited)	<1 cubic yard (or 2-square-yard surface area)
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: HAZARDOUS MATERIALS

Term	Definition
Magnitude	
Major	Large generator of hazardous waste (generates greater than 1,000 kg of hazardous waste in a calendar month)
Moderate	Large intermittent generator of hazardous waste
Minor	Small quantity generator (generates less than 1,000 kg of hazardous waste in a calendar month)
Duration	
Long Term	Generates hazardous waste throughout life of the project
Medium Term (limited or intermittent)	Intermittent generator of hazardous waste
Short Term	Generates hazardous waste only during infrequent operations
Extent	
Large	Generates hazardous waste during all phases of construction and operation
Medium (localized)	Generates hazardous waste during about half of the construction and operation
Small (limited)	Generates hazardous waste during less than half of the construction and operation
Likelihood	
Probable	Occurs under typical operating conditions.
Possible	Occurs under worst-case operating conditions.
Unlikely	Occurs under upset/malfunction conditions.

IMPACT: SOLID WASTE

Term	Definition
Magnitude	
Major	Existing landfill capacity less than two years, or no existing capacity; or groundwater contamination
Moderate	Landfill capacity would be depleted in two to seven years; no groundwater contamination
Minor	Landfill capacity would be depleted in more than seven years; no groundwater contamination
Duration	
Long Term	Permitting and siting of new disposal facility would take more than three years; or groundwater contamination
Medium Term (limited or intermittent)	Siting and permitting of new disposal facility would take between one to three years
Short Term	Siting and permitting would take less than one year; no groundwater contamination
Extent	
Large	Multiple landfills needed or a large landfill needed to expand capacity (>100 acres); or large groundwater contaminant plume
Medium (localized)	Moderate size landfill needed – 40 to 100 acres.
Small (limited)	Small landfill needed – less than 40 acres.
Likelihood	
Probable	Occurs under typical facility operating conditions.
Possible	Occurs under worst-case operating conditions.
Unlikely	Occurs under upset/malfunction conditions.

IMPACT: BIOLOGICAL RESOURCES

WILDLIFE AND MIGRATORY BIRDS

VEGETATION AND NON-INVASIVE SPECIES

T&E SPECIES AND SPECIAL STATUS SPECIES

Term	Definition
Magnitude	
Major	Loss of any threatened or endangered species, loss or degradation of any critical habitat. Impacts to threatened or endangered species are considered to be of major magnitude unless a Biological Assessment team report has been prepared and indicates otherwise
Moderate	Loss of any sensitive species or habitats; loss or degradation of any unusual plant communities
Minor	Loss or degradation of undisturbed/developed vegetation or habitat in affected area
Duration	
Long Term	Greater than one year (or during critical periods)
Medium Term (limited or intermittent)	One month to one year
Short Term	Less than one month
Extent	
Large	Greater than five percent of regional (as defined by county or space center boundaries, if known) resources
Medium (localized)	Two to five percent of regional resources
Small (limited)	Less than two percent of regional resources
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: CULTURAL RESOURCES

Term	Definition
<u>Magnitude</u>	
Major	The impact on resources is substantial and noticeable. The impact changes one or more character-defining features of an archeological resource, diminishing the integrity of the resource to the extent that it is no longer eligible for listing on the NRHP. The Section 106 determination would be adverse effect.
Moderate	The impact is measurable and perceptible. The impact is readily apparent or changes one or more character-defining features of an archeological resource to the extent that its NRHP eligibility is jeopardized. The Section 106 determination would be adverse effect.
Minor	The impact on archeological resources is measureable or perceptible, but it is slight and localized within a relatively small area of a site or group of sites. The impact does not affect the character-defining features of NRHP-listed or eligible archeological resources and would not have an effect on the overall integrity of any archeological resources. The Section 106 determination would be no adverse effect.
Negligible	The impact on archeological resources is the lowest level of detection, barely perceptible and not measurable. The Section 106 determination would be no adverse effect.
<u>Duration</u>	
Permanent	Permanent
Long Term	More than five years
Medium Term (limited or intermittent)	One to five years
Short Term	Less than one year
<u>Extent</u>	Extent really does not apply to cultural resources analysis.
Large	Most of historic or archaeological site or district affected (more than 50 percent)
Medium (localized)	Some of historic or archaeological site or district affected (5-50 percent)
Small (limited)	Small portion of historic or archaeological site or district affected (less than five percent)

<u>Likelihood</u>	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

Sources: National Historic Preservation Act
36 CFR 800: Protection of Historic and Cultural Properties

IMPACT: VISUAL RESOURCES

Term	Definition
Magnitude	
Major	A modification, which is dominant in the landscape and demands attention
Moderate	A modification, which attracts attention but is not dominant
Minor	A modification, which can be seen but does not attract attention
Duration	
Long Term	Project life of 20 years or more
Medium Term (limited or intermittent)	Project life of 5 to 10 years
Short Term	Project life of less than five years
Extent	
Large	Visual quality were altered for more than 1,000 people
Medium (localized)	Visual quality were altered for 100-1,000 people
Small (limited)	Visual quality were altered for less than 100 people
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

Source: Bureau of Land Management: Visual Resource Management Guidelines

IMPACT: LAND USE

Term	Definition
Magnitude	
Major	In conflict with Federal or State land use plans
Moderate	In conflict with regional or county land use plans
Minor	In conflict with nearby municipal or site-specific land use plans
Duration	
Long Term	Project life is more than 20 years
Medium Term (limited or intermittent)	Project life is 5-20 years
Short Term	Project life is less than five years
Extent	
Large	Proposed project occupies an area greater than five percent of the planning area jurisdiction
Medium (localized)	------
Small (limited)	Proposed project occupies an area less than five percent of the planning area jurisdiction
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: RECREATION

Term	Definition
Magnitude	
Major	Project would eliminate areas of prime or unique recreation opportunities or facilities
Moderate	Reduction of recreational opportunities within the area
Minor	Slight modification of recreation opportunities within the area
Duration	
Long-term	Project life is more than 20 years
Medium-term (limited or intermittent)	Project life is 5 to 20 years
Short-term	Project life is less than five years
Extent	
Large	Users from the State or beyond
Medium (localized)	Users from Sierra County and neighboring counties
Small (limited)	Predominantly local users
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: SPECIAL MANAGEMENT AREAS

Term	Definition
Magnitude	
Major	Project would significantly impair use or viability of Special Management Areas
Moderate	Project would hinder use or viability of Special Management Areas
Minor	Slight modification of Special Management Areas
Duration	
Long Term	Project life is more than 20 years
Medium Term (limited or intermittent)	Project life is 5 to 20 years
Short Term	Project life is less than five years
Extent	
Large	Project would directly impact Special Management Areas immediately adjacent to and not adjacent to project area
Medium (localized)	Project may impact adjacent Special Management Areas
Small (limited)	Impacts would be confined to project area
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: LANDS AND REALTY

Term	Definition
Magnitude	
Major	In conflict with Federal or State land use plans
Moderate	In conflict with regional or county land use plans
Minor	In conflict with nearby municipal or site-specific land use plans
Duration	
Long Term	Project life is more than 20 years
Medium Term (limited or intermittent)	Project life is 5 to 20 years
Short Term	Project life is less than five years
Extent	
Large	Proposed project occupies an area greater than five percent of the planning area jurisdiction
Medium (localized)	------
Small (limited)	Proposed project occupies an area less than five percent of the planning area jurisdiction
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: RANGE AND LIVESTOCK

Term	Definition
Magnitude	
Major	Impair use of grazing allotment such that a reduction in permitted active AUM use would be required that could cause economic harm to the permittee
Moderate	Hinder use of grazing allotment such that permitted active AUM use would be adjusted
Minor	Disrupt use of grazing allotment but no adjustment to active AUM use
Duration	
Long-term	Project life of ten years or more
Medium-term (limited or intermittent)	Project life of five to ten years
Short-term	Project life of less than five years
Extent	
Large	New surface disturbance on BLM land within grazing allotment resulting in greater than ten percent reduction of forage derived from BLM land
Medium (localized)	New surface disturbance on BLM land within grazing allotment resulting in five to ten percent reduction of forage derived from BLM land
Small (limited)	New surface disturbance on BLM land within grazing allotment resulting in less than five percent reduction of forage derived from BLM land
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: TRAFFIC

Term	Definition
Magnitude	
Major	Service level decreased to E or below (vehicle spacing is at approximately six car lengths)
Moderate	Service level decrease to D (vehicle spacing is at or above 165’, or nine car lengths)
Minor	Service level remains at C or above (vehicle spacing is in range of 220’, or 11 car lengths.)
Duration	
Long Term	More than three years (operational period)
Medium Term (limited or intermittent)	One to three years (generally equivalent to construction period)
Short Term	Less than one year (associated with temporary road closures)
Extent	
Large	Multiple intersections or road segments on key access routes to community
Medium (localized)	One to three intersections or road segments, primarily affects traffic routes
Small (limited)	One intersection or road segment, not key location in local system
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/ malfunction conditions

IMPACT: NOISE

Term	Definition
Magnitude	
Major	Project creates a substantial amount of incompatible land use in high density residential areas
Moderate	Project creates some amount of incompatible land use in either undeveloped, agricultural, or low density residential areas
Minor	Project does not create any incompatible land use
Duration	
Long Term	Ongoing or indefinitely
Medium Term	Greater than one year
Short Term	Less than one year
Extent	
Large	Regional level effects - noise would be audible for several miles
Medium	Measurable effects localized to areas surrounding the site
Small	Measurable effects confined primarily to the permit boundary
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: VIBRATIONS

Term	Definition
Magnitude	**A-Weighted (humans)**
Major	Project generates vibrations that would be damaging to structures and distinctly perceptible in high density residential areas
Moderate	Project generates vibrations that would be damaging to structures and distinctly perceptible in either undeveloped, agricultural, or low density residential areas
Minor	Project does not generates vibrations that would be damaging to structures and distinctly perceptible at any nearby residence
Duration	
Long Term	Ongoing or indefinitely
Medium Term	Greater than one year
Short Term	Less than one year
Extent	
Large	Regional level effects - noise would be audible for several miles
Medium	Measurable effects localized to areas surrounding the site
Small	Measurable effects confined primarily to the permit boundary
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: SOCIOECONOMICS – CHANGES IN RESIDENT POPULATION, HOUSING, AND COMMUNITY SERVICES

Term	Definition
Magnitude	
Major	Greater than three percent change in resident population, causing existing community services (educational, health, fire, and police services) and housing to be over capacity
Moderate	Two to three percent change in population, causing the existing capacities of one or more community service or available housing to reach capacity
Minor	Less than one percent change in population. Change in population would increase demand on community services and decrease housing vacancy, but all would continue to operate below capacity
Duration	
Long Term	Beyond the life of the project
Medium Term (limited or intermittent)	Between two years up to the life of the project.
Short Term	Less than two years, or the duration of the construction phase
Extent	
Large	Regional, State, or national
Medium (localized)	Entire county or Region of Influence
Small (limited)	Town, city, or census-designated place
Likelihood	
Probable	Greater than 50 percent chance of occurrence based on population trends, current infrastructure, and capacities
Possible	5 to 50 percent chance of occurrence based on population trends, current infrastructure, and capacities
Unlikely	Less than five percent chance of occurrence based on population trends, current infrastructure, and capacities

IMPACT: CHANGES IN LABOR INCOME, ECONOMIC ACTIVITY, AND EMPLOYMENT

Term	Definition
Magnitude	
Major	Greater than ten percent change in labor income and/or economic activity within county. Greater than three percent change in annual employment within the county
Moderate	Between five to ten percent change in labor income or economic activity within county. Between two to three percent change in annual employment within the county
Minor	Less than five percent change in labor income or economic activity within county. Less than two percent change in annual employment within the county
Duration	
Long Term	Salaries and wages from direct jobs spent and re-invested in the county beyond the life of the project. Jobs are created and filled locally for the duration of the project; economic activity continues beyond the life of the project
Medium Term	Salaries and wages from direct jobs spent in the county and jobs are created and filled locally for the life of the project
Short Term	Spending of wages and salaries is localized and temporary and construction jobs are created and filled locally for a period of less than two years (or duration of the construction phase)
Extent	
Large	Change in labor income and economic activity affects surrounding counties up to entire State. Direct, indirect, and induced jobs created and filled in county and surrounding counties, with some indirect and induced jobs in the State
Medium (localized)	Change in labor income and economic activity affects entire county. Direct, indirect, and induced jobs created and filled in county with spillover in surrounding counties
Small (limited)	Change in labor income affects a portion of the county. Impact of jobs limited to county
Likelihood	
Probable	Greater than 50 percent chance of occurrence based on economic theory, historical trends, and statistics.
Possible	Between 5 to 50 percent chance of occurrence based on economic theory, historical trends, and statistics.

Unlikely	Less than five percent chance of occurrence based on economic theory, historical trends and statistics.

IMPACT: ENVIRONMENTAL JUSTICE

Term	Definition
Magnitude	
Major	Disproportionately high environmental impact, which affects an entire minority and low income community as well as pollution to fish/wildlife for subsistence consumption
Minor	A disproportionate environmental impact, which affects a portion of a minority or low income community
Duration	
Long Term	Throughout the life of the project construction and operation
Medium Term (limited or intermittent)	Temporarily (from two to six months)
Short Term	Isolated incident or less than two months
Extent	
Large	100 percent of the impact is experienced by minority or low income populations
Medium (localized)	75 percent of the impact is experienced by minority or low income populations
Small (limited)	60 percent of the impact is experienced by minority or low income populations
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions.

Sources: Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Council on Environmental Quality: Environmental Justice, Guidance Under the National Environmental Policy Act

IMPACT: HUMAN HEALTH AND SAFETY

Term	Definition
Magnitude	
Major	Catastrophic event resulting in loss of life, severe injuries requiring hospitalization, major property damage, or loss
Moderate	Event resulting in moderate injuries, which may require hospitalization, moderate property damage, or loss
Minor	Event resulting in minor injuries, which do not require hospitalization, minor property damage, or loss
Duration	
Long Term	>Ten years to return to normal
Medium Term (limited or intermittent)	One to ten years to return to normal
Short Term	<One year to return to normal
Extent	
Large	Extending outside buffer zone into region, State, or nation
Medium(localized)	Confined to within buffer zone into region, State, or nation
Small(limited)	Confined to site or individual facility on site
Likelihood	
Probable	Occurs under typical operating conditions
Possible	Occurs under worst-case operating conditions
Unlikely	Occurs under upset/malfunction conditions

IMPACT: UTILITIES AND INFRASTRUCTURE

Term	Definition		
Magnitude			
Major	Exceeds capacity of existing systems or services		
Moderate	Approaches capacity of existing systems or services		
Minor	Below capacity of existing systems or services		
Duration	Power and Water Supply, Sewage Treatment (Continuous or intermittent)	Solid Waste Management	On-Mine Facilities
Long Term	Longer than 24 hours	Longer than 14 days	Beyond life of mine and reclamation period
Medium Term	8 to 24 hours	7 to 14 days	Throughout life of mine and reclamation period
Short Term	Less than eight hours	Less than seven days	Throughout life of mine
Extent			
Large	Effect over entire region including Truth or Consequences and Williamsburg		
Medium (localized)	Effect over local area including town of Hillsboro		
Small (1imited)	Effect within permit boundary		
Likelihood			
Probable	Occurs under typical operating conditions		
Possible	Occurs under worst-case operating conditions		
Unlikely	Occurs under upset/malfunction conditions		

APPENDIX B

AIR QUALITY SUPPORTING DOCUMENTATION

APPENDIX B: AIR QUALITY SUPPORTING DOCUMENTATION

Table B-1. Uncontrolled Emissions for 25,000 tpd Operating Scenario

		TSP		PM_{10}		$PM_{2.5}$	
Unit ID	**Unit Description**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
S1	Drilling – Open Pit	5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit	54	7.8	28	1.2	1.6	0.068
S3	Prill Silo Loading	0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit	10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit	21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin	6.1	27	2.9	13	0.44	1.9
S7	Drop from Surge Bin to Apron Feeder	3.1	14	1.1	5.0	0.18	0.78
S10	Stacker Conveyor Drop to Course Ore Storage Pile	6.1	27	2.9	13	0.44	1.9
S11	Bulldozer Maintenance of Course Ore Storage Pile	21	30	4.5	6.5	2.2	3.2
S12	Course Ore Storage Pile Drop to Reclaimer	6.1	27	2.9	13	0.44	1.9
S13	Reclaimer Drop to Reclaim Conveyor	6.1	27	2.9	13	0.44	1.9
S14	Reclaim Conveyor Drop to Wet Mill	6.1	27	2.9	13	0.44	1.9
S15	Lime Silo Loading	18	3.9	12	2.5	0.90	0.20
S16	Drop to Molybdenum Storage Pile	0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S18	Drop to Copper Concentrate Storage Pile	0.011	0.048	0.0052	0.023	0.00079	0.0035
S19	Product Loading Trucks Molybdenum	0.00071	0.0031	0.00034	0.0015	0.000051	0.00022
S20	Product Loading Trucks Copper Concentrate	0.011	0.048	0.0052	0.023	0.00079	0.0035
S21	Truck Unloading Low Grade Ore Stockpile	0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area	21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile	3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area	21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area	2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area	1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area	0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode	8.4	31	2.7	10	0.27	1.0
S29	Truck Traffic Mine Trucks/Light Vehicles	1246	4559	355	1300	36	130
S30	Truck Traffic Product/Chemical Delivery Trucks	18	67	4.7	17	0.47	1.7
S31	Grader – Road Maintenance	11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile	0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area	3.2	14	1.6	7.0	0.24	1.0
S34	Wind Erosion Low Grade Ore Stockpile Area	1.3	5.6	0.64	2.8	0.10	0.42
S35	Wind Erosion Waste Dump Stockpile Area	3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area	3.3	14	1.6	7.2	0.25	1.1
	Uncontrolled Facility Totals	1518	5145	460	1519	54	170

Source: NMED, 2014.

Note: All NO_x, CO, SO_2 and VOC Emissions come from the open pit blasting (S2)

Table B-2. Controlled Emissions for 25,000 tpd Operating Scenario

		TSP		PM_{10}		$PM_{2.5}$	
Unit ID	**Unit Description**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
S1	Drilling – Open Pit	5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit	54	2.3	28	1.2	1.6	0.068
S3	Prill Silo Loading	0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit	10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit	21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin	1.5	6.7	0.72	3.2	0.11	0.48
S7	Drop from Surge Bin to Apron Feeder	1.0	4.5	1.0	4.5	1.0	4.5
S10	Stacker Conveyor Drop to Course Ore Storage Pile	1.5	6.7	0.72	3.2	0.11	0.48
S11	Bulldozer Maintenance of Course Ore Storage Pile	15	21	3.1	4.5	1.5	2.2
S12	Course Ore Storage Pile Drop to Reclaimer	1.0	4.5	1.0	4.5	1.0	4.5
S14	Reclaim Conveyor Drop to Wet Mill	0.23	1.0	0.11	0.47	0.016	0.072
S15	Lime Silo Loading	0.043	0.0094	0.043	0.0094	0.043	0.0094
S16	Drop to Molybdenum Storage Pile	1.0	4.5	1.0	4.5	1.0	4.5
S18	Drop to Copper Concentrate Storage Pile	0.0017	0.0072	0.00078	0.0034	0.00012	0.00052
S20	Product Loading Trucks Copper Concentrate	0.0033	0.014	0.0016	0.0069	0.00024	0.0010
S21	Truck Unloading Low Grade Ore Stockpile	0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area	21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile	3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area	21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area	2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area	1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area	0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode	3.3	12	1.1	4.0	0.11	0.40
S29	Truck Traffic Mine Trucks/Light Vehicles	87	319	25	91	2.5	9.1
S30	Truck Traffic Product/Chemical Delivery Trucks	3.7	13	0.95	3.5	0.095	0.35
S31	Grader – Road Maintenance	11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile	0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area	3.2	14	1.6	7.0	0.24	1.0
S34	Wind Erosion Low Grade Ore Stockpile Area	1.3	5.6	0.64	2.8	0.10	0.42
S35	Wind Erosion Waste Dump Stockpile Area	3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area	3.3	14	1.6	7.2	0.25	1.1
	Allowable Facility Totals	**279**	**657**	**97**	**222**	**19**	**48**

Source: NMED, 2014.

Note: All NO_x, CO, SO_2 and VOC Emissions come from the open pit blasting (S2)

DISPERSION MODEL REPORT FOR THEMAC RESOURCES NEW MEXICO COPPER CORPORATION'S COPPER FLAT MINE NSR PERMIT APPLICATION

Hillsboro, New Mexico

PREPARED FOR

THEMAC RESOURCES

Dated February 22, 2013

Prepared by

Paul Wade, Class One Technical Services, Inc.

CLASS 1 TECHNICAL SERVICES

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1.0 INTRODUCTION

This document presents a report for the Dispersion Model Analysis that was completed by Class One Technical Services, Inc. (CTS) on behalf of New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group Limited (THEMAC), to determine compliance of ambient air quality impacts from NMCC's Copper Flat Mine as part of that stationary source's 20.2.72 NMAC construction permit application. The objective of this modeling evaluation was to predict if a worst-case maximum operation of Copper Flat Mine resulted in ambient air concentrations of nitrogen dioxide (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter, i.e., total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), were below New Mexico and federal ambient air quality standards, NMAAQS and NAAQS respectively, and PSD NOx and PM_{10} Class I and II Increment.

1.1 PERMIT APPLICATION COPPER FLAT MINE PROCESS DESCRIPTION

The Copper Flat Mine is a copper/molybdenum porphyry deposit located in the Las Animas Mining District in South Central New Mexico, in Sierra County. The center of the mineralization is at approximately UTM coordinates 263,150 easting, 3,650,750 northing, Zone 13, NAD 83. The project is approximately 150 miles south of Albuquerque, New Mexico, approximately 20 miles southwest of Truth or Consequences, New Mexico, and approximately 3.8 miles northeast of Hillsboro, New Mexico. Access to Copper Flat Mine from Truth or Consequences is by 24 miles of paved highway and 3 miles of all-weather gravel road. The mine will consists of an open pit mine; a 25,000-ton per day crushing circuit; coarse ore storage pile and reclaimer; a 25,000-ton per day flotation mill and concentrator plant; and waste ore and mill tailings operations.

The Copper Flat Mine was originally developed in the 1970's by Quintana Mineral Corporation. Quintana Mineral Corporation applied for and received Air Quality Permit #0365. In 1982, operating under Air Quality Permit #0365-M1, the Copper Flat Partnership, Ltd. developed and operated the Project, which consisted of an open pit copper mine, a 15,000-ton per day flotation mill, and a 515-acre tailings impoundment. The Copper Flat Mine officially commenced full commercial production in April, 1982. In July 1982 the mine was shut down due to low copper prices and other economic considerations. In 1986 all on-site surface facilities were removed and a BLM approved program of non-destructive reclamation was carried out. Most of the property's infrastructure, including building foundations, power lines and water pipelines were preserved for reuse in the future in the event copper prices recovered sufficiently to make re-establishing the Project economically viable. In April of 1995, Alta Gold Company applied for a revision to Air Quality Permit #0365-M1. However, Alta Gold Company declared bankruptcy in early 1999. Air quality permit #0365-M1 was closed in 2002 due to inactivity.

NMCC is proposing to reopen the Copper Flat Project open pit mine to operate 24 hours per day, seven days per week, and 365 days per year. The mining of new ore would entail expansion of the existing open pit. A portion of the ore body at the Copper Flat Mine is exposed at the surface and would be mined by conventional truck and shovel open pit methods in a manner similar to the previous operation. An operational life of the mine is projected to be approximately 11 years. Over the life of the Project, approximately 159 million tons of material would be mined. The annual average operation would mine an estimated at 15.3 million tons of material per year over years one through 10. Approximately 1.7 million tons would be produced in pre-production and 4.7 million tons in year 11. The crushing operation would process an average 9.1 million tons of ore per year from years 1 through ten and between 4.0 million and 7.0 million tons in year 11 depending when the low grade ore is milled. Waste rock production is estimated to average 5.7 million tons per year or 60.7 million tons over the life of the mine. Approximately 3.0 million tons total of low grade ore would be mined in years one through three, with the majority of that, 2.5 million tons, being mined in year two. The low grade copper ore would likely be processed during operations as blend material and/or at the end of the mine life, depending on economic conditions at the time. As such, it would require stockpiling until such time at it is suitable for processing.

Copper Flat Mine is a source of particulate matter, nitrogen dioxide, carbon monoxide, and sulfur dioxide emissions. Nitrogen dioxide, carbon monoxide, and sulfur dioxide emissions occur during blasting in the open pit mine. Blasting operations will occur mostly during afternoon hours, for an estimated 290 blasts per year. Since the blasts will occur instantaneously with no schedule other than daylight/afternoon hours, modeling was performed for 1 hour per day of blasting emissions for nitrogen dioxide, carbon monoxide, and sulfur dioxide. Modeling of CO 1 hour was performed for all afternoon daylight hours to find the highest 1 hour impact from blasting. This same hour was then used in CO 8 hour, NOx, and SO_2 modeling. The CO 1 hour modeling found the highest 1 hour concentrations occurred in Hour 17 (4 PM).

The Copper Flat Project is designed to control particulate emissions to meet all regulatory standards. As per NMED regulations, the project air quality construction permit must be authorized by the NMED prior to the project commencing. Committed air quality practices would include dust control for mine unit operations. In general, the fugitive dust control program would provide for water application on haul roads and other disturbed areas; chemical dust suppressant application (such as magnesium chloride) where appropriate; and other dust control measures as per accepted and reasonable industry practice. Also, disturbed areas would be seeded with an interim seed mix to minimize fugitive dust emissions from un-vegetated surfaces where appropriate. Fugitive emissions in the process area would be controlled at the crusher, stockpile reclaimer, and conveyor drop points through the use of fugitive dust collectors. Other process areas requiring dust and/or emission controls include the concentrate drying and packaging circuit and the various process plants. Appropriate emission control equipment would be installed and operated in accordance with the air quality construction permit. The lime storage would be fitted with a dust collector for capture of fugitive dust during loading of the lime silo.

An existing Tailing Storage Facility at Copper Flat was constructed by Quintana Minerals to serve their 1982 mining operation. The facility received 1.2 million tons of material and was essentially reclaimed in 1986. The tailings impoundment remains in place and is located southeast of the former plant site. NMCC proposes to construct a new lined Tailing Storage Facility (TSF) over the area used by previous operations for tailing disposal. Tailing would be transported from the mill via slurry pipeline and deposited in the new facility. Approximately 100 million tons of tailings are expected to be impounded over the life of the project.

Tailing from the bulk rougher flotation process will be transported to the TSF where hydrocyclones will be used to produce sands to build the centerline TSF dam. The cyclone overflow will be deposited to the interior of the impoundment to produce a supernatant water pond used to reclaim water from the tailing for reuse in the milling process. During TSF dam construction, bulldozers and compactors will be used to compact the sands used in the dam. For years 1 through 4 of mining operations, topsoil will be removed from the tailing area and stockpiled in a borrow pile located southwest of the tailing area. This process will be performed by scrapers. Scraper travel routes between the tailing area and the borrow pile will be controlled with watering.

No gaseous contaminants, with the exception of blasting, are expected to be emitted to the atmosphere from the proposed stationary source operations. Drilling operations would be done wet or with other efficient dust control measures. At a minimum, haul roads, waste rock disposal areas, and ore transfer points would be wetted down on a regular basis to minimize dust emissions. Fugitive SO_2 emissions from ore and the flotation equipment are expected to be small due to the low volatility of the sulfur compounds present in the concentrate.

A significant majority of the modeled particulate matter emissions are from ground-release, fugitive dust sources where the maximum modeled concentrations are seen at the mine boundary. All ground-release, fugitive dust sources were modeled as "flat terrain" sources. The most recent version of AERMOD was used.

Proposed Facility Construction

As part of construction of the proposed facilities, earth moving, grading, and material hauling will have to be performed. These one time activities prior to operation of the mine have not been included as part of the permit application or dispersion modeling analysis.

A modeling protocol was submitted to the New Mexico Environment Department – Air Quality Bureau (NMED AQB) on December 6, 2012. It was approved by David Heath of the NMED AQB – Modeling Section on January 31, 2013.

Figure 1 presents the Copper Flat Mine overlaid onto a topographical map showing surrounding terrain. Figure 2 present an aerial view of the layout of Copper Flat Mine showing location of the open-pit, waste and low grade ore stockpile areas, tailing area, crusher location, mill and concentrator location, and mine haul roads in relation to mine boundaries. Figure 3 presents a process flow of the mining operations.

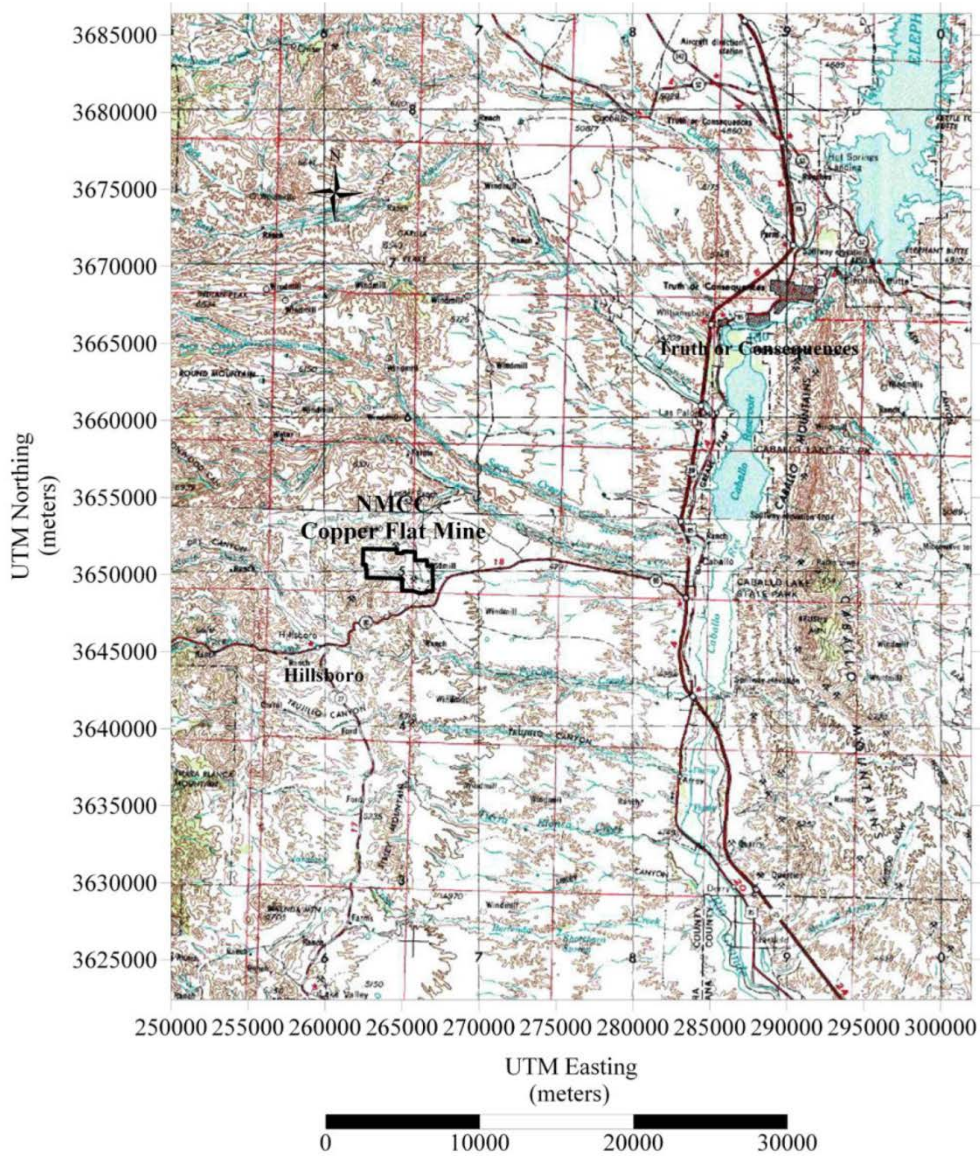

Figure 1: NMCC Copper Flat Mine Site Location

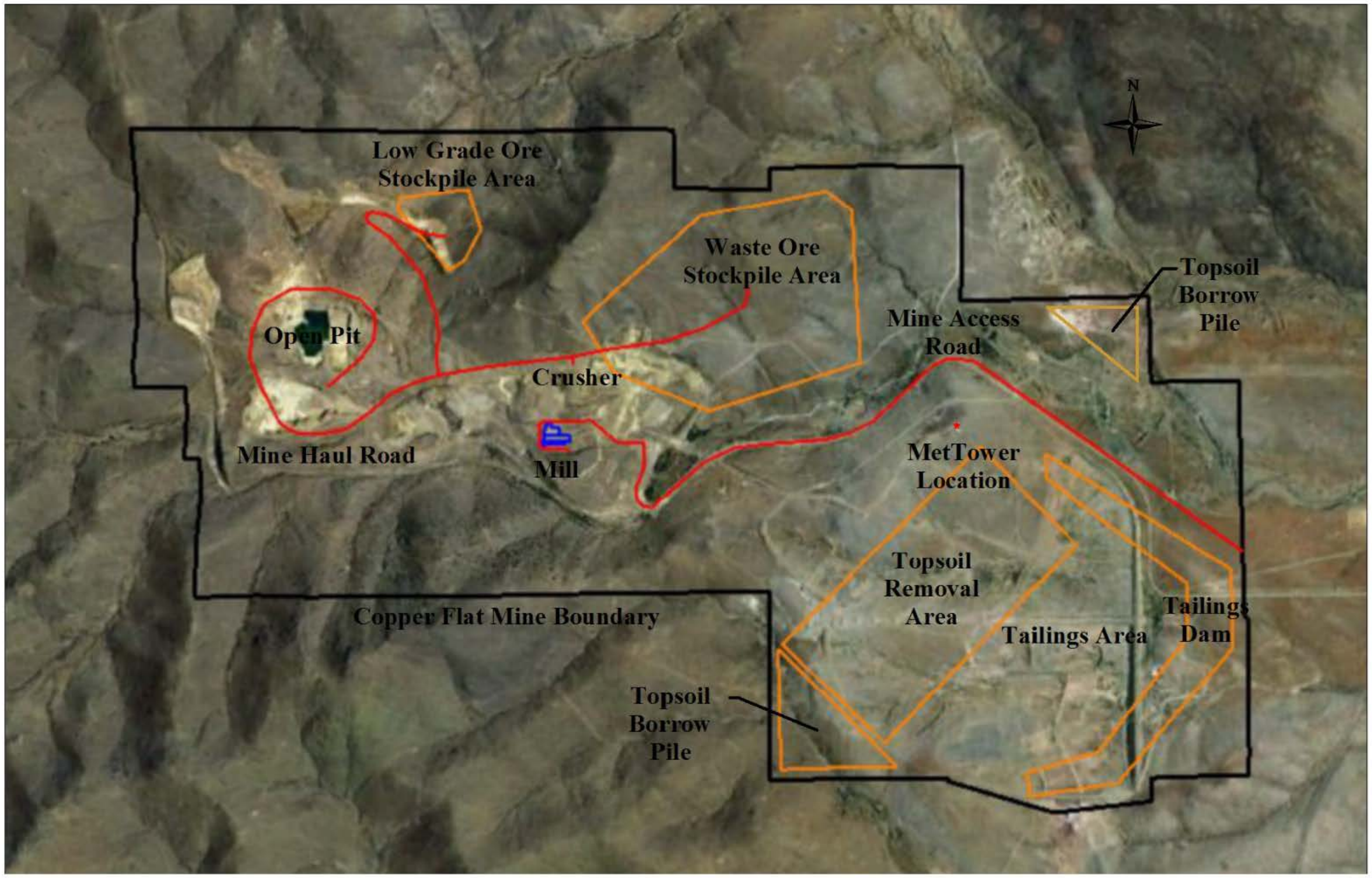

Figure 2: NMCC Copper Flat Mine Site Layout

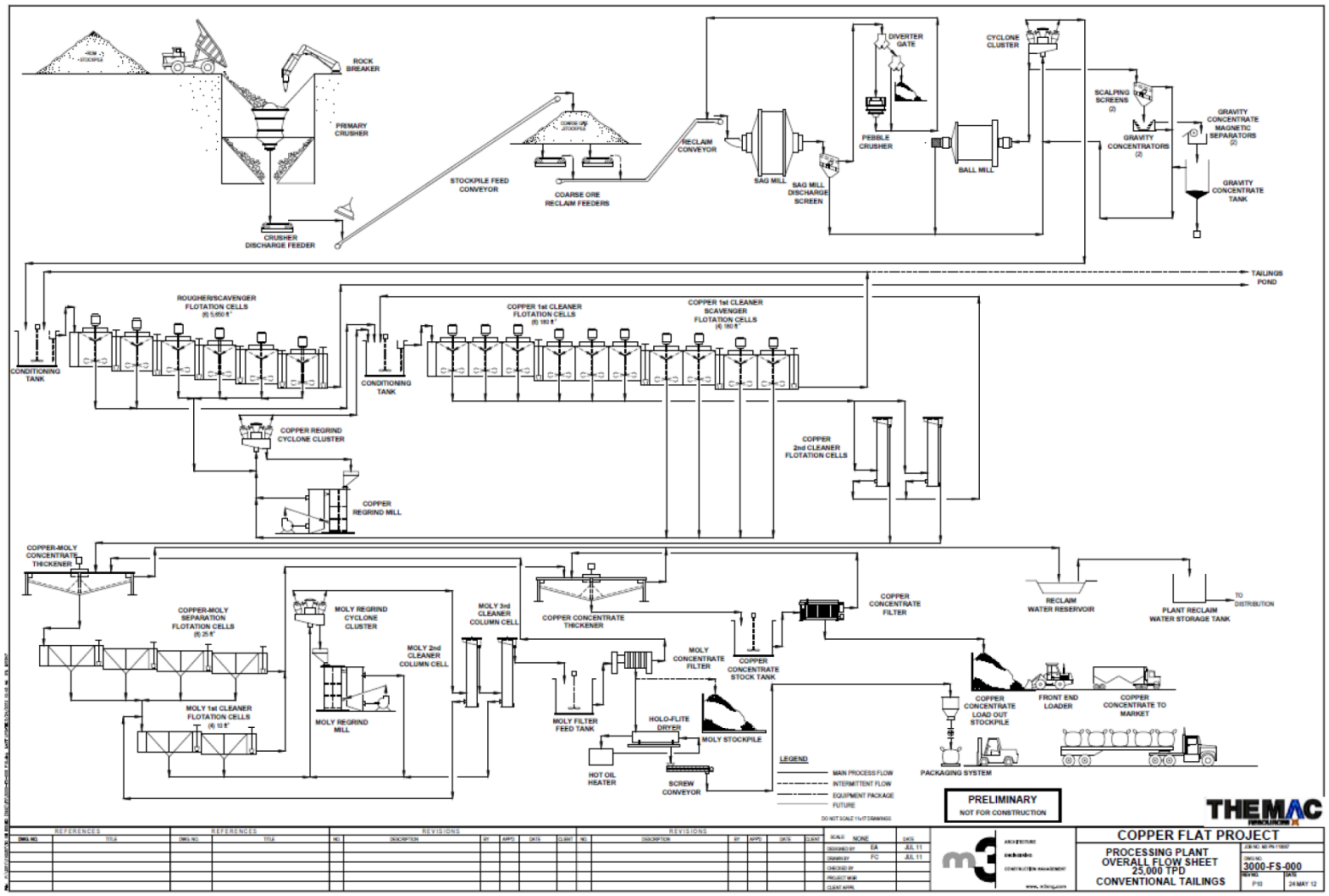

Figure 3: NMCC Copper Flat Mine Site Process Flow

1.2 MODEL SUMMARY RESULTS

The highest model results for maximum operation of Copper Flat Mine and applicable neighboring sources are summarized below in Tables 1, 2, and 3. No SSM modeling was performed for this facility.

TABLE 1: Summary of Air Dispersion Modeling Results for Blasting Combustion Emissions

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration With Background ($\mu g/m^3$)	Lowest Applicable Standard ($\mu g/m^3$)	% of Standard
CO 1 Hr.	3613	2000	5608	12438	45.1
CO 8 Hr.	452	500	---	---	---
SO_2 3 Hr.	36	25	54	1310	4.1
SO_2 24 Hr.	4.5	5	---	---	---
SO_2 Annual	0.14	1	---	---	---
NO_X 24 Hr.	38	5	97	156	62.2
NO_X Annual	1.2	1	9.0	78	11.5

Note: Background concentrations based on "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised July 29, 2011 and approved modeling protocol. Dispersion modeling inputs and settings are presented in Section 2.

TABLE 2: Summary of Air Dispersion Modeling Results for Particulate Emitting Sources

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration With Background ($\mu g/m^3$)	Lowest Applicable Standard ($\mu g/m^3$)	% of Standard
$PM_{2.5}$ 24 Hr. High 8th High	9.8	1.2	18.9	35	54.0
$PM_{2.5}$ Annual	2.4	0.3	7.4	12	61.7
PM_{10} 24 Hr. High 2nd High	29.9	5	49.8	150	33.2
PM_{10} Annual	6.8	1	21.2	50	42.4
TSP 24 Hr.	43.0	5	65.4	150	43.6
TSP Monthly	17.7	---	50.1	90	55.7
TSP Annual	9.5	1	28.6	60	47.7

Note: Background concentrations based on "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised July 29, 2011 and approved modeling protocol. Dispersion modeling inputs and settings are presented in Section 2.

TABLE 3: Summary of Air Dispersion Modeling Results for PSD Increment Analysis

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)	% of Standard
PM_{10} 24 Hr. Class I Increment	0.12	8	1.5
PM_{10} Annual Class I Increment	0.0032	4	0.8
PM_{10} 24 Hr. Class II Increment High 2nd High	29.9	30	99.7
PM_{10} Annual Class II Increment	6.8	17	40.0
NO_2 Annual Class I Increment	0.01	2.5	0.4
NO_2 Annual Class II Increment	1.2	25	4.8

2.0 SIGNIFICANT MONITORING AIR QUALITY IMPACT ANALYSIS

This section identifies the technical approach used for Class II federal and State ambient air quality standards, and PSD Class 1 and II Increment analysis for this stationary source. New Mexico Environment Department, Air Quality Bureau requires that all applicable criteria pollutant emissions be modeled using the most recent versions of US EPA's approved models and be compared with National Ambient Air Quality Standards (NAAQS), New Mexico Ambient Air Quality Standards (NMAAQS), and PSD Class I and II Increment. Table 3 shows the NAAQS, NMAAQS, and PSD Class 1 and II Increment (without footnotes) that the source's ambient impacts must meet in order to show compliance. Table 4 also lists the Class II Significant Impact Levels (SILs) which are used to assess whether a source had significant impact at downwind receptors. Table 5 lists modeling standards that were not required to be modeled.

The dispersion modeling analysis was performed to estimate the total particulate concentrations resulting from the operation of the Copper Flat Mine using an hourly emission rates based on a maximum 24 hour emission rate while all sources of emissions are operating. The modeling determined maximum off site concentrations for nitrogen dioxide (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), Total Suspended Particulate Matter (TSP) and particulate matter with aerodynamic diameter less than 10 micrometers (PM_{10}) and particulate matter with aerodynamic diameter less than 2.5 micrometers ($PM_{2.5}$), for comparison with modeling significance levels and national/ New Mexico ambient air quality standards (AAQS). The modeling followed the guidance and protocols outlined in the New Mexico Air Quality Bureau "Air Dispersion Modeling Guidelines" (Revised 06/29/11), approved modeling protocol submitted to the NMED AQB, and the most up to date EPA's *Guideline on Air Quality Models*.

During this analysis, all the Copper Flat Mine emission sources were modeled together to determine reasonable worst-case impacts from the facility. Pollutant emissions modeled came from point sources (stacks), volume sources (fugitive), open-pit sources (fugitive), and areapoly sources (fugitive).

TABLE 4: Air Quality Standard Summary

Pollutant	Avg. Period	Sig. Lev. (μg/m³)	Class I Sig. Lev. (μg/m³)	NAAQS	NMAAQS	PSD Increment Class I	PSD Increment Class II
CO	8-hour	500		9,000 ppb	8,700 ppb		
	1-hour	2,000		35,000 ppb	13,100 ppb		
NO_2	annual	1.0	0.1	99.67 μg/m³	50 ppb	2.5 μg/m³	25 μg/m³
	24-hour	5.0			100 ppb		
	1-hour	7.54		188.06 μg/m³			
$PM_{2.5}$	annual	0.3		15 μg/m³			
	24-hour	1.2		35 μg/m³			
PM_{10}	annual	1.0	0.2			4 μg/m³	17 μg/m³
	24-hour	5.0	0.3	150 μg/m³		8 μg/m³	30 μg/m³
TSP	7-day				110 μg/m³		
	30-day				90 μg/m³		
	annual	1.0			60μg/m³		
	24-hour	5.0			150μg/m³		
SO_2	annual	1.0	0.1		20 ppb		
	24-hour	5.0	0.2		100 ppb		
	3-hour	25.0	1.0	1309 μg/m³			
	1-hour	7.8		196.4 μg/m³			

TABLE 5: Standards for which Modeling is not Required

Standard not Modeled	Surrogate that Demonstrates Compliance
CO 8-hour NAAQS	CO 8-hour NMAAQS
CO 1-hour NAAQS	CO 1-hour NMAAQS
NO_2 annual NAAQS	NO_2 annual NMAAQS
TSP 7-day NMAAQS	TSP 24-hour NMAAQS

2.1 DISPERSION MODEL SELECTION

The dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 12345. This model is recommended by EPA for determining Class II impacts within 50 km of the source being assessed. Additionally, AERMOD was developed to handle complex terrain and building downwash. In this analysis, AERMOD was used to estimate pollutant ambient air concentrations of NOx, CO, SO_2, TSP, PM_{10}, and $PM_{2.5}$ from NMCC Copper Flat Mine emission sources.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD modeling system has three components: AERMAP, AERMET, and AERMOD. AERMAP is the terrain preprocessor program. AERMET is the meteorological data preprocessor. AERMOD includes the dispersion modeling algorithms and was developed to handle simple and complex terrain issues using improved algorithms. AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

AERMOD was run using all the regulatory default options including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and no use of gradual plume rise. Modeling beta options used in the modeling analysis included modeling selected ground release sources as "Flat" for terrain modeling. Modeling beta options used in the modeling analysis also included modeling rain caps or horizontal releases for point sources, were applicable. The model incorporated local terrain into the calculations with the exception of PSD Class I modeling analysis. For PSD Class I modeling, a majority of the sources are ground release sources where complex terrain impact will have little effect to the distance of the Class I area.

2.2 BUILDING WAKE EFFECTS

The NMCC Copper Flat facility includes several buildings. The buildings' dimensions were input into the dispersion model to assess the potential for downwash effects on emissions from nearby point sources. The direction-specific downwash parameters were calculated using BPIPPRM software, which is the Prime building downwash program associated with the AERMOD model. Output from BPIPPRM was incorporated into the AERMOD modeling input files.

2.3 METEOROLOGICAL DATA

Meteorological data collected at the NMCC's Copper Flat Mine meteorological tower (2011 – 2012) was used for the modeling analysis. NMCC's Copper Flat Mine meteorological tower is located on-site and the meteorological data collected is representative of the model area. Figure 4 shows a wind rose diagram of the meteorological tower's wind speed versus wind direction data that have been collected for the year 2011 for 10 meter. The meteorological tower data is processed using AERMET, upper air data from Santa Teresa, New Mexico and surface air data from T or C Airport near T or C, New Mexico for the same time period. Since the meteorological tower's onsite temperature is collected at two levels, the Bulk Richardson method was used in determining stability parameters. Following the new AERMET documentation on Low Wind conditions for low release sources, the Low Wind (non-Default) option was selected during meteorological processing. Meteorological tower instrumentation, procedures and audit results are contained in separate reports that were submitted along with the modeling protocol.

2.4 RECEPTORS AND TOPOGRAPHY

Modeling was completed using as many receptor locations to ensure that the maximum estimated impacts are identified. Following EPA guidelines, receptor locations were identified with sufficient density and spatial coverage to isolate the area with the highest impacts out to the pollutant significant impact levels (SIL).

The refined receptor grid includes receptors located 100 meters apart out to 500 meters from the property line, 250 meters out to 3000 meters, 500 meters out to 5000 meters, 1000 meters out to 20000 meters, and then 2500 out to the pollutant ROI. Fenceline receptor spacing was 50 meters.

All refined model receptors were preprocessed using the AERMAP software associated with AERMOD. The AERMAP software establishes a base elevation and a height scale for each receptor location. The height scale is a measure of the receptor's location and base elevation and its relation to the terrain feature that has the greatest influence in dispersion for that receptor. AERMAP was run using U.S. Geological Survey (USGS) digital elevation model (DEM) data. This modeling analysis will use 7.5-minute DEM 10 meter resolution data to give a detailed characterization of the terrain throughout the region. Output from AERMAP was used as input to the AERMOD runstream file for each model run. For fugitive sources of particulate (Volume, Open-Pit sources, and AreaPoly sources), the model was run using the "FLAT" source mode option.

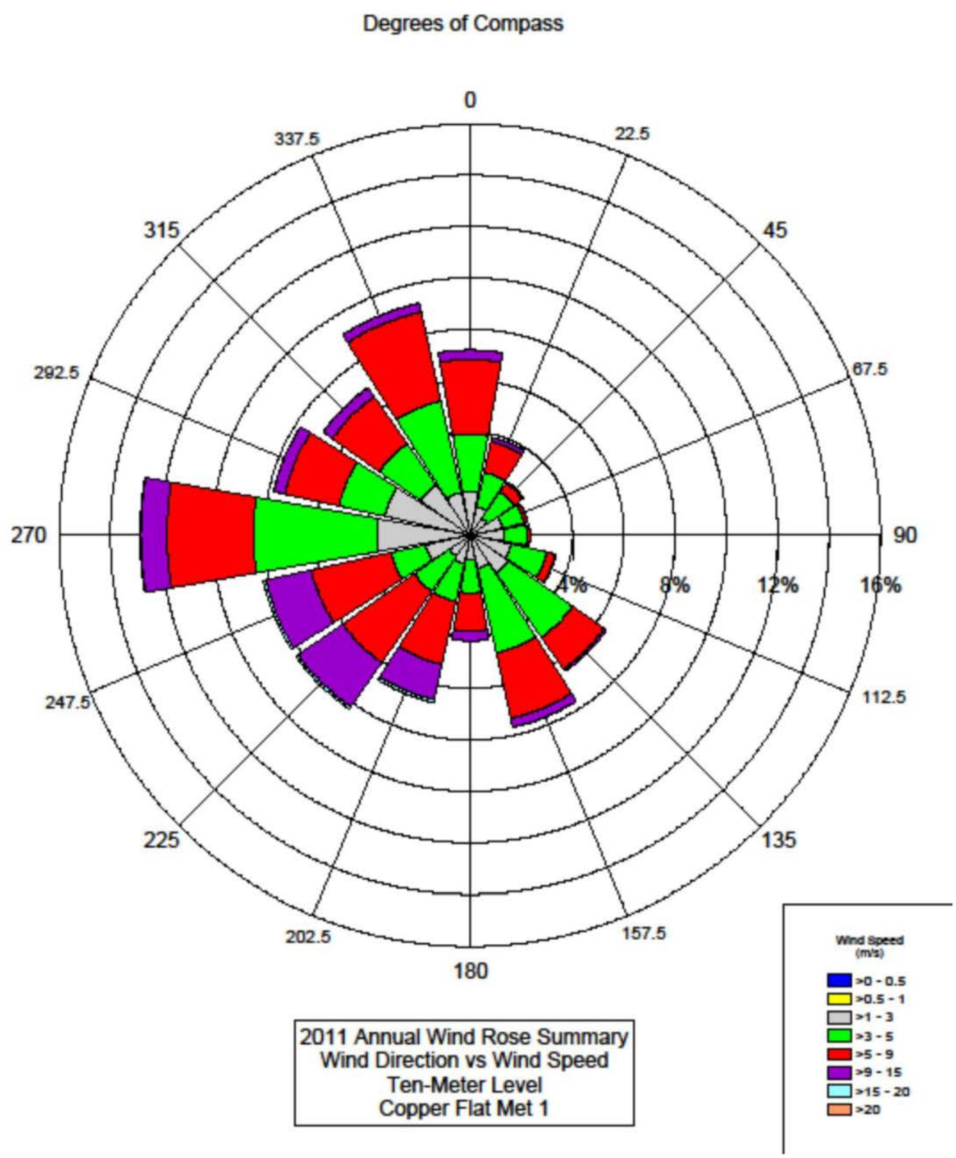

Figure 4: Wind Rose 10 Meter NMCC Meteorological Data Year 2011

2.5 MODELED EMISSION SOURCES INPUTS

Emissions of TSP, PM10, and PM2.5 were estimated using AP-42 Section 13.2.4 for material handling fugitive emissions (some sources with enclosures and water spray controls), AP-42 Section 11.19.2 for ore crushing and conveying emissions with a dust control collector baghouse or water spray controls, AP-42 Section 13.2.2 for unpaved road fugitive emissions, AP-42 Section 11.9 for bulldozer, scraper, and road grader fugitive emissions,[1] AP-42 Sections 11.19 for lime silo loading, and AP-42 Sections 11.9 for drilling and blasting. Emissions of NOx, CO, and SO_2 were estimated using AP-42 Section 13.2 for blasting of ANFO. The emission sources modeled for this analysis included all emission sources from the mine during normal, representative operations, except emissions from wind erosion and emergency generators. According to NMED policy, wind erosion particulate matter emissions need not be modeled.

Crusher vault, reclaimer tunnel, and molybdenum mill area ventilation exhaust were modeled as point sources. Areapoly sources were used to characterize truck unloading and/or bulldozer operations at low grade ore, waste ore, and tailing areas; and scraper loading, unloading, and scraper travel in the tailing area. Volume sources were used for the truck unloading at crusher circuit surge bin, course ore storage pile loading and maintenance, prill silo loading and unloading, and copper concentrate mill building fugitives. Open Pit source was used for all fugitive particulate source emission activities in the open pit. Volume source was used for blasting gas emissions from the open pit.

Air Quality Bureau's approved procedure for Modeling Haul Roads was followed to develop modeling input parameters for unpaved haul roads. Volume source characterization followed the steps described in the Air Quality Bureau's Guidelines.

Volume Source Characterization for Haul Truck Roads:

Step 1: Determine the number of volume sources, N. Divide the length of the road by the 2 X width. The result is the maximum number of volume sources that could be used to represent the road.

The average width of the haul truck roads is approximately 90 feet (27 meters). Add 6 meters to the road width to account for turbulence as the truck travels. The road width to calculate horizontal sigma in the model will equal 33 meters.

The average width of the product/chemical delivery truck roads is approximately 24 feet (7.3

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[1] In 1998 EPA announced a policy that emission factors in AP-42 Section 11.9 should not be used "for regulatory applications to [western surface coal mines]." AP-42, Table 11.9-1, Note. EPA acknowledged that "the technical consideration exists that no better alternative data are currently available[.]" Fourteen years later, that statement still remains applicable to particulate emission factors for AP-42 Section 11.9 emission factors.

meters). Add 6 meters to the road width to account for turbulence as the truck travels. The road width to calculate horizontal sigma in the model will equal 13 meters.

Step 2: Determine the height of the volume source. The height is equal to 1.7 times the height of vehicle generating the emissions – round to the nearest meter.

Height of the haul trucks = 25 feet (7.62 meters).

Height of the volume source = 1.7 times the height of vehicle generating the emissions = 1.7 x 7.62 m = 12.96 meters.

Height of the product/chemical delivery trucks = 13.1 feet (4 meters).

Height of the volume source = 1.7 times the height of vehicle generating the emissions = 1.7 x 4 m = 6.79 meters.

Step 3: Determine the initial horizontal sigma for each volume. Because the road is represented by adjacent volumes, divide the length of the volume by 2.15.

Initial horizontal sigma for each volume (haul truck) = 33 m/2.15 = 15.55

Initial horizontal sigma for each volume (product/chemical delivery truck) = 13.3 m/2.15 = 6.19

Step 4: Determine the initial vertical sigma. Divide the height of the volume source determined in Step 2 by 2.15.

Height of the volume source (haul truck) = 12.96 m
Initial vertical sigma = 12.96 m/2.15 = 6.03 m

Height of the volume source (product/chemical delivery truck) = 6.79 m
Initial vertical sigma = 6.79 m/2.15 = 3.16 m

Step 5: Determine the release point. Divide the height of the volume source (effective height) by two. This source is the center of volume source.

Release point (haul truck) = 12.96 m/2 = 6.48 m

Release point (product/chemical delivery truck) = 6.79 m/2 = 3.39 m

Step 6: Determine the emission rate for each volume source. Divide the total emission rate equally among the individual volumes used to represent the road. It is acceptable to artificially end the haul road up to 50 meters before the intersection with a public road. The reduced length of the road is due to the observation that vehicles normally slow down or stop before exiting the property. The emissions from the 50 meters of road are being equally distributed into the remaining volume sources making up the road.

Step 7: Determine the UTM coordinate for the release point. The release point location is the center of the base of the volume. This location must be at least one meter from the nearest receptor.

Volume Source for Unloading Ore Haul Trucks to Surge Bin, and Loading and Unloading the Prill Silo

Run-of-mine ore is delivered by haul truck from the open pit mine to the crusher circuit surge bin. Trucks delivering the dry portion of ANFO will load the prill (ammonium nitrate) into a silo, where it is stored until loaded in the blast trucks. Following NMED Guidelines, Section 5.2.3, model inputs for these transfer points are as follows:

Release height = 5 meters
Sigma z = volume height/2.15 = 10 meters/2.15 = 4.65
Sigma y = volume width/4.3 = 8 meters/4.3 = 1.86

Volume Source for the Course Ore Storage Pile

Crushed ore is loaded onto the course ore storage pile by a stacker conveyor. The pile will be maintained by bulldozer. The course ore stockpile will be 60 foot high with a base of 260 feet. Initial plume height is estimated to be 18 meters. Model inputs for loading ore on and maintaining the course ore pile is as follows:

Release height = 9 meters
Sigma z = volume height/2.15 = 18 meters/2.15 = 8.37
Sigma y = volume width/4.3 = 80 meters/4.3 = 18.6

Volume Source for Passive Exhaust from Copper Concentrate Mill Truck Doors

Copper concentrate loaded into storage pile and trucks is passively vented through the truck stall doors at the mill building. This is modeled as a volume source with an initial plume size of 2 meters horizontal by 4 meters vertical and 2 meters at the release point. Following NMED Guidelines, Section 5.2.3, model inputs for are as follows:

Release height = 2 meters
Sigma z = volume height/4.3 = 4 meters/4.3 = 0.93
Sigma y = volume height/4.3 = 2 meters/4.3 = 0.47

Volume Source for the Blasting Gaseous Emissions

Blasting gaseous emissions from the open pit were modeled as a volume source. The elevation was the top of the pit. Sigma y was based on the width of the pit and sigma z was based on twice the depth of the pit.

Release height = 0 meters
Sigma z = 180 meters/4.3 = 42
Sigma y = 762 meters/4.3 = 177.2

Point Source (Crusher Vault, Reclaim Tunnel, Molybdenum Mill, Lime Silo Exhaust)

Dust collectors are located at the underground crusher vault, reclaimer tunnel, molybdenum mill, and lime silo to control fugitive dust emission for each operation. For each source, model inputs will include stack height, stack diameter, stack exit temperature, and stack exit velocity. Table 6 presents the model inputs parameters for all stack emissions. The crusher vault and reclaimer tunnel exhaust stack will be equipped with a rain cap. The molybdenum mill and lime silo loading exhaust stack will vent horizontally.

TABLE 6: Point Source Model Inputs

Point Source	Stack Height (feet)	Stack Diameter (feet)	Stack Temperature (deg F)	ACFM	Velocity (m/s)
Crusher Vault Exhaust	3.28	2	Ambient	12,000	63.7
Reclaimer Tunnel Exhaust	3.28	2	Ambient	12,000	63.7
Molybdenum Mill Exhaust	40	2	Ambient	12,000	63.7
Prill Silo Loading Exhaust	70	1	Ambient	500	10.6
Lime Silo Loading Exhaust	70	1	Ambient	500	10.6

Areapoly Source (Bulldozer/Truck Unloading – Low Grade Ore and Waste Ore Areas, and Tailings Area)

Bulldozers operate in the open pit, low grade ore, waste ore, and tailings areas moving material. The areapoly source is defined by each area. These areas are summarized in Table 7. The release height is ½ the plume height or 1.7 times the height of the bulldozer blades. Bulldozer blade height is estimated to be approximately 11.5 feet or 3.5 meters.

Release height = 3.5 meters * 1.7 / 2 = 3 meters
Sigma z = 3.5 meters * 2/2.15 = 3.26

TABLE 7: Areapoly Source Model Inputs

Areapoly Source	Area ($meter^2$)	Release Height (meters)	Sigma z (meters)
Low Grade Ore Stockpile Area	70,079	3	3.26
Waste Ore Stockpile Area	699,171	3	3.26
Tailings Dam Area	295,888	3	3.26
Tailing Dam Topsoil Pile	120,000	3	3.26
Tailing Area Topsoil Removal by Scraper	669,993	3	3.26

Emission rates input in the model are summarized in Tables 8 and 9.

Table 8: Plant-Wide Controlled Particulate Emission Rates

Source ID	Source Description	Controlled					
		TSP		PM10		PM2.5	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S1	Drilling – Open Pit	5.4	19	2.8	9.9	0.57	2.0
S2	Blasting – Open Pit	54	2.3	28	1.2	1.6	0.068
S3	Prill Silo Loading	0.88	0.064	0.42	0.030	0.063	0.0046
S4	Truck Loading - Open Pit	10	44	4.7	21	0.72	3.1
S5	Bulldozer – Open Pit	21	41	4.5	8.9	2.2	4.3
S6	Raw Ore Unloading to Surge Bin	1.5	6.7	0.72	3.2	0.11	0.48
S7	Drop from Surge Bin to Apron Feeder	1.0	4.5	1.0	4.5	1.0	4.5
S8	Primary Crusher						
S9	Primary Crusher Apron Conveyor TP						
S10	Stacker Conveyor Drop to Course Ore Storage Pile	1.5	6.7	0.72	3.2	0.11	0.48
S11	Bulldozer Maintenance of Course Ore Storage Pile	15	21	3.1	4.5	1.5	2.2
S12	Course Ore Storage Pile Drop to Reclaimer	1.0	4.5	1.0	4.5	1.0	4.5
S13	Reclaimer Drop to Reclaim Conveyor						
S14	Reclaim Conveyor Drop to Wet Mill	0.23	1.0	0.11	0.47	0.016	0.072
S15	Lime Silo Loading	0.043	0.0094	0.043	0.0094	0.043	0.0094
S16	Drop to Molybdenum Storage Pile	1.0	4.5	1.0	4.5	1.0	4.5
S17	Drop to Molybdenum Bagger						
S19	Product Loading Trucks Molybdenum						
S18	Drop to Copper Concentrate Storage Pile	0.0017	0.0072	0.00078	0.0034	0.00012	0.00052
S20	Product Loading Trucks Copper Concentrate	0.0033	0.014	0.0016	0.0069	0.00024	0.0010
S21	Truck Unloading Low Grade Ore Stockpile	0.18	0.78	0.084	0.37	0.013	0.056
S22	Bulldozer Low Grade Ore Stockpile Area	21	20	4.5	4.3	2.2	2.1
S23	Truck Unloading Waste Dump Stockpile	3.8	17	1.8	7.8	0.27	1.2
S24	Bulldozer Waste Dump Stockpile Area	21	30	4.5	6.5	2.2	3.2
S25	Bulldozer Tailings Dam Area	2.9	4.2	0.54	0.78	0.30	0.44
S26	Scraper Loading Tailings Area	1.3	5.7	0.61	2.7	0.092	0.41
S27	Scraper Unloading Tailings Area	0.15	0.65	0.070	0.31	0.011	0.047
S28	Scraper Travel Mode	3.3	12	1.1	4.0	0.11	0.40
S29	Truck Traffic Mine Trucks/Light Vehicles	87	319	25	91	2.5	9.1

Table 8: Plant-Wide Controlled Particulate Emission Rates

Source ID	Source Description	Controlled					
		TSP		PM10		PM2.5	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S30	Truck Traffic Product/Chemical Delivery Trucks	3.7	13	0.95	3.5	0.095	0.35
S31	Grader – Road Maintenance	11	28	3.8	9.6	0.35	0.87
S32	Wind Erosion Course Ore Pile	0.25	1.1	0.12	0.54	0.018	0.081
S33	Wind Erosion Open Pit Area	3.2	14	1.6	7.0	0.24	1.0
S34	Wind Erosion Low Grade Ore Stockpile Area	1.3	5.6	0.64	2.8	0.10	0.42
S35	Wind Erosion Waste Dump Stockpile Area	3.9	17	2.0	8.6	0.30	1.3
S36	Wind Erosion Tailings Area	3.3	14	1.6	7.2	0.25	1.1
	Total	**279**	**657**	**97**	**222**	**19**	**48**

Table 9: Plant-Wide NOx, CO, SO_2 Emission Rates

Source ID	Source Description	Blasting Combustion Emissions					
		NOx		CO		SO_2	
		(lbs/hr)	TPY	(lbs/hr)	TPY	(lbs/hr)	TPY
S2	Blasting	375	54	1479	214	44	6.4

Note: Hourly emission rate was used as input into the model. Emissions in model were for 1 hour per day at the worst modeled 1 hour period in an afternoon for met year 2011.

2.6 PARTICLE SIZE DISTRIBUTION

TSP and PM_{10} emissions were modeled using plume depletion. Plume deposition simulates the effect of gravity as particles '"fall-out" from the plume to the ground as the plume travels downwind. Therefore, the farther the plume travels from the emission point to the receptor, the greater the effect of plume deposition and the greater the decrease in modeled impacts or concentrations. Particle size distribution, particle mass fraction, and particle density are required inputs to the model to perform this function.

The particle size distribution data used in the modeling for material handling was based upon data obtained from the City of Albuquerque AQB's "Air Dispersion Modeling Guidelines for Air Quality Permitting", revised 11/7/06, Table 1. Particle size distribution for fugitive road dust on unpaved roads will use the particle size *k* factors found in the AP-42 13.2.2 emission equations for unpaved roads (ver. 11/06). Particle size distribution for the dust control collector emissions is based on a fly ash classification analysis plus a baghouse that controls to 94.0% of particles less than 2.5 μm, 99.0% of particles between 2.5 and 10 μm, and 99.5% of particles between 10 and 30 μm. The fly ash particulate size distribution between 0 and 30 μm is 5.7% by volume for particles less than 2.5 μm, 34.2% by volume for particles between 2.5 and 10 μm, and 60.1% by volume for particles between 10 and 30 μm.

The mass-mean particle diameter was calculated using the formula:

$$d = ((d^3{}_1 + d^2{}_1 d_2 + d_1 d^2{}_2 + d^3{}_2) / 4)^{1/3}$$

Where: d = mass-mean particle diameter
d_1 = low end of particle size category range
d_2 = high end of particle size category range

A representative average particle density for soil (clay, quartz), and limestone were obtained from CRC, "Handbook of Chemistry and Physics", 80th Edition. The densities and size distribution for PM_{10} and TSP emission sources are presented in Tables 10, 11, 12, and 13.

TABLE 10: Aggregate Handling Fugitive Source Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
2.5 – 5	3.88	22.6	2.5
5 – 10	7.77	77.4	2.5
TSP			
2.5 – 5	3.88	6.0	2.5
5 – 10	7.77	20.5	2.5
10 – 15	12.66	16.0	2.5
15 – 20	17.62	17.5	2.5
20 – 30	25.33	22.5	2.5
30 – 45	38.00	17.5	2.5

Parameters based on values from the Albuquerque Air Quality Division Modeling Guidelines.

TABLE 11: Unpaved Road Vehicle Fugitive Dust Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	3.88	22.6	2.5
2.5 – 10	7.77	77.4	2.5
TSP			
0 – 2.5	3.88	2.6	2.5
2.5 – 10	7.77	22.9	2.5
10 - 30	21.54	74.5	2.5

Based on AP-42 Section 13.2.2 k factors.

TABLE 12: Fugitive Dust Collector Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	57.1	2.5
2.5 – 10	6.91	42.9	2.5
TSP			
0 – 2.5	1.57	34.7	2.5
2.5 – 10	6.91	34.7	2.5
10 - 30	21.54	30.6	2.5

TABLE 13: Lime Silo Dust Collector Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	57.1	2.2
2.5 – 10	6.91	42.9	2.2
TSP			
0 – 2.5	1.57	34.7	2.2
2.5 – 10	6.91	34.7	2.2
10 - 30	21.54	30.6	2.2

2.7 REGIONAL BACKGROUND CONCENTRATIONS

Ambient background concentrations represent the contribution of pollutant sources that are not included in the modeling analysis, including naturally occurring sources. If the modeled concentration of a criteria pollutant is above the modeling significance level, the background concentration for each criteria pollutant was added to the maximum modeled concentration to calculate the total estimated pollutant concentration for comparison with the AAQS.

The ambient background concentrations are listed in the Air Quality Bureau Guidelines for $PM_{2.5}$, NO_2, CO, and SO_2. For $PM_{2.5}$, NMCC used refined backgrounds from Silver City (Monitor ID 7S). For NO_2, NMCC used backgrounds from Deming (Monitor ID 7E). For SO_2, NMCC used backgrounds for southwest New Mexico. For CO, NMCC used backgrounds for New Mexico (Rio Rancho Monitor 2ZR).

Site specific ambient monitoring data was used for ambient background concentrations for PM_{10} and TSP (PM10 * 1.33). For TSP 30 day averaging period, the annual background concentration was added to the maximum modeled concentration.

	1 Hour (ppm)	**8 Hour (ppm)**	**Annual (ppm)**
NO_2	0.038		0.005
CO	2.1	1.5	
SO_2	0.0083		

Month	**$PM_{2.5}$ (µg/m^3)**	**PM_{10} (µg/m^3)**	**TSP (µg/m^3)**
Jan	9.2	16.8	22.3
Feb	6.9	14.7	19.5
Mar	8.1	13.5	18.0
Apr	6.0	29.3	38.9
May	7.3	28.8	38.2
Jun	8.8	31.8	42.2
Jul	9.5	29.5	39.2
Aug	9.1	18.5	24.6
Sep	7.1	26.8	35.7
Oct	7.5	27.5	36.6
Nov	9.8	18.5	24.6
Dec	10.2	13.5	18.0
Annual	**5.1**	**14.4**	**19.1**

ppm = parts per million
µg/m3= micrograms per cubic meter
TSP = Total suspended particulate

3.0 DISPERSION MODELING RESULTS

This section presents the results of the dispersion modeling performed in keeping with the modeling protocol approved by David Heath (email 013113) of the NMED AQB Modeling Section and the procedures discussed in Section 2 of this report. The AERMOD model was run for NMCC's Copper Flat Mine sources for concentrations of nitrogen dioxide (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter, i.e., total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$) to determine if the permit modifications would exceed applicable ambient air quality standards.

3.1 SIGNIFICANT IMPACT AREA

Significant impact (ROI) AERMOD dispersion modeling was completed for PM (TSP and PM_{10}), $PM_{2.5}$, NO_X, CO, and SO_2. All significant impact models were run with no building downwash with Copper Flat Mine emission sources only.

3.1.1 PM Significant Impact Area

The significant impact model for particulate was run using the TSP maximum emission rates for Copper Flat Mine particulate sources only. Figures 5 and 6 present the results of the 24-hour and annual averaging periods. Complete model input and output files are included on the attached CD-R as "NMCC Copper Flat Mine TSP ROI".

3.1.2 $PM_{2.5}$ Significant Impact Area

The significant impact model for $PM_{2.5}$ was run using the $PM_{2.5}$ maximum emission rates for Copper Flat Mine particulate sources only. Figures 7 and 8 present the results of the 24-hour and annual averaging periods. Complete model input and output files are included on the attached CD-R as "NMCC Copper Flat Mine PM25 ROI".

3.1.3 NO_X Significant Impact Area

The significant impact model for nitrogen dioxide was run using the NO_X maximum emission rate for Copper Flat Mine combustion source (blasting) only. Figures 9 and 10 present the results of the 24-hour and annual averaging periods. Complete model input and output files are included on the attached CD-R as "NMCC Copper Flat Mine Combust ROI".

3.1.4 CO Significant Impact Area

The significant impact model for carbon monoxide was run using the CO maximum emission rate for Copper Flat Mine combustion source (blasting) only. For the 8-hour averaging period model results were below the SILs. Figure 11 present the results of the 1-hour averaging period. Complete model input and output files are included on the attached CD-R as "NMCC Copper Flat Mine Combust ROI".

3.1.5 SO2 Significant Impact Area

The significant impact model for sulfur dioxide was run using the SO_2 maximum emission rate for Copper Flat Mine combustion source (blasting) only. For the 24 hour and annual averaging periods model results were below the SILs. Figure 12 present the results of the 3-hour averaging period. Complete model input and output files are included on the attached CD-R as "NMCC Copper Flat Mine Combust ROI".

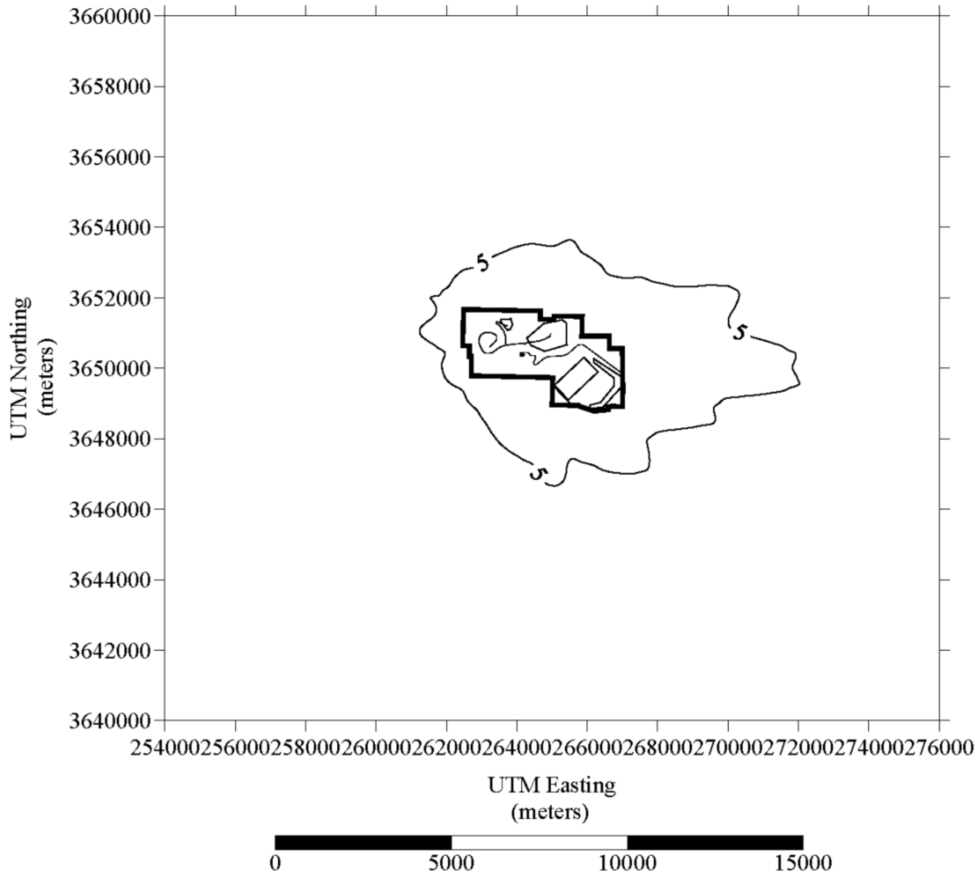

Figure 5: Isopleth of Copper Flat Mine's PM ROI Model Results
Copper Flat Mine Sources Only
24 Hour Average ($\mu g/m^3$)
ROI = 7.2 km

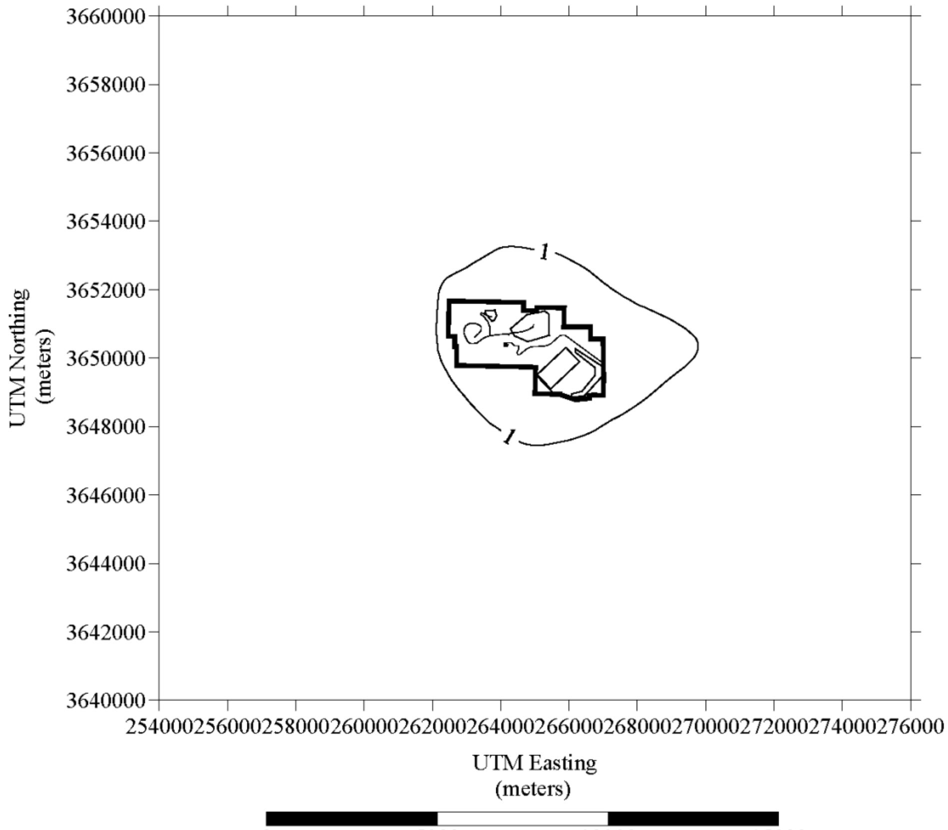

Figure 6: Isopleth of Copper Flat Mine's PM ROI Model Results
Copper Flat Mine Sources Only
Annual Average ($\mu g/m^3$)
ROI = 4.7 km

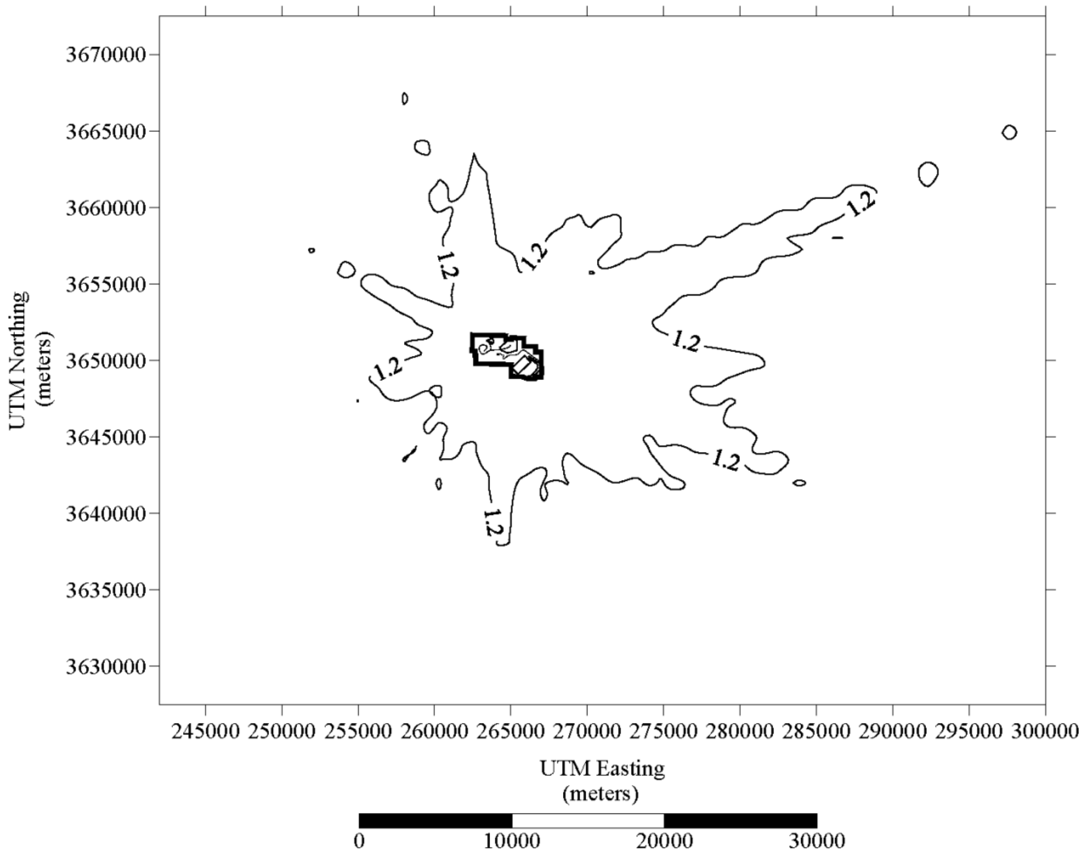

Figure 7: Isopleth of Copper Flat Mine's $PM_{2.5}$ ROI Model Results
Copper Flat Mine Sources Only
24 Hour Average ($\mu g/m^3$)
ROI = 35.9 km

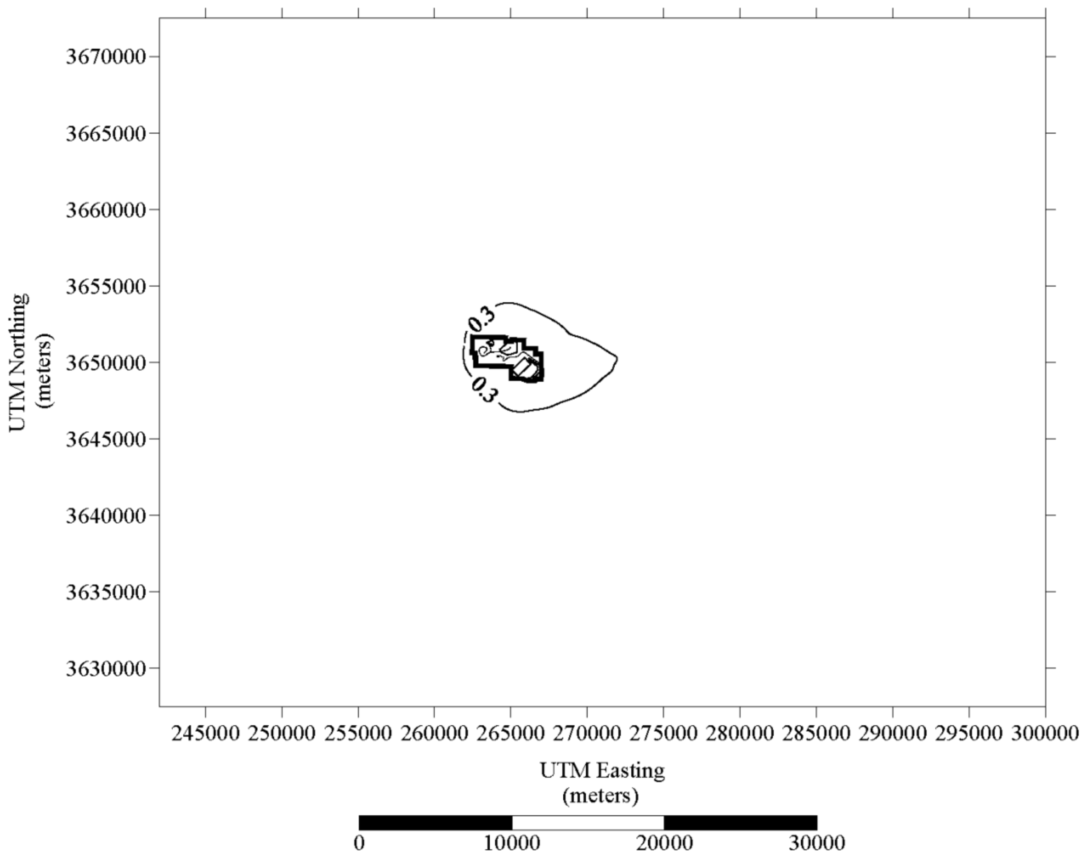

Figure 8: Isopleth of Copper Flat Mine's $PM_{2.5}$ ROI Model Results
Copper Flat Mine Sources Only
Annual Average ($\mu g/m^3$)
ROI = 6.7 km

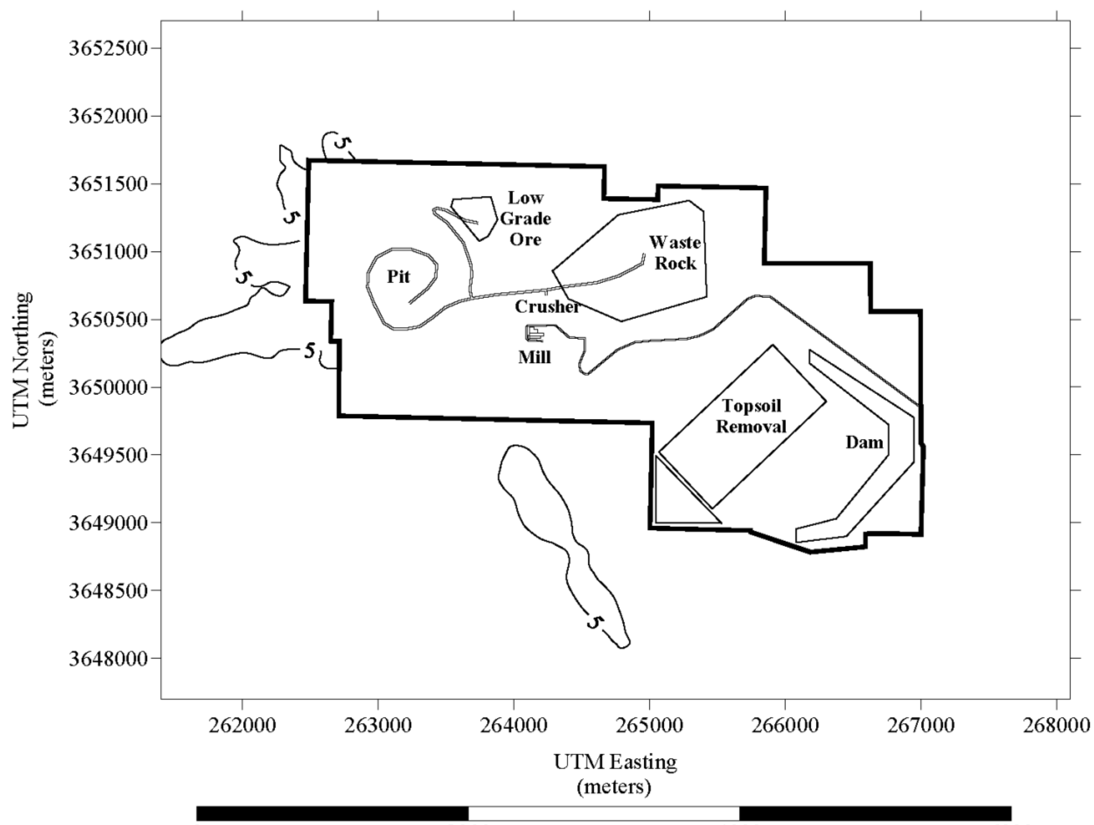

Figure 9: Isopleth of Copper Flat Mine's NO_2 ROI Model Results
Copper Flat Mine Sources Only
24 Hour Average ($\mu g/m^3$)
ROI = 3.1 km

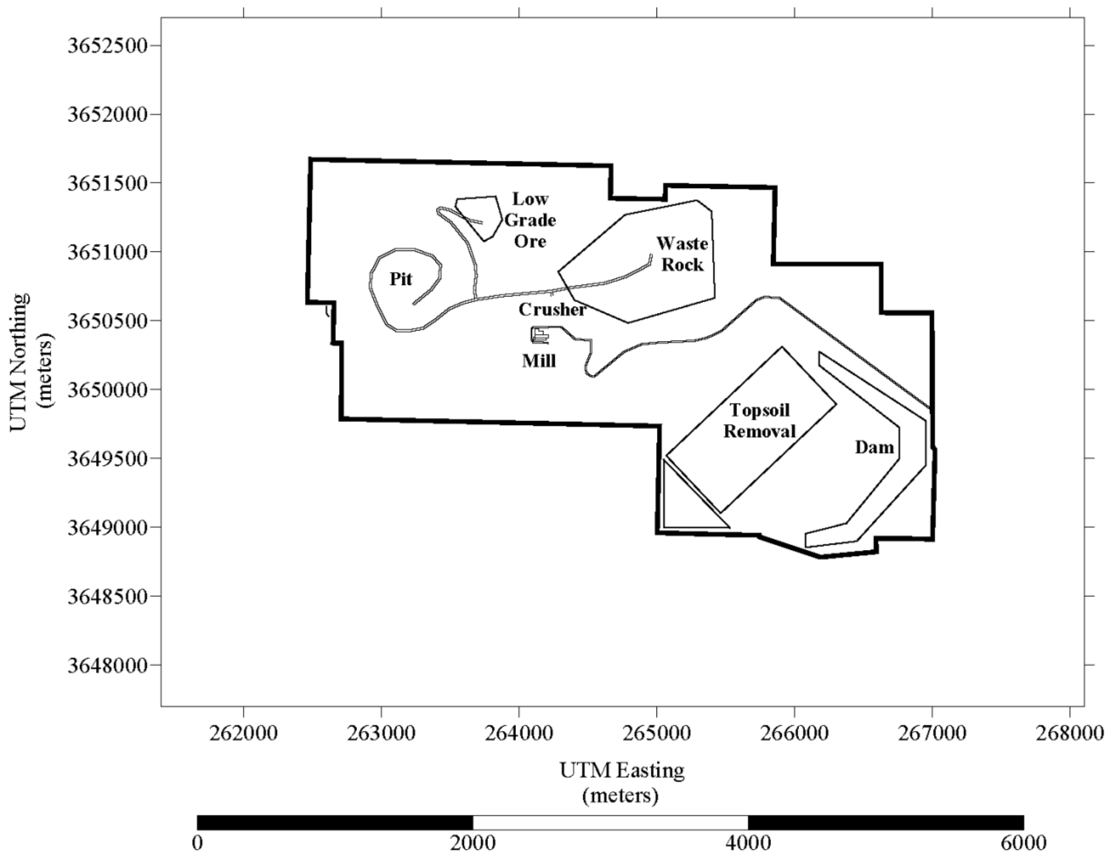

Figure 10: Isopleth of Copper Flat Mine's NO_2 ROI Model Results
Copper Flat Mine Sources Only
Annual Average ($\mu g/m^3$)
ROI = 0.6 km

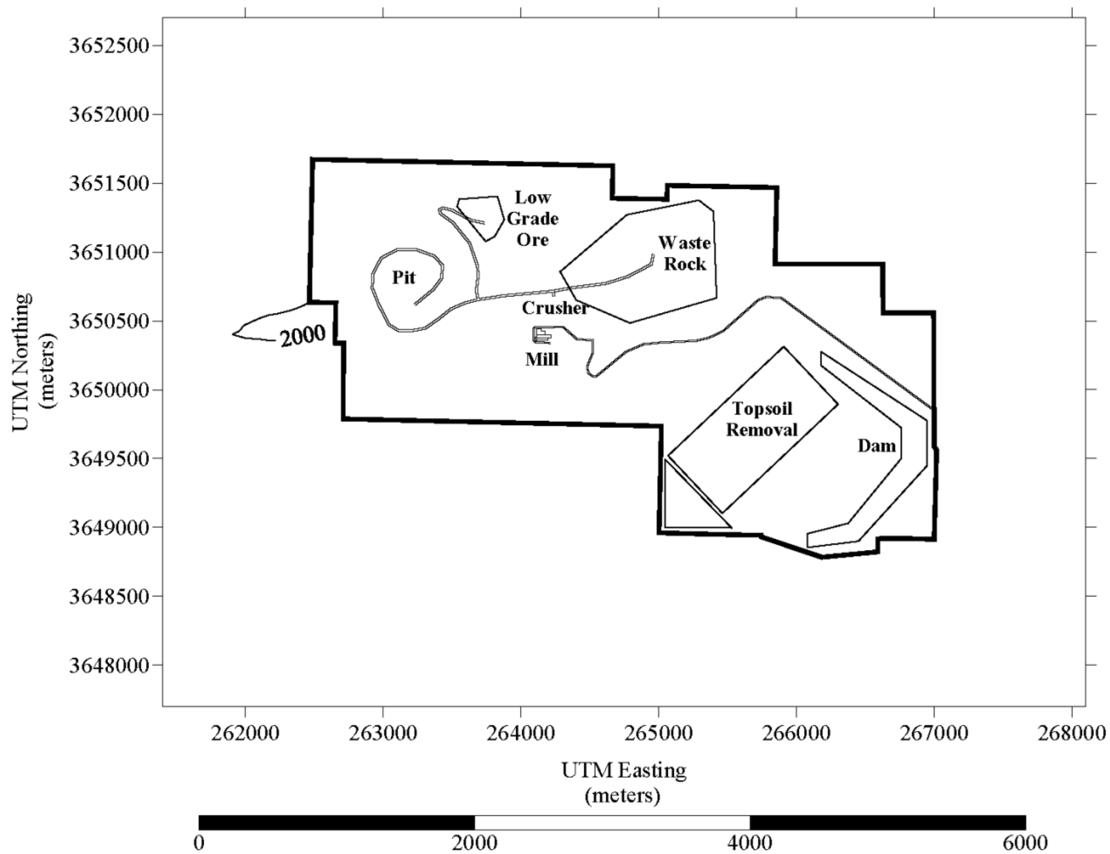

Figure 11: Isopleth of Copper Flat Mine's CO ROI Model Results
Copper Flat Mine Sources Only
1 Hour Average (μg/m^3)
ROI = 1.3 km

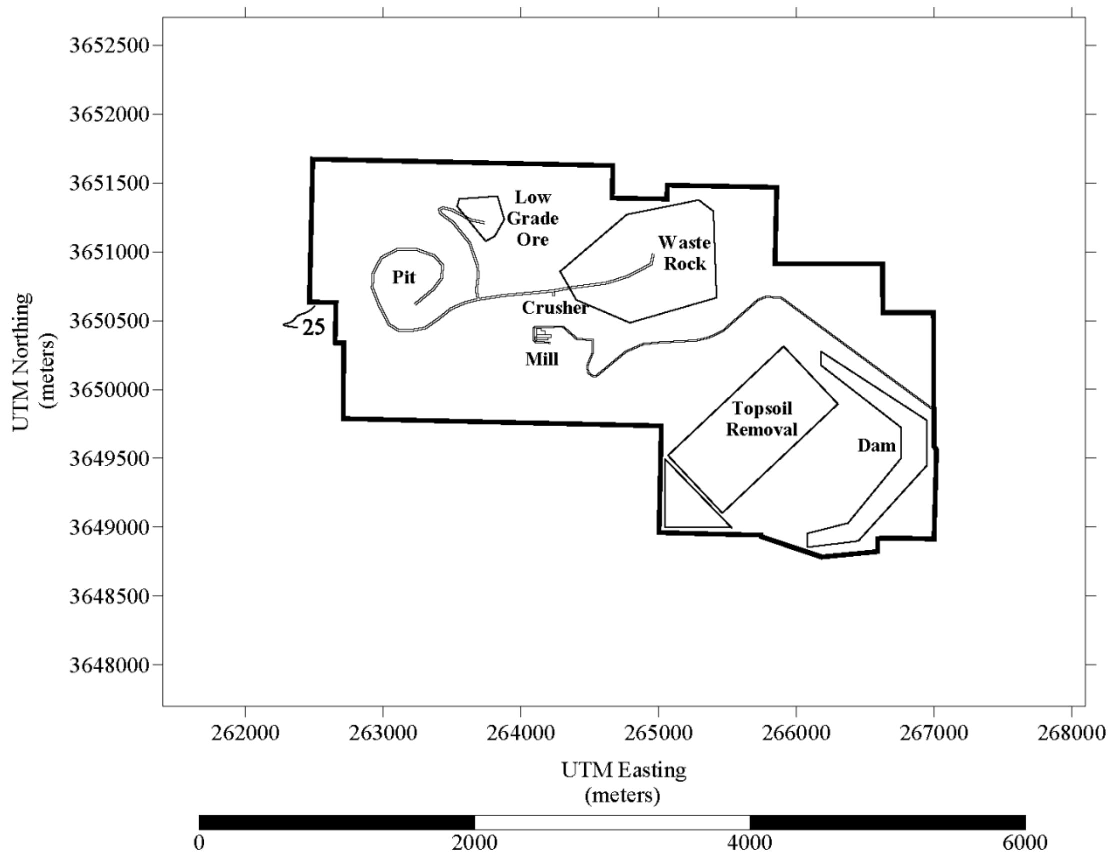

Figure 12: Isopleth of Copper Flat Mine's SO_2 ROI Model Results
Copper Flat Mine Sources Only
24 Hour Average ($\mu g/m^3$)
ROI = 0.9 km

3.2 REFINED DISPERSION MODELING

The following sections describe the method and results of refined modeling for nitrogen dioxide (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter, i.e., total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$). All refined modeling was performed in terrain mode. Elevations for receptors in all refined models were extracted from USGS 7½" DEM files. Receptors were generated using the model's self generating receptor option.

3.2.1 CO Refined Modeling Analysis

Carbon monoxide (CO) modeling included Copper Flat Mine combustion sources (blasting) and significant neighboring sources. CO refined modeling was run with a grid spacing of 50 meters along the facility boundary and 100 meters spacing out to 1000 meters beyond the facility boundary. Receptors were generated using the model's self generating receptor option. A list of NO_2 neighboring sources from the NMED's AIRS database can be found in Appendix A. CO ROI and Refined models show the maximum concentration for CO is located on or near the west facility boundary for both the 1 and 8 hour averages. Model results show no exceedance of CO significant impact levels (SIL) for the 8 hour averaging period.

Regional CO background concentrations were added to the 1 hour average modeled results and compared to the lowest applicable ambient standard. The 1-hour background concentrations for CO are presented in Section 2.7 of this report. The maximum CO model results are given below in Table 14. First and second highest 1 and 8 hour averages were taken from the maximum tables produced by the model.

The CO 1 hour model results are summarized in Figures 13 and 14. Model run is designated "NMCC Copper Flat Mine Combustion CIA". Complete model input and output files are included on the attached CD-R.

TABLE 14
Maximum Modeled CO Impacts
NMCC's Copper Flat Mine and Significant Neighbors CO Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
1 Hour Average				
1st Highest	3614	262655E, 3650582N	12/19/11	17
2nd Highest	3524	262656E, 3650630N	12/19/11	17
8 Hour Average				
1st Highest	452	262655E, 3650582N	12/19/11	24
2nd Highest	441	262656E, 3650630N	12/19/11	24

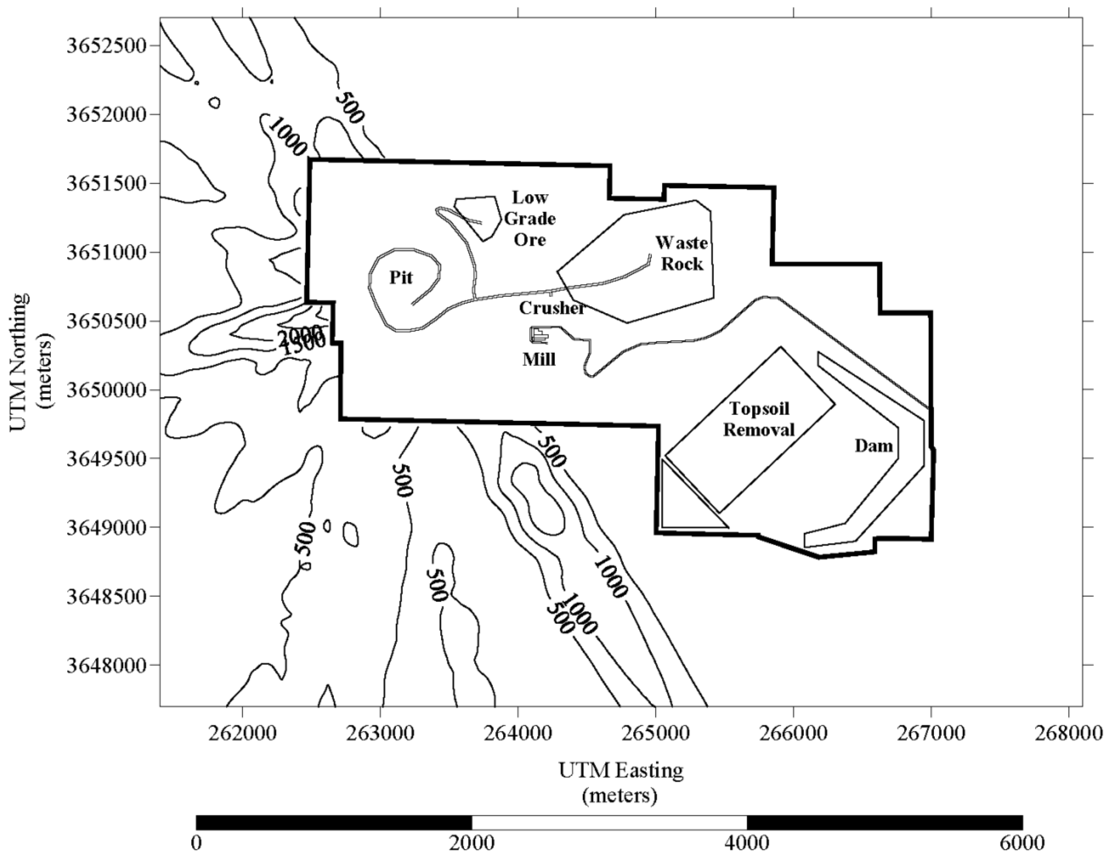

Figure 13: Isopleth of Copper Flat Mine's CO Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
1 Hour Average (μg/m^3)

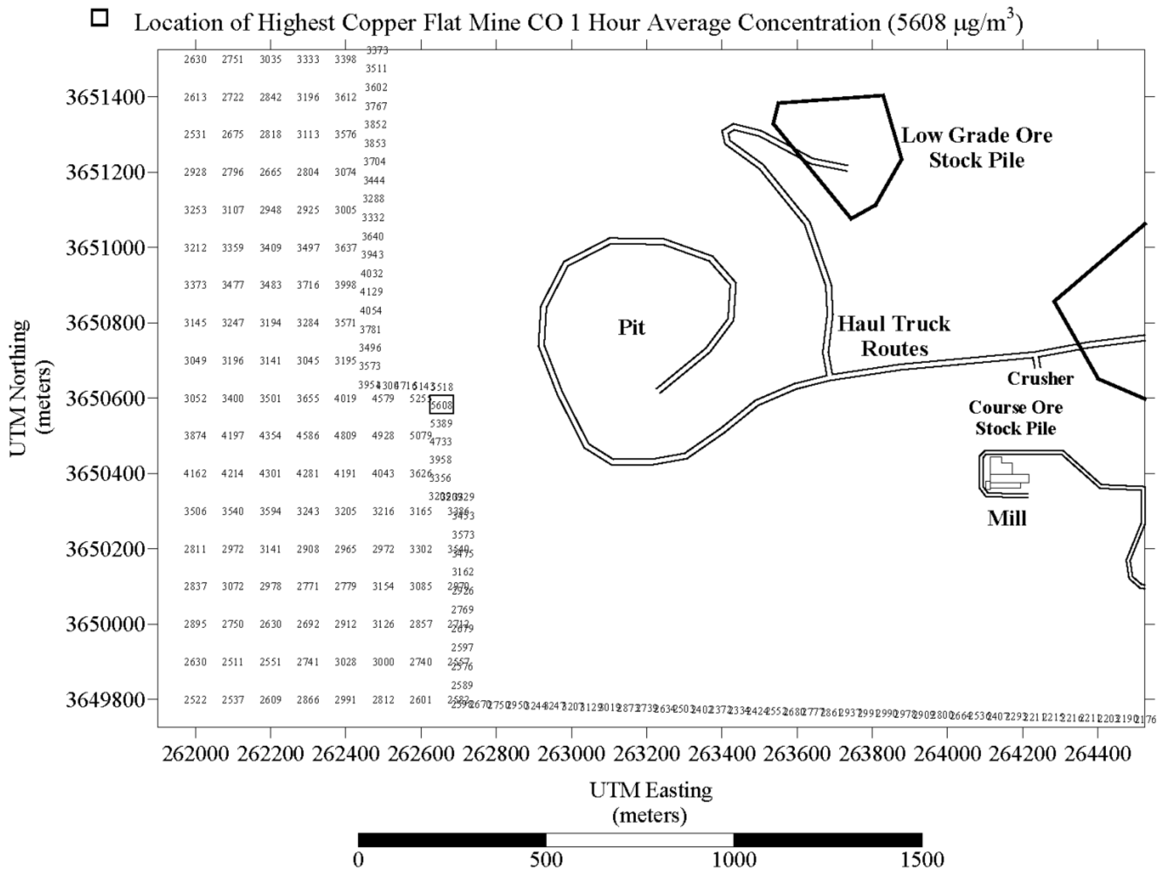

Figure 14: Copper Flat Mine's CO Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources plus Background
1 Hour Average (µg/m³)
(grid location of maximum modeled concentration)

3.2.2 SO_2 Refined Modeling Analysis

Sulfur dioxide (SO_2) modeling included Copper Flat Mine combustion sources (blasting) and significant neighboring sources. SO_2 refined modeling was run with a grid spacing of 50 meters along the facility boundary and 100 meters spacing out to 1000 meters beyond the facility boundary. Receptors were generated using the model's self generating receptor option. A list of NO_2 neighboring sources from the NMED's AIRS database can be found in Appendix A. SO_2 ROI and refined models show the maximum concentration for SO_2 is located on or near the east facility boundary for the 3 hour, 24 hour, and annual averages. ROI model results show no exceedance of SO_2 significant impact levels (SIL) for either the 24 hour or annual averaging periods.

Regional SO_2 background concentrations were added to the 3 hour average modeled results and compared to the lowest applicable ambient standard. The 3-hour background concentrations for SO_2 are presented in Section 2.7 of this report. The maximum SO_2 model results are given below in Table 15. First and second highest 3 and 24 hour averages, and annual averages were taken from the maximum tables produced by the model.

The SO_2 3 hour model results are summarized in Figures 15 and 16. Model run is designated "NMCC Copper Flat Mine Combustion CIA". Complete model input and output files are included on the attached CD-R.

TABLE 15
Maximum Modeled SO_2 Impacts
NMCC's Copper Flat Mine and Significant Neighbors SO_2 Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
3 Hour Average				
1st Highest	35.8	262655E,3650582N	12/19/11	18
2nd Highest	35.0	262656E,3650630N	12/19/11	18
24 Hour Average				
1st Highest	4.5	262655E,3650582N	12/19/11	24
2nd Highest	4.4	262656E,3650630N	12/19/11	24
Annual Average				
1st Highest	0.141	262656E,3650630N		
2nd Highest	0.135	262655E,3650582N		

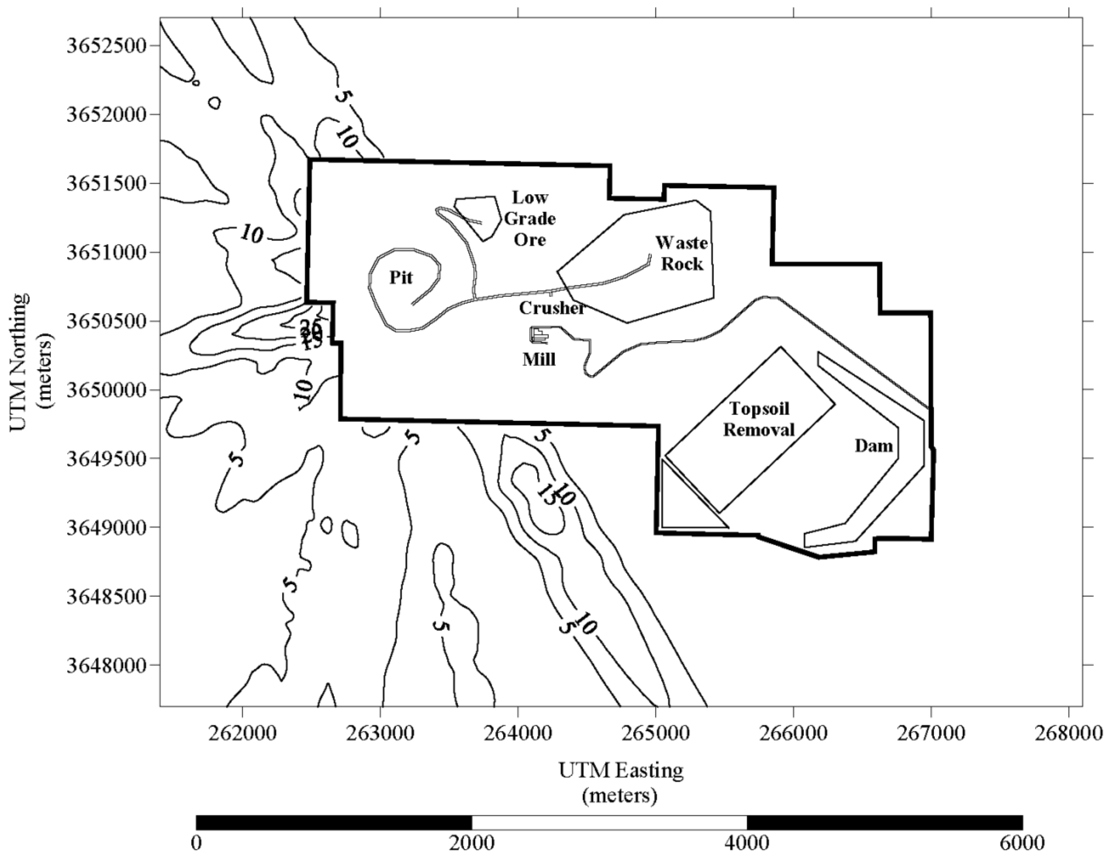

Figure 15: Isopleth of Copper Flat Mine's SO_2 Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
3 Hour Average ($\mu g/m^3$)

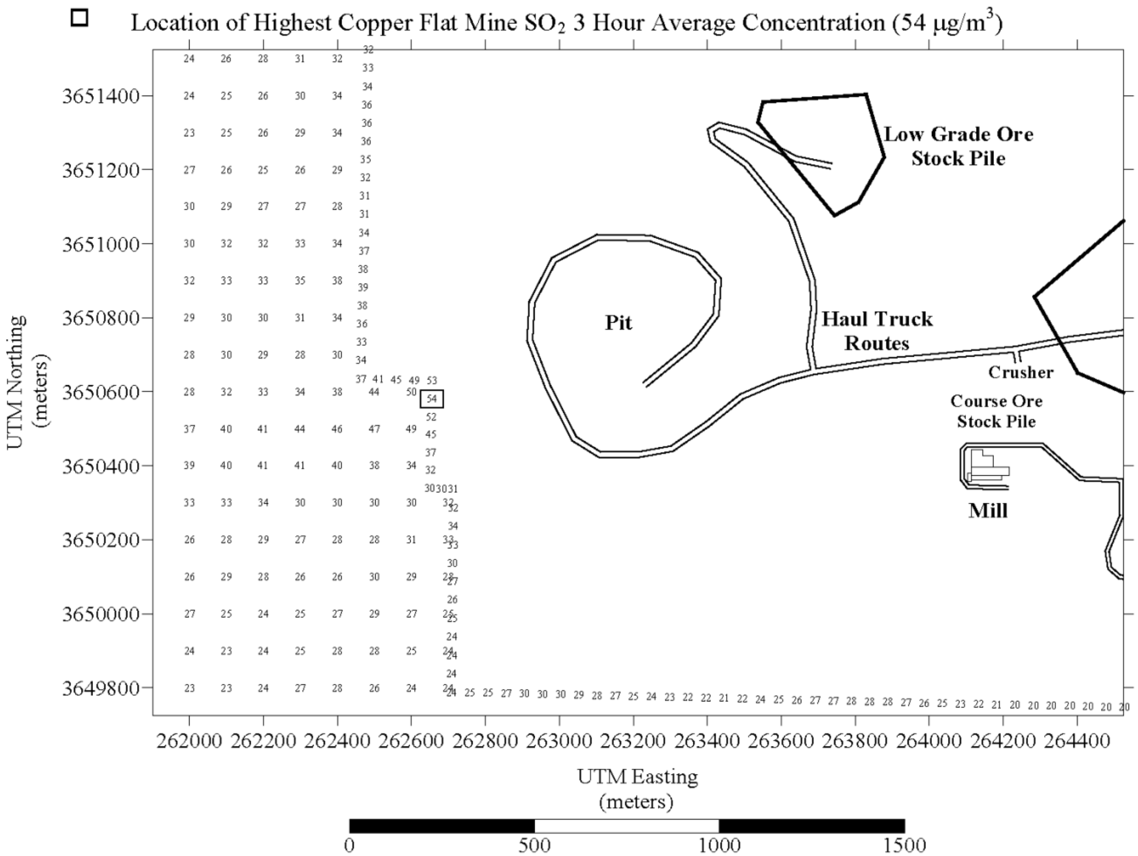

Figure 16: Copper Flat Mine's SO_2 Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources plus Background
3 Hour Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

3.2.3 NO_X Refined Modeling Analysis

NO_X modeling included Copper Flat Mine combustion sources (blasting) and significant neighboring sources. NO_X refined modeling was run with a grid spacing of 50 meters along the facility boundary and 100 meters spacing out to 1000 meters beyond the facility boundary. Refined modeling was run in terrain mode using 7.5-minute DEM 10 meter resolution data to give a detailed characterization of the terrain throughout the region. A list of NO_2 neighboring sources from the NMED's AIRS database can be found in Appendix A.

Regional NO_2 background concentrations were added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour and annual background concentrations for NO_2 are presented in Section 2.7 of this report. NO_X refined modeling shows the maximum concentration located west facility boundary for the 24 hour and annual averages. The maximum model results from the refined modeling are given below in Table 16. First and second highest 24 hour and annual averages were taken from the maximum tables produced by the model.

The NO_X model results are summarized in Figures 17 and 18 for the 24-hour averaging period and Figures 19 and 20 for the annual average. Model run is designated "NMCC Copper Flat Mine Combustion CIA". Complete model input and output files are included on the attached CD-R.

TABLE 16
Maximum Modeled NO_X Impacts
NMCC's Copper Flat Mine and Significant Neighbors NO_X Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
24 Hour Average				
1st Highest	38.2	262655E,3650582N	12/19/11	24
2nd Highest	37.2	262656E,3650630N	12/19/11	24
Annual Average				
1st Highest	1.22	262656E,3650630N		
2nd Highest	1.17	262655E,3650582N		

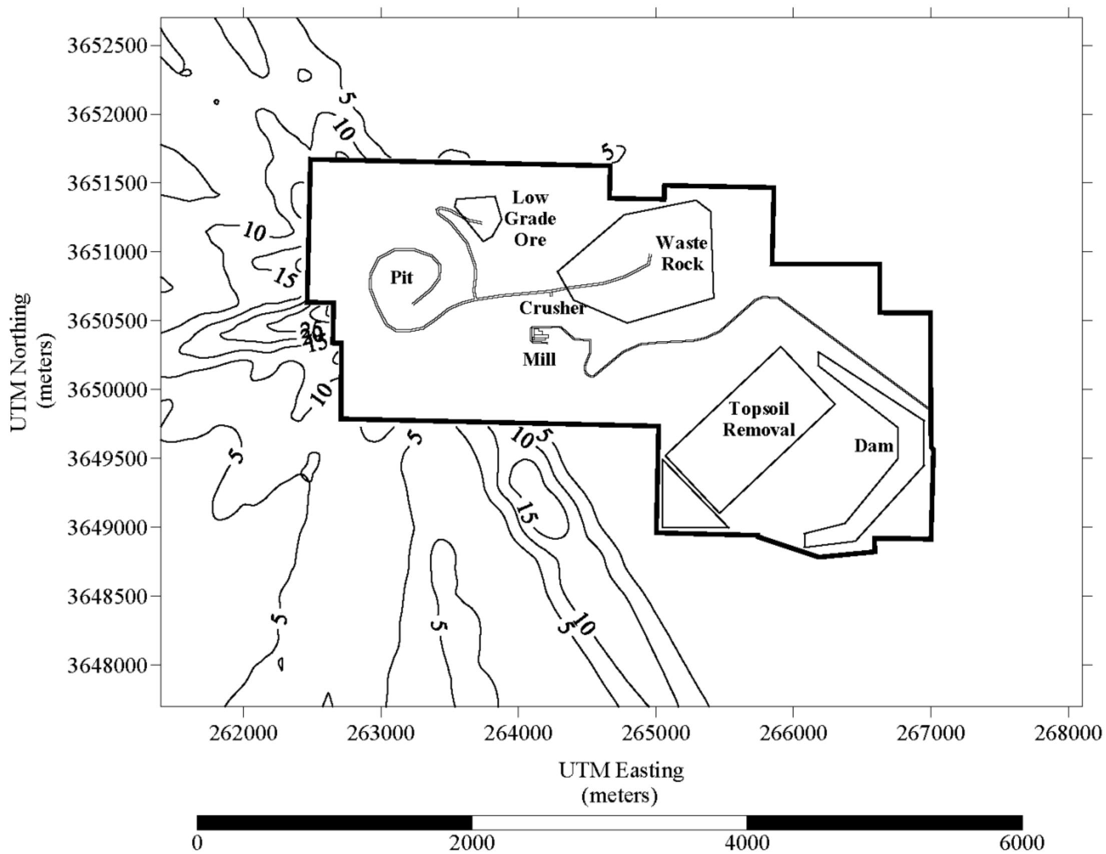

Figure 17: Isopleth of Copper Flat Mine's NO_X Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
24 Hour Average ($\mu g/m^3$)

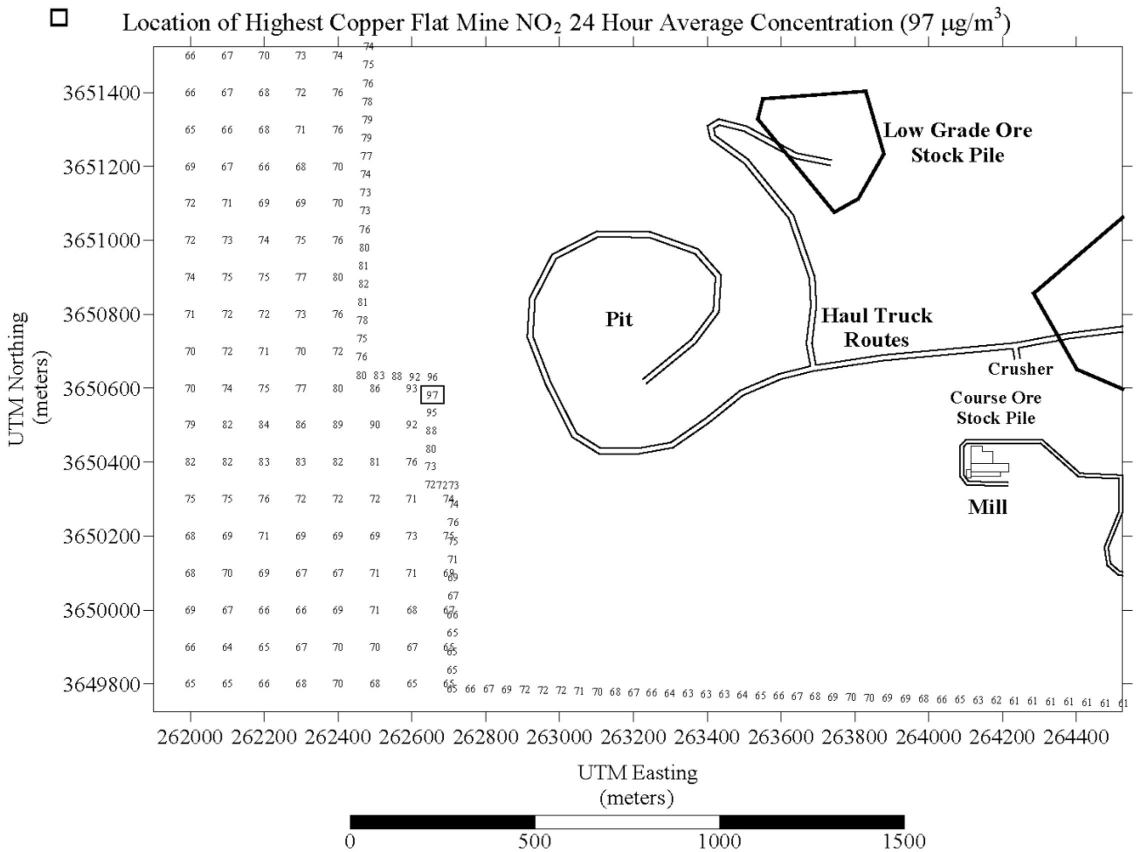

Figure 18: Copper Flat Mine's NO_X Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources plus Background
24 Hour Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

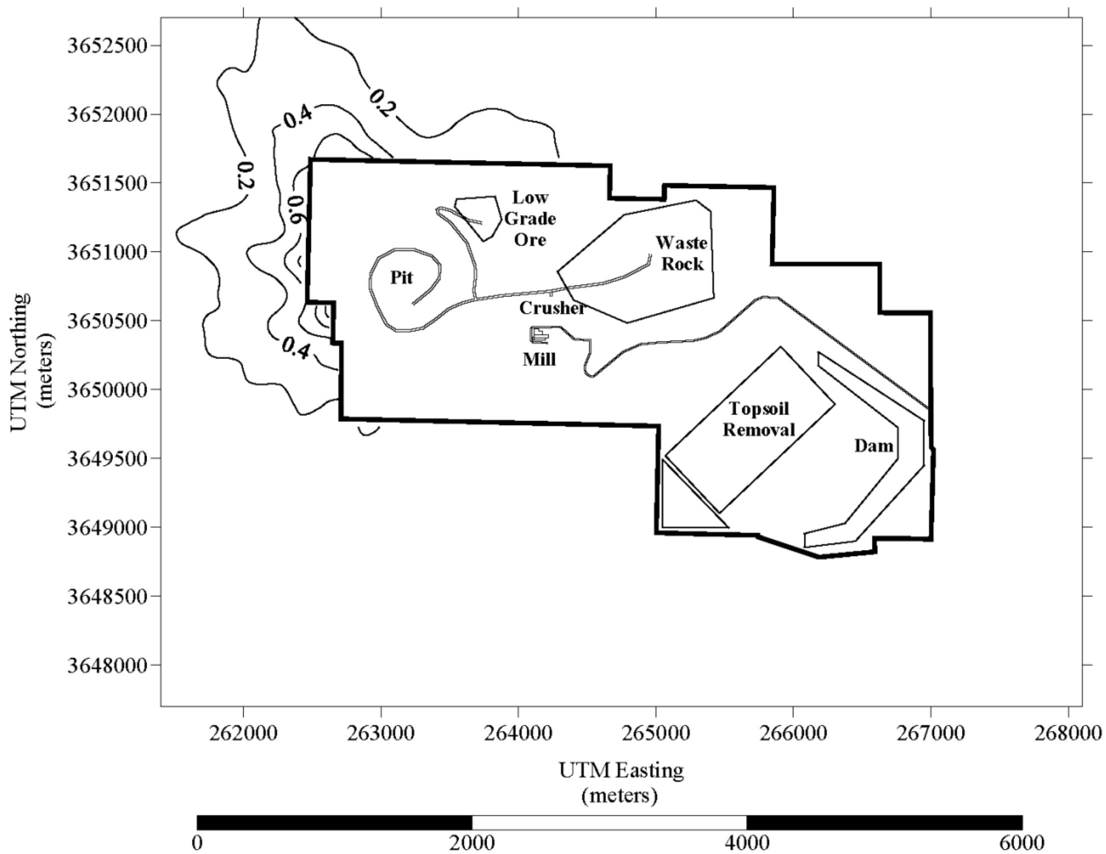

Figure 19: Isopleth of Copper Flat Mine's NO_X Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
Annual Average ($\mu g/m^3$)

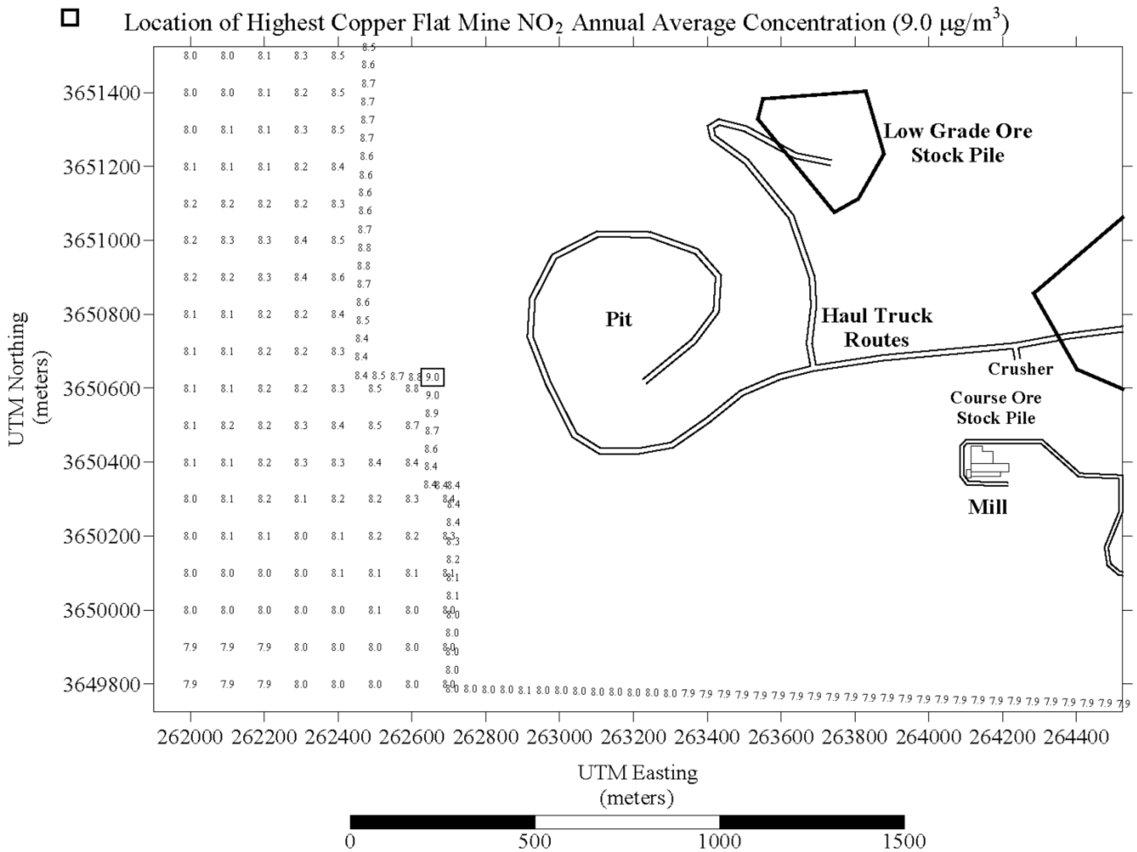

Figure 20: Copper Flat Mine's NO_X Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources plus Background
Annual Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

3.2.4 PM2.5 Refined Modeling Analysis

$PM_{2.5}$ modeled emission rates were determined from a daily crusher and mill throughput of 25,000 tons per day for a maximum short-term rate. Since all of the particulate matter emissions are direct PM emissions and will not result in secondary PM emissions, for the 24 hour average the highest 8^{th} high dispersion model result were compared to the $PM_{2.5}$ NAAQS. $PM_{2.5}$ refined modeling was run with a receptor grid spacing of 50 meters along the facility boundary, 100 meter grid spacing for receptors extended to 1000 meter beyond the facility boundary, 250 meter grid spacing for receptors extended from 1000 meter to 3 kilometers beyond the facility boundaries, 500 meter grid spacing for receptors extended from 3 kilometers to 5 kilometers beyond the facility boundaries, 1000 meter grid spacing for receptors extended from 5 kilometers to 10 kilometers beyond the facility boundaries, and 2500 meter grid spacing for receptors extended from 10 kilometers out to 32 kilometers. Receptors were generated using the model's self generating receptor option. Refined modeling was run in terrain mode using 7.5-minute DEM 10 meter resolution data to give a detailed characterization of the terrain throughout the region. A list of $PM_{2.5}$ neighboring sources from the NMED's AIRS database can be found in Appendix A.

Regional $PM_{2.5}$ background concentrations were added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour and annual background concentrations for $PM_{2.5}$ are presented in Section 2.7 of this report. $PM_{2.5}$ refined modeling show the maximum concentration for $PM_{2.5}$ is located on or near the northeast facility boundary for the 24 hour and annual averaging periods. Model results show no exceedance of federal $PM_{2.5}$ ambient air quality standards for the 24 hour or annual averaging periods. The maximum $PM_{2.5}$ model results are given below in Table 17. First and second highest 24 hour and annual averages were taken from the maximum tables produced by the model.

The $PM_{2.5}$ model results are summarized in Figures 21 and 22 for the 24-hour averaging period and Figures 23 and 24 for the annual average. This model run is designated "NMCC Copper Flat Mine PM25 CIA". Complete model input and output files are included on the attached CD-R.

TABLE 17
Maximum Modeled $PM_{2.5}$ Impacts
NMCC's Copper Flat Mine and Significant Neighbors $PM_{2.5}$ Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
24 Hour Average				
1st Highest 8th High	18.9	265845E,3650911N		24
2nd Highest 8th High	18.7	265846E,3650939N		24
Annual Average				
1st Highest	2.35	265845E,3650911N		
2nd Highest	2.32	265060E,3651383N		

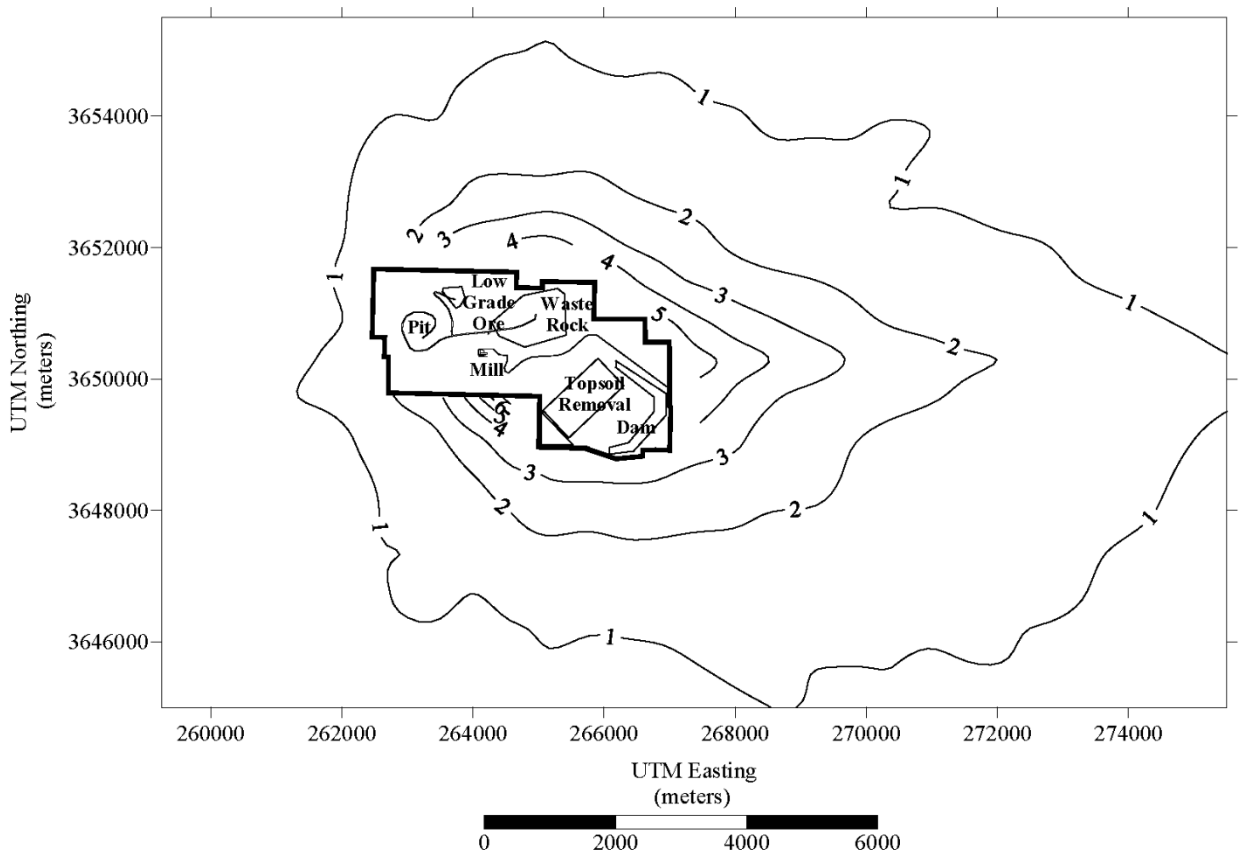

Figure 21: Isopleth of Copper Flat Mine's $PM_{2.5}$ Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
24 Hour Average ($\mu g/m^3$)

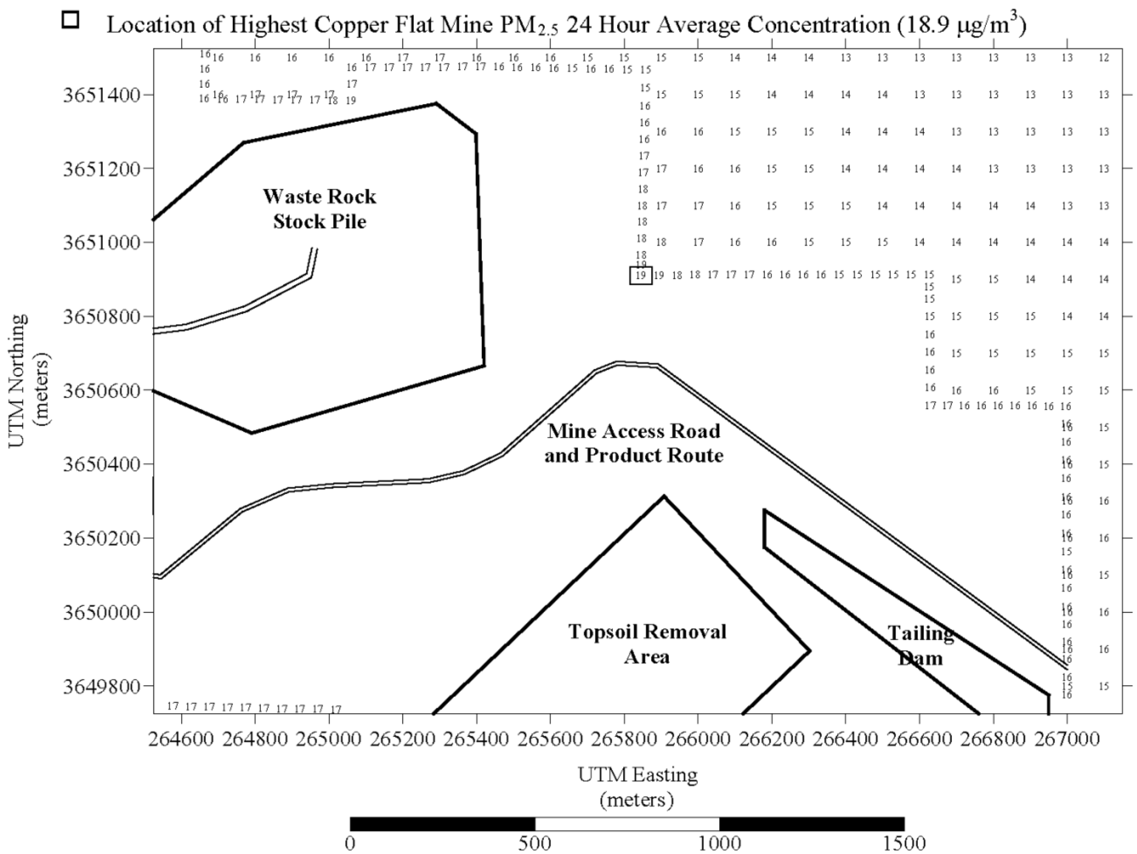

Figure 22: Copper Flat Mine's $PM_{2.5}$ Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources plus Background
24 Hour Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

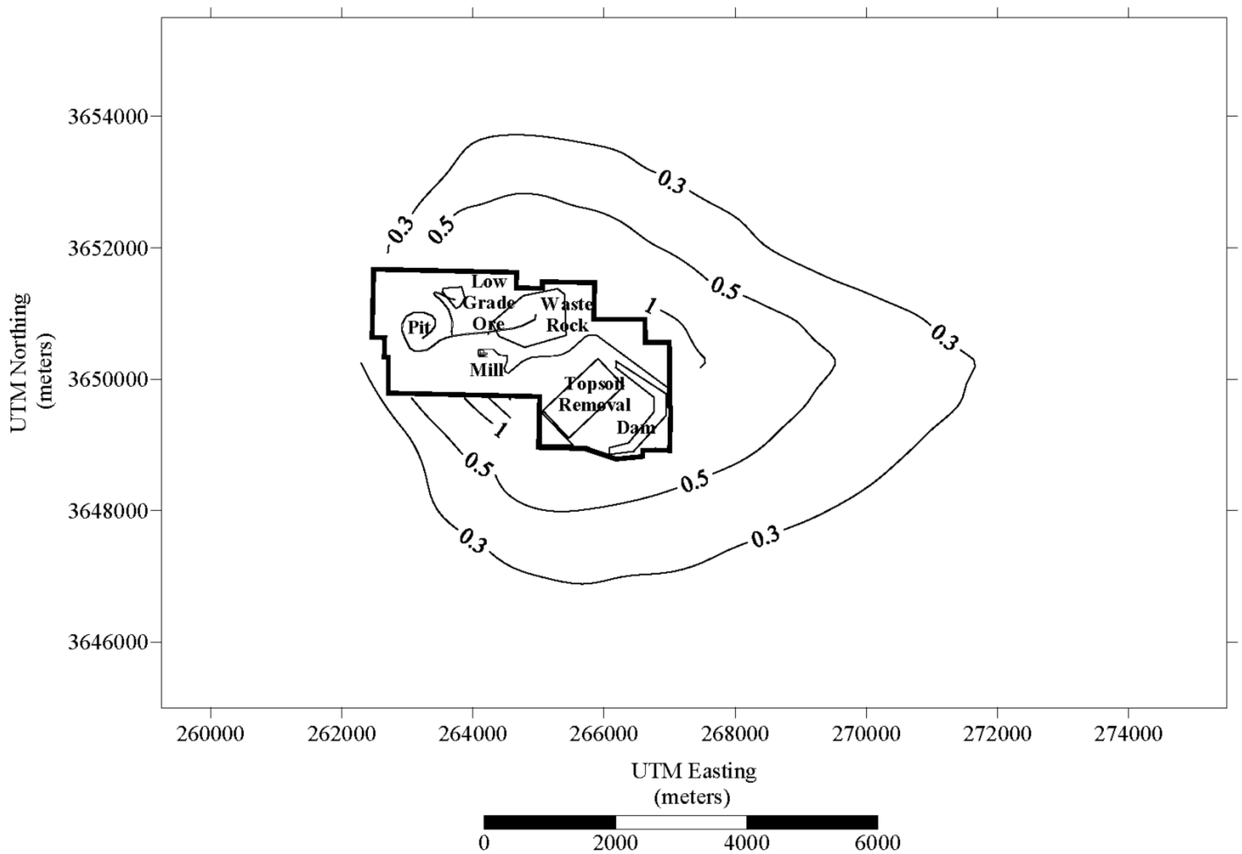

Figure 23: Isopleth of Copper Flat Mine's $PM_{2.5}$ Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
Annual Average ($\mu g/m^3$)

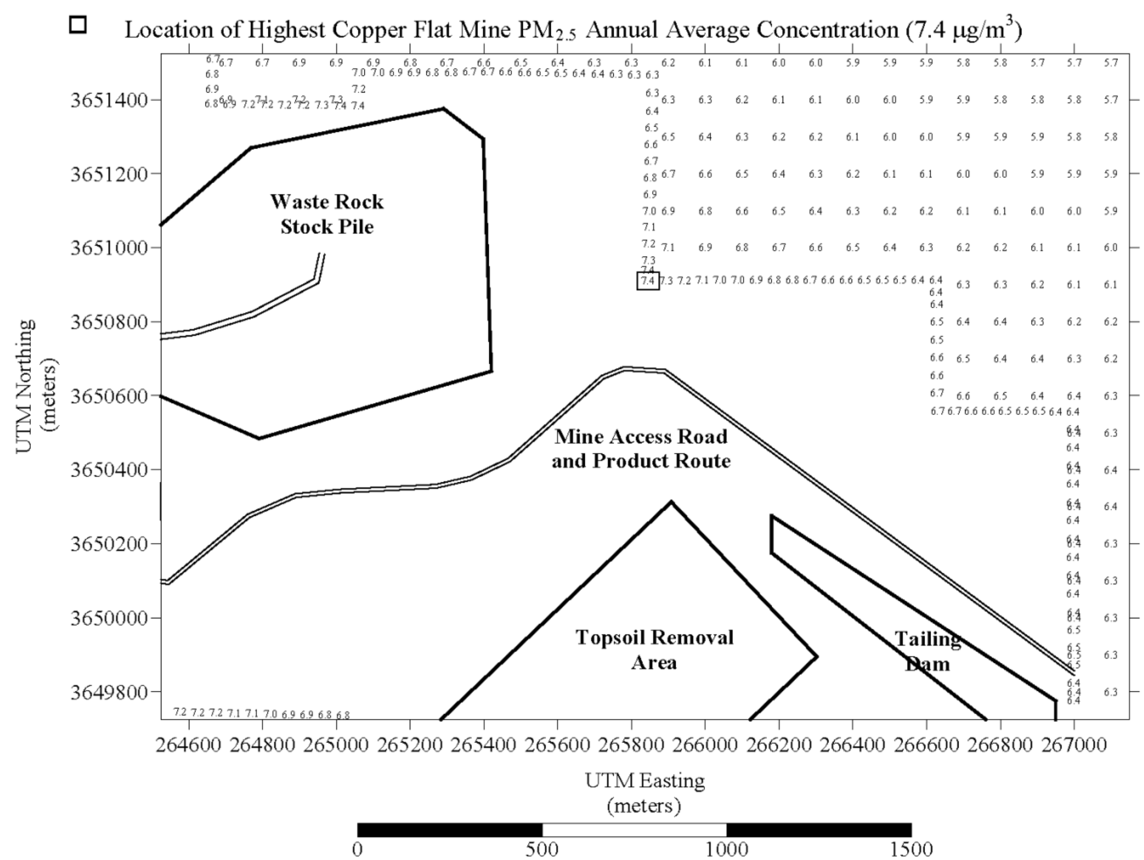

Figure 24: Copper Flat Mine's $PM_{2.5}$ Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources plus Background
Annual Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

3.2.5 PM_{10} Refined Modeling Analysis

PM_{10} modeled emission rates were determined from a daily crusher and mill throughput of 25,000 tons per day for a maximum short-term rate. Dispersion modeling run for determining maximum PM_{10} concentrations was run with plume depletion. PM_{10} refined modeling was run with a receptor grid spacing of 50 meters along the facility boundary, 100 meter grid spacing for receptors extended to 1000 meter beyond the facility boundary, 250 meter grid spacing for receptors extended from 1000 meter to 3 kilometers beyond the facility boundaries, and 500 meter grid spacing for receptors extended from 3 kilometers to 4 kilometers beyond the facility boundaries. Receptors were generated using the model's self generating receptor option. Refined modeling was run in terrain mode using 7.5-minute DEM 10 meter resolution data to give a detailed characterization of the terrain throughout the region. A list of PM_{10} neighboring sources from the NMED's AIRS database can be found in Appendix A.

Regional PM_{10} background concentrations were added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour background concentrations for PM_{10} are presented in Section 2.7 of this report. PM_{10} refined modeling show the maximum concentration for PM_{10} is located on or near the northeast facility boundary for the 24 hour averaging period. Model results show no exceedance of federal PM_{10} ambient air quality standards for the 24 hour averaging period. The maximum PM_{10} model results are given below in Table 18. First and second highest 24 hour averages were taken from the maximum tables produced by the model.

The PM_{10} model results are summarized in Figures 25 and 26 for the 24-hour averaging period. This model run was designated "NMCC Copper Flat Mine PM10 CIA". Complete model input and output files are included on the attached CD-R.

TABLE 18
Maximum Modeled PM_{10} Impacts
NMCC's Copper Flat Mine and Significant Neighbors PM_{10} Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
24 Hour Average				
1st Highest	49.8	265845E,3650911N		24
2nd Highest	49.3	265846E,3650939N		24

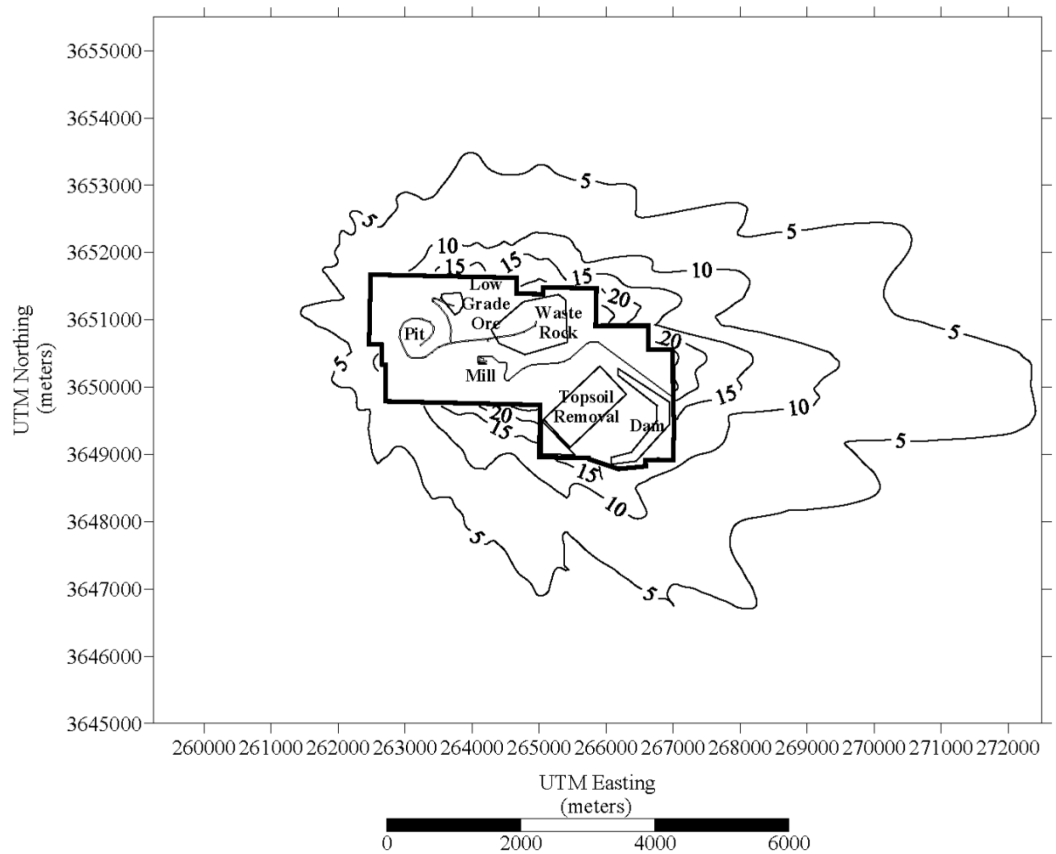

Figure 25: Isopleth of Copper Flat Mine's PM_{10} Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
24 Hour Average ($\mu g/m^3$)

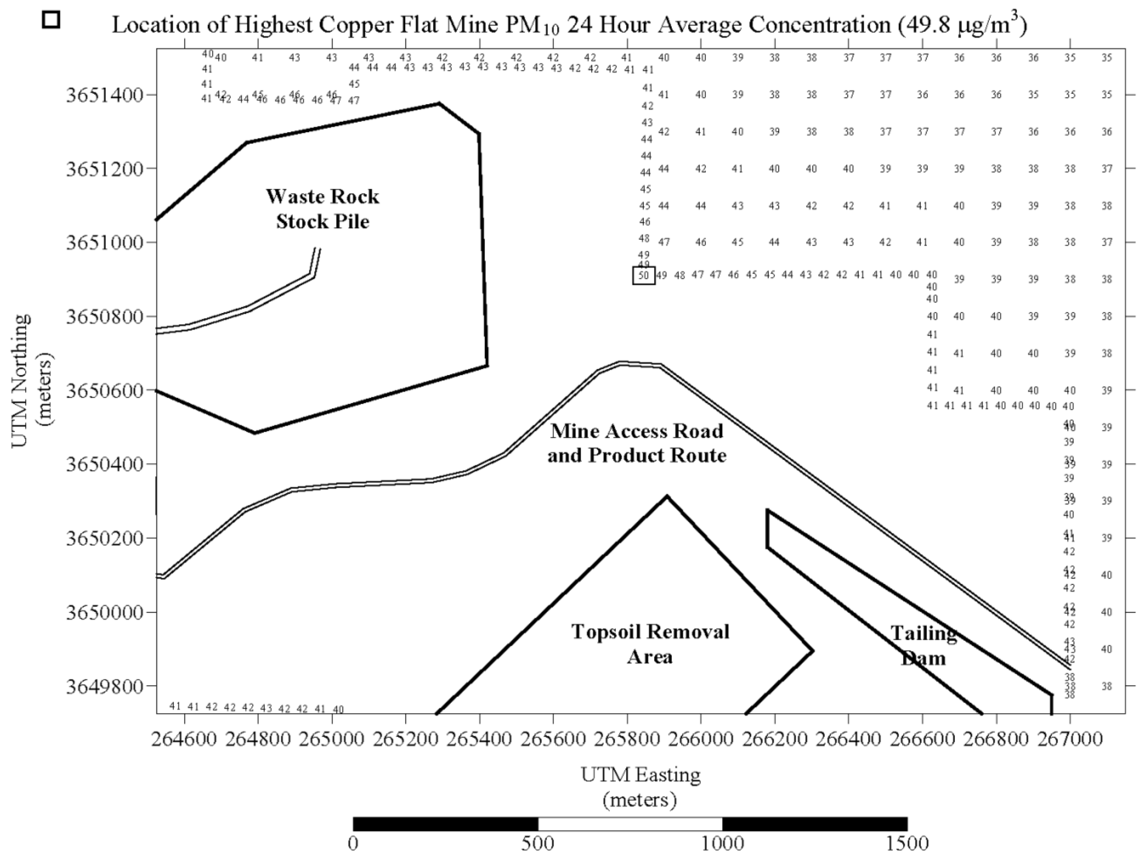

Figure 26: Copper Flat Mine PM_{10} Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Source
24 Hour Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

3.2.6 TSP Refined Modeling Analysis

TSP modeled emission rates were determined from a daily crusher and mill throughput of 25,000 tons per day for a maximum short-term rate. Dispersion modeling run for determining maximum TSP concentrations was run with plume depletion. TSP refined modeling was run with a receptor grid spacing of 50 meters along the facility boundary, 100 meter grid spacing for receptors extended to 1000 meter beyond the facility boundary, 250 meter grid spacing for receptors extended from 1000 meter to 3 kilometers beyond the facility boundaries, and 500 meter grid spacing for receptors extended from 3 kilometers to 4 kilometers beyond the facility boundaries. Receptors were generated using the model's self generating receptor option. Refined modeling was run in terrain mode using 7.5-minute DEM 10 meter resolution data to give a detailed characterization of the terrain throughout the region. A list of TSP neighboring sources from the NMED's AIRS database can be found in Appendix A.

Regional TSP background concentrations were added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour and annual background concentrations for TSP are presented in Section 2.7 of this report. TSP refined modeling show the maximum concentration for TSP is located on or near the northeast facility boundary for the 24 averaging period. TSP refined modeling show the maximum concentration for TSP is located on or near the north facility boundary for the monthly (30 day) and annual averaging periods. Model results show no exceedance of state TSP ambient air quality standards for the 24 hour, 30 day, or annual averaging periods. The maximum TSP model results are given below in Table 19. First and second highest 24 hour, monthly (30 day), and annual averages were taken from the maximum tables produced by the model.

The TSP model results are summarized in Figures 27 and 28 for the 24-hour averaging period, Figures 29 and 30 for the monthly (30 day) averaging period, and Figures 31 and 32 for the annual average. This model run was designated "NMCC Copper Flat Mine TSP CIA". Complete model input and output files are included on the attached CD-R.

TABLE 19
Maximum Modeled TSP Impacts
NMCC's Copper Flat Mine and Significant Neighbors TSP Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
24 Hour Average				
1st Highest	65.4	267000E,3649900N	11/28/11	24
2nd Highest	64.3	265060E,3651383N	01/13/11	24
Monthly Average				
1st Highest	50.1	265060E,3651383N	June	Monthly
2nd Highest	49.7	265010E,3651384N	June	Monthly
Annual Average				
1st Highest	9.5	265060E,3651383N		
2nd Highest	9.1	265010E,3651384N		

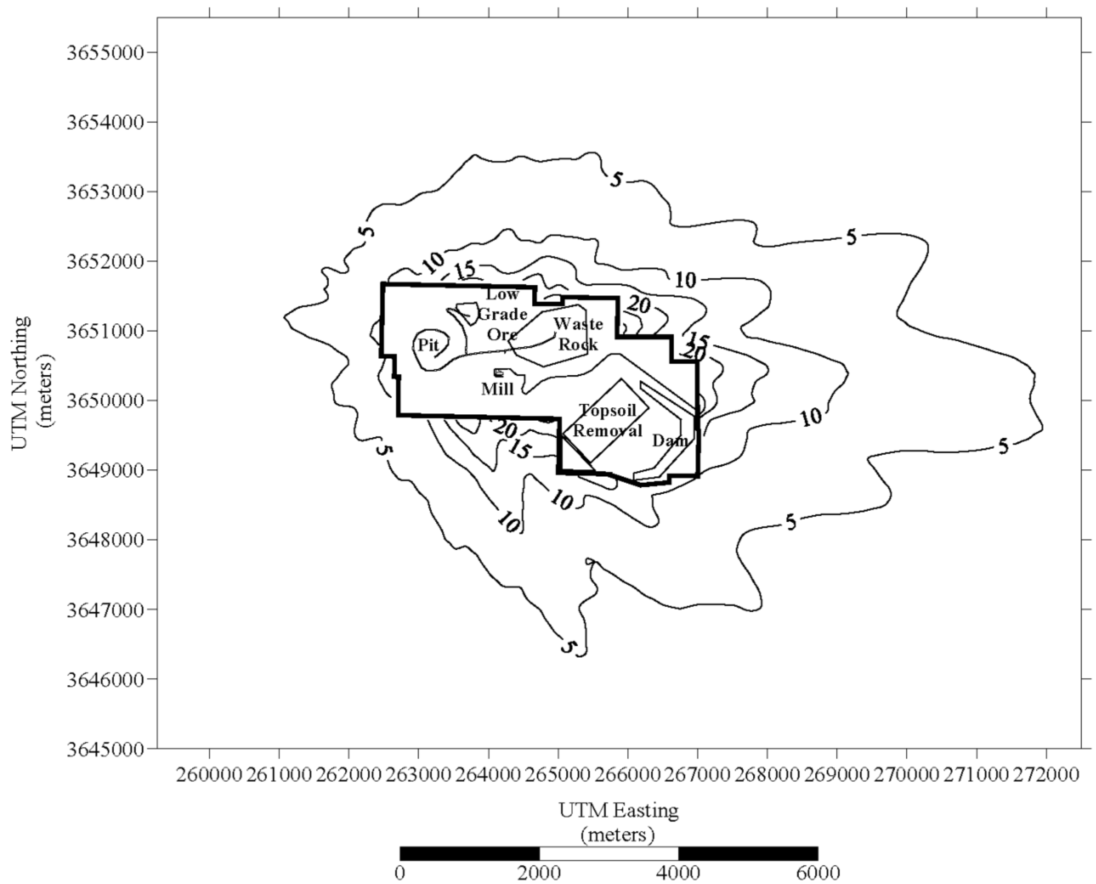

Figure 27: Isopleth of Copper Flat Mine's TSP Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
24 Hour Average ($\mu g/m^3$)

NMCC – Copper Flat Mine – Dispersion Model Report

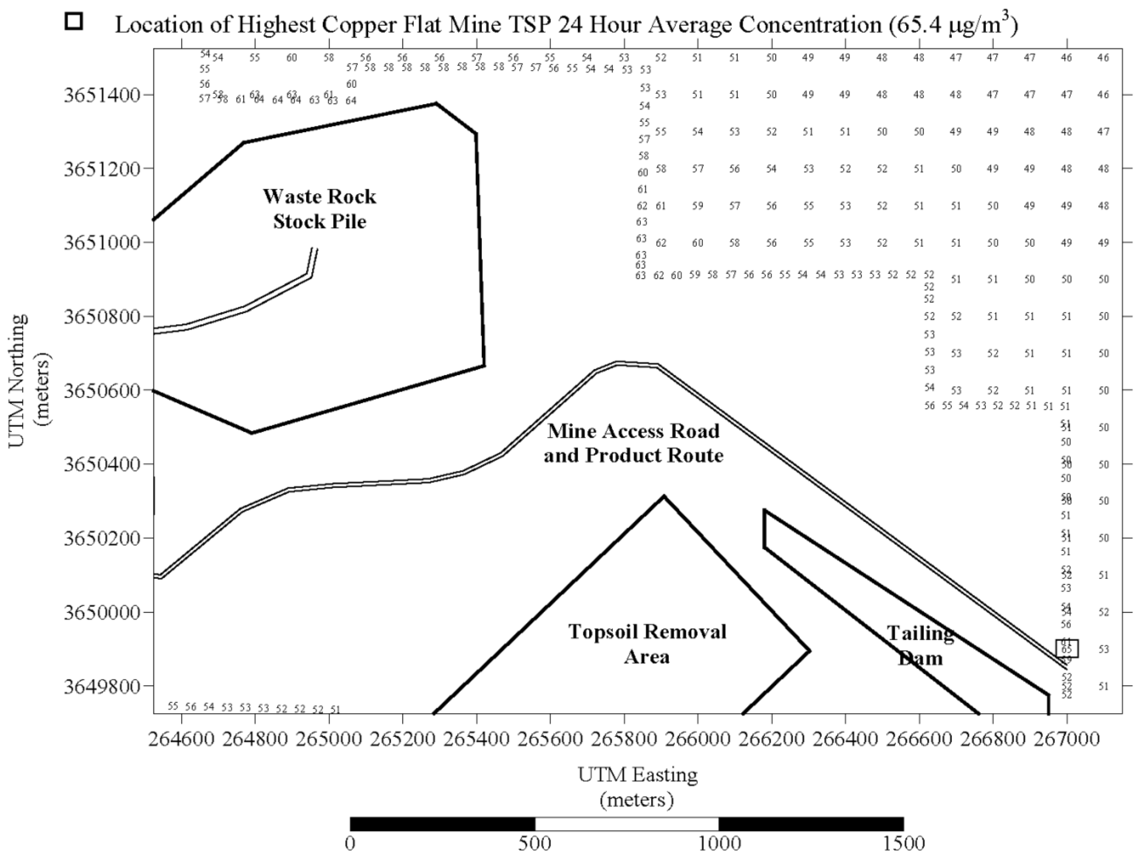

Figure 28: NMCC's Copper Flat Mine TSP Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
24 Hour Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

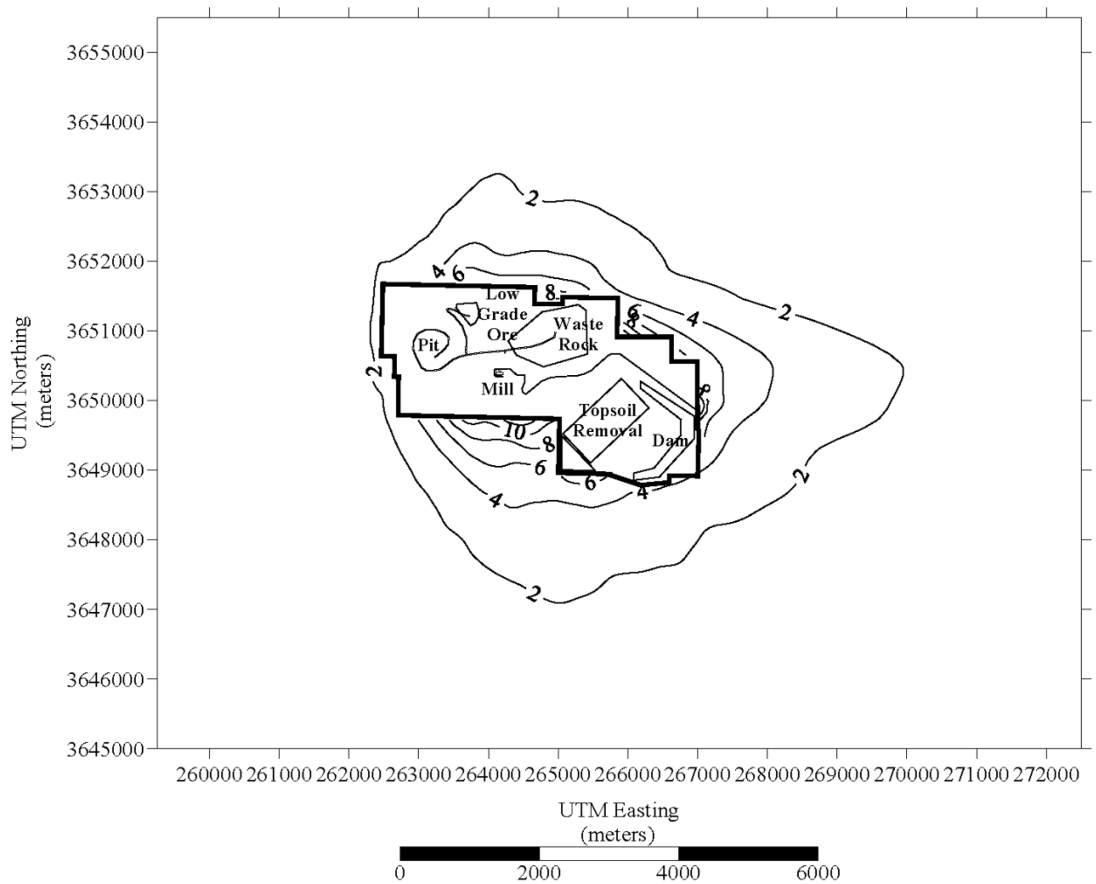

Figure 29: Isopleth of Copper Flat Mine's TSP Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
Monthly Average (μg/m^3)

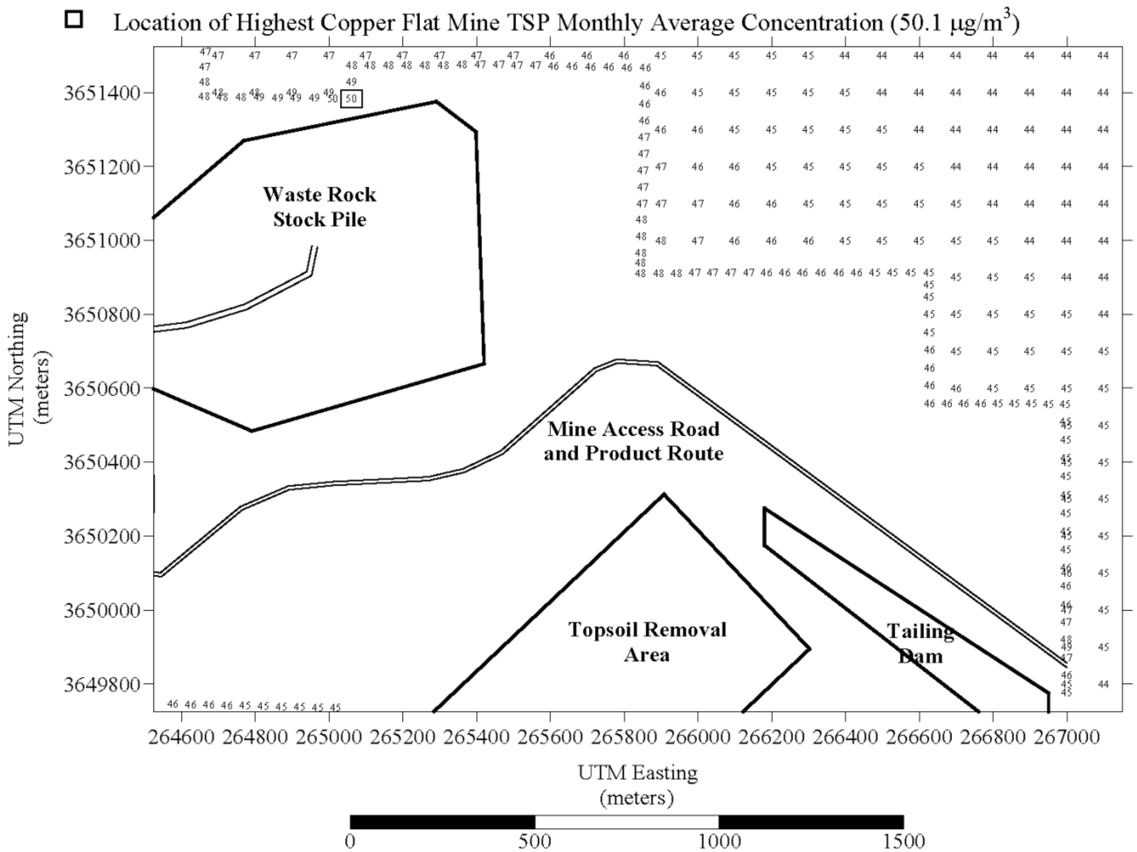

Figure 30: NMCC's Copper Flat Mine TSP Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
Monthly Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

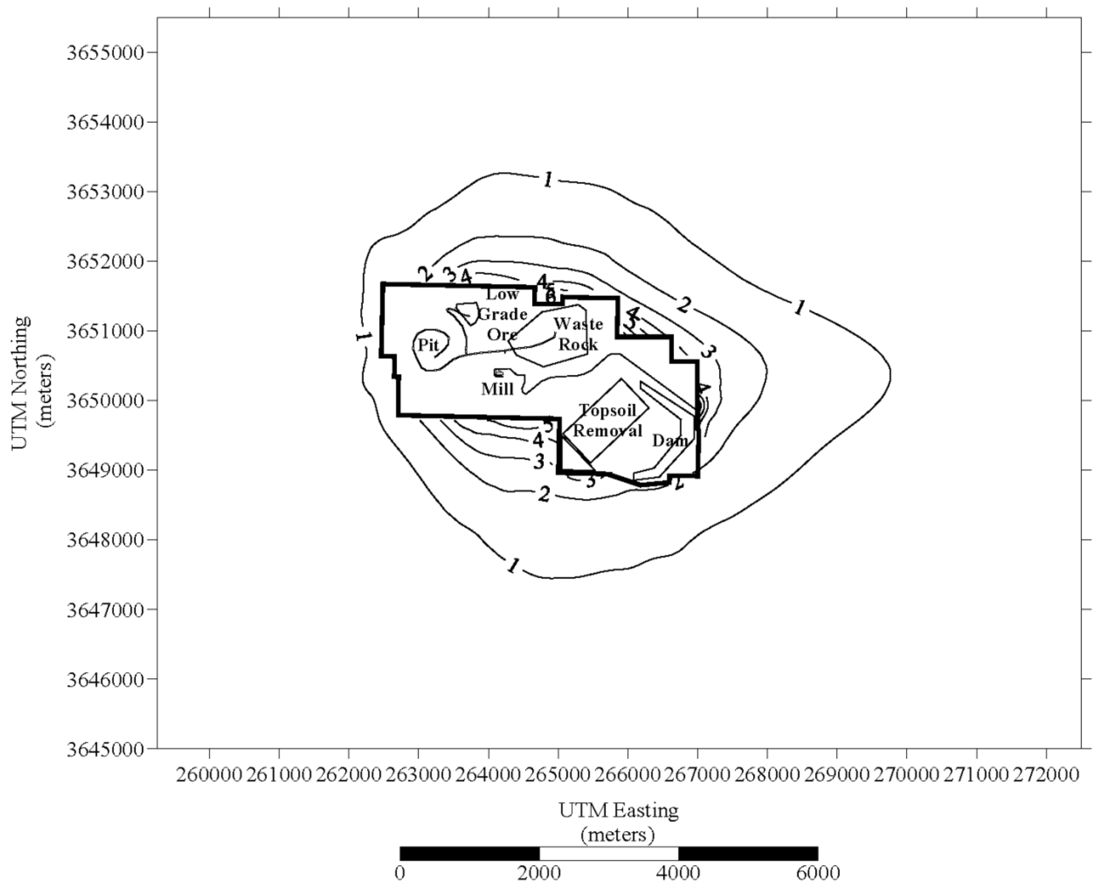

Figure 31: Isopleth of Copper Flat Mine's TSP Refined Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
Annual Average ($\mu g/m^3$)

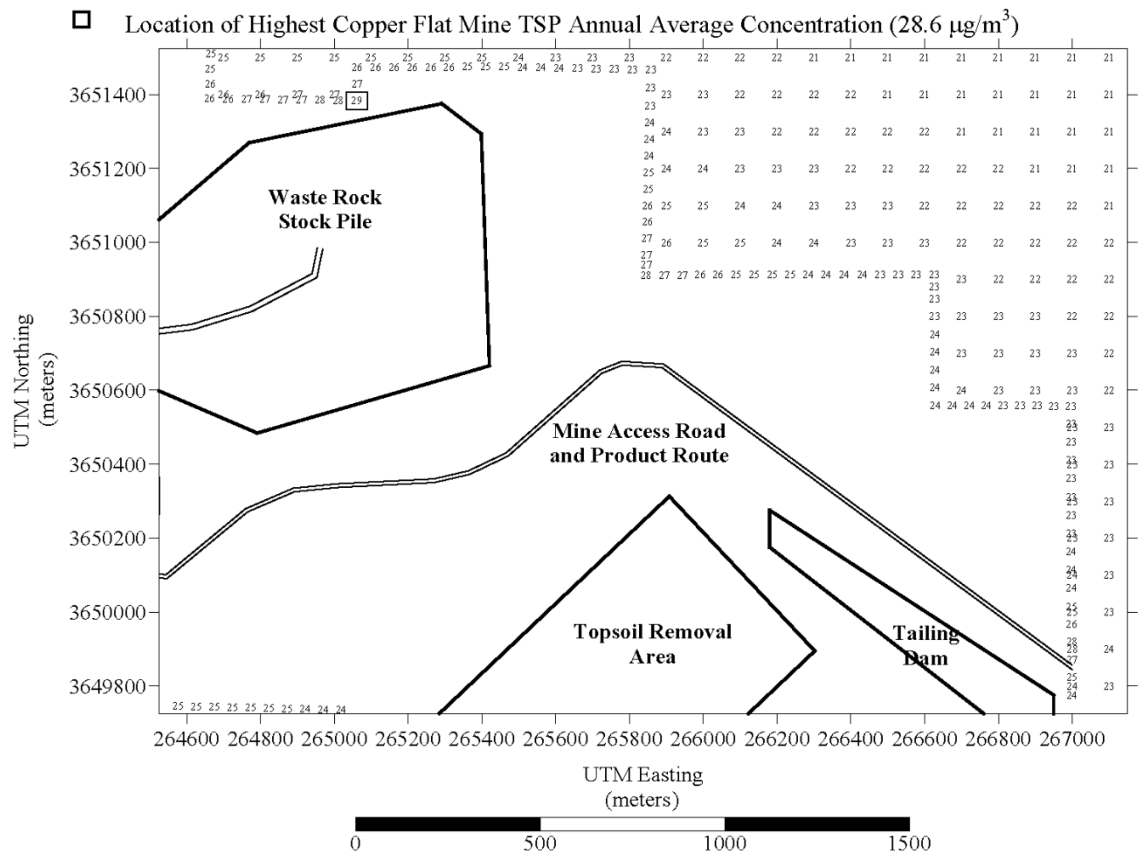

Figure 32: NMCC's Copper Flat Mine TSP Concentration Model Results
Copper Flat Mine Sources and Significant Neighboring Sources
Annual Average (μg/m³)
(grid location of maximum modeled concentration)

3.3 CLASS 1 AND 2 INCREMENT CONSUMPTION ANALYSIS

NMCC's Copper Flat Mine is located in AQCR 153 where the minor source baseline has been triggered for NO_2 and PM_{10}. The minor source baseline date was established for NO_2 on March 26, 1997 and PM_{10} on June 16, 2000 in the region (AQCR 153). CTS performed modeling analysis for NO_2 and PM_{10} increment consumption for the NMCC's Copper Flat Mine. The nearest Class I area is Gila Wilderness Area at approximately 46 kilometers away. Both PSD Class I and II increment modeling was performed for this permit application. No model result, NO_2 or $PM_{10,}$ were above EPA proposed SILs for Class 1 Areas, so no neighboring increment consumers were included.

3.3.1 NO_2 PSD Class I Increment Modeling Analysis

NO_2 Class I Increment modeling included the NMCC's Copper Flat Mine source (blasting) only. No model result for NO_2 was above EPA NO_2 proposed SILs for Class 1 Areas, so no neighboring increment consumers were included. NO_2 Class I Increment modeling was run with a receptor grid spacing of 50 meters along the Gila Wilderness Area boundary and 100 meters spacing within. Increment modeling was run in non-terrain mode. The maximum model results from the increment modeling are given below in Table 20. First highest annual averages were taken from the maximum tables produced by the model.

TABLE 20
Maximum Modeled NO_2 Class I Increment Impacts
NMCC's Copper Flat Mine Source Only

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
Annual Average				
1st Highest	0.0094	219066E,3669583N		

The model results are summarized in Figure 33 for the annual averaging period. The model run is designated "NMCC Copper Flat Mine NOX C1 Incre". Complete model input and output files are included on the enclosed CD.

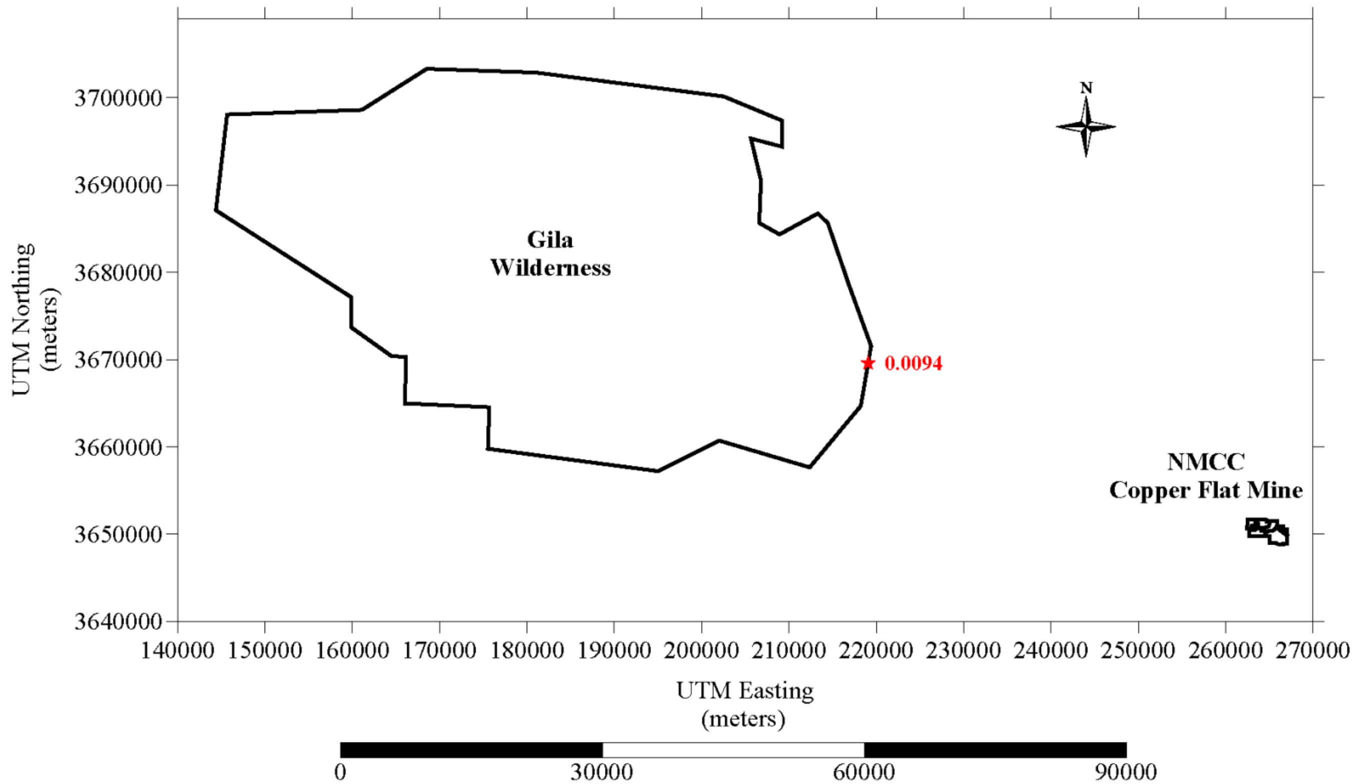

Figure 33: NMCC's Copper Flat Mine NO_2 Class I Increment Model Results
NMCC's Copper Flat Mine Sources Only
Annual Average ($\mu g/m^3$)

3.3.2 NO2 PSD Class II Increment Modeling Analysis

NO_2 Class II Increment modeling included the NMCC's Copper Flat Mine source (blasting) and significant neighboring increment consuming sources. NO_2 Class II Increment modeling was run with a grid spacing of 50 meters along the facility boundary and 100 meters spacing out to 1000 meters beyond the facility boundary. Increment modeling was run in terrain mode. A list of NO_2 increment consuming neighboring sources within 65 kilometers from the NMED's AIRS database can be found in Appendix A. The maximum NO_X model results from the refined modeling are given below in Table 21. First highest annual averages were taken from the maximum tables produced by the model.

TABLE 21
Maximum Modeled NO_2 Class II Increment Impacts
NMCC's Copper Flat Mine plus Increment Consuming Neighboring Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
Annual Average				
1st Highest	1.2	262656E,3659630N		

The model results are summarized in Figures 34 and 35 for the annual averaging period. The model run is designated "NMCC Copper Flat Mine NOX C2 Incre". Complete model input and output files are included on the enclosed CD-R.

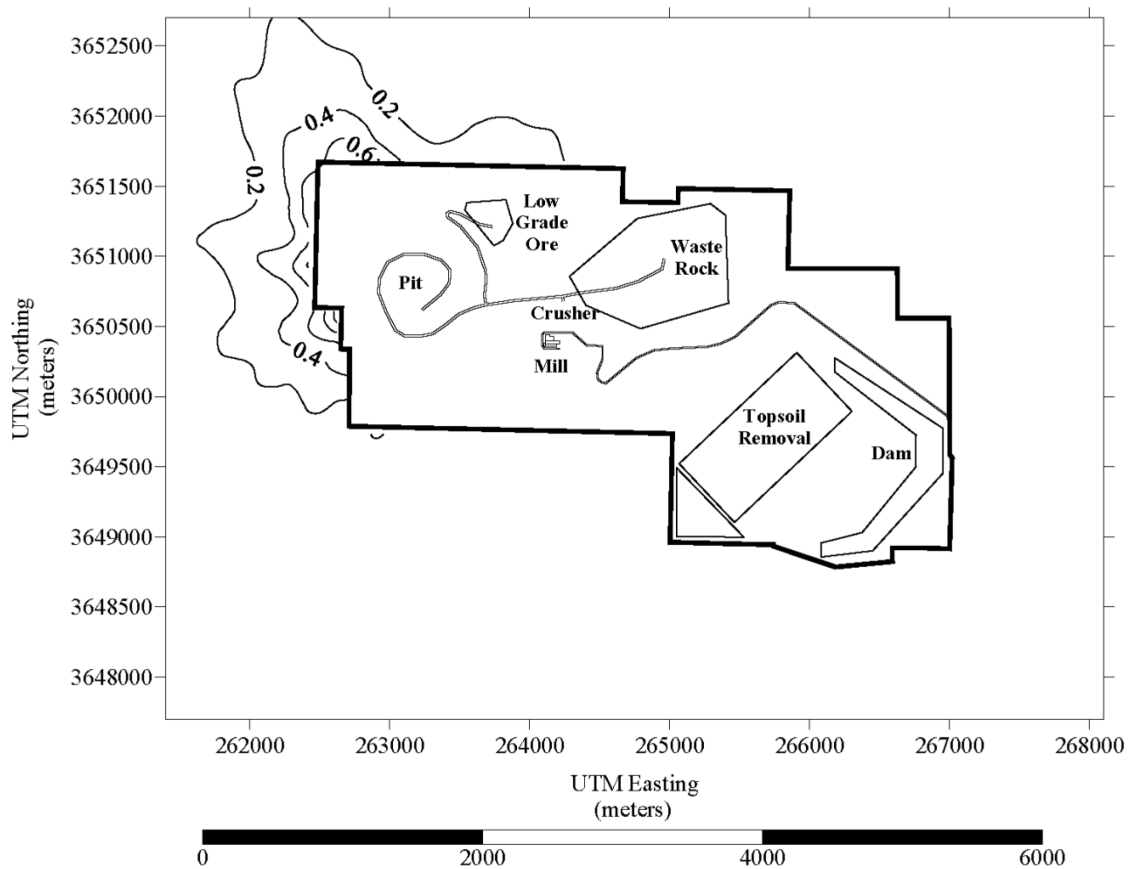

Figure 34: Isopleth of NMCC's Copper Flat Mine NO_2 Class II Increment Model Results
NMCC's Copper Flat Mine plus Neighboring Increment Consuming Sources
Annual Average ($\mu g/m^3$)

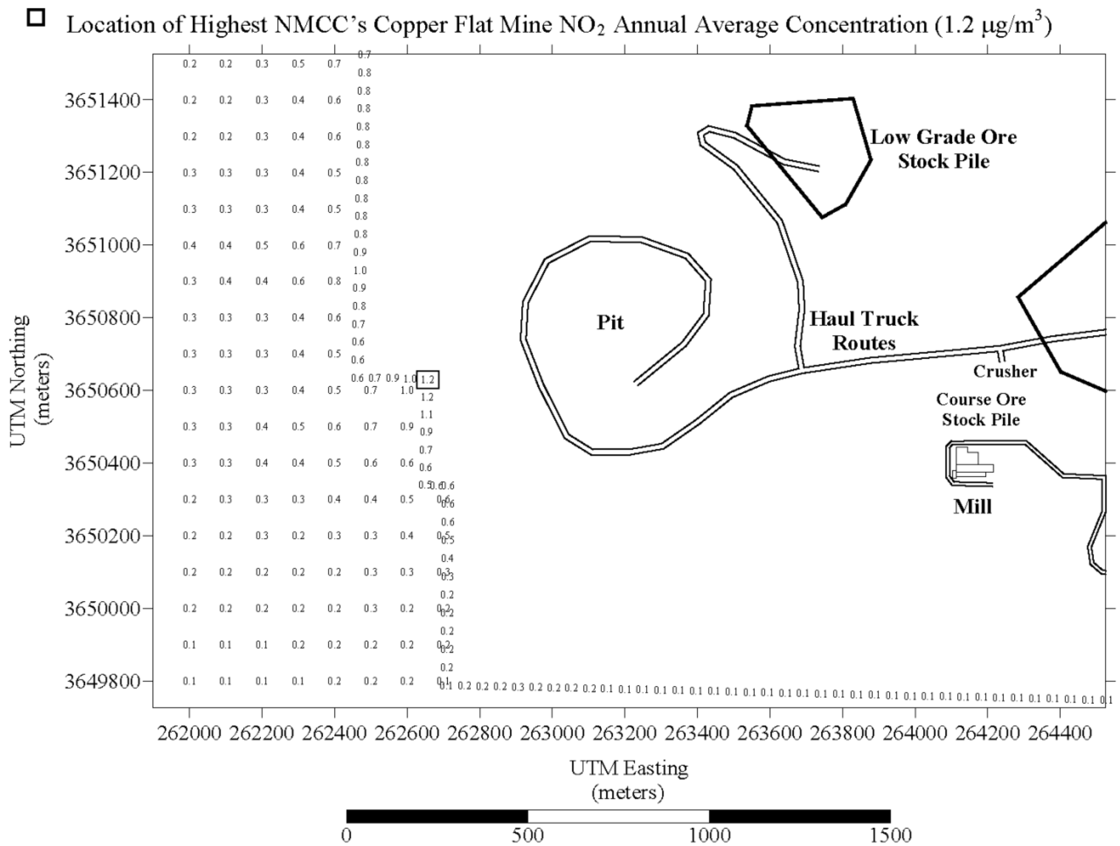

Figure 35: NMCC's Copper Flat Mine NO_2 Class II Increment Model Results
NMCC's Copper Flat Mine plus Neighboring Increment Consuming Sources
Annual Average (µg/m³)
(grid location of maximum modeled concentration)

3.3.3 PM_{10} PSD Class I Increment Modeling Analysis

PM_{10} Class I Increment modeling included the NMCC's Copper Flat Mine particulate emitting source only. No model result for PM_{10} was above the EPA proposed PM_{10} SILs for Class 1 Areas, so no neighboring increment consumers were included. PM_{10} Class I Increment modeling was run in plume depletion mode. PM_{10} Class I Increment modeling was run with a receptor grid spacing of 50 meters along the Gila Wilderness Area boundary and 100 meters spacing within. Increment modeling was run in non-terrain mode. The maximum model results from the increment modeling are given below in Table 22. First highest 24 hour and annual averages were taken from the maximum tables produced by the model.

TABLE 22
Maximum Modeled PM_{10} Class I Increment Impacts
NMCC's Copper Flat Mine Sources Only

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
24 Hour Average				
2nd Highest	0.12	214127E,3659756N	05/04/11	24
Annual Average				
1st Highest	0.0032	216469E,3662573N		

The model results are summarized in Figures 36 and 37 for the 24 hour and annual averaging periods. The model run is designated "NMCC Copper Flat Mine PM10 C1 Incre". Complete model input and output files are included on the enclosed CD-R.

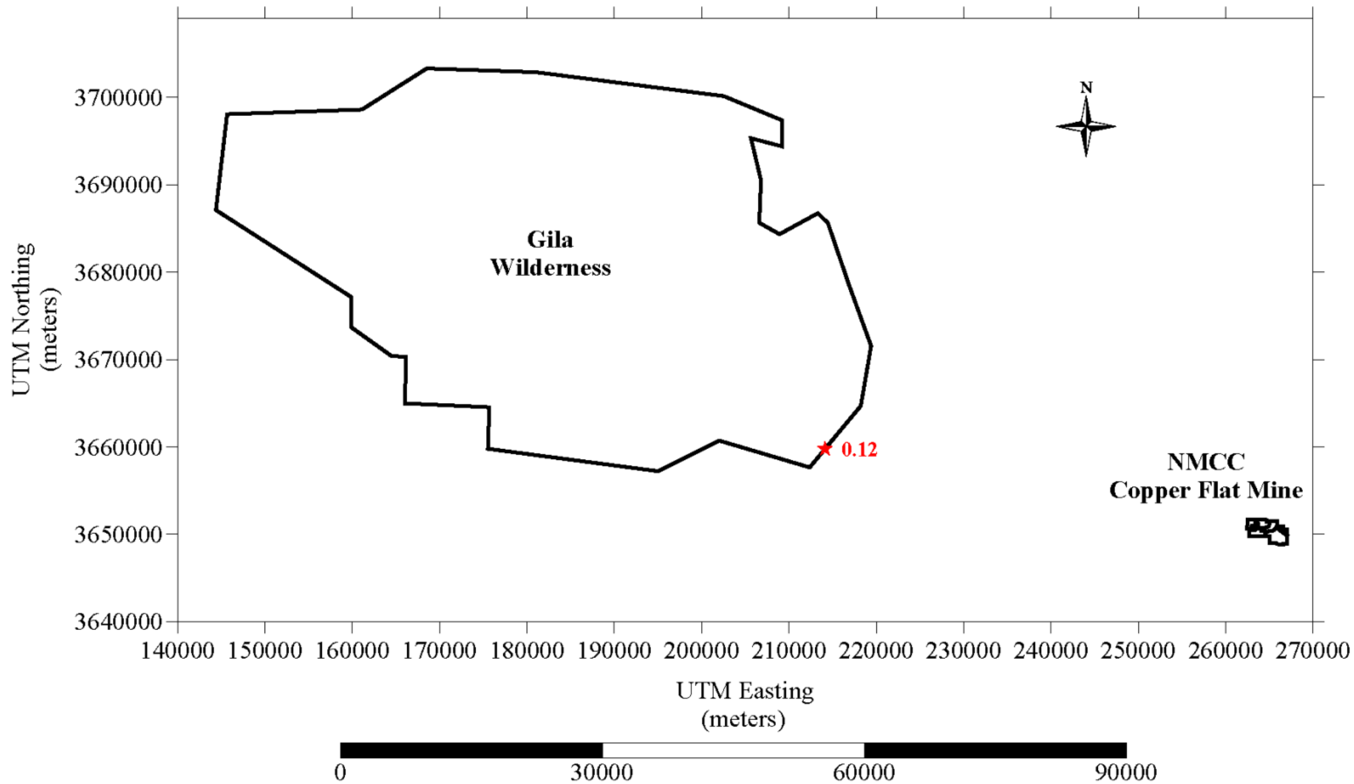

Figure 36: Isopleth of NMCC's Copper Flat Mine PM_{10} Class I Increment Model Results
NMCC's Copper Flat Mine Source Only
24 Hour Average ($\mu g/m^3$)

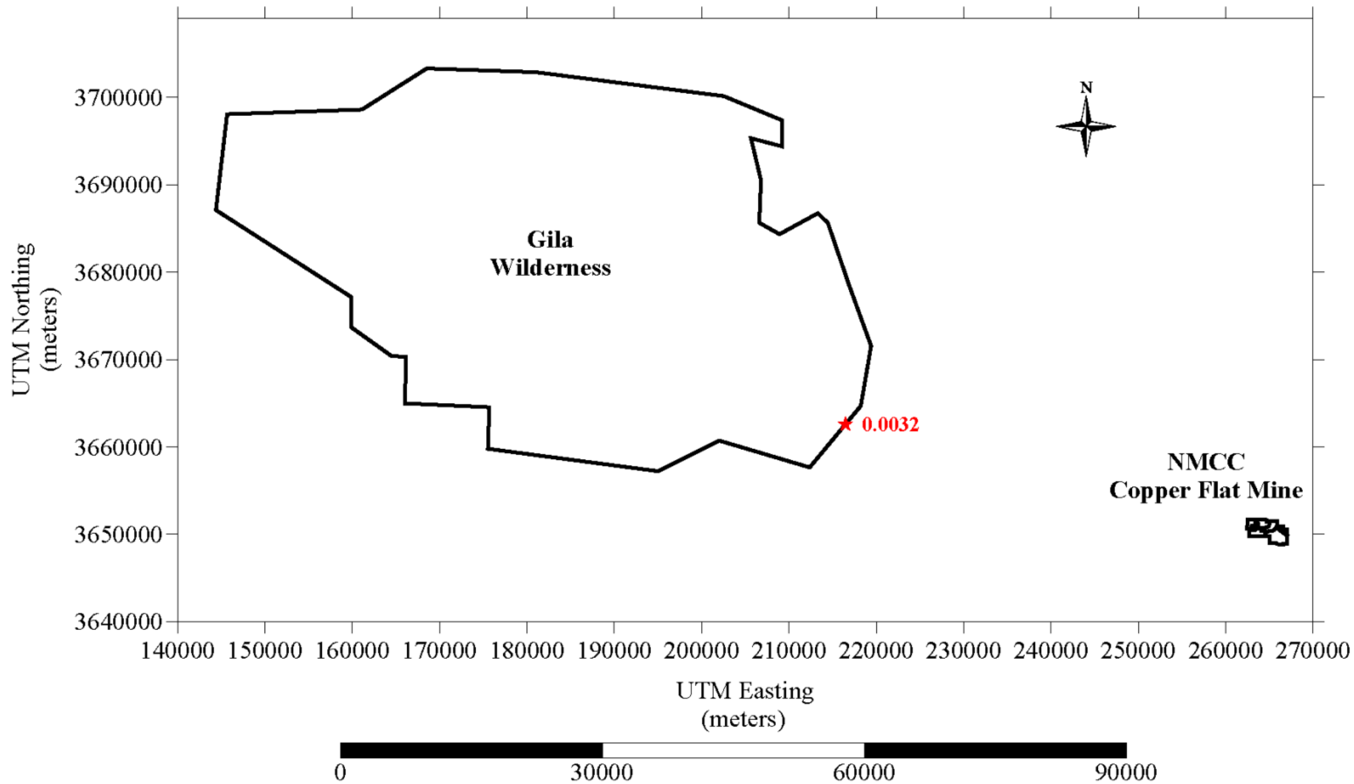

Figure 37: Isopleth of NMCC's Copper Flat Mine PM_{10} Class I Increment Model Results
NMCC's Copper Flat Mine Source Only
Annual Average ($\mu g/m^3$)

3.3.4 PM_{10} PSD Class II Increment Modeling Analysis

PM_{10} modeled increment consuming emission rates were determined from a daily crusher and mill throughput of 25,000 tons per day for a maximum short-term rate. Dispersion modeling run for determining maximum PM_{10} increment was run with plume depletion. PM_{10} increment modeling was run with a receptor grid spacing of 50 meters along the facility boundary, 100 meter grid spacing for receptors extended to 1000 meter beyond the facility boundary, 250 meter grid spacing for receptors extended from 1000 meter to 3 kilometers beyond the facility boundaries, and 500 meter grid spacing for receptors extended from 3 kilometers to 4 kilometers beyond the facility boundaries. Receptors were generated using the model's self generating receptor option. Increment modeling was run in terrain mode using 7.5-minute DEM 10 meter resolution data to give a detailed characterization of the terrain throughout the region. A list of PM_{10} neighboring increment consuming sources from the NMED's AIRS database can be found in Appendix A.

PM_{10} increment modeling show the maximum concentration is located on or near the northeast facility boundary for both the 24 hour and annual averaging periods. Model results show no exceedance of federal PSD Class II PM_{10} increment standard for the 24 hour and annual averaging periods. The maximum PSD Class II PM_{10} increment model results are given below in Table 23. The highest 2^{nd} high 24 hour average and highest annual average were taken from the maximum tables produced by the model.

TABLE 23
Maximum Modeled PM_{10} Class II Increment Impacts
NMCC's Copper Flat Mine Sources and Increment Consuming Neighboring Sources

	Concentration ($\mu g/m^3$)	Location UTMs E/N	Date	Hour
24 Hour Average				
High 2^{nd} Highest	29.9	265845E,3650911N	01/14/11	24
Annual Average				
1^{st} Highest	6.8	265845E,3650911N		

The PSD Class II PM_{10} increment model results are summarized in Figures 38 and 39 for the 24-hour averaging period and Figures 40 and 41 for the annual averaging period. This model run was designated "NMCC Copper Flat Mine PM10 C2 Incre". Complete model input and output files are included on the attached CD-R.

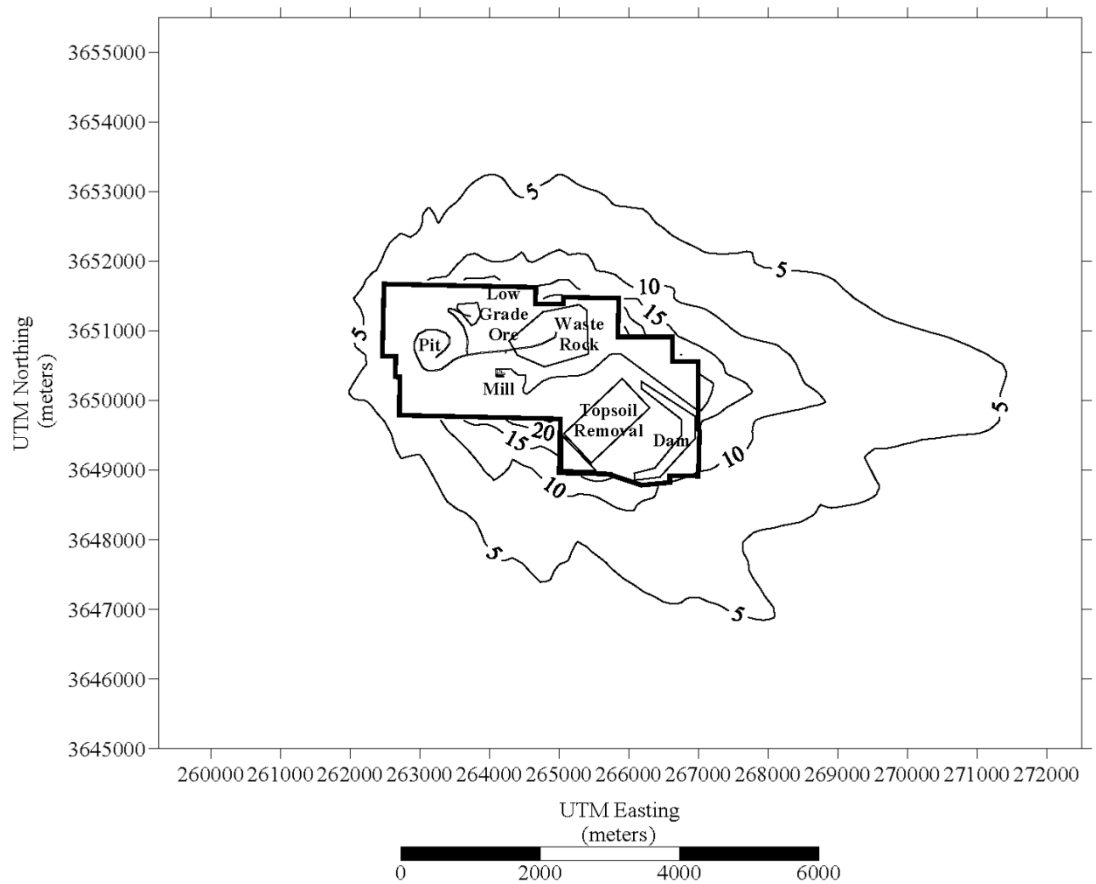

Figure 38: Isopleth of NMCC's Copper Flat Mine PM_{10} Class II Increment Model Results
NMCC's Copper Flat Mine plus Increment Consuming Neighboring Sources
24 Hour Average ($\mu g/m^3$)

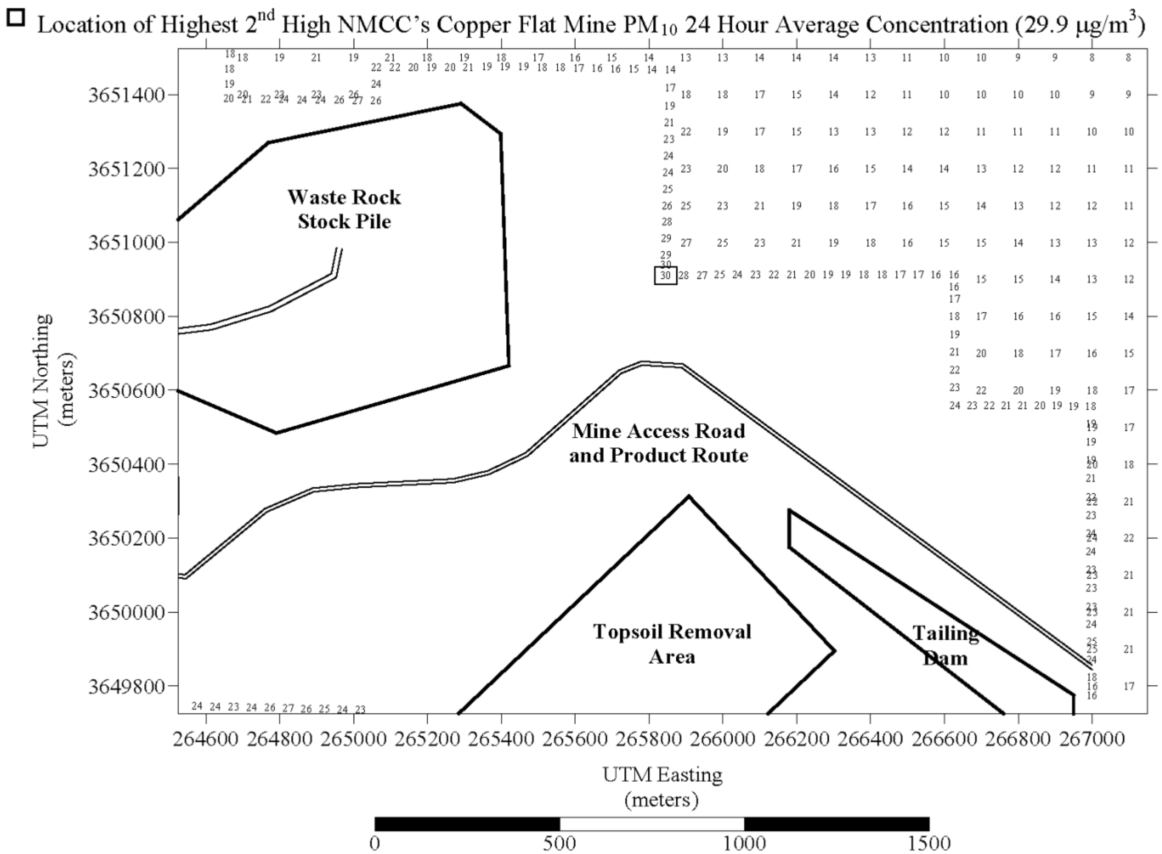

Figure 39: NMCC's Copper Flat Mine PM_{10} Class II Increment Model Results
NMCC's Copper Flat Mine plus Increment Consuming Neighboring Sources
24 Hour Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

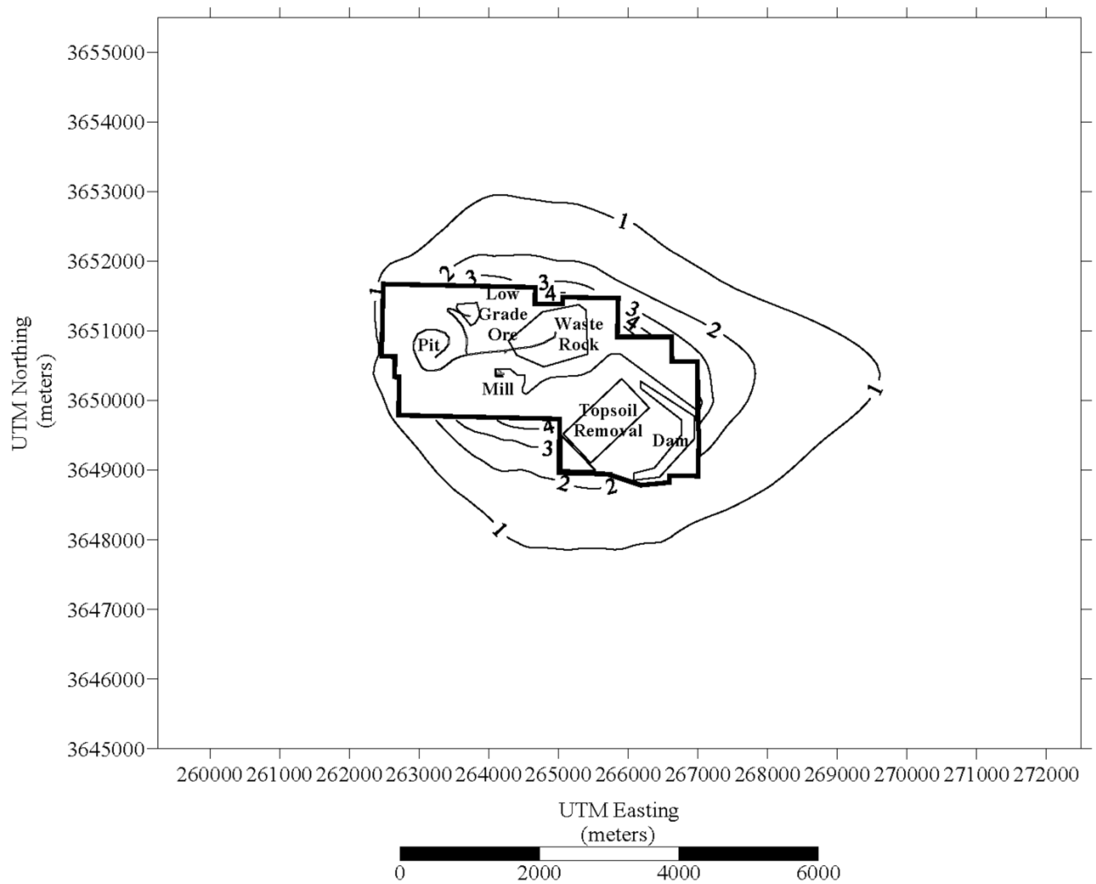

Figure 40: Isopleth of NMCC's Copper Flat Mine PM_{10} Class II Increment Model Results
NMCC's Copper Flat Mine plus Increment Consuming Neighboring Sources
Annual Average ($\mu g/m^3$)

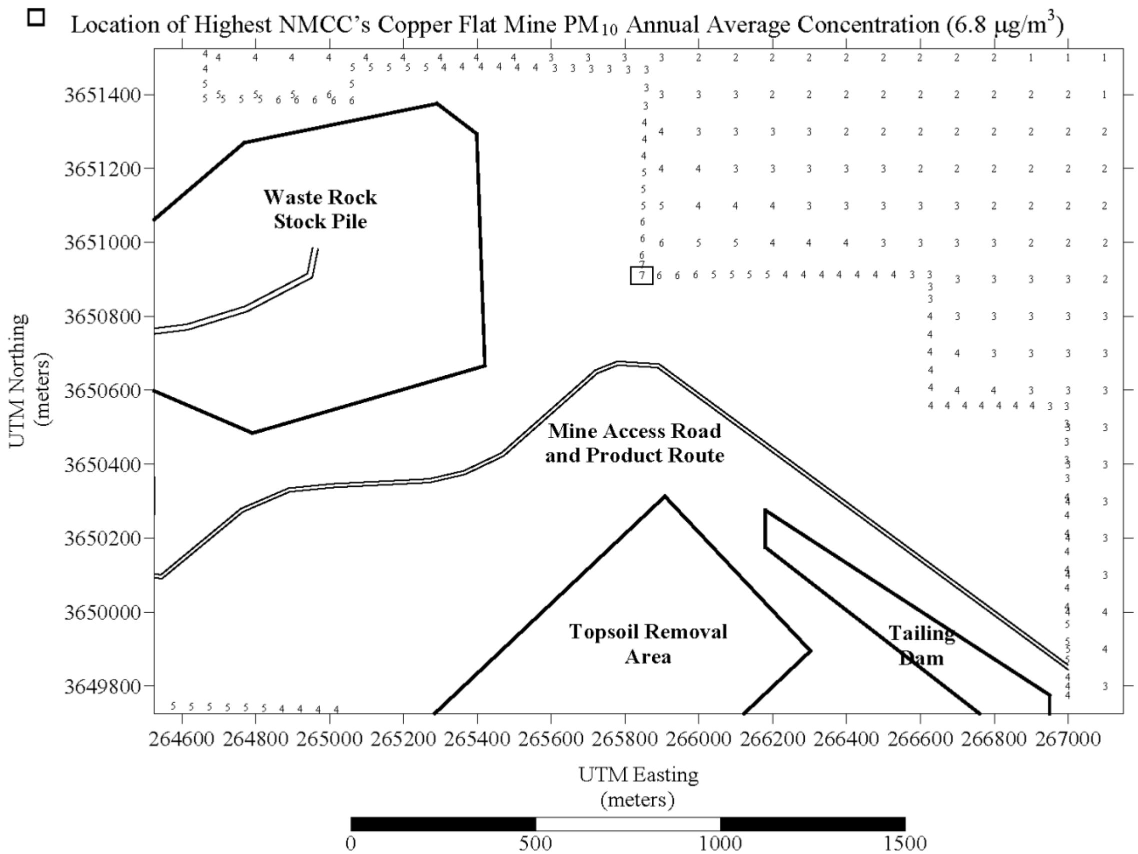

Figure 41: NMCC's Copper Flat Mine PM_{10} Class II Increment Model Results
NMCC's Copper Flat Mine plus Increment Consuming Neighboring Sources
Annual Average ($\mu g/m^3$)
(grid location of maximum modeled concentration)

4.0 REFERENCES

1. New Mexico Air Quality Bureau, Air Dispersion Modeling Guidelines, (Revised July 29, 2011). http://www.nmenv.state.nm.us/aqb/modeling/modelingpubs.html

2. AIR DISPERSION MODELING GUIDELINES For AIR QUALITY PERMITTING, City of Albuquerque, Environmental Health Department, Air Quality Division, Permitting & Technical Analysis Section (Revised 01/21/10).
http://www.cabq.gov/airquality/dispersionmodelingguidlines.html

3. Environmental Protection Agency, 40 CFR Part 51, Revision to the Guideline on Air Quality Models Appendix W: http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf

Appendix A: List of Significant Neighboring Sources

SourceID	Stack Release Type	MASTER_AI_NAME	UTMH (m)	UTMV (m)	Elevation (m)	STACK HEIGHT (m)	EXHAUST TEMP (K)	STACK VELOCITY (m/s)	STACK DIA. (m)	CO gs	NO2 & NO2 Incre. gs	SO2 gs
1943E2	Default	Granite Construction - 190TPH Concrete Batch Plant NOI 1419	252000	3641991	1787.6	3.048	873.15	39.624	0.100584	0.26573	1.14610	0.13731
1945E2	Default	Granite Construction - 450TPH Soil/Cement Plant NOI 1426	252000	3641991	1787.6	3.048	873.15	39.624	0.100584	0.26573	1.14610	0.13731

SourceID	Stack Release Type	MASTER_AI_NAME	UTMH (m)	UTMV (m)	Elevation (m)	STACK HEIGHT (m)	EXHAUST TEMP (K)	STACK VELOCITY (m/s)	STACK DIA. (m)	TSP gs	PM10 & PM10 Incre gs	PM2.5 gs
1943E2	Default	Granite Construction - 190TPH Concrete Batch Plant NOI 1419	252000	3641991	1787.6	3.048	873.15	39.624	0.100584	0.10419	0.10419	0.02605
1945E2	Default	Granite Construction - 450TPH Soil/Cement Plant NOI 1426	252000	3641991	1787.6	3.048	873.15	39.624	0.100584	0.10419	0.10419	0.02605

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CABINET SECRETARY-Designate

BUTCH TONGATE
DEPUTY SECRETARY

NEW SOURCE REVIEW PERMIT
Issued under 20.2.72 NMAC

Certified Mail No: 7011 3500 0003 5408 7628
Return Receipt Requested

NSR Permit No:	0365-M3
Facility Name:	Copper Flat Mine
Permittee Name:	New Mexico Copper Corporation
Mailing Address:	2424 Louisiana Blvd., NE, Suite 301 Albuquerque, New Mexico 87110
TEMPO/IDEA ID No:	1535-PRN201300001
AIRS No:	35-051-0013
Permitting Action:	Significant Permit Revision
Source Classification:	PSD Minor & Title V Minor
Facility Location:	32°57'59" N and 107°31'24" W
County:	Sierra
Air Quality Bureau Contact	Sam Speaker
Main AQB Phone No.	(505) 476-4300

Rita Bates
for **Richard L. Goodyear, PE**
Bureau Chief
Air Quality Bureau

6/25/13
Date

Template version: 3/5/13

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Richard L. Goodyear, PE
Bureau Chief
Air Quality Bureau

Date

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PART A FACILITY SPECIFIC REQUIREMENTS

A100 Introduction

A. Permit 0365-M3 is a new permit for a new facility located at the old mine site. Permit 0365-M2 was closed on October 16, 2001. There are no existing structures or activities located at this site.

A101 Permit Duration (expiration)

A. The term of this permit is permanent unless withdrawn or cancelled by the Department.

A102 Facility: Description

A. The function of the facility is to remove overburden material, mine copper ore, process the ore through a crushing and concentrator flotation circuit, transport the concentrate off site, and dispose of the mine tailing onsite.

B. This facility is located approximately 4.2 miles northeast of Hillsboro, New Mexico in Sierra County.

C. Table 102.A and Table 102.B show the total potential emissions from this facility for information only, not an enforceable condition, excluding exempt sources or activities.

Table 102.A: Total Potential Criteria Pollutant Emissions from Entire Facility

Pollutant	Emissions (tons per year)
Nitrogen Oxides (NOx)	54.0
Carbon Monoxide (CO)	214.0
Sulfur Dioxide (SO_2)	6.4
Total Suspended Particulates (TSP)	657
Particulate Matter less than 10 microns (PM_{10})	222
Particulate Matter less than 2.5 microns ($PM_{2.5}$)	48

Table 102.B: Total Potential HAPS that exceed 1.0 ton per year

Pollutant	Emissions (tons per year)
Total HAPs**	None Listed

* HAP emissions are already included in the VOC emission total.

** The total HAP emissions may not agree with the sum of individual HAPs because only individual HAPs greater than 1.0 tons per year are listed here.

A103 Facility: Applicable Regulations

A. The permittee shall comply with all applicable sections of the requirements listed in Table 103.A.

Table 103.A: Applicable Requirements

Applicable Requirements	Federally Enforceable	Unit No.
20.2.1 NMAC General Provisions	X	Facility
20.2.3 NMAC Ambient Air Quality Standards	X	Facility
20.2.7 NMAC Excess Emissions	X	Facility
20.2.61 NMAC Smoke and Visible Emissions	X	EG1* and EG2*
20.2.72 NMAC Construction Permit	X	Facility
20.2.73 NMAC Notice of Intent and Emissions Inventory Requirements	X	Facility
20.2.75 NMAC Construction Permit Fees	X	Facility
20.2.77 NMAC New Source Performance	X	S7, S8, S9, S10, S12, S13, S14, S16, 17, S19, S19, S20, EG1*, and EG2*
20.2.82 NMAC MACT Standards for Source Categories of HAPS	X	EG1* and EG2*

Applicable Requirements	Federally Enforceable	Unit No.
40 CFR 50 National Ambient Air Quality Standards	X	Facility
40 CFR 60, Subpart A, General Provisions	X	EG1*, EG2* and LL Sources
40 CFR 60, Subpart LL	X	LL Sources (S7, S8, S9, S10, S12, S13, S14, S16, 17, S19, S19, and S20)
40 CFR 60, Subpart IIII	X	EG1* and EG2*
40 CFR 63, Subpart A, General Provisions	X	EG1* and EG2*
40 CFR 63, Subpart ZZZZ	X	EG1* and EG2*

- Note: EG1 and EG2 are exempt equipment and not otherwise regulated in this permitting action.

A104 Facility: Regulated Sources

A. Table 104 lists the emission units authorized for this facility. Emission units identified as exempt activities (as defined in 20.2.72.202 NMAC) and/or equipment not regulated pursuant to the Act are not included.

Table 104: Regulated Sources List

Unit No.	Source Description	Make Model	Serial No.	Manufacture Date	Capacity	Other
S1	Open Pit - Drilling	NA	NA	NA	29,000 Hole/Year	Uncontrolled
S2	Open Pit - Blasting	NA	NA	NA	290 Blasts/Yr	Uncontrolled
S3	Prill Storage Silo	NA	NA	NA	3650 Tons/Yr	Uncontrolled
S4	Open Pit - Haul Truck Loading	NA	NA	NA	15,042,000 TPY	Uncontrolled
S5	Open Pit - Bulldozing	NA	NA	NA	8760 Hour/Yr	Uncontrolled
S6	Raw Ore Surge Bin	TBD	TBD	TBD	9,125,000 TPY	Water Sprays
S7	Surge Bin Apron Feeder	TBD	TBD	TBD	9,125,000 TPY	Primary Crusher Vault – Dust Collector
S8	Primary Crusher	TBD	TBD	TBD	9,125,000 TPY	
S9	Primary Crusher Apron Conveyor	TBD	TBD	TBD	9,125,000 TPY	
S10	Stacker Conveyor - Course Ore Pile	TBD	TBD	TBD	9,125,000 TPY	Water Sprays
S11	Course Ore Pile - Bulldozer	TBD	TBD	TBD	9,125,000 TPY	Water
S12	Course Ore Pile Reclaimer	TBD	TBD	TBD	9,125,000 TPY	Reclaimer Vault – Dust Collector
S13	Reclaimer Conveyor	TBD	TBD	TBD	9,125,000 TPY	

Unit No.	Source Description	Make Model	Serial No.	Manufacture Date	Capacity	Other
S14	Conveyor Drop into Wet Mill	TBD	TBD	TBD	9,125,000 TPY	Water Sprays & Enclosure
S15	Lime Silo	TBD	TBD	TBD	10,950 TPY	Lime Silo – Dust Collector
S16	Molybdenum Conveyor	TBD	TBD	TBD	930 TPY	Molybdenum Mill Area – Dust Collector
S17	Molybdenum Bagger	TBD	TBD	TBD	930 TPY	
S19	Truck Loading - Molybdenum	NA	NA	NA	930 TPY	
S18	Copper Concentrate Conveyor	TBD	TBD	TBD	100,700 TPY	Full Enclosure
S20	Truck Loading - Copper Concentrate	NA	NA	NA	100,700 TPY	¾ Enclosure
S21	Truck Unloading - Low Grade Ore	NA	NA	NA	267,000 TPY	Uncontrolled
S22	Bulldozer - Low Grade Ore Stockpile	NA	NA	NA	5840 Hour/Yr	Uncontrolled
S23	Truck Unloading - Waste Dump Stockpile	NA	NA	NA	5,650,000 TPY	Uncontrolled
S24	Bulldozer - Waste Dump Stockpile	NA	NA	NA	8760 Hour/Yr	Uncontrolled
S25	Bulldozer - Tailings Dam Area	NA	NA	NA	8760 Hour/Yr	Uncontrolled
S29	Truck Traffic - Mine Haul Trucks/Light Vehicles	NA	NA	NA	610,649 Mile/Yr	Haul Road Watering
S30	Truck Traffic - Product/Chemical Delivery Trucks	NA	NA	NA	22,073 Mile/Yr	Haul Road Watering
S31	Mine Road Grader	NA	NA	NA	5000 Hour/Yr	Uncontrolled
S32	Wind Erosion - Course Ore Pile	NA	NA	NA	1.2 Acres	Uncontrolled
S33	Wind Erosion - Open Pit Area	NA	NA	NA	169 Acres	Uncontrolled
S34	Wind Erosion - Low Grade Ore Stockpile Area	NA	NA	NA	68 Acres	Uncontrolled

Unit No.	Source Description	Make Model	Serial No.	Manufacture Date	Capacity	Other
S35	Wind Erosion - Waste Dump Stockpile Area	NA	NA	NA	210 Acres	Uncontrolled
S36	Wind Erosion - Tailings Area	NA	NA	NA	547 Acres	Uncontrolled

1. All TBD (to be determined) units and like-kind engine replacements must be evaluated for applicability to NSPS and NESHAP requirements.

A105 Facility: Control Equipment

A. Table 105 lists all the pollution control equipment required for this facility. Each emission point is identified by the same number that was assigned to it in the permit application.

Table 105: Control Equipment List:

Control Equipment Unit No.	Control Description	Pollutant being controlled	Control for Unit Number(s)[1]
1	Water/Chemical Suppressant Sprays	PM	S6
2	Primary Crusher Vault Particulate Dust Collector	PM	S7, S8, S9
3	Water/Chemical Suppressant Sprays	PM	S10
4	Water/Chemical Moisture Content	PM	S11
5	Coruse Ore Reclaimer Particulate Dust Collector	PM	S12 and S13
6	Passive Full Enclosure & Water Sprays	PM	S14
7	Lime Silo Particulate Dust Collector	PM	S15
8	Molybdenum Mill Area Particulate Dust Collector	PM	S16, S17, S19
9	Copper Concentrate Storage Pile Passive Full Enclosure	PM	S18
10	Copper Concentrate Truck Loading Passive 3/4 Enclosure	PM	S20
12	Haul Truck/Light Vehicle Haul Road Dust Control	PM	S29
13	Product/Chemical Delivery Access Road Dust Control	PM	S30

1. Control for unit number refers to a unit number from the Regulated Equipment List

A106 Facility: Allowable Emissions

A. The following Section lists the emission units and their allowable emission limits. (40 CFR 50, 40 CFR 60, Subparts A and XYZ, 20.2.72.210.A and B.1 NMAC).

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Table 106.A: Allowable Emissions

Unit No.	NO_x[1] pph	NO_x[1] tpy	CO pph	CO tpy	VOC pph	VOC tpy	SO_2 pph	SO_2 tpy	TSP pph	TSP tpy	PM_{10} pph	PM_{10} tpy	$PM_{2.5}$ pph	$PM_{2.5}$ tpy
S1	-	-	-	-	-	-	-	-	5.4	19	2.8	9.9	<	2.0
S2	374	54	1474	214	-	-	44	6.4	54	2.3	28	1.2	1.6	<
S3	-	-	-	-	-	-	-	-	<	<	<	<	<	<
S4	-	-	-	-	-	-	-	-	10	44	4.7	21	<	3.1
S5	-	-	-	-	-	-	-	-	21	41	4.5	8.9	2.2	4.3
S6	-	-	-	-	-	-	-	-	1.5	6.7	0.72	3.2	<	0.48
Primary Crusher Vault Dust Collector														
S7	-	-	-	-	-	-	-	-						
S8	-	-	-	-	-	-	-	-	1.0	4.5	1.0	4.5	1.0	4.5
S9	-	-	-	-	-	-	-	-						
S10	-	-	-	-	-	-	-	-	1.5	6.7	0.7	3.2	<	0.48
S11	-	-	-	-	-	-	-	-	15	21	3.1	4.5	1.50	2.2
Reclaimer Vault Dust Collector														
S12	-	-	-	-	-	-	-	-	1.0	4.5	1.0	4.5	1.0	4.5
S13	-	-	-	-	-	-	-	-						
S14	-	-	-	-	-	-	-	-	0.23	1.0	0.11	0.47	<	0.072
Lime Silo Loading Dust Collector														
S15	-	-	-	-	-	-	-	-	0.043	0.0094	0.043	0.0094	<	0.0094
Molybdenum Mill Dust Collector														
S16	-	-	-	-	-	-	-	-						
S17	-	-	-	-	-	-	-	-	1.0	4.5	1.0	4.5	1.0	4.5
S19	-	-	-	-	-	-	-	-						
S18	-	-	-	-	-	-	-	-	<	<	<	<	<	<
S20	-	-	-	-	-	-	-	-	<	<	<	<	<	<
S21	-	-	-	-	-	-	-	-	<	<	<	<	<	<
S22	-	-	-	-	-	-	-	-	21	20	4.5	4.3	2.2	2.1
S23	-	-	-	-	-	-	-	-	3.8	17	1.8	7.8	<	1.2
S24	-	-	-	-	-	-	-	-	21	30	4.5	6.5	2.2	3.2
S25	-	-	-	-	-	-	-	-	2.9	4.2	0.5	0.8	0.3	0.4
S29	-	-	-	-	-	-	-	-	87	319	25	91	2.5	9.1
S30	-	-	-	-	-	-	-	-	3.7	13	1.0	3.5	<	<
S31	-	-	-	-	-	-	-	-	11	28	3.8	9.6	<	<
S32	-	-	-	-	-	-	-	-	<	1.1	<	<	<	<
S33	-	-	-	-	-	-	-	-	3.2	14	1.6	7.0	<	1.0
S34	-	-	-	-	-	-	-	-	1.3	5.6	<	2.8	<	<
S35	-	-	-	-	-	-	-	-	3.9	17	2.0	8.6	<	1.3
S36	-	-	-	-	-	-	-	-	3.3	14	1.6	7.2	<	1.1

1 Nitrogen dioxide emissions include all oxides of nitrogen expressed as NO_2

2 “-” indicates the application represented emissions of this pollutant are not expected.

3 “<” indicates the application represented uncontrolled emissions are less than 1.0 pph or 1.0 tpy for this pollutant. Allowable limits are not imposed on this level of emissions, except for flares and pollutants with controls.

4 “*” indicates hourly emission limits are not appropriate for this operating situation.

A107 Facility: Allowable Startup, Shutdown, Maintenance, and Malfunctions(SSM&M)

A. Allowable SSM&M emission limits are not imposed at this time. The permittee shall maintain records in accordance with Condition B109.C.

A108 Facility: Allowable Operations

A. This facility is authorized for continuous operation. No monitoring, recordkeeping, and reporting are required to demonstrate compliance with continuous hours of operation.

A109 Facility: Reporting Schedules – Not Applicable

A110 Facility: Fuel Sulfur Requirements – N/A

A111 Facility: 20.2.61 NMAC N/A

A112 Facility: Haul Roads

A. Truck Traffic

Requirement: The number of haul road round trips shall not exceed: (1) 91,250 Trips/yr for the material delivered to the Crusher (2) 2,670 Trips/yr for the material delivered to the low grade ore stockpile, (3) 56,500 Trips/yr for the material delivered to open pit waste stockpile, and (4) 4,558 trucks per year of copper concentrate products, molybdenum concentrate products, and chemical delivery trucks. Each day for the first 365-days, compliance shall be determined by calculating the cumulative total truck traffic each day for each group listed above. After the first 365-days, compliance shall be determined by calculating the daily rolling 365-day total for each group above.
Monitoring: The permittee shall continually monitor the total number of haul road round trips per day for each group.
Recordkeeping: The permittee shall keep daily records of: the total number of haul road trips per day, for the first 365-days - the cumulative daily total, and after the first 365-days - the daily rolling 365-day total.
Reporting: The permittee shall report in accordance with Section B110.

B. Plant Access Haul Road Control – Day and Night (Unit S30)

Requirement: Compliance with the haul road emissions limits in table A106.A shall be demonstrated by the application of base course and watering to control particulate emissions from haul roads. The permittee shall reapply base course and/or water to the haul roads immediately upon observing visible emissions higher than the headlights or taillights of a typical highway semi-truck. This control measure shall be used on roads as far as the nearest public road.
Monitoring: When there is material being transported on the roads, the permittee shall continually monitor the dust generated on the Plant Access Haul Road to determine if water and/or base course is needed. For each hour of night operation in which the haul roads were not watered, the permittee shall monitor the road surfaces to see if dust is rising higher than the headlights or taillights of a typical highway semi-truck.
Recordkeeping: Records summarizing the observations conducted on dust from haul road traffic shall be made at least once in the morning during the first hour of morning truck traffic and at least once in the afternoon during the first hour of afternoon (12:00 PM) truck traffic. For each summary record, the permittee shall record the name of the person making the record, date, time of the record, and any actions taken as a result of the observation. If water or base course is applied to the roads, based on the above monitoring requirements, then the record shall also include: (1) date, time, quantity, and location(s) of the water application, or equivalent control measures. (2) quantity, and location(s) of the base course application. (3) For night operations, the permittee shall make a record of each hourly dust monitoring activity to see if additional watering is necessary. At a minimum the record shall include the date, the time of the observation, the roads and surfaces observed, the results of the observation, and the name of the person making the observation. If observations are not made for reasons such as weather conditions or no truck traffic, the permittee shall record the time period and reason why the observation was not made.
Reporting: The permittee shall report in accordance with Section B110.

C. Mine Haul Road Control - Day and Night

Requirement: 1. All haul roads and truck traffic areas other than the Plant Access Haul road (Unit 30) used to deliver mined material to the crusher, low grade ore stockpile, and open pit waste stockpile (including Unit S29) shall be watered no less than once every two hours. The water application ratio shall be at least 0.27 gal/m^2 (1.01 L/m^2). This control measure shall be used on roads as far as the nearest public road.

The frequency of watering once every 2-hrs can be relaxed if there is no traffic on the roads or during period where weather conditions result in no visible emissions from vehicle traffic. Night time traffic shall be watered at the same frequency that accrued during the previous calendar day except when the application of water would result in unsafe roads due to mud or ice. 2. As an alternative to watering every two hours, the permittee may apply and maintain surfactants on the haul roads or portions of the haul roads and water the roads at least once in the morning between the hours of 9:30 and 11:00 AM and once in the afternoon between the hours of 2:00 PM and 4:00 PM. Water shall be reapplied if visible emissions are observed to be higher than the headlights or taillights of a typical factory available pickup truck **(including 4x4 trucks)** or leaving the haul road. The surfactant shall be reapplied as recommended by the manufacturer, but at no less than once every 90-days and maintained in accordance with manufactures recommended procedures.
Monitoring: 1. The permittee shall monitor the frequency, quantity, and location(s) of the water application, or equivalent control measures. 2. The permittee shall monitor the haul roads (or portions of haul roads) where surfactant is applied daily to insure the surfactant is maintained as specified by the manufacture.
Recordkeeping: 1. The permittee shall keep daily records of the frequency, quantity, and location(s) of the water application, or equivalent control measures. 2. The permittee shall keep track of the daily surfactant monitoring required above and any surfactant maintenance. 3. The permittee shall keep a map on file that clearly shows where surfactants are being used. 4. The permittee shall keep a copy of the surfactant manufacturer's recommended application and maintenance procedures for Department review.
Reporting: The permittee shall report in accordance with Section B110.

A113 <u>Facility: Initial Location Requirements</u>

A. This is not a portable facility

B. Colocation is not authorized by this permit.

A114 <u>Facility: Relocation Requirements</u>

A. This facility may not be relocated.

A115 Alternative Operating Scenario

A. As allowed in Part B of this permit. The permittee shall operate this facility in such manner that all applicable requirements and the requirements of 20.2.72 NMAC are met regardless of what scenario the facility is operating under.

EQUIPMENT SPECIFIC REQUIREMENTS

OIL AND GAS INDUSTRY

A200 Oil and Gas Industry

A300 Construction Industry - Aggregate

A400 Construction Industry – Asphalt

A500 Construction Industry – Concrete

A600 Power Generation Industry

A700 Solid Waste Disposal (Landfills) Industry– Not Required

A800 Miscellaneous Operations Introduction – Not Required

A. Facility Throughput

Requirement: The permittee shall comply with the following throughput limits based on a daily rolling 365-day total. For the first 365-days of operations the limit below shall be interpreted as a cumulative total calculated once each calendar day. (1) Crusher/SAG mill production rate 9,125,000 tons/yr. (2) Copper Concentrate production rate of 100,700 tons/yr. (3) Molybdenum concentration production rate of 930 tons/yr (4) ANFO use shall not exceed 6,380 tons/yr (5) Lime delivery rate of 10,950 tons/yr
Monitoring: 1) The permittee shall continually monitor the amount of material processed for the following processes. This shall be done by use of a weigh belt and a non-resettable electronic data logger. The data logger shall record a reading no less than once every

6-minutes. a) Ore that passes that is delivered to the Crusher/SAG mill b) Copper concentrate produced c) Molybdenum concentrate produced. 2) The permittee shall continuously monitor the amount of ANFO used each calendar day. 3) The permittee shall continuously monitor the amount of lime delivered to the facility each day.
Recordkeeping: The permittee shall keep records of: the daily monitoring values required above the cumulative total - for the first 365 days, the daily rolling 365-day total - after the first 365-days, and any required calculations.
Reporting: The permittee shall report in accordance with Section B110.

A801 Lime Silo

A. Lime Silo – Process Rate (Unit S15)

Requirement: Lime Silo (Unit: S130) loading shall not exceed 10,950 tons per year based on a monthly rolling 12-month total.
Monitoring: The permittee shall continuously monitor the date, time, and amount of material loaded into the lime silo.
Recordkeeping: The permittee shall maintain an operating log recording date, time, and total Lime loaded into the silo (Unit S15). During the first 12-months of monitoring, each month the permittee shall record the monthly cumulative total. After the first 12-months of monitoring, the monthly rolling 12-month total.
Reporting: The permittee shall report in accordance with Section B110.

B. Lime Silo – Fabric Filter (Unit S15)

Requirement: The lime silo (Unit S15) shall be equipped with a baghouse/cartridge filter so that all displaced dust from the silo is vented to the baghouse/cartridge filter. The baghouse/cartridge filter shall be equipped with a device to continually monitor and measure the pressure drop across the filter. The permittee shall establish a normal operating range within the first 90-days of operation. The permittee shall keep this information on file for the life of the unit.
Monitoring: The permittee shall monitor the differential pressure across the filter each time lime is added to the silo. The differential pressure reading shall be taken while material is actively being loaded to the silo.
Recordkeeping: The differential pressure measured by the gauge on the fabric filter shall be recorded once each time material is added to the silo. When Material is added to the silo, the permittee shall also record the date, start time, and end time of the baghouse/cartridge filter.

Reporting: The permittee shall report in accordance with Section B110.

C. Lime Silos – Alarm (Unit S15)

Requirement: The owner or operator shall equip silos with audible alarms, which activate when the silo is between 90 and 95 percent full.
Monitoring: The fill alarm shall be tested no less than once per calendar year to insure proper operation.
Recordkeeping: The permittee shall maintain a record of the annual alarm test and any maintenance that resulted from the test.
Reporting: The permittee shall report in accordance with Section B110.

A802 Dust Collectors

A. Dust Collectors (Units S7, S8, and S9; Units S12 and S13; and Units S16, S17, and S19)

Requirement: The following units shall be equipped with a baghouse/cartridge filter so that all displaced dust from the silo is vented to the baghouse/cartridge filter. The baghouse/cartridge filter shall be equipped with a device to continually monitor and measure the pressure drop across the filter. A. S7, S8, S9 - Primary Crusher Vault – Dust Collector. B. S12 and S13 - Reclaimer Vault – Dust Collector. C. 16, 17, 19 Molybdenum Mill Area - Dust Collector The permittee shall establish a normal operating range within the first 90-days of operation. The permittee shall keep this information on file for the life of the unit.
Monitoring: The permittee shall continually monitor the differential pressure across the filter by use of electronic monitoring system and a data logger. The data logger shall take reading at least once every 6-minutes..
Recordkeeping: The differential pressure shall be recorded by a data logger. When the facility is in operation, the permittee shall maintain a daily operating log recording all operating times of the baghouse/cartridge filter.
Reporting: The permittee shall report in accordance with Section B110.

A803 Moisture Content of Tailing Embankment Material

A. No less than 10%

Requirement: The moisture content of the tailings being added to the tailing embankment shall be 10% or more.
Monitoring: Once each calendar week the concentrator is operated, the permittee shall measure the moisture content of the tailing embankment material.

If the value reads more than 10% for more than 52 consecutive weeks, the monitoring frequency can be reduced to once in July and upon request by the Department. If at any time the moisture content fall below 10%, then weekly monitoring shall resume until such time that 52 consecutive weekly readings are 10% or more are recorded.
Recordkeeping: The permittee shall keep a log of the sample date, sample time, and moisture content test results.
Reporting: The permittee shall report in accordance with Section B110.

A804 <u>Moisture Content of Copper Concentrate</u>

A. No less than 8%

Requirement: The moisture content of the copper concentrate shall be 8% or more.
Monitoring: Once each week the permittee shall measure the moisture content of the Copper concentrate material storage pile as it is discharged from the mill. If the value reads more than 8% for more than 52 consecutive weeks, the monitoring frequency can be reduced to once in July and upon request by the Department. If at any time the moisture content fall below 8%, then weekly monitoring shall resume until such time that 52 consecutive weekly readings are 8% or more are recorded.
Recordkeeping: The permittee shall keep a log of the sample date, sample time, and moisture content test results.
Reporting: The permittee shall report in accordance with Section B110.

A805 <u>Raw Ore Surge Bin (Unit S6)</u>

A. Daily Inspection of Water Sprays(Unit S6)

Requirement: The permittee shall demonstrate ongoing compliance with the requested allowable emissions limits established in this permit by installing, operating, and maintaining water sprays to control dust emissions.
Monitoring: Within two hours of startup of each calendar day, the permittee shall inspect the water sprays to ensure they are controlling fugitive dust emissions. This inspection shall include, but is not limited to; spray bars are pointing in the right places, are not blocked or plugged, and are atomizing the water properly.
Recordkeeping: A daily record shall be made of the inspection and any maintenance activity that resulted from the inspection. At a minimum, the record shall include the date, time, name of individual conducting the test, a description of any malfunction, and any corrective actions taken. The record shall be attached to a description of what shall be inspected, to insure that the inspector understands his or her responsibilities.
Reporting: The permittee shall report in accordance with Section B110.

A806 Stacker Conveyor - Course Ore Pile (Unit S10)

A. Daily Inspection of Water Sprays (Unit S10)

Requirement: The permittee shall demonstrate ongoing compliance with the requested allowable emissions limits established in this permit by installing, operating, and maintaining water sprays to control dust emissions.
Monitoring: Within two hours of startup of each calendar day, the permittee shall inspect the water sprays to ensure they are controlling fugitive dust emissions. This inspection shall include, but is not limited to; spray bars are pointing in the right places, are not blocked or plugged, and are atomizing the water properly.
Recordkeeping: A daily record shall be made of the inspection and any maintenance activity that resulted from the inspection. At a minimum, the record shall include the date, time, name of individual conducting the test, a description of any malfunction, and any corrective actions taken. The record shall be attached to a description of what shall be inspected, to insure that the inspector understands his or her responsibilities.
Reporting: The permittee shall report in accordance with Section B110.

A807 Bulldozer Activity (Unit S5, S11, S22, S24 and S25)

A. Limit to annual hours of operation for Bulldozer Activities.

Requirement: The total operating hours for bulldozers shall not exceed 40,880 hours per year. For the first 12-months this limit shall be based on a cumulative total. After the first 12-months this limit shall be based on a weekly rolling 52-week total.
Monitoring: The permittee shall continually monitor the total meter hours of all bulldozers operating.
Recordkeeping: The permittee shall keep a daily log showing the date, and non-resettable runtime meter readings for all operating bulldozers each calendar day that the units operated. Each calendar week the permittee shall calculate the weekly and weekly rolling 52-week total to show compliance or noncompliance with this requirement.
Reporting: The permittee shall report in accordance with Section B110.

A808 Conveyor Drop into Wet SAG Mill (Unit S14)

A. The permittee shall design and operate the SAG Mill as a wet process. This includes adding water to the material on Unit 14 before or at the material drop point.

B. The Conveyor belt (Unit S14) transfer to the wet mill shall be done within a building or structure. The building or structure shall be a full enclosure.

A809 Unit S18 shall be within a Full Enclosure. Copper Concentrate Conveyor

A. The Copper Concentrate Conveyor belt drop (Unit S18) shall be located within a building or structure. The building or structure shall be a full enclosure.

A810 Unit S20 shall be enclosed within a structure that has at least three wall (¾ enclose).

A. The Truck Loading - Copper Concentrate Conveyor belt drop (Unit S20) shall be located within a building or structure. The building or structure shall be a 3/4 enclosure.

A811 Tailing Storage Area Scraper Activity

A. Tailings Storage Area Scraper Activity

Requirement: The scraper activity in the tailings storage area shall be completed within 20-months of start of that activity (Unit 28 in the application).
Monitoring: None
Recordkeeping: The permittee shall keep a record of the date that Scraper activity started and a date of completion of scraper activity.
Reporting: The permittee shall report in accordance with Section B110.

A812 Fugitive Dust Plan

A. Fugitive Dust Control Plan (FDCP)

Requirement: The permittee shall develop a Fugitive Dust Control Plan (FDCP) for minimizing emissions from areas such as aggregate feeders, bins, bin scales, storage pile, overburden removal, disturbed earth, buildings, truck loading/unloading, or active pits. The FDCP shall include, but is not limited to: Sites of overburden removal and active pit areas shall be watered, dependent on existing wind speeds and soil moisture content, as necessary to minimize dust emissions. Or, stock piles shall be maintained with standard industry practices and procedures to minimize fugitive emissions to the atmosphere.
Monitoring: Once each calendar month, the permittee shall inspect each area to insure that fugitive dust is being minimized and determine if the FDCP plan needs updated.
Recordkeeping: Monthly, the permittee shall make a record of each monthly inspection and revise the plan to address past shortcomings as well as future activities. If no changes are needed, then the permittee shall make a record that the plan needs no changes. The permittee shall make a record of any action taken to minimize emissions as a result of the FDCP or monthly inspections.
Reporting: The permittee shall report in accordance with Section B110.

A813 40 CFR 60 Subpart LL

A. 40 CFR 60 Subpart LL (S7, S9, S9, S10, S12, S13, S14, S16, 17, S19, S19, and S20)

Requirement: This facility shall comply with the applicable requirements of 40 CFR 60 Subpart A and LL - Standards of Performance for Metallic Mineral Processing Plants.
Monitoring: This facility shall monitor in accordance with 40 CFR 60 Subpart LL.
Recordkeeping: This facility shall keep records in accordance with 40 CFR 60 Subpart LL.
Reporting: This facility shall report in accordance with 40 CFR 60 Subpart LL.

A814 Blasting (Unit S2)

A. Blasting Limitations (Unit S2)

Requirement: To demonstrate compliance with the emission limits, blasting shall only be done once per day and during Daylight Hours Only.
Monitoring: None
Recordkeeping: The permittee shall keep a log of the date and time of each blasting event.
Reporting: This facility shall report in accordance with 40 CFR 60 Subpart LL.

PART B GENERAL CONDITIONS

B100 Introduction

A. The Department has reviewed the permit application for the proposed construction/modification/revision and has determined that the provisions of the Act and ambient air quality standards will be met. Conditions have been imposed in this permit to assure continued compliance. 20.2.72.210.D NMAC, states that any term or condition imposed by the Department on a permit is enforceable to the same extent as a regulation of the Environmental Improvement Board.

B101 Legal

A. The contents of a permit application specifically identified by the Department shall become the terms and conditions of the permit or permit revision. Unless modified by conditions of this permit, the permittee shall construct or modify and operate the Facility in accordance with all representations of the application and supplemental submittals that the Department relied upon to determine compliance with applicable regulations and ambient air quality standards. If the Department relied on air quality modeling to issue this permit, any change in the parameters used for this modeling shall be submitted to the Department for review. Upon the Department's request, the permittee shall submit additional modeling for review by the Department. Results of that review may require a permit modification. (20.2.72.210.A NMAC)

B. Any future physical changes, changes in the method of operation or changes in the restricted area may constitute a modification as defined by 20.2.72 NMAC, Construction Permits. Unless the source or activity is exempt under 20.2.72.202 NMAC, no modification shall begin prior to issuance of a permit. (20.2.72 NMAC Sections 200.A.2 and E, and 210.B.4)

C. Changes in plans, specifications, and other representations stated in the application documents shall not be made if they cause a change in the method of control of emissions or in the character of emissions, will increase the discharge of emissions or affect modeling results. Any such proposed changes shall be submitted as a revision or modification. (20.2.72 NMAC Sections 200.A.2 and E, and 210.B.4)

D. The permittee shall establish and maintain the property's Restricted Area as identified in plot plan submitted with the application. (20.2.72 NMAC Sections 200.A.2 and E, and 210.B.4)

E. Applications for permit revisions and modifications shall be submitted to:

Program Manager, Permits Section

New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113

F. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate the source including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. (20.2.7.109, 20.2.72.210.A, 20.2.72.210.B, 20.2.72.210.C, 20.2.72.210.E NMAC) The establishment of allowable malfunction emission limits does not supersede this requirement.

B102 Authority

A. This permit is issued pursuant to the Air Quality Control Act (Act) and regulations adopted pursuant to the Act including Title 20, Chapter 2, Part 72 of the New Mexico Administrative Code (NMAC), (20.2.72 NMAC), Construction Permits and is enforceable pursuant to the Act and the air quality control regulations applicable to this source.

B. The Department is the Administrator for 40 CFR Parts 60, 61, and 63 pursuant to the delegation and exceptions of Section 10 of 20.2.77 NMAC (NSPS), 20.2.78 NMAC (NESHAP), and 20.2.82 NMAC (MACT).

B103 Annual Fee

A. The Department will assess an annual fee for this Facility. The regulation 20.2.75 NMAC set the fee amount at $1,500 through 2004 and requires it to be adjusted annually for the Consumer Price Index on January 1. The current fee amount is available by contacting the Department or can be found on the Department's website. The AQB will invoice the permittee for the annual fee amount at the beginning of each calendar year. This fee does not apply to sources which are assessed an annual fee in accordance with 20.2.71 NMAC. For sources that satisfy the definition of "small business" in 20.2.75.7.F NMAC, this annual fee will be divided by two. (20.2.75.11 NMAC)

B. All fees shall be remitted in the form of a corporate check, certified check, or money order made payable to the "NM Environment Department, AQB" mailed to the address shown on the invoice and shall be accompanied by the remittance slip attached to the invoice.

B104 Appeal Procedures

A. Any person who participated in a permitting action before the Department and who is adversely affected by such permitting action, may file a petition for hearing before the Environmental Improvement Board. The petition shall be made in writing to the Environmental Improvement Board within thirty (30) days from the date notice is given of the Department's action and shall specify the portions of the permitting action to which the petitioner objects, certify that a copy of the petition has been mailed or hand-delivered and attach a copy of the permitting action for which review is sought. Unless a timely request for hearing is made, the decision of the Department shall be final. The petition shall be copied simultaneously to the Department upon receipt of the appeal notice. If the petitioner is not the applicant or permittee, the petitioner shall mail or hand-deliver a copy of the petition to the applicant or permittee. The Department shall certify the administrative record to the board. Petitions for a hearing shall be sent to: (20.2.72.207.F NMAC)

Secretary, New Mexico Environmental Improvement Board
1190 St. Francis Drive, Runnels Bldg. Rm. N2153
P.O. Box 5469
Santa Fe, New Mexico 87502

B105 Submittal of Reports and Certifications

A. Stack Test Protocols and Stack Test Reports shall be submitted electronically to Stacktest.AQB@state.nm.us.

B. Excess Emission Reports shall be submitted electronically to eereports.aqb@state.nm.us. (20.2.7.110 NMAC)

C. Regularly scheduled reports shall be submitted to:

Manager, Compliance and Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113

B106 NSPS and/or MACT Startup, Shutdown, and Malfunction Operations

A. If a facility is subject to a NSPS standard in 40 CFR 60, each owner or operator that installs and operates a continuous monitoring device required by a NSPS regulation shall comply with the excess emissions reporting requirements in accordance with 40 CFR 60.7(c), unless specifically exempted in the applicable subpart.

B. If a facility is subject to a NSPS standard in 40 CFR 60, then in accordance with 40 CFR 60.8(c), emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction shall not be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard.

C. If a facility is subject to a MACT standard in 40 CFR 63, then the facility is subject to the requirement for a Startup, Shutdown and Malfunction Plan (SSM) under 40 CFR 63.6(e)(3), unless specifically exempted in the applicable subpart.

B107 Startup, Shutdown, and Maintenance Operations

A. The establishment of permitted startup, shutdown, and maintenance (SSM) emission limits does not supersede the requirements of 20.2.7.14.A NMAC. Except for operations or equipment subject to Condition B106, the permittee shall establish and implement a plan to minimize emissions during routine or predictable start up, shut down, and scheduled maintenance (SSM work practice plan) and shall operate in accordance with the procedures set forth in the plan. (SSM work practice plan) (20.2.7.14.A NMAC)

B108 General Monitoring Requirements

A. These requirements do not supersede or relax requirements of federal regulations.

B. The following monitoring requirements shall be used to determine compliance with applicable requirements and emission limits. Any sampling, whether by portable analyzer or EPA reference method, that measures an emission rate over the applicable averaging period greater than an emission limit in this permit constitutes noncompliance with this permit. The Department may require, at its discretion, additional tests pursuant to EPA Reference Methods at any time, including when sampling by portable analyzer measures an emission rate greater than an emission limit in this permit; but such requirement shall not be construed as a determination that the sampling by portable analyzer does not establish noncompliance with this permit and shall not stay enforcement of such noncompliance based on the sampling by portable analyzer.

C. If the emission unit is shutdown at the time when periodic monitoring is due to be accomplished, the permittee is not required to restart the unit for the sole purpose of performing the monitoring. Using electronic or written mail, the permittee shall notify the Department's Compliance and Enforcement Section of a delay in emission tests prior to the deadline for accomplishing the tests. Upon recommencing operation, the permittee shall submit any pertinent pre-test notification requirements set forth in the current version of the Department's Standard Operating Procedures For Use Of Portable Analyzers in Performance Test, and shall accomplish the monitoring.

D. The requirement for monitoring during any monitoring period is based on the percentage of time that the unit has operated. However, to invoke the monitoring period exemption at B108.D(2), hours of operation shall be monitored and recorded.

(1) If the emission unit has operated for more than 25% of a monitoring period, then the permittee shall conduct monitoring during that period.

(2) If the emission unit has operated for 25% or less of a monitoring period then the monitoring is not required. After two successive periods without monitoring, the permittee shall conduct monitoring during the next period regardless of the time operated during that period, except that for any monitoring period in which a unit has operated for less than 10% of the monitoring period, the period will not be considered as one of the two successive periods.

(3) If invoking the monitoring **period** exemption in B108.D(2), the actual operating time of a unit shall not exceed the monitoring period required by this permit before the required monitoring is performed. For example, if the monitoring period is annual, the operating hours of the unit shall not exceed 8760 hours before monitoring is conducted. Regardless of the time that a unit actually operates, a minimum of one of each type of monitoring activity shall be conducted during any five-year period.

E. For all periodic monitoring events, except when a federal or state regulation is more stringent, three test runs shall be conducted at 90% or greater of the unit's capacity as stated in this permit, or in the permit application if not in the permit, and at additional loads when requested by the Department. If the 90% capacity cannot be achieved, the monitoring will be conducted at the maximum achievable load under prevailing operating conditions except when a federal or state regulation requires more restrictive test conditions. The load and the parameters used to calculate it shall be recorded to document operating conditions and shall be included with the monitoring report.

F. When requested by the Department, the permittee shall provide schedules of testing and monitoring activities. Compliance tests from previous NSR and Title V permits may be re-imposed if it is deemed necessary by the Department to determine whether the source is in compliance with applicable regulations or permit conditions.

G. If monitoring is new or is in addition to monitoring imposed by an existing applicable requirement, it shall become effective 120 days after the date of permit issuance. For emission units that have not commenced operation, the associated new or additional monitoring shall not apply until 120 days after the units commence operation. All pre-existing monitoring requirements incorporated in this permit shall continue to apply from the date of permit issuance.

B109 General Recordkeeping Requirements

A. The permittee shall maintain records to assure and verify compliance with the terms and conditions of this permit and any other applicable requirements that become effective after permit issuance. The minimum information to be included in these records is:

(1) equipment identification (include make, model and serial number for all tested equipment and emission controls);

(2) date(s) and time(s) of sampling or measurements;

(3) date(s) analyses were performed;

(4) the qualified entity that performed the analyses;

(5) analytical or test methods used;

(6) results of analyses or tests; and

(7) operating conditions existing at the time of sampling or measurement.

B. Except as provided in the Specific Conditions, records shall be maintained on-site or at the permittee's local business office for a minimum of two (2) years from the time of recording and shall be made available to Department personnel upon request. Sources subject to 20.2.70 NMAC "Operating Permits" shall maintain records on-site for a minimum of five (5) years from the time of recording.

C. Malfunction emissions and routine and predictable emissions during startup, shutdown, and scheduled maintenance (SSM):

(1) The permittee shall keep records of all events subject to the plan to minimize emissions during routine or predictable SSM. (20.2.7.14.A NMAC)

(2) If the facility has allowable SSM emission limits in this permit, the permittee shall record all SSM events, including the date, the start time, the end time, and a description of the event. This record also shall include a copy of the manufacturer's, or equivalent, documentation showing that any maintenance qualified as scheduled. Scheduled maintenance is an activity that occurs at an established frequency pursuant to a written protocol published by the manufacturer or other reliable source. The authorization of allowable SSM emissions does not supersede any applicable federal or state standard. The most stringent requirement applies.

(3) If the facility has allowable malfunction emission limits in this permit, the permittee shall record all malfunction events to be applied against these limits, including the date, the start time, the end time, and a description of the event. **Malfunction means** any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential

to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. (40 CFR 63.2, 20.2.7.7.E NMAC) The authorization of allowable malfunction emissions does not supersede any applicable federal or state standard. The most stringent requirement applies. This authorization only allows the permittee to avoid submitting reports under 20.2.7 NMAC for total annual emissions that are below the authorized limit.

B110 General Reporting Requirements
(20.2.72 NMAC Sections 210 and 212)

A. Records and reports shall be maintained on-site or at the permittee's local business office unless specifically required to be submitted to the Department or EPA by another condition of this permit or by a state or federal regulation. Records for unmanned sites may be kept at the nearest business office.

B. The permittee shall notify the Department's Compliance Reporting Section using the current Submittal Form posted to NMED's Air Quality web site under Compliance and Enforcement/Submittal Forms in writing of, or provide the Department with (20.2.72.212.A and B):

(1) the anticipated date of initial startup of each new or modified source not less than thirty (30) days prior to the date. Notification may occur prior to issuance of the permit, but actual startup shall not occur earlier than the permit issuance date;

(2) after receiving authority to construct, the equipment serial number as provided by the manufacturer or permanently affixed if shop-built and the actual date of initial startup of each new or modified source within fifteen (15) days after the startup date; and

(3) the date when each new or modified emission source reaches the maximum production rate at which it will operate within fifteen (15) days after that date.

C. The permittee shall notify the Department's Permitting Program Manager, in writing of, or provide the Department with (20.2.72.212.C and D):

(1) any change of operators or any equipment substitutions within fifteen (15) days of such change;

(2) any necessary update or correction no more than sixty (60) days after the operator knows or should have known of the condition necessitating the update or correction of the permit.

D. Results of emission tests and monitoring for each pollutant (except opacity) shall be reported in pounds per hour (unless otherwise specified) and tons per year. Opacity shall be reported in percent. The number of significant figures corresponding to the full accuracy inherent in the testing instrument or Method test used to obtain the data shall be used to calculate and report test results in accordance with 20.2.1.116.B and C NMAC. Upon request by the Department, CEMS and other tabular data shall be submitted in editable, MS Excel format.

E. The permittee shall submit reports of excess emissions in accordance with 20.2.7.110.A NMAC.

B111 <u>General Testing Requirements</u>

A. Compliance Tests

(1) Compliance test requirements from previous permits (if any) are still in effect, unless the tests have been satisfactorily completed. Compliance tests may be re-imposed if it is deemed necessary by the Department to determine whether the source is in compliance with applicable regulations or permit conditions. (20.2.72 NMAC Sections 210.C and 213)

(2) Compliance tests shall be conducted within sixty (60) days after the unit(s) achieve the maximum normal production rate. If the maximum normal production rate does not occur within one hundred twenty (120) days of source startup, then the tests must be conducted no later than one hundred eighty (180) days after initial startup of the source.

(3) Unless otherwise indicated by Specific Conditions or regulatory requirements, the default time period for each test run shall be **at least** 60 minutes and each performance test shall consist of three separate runs using the applicable test method. For the purpose of determining compliance with an applicable emission limit, the arithmetic mean of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond the owner or operator's control, compliance may, upon the Department approval, be determined using the arithmetic mean of the results of the two other runs.

(4) Testing of emissions shall be conducted with the emissions unit operating at 90 to 100 percent of the maximum operating rate allowed by the permit. If it is not possible to test at that rate, the source may test at a lower operating rate, subject to the approval of the Department.

(5) Testing performed at less than 90 percent of permitted capacity will limit emission unit operation to 110 percent of the tested capacity until a new test is conducted.

(6) If conditions change such that unit operation above 110 percent of tested capacity is possible, the source must submit a protocol to the Department within 30 days of such change to conduct a new emissions test.

B. EPA Reference Method Tests

(1) All compliance tests required by this permit, unless otherwise specified by Specific Conditions of this permit, shall be conducted in accordance with the requirements of CFR Title 40, Part 60, Subpart A, General Provisions, and the following EPA Reference Methods as specified by CFR Title 40, Part 60, Appendix A:

(a) Methods 1 through 4 for stack gas flowrate

(b) Method 5 for TSP

(c) Method 6C and 19 for SO_2

(d) Method 7E for NO_X (test results shall be expressed as nitrogen dioxide (NO_2) using a molecular weight of 46 lb/lb-mol in all calculations (each ppm of NO/NO_2 is equivalent to 1.194 x 10-7 lb/SCF)

(e) Method 9 for opacity

(f) Method 10 for CO

(g) Method 19 may be used in lieu of Methods 1-4 for stack gas flowrate upon approval of the Department. A justification for this proposal must be provided along with a contemporaneous fuel gas analysis (preferably on the day of the test) and a recent fuel flow meter calibration certificate (within the most recent quarter).

(h) Method 7E or 20 for Turbines per 60.335 or 60.4400

(i) Method 29 for Metals

(j) Method 201A for filterable PM_{10} and $PM_{2.5}$

(k) Method 202 for condensable PM

(l) Method 320 for organic Hazardous Air Pollutants (HAPs)

(m) Method 25A for VOC reduction efficiency

(2) Alternative test method(s) may be used if the Department approves the change

C. Periodic Monitoring and Portable Analyzer Requirements

(1) Periodic emissions tests (periodic monitoring) may be conducted in accordance with EPA Reference Methods or by utilizing a portable analyzer. Periodic monitoring utilizing a portable analyzer shall be conducted in accordance with the requirements of ASTM D 6522-00. However, if a facility has met a previously approved Department criterion for portable analyzers, the analyzer may be operated in accordance with that criterion until it is replaced.

(2) Unless otherwise indicated by Specific Conditions or regulatory requirements, the default time period for each test run shall be **at least** 20 minutes.

Each performance test shall consist of three separate runs. The arithmetic mean of results of the three runs shall be used to determine compliance with the applicable emission limit.

(3) Testing of emissions shall be conducted in accordance with the requirements at Section B108.E.

(4) During emissions tests, pollutant, O_2 concentration and fuel flow rate shall be monitored and recorded. This information shall be included with the test report furnished to the Department.

(5) Pollutant emission rate shall be calculated in accordance with 40 CFR 60, Appendix A, Method 19 utilizing fuel flow rate (scf) and fuel heating value (Btu/scf) obtained during the test.

D. Test Procedures:

(1) The permittee shall notify the Department's Program Manager, Compliance and Enforcement Section at least thirty (30) days before the test date and allow a representative of the Department to be present at the test.

(2) Equipment shall be tested in the "as found" condition. Equipment may not be adjusted or tuned prior to any test for the purpose of lowering emissions, and then returned to previous settings or operating conditions after the test is complete.

(3) Contents of test notifications, protocols and test reports shall conform to the format specified by the Department's Universal Test Notification, Protocol and Report Form and Instructions. Current forms and instructions are posted to NMED's Air Quality web site under Compliance and Enforcement Testing.

(4) The permittee shall provide (a) sampling ports adequate for the test methods applicable to the facility, (b) safe sampling platforms, (c) safe access to sampling platforms and (d) utilities for sampling and testing equipment.

(5) The stack shall be of sufficient height and diameter and the sample ports shall be located so that a representative test of the emissions can be performed in accordance with the requirements of EPA Method 1 or ASTM D 6522-00 as applicable.

(6) Where necessary to prevent cyclonic flow in the stack, flow straighteners shall be installed

(7) Unless otherwise indicated by Specific Conditions or regulatory requirements, test reports shall be submitted to the Department no later than 30 days after completion of the test.

B112 Compliance

A. The Department shall be given the right to enter the facility at all reasonable times to verify the terms and conditions of this permit. Required records shall be organized by date and subject matter and shall at all times be readily available for inspection. The permittee, upon verbal or written request from an authorized representative of the Department who appears at the facility, shall immediately produce for inspection or copying any records required to be maintained at the facility. Upon written request at other times, the permittee shall deliver to the Department paper or electronic copies of any and all required records maintained on site or at an off-site location. Requested records shall be copied and delivered at the permittee's expense within three business days from receipt of request unless the Department allows additional time. Required records may include records required by permit and other information necessary to demonstrate compliance with terms and conditions of this permit. (NMSA 1978, Section 74-2-13)

B. A copy of the most recent permit(s) issued by the Department shall be kept at the permitted facility or (for unmanned sites) at the nearest company office and shall be made available to Department personnel for inspection upon request. (20.2.72.210.B.4 NMAC)

C. Emissions limits associated with the energy input of a Unit, i.e. lb/MMBtu, shall apply at all times unless stated otherwise in a Specific Condition of this permit. The averaging time for each emissions limit, including those based on energy input of a Unit (i.e. lb/MMBtu) is one (1) hour unless stated otherwise in a Specific Condition of this permit or in the applicable requirement that establishes the limit.

B113 Permit Cancellation and Revocation

A. The Department may revoke this permit if the applicant or permittee has knowingly and willfully misrepresented a material fact in the application for the permit. Revocation will be made in writing, and an administrative appeal may be taken to the Secretary of the Department within thirty (30) days. Appeals will be handled in accordance with the Department's Rules Governing Appeals From Compliance Orders.

B. The Department shall automatically cancel any permit for any source which ceases operation for five (5) years or more, or permanently. Reactivation of any source after the five (5) year period shall require a new permit. (20.2.72 NMAC)

C. The Department may cancel a permit if the construction or modification is not commenced within two (2) years from the date of issuance or if, during the construction or modification, work is suspended for a total of one (1) year. (20.2.72 NMAC)

B114 Notification to Subsequent Owners

A. The permit and conditions apply in the event of any change in control or ownership of the Facility. No permit modification is required in such case. However, in the event of any such change in control or ownership, the permittee shall notify the succeeding owner of the permit and conditions and shall notify the Department's Program Manager, Permits Section of the change in ownership within fifteen (15) days of that change. (20.2.72.212.C NMAC)

B. Any new owner or operator shall notify the Department's Program Manager, Permits Section, within thirty (30) days of assuming ownership, of the new owner's or operator's name and address. (20.2.73.200.E.3 NMAC)

B115 Asbestos Demolition

A. Before any asbestos demolition or renovation work, the permittee shall determine whether 40 CFR 61 Subpart M, National Emissions Standards for Asbestos applies. If required, the permittee shall notify the Department's Program Manager, Compliance and Enforcement Section using forms furnished by the Department.

B116 Short Term Engine Replacement

A. The following Alternative Operating Scenario (AOS) addresses engine breakdown or periodic maintenance and repair, which requires the use of a short term replacement engine. The following requirements do not apply to engines that are exempt per 20.2.72.202.B(3) NMAC. Changes to exempt engines must be reported in accordance with 20.2.72.202.B NMAC. A short term replacement engine may be substituted for any engine allowed by this permit for no more than 120 days in any rolling twelve month period per permitted engine. The compliance demonstrations required as part of this AOS are in addition to any other compliance demonstrations required by this permit.

(1) The permittee may temporarily replace an existing engine that is subject to the emission limits set forth in this permit with another engine regardless of manufacturer, model, and horsepower without modifying this permit. The permittee shall submit written notification to the Department within 15 days of the date of engine substitution according to condition B110.C(1).

(a) The potential emission rates of the replacement engine shall be determined using the replacement engine's manufacturer specifications and shall comply with the existing engine's permitted emission limits.

(b) The direction of the exhaust stack for the replacement engine shall be either vertical or the same direction as for the existing engine. The replacement engine's stack height and flow parameters shall be at least as effective in the dispersion of air pollutants as the modeled stack height and flow parameters for the existing permitted engine. The following equation may be used to show that the replacement engine disperses pollutants as well as the existing engine. The value calculated for the replacement engine on the right side of the equation shall be equal to or greater than the value for the existing engine on the left side of the equation. The permitting page of the Air Quality Bureau website contains a spreadsheet that performs this calculation.

EXISTING ENGINE REPLACMENT ENGINE

$$\frac{[(g) \times (h1)] + [(v1)^2/2] + [(c) \times (T1)]}{q1} \leq \frac{[(g) \times (h2)] + [(v2)^2/2] + [(c) \times (T2)]}{q2}$$

Where
g = gravitational constant = 32.2 ft/sec^2
h1 = existing stack height, feet
v1 = exhaust velocity, existing engine, feet per second
c = specific heat of exhaust, 0.28 BTU/lb-degree F
T1 = absolute temperature of exhaust, existing engine = degree F + 460
q1 = permitted allowable emission rate, existing engine, lbs/hour
h2 = replacement stack height, feet
v2 = exhaust velocity, replacement engine, feet per second
T2 = absolute temperature of exhaust, replacement engine = degree F + 460
q2 = manufacturer's potential emission rate, replacement engine, lbs/hour

The permittee shall keep records showing that the replacement engine is at least as effective in the dispersion of air pollutants as the existing engine.

(c) Test measurement of NOx and CO emissions from the temporary replacement engine shall be performed in accordance with Section B111 with the exception of Condition B111A(3) and B111B for EPA Reference Methods Tests or SectionB111C for portable analyzer test measurements. Compliance test(s) shall be conducted within fifteen (15) days after the unit begins operation, and records of the results shall be kept according to section B109.B. This test shall be performed even if the engine is removed prior to 15 days on site.

i. These compliance tests are not required for an engine certified under 40CFR60, subparts IIII, or JJJJ, or 40CFR63, subpart ZZZZ if the permittee demonstrates that one of these requirements causes such engine to comply with all emission limits of this permit. The permittee shall submit this demonstration to the Department within 48 hours of placing the new unit into operation. This submittal shall include documentation that the engine is certified, that the engine is within its useful life, as defined and specified in the applicable requirement, and shall include calculations showing that the applicable emissions standards result in compliance with the permit limits.

ii. These compliance tests are not required if a test was conducted by portable analyzer or by EPA Method test (including any required by 40CFR60, subparts IIII and JJJJ and 40CFR63, subpart ZZZZ) within the last 12 months. These previous tests are valid only if conducted at the same or lower elevation as the existing engine location prior to commencing operation as a temporary replacement. A copy of the test results shall be kept according to section B109.B.

(d) Compliance tests for NOx and CO shall be conducted if requested by the Department in writing to determine whether the replacement engine is in compliance with applicable regulations or permit conditions.

(e) Upon determining that emissions data developed according to B116.A.1(c) fail to indicate compliance with either the NOx or CO emission limits, the permittee shall notify the Department within 48 hours. Also within that time, the permittee shall implement one of the following corrective actions:

i. The engine shall be adjusted to reduce NOx and CO emissions and tested per B116.A.1(c) to demonstrate compliance with permit limits.

ii. The engine shall discontinue operation or be replaced with a different unit.

(2) Short term replacement engines, whether of the same manufacturer, model, and horsepower, or of a different manufacturer, model, or horsepower, are subject to all federal and state applicable requirements, regardless of whether they are set forth in this permit (including monitoring and recordkeeping), and shall be subject to any shield afforded by this permit.

(3) The permittee shall maintain a contemporaneous record documenting the unit number, manufacturer, model number, horsepower, emission factors, emission test results, and serial number of any existing engine that is replaced, and the replacement engine. Additionally, the record shall document the replacement duration in days, and the beginning and end dates of the short term engine replacement.

(4) The permittee shall maintain records of a regulatory applicability determination for each replacement engine (including 40CFR60, subparts IIII and JJJJ and

40CFR63, subpart ZZZZ) and shall comply with all associated regulatory requirements.

B. Additional requirements for replacement of engines at sources that are major as defined in regulation 20.2.74 NMAC, Permits – Prevention of Significant Deterioration, section 7.AF. For sources that are major under PSD, the total cumulative operating hours of the replacement engine shall be limited using the following procedure:

(1) Daily, the actual emissions from the replacement engine of each pollutant regulated by this permit for the existing engine shall be calculated and recorded.

(2) The sum of the total actual emissions since the commencement of operation of the replacement engine shall not exceed the significant emission rates in Table 2 of 20.2.74 NMAC, section 502 for the time that the replacement engine is located at the facility.

C. All records required by this section shall be kept according to section B109.

PART C MISCELLANEOUS

C100 Supporting On-Line Documents

A. Copies of the following documents can be downloaded from NMED's web site under Compliance and Enforcement or requested from the Bureau.

(1) Excess Emission Form (for reporting deviations and emergencies)

(2) Universal Stack Test Notification, Protocol and Report Form and Instructions

(3) SOP for Use of Portable Analyzers in Performance Tests

C101 Definitions

A. **"Daylight"** is defined as the time period between sunrise and sunset, as defined by the Astronomical Applications Department of the U.S. Naval Observatory. (Data for one day or a table of sunrise/sunset for an entire year can be obtained at http://aa.usno.navy.mil/. Alternatively, these times can be obtained from a Farmer's Almanac or from http://www.almanac.com/rise/).

B. **"Exempt Sources"** and **"Exempt Activities"** is defined as those sources or activities that are exempted in accordance with 20.2.72.202 NMAC. Note; exemptions are only valid for most 20.2.72 NMAC permitting actions.

C. **"Fugitive Emission"** means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

D. **"Insignificant Activities"** means those activities which have been listed by the department and approved by the administrator as insignificant on the basis of size, emissions or production rate. Note; insignificant activities are only valid for 20.2.70 NMAC permitting actions.

E. **"Natural Gas"** is defined as a naturally occurring fluid mixture of hydrocarbons that contains 20.0 grains or less of total sulfur per 100 standard cubic feet (SCF) and is either composed of at least 70% methane by volume or has a gross calorific value of between 950 and 1100 Btu per standard cubic foot. (40 CFR 60.631)

F. **"Natural Gas Liquids"** means the hydrocarbons, such as ethane, propane, butane, and pentane, that are extracted from field gas. (40 CFR 60.631)

G. **"National Ambient air Quality Standards"** means, unless otherwise modified, the primary (health-related) and secondary (welfare-based) federal ambient air quality standards promulgated by the US EPA pursuant to Section 109 of the Federal Act.

H. **"Night"** is the time period between sunset and sunrise, as defined by the Astronomical Applications Department of the U.S. Naval Observatory. (Data for one day or a table of sunrise/sunset for an entire year can be obtained at http://aa.usno.navy.mil/. Alternatively, these times can be obtained from a Farmer's Almanac or from http://www.almanac.com/rise/).

I. **"Night Operation** or **Operation at Night"** is operating a source of emissions at night.

J. **"NO2"** or "Nitrogen dioxide" means the chemical compound containing one atom of nitrogen and two atoms of oxygen, for the purposes of ambient determinations. The term **"nitrogen dioxide,"** for the purposes of stack emissions monitoring, shall include nitrogen dioxide (the chemical compound containing one atom of nitrogen and two atoms of oxygen), nitric oxide (the chemical compound containing one atom of nitrogen and one atom of oxygen), and other oxides of nitrogen which may test as nitrogen dioxide and is sometimes referred to as NOx or NO_2. (20.2.2 NMAC)

K. "**NOx**" see NO_2

L. **"Potential Emission Rate"** means the emission rate of a source at its maximum capacity to emit a regulated air contaminant under its physical and operational design, provided any physical or operational limitation on the capacity of the source to emit a regulated air contaminant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its physical and operational design only if the limitation or the effect it would have on emissions is enforceable by the department pursuant to the Air Quality Control Act or the federal Act.

M. "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.

N. **"Shutdown"**, for requirements under 20.2.72 NMAC, means the cessation of operation of any air pollution control equipment, process equipment or process for any purpose, except routine phasing out of batch process units.

O. **"SSM"**, for requirements under 20.2.7 NMAC, means routine or predictable startup, shutdown, or scheduled maintenance.

(1) **"Shutdown"**, for requirements under 20.2.7 NMAC, means the cessation of operation of any air pollution control equipment or process equipment.

(2) **"Startup"**, for requirements under 20.2.7 NMAC, means the setting into operation of any air pollution control equipment or process equipment.

P. **"Startup"**, for requirements under 20.2.72 NMAC, means the setting into operation of any air pollution control equipment, process equipment or process for any purpose, except routine phasing in of batch process units.

C102 Acronyms

2SLB .... 2-stroke lean burn
4SLB .... 4-stroke lean burn
4SRB .... 4-stroke rich burn
acfm .... actual cubic feet per minute
AFR .... air fuel ratio
AP-42 .... EPA Air Pollutant Emission Factors
AQB .... Air Quality Bureau
AQCR .... Air Quality Control Region
ASTM .... American Society for Testing and Materials
BTU .... British ThermalUnit
CAA .... Clean Air Act of 1970 and 1990 Amendments
CEM .... continuous emissions monitoring
cfh .... cubic feet per hour
cfm .... cubic feet per minute
CFR .... Code of Federal Regulation
CI .... compression ignition
CO .... carbon monoxides
COMS .... continuous opacity monitoring system
EIB .... Environmental Improvement Board

EPA .... United States Environmental Protection Agency
gr./100 cf .... grains per one hundred cubic feet
gr./dscf .... grains per dry standard cubic foot
GRI .... Gas Research Institute
HAP .... hazardous air pollutant
hp .... horsepower
H_2S .... hydrogen sulfide
IC .... internal combustion
KW/hr .... kilowatts per hour
lb/hr .... pounds per hour
lb/MMBtu .... pounds per million British Thermal Unit
MACT .... Maximum Achievable Control Technology
MMcf/hr .... million cubic feet per hour
MMscf .... million standard cubic feet
N/A .... not applicable
NAAQS .... National Ambient Air Quality Standards
NESHAP .... National Emission Standards for Hazardous Air Pollutants
NG .... natural gas
NGL .... natural gas liquids
NMAAQS .... New Mexico Ambient Air Quality Standards
NMAC .... New Mexico Administrative Code
NMED .... New Mexico Environment Department
NMSA .... New Mexico Statues Annotated
NOx .... nitrogen oxides
NSCR .... non-selective catalytic reduction
NSPS .... New Source Performance Standard
NSR .... New Source Review
PEM .... parametric emissions monitoring
PM .... particulate matter (equivalent to TSP, total suspended particulate)
PM_{10} .... particulate matter 10 microns and less in diameter
$PM_{2.5}$ .... particulate matter 2.5 microns and less in diameter
pph .... pounds per hour
ppmv .... parts per million by volume
PSD .... Prevention of Significant Deterioration
RATA .... Relative Accuracy Test Assessment
RICE .... reciprocating internal combustion engine
rpm .... revolutions per minute
scfm .... standard cubic feet per minute
SI .... spark ignition
SO_2 .... sulfur dioxide
SSM .... Startup Shutdown Maintenance (see SSM definition)
TAP .... Toxic Air Pollutant
TBD .... to be determined
THC .... total hydrocarbons

TSP.. Total Suspended Particulates
tpy ....tons per year
ULSD ....ultra low sulfur diesel
USEPA.. United States Environmental Protection Agency
UTM...Universal Transverse Mercator Coordinate system
UTMH...Universal Transverse Mercator Horizontal
UTMV...Universal Transverse Mercator Vertical
VHAP...volatile hazardous air pollutant
VOC .... volatile organic compounds

APPENDIX C

PROBABLE HYDROLOGIC CONSEQUENCES REPORT

APPENDIX C: PROBABLE HYDROLOGIC CONSEQUENCES REPORT

DECEMBER 2017

THEMAC RESOURCES

New Mexico Copper Corporation

PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT SIERRA COUNTY NEW MEXICO

JSAI
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December 12, 2017

PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT, SIERRA COUNTY, NEW MEXICO

EXECUTIVE SUMMARY

The proposed Copper Flat Project includes a mine pit, supply wells, tailings facility, and waste rock facilities (Fig. 1.1) located in the Hillsboro Mining District, Sierra County, New Mexico.

Presented in this report is the evaluation of the hydrologic consequences of the proposed operating plan detailed in the New Mexico Copper Corporation (NMCC) Updated Mining Operation and Reclamation Plan for Copper Flat Mine, Rev. 1 (THEMAC, 2017a) and in the New Mexico Copper Corporation Discharge Permit Application, Rev. 1 (THEMAC, 2017b). The operating plan reviewed herein reflects a nominal processing rate of 30,000 tons of ore per day for 11.5 years and aligns with “Alternative 2” in the Copper Flat Draft Environmental Impact Statement (BLM, 2015).

The objective of this report is to develop a determination of the probable hydrologic consequences of the operation and reclamation on both the permit and affected areas with respect to the hydrologic regime, quantity and quality of surface and groundwater systems that may be affected by the proposed operations (NMAC 19.10.6.602.(13)(g)(v)) of the Mining Act regulations.

Groundwater systems include:

- The regional Santa Fe Group (SFG) aquifer.
- Quaternary-age alluvial aquifers along Animas Creek and Percha Creek.
- The crystalline bedrock of the Animas Uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary-age alluvial aquifer discharges to the surface.
- An area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs discharging from the crystalline bedrock.
- Storm water flows in Grayback Arroyo.

“Consequences” considered here are the resulting effects on the hydrologic regime of NMCC’s proposed operation and reclamation including both water use, and surface and groundwater impact mitigation measures.

The sources of possible hydrologic consequences of the Project include:

1. Groundwater withdrawals from the SFG aquifer: The mine water supply will be withdrawn from pumping wells PW-1, PW-2, PW-3, and PW-4. Water level in the SFG aquifer will be lowered around the well field and then gradually recover after mining. Secondary effects evaluated include:
   a. Reduced groundwater discharge to Rio Grande and Caballo Reservoir.
   b. Reduced flow to artesian wells and other effects to local groundwater users.
   c. Potential reduced discharge to shallow aquifers along Animas Creek and Percha Creek, leading to lower alluvial water levels and reduced discharge to the perennial flow and riparian areas along Animas Creek.
   d. Potential ground subsidence.
2. Groundwater withdrawals from the crystalline bedrock associated with the open pit. Water levels in the bedrock around the pit will be permanently lowered, and groundwater will flow to the pit and evaporate. Groundwater flow rates to the pit and the future open pit water level and water balance area assessed. Secondary effects evaluated include:
   a. Potential groundwater discharge from the open pit.
   b. Potential effects on springs discharging from the crystalline bedrock and on the Percha Creek perennial (riparian) area.
3. Potential for groundwater discharge from the tailings storage facility (TSF) and waste rock stockpiles (WRSPs).

The consequences were evaluated using the numerical groundwater flow model (JSAI, 2014) developed for the Copper Flat Project. Effects include the following:

Santa Fe Group (SFG) Aquifer

- Water-level drawdown in the SFG aquifer is projected to reach a maximum of about 70 ft at the well field, at the end of mining. Drawdown will decrease with distance from the well field. Water levels will then recover over a period of about 20 to 30 years.
- Total reductions in discharge to the system from the SFG aquifer are projected to peak at a total of about 3,100 acre-feet per year (ac-ft/yr) shortly after the end of mining, then diminish to near-zero over about 30 years (Fig 3.3; Table 3.1).
- Flow induced from the Palomas Graben north of the study area is projected to reach a maximum of less than 800 ac-ft/yr at the end of mining, which is estimated to result in an additional reduction of discharge to the Rio Grande by a maximum of 275 ac-ft/yr.
- Potential impairment of existing water rights from reduced discharge to flowing wells may occur.
- Effects on shallow groundwater (riparian) systems along Las Animas Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measureable small changes in surface flow and riparian evapotranspiration.
- Depletion to the Rio Grande is projected to peak around 2,080 ac-ft/yr at the end of mining, then reduce to 28 ac-ft/yr 100 years after mining (Fig. 3.3; Table 3.1)

As required by New Mexico Office of the State Engineer (NMOSE), NMCC will mitigate the effects of pumping of the SFG aquifer by offsetting reductions in discharge to the Rio Grande by lease or purchase of additional water rights in the amount of the model-simulated reductions to flow.

NMCC will work with the NMOSE to ensure that impairment to existing water rights (including permitted wells) according to NMOSE criteria, by NMCC pumping, will be appropriately mitigated.

- Pumping of the production water-supply wells is not expected to result in measurable ground subsidence. No water-quality effects are expected from pumping the proposed supply wells in the affected area.

Crystalline Bedrock

- At the end of mining, groundwater-level drawdown in the bedrock around the open pit is projected to reach a maximum of about 800 ft at the pit.
- A permanent cone of depression will form around the pit, with maximum drawdown of about 600 ft at the edge of the pit.
- The pit, which currently is an evaporative hydrologic sink, will form an evaporative hydrologic sink again in the future.

After mining, the pit will be filled with fresh water from the production water-supply wells to inundate portion of the pit walls and create a steady-state hydraulic sink with the surrounding groundwater system (rapid fill). The rapid fill will begin immediately after mining and will be completed in approximately 6 months. The rapid fill requires pumping 2,200 ac-ft into the pit and will fill the pit to elevation 4,894 ft amsl. At hydrologic equilibrium, the final pit water level is projected to be about 4,897 ft amsl, about 580 ft below the pit crest at the haul road entrance. The post-mining pit water body that forms after mining from rapid fill remediation will be about 250 ft in depth and have a steady-state surface area of about 22 acres. Steady state groundwater inflow is estimated at 36 ac-ft/yr and captured storm-water runoff is estimated at 57 ac-ft/yr. Pit water evaporation is projected to be about 93 ac-ft/yr. Evaporation will maintain the hydraulic sink in perpetuity.

Long-term, indirect effects to springs discharging in and around the Animas Uplift are projected to be minimal and not measureable. Water quality effects for the open pit water body are addressed in a separate report prepared for the project.

Storm-Water Flows

Storm-water flow through Grayback Arroyo will not be affected. During operations and after reclamation, storm-water flows from Grayback Arroyo will be conveyed around the open pit in the existing bypass channel and through the mine area with no expected hydrologic consequences.

TSF and WRSPs

Infiltration to groundwater from the tailings and waste rock storage areas is not expected due to installation of liner under the TSF and placement of WRSPs on low permeable crystalline bedrock. Any meteoric water that might infiltrate to groundwater is expected to remain in the immediate area for centuries, due to the low permeability of the SFG sediments near the Animas Uplift and due to the presence of flow-inhibiting faults. The impact to groundwater chemistry is expected to be minimal.

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PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT, SIERRA COUNTY, NEW MEXICO

1.0 INTRODUCTION

This report presents an evaluation of the probable hydrologic consequences of the proposed Copper Flat Project (Project) in Sierra County, New Mexico. Hydrologic consequences refer to any changes, resulting from the Project, to groundwater and surface water systems, including changes to flow, water level, or chemical composition.

The Project is located in the Hillsboro Mining District, shown on Figure 1.1. Effects on both the mine permit area (Fig. 1.1) and the surrounding affected area are evaluated with respect to the hydrologic regime, quantity, and quality of surface and groundwater systems that may be affected by the proposed operations (NMAC 19.10.6.602.(13)(g)(v)).

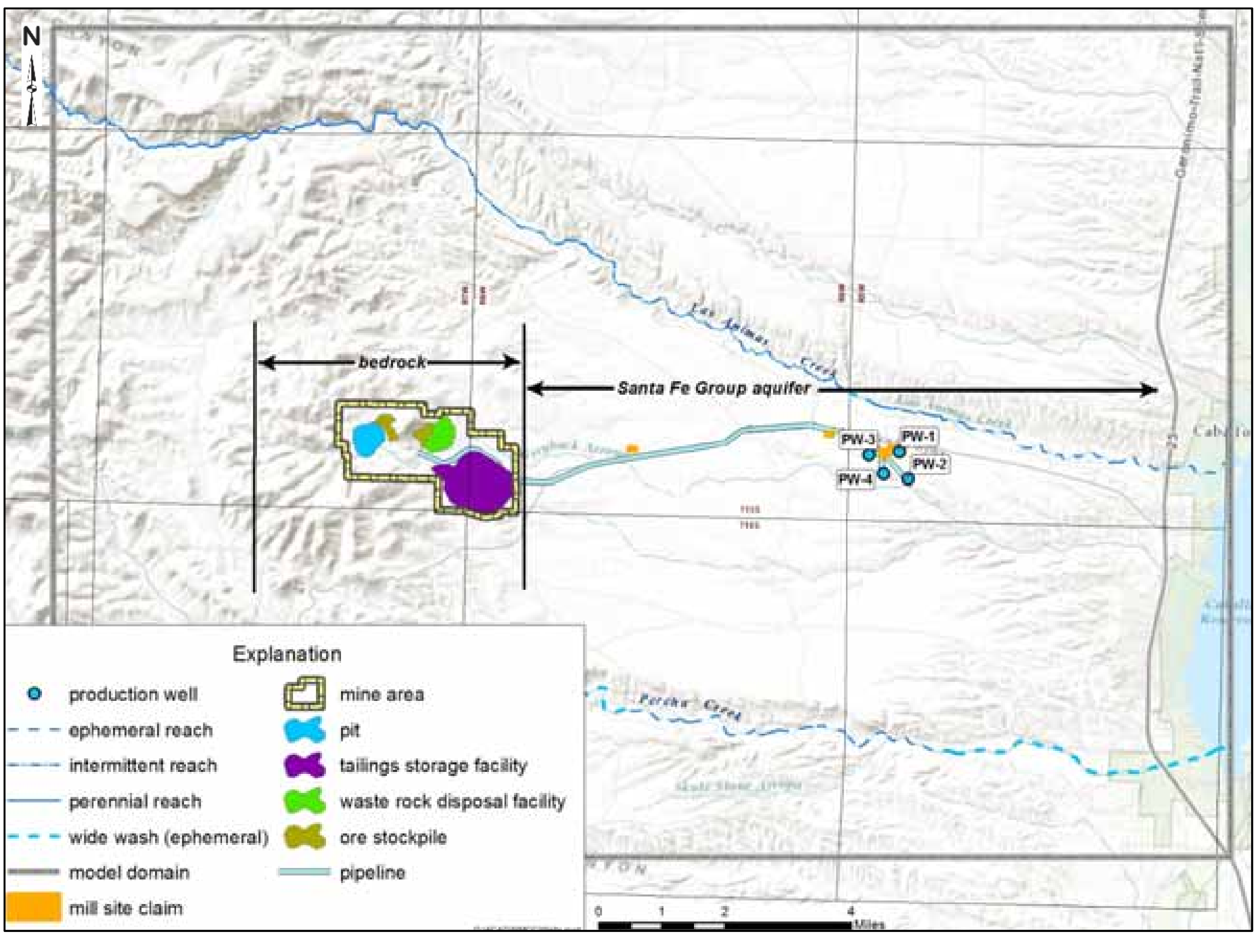

Figure 1.1. Map showing New Mexico Copper Corporation proposed mine facilities, mine area, and the affected area evaluated, Sierra County, New Mexico.

For the analysis of probable hydrologic consequences, the affected area includes the mine permit area containing the open pit and surrounding facilities, located on the andesite and quartz monzonite crystalline bedrock of the Animas Uplift (Fig. 1.1), as well as the affected area including the Santa Fe Group (SFG) aquifer around water supply wells PW-1 through PW-4 and surface and groundwater under Las Animas and Percha Creeks. The area evaluated for potential effects was the "model domain" shown on Figure 1.1.

1.1 Project Description

NMCC proposes to expand the existing open pit, previously developed by Quintana Minerals Corporation (Quintana) during a brief period of operation in 1982.

The existing pit was excavated to about 100 ft below original ground surface, with bottom elevation at about 5,400 feet above mean sea level (ft amsl). A permanent pool of water is present in the existing pit. The current water body has a surface area of about 5 acres, ranges from 10 to 35 ft deep, and contains 60 to 80 ac-ft of water. A diversion channel routes Grayback Arroyo around the pit.

Other facilities from 1982, including processing plant, waste rock storage and tailings storage, have been partially reclaimed. Water-supply wells PW-1, PW-2, PW-3, and PW-4 (Fig. 1.1) have been unused since 1982, except for pumping tests conducted by NMCC in 2012 to 2013.

Features of the Project include (Fig. 1.1) an expanded pit, processing plant, a lined tailings storage facility (TSF), and waste rock stockpiles (WRSPs). The water-supply wells will be re-activated. The Grayback Arroyo diversion would be maintained. Other diversions will route surface runoff around the processing plant and waste rock and tailings storage facilities.

The proposed operating scenario is detailed in NMCC's Updated Mining Operation and Reclamation Plan for Copper Flat Mine (MORP; THEMAC, 2017a, Rev. 1) and in NMCC's Discharge Permit Application (DP: THEMAC, 2017b, Rev 1). The planned scenario reflects a processing rate of 30,000 tons of ore per day for 11 to 12 years, and aligns with "Alternative 2" in the Copper Flat Draft Environmental Impact Statement (BLM, 2015). Upon receiving the required permit approvals, the Project will begin site preparation and construction, which will last approximately 2 years.

The operating life (period of mining) of the project is anticipated to be 11 to 12 years as noted in the MORP. NMCC will mine approximately 113 million tons of ore and 45 million tons of waste rock during the operating life of the mine (158 million tons). Depending on operational conditions, the mining operation will supply 8.9 to 10.8 million tons per year of copper ore to the mill for processing.

The pit will be expanded to occupy a footprint of 129 acres, reaching an ultimate bottom elevation of 4,650 ft amsl, about 825 ft below original ground surface. At the end of mining, the pit would be rapid-filled with good quality water from the production wells to the projected long-term stable water level and prevent oxidation of sulfates below the pit lake water line, thus optimizing pit water quality.

The WRSPs will be placed completely on crystalline bedrock, which provides a natural low-permeability liner. During operations, surface-water runoff collection trenches will be constructed, as needed, to collect and route runoff from the WRSPs to storm-water impoundments at the toe. These trenches will be constructed into the andesite bedrock to prevent water from entering the alluvial surface material down-gradient of the WRSPs. After mining ceases, the WRSPs will be reclaimed and covered with a 3-ft-thick engineered layered system of fill materials designed to store precipitation until it evaporates and prevent infiltration into the underlying WRSPs.

The TSF will be placed on an engineered liner system to prevent subsurface infiltration. The lined TSF will include an over-liner drainage system to maximize reclaim of water and minimize pressure on the liner. Underdrains beneath the dam will collect seepage and preserve dam stability. Water will be reclaimed from the surface of the tailings in a supernatant pond. After mining, the facility will be drained down reclaimed and covered with a 3-ft-thick layered system of fill materials to prevent infiltration into the tailings.

Ore will be trucked from the pit to the processing plant for crushing, grinding, and flotation recovery of copper. The mill will process ore at an average rate of 27,890 tons per day over the life of the operation. Milling will also include a molybdenum processing circuit and a gravity gold recovery circuit.

After mining, the site will be closed and reclaimed per an approved Reclamation and Closure Plan. NMCC has prepared a Reclamation and Closure Plan described in the Mine Operation and Reclamation Plan submitted to the Mining and Minerals Division as part of NMCC's Permit Application Package (THEMAC, 2017a; Golder, 2017).

The objective of the Reclamation and Closure Plan is to reclaim and close the facility in a manner protective of groundwater in conformance with the NM Copper Rules, meet the reclamation requirements of the New Mexico Mining Act, and return the mine area to conditions similar to those present before NMCC's re-establishment of the mine. The Reclamation and Closure Plan is designed to re-establish grazing in the area and allow for long-term use of the reclaimed areas by wildlife known to historically use the area without affecting the potential for other uses such as mining and recreation.

1.2 Analysis Method

The model of groundwater flow in the Animas Uplift and the Palomas Basin (JSAI, 2014) was used to project the hydrologic consequences of development of the Copper Flat Project. The numerical model was peer reviewed and adopted by the New Mexico Office of the State Engineer (NMOSE) in its deliberations regarding NMCC water rights declarations, and used for the Copper Flat Draft Environmental Impact Statement (BLM, 2015).

The mine site water balance developed for the proposed Mining Operation and Reclamation Plan (THEMAC, 2017a) was simulated in the numerical model to estimate potential effects on groundwater and surface-water levels and flows for the pre-mining, mining, and post-mining periods.

This analysis meets the requirements of NMAC 19.10.6.602.(13)(g)(v) by evaluating the probable hydrologic consequences of the operation and reclamation on both the permit and affected areas, with respect to the hydrologic regime, quantity, and quality of surface and groundwater systems that may be affected by the proposed operations.

The analysis takes into account both water use by the proposed operation and proposed mitigation strategies to reduce or eliminate the effects of the proposed operation. The “hydrologic regime” is considered to be surface and groundwater systems potentially affected by NMCC’s proposed operation and reclamation of Copper Flat.

Surface and groundwater systems in the area include the following.

Groundwater is found in:

- The regional Santa Fe Group (SFG) aquifer.
- Quaternary-age alluvial aquifers along Animas Creek and Percha Creek.
- The crystalline bedrock of the Animas Uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary-age alluvial aquifer discharges to the surface.
- An area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs discharging from the crystalline bedrock.
- Storm water flows in Grayback Arroyo.

“Consequences” considered here are the resulting effects on the hydrologic regime of NMCC’s proposed operation and reclamation including both water use, and surface and groundwater impact mitigation measures.

The sources of possible hydrologic consequences of the Project include:

1. Groundwater withdrawals from the SFG aquifer: The mine water supply will be withdrawn from pumping wells PW-1, P W-2, P W-3, and P W-4. Water level in the SFG aquifer will be lowered around the well field and then gradually recover after mining. Secondary effects evaluated include:
   a. Reduced groundwater discharge to Rio Grande and Caballo Reservoir.
   b. Reduced flow to artesian wells and other effects to local groundwater users.
   c. Potential reduced discharge to shallow aquifers along Animas Creek and Percha Creek, leading to lower alluvial water levels and reduced discharge to the perennial flow and riparian areas along Animas Creek.
   d. Potential ground subsidence.

2. Groundwater withdrawals from the crystalline bedrock associated with the open pit. Water levels in the bedrock around the pit will be permanently lowered, and groundwater will flow to the pit and evaporate. Groundwater flow rates to the pit and the future open pit water level and water balance are assessed. Secondary effects evaluated include:
   a. Potential effects on springs discharging from the crystalline bedrock and on the Percha Creek perennial (riparian) area.

3. Potential for groundwater discharge from the WRSPs and TSF.

The consequences were evaluated using the numerical model (JSAI, 2014), which was developed using the United States Geological Survey (USGS) groundwater-flow modeling code MODFLOW (McDonald and Harbaugh, 1988).

Water supply pumping from the SFG aquifer was simulated at rates specified in the mine-site water balance using the MODFLOW module WEL. Pumping was simulated for the pre-mining period of construction, for the period of mining and for post-mining filling of the open pit. The period-of-pumping simulation is followed by simulation of the post-pumping recovery of water levels.

Pit-area dewatering is simulated initially as pumping from the open pit, represented using MODFLOW module LAK2 (JSAI, 2014, appendix D). After the initial dewatering of the existing pit, a set of drain boundary conditions (MODFLOW module DRN) simulate a lowering of groundwater levels as the open pit depth increases. The simulated drain elevations initially represent the extent and elevation of the current pit. The drain elevations are then lowered and new drains are added through the simulation time, to transform the boundary conditions to represent the ultimate pit. The post-mining pit filling and pit water balance is simulated using module LAK2.

Potential for groundwater discharge from the WRSPs and TSF are estimated independently of the numerical model.

1.3 Report Structure

The contents of the report are organized as follows:

Section 1.0 – Describes the Project and analysis methods and outlines the report

Section 2.0 – Projected water demand for mine water supply and rapid-filling in mine area, and estimated open-pit dewatering

Section 3.0 – Probable hydrologic consequences for mine area including the following:

- 3.1 Groundwater withdrawals from the SFG aquifer
  - 3.1.1 Regional groundwater level drawdown
  - 3.1.2 Effects on water balance
  - 3.1.3 Flow from north Palomas Graben
  - 3.1.4 Operational plans for no net effect on the Rio Grande
  - 3.1.5 Other water rights
  - 3.1.6 Effects of reduced flowing well pressure
  - 3.1.7 Effects on Quaternary-age alluvial aquifers and Animas Creek perennial flow and riparian zones
  - 3.1.8 Ground subsidence
- 3.2 Groundwater withdrawals from the crystalline bedrock
  - 3.2.1 End-of-mining groundwater drawdown
  - 3.2.2 Open pit water balance
  - 3.2.3 Potential open pit discharge to groundwater
  - 3.2.4 Effects on springs and on the Percha Creek perennial (riparian) area
- 3.3 Potential groundwater discharge from tailings and waste rock
  - 3.3.1 Tailings infiltration
  - 3.3.2 Waste rock infiltration
  - 3.3.3 Groundwater flow paths and travel times

Section 4.0 – Report conclusions with a summary of results

Section 5.0 – References

Appendix A – Additional results regarding projected groundwater-level hydrographs at different locations

Appendix B – Technical Memorandum regarding the analysis of liner leakage rates

2.0 PROJECT WATER DEMAND

The projected water demand is based on the proposed mine plan for Copper Flat as detailed in the Mining Operation and Reclamation Plan, Rev. 1 (THEMAC, 2017a), which includes a water balance accounting for seasonal effects of climate, recycled process water, makeup water from supply wells, open pit dewatering, and diverted and captured storm-water runoff from the mine area.

The projected monthly water demand was obtained in electronic form (spreadsheet file “Nov 2016 Water Balance Prod Well GPM.xlsx,” NMCC personal communication, February 2017). Operational demand increases in summer and decreases in winter, averaging 6,105 ac-ft/yr over the 11.5-year life of the mining operation.

Water will be withdrawn from the SFG aquifer to provide the main water supply for the mine. Water will also be withdrawn from the crystalline bedrock, to dewater the pit. After mining, water will be withdrawn from the SFG aquifer to rapid-fill the open pit.

2.1 Water-Supply Pumping

The estimated rates of groundwater use are summarized on Table 2.1. Project water demand includes the mine construction and start up, 11.5-year mining period, and post-mining reclamation water demand requirements. Pumping for rapid fill reclamation of the open pit will require 2,200 ac-ft over 0.5 year.

Table 2.1. Projected water-supply pumping

component	unit	result
pumping duration (includes construction, operation, reclamation)	years	23.0
average pumping rate over full project duration	gpm	2,180
summer maximum pumping rate	gpm	4,224
winter minimum pumping rate	gpm	3,388
water removed from aquifer over pumping duration	ac-ft	73,856
average annual pumping rate over pumping duration	ac-ft/yr	3,211
maximum annual withdrawal rate	ac-ft/yr	6,095

gpm - gallons per minute ac-ft/yr - acre-feet per year

The Project water use is presented in more detail in Table 2.2, showing year-by-year projections of water needs. The table presents the water balance for the mine operation that has been provided to the U.S. Bureau of Land Management in response to comments on the Draft Environmental Impact Statement, with the exception in listing a smaller volume of water (2,200 ac-ft instead of 2,800 ac-ft) used for post-mining filling of the pit.

Table 2.2. Projected water-supply pumping (acre-feet per year)

year	production wells	operation	construction	startup	rapid fill	reclamation
1	132	0	132	0	0	0
2	673	0	233	440	0	0
3	6,081	6,081	0	0	0	0
4	6,087	6,087	0	0	0	0
5	6,071	6,071	0	0	0	0
6	6,088	6,088	0	0	0	0
7	6,078	6,078	0	0	0	0
8	6,086	6,086	0	0	0	0
9	6,090	6,090	0	0	0	0
10	6,095	6,095	0	0	0	0
11	6,095	6,095	0	0	0	0
12	6,090	6,090	0	0	0	0
13	6,093	6,093	0	0	0	0
14	5,472	2,621	0	0	2,200	651
15	321	0	0	0	0	321
16	97	0	0	0	0	97
17	97	0	0	0	0	97
18	50	0	0	0	0	50
19	24	0	0	0	0	24
20	15	0	0	0	0	15
21	10	0	0	0	0	10
22	6	0	0	0	0	6
23	5	0	0	0	0	5
24	0	0	0	0	0	0
25	0	0	0	0	0	0
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Total	73,856	69,575	365	440	2,200	1,276

This smaller post-mining filling of the pit volume is a refinement of the plan that does not measurably change the effects of the Project. The revised pit water balance is reflected in the analysis of pit water (SRK, 2017). Other, smaller adjustments to the estimated water balance may arise as the Project develops, with no measureable change to the effects of the Project.

2.2 Open-Pit Dewatering and Refilling

Pit dewatering is simulated assuming initial pit sump pumping of 100 gallons per minute (gpm), projected to empty the existing pit, with a water volume of about 60 ac-ft (INTERA et al., 2012), in about 4-1/2 months. During operations, groundwater and runoff flowing to the pit will be collected in sumps and pumped out. Projected pit dewatering during mining is summarized in Table 2.3.

Table 2.3. Pit dewatering

pit dewatering duration	years	11.4
average pit dewatering rate	gpm	28
total water withdrawn by pumping over full project duration	ac-ft	499

gpm - gallons per minute ac-ft – acre-feet

The schedule of dewatering is shown on Figure 2.1 including projected pit bottom elevation, pit-area groundwater elevation, and dewatering rates. Long-term total flow is expected to range between about 35 and 65 gpm (56 and 105 ac-ft/yr) with an initial minimum of about 20 gpm (32 ac-ft/yr) and a maximum of about 70 gpm (113 ac-ft/yr), as the pit bottom approaches final elevation of 4,650 ft amsl.

After mining is complete, the pit will be rapid filled to the projected steady-state post-mining equilibrium water level.

Current and projected final pit geometry are summarized on Figure 2.2 showing the water surface area as a function of water level. The existing pit currently has a water surface area of about 5.2 acres. The proposed pit would have water surface area of about 22 acres, with a final water level near 4,897 ft amsl. Rainfall, runoff, and groundwater inflows to the ultimate pit are projected (Section 3.2 below) to be about 100 ac-ft/yr, sufficient to sustain evaporation from a water surface of about 22 acres.

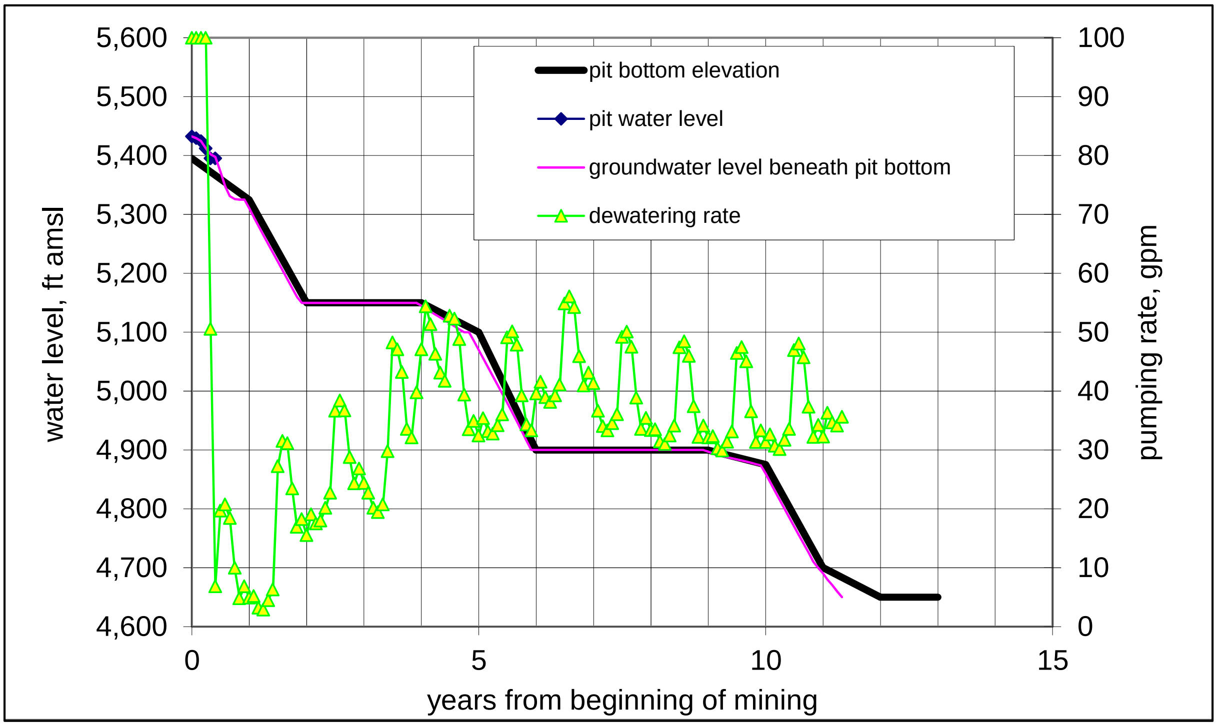

Figure 2.1. Projected pit bottom elevation, groundwater level, and dewatering rate.

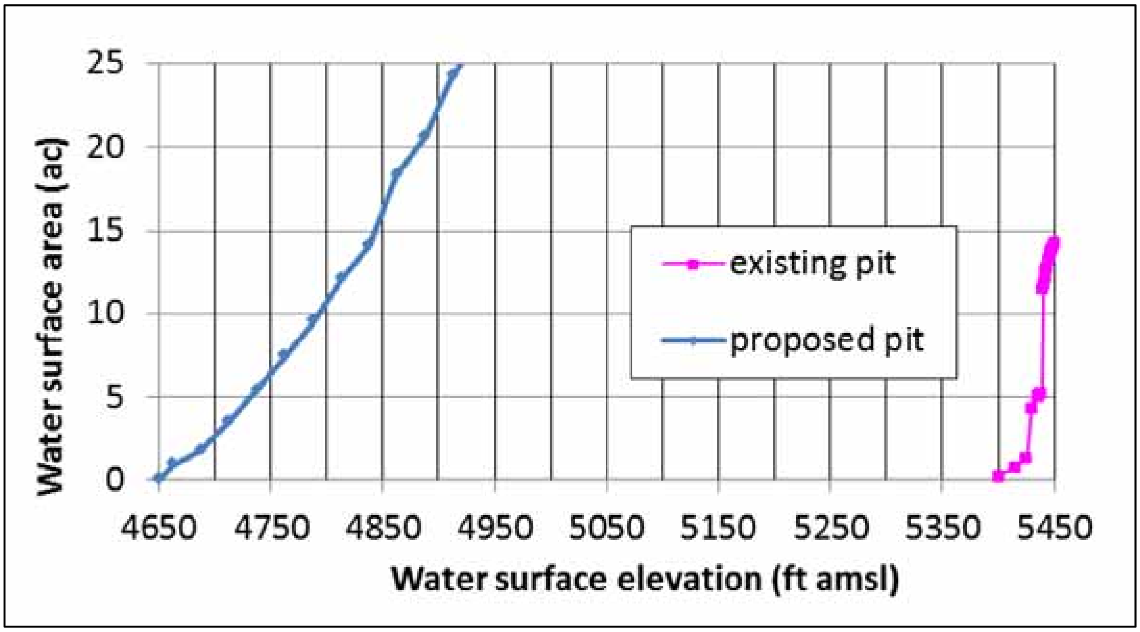

Figure 2.2. Current pit and final pit elevations and water-surface areas.

3.0 PROBABLE HYDROLOGIC CONSEQUENCES

Probable hydrologic consequences are related to the direct hydrologic consequences of the Project:

1. Groundwater withdrawal from the SFG aquifer for mine water supply.
2. Groundwater withdrawal from the crystalline bedrock around the open pit.
3. Potential for infiltration of water from the TSF and WRSPs to groundwater systems.

3.1 Groundwater Withdrawals From the SFG Aquifer

The most direct consequence of groundwater withdrawal from the SFG aquifer will be groundwater-level drawdown in the aquifer (Sec. 3.1.1). This will in turn result in changes to the aquifer water balance (Sec. 3.1.2), including increased inflow from the north Palomas Graben (Sec. 3.1.3), reduced discharge to the Rio Grande and Caballo Reservoir, reduced discharge to flowing wells, and reduced discharge to the Quaternary-age alluvial aquifers.

The consequences of reduced discharge to the Rio Grande and Caballo are discussed in Section 3.1.4. Potential consequences to other groundwater rights are discussed in Section 3.1.5, with the consequences of reduced discharge to flowing wells discussed in Section 3.1.6.

The potential consequences of reduced discharge to Quaternary-age alluvial aquifers, including reduced discharge to the perennial and riparian zone along Animas Creek, are discussed in Section 3.1.7.

Potential land subsidence, another possible consequence of groundwater drawdown, is discussed in Section 3.1.8.

3.1.1 Regional Groundwater Level Drawdown

Contours of projected groundwater-level drawdown at the end of mining in the SFG aquifer around the water-supply wells are shown on Figure 3.1. After the end of mining, water levels in the SFG aquifer will gradually recover to pre-mining levels over about 20 to 30 years.

The groundwater-level drawdown over time will in turn cause reduced discharge from the SFG aquifer to the Rio Grande and Caballo, and reduced discharge to other related hydrogeologic systems.

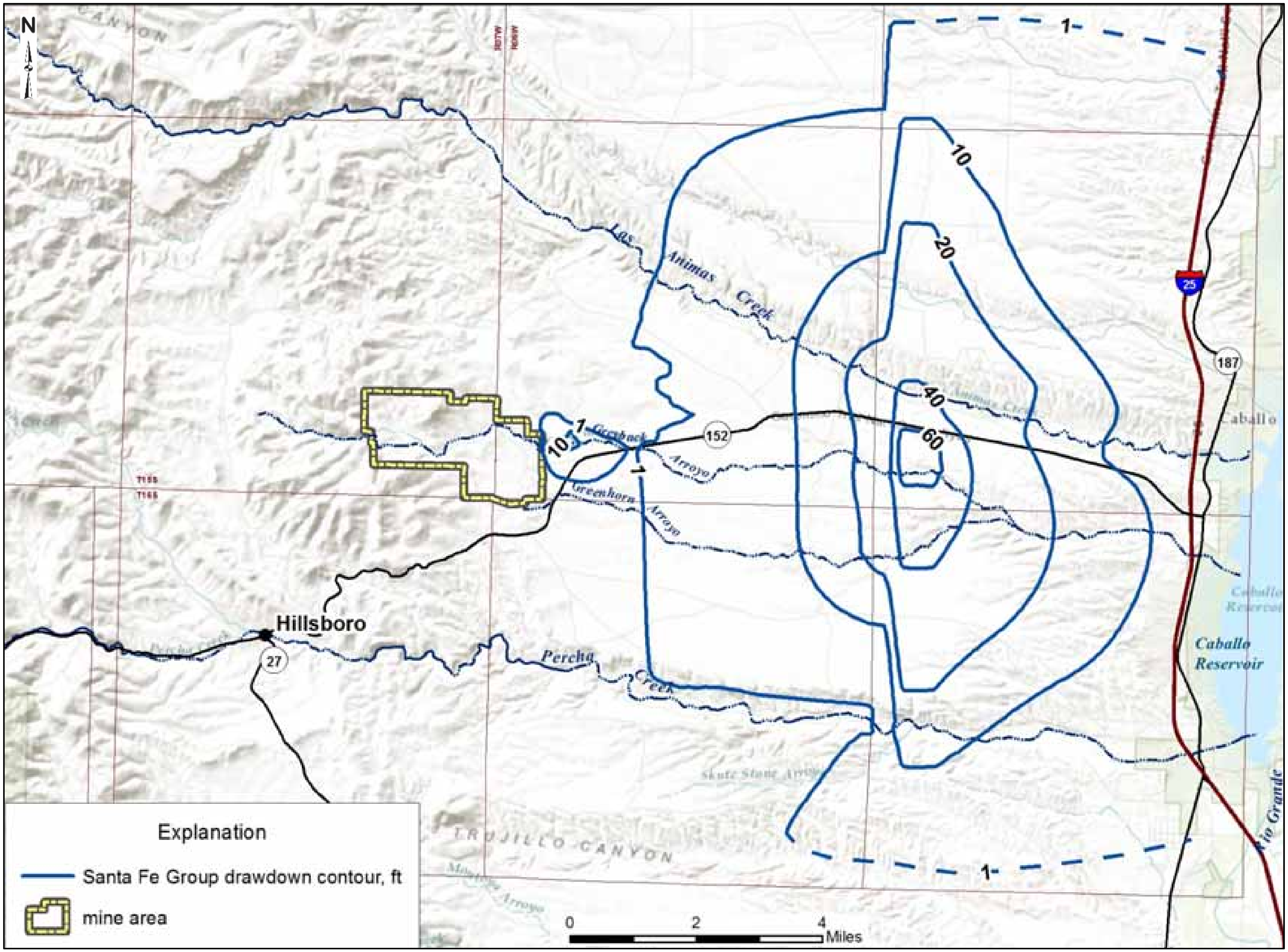

Figure 3.1. Projected end-of-mining groundwater drawdown in the SFG aquifer.

3.1.2 Effects on Water Balance

The groundwater pumped is initially removed from aquifer storage. Over time, more water is provided by increased inflow from the Palomas Graben north of the study area and by reduced discharge out of the study area. The sources of the water pumped are shown on Figure 3.2.

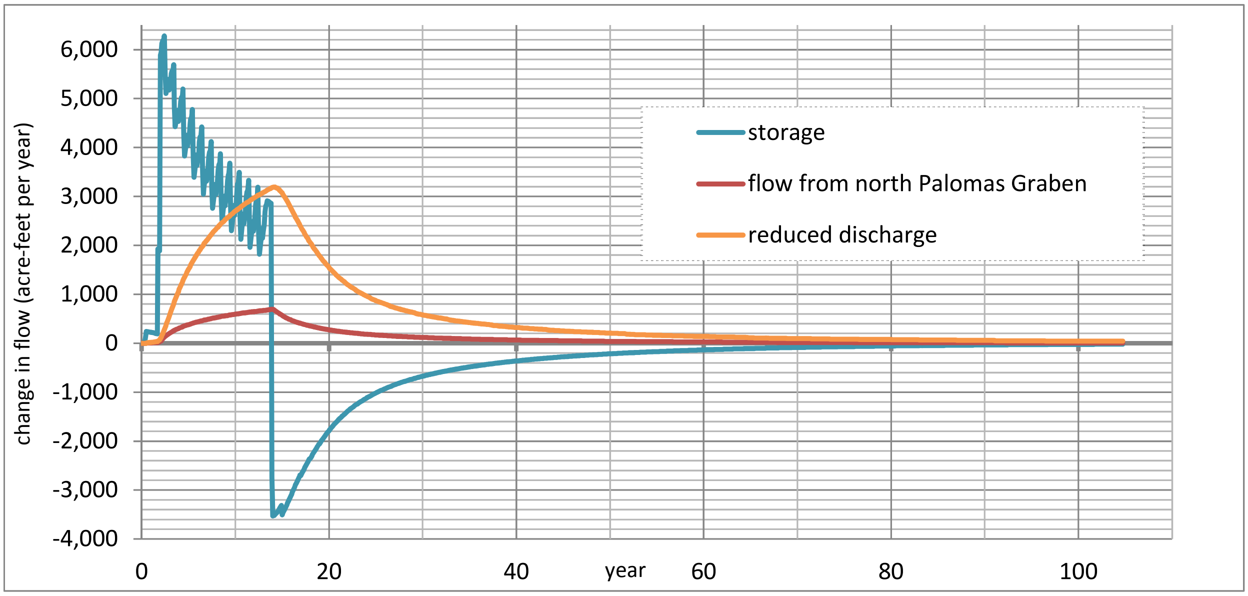

Figure 3.2. Projected sources of water pumped.

The hydrologic effect of additional inflow from the north Palomas Graben on the Rio Grande is estimated in Section 3.1.3.

The reductions in discharge are presented in detail on Figure 3.3, and include components of (1) reduced discharge to the Rio Grande both above and below Caballo Reservoir, (2) reduced discharge to flowing wells, and (3) reduced discharge to Quaternary-age alluvial aquifers and the Animas Creek perennial (riparian) zone.

The effects of reduced discharge to Caballo Reservoir and the Rio Grande are discussed in Section 3.1.4. The potential effects on other groundwater rights are discussed in Section 3.1.5. The potential hydrologic effects of reduced discharge to flowing wells are discussed in Section 3.1.6.

The potential hydrologic effects of reduced discharge to Quaternary-age alluvial aquifers and the Animas Creek perennial (riparian) zone are discussed in Section 3.1.7.

The projected water balance changes are summarized in Table 3.1.

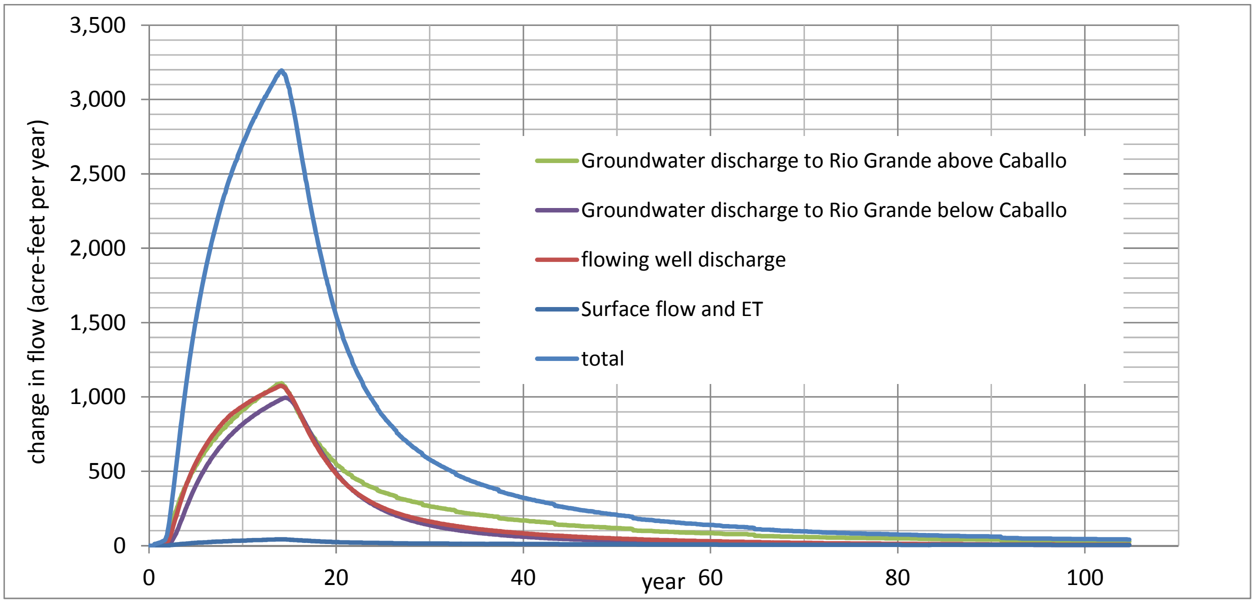

Figure 3.3. Projected reductions in discharge.

Table 3.1. Summary of results

change in flow, acre-feet/year		
parameter	**rate 3 months after pit filling**	**rate 100 yrs after mining**
storage	-3,525	-12
groundwater discharge to Rio Grande above Caballo Dam	1,089	25
groundwater discharge to Rio Grande below Caballo Dam	983	3
discharge from flowing wells	1,075	5
Animas Creek evapotranspiration and flow reduction	18	0
Percha Creek evapotranspiration and flow reduction	25	2
flow to open pit	28	29
inflow from graben north of study area	686	3

cumulated change in volume, acre-feet	
parameter	**volume change 3 months after pit filling**
storage	42,813
Rio Grande above Caballo Dam	8,878
Rio Grande below Caballo Dam	7,504
flowing wells	9,007
Animas Creek flow and evapotranspiration	147
Percha Creek flow and evapotranspiration	180
flow to open pit	-467
inflow from graben north of study area	5,924
total	**73,987**

3.1.3 Flow From North Palomas Graben

Induced groundwater flow from the Palomas Graben (Fig. 3.2) north of the study area would result in reduced discharge to the Rio Grande, beyond the reductions shown in Figure 3.3.

Based on discussions with the NMOSE, the effect of increased flow from north of the study area on the Rio Grande is estimated here using an analytical solution (Glover and Balmer, 1954; Theis, 1941) for the effect on streamflow of pumping a well.

The solution applied here simulates an impermeable barrier west of the Palomas Graben, reflecting the fault barrier and lack of aquifer transmissivity west of the graben.

A computer program employed by NMOSE (E. Keyes, personal communication, 2015) was used to compute the effect on the Rio Grande from removal of (the numerical model-computed) water from the graben, using assumptions listed in Table 3.2.

Table 3.2. Parameters for Glover-Balmer solution

transmissivity (ft^2/day)	3,700
storage coefficient (percent)	10
distance from well to river (miles)	6
distance from well to barrier (mile)	1

Results are shown on Figure 3.4 for a scenario pumping a constant 6,100 ac-ft/yr for 12 years. The computed effect on the Rio Grande would be added to the "Rio Grande above Caballo" effect shown on Figure 3.3.

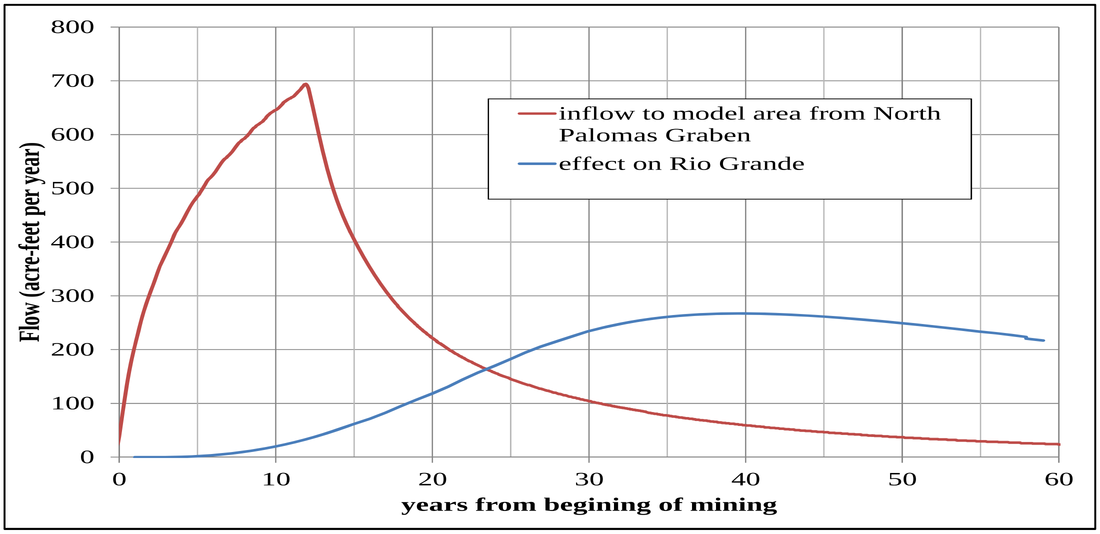

Figure 3.4. Projected effect on Rio Grande of increased flow from north Palomas Graben.

3.1.4 Operational Plans for No Net Effect on the Rio Grande

NMCC has committed to offset the effects of reduced discharge to the Rio Grande system (Figs. 3.3 and 3.4) during and after the operation of the Copper Flat Mine to ensure no net reduction in flows of the Rio Grande, in a manner approved by the NMOSE.

NMCC has procured a lease for water from the Jicarilla Apace Nation (Nation) that has been approved by the United States Secretary of the Interior.

The Nation is the owner of water rights through a water rights settlement agreement authorized and adopted by the United States Congress and the State of New Mexico in the Jicarilla Apache Tribe Water Rights Settlement Act of October 23, 1992 (Settlement Act).

The Settlement Act expressly permits trans-basin transfers and the Nation currently has the right to lease 6,500 ac-ft/yr. The Jicarilla lease water is diverted from three tributaries in Colorado, diverted through the San Juan Chama project tunnels and is stored in Heron Reservoir in northern New Mexico.

The water purchased by NMCC for offset purposes will travel down the Chama River and into the Rio Grande in the same manner that other Jicarilla-leased water is allowed with the approval of the Secretary of Interior and NMOSE.

Flow of Jicarilla lease water arriving at Caballo Reservoir will be computed based on agreed-upon evaporation and conveyance losses between Heron Reservoir and Caballo Dam. NMCC will provide sufficient water arriving at Caballo Dam to offset the groundwater-flow model-computed effects (Figs. 3.3 and 3.4) both above and below Caballo Dam.

The Jicarilla lease has been executed by NMCC and the Nation and the agreement has been reviewed and approved by the United States Bureau of Reclamation action with the full authority of the United States Secretary of Interior. The lease specifically allows water to be utilized at the locations where NMCC pumping effects on the Rio Grande are predicted to take place.

All that remains to allow the diversion of Jicarilla lease water is NMOSE approval of the NMCC plan to use wells LRG-4652 through LRG-4652-S-3 (PW-1 through PW-4), which is pending an on-going proceeding and negotiation. NMCC is working with NMOSE to incorporate into the permit all monitoring, offsets, and replacement requirements deemed necessary to avoid impairment to other water users and impacts to the Rio Grande.

When the permit is issued, the conditions of approval will include an express condition by NMOSE, that the pumping effect on the Rio Grande will be offset by the water purchased under the lease from the Nation. The permit will address the length of time offsets and monitoring are necessary to protect the Rio Grande and existing water users after mine operations cease.

If NMCC, at some point after mine operation ceases and impacts to the river are decreasing, elects to stop leasing water from the Nation to provide for offsets on the river, NMCC will either secure another lease of equally effectual water or secure and permanently retire water rights. NMCC will supply the offset water in the quantity and location sufficient to offset the effects of NMCC pumping, in a manner agreed by NMOSE.

In the case of the permanent retirement of water rights, the offset would continue to have a positive effect on the Rio Grande even after the NMCC effect ceases. In any case, NMCC will take steps to ensure that no net reduction of flow to the Rio Grande occurs.

3.1.5 Other Water Rights

The SFG aquifer will have a limited area of significant drawdown, which may directly affect a small number of private wells. During the operation of its production wells, NMCC will work with NMOSE to ensure that impairment to existing water rights, according to NMOSE criteria, shown to be caused by NMCC pumping, will be mitigated, as appropriate, so that there is no net loss of available water to the existing water right.

Flowing wells along the eastern ends of Animas Creek and Percha Creek will experience a reduction in artesian pressure and reduced flow, as described in Section 3.1.6.

Groundwater model projections indicate that private wells in the shallow aquifer along Animas Creek and Percha Creek will not be affected by the pumping of the NMCC production wells, as described in Section 3.1.7.

3.1.6 Effects of Reduced Flowing Well Pressure

The model estimates a peak reduction in discharge to flowing wells of 1,054 ac-ft/yr, out of a pre-mining discharge of 2,030 ac-ft/yr (Table 3.1). The effect builds gradually from zero, to a maximum of 1,054 ac-ft/yr shortly after the end of mining, then gradually diminishes to near-zero over 30 years (Fig. 3.3). The possible consequences of reduced discharge to flowing wells are discussed below.

The flowing wells are located in the lower (eastern) section of the study area, upstream of Caballo Reservoir. Most of the wells are located along Animas Creek, with the remainder along Percha Creek. Estimated pre-mining discharge to flowing wells of 2,030 ac-ft/yr consists of 1,750 ac-ft/yr of discharge to Animas Creek wells and 280 ac-ft/yr to wells along Percha Creek.

In general, discharge from the flowing wells is used to fill unlined ponds, which in turn serve as reservoirs for irrigation systems. Most wells are allowed to flow continually, maintaining permanent ponds; these are visible in Google Earth images taken both inside and outside the irrigation season.

The discharge from flowing wells to ponds can evaporate from the pond, infiltrate into the shallow groundwater system or be pumped to irrigate fields. Water applied to the fields may be discharged as evapotranspiration or infiltrate to the shallow groundwater system.

Discharge from the flowing wells does not contribute significantly to streamflow, as there are no perennial stream sections in the artesian zone of the lower Animas and Percha Creek basins (INTERA et al., 2012). Flowing well discharge instead contributes to the shallow groundwater systems along Animas Creek and Percha Creek.

The pond and field areas along Animas Creek were estimated based on Google Earth, at 3.9 and 125.8 acres, respectively. By comparison, the 1966 hydrographic survey indicates 8.4 acres of pond and 191.2 acres of field. The estimated discharge from flowing wells is larger than would be required to irrigate the areas indicated. Pond and field areas are listed in Table 3.3, along with the maximum rate of evaporation and evapotranspiration (JSAI, 2014, section 2.4) that could occur from the given areas.

Table 3.3. Areas and potential evapotranspiration for Animas Creek ponds and fields

	area (acres)	maximum ET (in./yr)	ET (ac-ft/yr)
ponds	3.9	65	21
fields	125.8	65	681
total	**130**		**703**

ac-ft/yr - acre-feet per year

As indicated in Table 3.3, the maximum evaporation and evapotranspiration that could occur from the given areas of pond and field is 703 ac-ft/yr. This implies that most of the 1,750 ac-ft/yr of flowing well discharge along Animas Creek infiltrates to the shallow aquifer, either from the fields or through the ponds.

Current water balance for Animas Creek flowing wells was estimated assuming (1) typical application of irrigation water, with 70-percent evapotranspiration of the water applied and 30-percent infiltration to the shallow groundwater system, and (2) infiltration of any remaining flowing well discharge through the ponds. Results are presented in Table 3.4.

Some wells with reduced artesian pressure may be pumped in order to maintain water supply. Model-projected additional drawdown at the end of mining, due to pumping flowing wells at pre-mining rates, is shown on Figure 3.5. Incremental drawdown reaches a maximum of less than 10 ft in the lower reach of Animas Creek basin.

Table 3.4. Estimated water balance for Animas Creek flowing wells

flowing well discharge	**1,750**
evapotranspiration (ET)	703
infiltration (fields)	301
infiltration (ponds)	746
Total (ac-ft/yr)	**1,750**

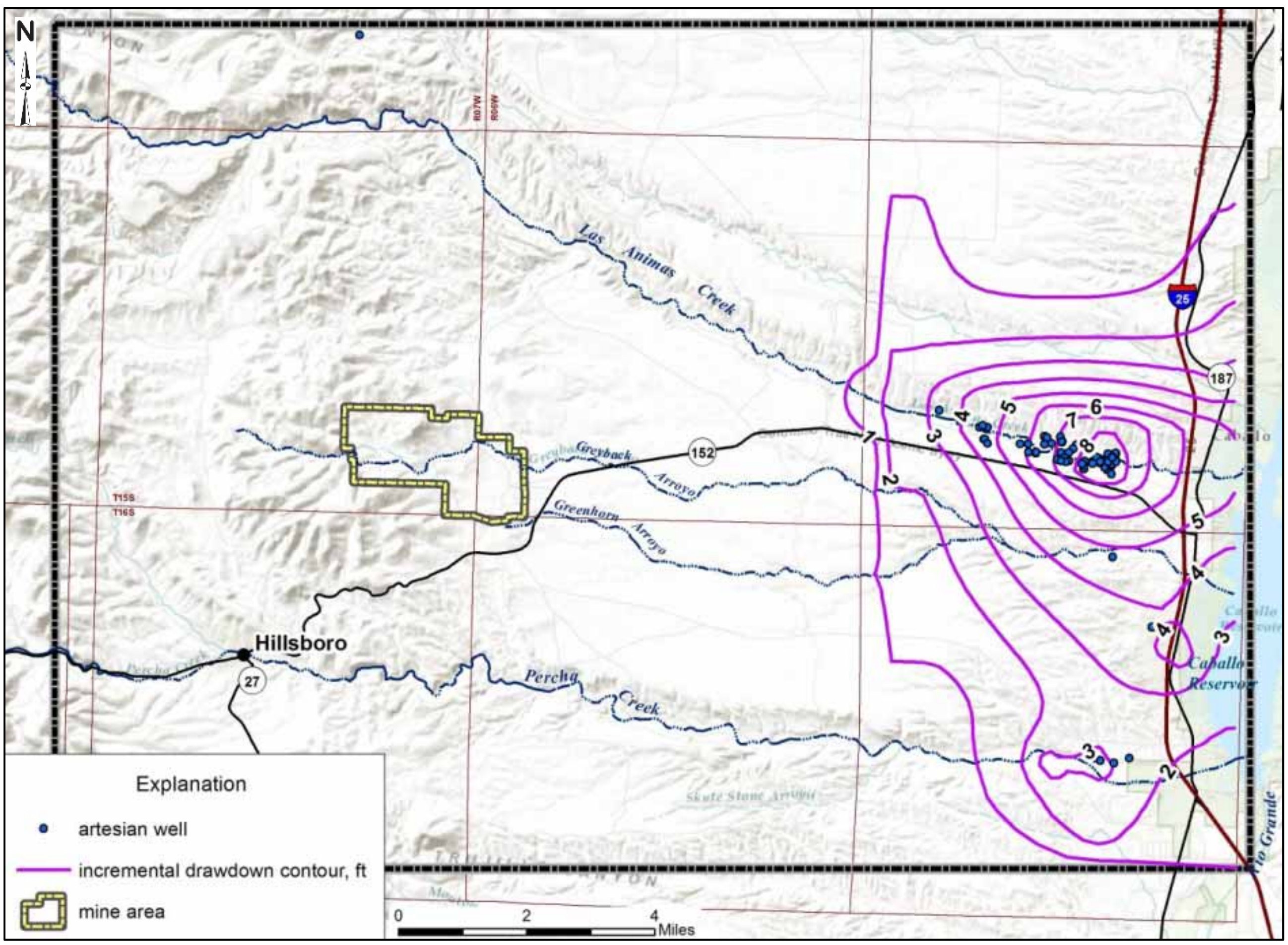

Figure 3.5. Projected incremental drawdown due to pumping of flowing wells at current flow rates.

3.1.7 Effects on Quaternary-Age Alluvial Aquifers and Animas Creek Perennial Flow and Riparian Zone

The shallow groundwater and riparian systems along Animas Creek and Percha Creek overlie the SFG sediments. Geology of the study area is shown on Figure 3.6, showing faulting within the SFG. An important fault-bounded feature is the Palomas Graben, in which the Copper Flat water-supply wells are completed.

West of the graben, the SFG sediments are thinner and less permeable, and do not yield substantial flow to wells. Within and east of the graben, the SFG forms an aquifer capable of yielding substantial flow. The hydrologic relationship of the shallow alluvial systems to the SFG is illustrated in cross-section C-C' (Fig. 3.7) along Animas Creek.

West of the graben, the low transmissivity of the SFG results in elevated water levels reaching the level of the shallow alluvium. Flow between the SFG and the alluvium is limited by low transmissivity and the small water-level gradient between the two.

Near the graben, the increased transmissivity of the SFG results in water levels dropping below the bottom of the alluvium, forming a hydraulic disconnection between the SFG aquifer and the alluvial groundwater system (Fig. 3.8). As a result, water flows from the alluvium to the SFG, through low-permeability clay beds, only by gravity; pumping from the SFG does not increase the flow or change water levels in the alluvium.

East of the graben, water flows down-dip along the permeable SFG beds. In the lower part of the basin, water level in the SFG pressurizes the confining clay beds from below. Water discharges from the SFG to the alluvium and to Caballo reservoir by flowing slowly across the resistant clay beds, or by discharging to flowing wells.

As a result, groundwater-level changes in the shallow alluvium, due to pumping in the SFG, will be highly attenuated. The main area of groundwater drawdown in the SFG (Fig. 3.1) will be in the graben, where the alluvium is disconnected from the SFG (Fig. 3.7).

Away from the graben, SFG drawdown will be smaller, and the connection to the alluvium is limited by low-permeability clay beds (Fig. 3.8).

A contour map of projected groundwater-level drawdown within Quaternary-age alluvial aquifers at the end of mining is shown on Figure 3.9. The figure indicates that peak groundwater-level drawdown along Animas Creek and most of Percha Creek will be less than 1 ft. Drawdown in a small area along lower Percha Creek is projected to be greater than 1 ft and less than 2 ft. The projected effects on evapotranspiration and surface discharge from the shallow aquifers are correspondingly small (Table 3.1). After mining ends water levels will slowly recover to pre-mining levels.

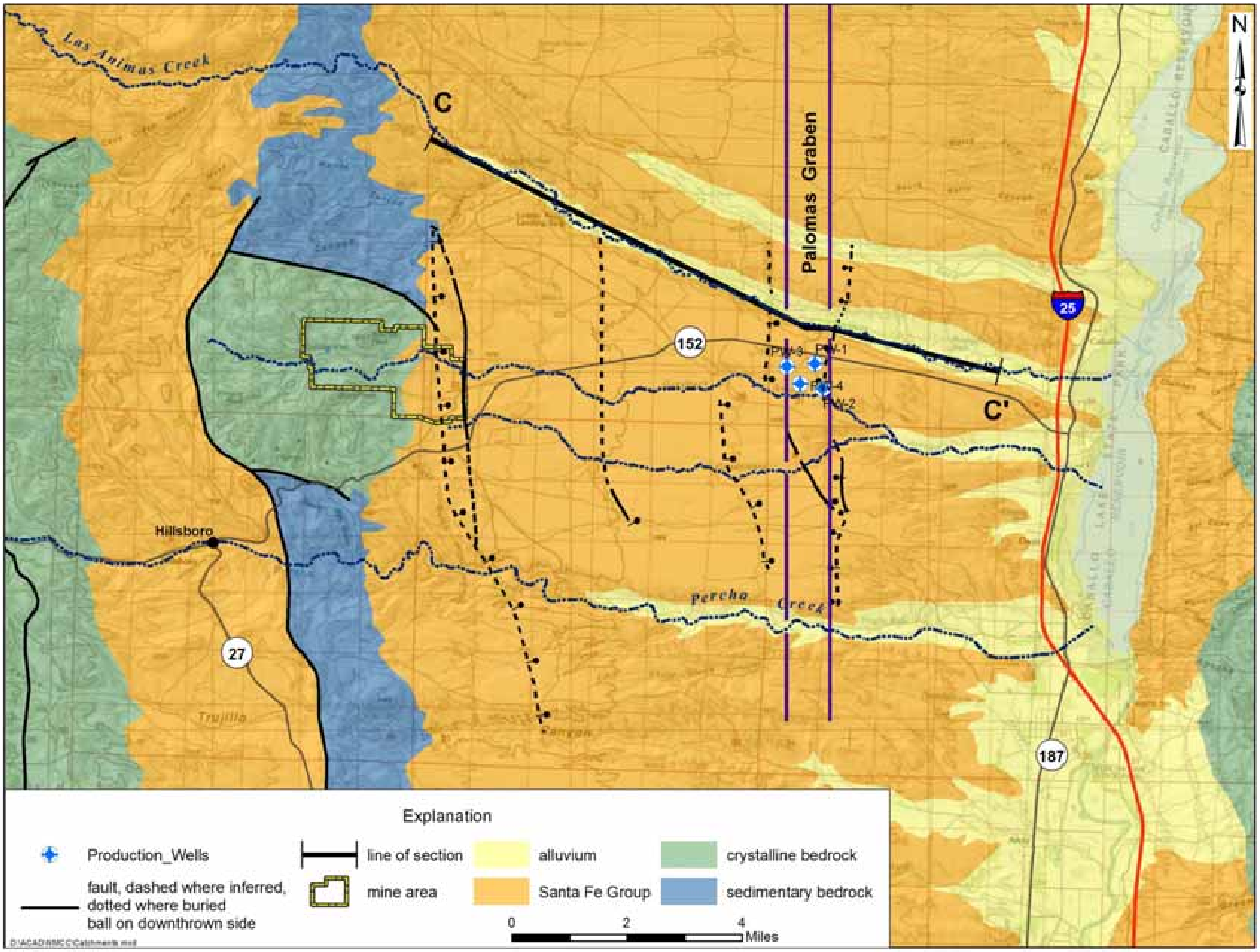

Figure 3.6. Geologic map.

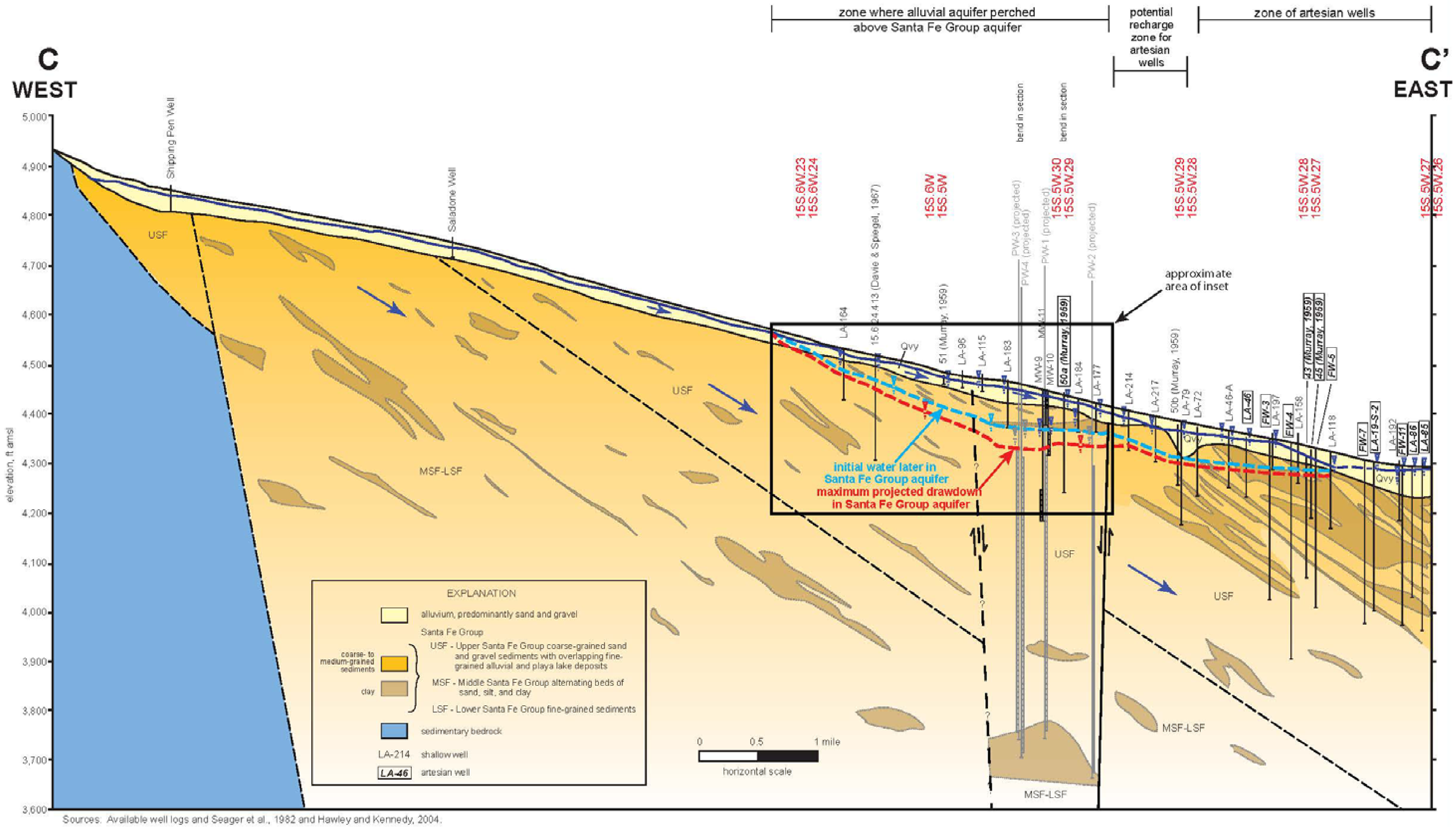

Figure 3.7. Cross-section C-C'.

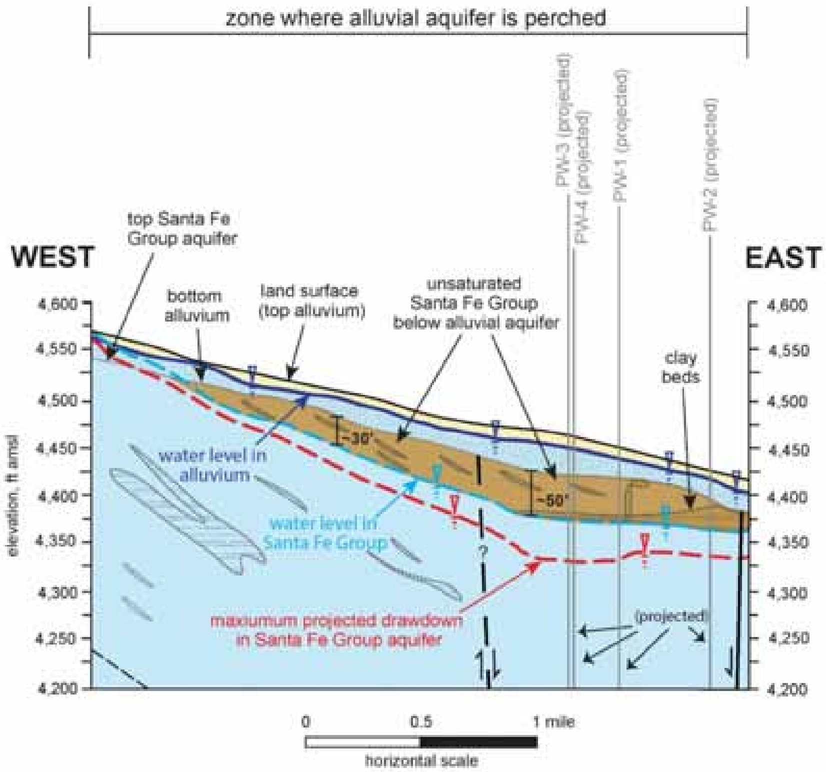

Figure 3.8. Section C-C', inset area of perched shallow aquifer.

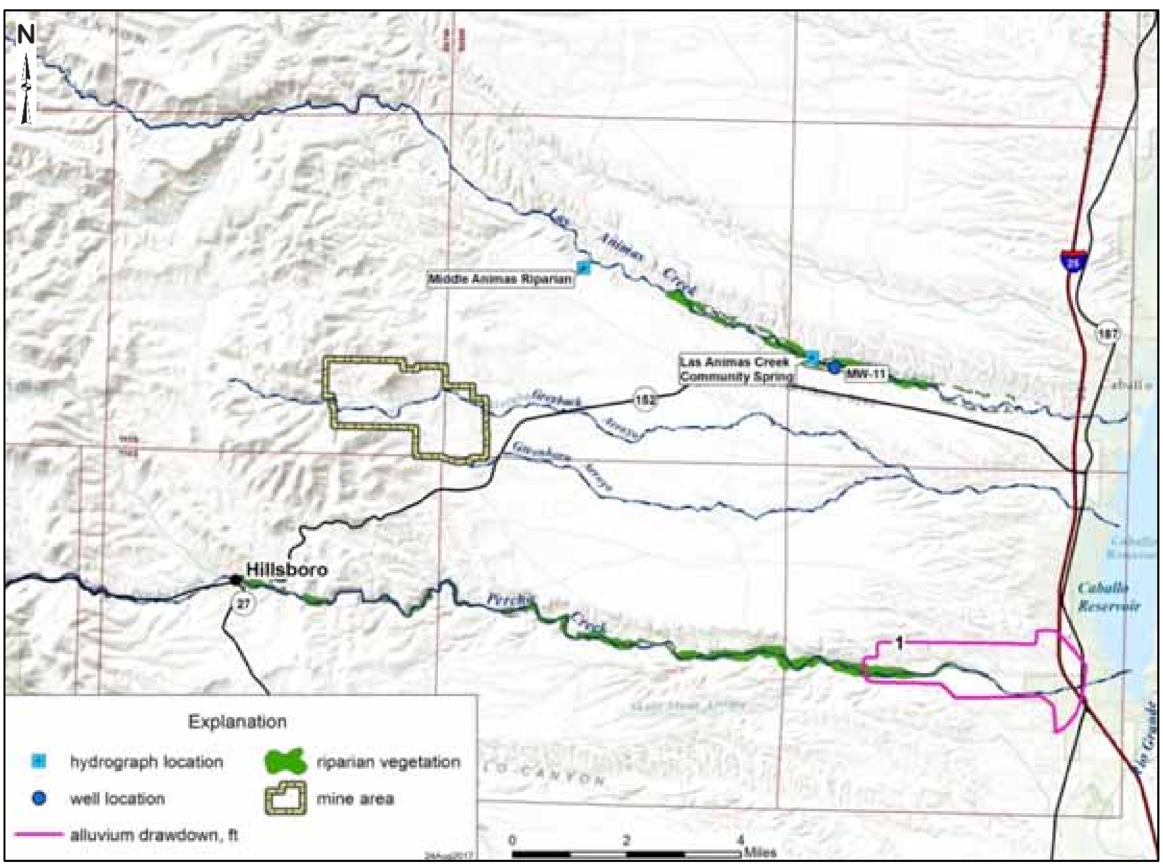

Figure 3.9. Projected end-of-mining groundwater drawdown, shallow aquifers.

3.1.8 Ground Subsidence

The potential for land surface subsidence due to groundwater-level drawdown was evaluated using the method of Hoffman and others (Hoffman et al., 2003). Potential subsidence due to dewatering of the crystalline bedrock is negligible; therefore, subsidence potential was evaluated only for the SFG aquifer around the well field.

Projected maximum drawdown (maximum drawdown near the well field occurs at the end of mining; maximum drawdown farther away may occur later) is shown on Figure 3.10, with an area-wide maximum drawdown of about 70 ft occurring at the well field.

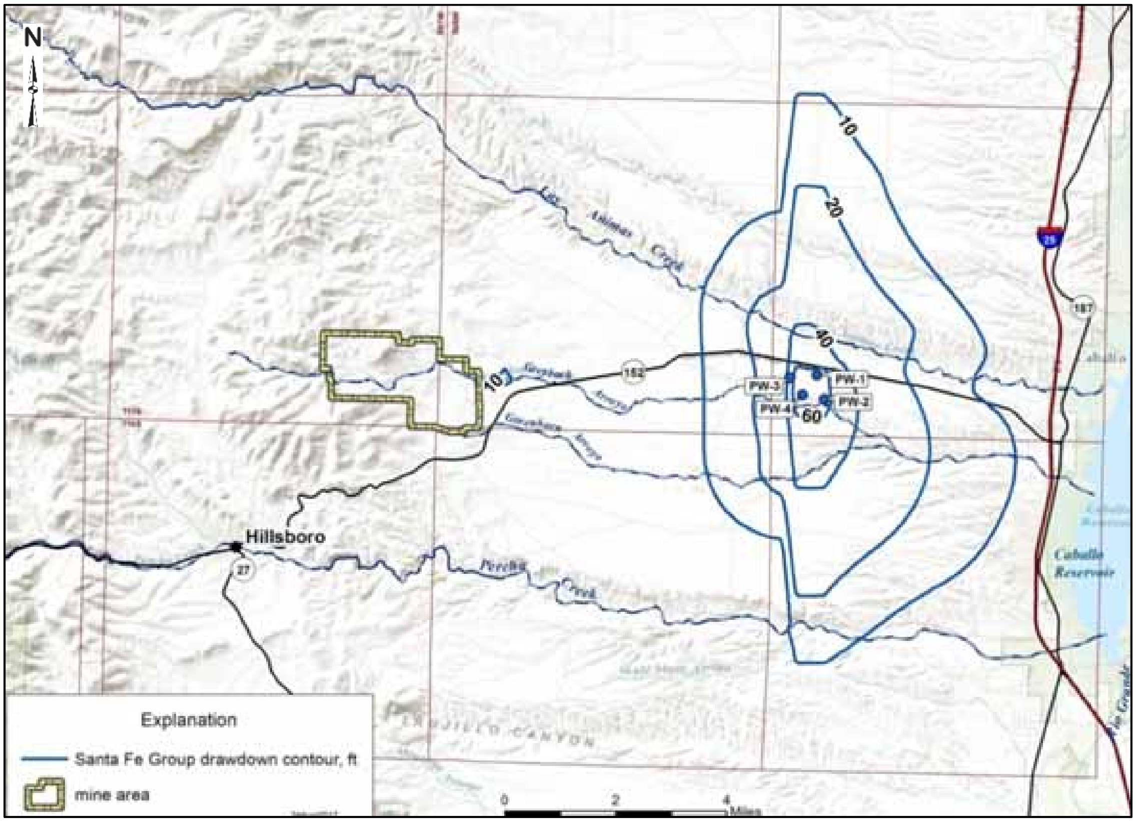

Figure 3.10. Projected maximum drawdown in Santa Fe Group aquifer.

Subsidence is estimated using equation (1) (Hoffman et al., 2003, equation 9):

$$\Delta b = S_s b \Delta h \qquad (1)$$

where, b is the saturated thickness of compressible beds
Δb is land surface subsidence
S_s is the specific storage of the compressible beds
Δh is drawdown

Thickness of compressible beds is assumed at 5,000 ft. Specific storage (storage coefficient per unit aquifer thickness) for SFG is modeled at 2.0 x 10-6/ft. Maximum subsidence is then estimated using equation (2):

$$\Delta b = (2 \times 10^{-6}\ /\text{ft}) \times (5{,}000\ \text{ft}) \times (70\ \text{ft}) = 0.70\ \text{ft} \qquad (2)$$

By using conservative assumptions, a maximum potential subsidence of 0.7 ft is calculated for the immediate area of the well field, where drawdown reaches a maximum. Subsidence decreases with distance from the well field area in proportion to drawdown. Contours of maximum potential subsidence are illustrated on Figure 3.11.

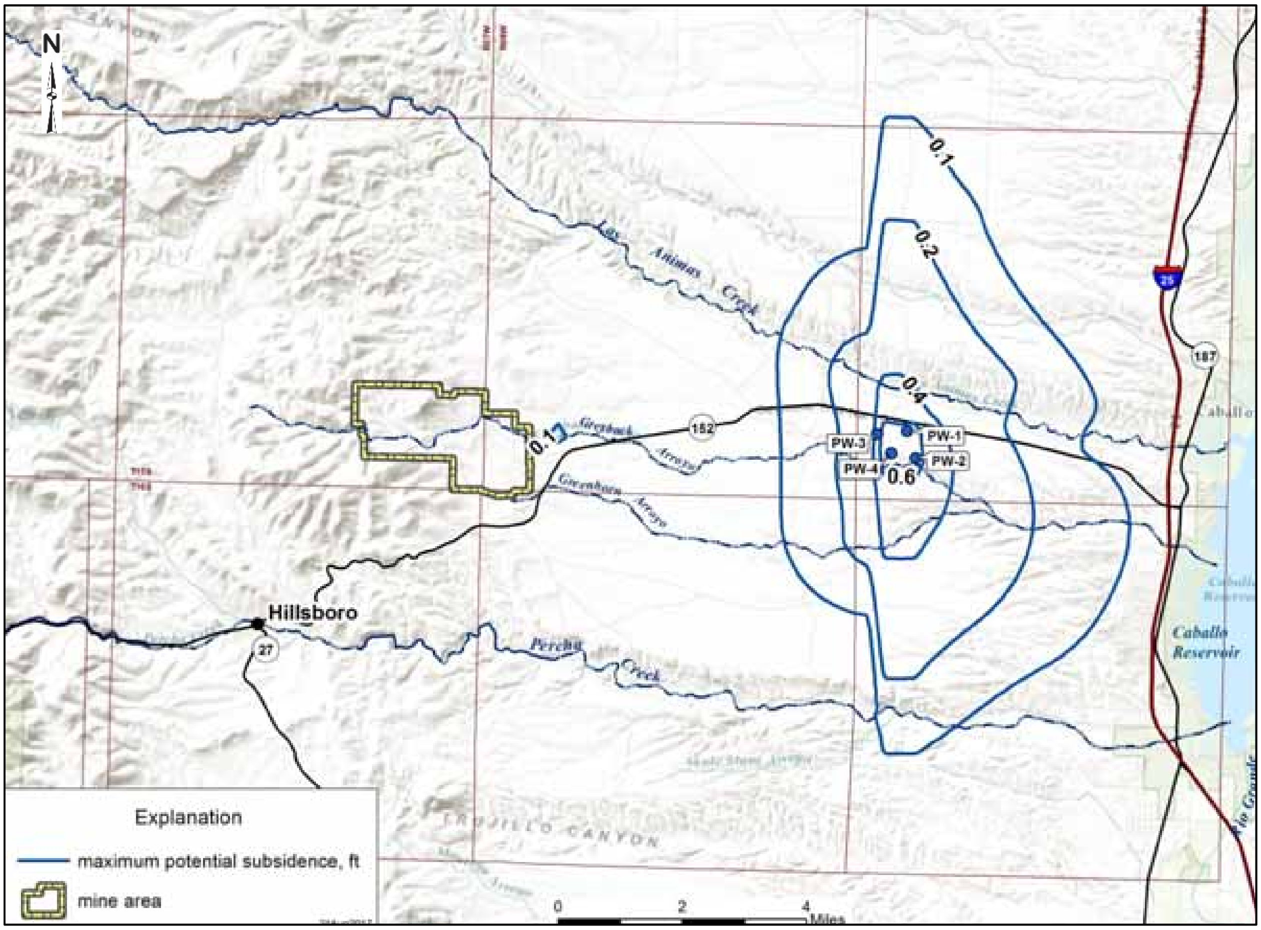

Figure 3.11. Projected worst-case potential maximum subsidence.

Outside of the well field area, the maximum potential subsidence shown on Figure 3.11 is less than about 0.4 ft (less than 5 inches), not noticeable over many years, but still over-estimated; it represents the total long-term subsidence that might be expected if groundwater drawdown is maintained.

Because the maximum groundwater drawdown would only occur near the end of mining, and would be immediately followed by post-mining water-level recovery, the drawdown would not persist for an extended period, and most of the potential subsidence would not occur. Actual subsidence is expected to be minimal at the well field and nil elsewhere.

3.2 Groundwater Withdrawals From the Crystalline Bedrock

Groundwater withdrawals from the crystalline bedrock will occur during dewatering of the open pit and after mining as groundwater flows into the pit. Consequences considered below include the following:

- Groundwater drawdown occurring during dewatering of the open pit is presented in Section 3.2.1.
- Groundwater discharge to the pit and the post-mining pit water balance are presented in Section 3.2.2.
- Potential discharge of groundwater from the open pit is discussed in Section 3.2.3.
- Long-term groundwater drawdown and potential effects on springs discharging from the crystalline bedrock are discussed in Section 3.2.4.

3.2.1 End-of-Mining Groundwater Drawdown

Groundwater drawdown in the crystalline bedrock at the end of mining is shown on Figure 3.12. Drawdown approaches a maximum of about 750 ft at the bottom of the dewatered pit. Drawdown of 1 ft extends for an approximately 2-mile radius around the pit.

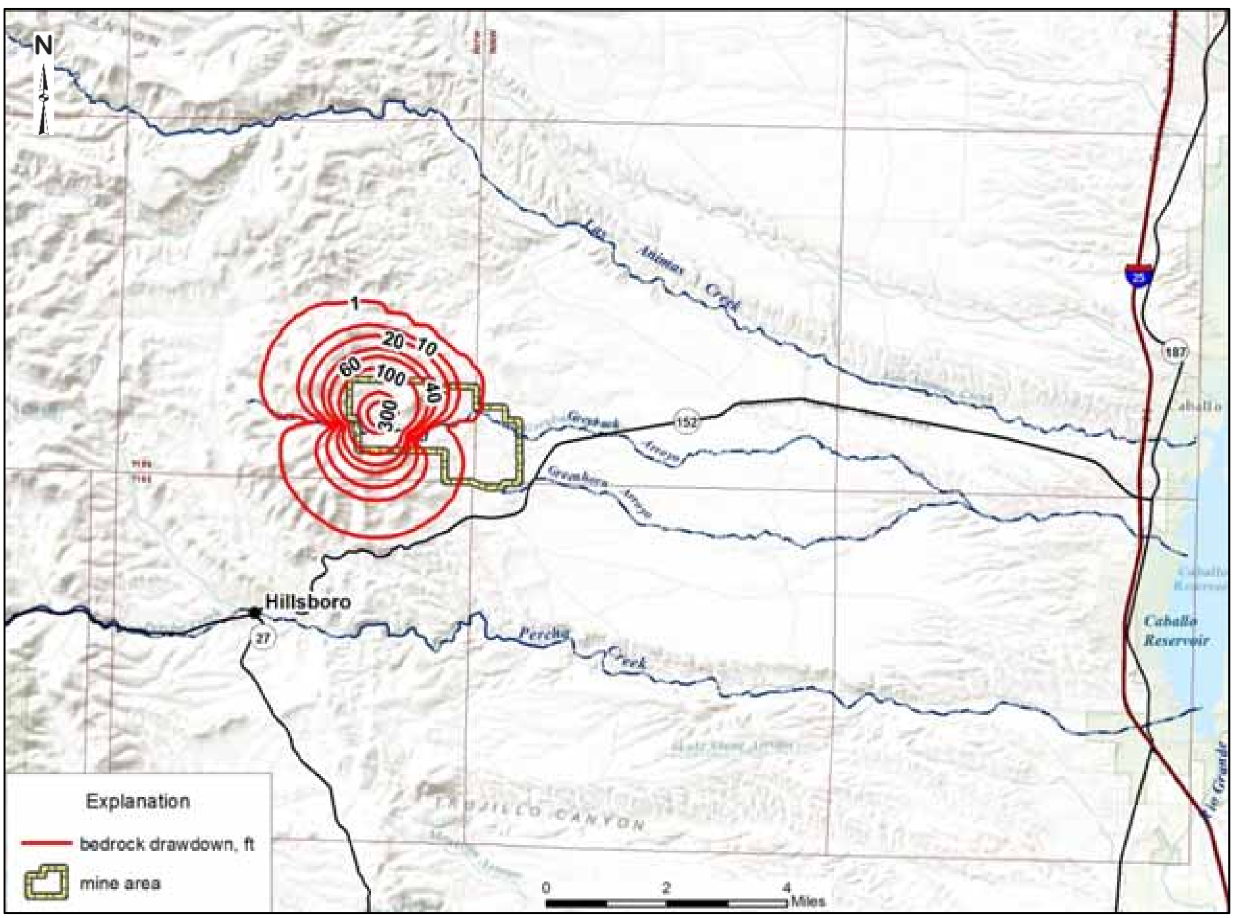

Figure 3.12. Projected end-of-mining groundwater drawdown in the crystalline bedrock.

3.2.2 Open Pit Water Balance

The post-mining pit water level and water balance were simulated assuming the pit geometry and watershed shown on Figure 3.13. The area within the pit highwall is about 129 acres, and the total pit watershed area is about 314 acres.

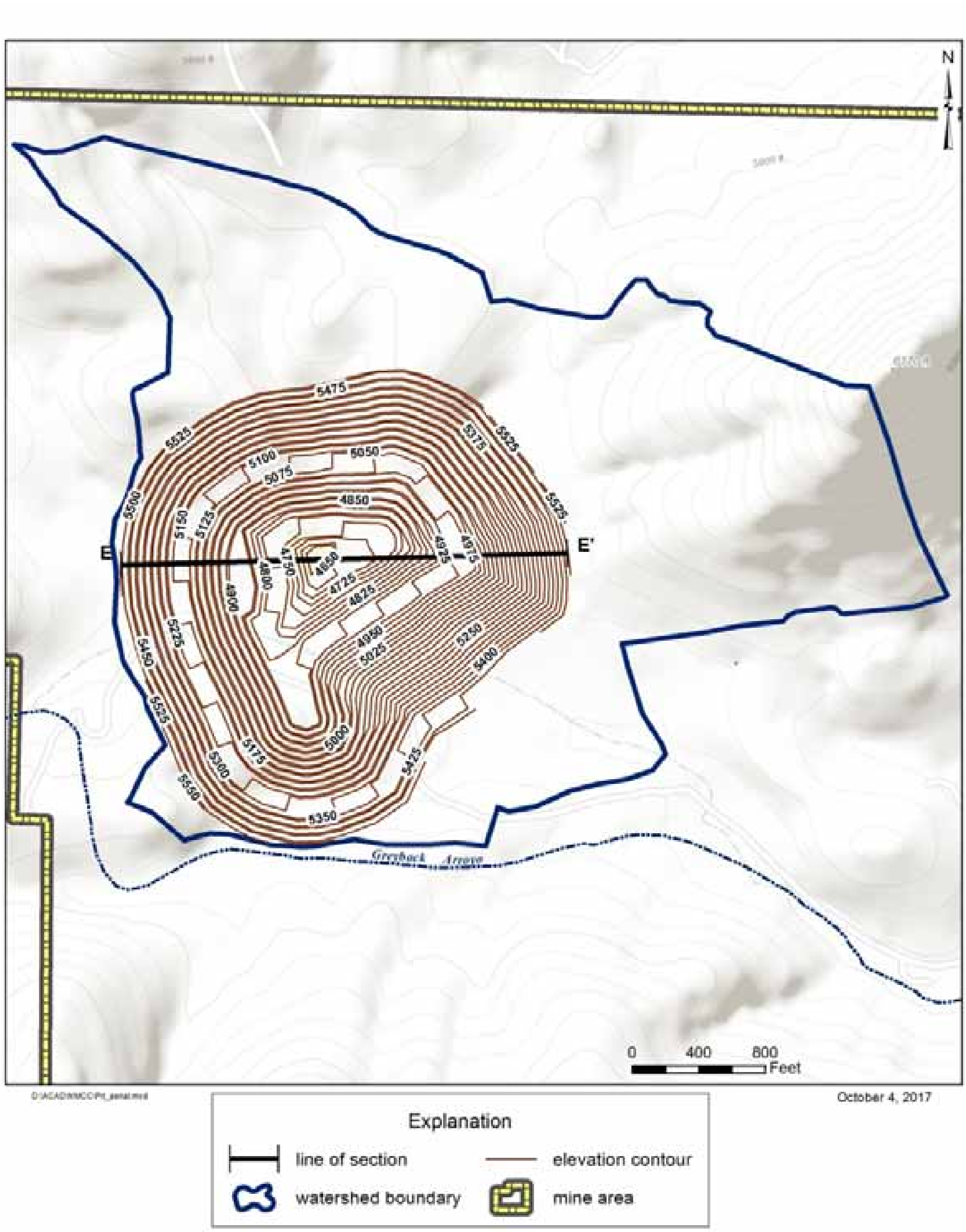

Figure 3.13. Ultimate open pit and watershed area.

Precipitation on the pit area was estimated for each month based on the record at Hillsboro (JSAI, 2014, section 2.0), with annual average precipitation of 12.5 in. Runoff from the un-reclaimed sections of the pit was simulated at 12.6 percent of precipitation, and runoff from reclaimed sections of the pit was simulated at 30.3 percent. Runoff from the remainder of the watershed was simulated at 7.1 percent of precipitation.

Evaporation from the open pit was assumed at 50 in./yr, less than the 65 in./yr estimated potential evaporation (JSAI, 2014, section 2.4) for the area. The lower rate reflects the wind and sun sheltering effects of the deep pit. Monthly evaporation rates based on the record at Hillsboro were scaled to match the annual rate of 50 in./yr.

Post-mining reclamation would include use of the water-supply wells PW-1 through PW-4, and a temporary pipeline to the bottom of the pit, to rapidly fill the pit to the expected long-term post-mining equilibrium water level. The post-mining simulation assumes this “rapid fill” scenario. Rapid filling will result in better water quality in the open pit by filling it with clean water and inhibiting oxidation of sulfide by submerging potential acid-generating sections of the pit wall (SRK, 2017).

A pumping rate of 2,726 gpm is simulated in the model, sufficient to fill the pit to elevation 4,894 ft amsl in 6 months. Total volume pumped from the supply wells will be 2,200 ac-ft. The open pit water body elevation of about 4,894 ft amsl corresponds to a water-surface area of about 21.7 acres. Water levels will fluctuate around this mean by a few feet, rising and falling seasonally and with wet and dry climatic conditions.

Simulated water level in the pit after the end of mining is presented on Figure 3.14. The final long-term water level of about 4,897 ft amsl corresponds to a water-surface area of about 22.3 acres. Water levels will fluctuate around this mean, rising and falling seasonally and with wet and dry climatic conditions.

The simulated annual pit water balance is presented on Figure 3.15, showing a final pit water balance of about 93 ac-ft/yr, with about 57 ac-ft/yr from precipitation and runoff, and 36 ac-ft/yr from groundwater inflow, all discharging as evaporation from the pit water surface.

After reclamation, groundwater levels in the bedrock around the open pit will remain below pre-mining levels, due to groundwater flowing to the open pit and discharging as evaporation from the hydrologic sink. Future water-level patterns can be seen in the hydrographs at selected locations, presented in Appendix A.

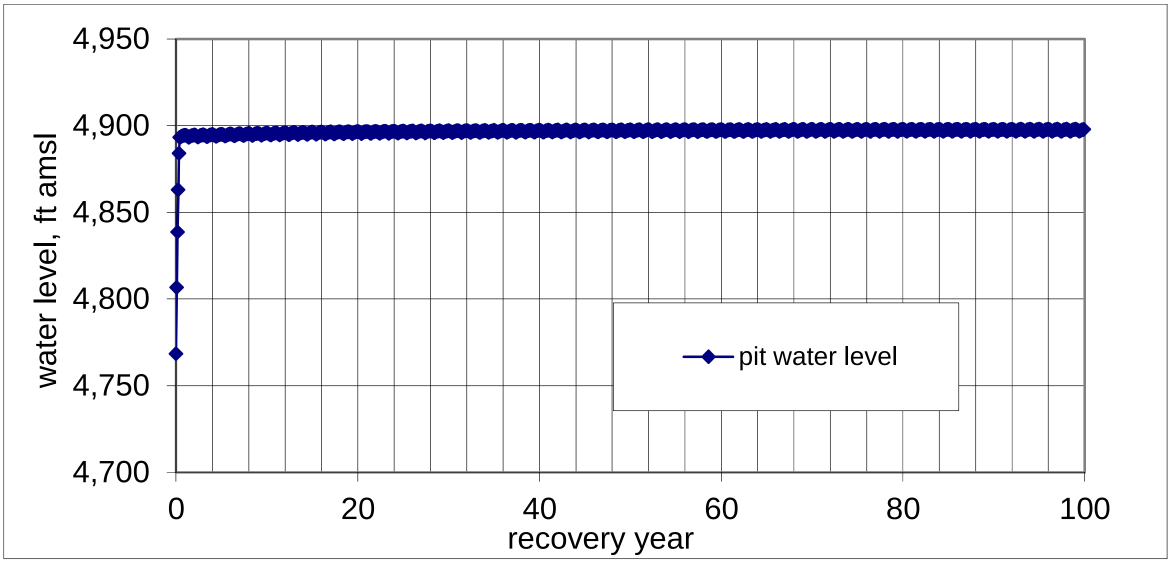

Figure 3.14. Projected open-pit water level (rapid fill in year 1).

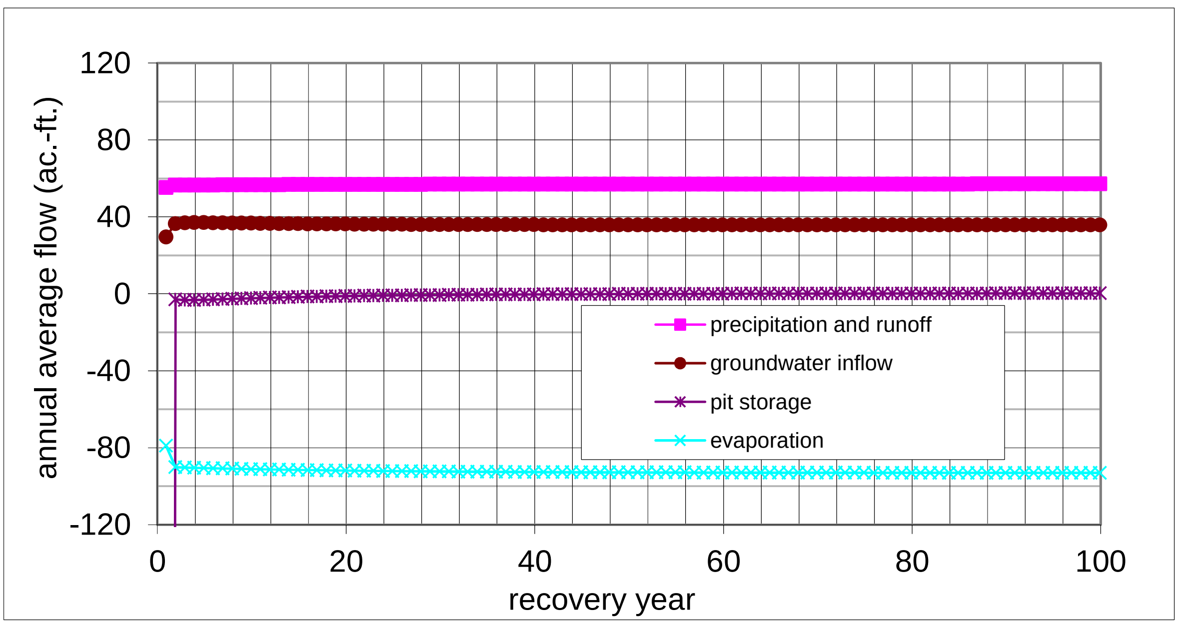

Figure 3.15. Projected open-pit water balance (rapid fill in year 1).

3.2.3 Potential Open Pit Discharge to Groundwater

The post-mining pit will be a groundwater sink, with the open pit water level below surrounding groundwater levels in the crystalline bedrock. The pit will remain a hydraulic sink after rapid filling of the pit during reclamation, and after precipitation events that raise the pit water level.

For a short period immediately following rapid fill, water may flow out of the pit into the dewatered space around it, then return to the pit as conditions equilibrate. Model-simulated flow to this dewatered space during the 6-month rapid filling totals 0.74 ac-ft. This water remains in the immediate vicinity of the pit wall before returning to the pit.

The hydraulic conditions around the pit are shown in cross-section on Figure 3.16 for pre-mining, end-of-mining, and 100-year post-mining conditions. The pit will remain as a hydraulic sink during temporary water level fluctuations because of the deep cone of depression caused by dewatering and maintained by water surface evaporation.

In order for it to be possible for water to flow from the pit to groundwater, the open pit water level would have to be higher than surrounding groundwater (>5,100 ft elevation). No conceivable storm event, wet year, or even wet decade could possibly add enough water to the pit to reach the water level required to achieve flow-through.

The projected post-mining potentiometric surface, including the closed contours around the hydraulic sink of the open pit, is shown in plan view on Figure 3.17.

3.2.4 Effects on Springs

Spring locations identified in the area (INTERA et al., 2012; BLM, 2015) are shown on Figure 3.18. The springs fall into several groups: (1) springs discharging on the Animas Uplift, (2) springs discharging in the Animas graben west of the uplift and (3) springs discharging to the Palomas Basin, at the eastern edge of the uplift and along parallel fault trends stepping down from the Uplift into the Basin.

The springs of the Animas Uplift (BG1, BG2 and other occasional seeps) are fed by local, perched groundwater systems or by near-surface circulation of local precipitation, and are ephemeral (INTERA et al., 2012), flowing only after precipitation events. These would not be affected by the flow of groundwater toward the open pit within the crystalline bedrock.

Springs of the Animas Graben, including Warm Spring (WS), WSCS-A, CSCS-B, CSCS-C and Cave Creek Spring, discharge from the SFG deposits west of the Animas Uplift. The source of their water is the Las Animas Creek and Percha Creek watersheds west of the Animas Uplift. The andesite of the uplift acts as a barrier to flow at depth (JSAI, 2014, p.24) and the groundwater systems of the graben and the uplift are separate. Flow at springs in the Animas Graben will therefore not be directly affected by the movement of groundwater in the Animas Uplift toward the open pit.

Springs discharging at the east edge of the Animas Uplift include Warm Spring on Animas Creek and PCS-A on Percha Creek. In the Palomas Basin east of the uplift, springs discharge from alluvium along Las Animas Creek, along a set of fault structures parallel to the uplift.

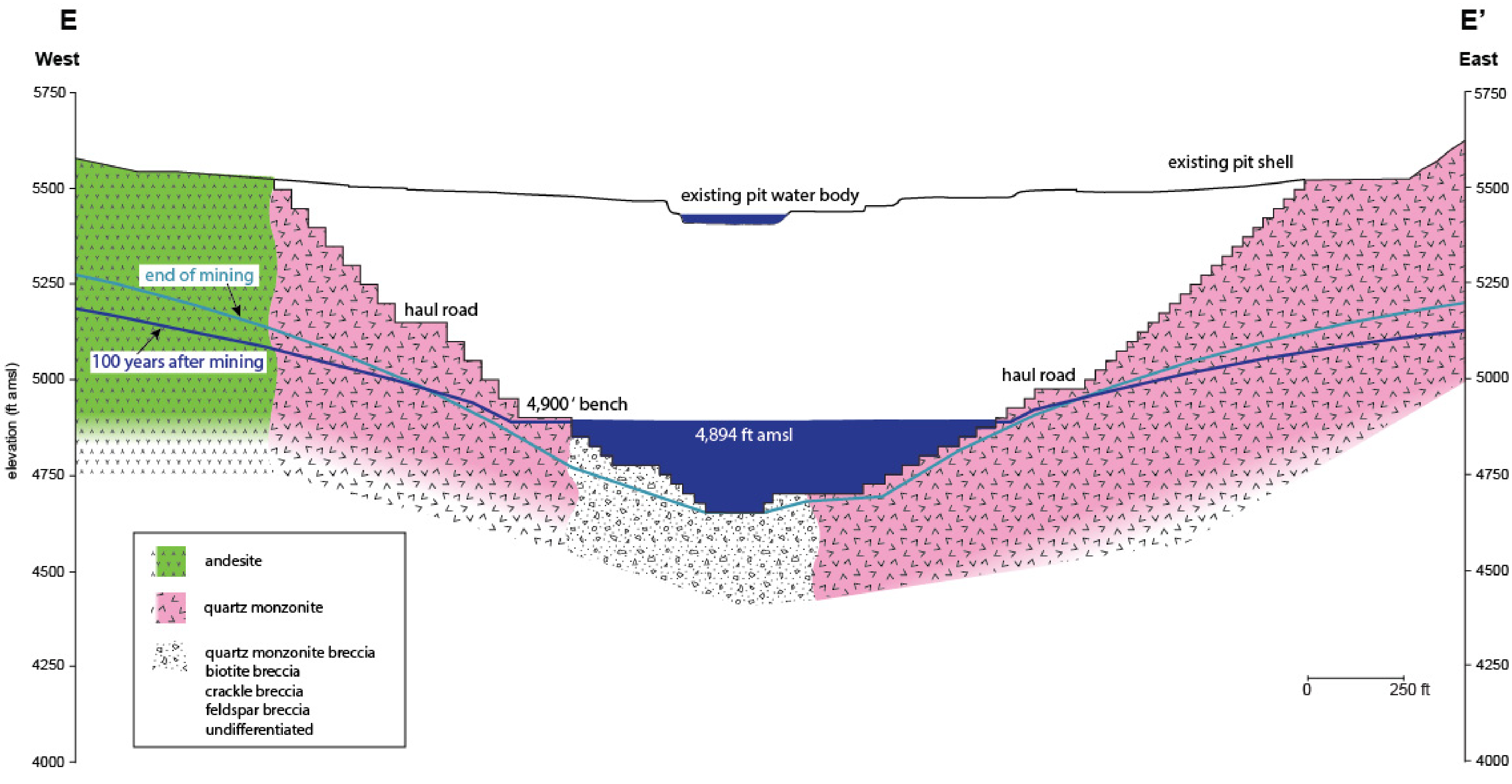

Figure 3.16. West-to-east hydrogeologic cross-section E-E' showing water-level profile across existing pit and proposed open pit after rapid fill.

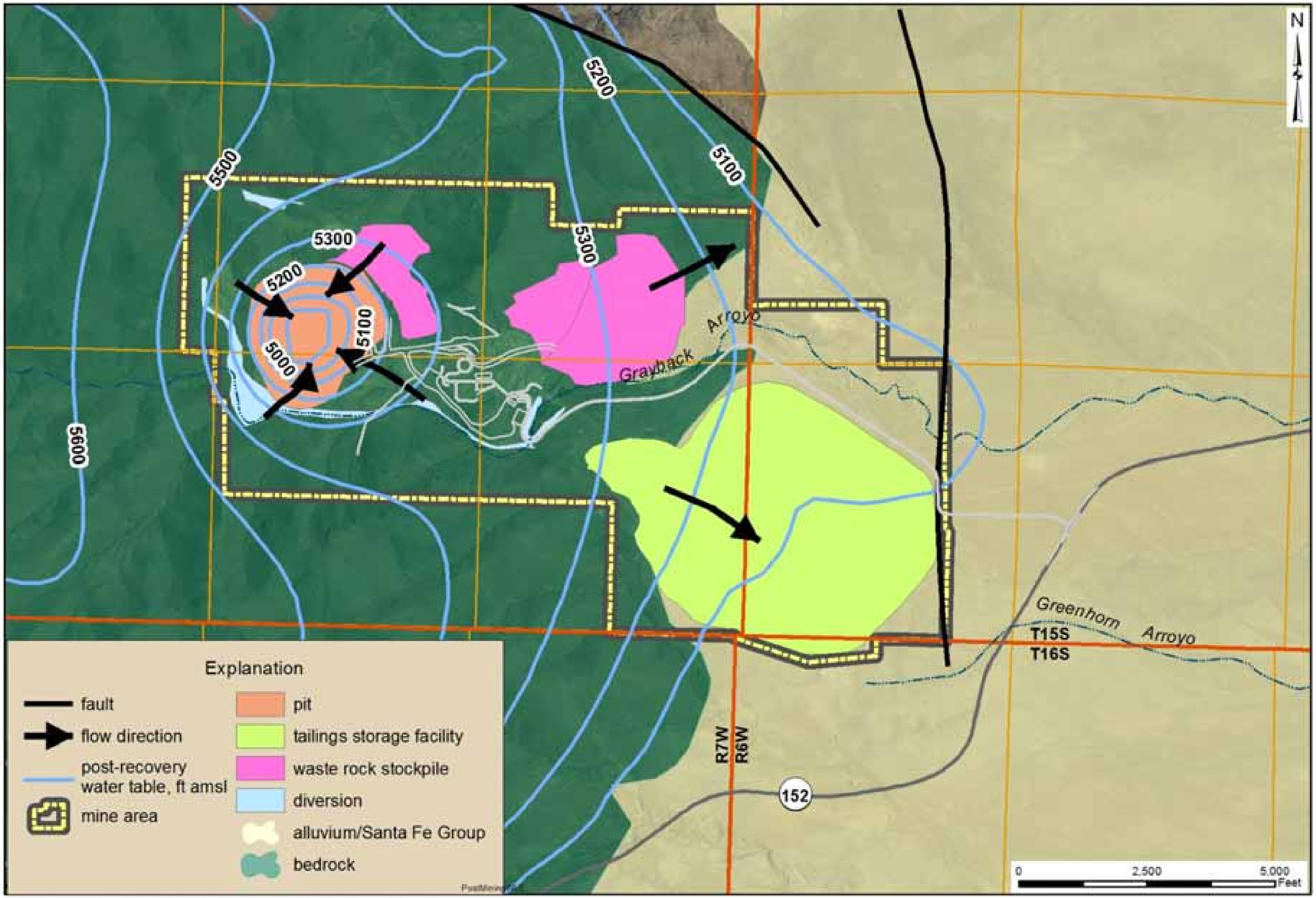

Figure 3.17. Proposed mine facilities and projected post-mining groundwater elevation.

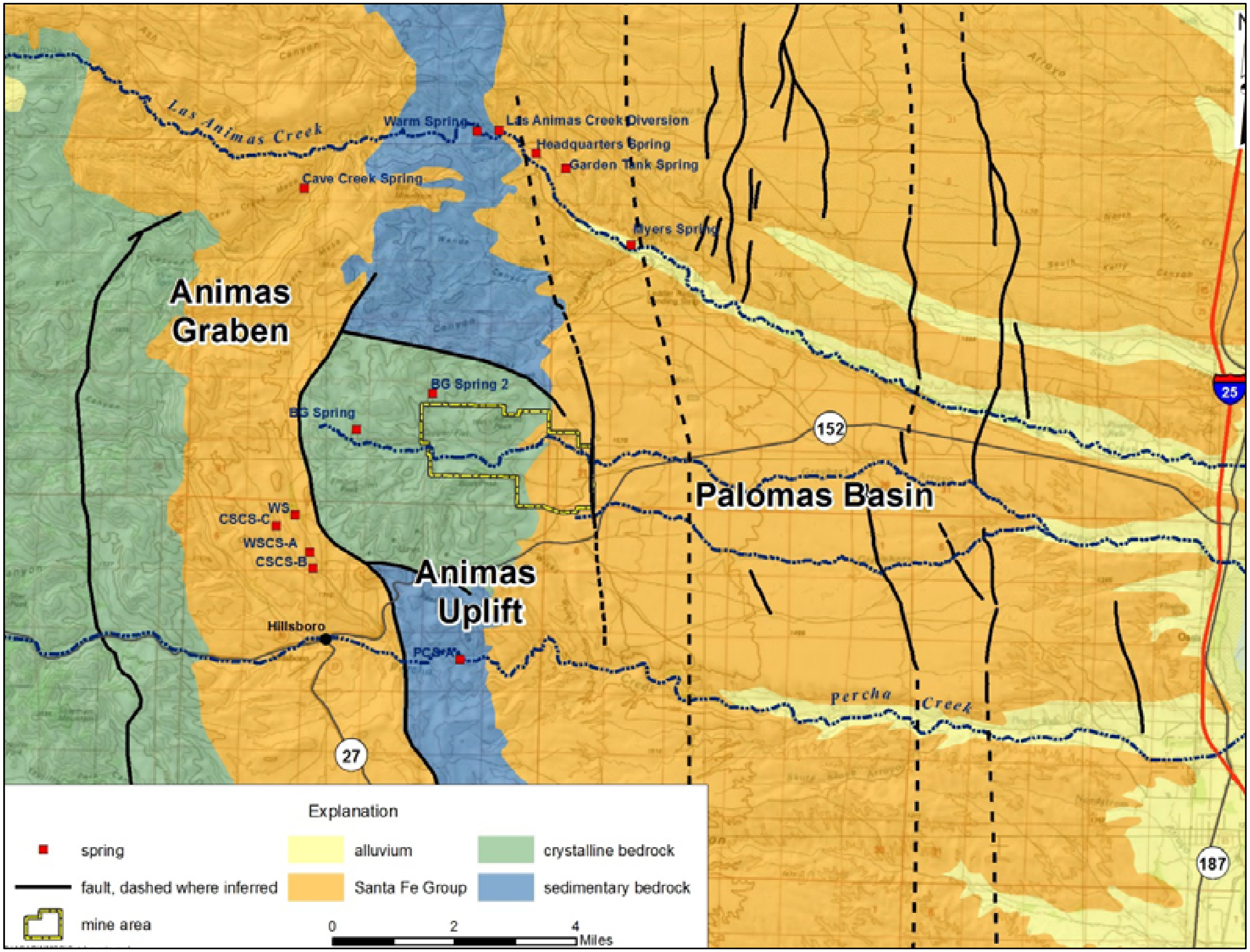

Figure 3.18. Locations of springs in and around the Animas Uplift.

The active springs of the Animas Graben and of the eastern edge of the uplift and the Palomas basin could be indirectly affected by the project if groundwater levels were lowered through indirect connection to the Animas Uplift. Future groundwater level change at each potentially affected location was evaluated using the numerical model. Results are summarized on Table 3.5.

Table 3.5. Projected groundwater-level change (in ft) at spring locations

	end of mining	100y post-mining
CSCS-C	0.01	0.16
WS	0.02	0.19
WSCS-A	0.01	0.13
CSCS-B	0.01	0.12
Cave Creek	0.05	0.15
PCS-A	0	0
(Animas) Warm	0.02	0.05
Myers	0.01	0.01

For the Animas Graben springs, groundwater level is projected to decline by up to 0.19 ft (2.3 in.), 100 years after the end of mining. Discharge is not expected to decrease because the source of water for these springs is west of the Animas Uplift (JSAI, 2014, p. 24). However, discharge locations could move a short distance due to a change in water level.

In the eastern part of the uplift, projected maximum change in water level is 0.05 ft (0.6 in.) at Animas Warm Spring. On Percha Creek, no water level change is projected at PCS-A, either during mining or in the 100 years following the end of mining. In the Palomas Basin, water level at Myers Spring is projected to decline by 0.01 ft (0.12 in.).

No direct effects to identified springs are predicted to occur as a result of the project, because (1) the springs of the Animas Uplift are ephemeral, precipitation-event-fed springs unrelated to the bedrock groundwater system, (2) the springs of the Animas Graben are fed by groundwater from the west and from depth, chemically unrelated to groundwater of the Uplift.

Small indirect effects may occur, however, due to lowering of groundwater levels in the Animas Graben or in the western edge of the Palomas Basin, due to an attenuated connection with the crystalline bedrock of the Animas Uplift. The small, long-term projected effects presented on Table 3.5 conservatively assume that these attenuated connections exist, although they have not been observed in reality.

In conclusion, the direct effects of the Project on mapped springs are projected to be zero. The long-term indirect effects presented (maximum of 2.3 inches over 100 years) are too small and manifest too slowly to be measureable or significant.

3.3 Potential Discharge From Tailings and Waste Rock Stockpiles

Potential for groundwater infiltration from the TSF is evaluated in Section 3.3.1. Potential for groundwater infiltration from the WRSPs is evaluated in Section 3.3.2. Groundwater flow paths and travel times down-gradient from the facilities are evaluated in Section 3.3.3.

The area of the mine including the open pit, waste rock storage facilities, and the tailings impoundment are shown above on Figure 3.17. The WRSPs lie on crystalline bedrock, while the TSF lies partially on SFG sediments.

Contours of the projected post-mining water-table surface, and arrows indicating the directions of groundwater flow, are also shown on Figure 3.17. Any infiltration from the WRSP around the pit would flow into the pit, while any infiltration from the eastern-most WRSP or from the TSF would flow northeast and southeast, respectively.

3.3.1 Tailings Infiltration

Because the tailings impoundment will be lined, infiltration from the tailings is not expected. However, unexpected sources of potential infiltration include manufacturing defects in the liner and other holes, in the liner and along the seams, developed during placement.

NMCC considers the potential for leaks in the liner to be very unlikely. Nonetheless, the potential occurrence of leaks in the tailings facility liner was evaluated based on previous analyses presented in Appendix B. An assumed liner leak occurrence for the purpose of evaluation is one circular defect per acre, with a standard defect area of 1.0 cm^2 (corresponding to a round hole diameter of 1.128 cm).

The rate of leakage through the defect, assuming a compacted bedding layer beneath the liner and an underdrain system above the liner (Golder, 2016), is given (Appendix B, equation 1) by

$$q=\beta_c[1+0.1(h_w/L_s)^{0.95}]a_d^{0.1}h_w^{0.9}K_s^{0.74}$$

where,
- q is flow through a circular defect
- β_c is the coefficient relating to liner contact with bedding material (0.21 for good contact)
- h_w is the depth of water above the geomembrane
- L_s is the thickness of bedding material
- a_d is the area of the defect (1 cm^2)
- K_s is the saturated hydraulic conductivity of bedding material

Because the impoundment is designed with a 1.5-ft-thick drainage layer above the liner (Golder, 2016), head on the liner h_w will be less than 1.5 ft. Assuming the standard defect size (a_d = 1.0 cm²) occurring once per acre and the design bedding layer conductivity (K_s =10^{-6} cm/s), leakage from the lined 536-acre (Golder, 2016) tailings storage facility is estimated in Table 3.6 at about 0.5 gpm. The total area of the tailings storage including surrounding facilities is approximately 630 acres, but the active storage area is 536 acres. As shown by the data in Table 3.6, the probable hydrologic consequence from a postulated leak in the liner is nil.

Table 3.6. Potential tailings liner leakage

B_c	0.21
h_w	1.5 ft
L_s	1 ft
a_d	1.0 cm²
K_s	1x10^{-6} cm/s
q	0.0009 gpm/acre
total flow	0.5 gpm

3.3.2 Waste Rock Stockpile Infiltration

Significant infiltration from the waste rock is unlikely because:

1. The waste rock lies on low-permeability (model-calibrated permeability < 10^{-6} cm/s) andesite bedrock. The andesite will function as a liner.
2. The waste rock will be deposited dry; precipitation infiltrating into the waste rock will tend to be held in storage above the water table. Depth to water in the area ranges from about 50 to 100 ft below ground level.
3. The waste rock deposits will be reclaimed and covered with a 3-ft-thick engineered low-infiltration store-and-release type cover. The cover will have the capacity to retain most precipitation events in storage, without percolation through to the waste rock below. Stored precipitation will eventually be released as evapotranspiration. The cover would only allow water into the waste rock after extreme precipitation events.

To summarize, the waste rock cover will prevent most precipitation from reaching the waste rock. The water infiltrating will be held in storage due to the unsaturated state of the waste rock. During operations, any water that flows through the waste rock will reach the low-permeability andesite liner, and will flow along the andesite surface to collection ponds at the base of the facility. Post-mining, the reclamation cover will prevent water infiltration into the waste rock. Surface water run-on will be diverted around and away from the reclaimed WRSPs.

Therefore, water available to enter the SFG aquifer is expected to not provide a significant probable hydrologic consequence.

Infiltration through the cover was evaluated based on reasonable hydraulic properties for a single-layer cover material, shown in Table 3.7, and on the distribution of daily evaporation and the more than 100-year record of daily precipitation at Hillsboro (JSAI, 2014, fig. 2.3), using a 1-dimensional model of variably saturated flow and infiltration (Niswonger et al., 2006).

Table 3.7. Waste rock cover properties

saturated water content (percent)	20
initial water content (percent)	6
residual water content (percent)	6
Brooks-Corey exponent	2.5
cover thickness (ft)	3.0
saturated hydraulic conductivity (cm/s)	1.0E-04
specific storage (ft^{-1})	1.00E-06

cm/s - centimeter per second

Results indicate long-term infiltration through the cover of about 2 percent of precipitation, or about 0.25 in./yr. Out of the total area of the waste rock stockpiles, approximately 287 acres is subject to infiltration. Over the 287 acres, total infiltration through the cover would be about 2.1 gpm.

Of the estimated infiltration through the cover, most is expected to be retained in the waste rock. Assuming field capacity (the water content retained before downward percolation begins) of the waste rock of 6 percent, 0.25 in. of infiltration would wet a 4.2-in. thickness of waste rock to field capacity. At this rate, it would require hundreds of years of repeated infiltration events to produce internal flow of water within the waste rock.

Of the infiltration through the cover that is not retained in the waste rock (discharging through preferential flow paths), most will flow on top of the andesite. Discharge into the groundwater system (SFG aquifer) is expected to be nil.

4.0 CONCLUSIONS

The probable hydrologic consequences from development of the Copper Flat Project were evaluated for the mine area and affected area using the numerical model of groundwater flow developed by JSAI (2014).

The objective of this report was to develop a determination of the probable hydrologic consequences of the operation and reclamation, on both the permit area and the affected area, with respect to the hydrologic regime, quantity and quality of surface and groundwater systems that may be affected by the proposed operations (NMAC 19.10.6.602.(13)(g)(v) of the Mining Act regulations).

Groundwater systems include:

- The regional SFG aquifer.
- Quaternary-age alluvial aquifers along Animas Creek and Percha Creek.
- The crystalline bedrock of the Animas Uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary alluvial aquifer discharges to the surface.
- An area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs discharging from the crystalline bedrock.
- Storm water flows in Grayback Arroyo.

The sources of possible hydrologic consequences of the Project include:

1. Groundwater withdrawals from the SFG aquifer: The mine water supply will be withdrawn from pumping wells PW-1, PW-2, PW-3, and PW-4. Water level in the SFG aquifer will be lowered around the well field and then gradually recover after mining. Secondary effects evaluated include:
    a. Reduced groundwater discharge to Rio Grande and Caballo Reservoir.
    b. Reduced flow to artesian wells and other effects to local groundwater users.
    c. Potential reduced discharge to shallow aquifers along Animas Creek and Percha Creek, leading to lower alluvial water levels and reduced discharge to the perennial flow and riparian areas along Animas Creek.
    d. Potential ground subsidence.

2. Groundwater withdrawals from the crystalline bedrock associated with the open pit. Water levels in the bedrock around the pit will be permanently lowered, and groundwater will flow to the pit and evaporate. Groundwater flow rates to the pit and the future open pit water level and water balance area assessed. Secondary effects evaluated include:
   a. Potential groundwater discharge from the open pit.
   b. Potential effects on springs discharging from the crystalline bedrock and on the Percha Creek perennial (riparian) area.
3. Potential for groundwater discharge from the WRSPs and TSF.

4.1 Groundwater Withdrawals From the SFG Aquifer

Water-level drawdown in the SFG aquifer is projected to reach a maximum of about 70 ft at the well field, at the end of mining. Maximum drawdown decreases with distance from the well field. Water levels will then recover over a period of about 20 to 30 years.

Total reductions in discharge to the system are projected to peak at a total of about 3,100 ac-ft/yr shortly after the end of mining, then diminish to near-zero over about 30 years (Fig. 3.3).

- Flow induced from the Palomas Graben north of the study area is projected to reach a maximum of less than 800 ac-ft/yr at the end of mining, which is estimated to result in an additional reduction of discharge to the Rio Grande by a maximum of 275 ac-ft/yr.
- Effects on the shallow groundwater (riparian) systems along Las Animas Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measureable small changes in surface flow and riparian evapotranspiration.
- Depletion to the Rio Grande is projected to peak around 2,080 ac-ft/yr at the end of mining, then reduce to 28 ac-ft/yr 100 years after mining (Fig. 3.3; Table 3.1)
- Groundwater withdrawals for water supply are not expected to result in measurable ground subsidence.

As required by NMOSE, NMCC will offset any reductions in discharge to the Rio Grande by lease or purchase of additional water rights in the amount of the model-simulated reductions to flow.

NMCC will work with the NMOSE to ensure that impairment to existing water rights by NMCC pumping, according to NMOSE criteria, will be mitigated, as appropriate, so that there is no net loss of available water to existing water rights.

No water-quality effects are expected from pumping the proposed supply wells in the affected area.

4.2 Groundwater Withdrawals From the Crystalline Bedrock

At the end of mining, groundwater-level drawdown in the bedrock around the open pit reaches a maximum of about 800 ft at the pit. A permanent cone of depression will form around the pit, with maximum drawdown of about 600 ft at the edge of the pit. The pit, which currently is an evaporative hydrologic sink, will form an evaporative hydrologic sink again in the future.

Final pit water level after mining is projected to be about 4,894 ft amsl, about 640 ft below the pit rim. The open pit water body that forms after mining and rapid fill remediation will be about 250 ft in depth and have a steady-state surface area of about 22 acres. Steady state groundwater inflow is estimated at 36 ac-ft/yr and captured storm-water runoff is estimated at 57 ac-ft/yr. Pit water evaporation is projected to be about 93 ac-ft/yr.

During operations and after reclamation, storm-water flows from Grayback Arroyo will be conveyed around the open pit in the existing bypass channel and through the mine area with no expected hydrologic consequences. Water quality effects for the open pit water body are addressed in a separate report prepared for the project.

Long-term, indirect effects to springs discharging in and around the Animas Uplift are projected to be minimal and not measureable.

4.3 Potential Groundwater Discharge From Tailings and Waste Rock

Infiltration to groundwater from the tailings and waste rock storage areas is not expected. The meteoric water that may infiltrate is expected to remain in the immediate area for centuries, due to the low permeability of the SFG sediments near the Animas Uplift and due to the presence of flow-inhibiting faults. The impact to groundwater chemistry is expected to be minimal.

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APPENDICES

Appendix A.

Projected Groundwater-Level Hydrographs at Selected Locations

APPENDIX A.

HYDROGRAPHS

Projected groundwater drawdown 100 years after mining is shown on Figure A1. Water-level change in the bedrock will be about 580 ft near the bottom of the pit.

Projected water-level hydrographs for most well locations shown on Figure A1 are shown on Figures A2 through A24.

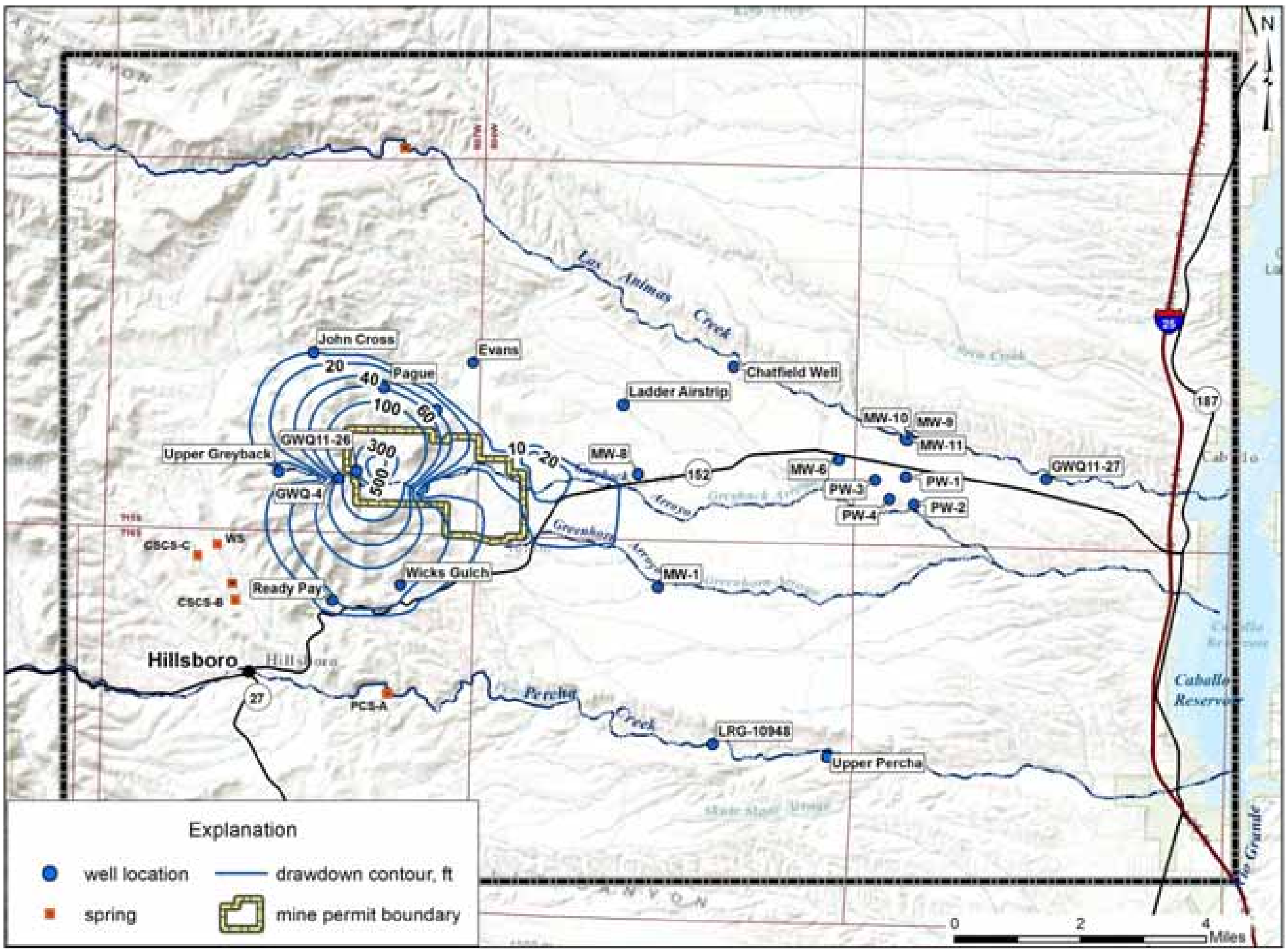

Figure A1. Projected groundwater drawdown 100 years after mining.

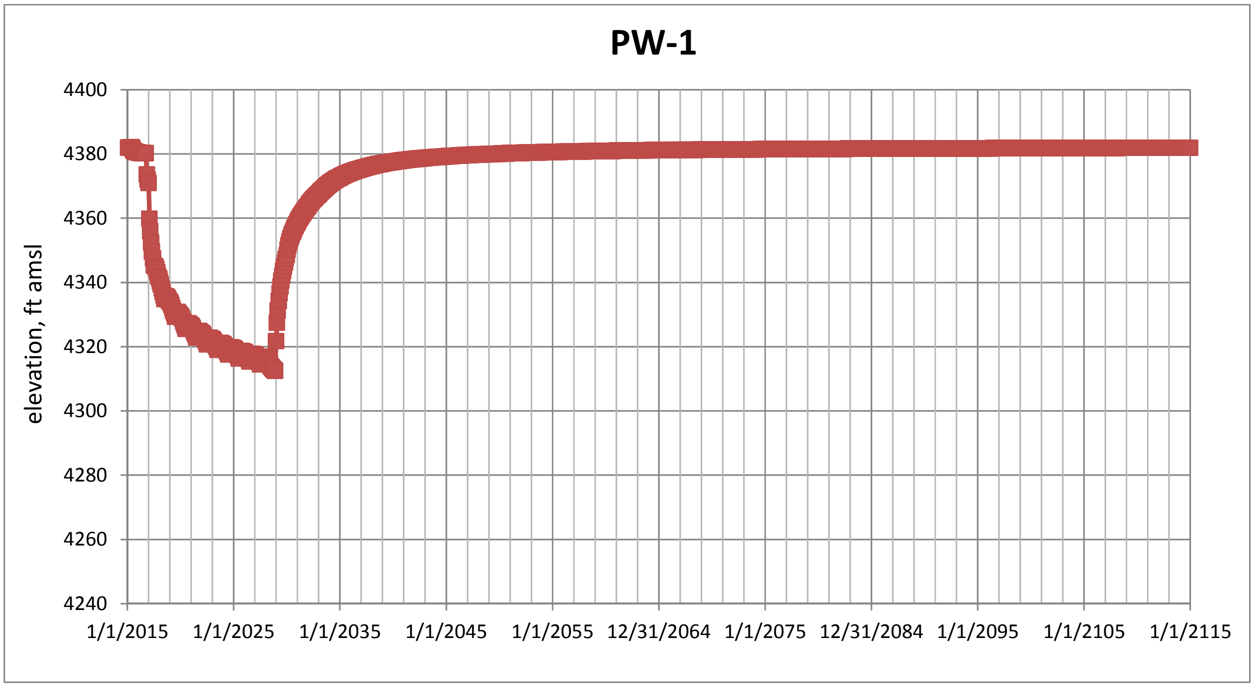

Figure A2. Projected water levels at PW-1.

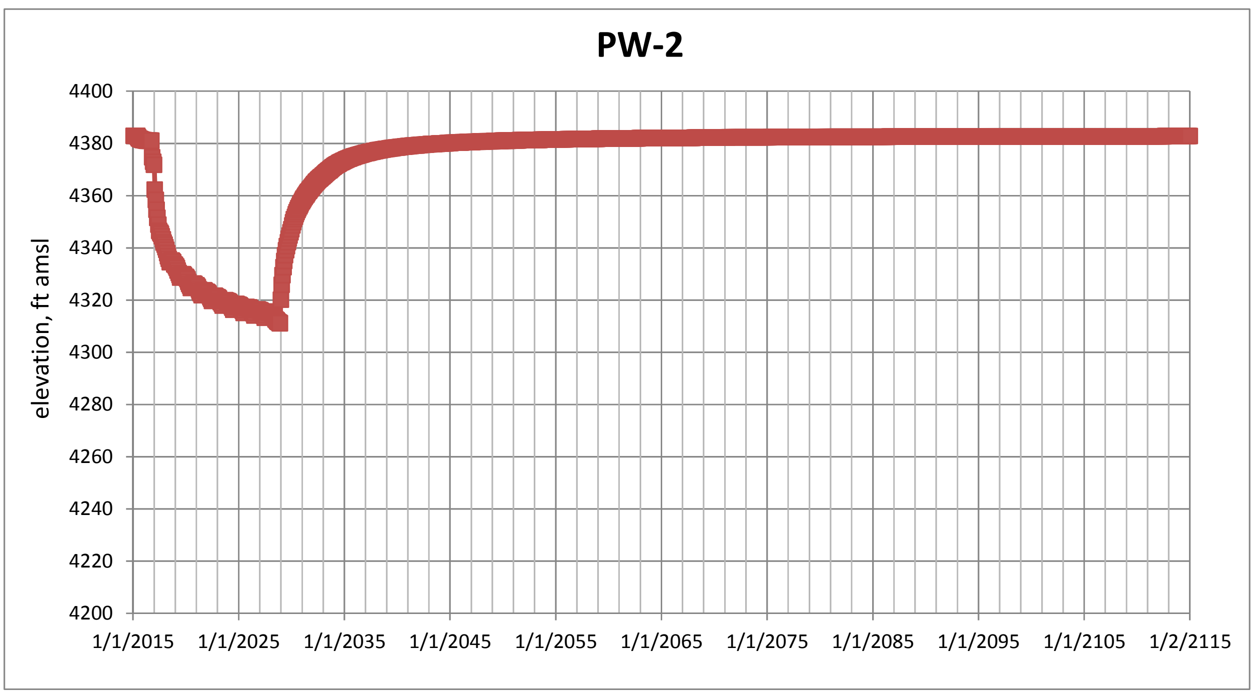

Figure A3. Projected water levels at PW-2.

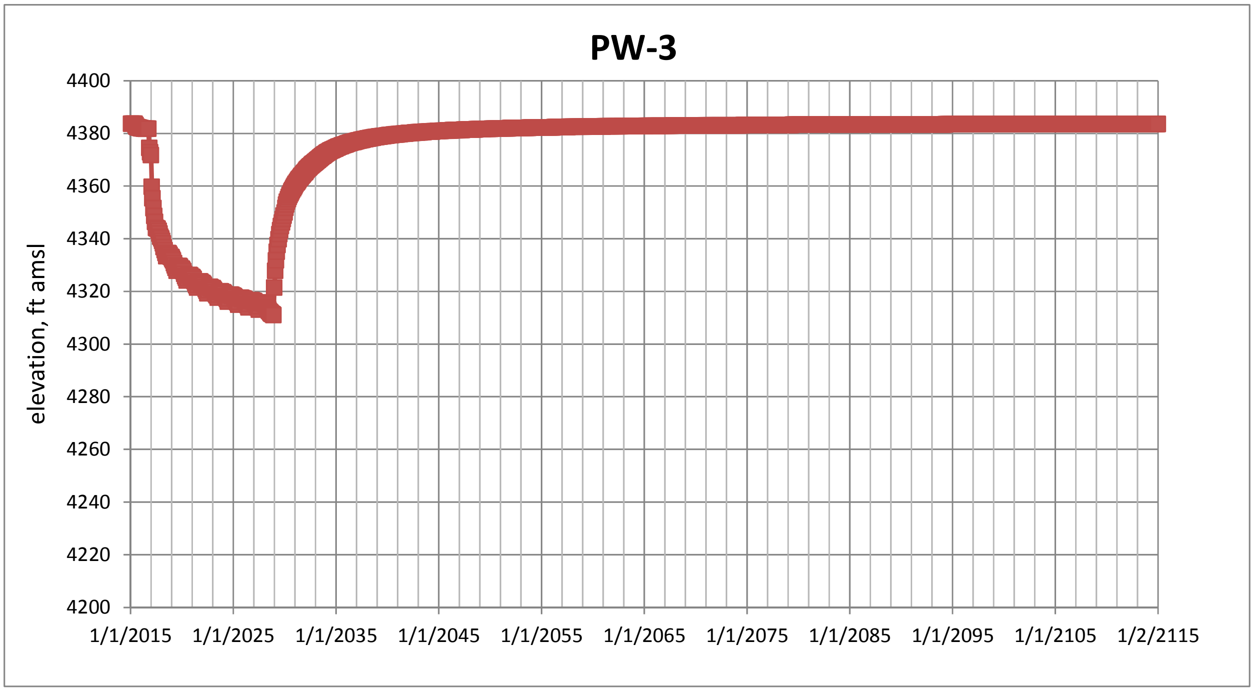

Figure A4. Projected water levels at PW-3.

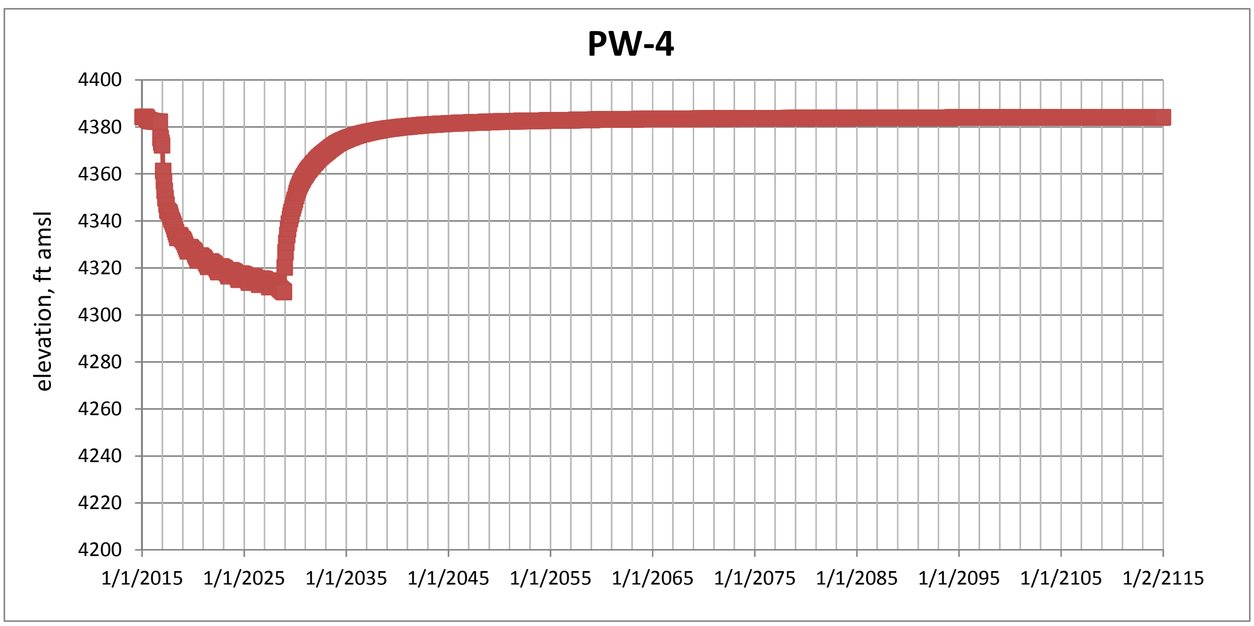

Figure A5. Projected water levels at PW-4.

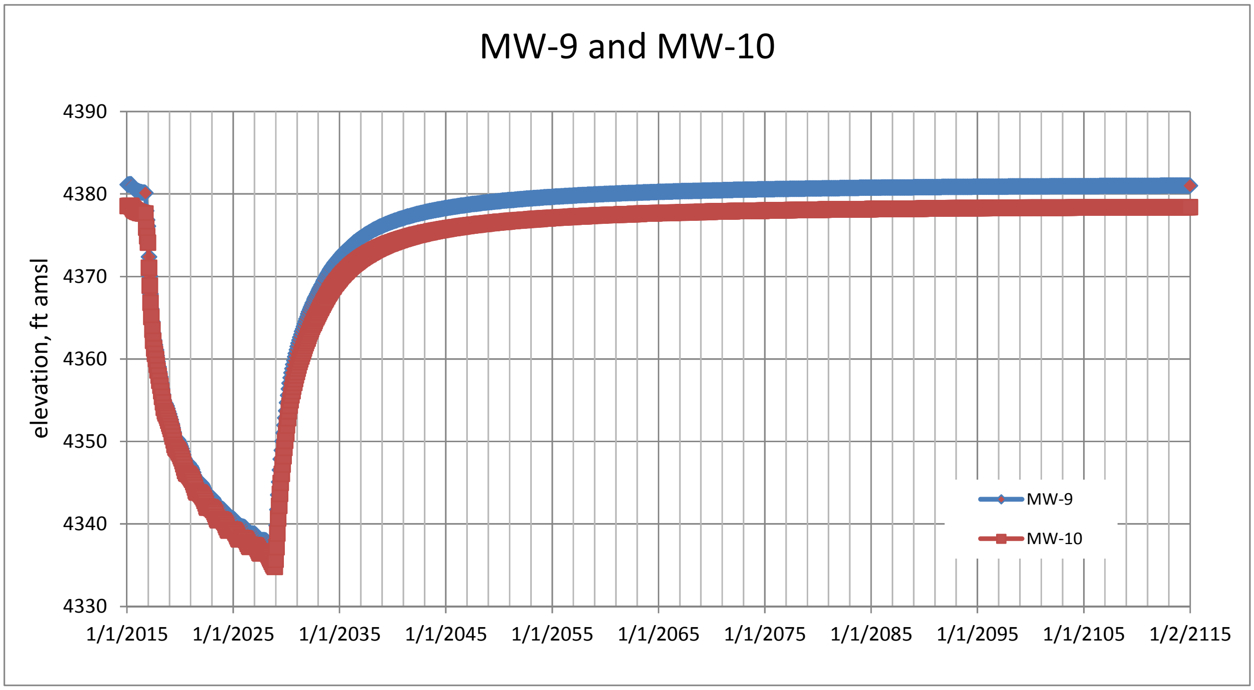

Figure A6. Projected water levels at MW-9 and MW-10.

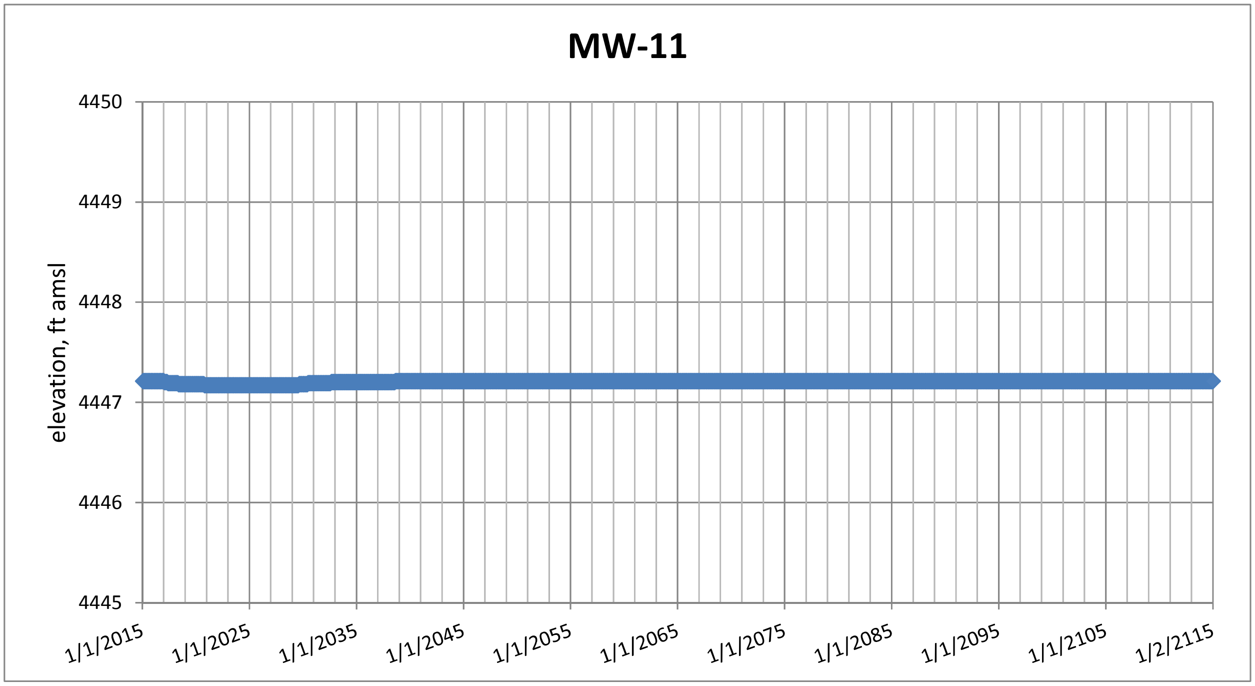

Figure A7. Projected water levels at MW-11.

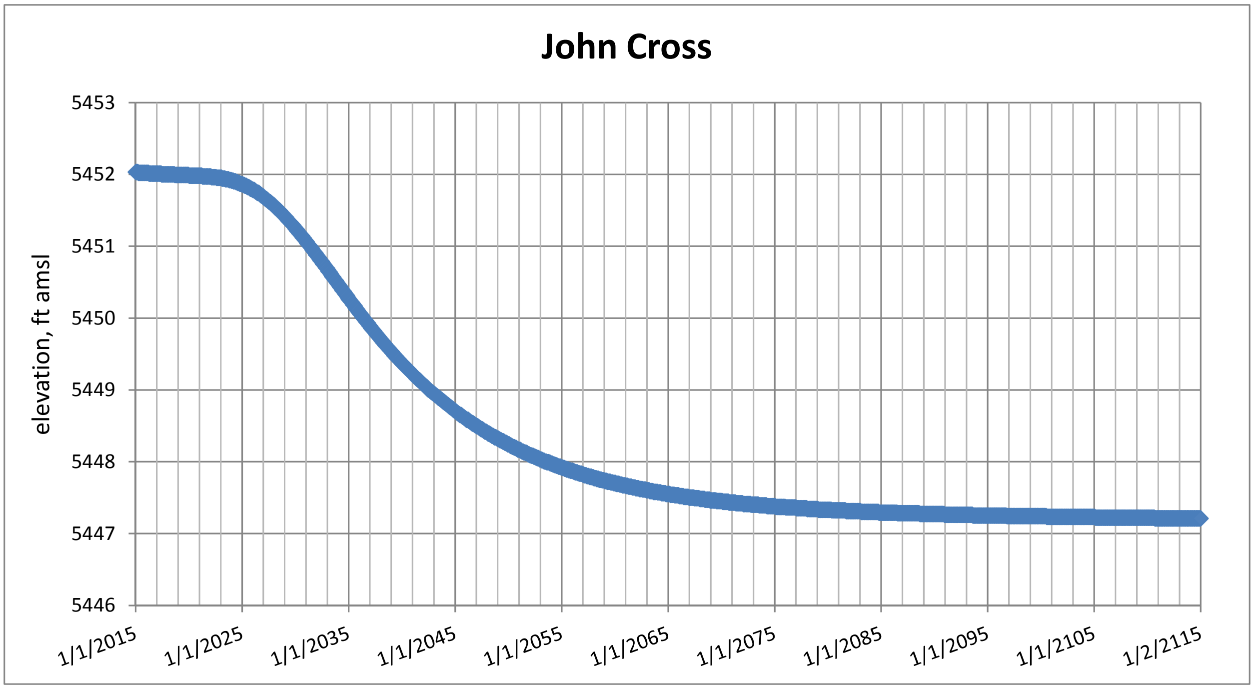

Figure A8. Projected water levels at John Cross.

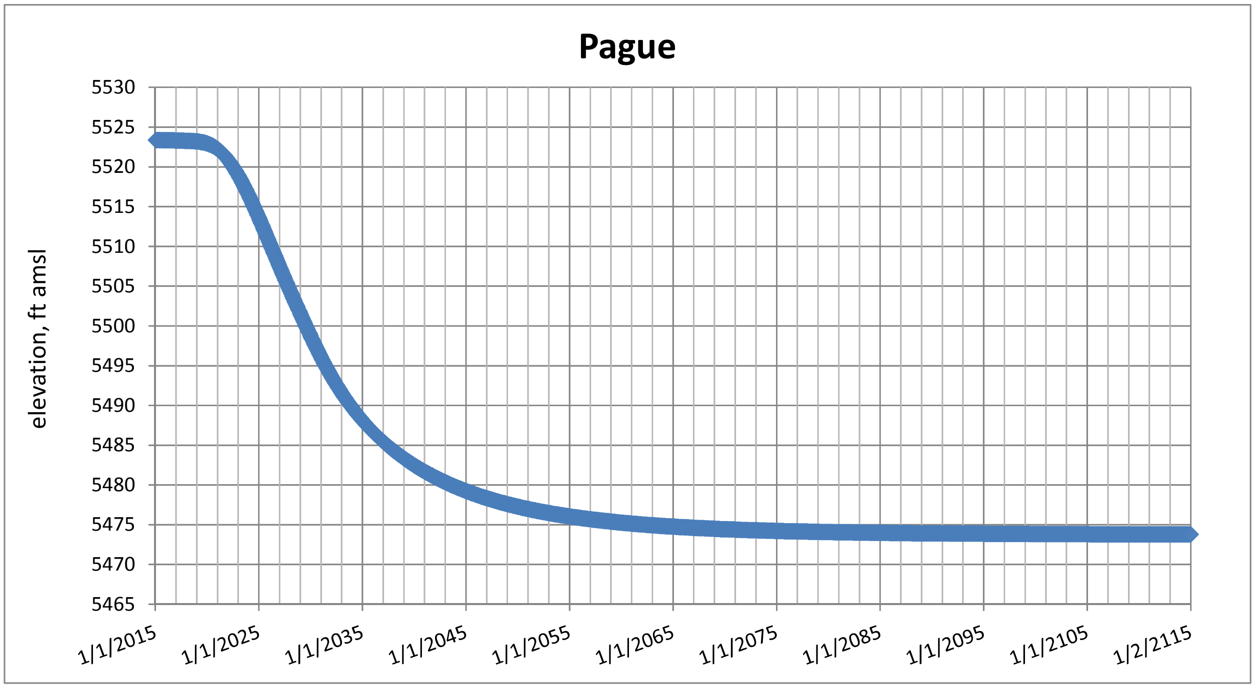

Figure A9. Projected water levels at Pague.

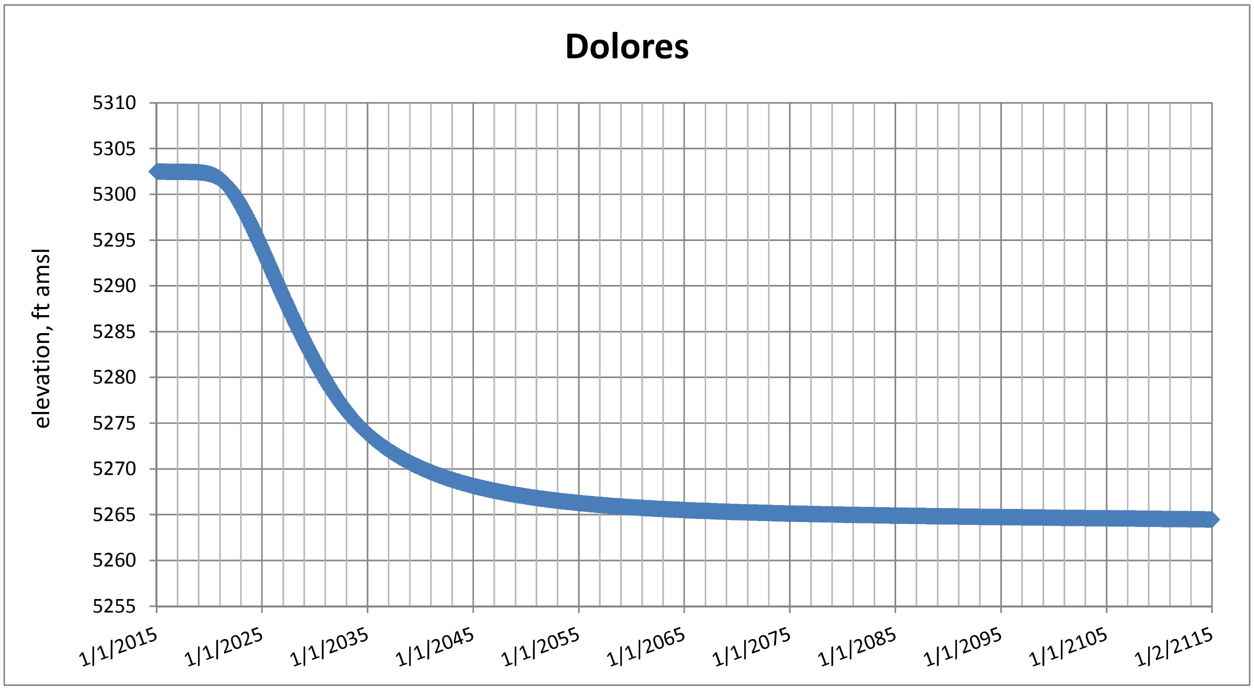

Figure A10. Projected water levels at Dolores.

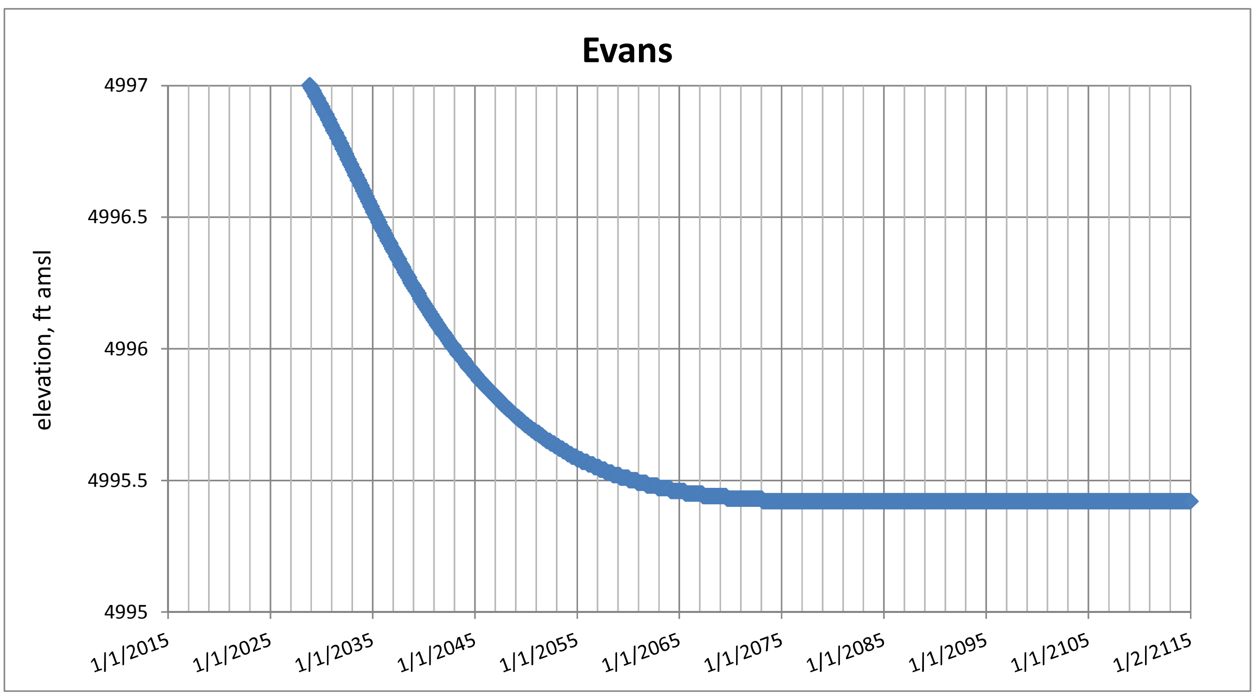

Figure A11. Projected water levels at Evans.

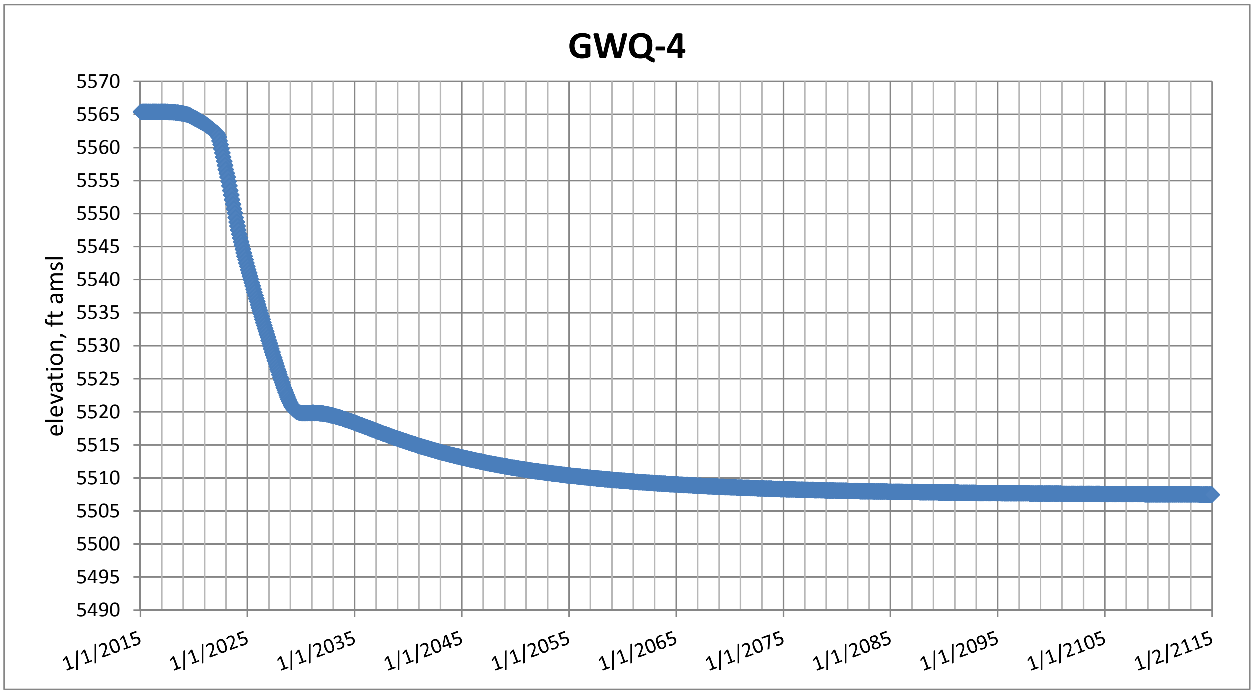

Figure A12. Projected water levels at GWQ-4.

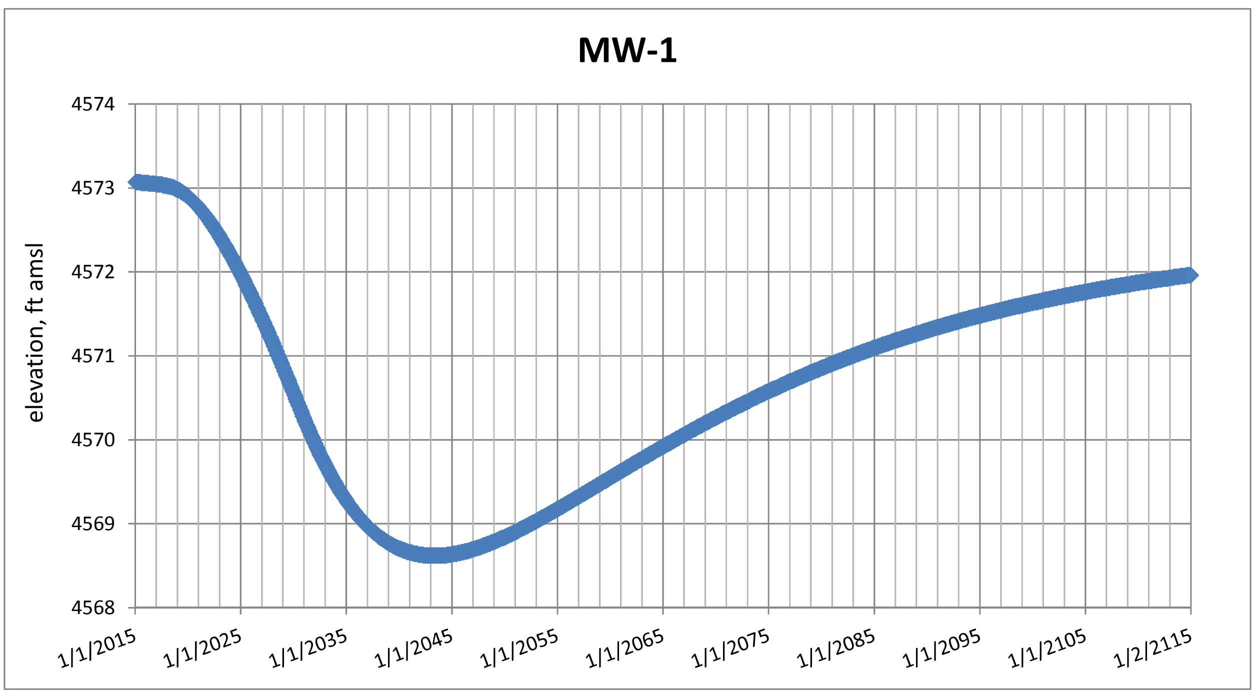

Figure A13. Projected water levels at MW-1.

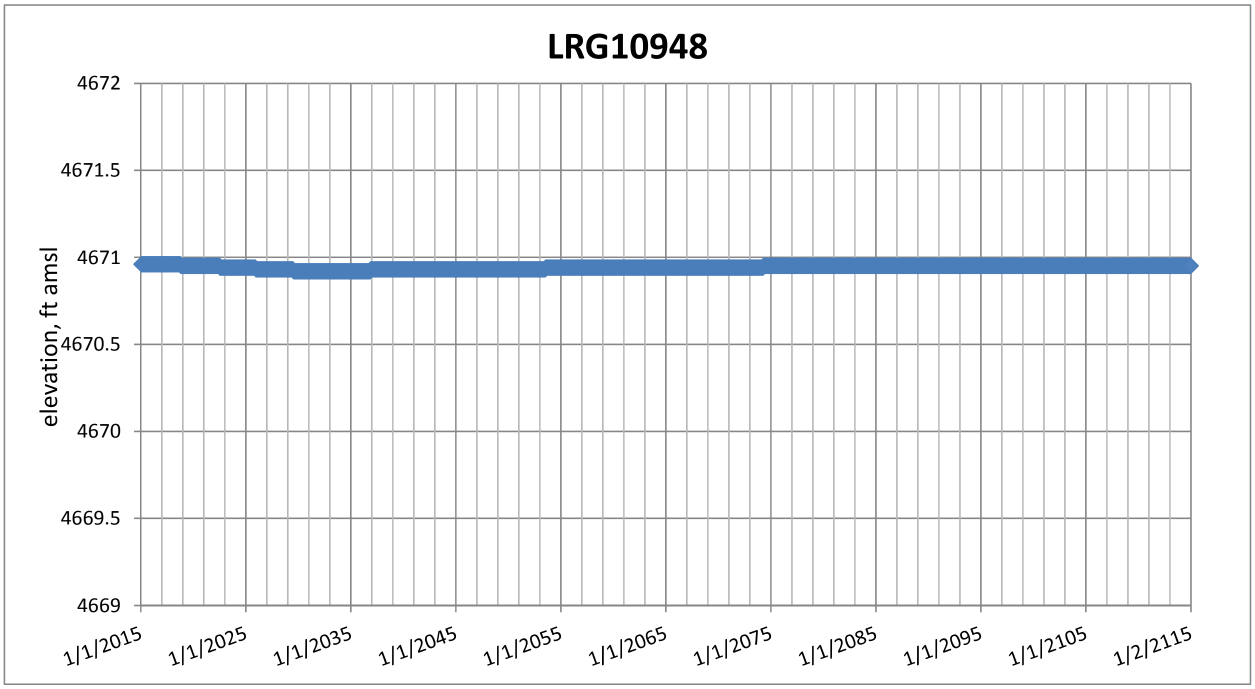

Figure A14. Projected water levels at LRG-10948.

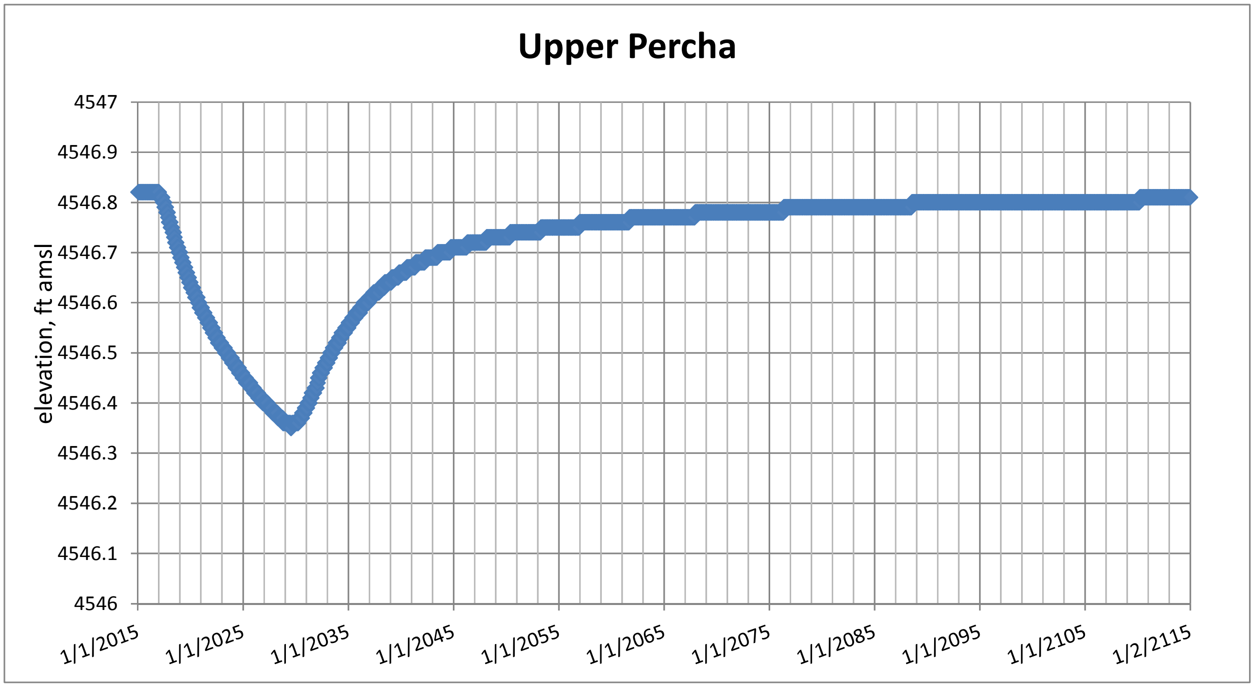

Figure A15. Projected water levels at Upper Percha.

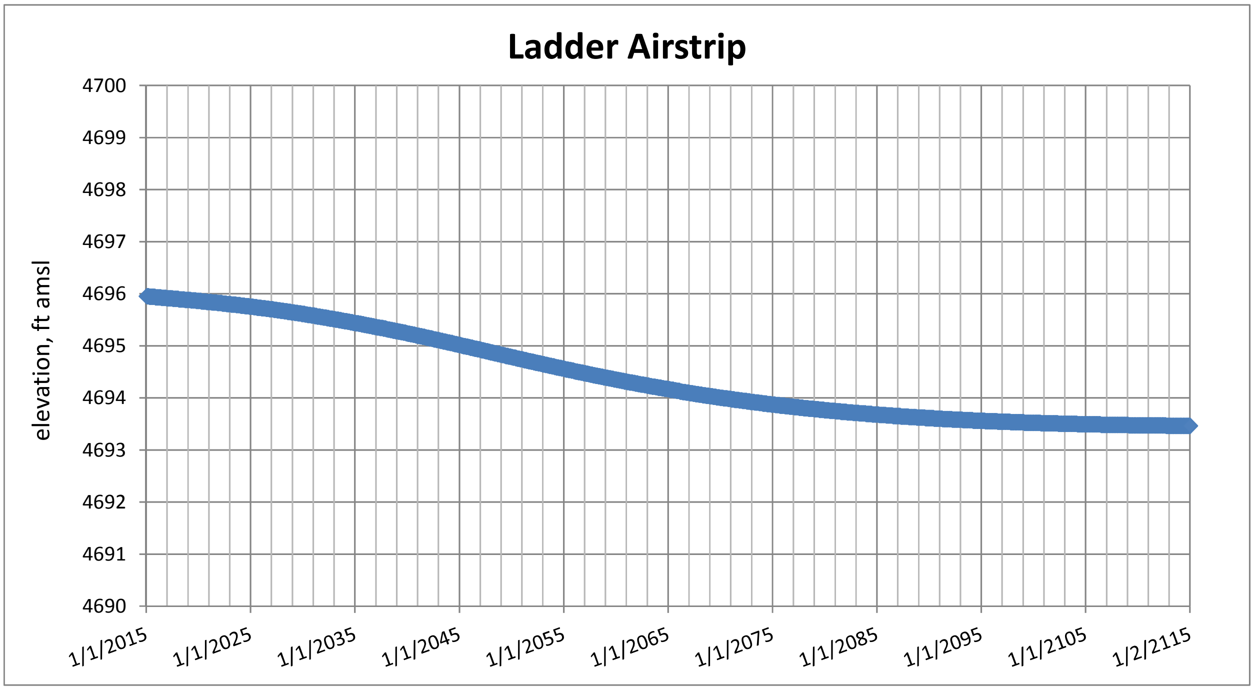

Figure A16. Projected water levels at Ladder Airstrip.

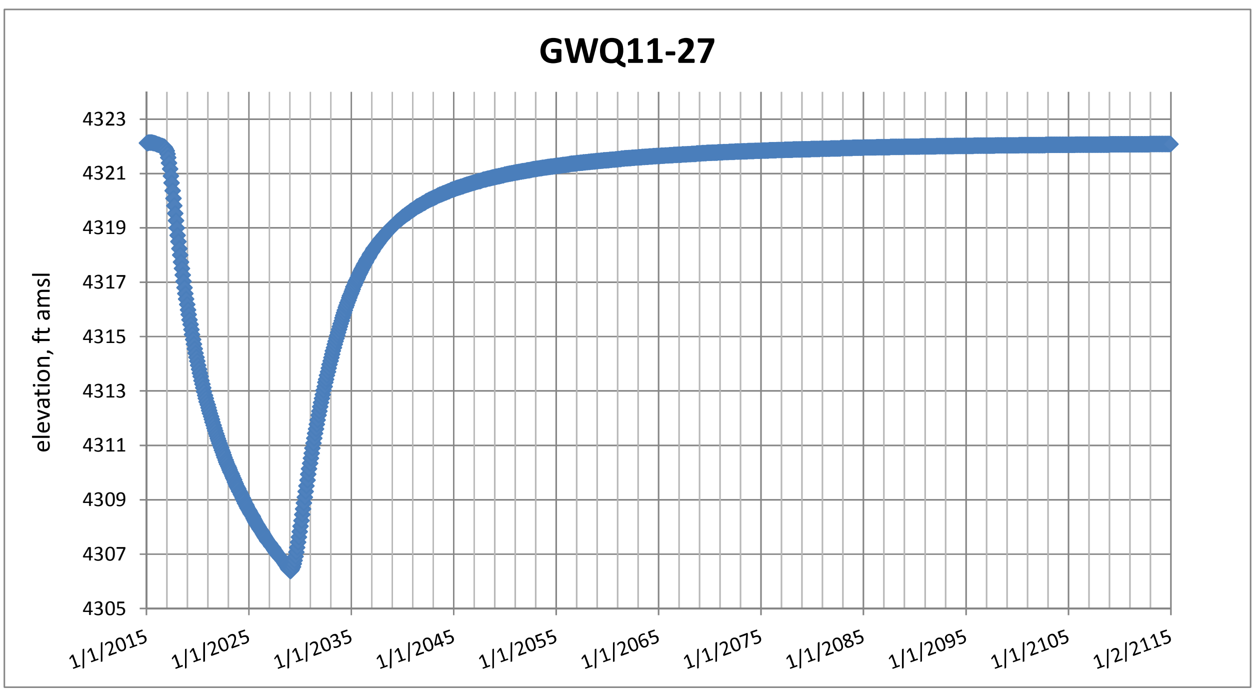

Figure A17. Projected water levels at GWQ11-27.

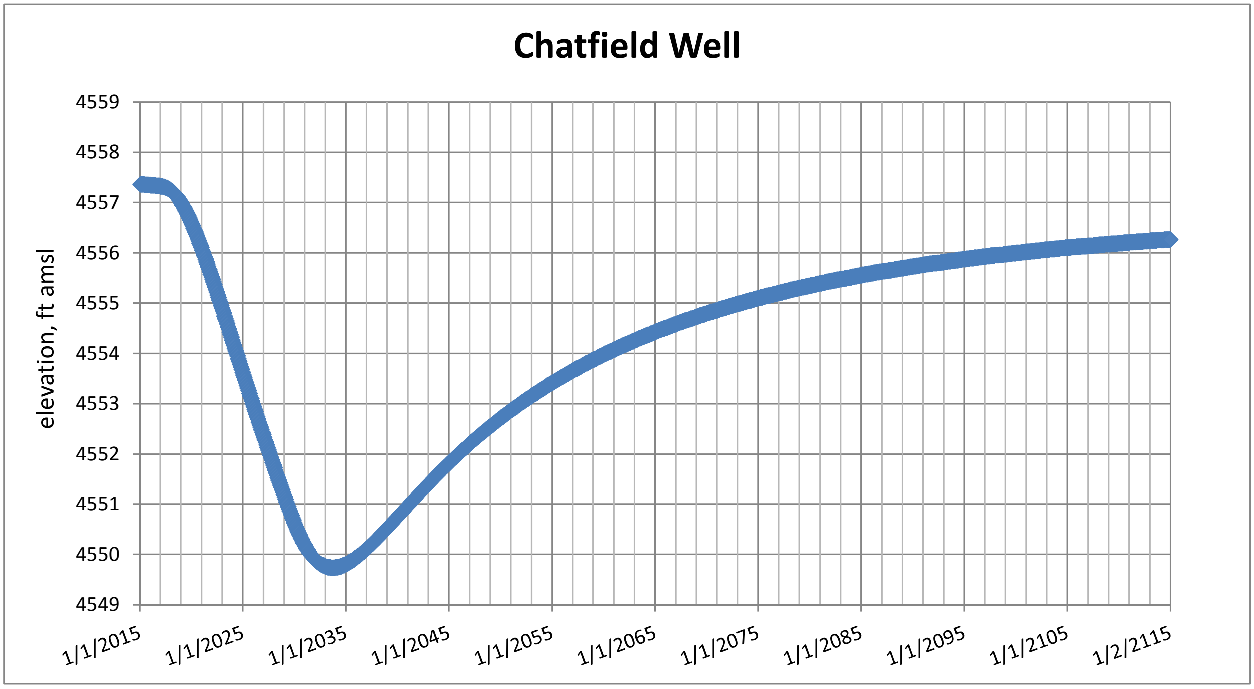

Figure A18. Projected water levels at Chatfield Well.

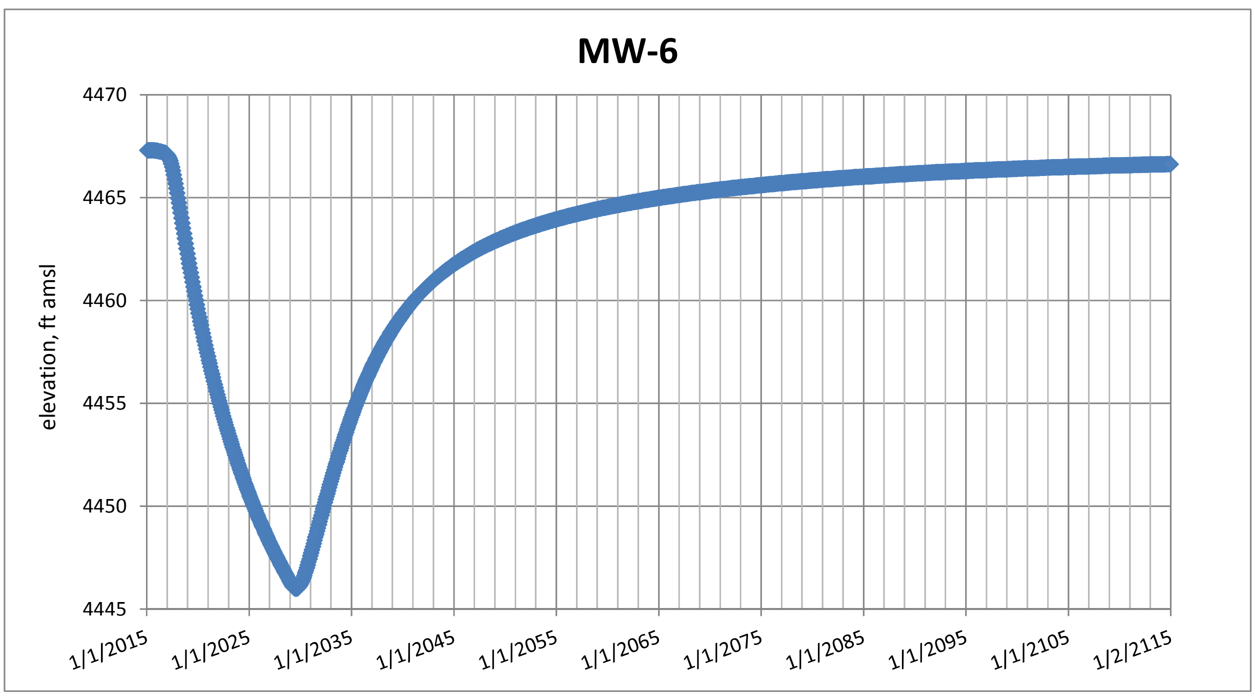

Figure A19. Projected water levels at MW-6.

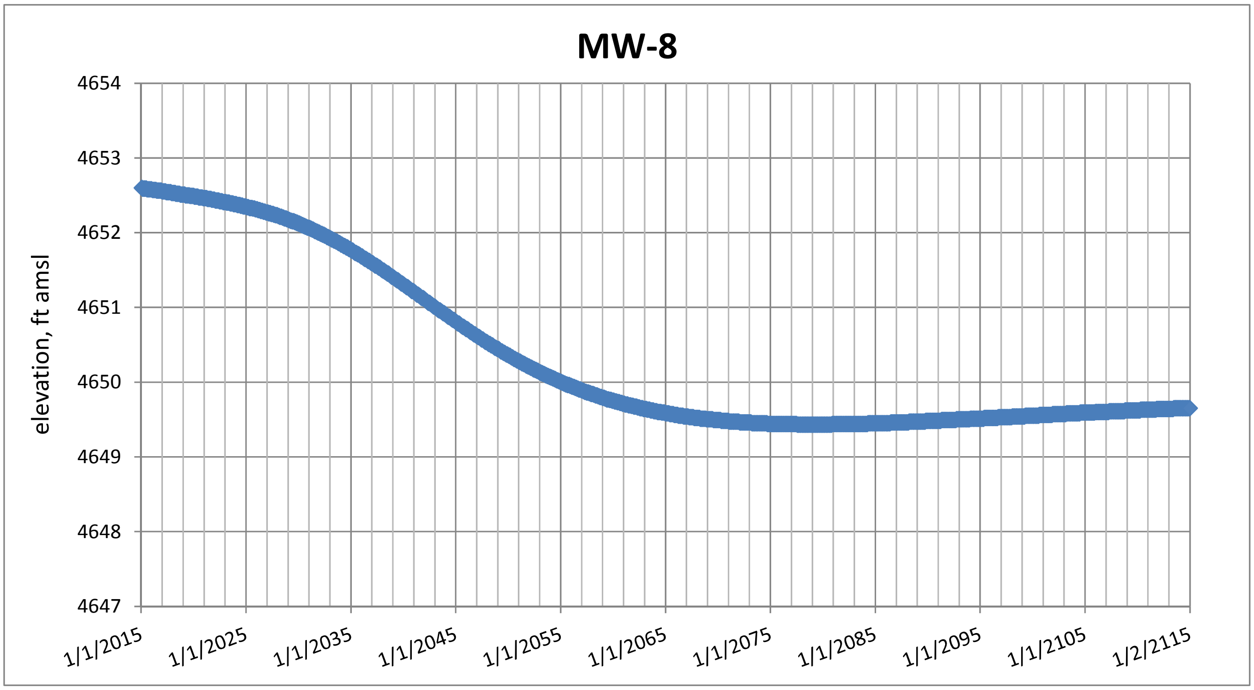

Figure A20. Projected water levels at MW-8.

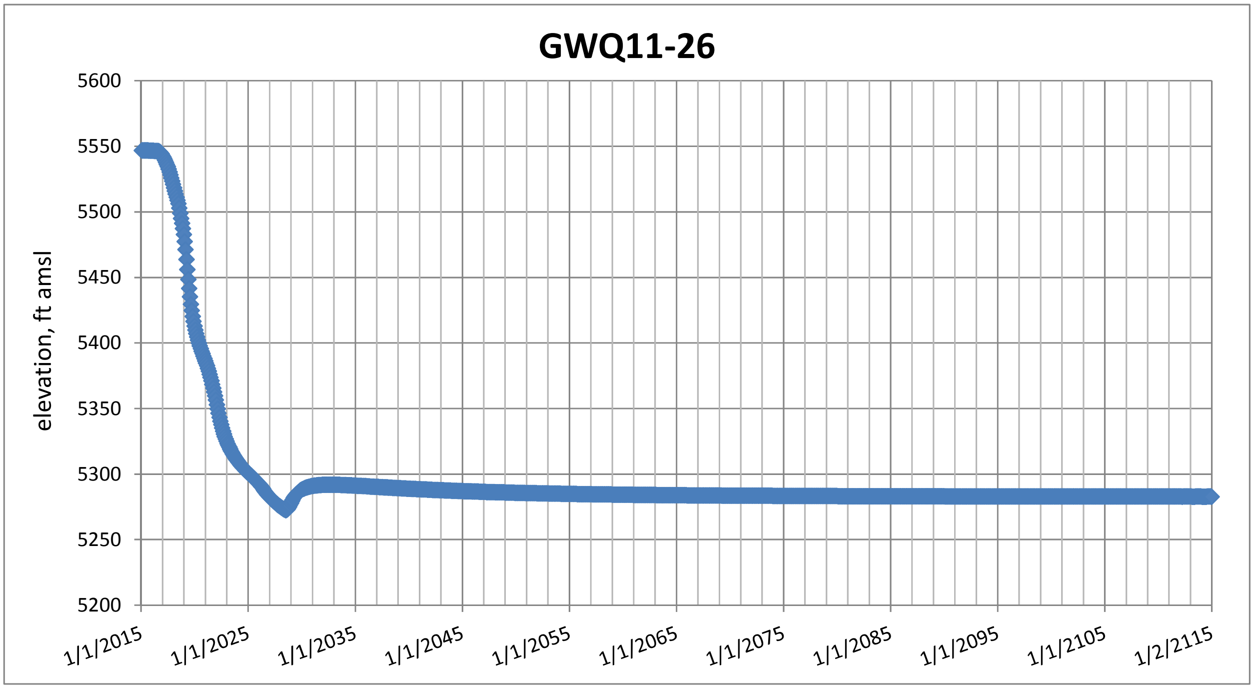

Figure A21. Projected water levels at GWQ11-26.

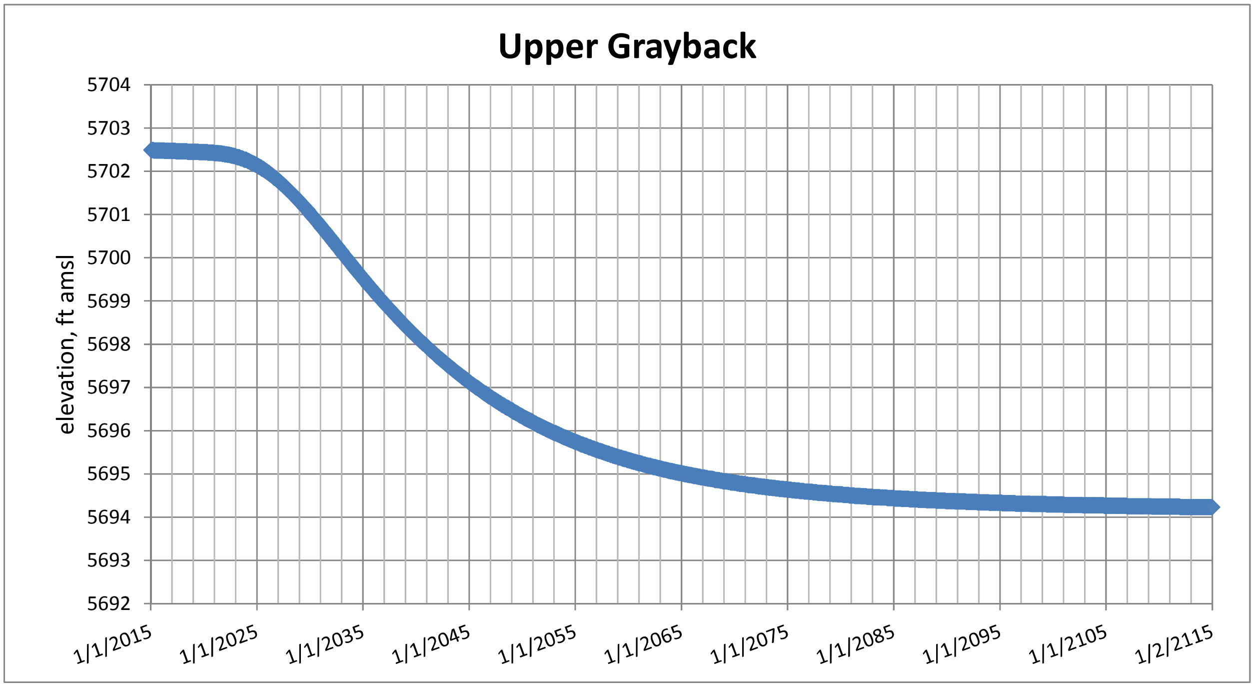

Figure A22. Projected water levels at Upper Grayback.

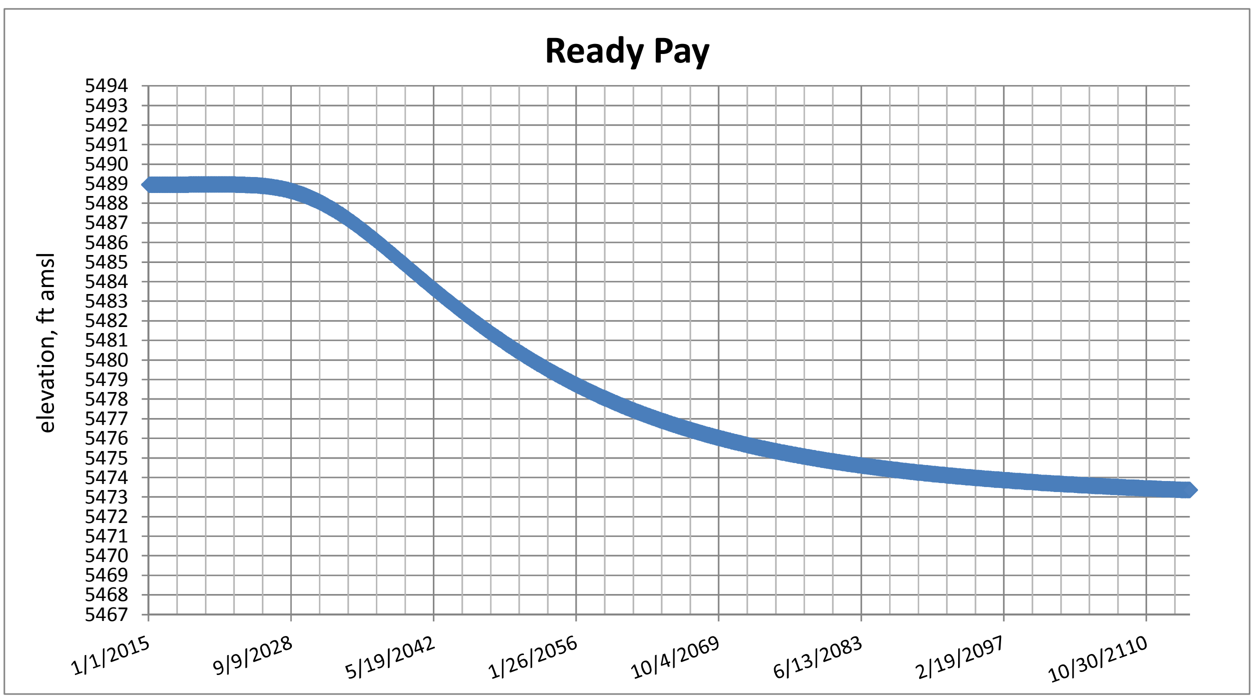

Figure A23. Projected water levels at Ready Pay.

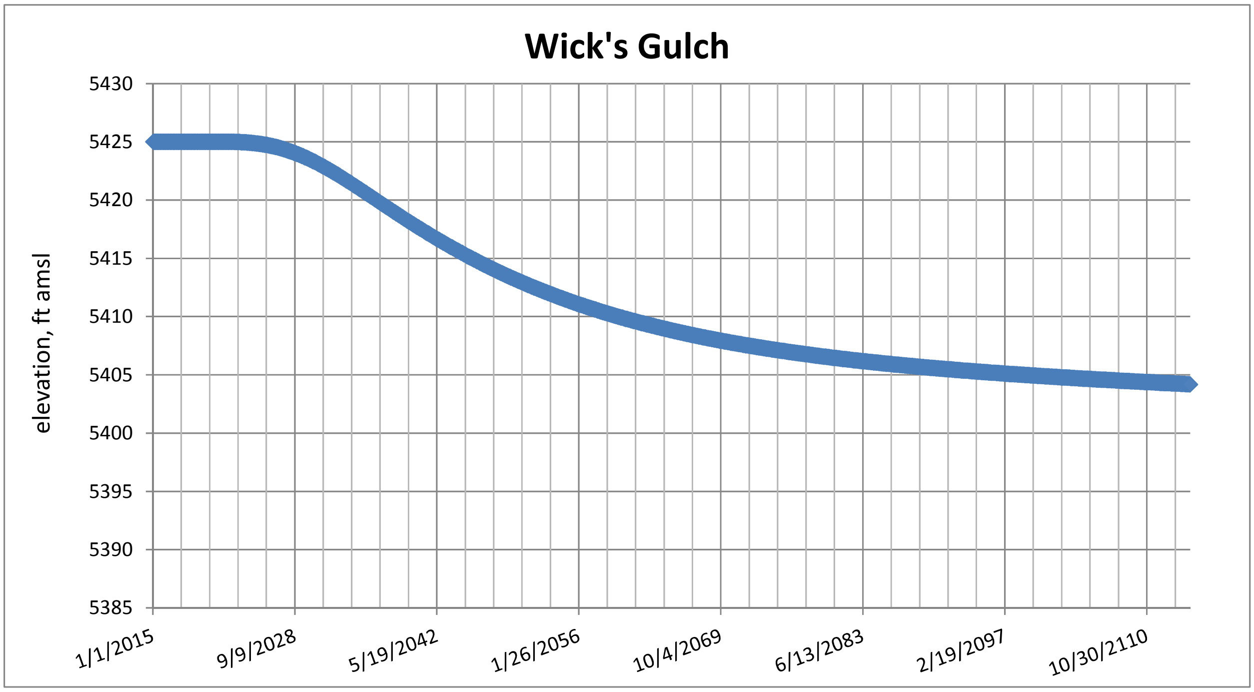

Figure A24. Projected water levels at Wick's Gulch.

Appendix B.

Technical Memo Regarding Liner Leakage Rates

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MEMORANDUM

To: JSAI Internal Memo

From: Michael A. Jones, Principal Hydrologist

Date: December 8, 2010

Subject: liner leakage projection

Introduction

Synthetic liners have been widely used in the modern mining industry to minimize/eliminate mine contact water intrusion to the surrounding surface water and groundwater systems. Even though the liner materials are virtually impermeable, holes and tears regularly occur and synthetic liners leak. In general, the leakage rates depend on many factors including liner quality, installation quality, stress due to weight of the impounded material and traffic, water pressure on the liner, over-liner/under-liner material hydrogeologic and geotechnical properties and conditions, and so on.

Environmental Impact Assessment (EIS) on any new project always requires estimating leakage through the lined mine facilities including leach pads, tailing storage facilities (TSF), contact water ponds, and waste rock dumps. Based on the estimated seepage (source) and hydrologic properties of the underlying aquifers (receiver), evaluation of solute transport downstream can be carried out using numerical or analytical methods. In certain circumstances, the liner leakage must be estimated in order to properly design the seepage collection systems.

Various assumptions and methods have been used by different professionals to estimate liner leakage. Depending on which firm is contracted, different seepage estimates can be obtained for the same facility.

This memorandum intends to provide guidance on how to estimate liner leakage for future projects. Standardizing the approach will make the liner leakage estimates more defendable and irrelevant to the selection of consulting firm.

Liner Defect Assumptions

There are few papers on the size and frequency of occurrence of defects in liners (Erickson and Thiel, 2002; Colucci and Lavagnolo,1995; Rowel, 2005). The studies are generally in agreement. In a 3-year field study, Colucci and Lavagnolo (1995) found that the size of liner defects in waste landfills varies substantially with a median hole area of about 1 cm2 (Table 1).

Holes can be detected by electrical leak survey. Rowel et al. (2005) found that (1) no holes were detected for 30% of electrical leak surveys, and (2) fewer than 5 holes/ha were detected for 50% of the surveys with remaining 20% surveys having more than 5 holes/ha.

Some analyses have assumed a more frequent occurrence of smaller defects. In an EPA funded study, defect hole diameters were assumed to be 0.3 and 1 cm, but the corresponding numbers of holes were assumed to be 9 and 3.6 hole/ha, respectively (Barlaz et al., 2002).

Table 1. Reported size of holes in geomembranes (after Colucci & Lavagnolo, 1995)

Leak area (mm^2)	Equivalent radius for circular hole, r_o (mm)	Percentage (%)	Cumulative percentage (%)
0-20	0-2.5	23.2	23.2
20-100	2.5-5.64	26.3	49.5
100-500	5.64-12.6	28.2	77.7
500-1000	12.6-17.8	8.8	86.5
10^3-10^4	17.8-56.4	7.8	94.3
10^4-10^5	56.4-178	4.5	98.2
10^5-10^6	178-517	1.2	100

For estimating liner leakage, we recommend using the following assumptions for the occurrence and size of liner defects:

- 1 circular defect per acre (or 2.5 defects per hectare)
- Area of defect = 1 cm^2 (equivalent hole diameter of about 1.13 cm)

These recommendations are in agreement with Giroud and Bonaparte (1989) for calculations to size the components of the lining system, and have been used by some consulting firms.

Liner Leakage Equation 1 (for non TSF Facility)

We recommend an equation (Giruoud et al., 1997) to estimate liner leakage for non TSF facilities. The equation represents an impeded flow condition with a geomembrane underlain by a low permeable medium such as a (compacted) soil foundation.

The Giruoud et al. (1997) Equation is listed below:

$$q = \beta_c \left[1 + 0.1 \left(\frac{h_w}{L_s} \right)^{0.95} \right] a_d^{\,0.1} h_w^{\,0.9} K_s^{\,0.74}$$

q =	leakage through a circular defect in composite liner (m^3/sec)
β_c =	coefficient relating to liner contact (0.21 for good and 1.15 for poor)
h_w =	depth of water above the geomembrane (m)
L_s =	thickness of soil liner (m)
a_d =	area of defect (m^2)
K_s =	saturated hydraulic conductivity of soil liner (m/s)

It should be noted that, in the above equation, the leakage rate has a non-linear relationship with the area of the defect. Therefore, the leakage through a single hole should be calculated first; then total leakage through the facility should be calculated based on the total number of defect holes within the facility footprint.

Liner Leakage Equation 2 (for TSF Facility)

The Giruoud et al. (1997) Equation is only suitable for lined leach pads, waste dumps and landfills where leakage is only impeded by defect size and conductance of the underlying soil liner. In a TSF, however, seepage through a liner defect will be most likely restricted by the permeability of tailings around the hole. In other words, hydraulic properties of both the over-liner tailings and the under-liner soil restrict the flow of water through the defect.

Coffey (Appendix A) has proposed an analytical solution to calculate liner leakage through a defect confined by both aquifers:

$$Q = (h_T - h_A)\, \pi D_H / (1/k_T + 1/k_A) \qquad (1)$$

Where, Q is leakage rate through a defect; hT and hA are, respectively, total head in the tailings and in the underlying soil; kT and kA are, respectively, hydraulic conductivity of the tailings and underneath soil; and DH is the diameter of the defect.

If the underlying soil is not pressurized, i.e., in an unsaturated condition, the above equation can be simplified to:

$$\boldsymbol{Q} = h_T \, \pi \, D_H \, k_T \qquad (2)$$

Derivation of equations is provided in Appendix A. We have reviewed and verified the Coffey work and found it is correct mathematically.

The analytical solution proposed by Coffey was also validated by John Shomaker & Associates, Inc. (JSAI) using a spreadsheet-based numerical model and U.S. Geological Survey (USGS) finite difference code MODFLOW. Results obtained for an example problem, using both analytical and numerical solutions, are compared in Table 2. Apparently, they are in close agreement.

Table 2. Calculated seepage through a defect - numerical and analytical solutions

	Case
D_H (cm)	1.128
A (cm^2)	1.000
h_T(m)	30
K_T (cm/s)	1.00E-06
Coffey - Eq2 Q (cm^3/s)	0.011
JSAI - Spreadsheet Q (cm^3/s)	0.011
JSAI - MODFLOW Q (cm^3/s)	0.012

Discussion

Rowe (2005) reports landfill liner seepage as detected by liner detection systems (LDS) for various liner configurations (Table 3). It was found that (1) average leakage rates through single geomembrane liners were between 130-190 liters per ha per day (lphd), and (2) average leakage rates through geomembrane plus compacted clay liners were between 50- 90 lphd.

The following assumptions were used in an example calculation:

> β_c = 0.21, h_w = 60 cm, L_s = 30 cm, a_d = 0.0001 m^2, K_s =1.00E-7 m/s, and defect frequency (n) is 1 hole/acre,

Estimated liner leakage from the Giruoud et al. (1997) Equation is:

$$Q = n \times q = 36 \text{ liters/acre/day} = 89 \text{ liters/ha/day (lphd)}$$

The calculated result is in close agreement with the Rowe (2005) field measurements. Therefore, we suggest a general rule that leakage of a lined leach pad (or waste dump) is likely about 100 lphd.

Table 3. Field-measured liner seepage (after Rowe, 2005)

Liner/stage	No. of cells	Average monthly flows: lphd			Peak monthly flows: lphd		
		Mean*	SD†	Max‡	Mean*	SD†	Max‡
Single liner: GM alone							
Active	25	190	330	1600§ 790¶	360	610	3070§ 1830¶
Post-closure	6	130	120	330	330	30	1130
Composite GM/GCL liner							
Active	22	1·5	2·7	11¶	9	16	54¶
Post-closure	5	0·6	0·9	2	4	5	10
Composite GM/CCL or GM/GCL/CCL liner							
Active	11	90	90	370§ 260¶	250	370	1990§ 1240¶
Post-closure	3	50	50	220	60	90	250

*Mean and †standard deviation of reported average and peak average monthly flows: these were obtained for different cells over different periods, and include data obtained for systems with sand, gravel and GN LDS.
‡Maximum value reported.
§Largest value reported, but it is for sand LDS and so may reflect stored water in the LDS shortly after construction.
¶Largest value for liner system with GN LDS.

References

Barlaz, M.A., Gabr, M.A., and Mohammed, P.E., 2002, Final Report: Closing the gaps in the regulation of municipal solid waste landfills: Defining the end of the post-closure monitoring period and the future stability of leachate recirculation landfills: EPA Grant Number: R827580.

Colucci, P., and Lavagnolo, M.C., 1995, Three years field experience in electrical control of synthetic landfill liners: Proc. 5th Int. Landfill Symp., Cagliari, pp 437-452.

Erickson, R.B., and Thiel, R., 2002, Design and application of the geomembrane supported GCL in one-product and encapsulated composite liner systems: Clay Geosynthetic Barriers, Zanzinger, Koerner & Gartung (eds), Swets & Zeitlinger, Lisse, ISBN 90 5809 380 8, pp 31-40.

Giroud, J.P., and Bonaparte, R., 1989, Leakage through liners constructed with geomembranes – Part I. Geomembrane liners, geotextiles and geomembranes Vol 8, pp 27-67.

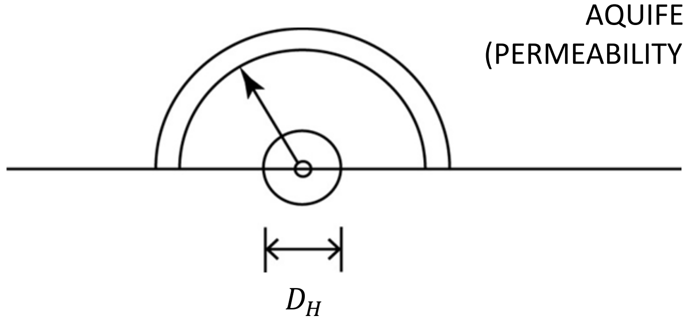
Giroud, J.P., Khire, M.V., and Soderman, K.L., 1997, Liquid migration through defects in a geomembrane overlain and underlain by permeable media: Geosynthetics International, Vol. 4, Nos. 3-4, pp 293-321.

Rowe, R.K., 2005, Long-term performance of contaminant barrier systems: Ge´otechnique 55, No. 9, pp 631-678.

Appendix A

Seepage Loss through a Circular Hole in Geomemberance
(Coffey, 2010)

CONSIDER SEEPAGE LOSS THROUGH A CIRCULAR HOLE OF DIAMETER D_H
IN A MEMBRANE SEPARATING TWO MATERIALS OF DIFFERENT PERMEABILITY.

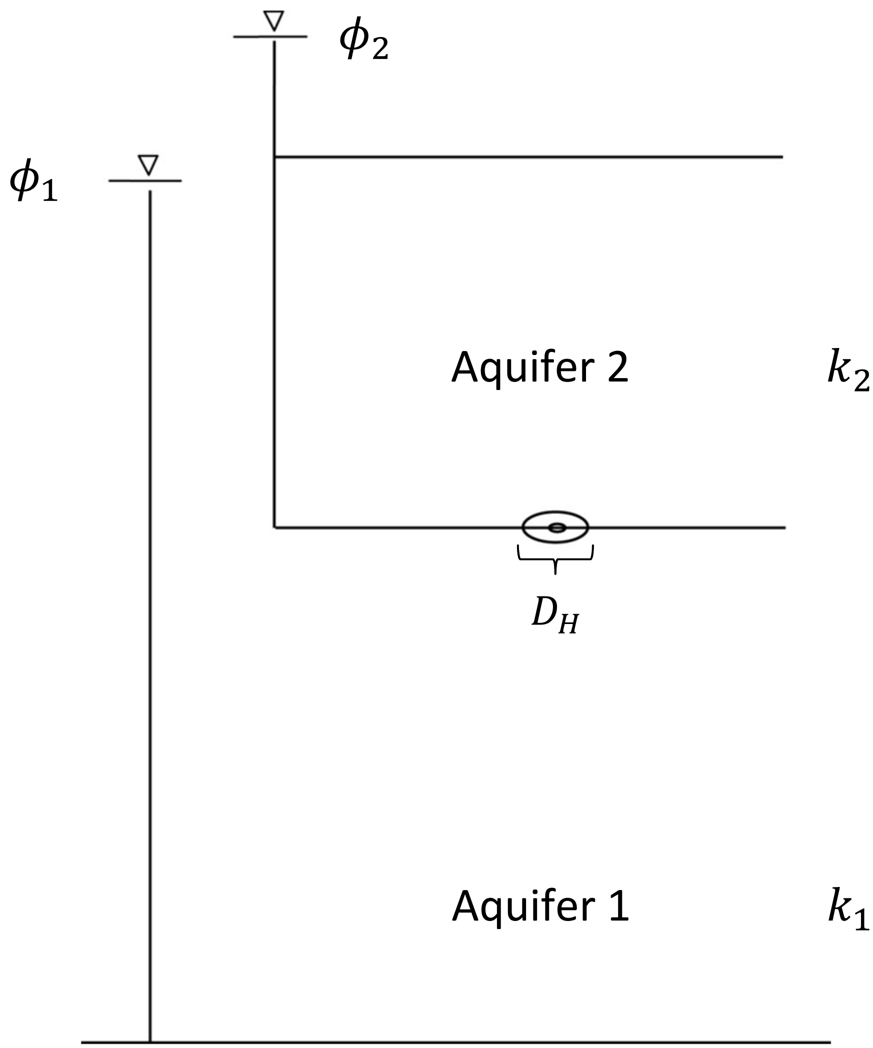


$$Q = k \underbrace{2\pi r^2}_{\text{area of half sphere}} \frac{d\phi}{dr}$$

Under steady state, Q is uniform over r

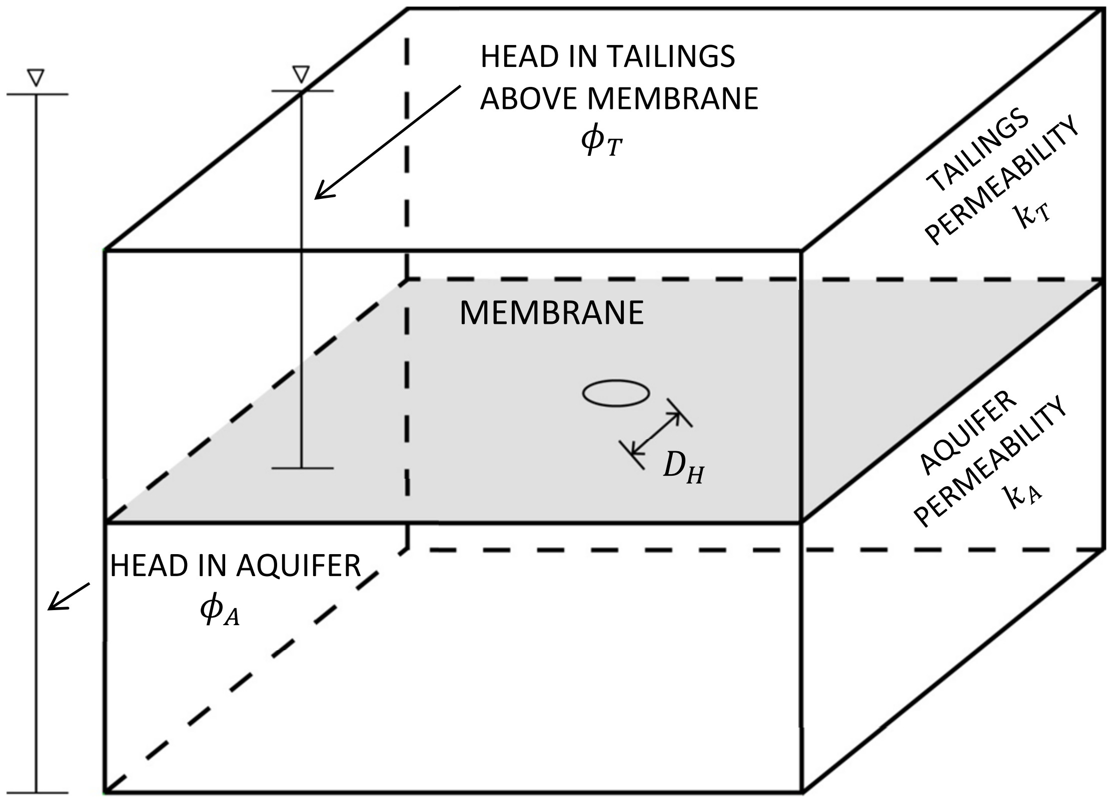
$$\phi = \int_{r_a}^{\infty} \frac{Q}{2\pi k r^2} dr = -\left[\frac{Q}{2\pi k r}\right]_{r_a}^{\infty} = \frac{Q}{2\pi k r_a}$$

Head loss to hole: $\Delta\phi = \frac{Q}{\pi k D_H}$ (noting $2r_H = D_H$)



$$\phi_2 - \phi_1 = \frac{Q}{\pi D_H k_2} + \frac{Q}{\pi D_H k_1} = \frac{Q}{\pi D_H}\left(\frac{1}{k_2} + \frac{1}{k_1}\right)$$

$$Q = \frac{\pi D_H (\phi_2 - \phi_1)}{\left(\frac{1}{k_2} + \frac{1}{k_1}\right)}$$



LEAKAGE THROUGH HOLE OF DIAMETER D_H:

$$Q = \frac{\pi D_H (\phi_T - \phi_A)}{\left(\frac{1}{k_A} + \frac{1}{k_T}\right)}$$

$Q = \pi \phi_T k_T D_H$ for fully drained layer below

APPENDIX D

SURFACE WATER ANALYSIS DATA

APPENDIX D: SURFACE WATER ANALYSIS DATA

SampType	ClientSampID	CollectionDate	Analyte	Result	Units
SW	SWQ-2	10/27/1981	pH	8.7	pH units
SW	SWQ-2	10/27/1981	Calcium	175	mg/L
SW	SWQ-2	10/27/1981	Chloride	46	mg/L
SW	SWQ-2	10/27/1981	Fluoride	0.8	mg/L
SW	SWQ-2	10/27/1981	Nitrogen, Nitrate (As N)	6.6	mg/L
SW	SWQ-2	10/27/1981	Sulfate	460	mg/L
SW	SWQ-2	10/27/1981	TDS	1060	mg/L
SW	SWQ-2	10/27/1981	Al	<0.01	mg/L
SW	SWQ-2	10/27/1981	As	<0.01	mg/L
SW	SWQ-2	10/27/1981	Ba	<0.2	mg/L
SW	SWQ-2	10/27/1981	Cadmium	<0.005	mg/L
SW	SWQ-2	10/27/1981	Chromium	<0.01	mg/L
SW	SWQ-2	10/27/1981	Copper	<0.05	mg/L
SW	SWQ-2	10/27/1981	Cyanide	<0.01	mg/L
SW	SWQ-2	10/27/1981	Lead	<0.02	mg/L
SW	SWQ-2	10/27/1981	Iron	<0.05	mg/L
SW	SWQ-2	10/27/1981	Manganese	<0.05	mg/L
SW	SWQ-2	10/27/1981	Mercury	0.004	mg/L
SW	SWQ-2	10/27/1981	Nitrogen	<0.05	mg/L
SW	SWQ-2	10/27/1981	Phenols	<0.005	mg/L
SW	SWQ-2	10/27/1981	Ag	<0.02	mg/L
SW	SWQ-2	10/27/1981	Selenium	<0.005	mg/L
SW	SWQ-2	10/27/1981	Boron	<0.1	mg/L
SW	SWQ-2	10/27/1981	Cobalt	<0.02	mg/L
SW	SWQ-2	10/27/1981	Molybdenum	<0.05	mg/L
SW	SWQ-2A	10/27/1981	pH	8.2	pH units
SW	SWQ-2A	10/27/1981	Calcium	107	mg/L
SW	SWQ-2A	10/27/1981	Chloride	46	mg/L
SW	SWQ-2A	10/27/1981	Fluoride	0.6	mg/L
SW	SWQ-2A	10/27/1981	Nitrogen, Nitrate (As N)	0.3	mg/L
SW	SWQ-2A	10/27/1981	Sulfate	360	mg/L
SW	SWQ-2A	10/27/1981	TDS	830	mg/L
SW	SWQ-2A	10/27/1981	Al	<0.01	mg/L
SW	SWQ-2A	10/27/1981	As	<0.01	mg/L
SW	SWQ-2A	10/27/1981	Ba	<0.2	mg/L
SW	SWQ-2A	10/27/1981	Cadmium	<0.005	mg/L
SW	SWQ-2A	10/27/1981	Chromium	<0.01	mg/L
SW	SWQ-2A	10/27/1981	Copper	<0.05	mg/L
SW	SWQ-2A	10/27/1981	Cyanide	<0.01	mg/L
SW	SWQ-2A	10/27/1981	Lead	<0.02	mg/L
SW	SWQ-2A	10/27/1981	Iron	<0.05	mg/L
SW	SWQ-2A	10/27/1981	Manganese	<0.05	mg/L
SW	SWQ-2A	10/27/1981	Mercury	<0.001	mg/L
SW	SWQ-2A	10/27/1981	Nitrogen	<0.05	mg/L
SW	SWQ-2A	10/27/1981	Phenols	<0.005	mg/L
SW	SWQ-2A	10/27/1981	Ag	<0.02	mg/L
SW	SWQ-2A	10/27/1981	Selenium	<0.005	mg/L
SW	SWQ-2A	10/27/1981	Boron	<0.01	mg/L
SW	SWQ-2A	10/27/1981	Cobalt	<0.02	mg/L
SW	SWQ-2A	10/27/1981	Molybdenum	<0.05	mg/L
SW	SWQ-2	2/25/1982	pH	8.1	pH units
SW	SWQ-2	2/25/1982	Chloride	80	mg/L
SW	SWQ-2	2/25/1982	Fluoride	0.7	mg/L
SW	SWQ-2	2/25/1982	Nitrogen, Nitrate (As N)	4.2	mg/L
SW	SWQ-2	2/25/1982	Sulfate	658	mg/L
SW	SWQ-2	2/25/1982	TDS	1360	mg/L
SW	SWQ-2	2/25/1982	Cadmium	<0.005	mg/L
SW	SWQ-2	2/25/1982	Copper	<0.05	mg/L
SW	SWQ-2	2/25/1982	Cyanide	<0.01	mg/L
SW	SWQ-2	2/25/1982	Iron	0.13	mg/L
SW	SWQ-2	2/25/1982	Manganese	<0.05	mg/L
SW	SWQ-2	2/25/1982	Mercury	<0.001	mg/L
SW	SWQ-2	2/25/1982	Selenium	<0.005	mg/L
SW	SWQ-2	2/25/1982	Molybdenum	<0.05	mg/L
SW	SWQ-2A	2/25/1982	pH	8.4	pH units
SW	SWQ-2A	2/25/1982	Chloride	50	mg/L
SW	SWQ-2A	2/25/1982	Fluoride	0.7	mg/L
SW	SWQ-2A	2/25/1982	Nitrogen, Nitrate (As N)	0.2	mg/L
SW	SWQ-2A	2/25/1982	Sulfate	320	mg/L
SW	SWQ-2A	2/25/1982	TDS	800	mg/L
SW	SWQ-2A	2/25/1982	Cadmium	<0.005	mg/L
SW	SWQ-2A	2/25/1982	Copper	<0.05	mg/L
SW	SWQ-2A	2/25/1982	Cyanide	<0.01	mg/L
SW	SWQ-2A	2/25/1982	Iron	0.1	mg/L

SW	SWQ-2A	2/25/1982	Manganese	<0.05	mg/L
SW	SWQ-2A	2/25/1982	Mercury	<0.001	mg/L
SW	SWQ-2A	2/25/1982	Selenium	<0.005	mg/L
SW	SWQ-2A	2/25/1982	Molybdenum	<0.05	mg/L
SW	SWQ-2	5/12/1982	pH	7.9	pH units
SW	SWQ-2	5/12/1982	Chloride	108	mg/L
SW	SWQ-2	5/12/1982	Fluoride	0.7	mg/L
SW	SWQ-2	5/12/1982	Nitrogen, Nitrate (As N)	3	mg/L
SW	SWQ-2	5/12/1982	Sulfate	700	mg/L
SW	SWQ-2	5/12/1982	TDS	1380	mg/L
SW	SWQ-2	5/12/1982	Cadmium	<0.005	mg/L
SW	SWQ-2	5/12/1982	Copper	<0.05	mg/L
SW	SWQ-2	5/12/1982	Cyanide	<0.01	mg/L
SW	SWQ-2	5/12/1982	Iron	<0.01	mg/L
SW	SWQ-2	5/12/1982	Manganese	<0.05	mg/L
SW	SWQ-2	5/12/1982	Mercury	<0.001	mg/L
SW	SWQ-2	5/12/1982	Selenium	<0.005	mg/L
SW	SWQ-2	5/12/1982	Molybdenum	<0.05	mg/L
SW	SWQ-1	12/28/1982	pH	8	pH units
SW	SWQ-1	12/28/1982	Chloride	10	mg/L
SW	SWQ-1	12/28/1982	Fluoride	0.3	mg/L
SW	SWQ-1	12/28/1982	Nitrogen, Nitrate (As N)	0.9	mg/L
SW	SWQ-1	12/28/1982	Sulfate	68	mg/L
SW	SWQ-1	12/28/1982	TDS	250	mg/L
SW	SWQ-1	12/28/1982	Cadmium	<0.005	mg/L
SW	SWQ-1	12/28/1982	Copper	<0.05	mg/L
SW	SWQ-1	12/28/1982	Cyanide	<0.01	mg/L
SW	SWQ-1	12/28/1982	Iron	<0.01	mg/L
SW	SWQ-1	12/28/1982	Manganese	<0.05	mg/L
SW	SWQ-1	12/28/1982	Mercury	<0.001	mg/L
SW	SWQ-1	12/28/1982	Selenium	<0.005	mg/L
SW	SWQ-1	12/28/1982	Molybdenum	<0.05	mg/L
SW	SWQ-1	2/21/1983	pH	8	pH units
SW	SWQ-1	2/21/1983	Chloride	20	mg/L
SW	SWQ-1	2/21/1983	Fluoride	0.3	mg/L
SW	SWQ-1	2/21/1983	Nitrogen, Nitrate (As N)	4.4	mg/L
SW	SWQ-1	2/21/1983	Sulfate	161	mg/L
SW	SWQ-1	2/21/1983	TDS	470	mg/L
SW	SWQ-1	2/21/1983	Cadmium	<0.005	mg/L
SW	SWQ-1	2/21/1983	Copper	<0.05	mg/L
SW	SWQ-1	2/21/1983	Cyanide	<0.01	mg/L
SW	SWQ-1	2/21/1983	Iron	<0.01	mg/L
SW	SWQ-1	2/21/1983	Manganese	<0.05	mg/L
SW	SWQ-1	2/21/1983	Mercury	<0.001	mg/L
SW	SWQ-1	2/21/1983	Selenium	<0.005	mg/L
SW	SWQ-1	2/21/1983	Molybdenum	<0.05	mg/L
SW	SWQ-2	2/21/1983	pH	8.4	pH units
SW	SWQ-2	2/21/1983	Chloride	68	mg/L
SW	SWQ-2	2/21/1983	Fluoride	0.7	mg/L
SW	SWQ-2	2/21/1983	Nitrogen, Nitrate (As N)	0.8	mg/L
SW	SWQ-2	2/21/1983	Sulfate	445	mg/L
SW	SWQ-2	2/21/1983	TDS	990	mg/L
SW	SWQ-2	2/21/1983	Cadmium	<0.005	mg/L
SW	SWQ-2	2/21/1983	Copper	<0.05	mg/L
SW	SWQ-2	2/21/1983	Cyanide	<0.01	mg/L
SW	SWQ-2	2/21/1983	Iron	<0.01	mg/L
SW	SWQ-2	2/21/1983	Manganese	<0.05	mg/L
SW	SWQ-2	2/21/1983	Mercury	<0.001	mg/L
SW	SWQ-2	2/21/1983	Selenium	<0.005	mg/L
SW	SWQ-2	2/21/1983	Molybdenum	<0.05	mg/L
SW	SWQ-2	5/13/1983	pH	8.4	pH units
SW	SWQ-2	5/13/1983	Chloride	84	mg/L
SW	SWQ-2	5/13/1983	Fluoride	0.8	mg/L
SW	SWQ-2	5/13/1983	Nitrogen, Nitrate (As N)	0.3	mg/L
SW	SWQ-2	5/13/1983	Sulfate	517	mg/L
SW	SWQ-2	5/13/1983	TDS	1120	mg/L
SW	SWQ-2	5/13/1983	Cadmium	<0.005	mg/L
SW	SWQ-2	5/13/1983	Copper	<0.05	mg/L
SW	SWQ-2	5/13/1983	Cyanide	<0.01	mg/L
SW	SWQ-2	5/13/1983	Iron	<0.01	mg/L
SW	SWQ-2	5/13/1983	Manganese	<0.05	mg/L
SW	SWQ-2	5/13/1983	Mercury	<0.001	mg/L
SW	SWQ-2	5/13/1983	Selenium	<0.005	mg/L
SW	SWQ-2	5/13/1983	Molybdenum	<0.05	mg/L
SW	SWQ-2	8/9/1983	pH	8	pH units
SW	SWQ-2	8/9/1983	Chloride	142	mg/L

SW	SWQ-2	8/9/1983	Fluoride	0.7	mg/L
SW	SWQ-2	8/9/1983	Nitrogen, Nitrate (As N)	<0.2	mg/L
SW	SWQ-2	8/9/1983	Sulfate	675	mg/L
SW	SWQ-2	8/9/1983	TDS	1620	mg/L
SW	SWQ-2	8/9/1983	Cadmium	<0.005	mg/L
SW	SWQ-2	8/9/1983	Copper	<0.05	mg/L
SW	SWQ-2	8/9/1983	Cyanide	<0.01	mg/L
SW	SWQ-2	8/9/1983	Iron	<0.01	mg/L
SW	SWQ-2	8/9/1983	Manganese	0.058	mg/L
SW	SWQ-2	8/9/1983	Mercury	<0.001	mg/L
SW	SWQ-2	8/9/1983	Selenium	<0.005	mg/L
SW	SWQ-2	8/9/1983	Molybdenum	<0.05	mg/L
SW	SWQ-2	11/1/1983	pH	8.2	pH units
SW	SWQ-2	11/1/1983	Chloride	72	mg/L
SW	SWQ-2	11/1/1983	Fluoride	0.8	mg/L
SW	SWQ-2	11/1/1983	Nitrogen, Nitrate (As N)	0.3	mg/L
SW	SWQ-2	11/1/1983	Sulfate	553	mg/L
SW	SWQ-2	11/1/1983	TDS	1170	mg/L
SW	SWQ-2	11/1/1983	Cadmium	<0.005	mg/L
SW	SWQ-2	11/1/1983	Copper	<0.05	mg/L
SW	SWQ-2	11/1/1983	Cyanide	<0.01	mg/L
SW	SWQ-2	11/1/1983	Iron	<0.01	mg/L
SW	SWQ-2	11/1/1983	Manganese	<0.05	mg/L
SW	SWQ-2	11/1/1983	Mercury	<0.001	mg/L
SW	SWQ-2	11/1/1983	Selenium	<0.005	mg/L
SW	SWQ-2	11/1/1983	Molybdenum	<0.05	mg/L
SW	SWQ-2	12/23/1983	pH	8	pH units
SW	SWQ-2	12/23/1983	Chloride	82	mg/L
SW	SWQ-2	12/23/1983	Fluoride	0.5	mg/L
SW	SWQ-2	12/23/1983	Nitrogen, Nitrate (As N)	11.2	mg/L
SW	SWQ-2	12/23/1983	Sulfate	550	mg/L
SW	SWQ-2	12/23/1983	TDS	1180	mg/L
SW	SWQ-2	12/23/1983	Cadmium	<0.005	mg/L
SW	SWQ-2	12/23/1983	Copper	<0.05	mg/L
SW	SWQ-2	12/23/1983	Cyanide	<0.01	mg/L
SW	SWQ-2	12/23/1983	Iron	<0.01	mg/L
SW	SWQ-2	12/23/1983	Manganese	<0.05	mg/L
SW	SWQ-2	12/23/1983	Mercury	<0.001	mg/L
SW	SWQ-2	12/23/1983	Selenium	<0.005	mg/L
SW	SWQ-2	12/23/1983	Molybdenum	<0.05	mg/L
SW	SWQ-2	3/16/1984	pH	8.3	pH units
SW	SWQ-2	3/16/1984	Chloride	68	mg/L
SW	SWQ-2	3/16/1984	Fluoride	0.8	mg/L
SW	SWQ-2	3/16/1984	Nitrogen, Nitrate (As N)	5.3	mg/L
SW	SWQ-2	3/16/1984	Sulfate	515	mg/L
SW	SWQ-2	3/16/1984	TDS	1140	mg/L
SW	SWQ-2	3/16/1984	Cadmium	<0.005	mg/L
SW	SWQ-2	3/16/1984	Copper	<0.05	mg/L
SW	SWQ-2	3/16/1984	Cyanide	<0.01	mg/L
SW	SWQ-2	3/16/1984	Iron	<0.01	mg/L
SW	SWQ-2	3/16/1984	Manganese	<0.05	mg/L
SW	SWQ-2	3/16/1984	Mercury	<0.001	mg/L
SW	SWQ-2	3/16/1984	Selenium	<0.005	mg/L
SW	SWQ-2	3/16/1984	Molybdenum	<0.05	mg/L
SW	SWQ-2	5/30/1984	pH	8.1	pH units
SW	SWQ-2	5/30/1984	Chloride	94	mg/L
SW	SWQ-2	5/30/1984	Fluoride	0.8	mg/L
SW	SWQ-2	5/30/1984	Nitrogen, Nitrate (As N)	0.4	mg/L
SW	SWQ-2	5/30/1984	Sulfate	720	mg/L
SW	SWQ-2	5/30/1984	TDS	1420	mg/L
SW	SWQ-2	5/30/1984	Cadmium	<0.005	mg/L
SW	SWQ-2	5/30/1984	Copper	<0.05	mg/L
SW	SWQ-2	5/30/1984	Cyanide	<0.01	mg/L
SW	SWQ-2	5/30/1984	Iron	<0.01	mg/L
SW	SWQ-2	5/30/1984	Manganese	<0.05	mg/L
SW	SWQ-2	5/30/1984	Mercury	<0.001	mg/L
SW	SWQ-2	5/30/1984	Selenium	<0.005	mg/L
SW	SWQ-2	5/30/1984	Molybdenum	<0.05	mg/L
SW	SWQ-2	9/12/1984	pH	8.1	pH units
SW	SWQ-2	9/12/1984	Chloride	80	mg/L
SW	SWQ-2	9/12/1984	Fluoride	0.9	mg/L
SW	SWQ-2	9/12/1984	Nitrogen, Nitrate (As N)	0.4	mg/L
SW	SWQ-2	9/12/1984	Sulfate	577	mg/L
SW	SWQ-2	9/12/1984	TDS	1190	mg/L
SW	SWQ-2	9/12/1984	Cadmium	<0.005	mg/L
SW	SWQ-2	9/12/1984	Copper	<0.05	mg/L

SW	SWQ-2	9/12/1984	Cyanide	<0.01	mg/L
SW	SWQ-2	9/12/1984	Iron	<0.01	mg/L
SW	SWQ-2	9/12/1984	Manganese	<0.05	mg/L
SW	SWQ-2	9/12/1984	Mercury	<0.001	mg/L
SW	SWQ-2	9/12/1984	Selenium	<0.005	mg/L
SW	SWQ-2	9/12/1984	Molybdenum	<0.05	mg/L
SW	SWQ-2	11/27/1984	pH	8.2	pH units
SW	SWQ-2	11/27/1984	Chloride	88	mg/L
SW	SWQ-2	11/27/1984	Fluoride	0.8	mg/L
SW	SWQ-2	11/27/1984	Nitrogen, Nitrate (As N)	<0.2	mg/L
SW	SWQ-2	11/27/1984	Sulfate	675	mg/L
SW	SWQ-2	11/27/1984	TDS	1360	mg/L
SW	SWQ-2	11/27/1984	Cadmium	<0.005	mg/L
SW	SWQ-2	11/27/1984	Copper	<0.05	mg/L
SW	SWQ-2	11/27/1984	Cyanide	<0.01	mg/L
SW	SWQ-2	11/27/1984	Iron	<0.01	mg/L
SW	SWQ-2	11/27/1984	Manganese	<0.05	mg/L
SW	SWQ-2	11/27/1984	Mercury	<0.001	mg/L
SW	SWQ-2	11/27/1984	Selenium	<0.005	mg/L
SW	SWQ-2	11/27/1984	Molybdenum	<0.05	mg/L
SW	SWQ-2	5/17/1985	pH	8	pH units
SW	SWQ-2	5/17/1985	Chloride	102	mg/L
SW	SWQ-2	5/17/1985	Sulfate	770	mg/L
SW	SWQ-2	5/17/1985	TDS	1640	mg/L
SW	SWQ-2	11/13/1985	pH	7.9	pH units
SW	SWQ-2	11/13/1985	Chloride	94	mg/L
SW	SWQ-2	11/13/1985	Sulfate	770	mg/L
SW	SWQ-2	11/13/1985	TDS	1590	mg/L
SW	SWQ-2	10/13/1986	pH	7.9	pH units
SW	SWQ-2	10/13/1986	Chloride	136	mg/L
SW	SWQ-2	10/13/1986	Sulfate	830	mg/L
SW	SWQ-2	10/13/1986	TDS	1840	mg/L
SW	SWQ-2	7/19/1991	pH	7.57	pH units
SW	SWQ-2	7/19/1991	Specific Conductance	4310	µmhos/cm
SW	SWQ-2	7/19/1991	Calcium	561.1	mg/L
SW	SWQ-2	7/19/1991	Chloride	216.7	mg/L
SW	SWQ-2	7/19/1991	Fluoride	0.57	mg/L
SW	SWQ-2	7/19/1991	Nitrogen, Nitrate (As N)	12.74	mg/L
SW	SWQ-2	7/19/1991	Sodium	264.3	mg/L
SW	SWQ-2	7/19/1991	Potassium	10.9	mg/L
SW	SWQ-2	7/19/1991	Sulfate	1585.5	mg/L
SW	SWQ-2	7/19/1991	TDS	3019	mg/L
SW	SWQ-2	7/19/1991	As	<0.002	mg/L
SW	SWQ-2	7/19/1991	Ba	<0.01	mg/L
SW	SWQ-2	7/19/1991	Cadmium	<0.005	mg/L
SW	SWQ-2	7/19/1991	Chromium	<0.02	mg/L
SW	SWQ-2	7/19/1991	Lead	<0.005	mg/L
SW	SWQ-2	7/19/1991	Iron	<0.05	mg/L
SW	SWQ-2	7/19/1991	Magnesium	129.1	mg/L
SW	SWQ-2	7/19/1991	Manganese	<0.02	mg/L
SW	SWQ-2	7/19/1991	Mercury	<0.0002	mg/L
SW	SWQ-2	7/19/1991	Ag	<0.02	mg/L
SW	SWQ-2	7/19/1991	Selenium	<0.001	mg/L
SW	SWQ-3	7/19/1991	pH	7.52	pH units
SW	SWQ-3	7/19/1991	Specific Conductance	3120	µmhos/cm
SW	SWQ-3	7/19/1991	Calcium	334.1	mg/L
SW	SWQ-3	7/19/1991	Chloride	143.9	mg/L
SW	SWQ-3	7/19/1991	Fluoride	0.73	mg/L
SW	SWQ-3	7/19/1991	Nitrogen, Nitrate (As N)	1.39	mg/L
SW	SWQ-3	7/19/1991	Sodium	189.5	mg/L
SW	SWQ-3	7/19/1991	Potassium	7.4	mg/L
SW	SWQ-3	7/19/1991	Sulfate	1108.2	mg/L
SW	SWQ-3	7/19/1991	TDS	2191	mg/L
SW	SWQ-3	7/19/1991	As	<0.002	mg/L
SW	SWQ-3	7/19/1991	Ba	0.03	mg/L
SW	SWQ-3	7/19/1991	Cadmium	<0.005	mg/L
SW	SWQ-3	7/19/1991	Chromium	<0.02	mg/L
SW	SWQ-3	7/19/1991	Lead	<0.005	mg/L
SW	SWQ-3	7/19/1991	Iron	0.14	mg/L
SW	SWQ-3	7/19/1991	Magnesium	84.6	mg/L
SW	SWQ-3	7/19/1991	Manganese	<0.02	mg/L
SW	SWQ-3	7/19/1991	Mercury	<0.0002	mg/L
SW	SWQ-3	7/19/1991	Ag	<0.02	mg/L
SW	SWQ-3	7/19/1991	Selenium	<0.001	mg/L
SW	SWQ-3	8/29/1991	pH	7.82	pH units
SW	SWQ-3	8/29/1991	Chloride	231.3	mg/L

SW	SWQ-3	8/29/1991	Sulfate	1884.2	mg/L
SW	SWQ-3	8/29/1991	TDS	3596	mg/L
SW	SWQ-3	8/29/1991	Copper	0.015	mg/L
SW	SWQ-3	11/26/1991	pH	7.71	pH units
SW	SWQ-3	11/26/1991	Chloride	141.1	mg/L
SW	SWQ-3	11/26/1991	Sulfate	1419	mg/L
SW	SWQ-3	11/26/1991	TDS	2657	mg/L
SW	SWQ-3	11/26/1991	Copper	0.001	mg/L
SW	SWQ-3	3/15/1992	pH	8.08	pH units
SW	SWQ-3	3/15/1992	Chloride	99.2	mg/L
SW	SWQ-3	3/15/1992	Sulfate	1247.6	mg/L
SW	SWQ-3	3/15/1992	TDS	2393	mg/L
SW	SWQ-3	5/25/1992	pH	8.07	pH units
SW	SWQ-3	5/25/1992	Chloride	102.9	mg/L
SW	SWQ-3	5/25/1992	Sulfate	1185.2	mg/L
SW	SWQ-3	5/25/1992	TDS	2380	mg/L
SW	SWQ-1	7/16/1992	pH	7.37	pH units
SW	SWQ-1	7/16/1992	Chloride	47.2	mg/L
SW	SWQ-1	7/16/1992	Sulfate	298.3	mg/L
SW	SWQ-1	7/16/1992	TDS	965	mg/L
SW	SWQ-2	7/16/1992	pH	7.57	pH units
SW	SWQ-2	7/16/1992	Chloride	93.4	mg/L
SW	SWQ-2	7/16/1992	Sulfate	1154.9	mg/L
SW	SWQ-2	7/16/1992	TDS	2305	mg/L
SW	SWQ-3	7/16/1992	pH	7.66	pH units
SW	SWQ-3	7/16/1992	Chloride	128.7	mg/L
SW	SWQ-3	7/16/1992	Sulfate	1654	mg/L
SW	SWQ-3	7/16/1992	TDS	3364	mg/L
SW	SWQ-2	10/8/1992	pH	7.53	pH units
SW	SWQ-2	10/8/1992	Chloride	130.7	mg/L
SW	SWQ-2	10/8/1992	Sulfate	1470.5	mg/L
SW	SWQ-2	10/8/1992	TDS	2685	mg/L
SW	SWQ-3	10/8/1992	pH	7.49	pH units
SW	SWQ-3	10/8/1992	Chloride	174.4	mg/L
SW	SWQ-3	10/8/1992	Sulfate	1667.4	mg/L
SW	SWQ-3	10/8/1992	TDS	3611	mg/L
SW	SWQ-1	11/27/1992	pH	8.31	pH units
SW	SWQ-1	11/27/1992	Chloride	16.7	mg/L
SW	SWQ-1	11/27/1992	Sulfate	180.8	mg/L
SW	SWQ-1	11/27/1992	TDS	545	mg/L
SW	SWQ-3	11/27/1992	pH	8.35	pH units
SW	SWQ-3	11/27/1992	Chloride	160.5	mg/L
SW	SWQ-3	11/27/1992	Sulfate	952.2	mg/L
SW	SWQ-3	11/27/1992	TDS	1866	mg/L
SW	SWQ-2	12/15/1992	pH	7.61	pH units
SW	SWQ-2	12/15/1992	Chloride	192.5	mg/L
SW	SWQ-2	12/15/1992	Sulfate	1613	mg/L
SW	SWQ-2	12/15/1992	TDS	3108	mg/L
SW	SWQ-3	12/15/1992	pH	8.15	pH units
SW	SWQ-3	12/15/1992	Chloride	221.6	mg/L
SW	SWQ-3	12/15/1992	Sulfate	1549.4	mg/L
SW	SWQ-3	12/15/1992	TDS	3436	mg/L
SW	SWQ-1	2/25/1993	pH	8.34	pH units
SW	SWQ-1	2/25/1993	Chloride	28.9	mg/L
SW	SWQ-1	2/25/1993	Sulfate	323.1	mg/L
SW	SWQ-1	2/25/1993	TDS	844	mg/L
SW	SWQ-2	2/25/1993	pH	7.58	pH units
SW	SWQ-2	2/25/1993	Chloride	135.9	mg/L
SW	SWQ-2	2/25/1993	Sulfate	1459.3	mg/L
SW	SWQ-2	2/25/1993	TDS	2713	mg/L
SW	SWQ-3	2/25/1993	pH	8.01	pH units
SW	SWQ-3	2/25/1993	Chloride	150.7	mg/L
SW	SWQ-3	2/25/1993	Sulfate	1573.7	mg/L
SW	SWQ-3	2/25/1993	TDS	2974	mg/L
SW	SWQ-3	9/28/1993	pH	8.13	pH units
SW	SWQ-3	9/28/1993	Chloride	226.9	mg/L
SW	SWQ-3	9/28/1993	Sulfate	1254	mg/L
SW	SWQ-3	9/28/1993	TDS	4432	mg/L
SW	SWQ-2	6/23/1994	pH	8.87	pH units
SW	SWQ-2	6/23/1994	Chloride	197.3	mg/L
SW	SWQ-2	6/23/1994	Sulfate	2369	mg/L
SW	SWQ-2	6/23/1994	TDS	3958	mg/L
SW	SWQ-3	6/23/1994	pH	8.37	pH units
SW	SWQ-3	6/23/1994	Chloride	157.4	mg/L
SW	SWQ-3	6/23/1994	Sulfate	1712	mg/L
SW	SWQ-3	6/23/1994	TDS	2934	mg/L

SW	SWQ-2	1/29/1995	pH	7.64	pH units
SW	SWQ-2	1/29/1995	Chloride	89.2	mg/L
SW	SWQ-2	1/29/1995	Sulfate	1286.2	mg/L
SW	SWQ-2	1/29/1995	TDS	2653	mg/L
SW	SWQ-3	1/29/1995	pH	7.93	pH units
SW	SWQ-3	1/29/1995	Chloride	237.6	mg/L
SW	SWQ-3	1/29/1995	Sulfate	1671.7	mg/L
SW	SWQ-3	1/29/1995	TDS	3185	mg/L
SW	SWQ-2	3/29/1995	pH	7.83	pH units
SW	SWQ-2	3/29/1995	Chloride	83.9	mg/L
SW	SWQ-2	3/29/1995	Sulfate	1388.2	mg/L
SW	SWQ-2	3/29/1995	TDS	2866	mg/L
SW	SWQ-3	3/29/1995	pH	8.23	pH units
SW	SWQ-3	3/29/1995	Chloride	100.6	mg/L
SW	SWQ-3	3/29/1995	Sulfate	1709.7	mg/L
SW	SWQ-3	3/29/1995	TDS	3216	mg/L
SW	SWQ-2	6/27/1995	pH	7.74	pH units
SW	SWQ-2	6/27/1995	Chloride	127.3	mg/L
SW	SWQ-2	6/27/1995	Sulfate	1877	mg/L
SW	SWQ-2	6/27/1995	TDS	3235	mg/L
SW	SWQ-3	6/27/1995	pH	7.51	pH units
SW	SWQ-3	6/27/1995	Chloride	200.3	mg/L
SW	SWQ-3	6/27/1995	Sulfate	1792.4	mg/L
SW	SWQ-3	6/27/1995	TDS	3393	mg/L
SW	SWQ-2	9/21/1995	pH	7.58	pH units
SW	SWQ-2	9/21/1995	Chloride	31.1	mg/L
SW	SWQ-2	9/21/1995	Sulfate	271.2	mg/L
SW	SWQ-2	9/21/1995	TDS	500	mg/L
SW	SWQ-3	9/21/1995	pH	8.73	pH units
SW	SWQ-3	9/21/1995	Chloride	178.5	mg/L
SW	SWQ-3	9/21/1995	Sulfate	2382	mg/L
SW	SWQ-3	9/21/1995	TDS	3741	mg/L
SW	SWQ-2	1/10/1996	pH	7.37	pH units
SW	SWQ-2	1/10/1996	Chloride	167.2	mg/L
SW	SWQ-2	1/10/1996	Sulfate	2336.9	mg/L
SW	SWQ-2	1/10/1996	TDS	3991	mg/L
SW	SWQ-3	1/10/1996	pH	7.78	pH units
SW	SWQ-3	1/10/1996	Chloride	112	mg/L
SW	SWQ-3	1/10/1996	Sulfate	1936.6	mg/L
SW	SWQ-3	1/10/1996	TDS	3666	mg/L
SW	SWQ-2	4/3/1996	pH	8.06	pH units
SW	SWQ-2	4/3/1996	Chloride	222.6	mg/L
SW	SWQ-2	4/3/1996	Sulfate	2566.3	mg/L
SW	SWQ-2	4/3/1996	TDS	4464	mg/L
SW	SWQ-3	4/3/1996	Chloride	157	mg/L
SW	SWQ-3	4/3/1996	Sulfate	2236.3	mg/L
SW	SWQ-3	4/3/1996	TDS	3635	mg/L
SW	SWQ-2	9/25/1996	pH	7.66	pH units
SW	SWQ-2	9/25/1996	Chloride	143.7	mg/L
SW	SWQ-2	9/25/1996	Sulfate	1987	mg/L
SW	SWQ-2	9/25/1996	TDS	3997	mg/L
SW	SWQ-3	9/25/1996	pH	7.64	pH units
SW	SWQ-3	9/25/1996	Chloride	96.7	mg/L
SW	SWQ-3	9/25/1996	Sulfate	1153	mg/L
SW	SWQ-3	9/25/1996	TDS	2568	mg/L
SW	SWQ-2	1/15/1997	pH	7.43	pH units
SW	SWQ-2	1/15/1997	Chloride	148	mg/L
SW	SWQ-2	1/15/1997	Sulfate	1356	mg/L
SW	SWQ-2	1/15/1997	TDS	3436	mg/L
SW	SWQ-3	1/15/1997	pH	8.13	pH units
SW	SWQ-3	1/15/1997	Chloride	148	mg/L
SW	SWQ-3	1/15/1997	Sulfate	1356	mg/L
SW	SWQ-3	1/15/1997	TDS	3436	mg/L
SW	PWS-1	8/19/2010	Aluminum	540	mg/L
SW	PWS-1	8/19/2010	Barium	<0.10	mg/L
SW	PWS-1	8/19/2010	Beryllium	0.14	mg/L
SW	PWS-1	8/19/2010	Boron	<2.0	mg/L
SW	PWS-1	8/19/2010	Cadmium	0.14	mg/L
SW	PWS-1	8/19/2010	Calcium	470	mg/L
SW	PWS-1	8/19/2010	Chromium	<0.30	mg/L
SW	PWS-1	8/19/2010	Cobalt	1.5	mg/L
SW	PWS-1	8/19/2010	Copper	80	mg/L
SW	PWS-1	8/19/2010	Iron	1600	mg/L
SW	PWS-1	8/19/2010	Lead	<0.25	mg/L
SW	PWS-1	8/19/2010	Magnesium	190	mg/L
SW	PWS-1	8/19/2010	Manganese	24	mg/L

SW	PWS-1	8/19/2010	Molybdenum	<0.40	mg/L
SW	PWS-1	8/19/2010	Nickel	<0.50	mg/L
SW	PWS-1	8/19/2010	Potassium	<50	mg/L
SW	PWS-1	8/19/2010	Silver	<0.25	mg/L
SW	PWS-1	8/19/2010	Sodium	<50	mg/L
SW	PWS-1	8/19/2010	Vanadium	<2.5	mg/L
SW	PWS-1	8/19/2010	Zinc	12	mg/L
SW	PWS-1	8/19/2010	Antimony	<0.0010	mg/L
SW	PWS-1	8/19/2010	Arsenic	0.0016	mg/L
SW	PWS-1	8/19/2010	Selenium	0.086	mg/L
SW	PWS-1	8/19/2010	Thallium	<0.0010	mg/L
SW	PWS-1	8/19/2010	Uranium	1.4	mg/L
SW	PWS-1	8/19/2010	Mercury	<0.0010	mg/L
SW	PWS-1	8/19/2010	Fluoride	51	mg/L
SW	PWS-1	8/19/2010	Chloride	21	mg/L
SW	PWS-1	8/19/2010	Nitrate (As N)+Nitrite (As N)	<1.0	mg/L
SW	PWS-1	8/19/2010	Sulfate	11000	mg/L
SW	PWS-1	8/19/2010	Alkalinity, Total (As CaCO3)	<20	mg/L CaCO3
SW	PWS-1	8/19/2010	Carbonate	<2.0	mg/L CaCO3
SW	PWS-1	8/19/2010	Bicarbonate	<20	mg/L CaCO3
SW	PWS-1	8/19/2010	Cyanide	<0.0050	mg/L
SW	PWS-1	8/19/2010	Specific Conductance	6500	µmhos/cm
SW	PWS-1	8/19/2010	pH	2	pH units
SW	PWS-1	8/19/2010	TDS	13900	mg/L
SW	PWS-1	8/19/2010	Residue, Total	15000	mg/L
SW	PWS-1	8/19/2010	Suspended Solids	<10	mg/L
SW	PWS-1	8/19/2010	Silica	150	mg/L
SW	SWQ-3	8/19/2010	Aluminum	<0.020	mg/L
SW	SWQ-3	8/19/2010	Barium	0.062	mg/L
SW	SWQ-3	8/19/2010	Beryllium	<0.0020	mg/L
SW	SWQ-3	8/19/2010	Boron	0.14	mg/L
SW	SWQ-3	8/19/2010	Cadmium	<0.0020	mg/L
SW	SWQ-3	8/19/2010	Calcium	530	mg/L
SW	SWQ-3	8/19/2010	Chromium	<0.0060	mg/L
SW	SWQ-3	8/19/2010	Cobalt	<0.0060	mg/L
SW	SWQ-3	8/19/2010	Copper	0.062	mg/L
SW	SWQ-3	8/19/2010	Iron	0.055	mg/L
SW	SWQ-3	8/19/2010	Lead	<0.0050	mg/L
SW	SWQ-3	8/19/2010	Magnesium	190	mg/L
SW	SWQ-3	8/19/2010	Manganese	0.14	mg/L
SW	SWQ-3	8/19/2010	Molybdenum	0.047	mg/L
SW	SWQ-3	8/19/2010	Nickel	<0.010	mg/L
SW	SWQ-3	8/19/2010	Potassium	5.7	mg/L
SW	SWQ-3	8/19/2010	Silver	<0.0050	mg/L
SW	SWQ-3	8/19/2010	Sodium	490	mg/L
SW	SWQ-3	8/19/2010	Vanadium	<0.050	mg/L
SW	SWQ-3	8/19/2010	Zinc	0.023	mg/L
SW	SWQ-3	8/19/2010	Antimony	<0.0010	mg/L
SW	SWQ-3	8/19/2010	Arsenic	<0.0010	mg/L
SW	SWQ-3	8/19/2010	Selenium	0.013	mg/L
SW	SWQ-3	8/19/2010	Thallium	<0.0010	mg/L
SW	SWQ-3	8/19/2010	Uranium	0.029	mg/L
SW	SWQ-3	8/19/2010	Mercury	<0.00020	mg/L
SW	SWQ-3	8/19/2010	Fluoride	1.5	mg/L
SW	SWQ-3	8/19/2010	Chloride	130	mg/L
SW	SWQ-3	8/19/2010	Nitrate (As N)+Nitrite (As N)	<1.0	mg/L
SW	SWQ-3	8/19/2010	Sulfate	2900	mg/L
SW	SWQ-3	8/19/2010	Alkalinity, Total (As CaCO3)	250	mg/L CaCO3
SW	SWQ-3	8/19/2010	Carbonate	<2.0	mg/L CaCO3
SW	SWQ-3	8/19/2010	Bicarbonate	250	mg/L CaCO3
SW	SWQ-3	8/19/2010	Cyanide	<0.0050	mg/L
SW	SWQ-3	8/19/2010	Specific Conductance	4100	µmhos/cm
SW	SWQ-3	8/19/2010	pH	8	pH units
SW	SWQ-3	8/19/2010	TDS	4500	mg/L
SW	SWQ-3	8/19/2010	Residue, Total	4700	mg/L
SW	SWQ-3	8/19/2010	Suspended Solids	<10	mg/L
SW	SWQ-3	8/19/2010	Silica	40	mg/L
SW	LAC-E	8/20/2010	Aluminum	<0.020	mg/L
SW	LAC-E	8/20/2010	Barium	0.018	mg/L
SW	LAC-E	8/20/2010	Beryllium	<0.0020	mg/L
SW	LAC-E	8/20/2010	Boron	<0.040	mg/L
SW	LAC-E	8/20/2010	Cadmium	<0.0020	mg/L
SW	LAC-E	8/20/2010	Calcium	44	mg/L
SW	LAC-E	8/20/2010	Chromium	<0.0060	mg/L
SW	LAC-E	8/20/2010	Cobalt	<0.0060	mg/L
SW	LAC-E	8/20/2010	Copper	<0.0060	mg/L

SW	LAC-E	8/20/2010	Iron	<0.020	mg/L
SW	LAC-E	8/20/2010	Lead	<0.0050	mg/L
SW	LAC-E	8/20/2010	Magnesium	6.8	mg/L
SW	LAC-E	8/20/2010	Manganese	0.01	mg/L
SW	LAC-E	8/20/2010	Molybdenum	<0.0080	mg/L
SW	LAC-E	8/20/2010	Nickel	<0.010	mg/L
SW	LAC-E	8/20/2010	Potassium	1.9	mg/L
SW	LAC-E	8/20/2010	Silver	<0.0050	mg/L
SW	LAC-E	8/20/2010	Sodium	20	mg/L
SW	LAC-E	8/20/2010	Vanadium	<0.050	mg/L
SW	LAC-E	8/20/2010	Zinc	<0.010	mg/L
SW	LAC-E	8/20/2010	Antimony	<0.0010	mg/L
SW	LAC-E	8/20/2010	Arsenic	0.002	mg/L
SW	LAC-E	8/20/2010	Selenium	<0.0010	mg/L
SW	LAC-E	8/20/2010	Thallium	<0.0010	mg/L
SW	LAC-E	8/20/2010	Uranium	<0.0010	mg/L
SW	LAC-E	8/20/2010	Mercury	<0.00020	mg/L
SW	LAC-E	8/20/2010	Fluoride	0.45	mg/L
SW	LAC-E	8/20/2010	Chloride	9.8	mg/L
SW	LAC-E	8/20/2010	Nitrate (As N)+Nitrite (As N)	<1.0	mg/L
SW	LAC-E	8/20/2010	Sulfate	11	mg/L
SW	LAC-E	8/20/2010	Alkalinity, Total (As CaCO3)	150	mg/L CaCO3
SW	LAC-E	8/20/2010	Carbonate	<2.0	mg/L CaCO3
SW	LAC-E	8/20/2010	Bicarbonate	150	mg/L CaCO3
SW	LAC-E	8/20/2010	Cyanide	<0.0050	mg/L
SW	LAC-E	8/20/2010	Specific Conductance	330	µmhos/cm
SW	LAC-E	8/20/2010	pH	8	pH units
SW	LAC-E	8/20/2010	TDS	236	mg/L
SW	LAC-E	8/20/2010	Residue, Total	260	mg/L
SW	LAC-E	8/20/2010	Suspended Solids	11	mg/L
SW	LAC-E	8/20/2010	Silica	42	mg/L
SW	LAC-C	8/23/2010	Aluminum	<0.020	mg/L
SW	LAC-C	8/23/2010	Barium	0.014	mg/L
SW	LAC-C	8/23/2010	Beryllium	<0.0020	mg/L
SW	LAC-C	8/23/2010	Boron	<0.040	mg/L
SW	LAC-C	8/23/2010	Cadmium	<0.0020	mg/L
SW	LAC-C	8/23/2010	Calcium	36	mg/L
SW	LAC-C	8/23/2010	Chromium	<0.0060	mg/L
SW	LAC-C	8/23/2010	Cobalt	<0.0060	mg/L
SW	LAC-C	8/23/2010	Copper	<0.0060	mg/L
SW	LAC-C	8/23/2010	Iron	<0.020	mg/L
SW	LAC-C	8/23/2010	Lead	<0.0050	mg/L
SW	LAC-C	8/23/2010	Magnesium	6.2	mg/L
SW	LAC-C	8/23/2010	Manganese	0.0076	mg/L
SW	LAC-C	8/23/2010	Molybdenum	<0.0080	mg/L
SW	LAC-C	8/23/2010	Nickel	<0.010	mg/L
SW	LAC-C	8/23/2010	Potassium	2.1	mg/L
SW	LAC-C	8/23/2010	Silver	<0.0050	mg/L
SW	LAC-C	8/23/2010	Sodium	21	mg/L
SW	LAC-C	8/23/2010	Vanadium	<0.050	mg/L
SW	LAC-C	8/23/2010	Zinc	<0.010	mg/L
SW	LAC-C	8/23/2010	Antimony	<0.0010	mg/L
SW	LAC-C	8/23/2010	Arsenic	0.0021	mg/L
SW	LAC-C	8/23/2010	Selenium	<0.0010	mg/L
SW	LAC-C	8/23/2010	Thallium	<0.0010	mg/L
SW	LAC-C	8/23/2010	Uranium	<0.0010	mg/L
SW	LAC-C	8/23/2010	Mercury	<0.00020	mg/L
SW	LAC-C	8/23/2010	Fluoride	0.53	mg/L
SW	LAC-C	8/23/2010	Chloride	10	mg/L
SW	LAC-C	8/23/2010	Nitrate (As N)+Nitrite (As N)	<1.0	mg/L
SW	LAC-C	8/23/2010	Sulfate	11	mg/L
SW	LAC-C	8/23/2010	Alkalinity, Total (As CaCO3)	130	mg/L CaCO3
SW	LAC-C	8/23/2010	Carbonate	<2.0	mg/L CaCO3
SW	LAC-C	8/23/2010	Bicarbonate	130	mg/L CaCO3
SW	LAC-C	8/23/2010	Cyanide	<0.0050	mg/L
SW	LAC-C	8/23/2010	Specific Conductance	300	µmhos/cm
SW	LAC-C	8/23/2010	pH	8	pH units
SW	LAC-C	8/23/2010	TDS	218	mg/L
SW	LAC-C	8/23/2010	Residue, Total	220	mg/L
SW	LAC-C	8/23/2010	Suspended Solids	<10	mg/L
SW	LAC-C	8/23/2010	Silica	42	mg/L
SW	LAC-A	8/24/2010	Aluminum	<0.02	mg/L
SW	LAC-A	8/24/2010	Barium	0.011	mg/L
SW	LAC-A	8/24/2010	Beryllium	<0.002	mg/L
SW	LAC-A	8/24/2010	Boron	<0.04	mg/L
SW	LAC-A	8/24/2010	Cadmium	<0.002	mg/L

SW	LAC-A	8/24/2010	Calcium	27	mg/L
SW	LAC-A	8/24/2010	Chromium	<0.006	mg/L
SW	LAC-A	8/24/2010	Cobalt	<0.006	mg/L
SW	LAC-A	8/24/2010	Copper	<0.006	mg/L
SW	LAC-A	8/24/2010	Iron	0.023	mg/L
SW	LAC-A	8/24/2010	Lead	<0.005	mg/L
SW	LAC-A	8/24/2010	Magnesium	5.5	mg/L
SW	LAC-A	8/24/2010	Manganese	0.011	mg/L
SW	LAC-A	8/24/2010	Molybdenum	<0.008	mg/L
SW	LAC-A	8/24/2010	Nickel	<0.01	mg/L
SW	LAC-A	8/24/2010	Potassium	1.8	mg/L
SW	LAC-A	8/24/2010	Silicon	21	mg/L
SW	LAC-A	8/24/2010	Silver	<0.005	mg/L
SW	LAC-A	8/24/2010	Sodium	12	mg/L
SW	LAC-A	8/24/2010	Vanadium	<0.05	mg/L
SW	LAC-A	8/24/2010	Zinc	0.015	mg/L
SW	LAC-A	8/24/2010	Antimony	<0.001	mg/L
SW	LAC-A	8/24/2010	Arsenic	0.0012	mg/L
SW	LAC-A	8/24/2010	Selenium	<0.001	mg/L
SW	LAC-A	8/24/2010	Thallium	<0.001	mg/L
SW	LAC-A	8/24/2010	Uranium	<0.001	mg/L
SW	LAC-A	8/24/2010	Mercury	<0.0002	mg/L
SW	LAC-A	8/24/2010	Fluoride	0.31	mg/L
SW	LAC-A	8/24/2010	Chloride	2.8	mg/L
SW	LAC-A	8/24/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-A	8/24/2010	Sulfate	7.5	mg/L
SW	LAC-A	8/24/2010	Alkalinity, Total (As CaCO3)	100	mg/L CaCO3
SW	LAC-A	8/24/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-A	8/24/2010	Bicarbonate	100	mg/L CaCO3
SW	LAC-A	8/24/2010	Cyanide	<0.005	mg/L
SW	LAC-A	8/24/2010	Specific Conductance	220	µmhos/cm
SW	LAC-A	8/24/2010	pH	8.25	pH units
SW	LAC-A	8/24/2010	TDS	173	mg/L
SW	LAC-A	8/24/2010	Residue, Total	180	mg/L
SW	LAC-A	8/24/2010	Suspended Solids	<10	mg/L
SW	LAC-B	8/24/2010	Aluminum	<0.02	mg/L
SW	LAC-B	8/24/2010	Barium	0.012	mg/L
SW	LAC-B	8/24/2010	Beryllium	<0.002	mg/L
SW	LAC-B	8/24/2010	Boron	<0.04	mg/L
SW	LAC-B	8/24/2010	Cadmium	<0.002	mg/L
SW	LAC-B	8/24/2010	Calcium	28	mg/L
SW	LAC-B	8/24/2010	Chromium	<0.006	mg/L
SW	LAC-B	8/24/2010	Cobalt	<0.006	mg/L
SW	LAC-B	8/24/2010	Copper	<0.006	mg/L
SW	LAC-B	8/24/2010	Iron	0.02	mg/L
SW	LAC-B	8/24/2010	Lead	<0.005	mg/L
SW	LAC-B	8/24/2010	Magnesium	6.2	mg/L
SW	LAC-B	8/24/2010	Manganese	0.011	mg/L
SW	LAC-B	8/24/2010	Molybdenum	<0.008	mg/L
SW	LAC-B	8/24/2010	Nickel	<0.01	mg/L
SW	LAC-B	8/24/2010	Potassium	2	mg/L
SW	LAC-B	8/24/2010	Silicon	21	mg/L
SW	LAC-B	8/24/2010	Silver	<0.005	mg/L
SW	LAC-B	8/24/2010	Sodium	17	mg/L
SW	LAC-B	8/24/2010	Vanadium	<0.05	mg/L
SW	LAC-B	8/24/2010	Zinc	0.014	mg/L
SW	LAC-B	8/24/2010	Antimony	<0.001	mg/L
SW	LAC-B	8/24/2010	Arsenic	0.0016	mg/L
SW	LAC-B	8/24/2010	Selenium	<0.001	mg/L
SW	LAC-B	8/24/2010	Thallium	<0.001	mg/L
SW	LAC-B	8/24/2010	Uranium	<0.001	mg/L
SW	LAC-B	8/24/2010	Mercury	<0.0002	mg/L
SW	LAC-B	8/24/2010	Fluoride	0.4	mg/L
SW	LAC-B	8/24/2010	Chloride	8.6	mg/L
SW	LAC-B	8/24/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-B	8/24/2010	Sulfate	9	mg/L
SW	LAC-B	8/24/2010	Alkalinity, Total (As CaCO3)	110	mg/L CaCO3
SW	LAC-B	8/24/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-B	8/24/2010	Bicarbonate	110	mg/L CaCO3
SW	LAC-B	8/24/2010	Cyanide	<0.005	mg/L
SW	LAC-B	8/24/2010	Specific Conductance	260	µmhos/cm
SW	LAC-B	8/24/2010	pH	8.2	pH units
SW	LAC-B	8/24/2010	TDS	188	mg/L
SW	LAC-B	8/24/2010	Residue, Total	200	mg/L
SW	LAC-B	8/24/2010	Suspended Solids	<10	mg/L
SW	LAC-D	8/24/2010	Aluminum	<0.02	mg/L

SW	LAC-D	8/24/2010	Barium	0.018	mg/L
SW	LAC-D	8/24/2010	Beryllium	<0.002	mg/L
SW	LAC-D	8/24/2010	Boron	<0.04	mg/L
SW	LAC-D	8/24/2010	Cadmium	<0.002	mg/L
SW	LAC-D	8/24/2010	Calcium	49	mg/L
SW	LAC-D	8/24/2010	Chromium	<0.006	mg/L
SW	LAC-D	8/24/2010	Cobalt	<0.006	mg/L
SW	LAC-D	8/24/2010	Copper	<0.006	mg/L
SW	LAC-D	8/24/2010	Iron	<0.02	mg/L
SW	LAC-D	8/24/2010	Lead	<0.005	mg/L
SW	LAC-D	8/24/2010	Magnesium	7.4	mg/L
SW	LAC-D	8/24/2010	Manganese	0.0065	mg/L
SW	LAC-D	8/24/2010	Molybdenum	<0.008	mg/L
SW	LAC-D	8/24/2010	Nickel	<0.01	mg/L
SW	LAC-D	8/24/2010	Potassium	2	mg/L
SW	LAC-D	8/24/2010	Silicon	17	mg/L
SW	LAC-D	8/24/2010	Silver	<0.005	mg/L
SW	LAC-D	8/24/2010	Sodium	23	mg/L
SW	LAC-D	8/24/2010	Vanadium	<0.05	mg/L
SW	LAC-D	8/24/2010	Zinc	<0.01	mg/L
SW	LAC-D	8/24/2010	Antimony	<0.001	mg/L
SW	LAC-D	8/24/2010	Arsenic	0.0022	mg/L
SW	LAC-D	8/24/2010	Selenium	<0.001	mg/L
SW	LAC-D	8/24/2010	Thallium	<0.001	mg/L
SW	LAC-D	8/24/2010	Uranium	<0.001	mg/L
SW	LAC-D	8/24/2010	Mercury	<0.0002	mg/L
SW	LAC-D	8/24/2010	Fluoride	0.52	mg/L
SW	LAC-D	8/24/2010	Chloride	12	mg/L
SW	LAC-D	8/24/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-D	8/24/2010	Sulfate	12	mg/L
SW	LAC-D	8/24/2010	Alkalinity, Total (As CaCO3)	160	mg/L CaCO3
SW	LAC-D	8/24/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-D	8/24/2010	Bicarbonate	160	mg/L CaCO3
SW	LAC-D	8/24/2010	Cyanide	<0.005	mg/L
SW	LAC-D	8/24/2010	Specific Conductance	370	µmhos/cm
SW	LAC-D	8/24/2010	pH	8.08	pH units
SW	LAC-D	8/24/2010	TDS	255	mg/L
SW	LAC-D	8/24/2010	Residue, Total	260	mg/L
SW	LAC-D	8/24/2010	Suspended Solids	<10	mg/L
SW	NWS	8/24/2010	Aluminum	<0.02	mg/L
SW	NWS	8/24/2010	Barium	0.023	mg/L
SW	NWS	8/24/2010	Beryllium	<0.002	mg/L
SW	NWS	8/24/2010	Boron	0.041	mg/L
SW	NWS	8/24/2010	Cadmium	<0.002	mg/L
SW	NWS	8/24/2010	Calcium	39	mg/L
SW	NWS	8/24/2010	Chromium	<0.006	mg/L
SW	NWS	8/24/2010	Cobalt	<0.006	mg/L
SW	NWS	8/24/2010	Copper	<0.006	mg/L
SW	NWS	8/24/2010	Iron	<0.02	mg/L
SW	NWS	8/24/2010	Lead	<0.005	mg/L
SW	NWS	8/24/2010	Magnesium	13	mg/L
SW	NWS	8/24/2010	Manganese	<0.002	mg/L
SW	NWS	8/24/2010	Molybdenum	<0.008	mg/L
SW	NWS	8/24/2010	Nickel	<0.01	mg/L
SW	NWS	8/24/2010	Potassium	3.7	mg/L
SW	NWS	8/24/2010	Silicon	12	mg/L
SW	NWS	8/24/2010	Silver	<0.005	mg/L
SW	NWS	8/24/2010	Sodium	65	mg/L
SW	NWS	8/24/2010	Vanadium	<0.05	mg/L
SW	NWS	8/24/2010	Zinc	0.012	mg/L
SW	NWS	8/24/2010	Antimony	<0.001	mg/L
SW	NWS	8/24/2010	Arsenic	0.0065	mg/L
SW	NWS	8/24/2010	Selenium	<0.001	mg/L
SW	NWS	8/24/2010	Thallium	<0.001	mg/L
SW	NWS	8/24/2010	Uranium	0.0011	mg/L
SW	NWS	8/24/2010	Mercury	<0.0002	mg/L
SW	NWS	8/24/2010	Fluoride	1.7	mg/L
SW	NWS	8/24/2010	Chloride	73	mg/L
SW	NWS	8/24/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	NWS	8/24/2010	Sulfate	29	mg/L
SW	NWS	8/24/2010	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	NWS	8/24/2010	Carbonate	<2	mg/L CaCO3
SW	NWS	8/24/2010	Bicarbonate	170	mg/L CaCO3
SW	NWS	8/24/2010	Cyanide	<0.005	mg/L
SW	NWS	8/24/2010	Specific Conductance	560	µmhos/cm
SW	NWS	8/24/2010	pH	7.96	pH units

SW	NWS	8/24/2010	TDS	342	mg/L
SW	NWS	8/24/2010	Residue, Total	350	mg/L
SW	NWS	8/24/2010	Suspended Solids	<10	mg/L
SW	PC-A	8/24/2010	Aluminum	<0.02	mg/L
SW	PC-A	8/24/2010	Barium	0.04	mg/L
SW	PC-A	8/24/2010	Beryllium	<0.002	mg/L
SW	PC-A	8/24/2010	Boron	<0.04	mg/L
SW	PC-A	8/24/2010	Cadmium	<0.002	mg/L
SW	PC-A	8/24/2010	Calcium	77	mg/L
SW	PC-A	8/24/2010	Chromium	<0.006	mg/L
SW	PC-A	8/24/2010	Cobalt	<0.006	mg/L
SW	PC-A	8/24/2010	Copper	<0.006	mg/L
SW	PC-A	8/24/2010	Iron	<0.02	mg/L
SW	PC-A	8/24/2010	Lead	<0.005	mg/L
SW	PC-A	8/24/2010	Magnesium	14	mg/L
SW	PC-A	8/24/2010	Manganese	0.027	mg/L
SW	PC-A	8/24/2010	Molybdenum	<0.008	mg/L
SW	PC-A	8/24/2010	Nickel	<0.01	mg/L
SW	PC-A	8/24/2010	Potassium	1.3	mg/L
SW	PC-A	8/24/2010	Silicon	14	mg/L
SW	PC-A	8/24/2010	Silver	<0.005	mg/L
SW	PC-A	8/24/2010	Sodium	16	mg/L
SW	PC-A	8/24/2010	Vanadium	<0.05	mg/L
SW	PC-A	8/24/2010	Zinc	<0.01	mg/L
SW	PC-A	8/24/2010	Antimony	<0.001	mg/L
SW	PC-A	8/24/2010	Arsenic	0.0016	mg/L
SW	PC-A	8/24/2010	Selenium	<0.001	mg/L
SW	PC-A	8/24/2010	Thallium	<0.001	mg/L
SW	PC-A	8/24/2010	Uranium	0.002	mg/L
SW	PC-A	8/24/2010	Mercury	<0.0002	mg/L
SW	PC-A	8/24/2010	Fluoride	0.46	mg/L
SW	PC-A	8/24/2010	Chloride	8	mg/L
SW	PC-A	8/24/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-A	8/24/2010	Sulfate	70	mg/L
SW	PC-A	8/24/2010	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PC-A	8/24/2010	Carbonate	<2	mg/L CaCO3
SW	PC-A	8/24/2010	Bicarbonate	200	mg/L CaCO3
SW	PC-A	8/24/2010	Cyanide	<0.005	mg/L
SW	PC-A	8/24/2010	Specific Conductance	510	µmhos/cm
SW	PC-A	8/24/2010	pH	8.31	pH units
SW	PC-A	8/24/2010	TDS	344	mg/L
SW	PC-A	8/24/2010	Residue, Total	360	mg/L
SW	PC-A	8/24/2010	Suspended Solids	<10	mg/L
SW	CSCS-B	8/25/2010	Aluminum	0.035	mg/L
SW	CSCS-B	8/25/2010	Barium	0.013	mg/L
SW	CSCS-B	8/25/2010	Beryllium	<0.002	mg/L
SW	CSCS-B	8/25/2010	Boron	<0.04	mg/L
SW	CSCS-B	8/25/2010	Cadmium	<0.002	mg/L
SW	CSCS-B	8/25/2010	Calcium	38	mg/L
SW	CSCS-B	8/25/2010	Chromium	<0.006	mg/L
SW	CSCS-B	8/25/2010	Cobalt	<0.006	mg/L
SW	CSCS-B	8/25/2010	Copper	<0.006	mg/L
SW	CSCS-B	8/25/2010	Iron	0.032	mg/L
SW	CSCS-B	8/25/2010	Lead	<0.005	mg/L
SW	CSCS-B	8/25/2010	Magnesium	5.3	mg/L
SW	CSCS-B	8/25/2010	Manganese	0.0028	mg/L
SW	CSCS-B	8/25/2010	Molybdenum	0.011	mg/L
SW	CSCS-B	8/25/2010	Nickel	<0.01	mg/L
SW	CSCS-B	8/25/2010	Potassium	4.2	mg/L
SW	CSCS-B	8/25/2010	Silicon	35	mg/L
SW	CSCS-B	8/25/2010	Silver	<0.005	mg/L
SW	CSCS-B	8/25/2010	Sodium	96	mg/L
SW	CSCS-B	8/25/2010	Vanadium	<0.05	mg/L
SW	CSCS-B	8/25/2010	Zinc	<0.01	mg/L
SW	CSCS-B	8/25/2010	Antimony	<0.001	mg/L
SW	CSCS-B	8/25/2010	Arsenic	0.0042	mg/L
SW	CSCS-B	8/25/2010	Selenium	0.0012	mg/L
SW	CSCS-B	8/25/2010	Thallium	<0.001	mg/L
SW	CSCS-B	8/25/2010	Uranium	0.0019	mg/L
SW	CSCS-B	8/25/2010	Mercury	<0.0002	mg/L
SW	CSCS-B	8/25/2010	Fluoride	6.8	mg/L
SW	CSCS-B	8/25/2010	Chloride	13	mg/L
SW	CSCS-B	8/25/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	CSCS-B	8/25/2010	Sulfate	63	mg/L
SW	CSCS-B	8/25/2010	Alkalinity, Total (As CaCO3)	230	mg/L CaCO3
SW	CSCS-B	8/25/2010	Carbonate	<2	mg/L CaCO3

SW	CSCS-B	8/25/2010	Bicarbonate	230	mg/L CaCO3
SW	CSCS-B	8/25/2010	Specific Conductance	640	µmhos/cm
SW	CSCS-B	8/25/2010	pH	7.7	pH units
SW	CSCS-B	8/25/2010	TDS	453	mg/L
SW	CSCS-B	8/25/2010	Residue, Total	500	mg/L
SW	CSCS-B	8/25/2010	Suspended Solids	38	mg/L
SW	CSCS-B	8/25/2010	Cyanide	<0.01	mg/L
SW	CSCS-C	8/25/2010	Aluminum	0.38	mg/L
SW	CSCS-C	8/25/2010	Barium	0.015	mg/L
SW	CSCS-C	8/25/2010	Beryllium	<0.002	mg/L
SW	CSCS-C	8/25/2010	Boron	<0.04	mg/L
SW	CSCS-C	8/25/2010	Cadmium	<0.002	mg/L
SW	CSCS-C	8/25/2010	Calcium	11	mg/L
SW	CSCS-C	8/25/2010	Chromium	<0.006	mg/L
SW	CSCS-C	8/25/2010	Cobalt	<0.006	mg/L
SW	CSCS-C	8/25/2010	Copper	<0.006	mg/L
SW	CSCS-C	8/25/2010	Iron	0.12	mg/L
SW	CSCS-C	8/25/2010	Lead	<0.005	mg/L
SW	CSCS-C	8/25/2010	Magnesium	2.1	mg/L
SW	CSCS-C	8/25/2010	Manganese	0.017	mg/L
SW	CSCS-C	8/25/2010	Molybdenum	<0.008	mg/L
SW	CSCS-C	8/25/2010	Nickel	<0.01	mg/L
SW	CSCS-C	8/25/2010	Potassium	2.1	mg/L
SW	CSCS-C	8/25/2010	Silicon	19	mg/L
SW	CSCS-C	8/25/2010	Silver	<0.005	mg/L
SW	CSCS-C	8/25/2010	Sodium	4.7	mg/L
SW	CSCS-C	8/25/2010	Vanadium	<0.05	mg/L
SW	CSCS-C	8/25/2010	Zinc	<0.01	mg/L
SW	CSCS-C	8/25/2010	Antimony	<0.001	mg/L
SW	CSCS-C	8/25/2010	Arsenic	0.0012	mg/L
SW	CSCS-C	8/25/2010	Selenium	<0.001	mg/L
SW	CSCS-C	8/25/2010	Thallium	<0.001	mg/L
SW	CSCS-C	8/25/2010	Uranium	<0.001	mg/L
SW	CSCS-C	8/25/2010	Mercury	<0.0002	mg/L
SW	CSCS-C	8/25/2010	Fluoride	0.17	mg/L
SW	CSCS-C	8/25/2010	Chloride	1	mg/L
SW	CSCS-C	8/25/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	CSCS-C	8/25/2010	Sulfate	3.5	mg/L
SW	CSCS-C	8/25/2010	Alkalinity, Total (As CaCO3)	45	mg/L CaCO3
SW	CSCS-C	8/25/2010	Carbonate	<2	mg/L CaCO3
SW	CSCS-C	8/25/2010	Bicarbonate	45	mg/L CaCO3
SW	CSCS-C	8/25/2010	Specific Conductance	110	µmhos/cm
SW	CSCS-C	8/25/2010	pH	7.37	pH units
SW	CSCS-C	8/25/2010	TDS	445	mg/L
SW	CSCS-C	8/25/2010	Residue, Total	890	mg/L
SW	CSCS-C	8/25/2010	Suspended Solids	530	mg/L
SW	CSCS-C	8/25/2010	Cyanide	<0.01	mg/L
SW	SWQ-2	8/25/2010	Aluminum	1.5	mg/L
SW	SWQ-2	8/25/2010	Barium	0.01	mg/L
SW	SWQ-2	8/25/2010	Beryllium	<0.002	mg/L
SW	SWQ-2	8/25/2010	Boron	<0.04	mg/L
SW	SWQ-2	8/25/2010	Cadmium	<0.002	mg/L
SW	SWQ-2	8/25/2010	Calcium	6.5	mg/L
SW	SWQ-2	8/25/2010	Chromium	<0.006	mg/L
SW	SWQ-2	8/25/2010	Cobalt	<0.006	mg/L
SW	SWQ-2	8/25/2010	Copper	0.085	mg/L
SW	SWQ-2	8/25/2010	Iron	0.67	mg/L
SW	SWQ-2	8/25/2010	Lead	<0.005	mg/L
SW	SWQ-2	8/25/2010	Magnesium	2.4	mg/L
SW	SWQ-2	8/25/2010	Manganese	0.015	mg/L
SW	SWQ-2	8/25/2010	Molybdenum	<0.008	mg/L
SW	SWQ-2	8/25/2010	Nickel	<0.01	mg/L
SW	SWQ-2	8/25/2010	Potassium	1.9	mg/L
SW	SWQ-2	8/25/2010	Silicon	12	mg/L
SW	SWQ-2	8/25/2010	Silver	<0.005	mg/L
SW	SWQ-2	8/25/2010	Sodium	3.3	mg/L
SW	SWQ-2	8/25/2010	Vanadium	<0.05	mg/L
SW	SWQ-2	8/25/2010	Zinc	<0.01	mg/L
SW	SWQ-2	8/25/2010	Antimony	<0.001	mg/L
SW	SWQ-2	8/25/2010	Arsenic	<0.001	mg/L
SW	SWQ-2	8/25/2010	Selenium	<0.001	mg/L
SW	SWQ-2	8/25/2010	Thallium	<0.001	mg/L
SW	SWQ-2	8/25/2010	Uranium	<0.001	mg/L
SW	SWQ-2	8/25/2010	Mercury	<0.0002	mg/L
SW	SWQ-2	8/25/2010	Fluoride	0.57	mg/L
SW	SWQ-2	8/25/2010	Chloride	0.71	mg/L

SW	SWQ-2	8/25/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	SWQ-2	8/25/2010	Sulfate	11	mg/L
SW	SWQ-2	8/25/2010	Alkalinity, Total (As CaCO3)	21	mg/L CaCO3
SW	SWQ-2	8/25/2010	Carbonate	<2	mg/L CaCO3
SW	SWQ-2	8/25/2010	Bicarbonate	21	mg/L CaCO3
SW	SWQ-2	8/25/2010	Specific Conductance	89	µmhos/cm
SW	SWQ-2	8/25/2010	pH	7.42	pH units
SW	SWQ-2	8/25/2010	TDS	78	mg/L
SW	SWQ-2	8/25/2010	Residue, Total	130	mg/L
SW	SWQ-2	8/25/2010	Suspended Solids	35	mg/L
SW	SWQ-2	8/25/2010	Cyanide	<0.01	mg/L
SW	WS	8/25/2010	Aluminum	<0.02	mg/L
SW	WS	8/25/2010	Barium	0.01	mg/L
SW	WS	8/25/2010	Beryllium	<0.002	mg/L
SW	WS	8/25/2010	Boron	<0.04	mg/L
SW	WS	8/25/2010	Cadmium	<0.002	mg/L
SW	WS	8/25/2010	Calcium	7.2	mg/L
SW	WS	8/25/2010	Chromium	<0.006	mg/L
SW	WS	8/25/2010	Cobalt	<0.006	mg/L
SW	WS	8/25/2010	Copper	<0.006	mg/L
SW	WS	8/25/2010	Iron	<0.02	mg/L
SW	WS	8/25/2010	Lead	<0.005	mg/L
SW	WS	8/25/2010	Magnesium	<1	mg/L
SW	WS	8/25/2010	Manganese	0.021	mg/L
SW	WS	8/25/2010	Molybdenum	<0.008	mg/L
SW	WS	8/25/2010	Nickel	<0.01	mg/L
SW	WS	8/25/2010	Potassium	10	mg/L
SW	WS	8/25/2010	Silicon	64	mg/L
SW	WS	8/25/2010	Silver	<0.005	mg/L
SW	WS	8/25/2010	Sodium	160	mg/L
SW	WS	8/25/2010	Vanadium	<0.05	mg/L
SW	WS	8/25/2010	Zinc	0.016	mg/L
SW	WS	8/25/2010	Antimony	<0.001	mg/L
SW	WS	8/25/2010	Arsenic	<0.001	mg/L
SW	WS	8/25/2010	Selenium	<0.001	mg/L
SW	WS	8/25/2010	Thallium	<0.001	mg/L
SW	WS	8/25/2010	Uranium	<0.001	mg/L
SW	WS	8/25/2010	Mercury	<0.0002	mg/L
SW	WS	8/25/2010	Fluoride	16	mg/L
SW	WS	8/25/2010	Chloride	17	mg/L
SW	WS	8/25/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	WS	8/25/2010	Sulfate	89	mg/L
SW	WS	8/25/2010	Alkalinity, Total (As CaCO3)	220	mg/L CaCO3
SW	WS	8/25/2010	Carbonate	<2	mg/L CaCO3
SW	WS	8/25/2010	Bicarbonate	220	mg/L CaCO3
SW	WS	8/25/2010	Specific Conductance	720	µmhos/cm
SW	WS	8/25/2010	pH	8.3	pH units
SW	WS	8/25/2010	TDS	597	mg/L
SW	WS	8/25/2010	Residue, Total	590	mg/L
SW	WS	8/25/2010	Suspended Solids	<10	mg/L
SW	WS	8/25/2010	Cyanide	<0.01	mg/L
SW	WSCS-A	8/25/2010	Aluminum	0.74	mg/L
SW	WSCS-A	8/25/2010	Barium	0.016	mg/L
SW	WSCS-A	8/25/2010	Beryllium	<0.002	mg/L
SW	WSCS-A	8/25/2010	Boron	<0.04	mg/L
SW	WSCS-A	8/25/2010	Cadmium	<0.002	mg/L
SW	WSCS-A	8/25/2010	Calcium	9.5	mg/L
SW	WSCS-A	8/25/2010	Chromium	<0.006	mg/L
SW	WSCS-A	8/25/2010	Cobalt	<0.006	mg/L
SW	WSCS-A	8/25/2010	Copper	<0.006	mg/L
SW	WSCS-A	8/25/2010	Iron	0.36	mg/L
SW	WSCS-A	8/25/2010	Lead	<0.005	mg/L
SW	WSCS-A	8/25/2010	Magnesium	1.2	mg/L
SW	WSCS-A	8/25/2010	Manganese	0.018	mg/L
SW	WSCS-A	8/25/2010	Molybdenum	0.011	mg/L
SW	WSCS-A	8/25/2010	Nickel	<0.01	mg/L
SW	WSCS-A	8/25/2010	Potassium	7.8	mg/L
SW	WSCS-A	8/25/2010	Silicon	19	mg/L
SW	WSCS-A	8/25/2010	Silver	<0.005	mg/L
SW	WSCS-A	8/25/2010	Sodium	130	mg/L
SW	WSCS-A	8/25/2010	Vanadium	<0.05	mg/L
SW	WSCS-A	8/25/2010	Zinc	<0.01	mg/L
SW	WSCS-A	8/25/2010	Antimony	<0.001	mg/L
SW	WSCS-A	8/25/2010	Arsenic	0.0081	mg/L
SW	WSCS-A	8/25/2010	Selenium	<0.001	mg/L
SW	WSCS-A	8/25/2010	Thallium	<0.001	mg/L

SW	WSCS-A	8/25/2010	Uranium	<0.001	mg/L
SW	WSCS-A	8/25/2010	Mercury	<0.0002	mg/L
SW	WSCS-A	8/25/2010	Fluoride	13	mg/L
SW	WSCS-A	8/25/2010	Chloride	8.6	mg/L
SW	WSCS-A	8/25/2010	Nitrate (As N)+Nitrite (As N)	3.3	mg/L
SW	WSCS-A	8/25/2010	Sulfate	65	mg/L
SW	WSCS-A	8/25/2010	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	WSCS-A	8/25/2010	Carbonate	<2	mg/L CaCO3
SW	WSCS-A	8/25/2010	Bicarbonate	200	mg/L CaCO3
SW	WSCS-A	8/25/2010	Specific Conductance	600	µmhos/cm
SW	WSCS-A	8/25/2010	pH	8.38	pH units
SW	WSCS-A	8/25/2010	TDS	780	mg/L
SW	WSCS-A	8/25/2010	Residue, Total	1200	mg/L
SW	WSCS-A	8/25/2010	Suspended Solids	420	mg/L
SW	WSCS-A	8/25/2010	Cyanide	<0.01	mg/L
SW	PC-B	8/26/2010	Aluminum	<0.02	mg/L
SW	PC-B	8/26/2010	Barium	0.032	mg/L
SW	PC-B	8/26/2010	Beryllium	<0.002	mg/L
SW	PC-B	8/26/2010	Boron	<0.04	mg/L
SW	PC-B	8/26/2010	Cadmium	<0.002	mg/L
SW	PC-B	8/26/2010	Calcium	62	mg/L
SW	PC-B	8/26/2010	Chromium	<0.006	mg/L
SW	PC-B	8/26/2010	Cobalt	<0.006	mg/L
SW	PC-B	8/26/2010	Copper	<0.006	mg/L
SW	PC-B	8/26/2010	Iron	<0.02	mg/L
SW	PC-B	8/26/2010	Lead	<0.005	mg/L
SW	PC-B	8/26/2010	Magnesium	13	mg/L
SW	PC-B	8/26/2010	Manganese	0.01	mg/L
SW	PC-B	8/26/2010	Molybdenum	<0.008	mg/L
SW	PC-B	8/26/2010	Nickel	<0.01	mg/L
SW	PC-B	8/26/2010	Potassium	1.7	mg/L
SW	PC-B	8/26/2010	Silicon	15	mg/L
SW	PC-B	8/26/2010	Silver	<0.005	mg/L
SW	PC-B	8/26/2010	Sodium	14	mg/L
SW	PC-B	8/26/2010	Vanadium	<0.05	mg/L
SW	PC-B	8/26/2010	Zinc	0.018	mg/L
SW	PC-B	8/26/2010	Antimony	<0.001	mg/L
SW	PC-B	8/26/2010	Arsenic	0.0018	mg/L
SW	PC-B	8/26/2010	Selenium	<0.001	mg/L
SW	PC-B	8/26/2010	Thallium	<0.001	mg/L
SW	PC-B	8/26/2010	Uranium	0.0016	mg/L
SW	PC-B	8/26/2010	Mercury	<0.0002	mg/L
SW	PC-B	8/26/2010	Fluoride	0.51	mg/L
SW	PC-B	8/26/2010	Chloride	6	mg/L
SW	PC-B	8/26/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-B	8/26/2010	Sulfate	49	mg/L
SW	PC-B	8/26/2010	Alkalinity, Total (As CaCO3)	180	mg/L CaCO3
SW	PC-B	8/26/2010	Carbonate	4.6	mg/L CaCO3
SW	PC-B	8/26/2010	Bicarbonate	170	mg/L CaCO3
SW	PC-B	8/26/2010	Specific Conductance	450	µmhos/cm
SW	PC-B	8/26/2010	pH	8.46	pH units
SW	PC-B	8/26/2010	TDS	311	mg/L
SW	PC-B	8/26/2010	Residue, Total	320	mg/L
SW	PC-B	8/26/2010	Suspended Solids	<10	mg/L
SW	PC-B	8/26/2010	Cyanide	<0.01	mg/L
SW	PC-C	8/26/2010	Aluminum	<0.02	mg/L
SW	PC-C	8/26/2010	Barium	0.032	mg/L
SW	PC-C	8/26/2010	Beryllium	<0.002	mg/L
SW	PC-C	8/26/2010	Boron	<0.04	mg/L
SW	PC-C	8/26/2010	Cadmium	<0.002	mg/L
SW	PC-C	8/26/2010	Calcium	65	mg/L
SW	PC-C	8/26/2010	Chromium	<0.006	mg/L
SW	PC-C	8/26/2010	Cobalt	<0.006	mg/L
SW	PC-C	8/26/2010	Copper	<0.006	mg/L
SW	PC-C	8/26/2010	Iron	<0.02	mg/L
SW	PC-C	8/26/2010	Lead	<0.005	mg/L
SW	PC-C	8/26/2010	Magnesium	12	mg/L
SW	PC-C	8/26/2010	Manganese	0.016	mg/L
SW	PC-C	8/26/2010	Molybdenum	<0.008	mg/L
SW	PC-C	8/26/2010	Nickel	<0.01	mg/L
SW	PC-C	8/26/2010	Potassium	1.8	mg/L
SW	PC-C	8/26/2010	Silicon	16	mg/L
SW	PC-C	8/26/2010	Silver	<0.005	mg/L
SW	PC-C	8/26/2010	Sodium	18	mg/L
SW	PC-C	8/26/2010	Vanadium	<0.05	mg/L
SW	PC-C	8/26/2010	Zinc	0.016	mg/L

SW	PC-C	8/26/2010	Antimony	<0.001	mg/L
SW	PC-C	8/26/2010	Arsenic	0.0018	mg/L
SW	PC-C	8/26/2010	Selenium	<0.001	mg/L
SW	PC-C	8/26/2010	Thallium	<0.001	mg/L
SW	PC-C	8/26/2010	Uranium	0.0016	mg/L
SW	PC-C	8/26/2010	Mercury	<0.0002	mg/L
SW	PC-C	8/26/2010	Fluoride	0.86	mg/L
SW	PC-C	8/26/2010	Chloride	6	mg/L
SW	PC-C	8/26/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-C	8/26/2010	Sulfate	50	mg/L
SW	PC-C	8/26/2010	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PC-C	8/26/2010	Carbonate	9.1	mg/L CaCO3
SW	PC-C	8/26/2010	Bicarbonate	190	mg/L CaCO3
SW	PC-C	8/26/2010	Specific Conductance	470	µmhos/cm
SW	PC-C	8/26/2010	pH	8.51	pH units
SW	PC-C	8/26/2010	TDS	329	mg/L
SW	PC-C	8/26/2010	Residue, Total	350	mg/L
SW	PC-C	8/26/2010	Suspended Solids	15	mg/L
SW	PC-C	8/26/2010	Cyanide	<0.01	mg/L
SW	PCS-A	8/26/2010	Aluminum	<0.02	mg/L
SW	PCS-A	8/26/2010	Barium	0.0099	mg/L
SW	PCS-A	8/26/2010	Beryllium	<0.002	mg/L
SW	PCS-A	8/26/2010	Boron	<0.04	mg/L
SW	PCS-A	8/26/2010	Cadmium	<0.002	mg/L
SW	PCS-A	8/26/2010	Calcium	64	mg/L
SW	PCS-A	8/26/2010	Chromium	<0.006	mg/L
SW	PCS-A	8/26/2010	Cobalt	<0.006	mg/L
SW	PCS-A	8/26/2010	Copper	<0.006	mg/L
SW	PCS-A	8/26/2010	Iron	0.05	mg/L
SW	PCS-A	8/26/2010	Lead	<0.005	mg/L
SW	PCS-A	8/26/2010	Magnesium	10	mg/L
SW	PCS-A	8/26/2010	Manganese	<0.002	mg/L
SW	PCS-A	8/26/2010	Molybdenum	<0.008	mg/L
SW	PCS-A	8/26/2010	Nickel	<0.01	mg/L
SW	PCS-A	8/26/2010	Potassium	2.4	mg/L
SW	PCS-A	8/26/2010	Silicon	17	mg/L
SW	PCS-A	8/26/2010	Silver	<0.005	mg/L
SW	PCS-A	8/26/2010	Sodium	33	mg/L
SW	PCS-A	8/26/2010	Vanadium	<0.05	mg/L
SW	PCS-A	8/26/2010	Zinc	0.047	mg/L
SW	PCS-A	8/26/2010	Antimony	<0.001	mg/L
SW	PCS-A	8/26/2010	Arsenic	0.0019	mg/L
SW	PCS-A	8/26/2010	Selenium	0.0011	mg/L
SW	PCS-A	8/26/2010	Thallium	<0.001	mg/L
SW	PCS-A	8/26/2010	Uranium	0.0027	mg/L
SW	PCS-A	8/26/2010	Mercury	<0.0002	mg/L
SW	PCS-A	8/26/2010	Fluoride	1.6	mg/L
SW	PCS-A	8/26/2010	Chloride	8.5	mg/L
SW	PCS-A	8/26/2010	Nitrate (As N)+Nitrite (As N)	1	mg/L
SW	PCS-A	8/26/2010	Sulfate	56	mg/L
SW	PCS-A	8/26/2010	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PCS-A	8/26/2010	Carbonate	<2	mg/L CaCO3
SW	PCS-A	8/26/2010	Bicarbonate	200	mg/L CaCO3
SW	PCS-A	8/26/2010	Specific Conductance	520	µmhos/cm
SW	PCS-A	8/26/2010	pH	8.04	pH units
SW	PCS-A	8/26/2010	TDS	353	mg/L
SW	PCS-A	8/26/2010	Residue, Total	350	mg/L
SW	PCS-A	8/26/2010	Suspended Solids	<10	mg/L
SW	PCS-A	8/26/2010	Cyanide	<0.01	mg/L
SW	PC-D	8/27/2010	Aluminum	<0.02	mg/L
SW	PC-D	8/27/2010	Barium	0.029	mg/L
SW	PC-D	8/27/2010	Beryllium	<0.002	mg/L
SW	PC-D	8/27/2010	Boron	<0.04	mg/L
SW	PC-D	8/27/2010	Cadmium	<0.002	mg/L
SW	PC-D	8/27/2010	Calcium	64	mg/L
SW	PC-D	8/27/2010	Chromium	<0.006	mg/L
SW	PC-D	8/27/2010	Cobalt	<0.006	mg/L
SW	PC-D	8/27/2010	Copper	<0.006	mg/L
SW	PC-D	8/27/2010	Iron	<0.02	mg/L
SW	PC-D	8/27/2010	Lead	<0.005	mg/L
SW	PC-D	8/27/2010	Magnesium	12	mg/L
SW	PC-D	8/27/2010	Manganese	0.011	mg/L
SW	PC-D	8/27/2010	Molybdenum	<0.008	mg/L
SW	PC-D	8/27/2010	Nickel	<0.01	mg/L
SW	PC-D	8/27/2010	Potassium	2.1	mg/L
SW	PC-D	8/27/2010	Silicon	16	mg/L

SW	PC-D	8/27/2010	Silver	<0.005	mg/L
SW	PC-D	8/27/2010	Sodium	23	mg/L
SW	PC-D	8/27/2010	Vanadium	<0.05	mg/L
SW	PC-D	8/27/2010	Zinc	0.025	mg/L
SW	PC-D	8/27/2010	Antimony	<0.001	mg/L
SW	PC-D	8/27/2010	Arsenic	0.002	mg/L
SW	PC-D	8/27/2010	Selenium	<0.001	mg/L
SW	PC-D	8/27/2010	Thallium	<0.001	mg/L
SW	PC-D	8/27/2010	Uranium	0.0019	mg/L
SW	PC-D	8/27/2010	Mercury	<0.0002	mg/L
SW	PC-D	8/27/2010	Fluoride	1.2	mg/L
SW	PC-D	8/27/2010	Chloride	6.6	mg/L
SW	PC-D	8/27/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-D	8/27/2010	Sulfate	53	mg/L
SW	PC-D	8/27/2010	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PC-D	8/27/2010	Carbonate	5	mg/L CaCO3
SW	PC-D	8/27/2010	Bicarbonate	190	mg/L CaCO3
SW	PC-D	8/27/2010	Specific Conductance	480	µmhos/cm
SW	PC-D	8/27/2010	pH	8.45	pH units
SW	PC-D	8/27/2010	TDS	335	mg/L
SW	PC-D	8/27/2010	Residue, Total	340	mg/L
SW	PC-D	8/27/2010	Suspended Solids	<10	mg/L
SW	PC-D	8/27/2010	Cyanide	<0.01	mg/L
SW	SWQ-3	10/21/2010	Aluminum	<0.02	mg/L
SW	SWQ-3	10/21/2010	Barium	0.053	mg/L
SW	SWQ-3	10/21/2010	Beryllium	<0.002	mg/L
SW	SWQ-3	10/21/2010	Boron	0.089	mg/L
SW	SWQ-3	10/21/2010	Cadmium	<0.002	mg/L
SW	SWQ-3	10/21/2010	Calcium	630	mg/L
SW	SWQ-3	10/21/2010	Chromium	<0.006	mg/L
SW	SWQ-3	10/21/2010	Cobalt	<0.006	mg/L
SW	SWQ-3	10/21/2010	Copper	0.023	mg/L
SW	SWQ-3	10/21/2010	Iron	0.049	mg/L
SW	SWQ-3	10/21/2010	Lead	<0.005	mg/L
SW	SWQ-3	10/21/2010	Magnesium	260	mg/L
SW	SWQ-3	10/21/2010	Manganese	0.032	mg/L
SW	SWQ-3	10/21/2010	Molybdenum	0.03	mg/L
SW	SWQ-3	10/21/2010	Nickel	<0.01	mg/L
SW	SWQ-3	10/21/2010	Potassium	4.3	mg/L
SW	SWQ-3	10/21/2010	Silicon	19	mg/L
SW	SWQ-3	10/21/2010	Silver	<0.005	mg/L
SW	SWQ-3	10/21/2010	Sodium	520	mg/L
SW	SWQ-3	10/21/2010	Vanadium	<0.05	mg/L
SW	SWQ-3	10/21/2010	Zinc	0.48	mg/L
SW	SWQ-3	10/21/2010	Antimony	<0.001	mg/L
SW	SWQ-3	10/21/2010	Arsenic	<0.005	mg/L
SW	SWQ-3	10/21/2010	Selenium	0.016	mg/L
SW	SWQ-3	10/21/2010	Thallium	<0.001	mg/L
SW	SWQ-3	10/21/2010	Uranium	0.027	mg/L
SW	SWQ-3	10/21/2010	Mercury	<0.0002	mg/L
SW	SWQ-3	10/21/2010	Fluoride	1.3	mg/L
SW	SWQ-3	10/21/2010	Chloride	93	mg/L
SW	SWQ-3	10/21/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	SWQ-3	10/21/2010	Sulfate	3100	mg/L
SW	SWQ-3	10/21/2010	Alkalinity, Total (As CaCO3)	530	mg/L CaCO3
SW	SWQ-3	10/21/2010	Carbonate	<2	mg/L CaCO3
SW	SWQ-3	10/21/2010	Bicarbonate	530	mg/L CaCO3
SW	SWQ-3	10/21/2010	Specific Conductance	4600	µmhos/cm
SW	SWQ-3	10/21/2010	pH	7.99	pH units
SW	SWQ-3	10/21/2010	TDS	5080	mg/L
SW	SWQ-3	10/21/2010	Suspended Solids	<10	mg/L
SW	LAC-A	11/3/2010	Aluminum	<0.02	mg/L
SW	LAC-A	11/3/2010	Barium	0.016	mg/L
SW	LAC-A	11/3/2010	Beryllium	<0.002	mg/L
SW	LAC-A	11/3/2010	Boron	<0.04	mg/L
SW	LAC-A	11/3/2010	Cadmium	<0.002	mg/L
SW	LAC-A	11/3/2010	Calcium	46	mg/L
SW	LAC-A	11/3/2010	Chromium	<0.006	mg/L
SW	LAC-A	11/3/2010	Cobalt	<0.006	mg/L
SW	LAC-A	11/3/2010	Copper	<0.006	mg/L
SW	LAC-A	11/3/2010	Iron	<0.02	mg/L
SW	LAC-A	11/3/2010	Lead	<0.005	mg/L
SW	LAC-A	11/3/2010	Magnesium	9.4	mg/L
SW	LAC-A	11/3/2010	Manganese	0.0085	mg/L
SW	LAC-A	11/3/2010	Molybdenum	<0.008	mg/L
SW	LAC-A	11/3/2010	Nickel	<0.01	mg/L

SW	LAC-A	11/3/2010	Potassium	2.1	mg/L
SW	LAC-A	11/3/2010	Silicon	22	mg/L
SW	LAC-A	11/3/2010	Silver	<0.005	mg/L
SW	LAC-A	11/3/2010	Sodium	18	mg/L
SW	LAC-A	11/3/2010	Vanadium	<0.05	mg/L
SW	LAC-A	11/3/2010	Zinc	0.02	mg/L
SW	LAC-A	11/3/2010	Antimony	<0.001	mg/L
SW	LAC-A	11/3/2010	Arsenic	0.0011	mg/L
SW	LAC-A	11/3/2010	Selenium	<0.001	mg/L
SW	LAC-A	11/3/2010	Thallium	<0.001	mg/L
SW	LAC-A	11/3/2010	Uranium	<0.001	mg/L
SW	LAC-A	11/3/2010	Mercury	<0.0002	mg/L
SW	LAC-A	11/3/2010	Fluoride	0.27	mg/L
SW	LAC-A	11/3/2010	Chloride	5.1	mg/L
SW	LAC-A	11/3/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-A	11/3/2010	Sulfate	9.4	mg/L
SW	LAC-A	11/3/2010	Alkalinity, Total (As CaCO3)	160	mg/L CaCO3
SW	LAC-A	11/3/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-A	11/3/2010	Bicarbonate	160	mg/L CaCO3
SW	LAC-A	11/3/2010	Specific Conductance	320	µmhos/cm
SW	LAC-A	11/3/2010	pH	8.27	pH units
SW	LAC-A	11/3/2010	TDS	218	mg/L
SW	LAC-A	11/3/2010	Suspended Solids	<10	mg/L
SW	LAC-A	11/3/2010	Cyanide	<0.01	mg/L
SW	LAC-B	11/3/2010	Aluminum	<0.02	mg/L
SW	LAC-B	11/3/2010	Barium	0.022	mg/L
SW	LAC-B	11/3/2010	Beryllium	<0.002	mg/L
SW	LAC-B	11/3/2010	Boron	<0.04	mg/L
SW	LAC-B	11/3/2010	Cadmium	<0.002	mg/L
SW	LAC-B	11/3/2010	Calcium	40	mg/L
SW	LAC-B	11/3/2010	Chromium	<0.006	mg/L
SW	LAC-B	11/3/2010	Cobalt	<0.006	mg/L
SW	LAC-B	11/3/2010	Copper	<0.006	mg/L
SW	LAC-B	11/3/2010	Iron	<0.02	mg/L
SW	LAC-B	11/3/2010	Lead	<0.005	mg/L
SW	LAC-B	11/3/2010	Magnesium	11	mg/L
SW	LAC-B	11/3/2010	Manganese	0.0095	mg/L
SW	LAC-B	11/3/2010	Molybdenum	<0.008	mg/L
SW	LAC-B	11/3/2010	Nickel	<0.01	mg/L
SW	LAC-B	11/3/2010	Potassium	3.3	mg/L
SW	LAC-B	11/3/2010	Silicon	15	mg/L
SW	LAC-B	11/3/2010	Silver	<0.005	mg/L
SW	LAC-B	11/3/2010	Sodium	48	mg/L
SW	LAC-B	11/3/2010	Vanadium	<0.05	mg/L
SW	LAC-B	11/3/2010	Zinc	<0.01	mg/L
SW	LAC-B	11/3/2010	Antimony	<0.001	mg/L
SW	LAC-B	11/3/2010	Arsenic	0.004	mg/L
SW	LAC-B	11/3/2010	Selenium	<0.001	mg/L
SW	LAC-B	11/3/2010	Thallium	<0.001	mg/L
SW	LAC-B	11/3/2010	Uranium	<0.001	mg/L
SW	LAC-B	11/3/2010	Mercury	<0.0002	mg/L
SW	LAC-B	11/3/2010	Fluoride	1.1	mg/L
SW	LAC-B	11/3/2010	Chloride	47	mg/L
SW	LAC-B	11/3/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-B	11/3/2010	Sulfate	20	mg/L
SW	LAC-B	11/3/2010	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	LAC-B	11/3/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-B	11/3/2010	Bicarbonate	170	mg/L CaCO3
SW	LAC-B	11/3/2010	Specific Conductance	480	µmhos/cm
SW	LAC-B	11/3/2010	pH	8.19	pH units
SW	LAC-B	11/3/2010	TDS	292	mg/L
SW	LAC-B	11/3/2010	Suspended Solids	<10	mg/L
SW	LAC-B	11/3/2010	Cyanide	<0.01	mg/L
SW	LAC-C	11/3/2010	Aluminum	<0.02	mg/L
SW	LAC-C	11/3/2010	Barium	0.014	mg/L
SW	LAC-C	11/3/2010	Beryllium	<0.002	mg/L
SW	LAC-C	11/3/2010	Boron	<0.04	mg/L
SW	LAC-C	11/3/2010	Cadmium	<0.002	mg/L
SW	LAC-C	11/3/2010	Calcium	49	mg/L
SW	LAC-C	11/3/2010	Chromium	<0.006	mg/L
SW	LAC-C	11/3/2010	Cobalt	<0.006	mg/L
SW	LAC-C	11/3/2010	Copper	<0.006	mg/L
SW	LAC-C	11/3/2010	Iron	<0.02	mg/L
SW	LAC-C	11/3/2010	Lead	<0.005	mg/L
SW	LAC-C	11/3/2010	Magnesium	7.9	mg/L
SW	LAC-C	11/3/2010	Manganese	0.0045	mg/L

SW	LAC-C	11/3/2010	Molybdenum	<0.008	mg/L
SW	LAC-C	11/3/2010	Nickel	<0.01	mg/L
SW	LAC-C	11/3/2010	Potassium	2.2	mg/L
SW	LAC-C	11/3/2010	Silicon	19	mg/L
SW	LAC-C	11/3/2010	Silver	<0.005	mg/L
SW	LAC-C	11/3/2010	Sodium	24	mg/L
SW	LAC-C	11/3/2010	Vanadium	<0.05	mg/L
SW	LAC-C	11/3/2010	Zinc	<0.01	mg/L
SW	LAC-C	11/3/2010	Antimony	<0.001	mg/L
SW	LAC-C	11/3/2010	Arsenic	0.0019	mg/L
SW	LAC-C	11/3/2010	Selenium	<0.001	mg/L
SW	LAC-C	11/3/2010	Thallium	<0.001	mg/L
SW	LAC-C	11/3/2010	Uranium	<0.001	mg/L
SW	LAC-C	11/3/2010	Mercury	<0.0002	mg/L
SW	LAC-C	11/3/2010	Fluoride	0.51	mg/L
SW	LAC-C	11/3/2010	Chloride	13	mg/L
SW	LAC-C	11/3/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-C	11/3/2010	Sulfate	15	mg/L
SW	LAC-C	11/3/2010	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	LAC-C	11/3/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-C	11/3/2010	Bicarbonate	170	mg/L CaCO3
SW	LAC-C	11/3/2010	Specific Conductance	390	µmhos/cm
SW	LAC-C	11/3/2010	pH	7.8	pH units
SW	LAC-C	11/3/2010	TDS	252	mg/L
SW	LAC-C	11/3/2010	Suspended Solids	<10	mg/L
SW	LAC-C	11/3/2010	Cyanide	<0.01	mg/L
SW	NWS	11/3/2010	Aluminum	<0.02	mg/L
SW	NWS	11/3/2010	Barium	0.024	mg/L
SW	NWS	11/3/2010	Beryllium	<0.002	mg/L
SW	NWS	11/3/2010	Boron	0.043	mg/L
SW	NWS	11/3/2010	Cadmium	<0.002	mg/L
SW	NWS	11/3/2010	Calcium	38	mg/L
SW	NWS	11/3/2010	Chromium	<0.006	mg/L
SW	NWS	11/3/2010	Cobalt	<0.006	mg/L
SW	NWS	11/3/2010	Copper	<0.006	mg/L
SW	NWS	11/3/2010	Iron	<0.02	mg/L
SW	NWS	11/3/2010	Lead	<0.005	mg/L
SW	NWS	11/3/2010	Magnesium	13	mg/L
SW	NWS	11/3/2010	Manganese	<0.002	mg/L
SW	NWS	11/3/2010	Molybdenum	<0.008	mg/L
SW	NWS	11/3/2010	Nickel	<0.01	mg/L
SW	NWS	11/3/2010	Potassium	4	mg/L
SW	NWS	11/3/2010	Silicon	11	mg/L
SW	NWS	11/3/2010	Silver	<0.005	mg/L
SW	NWS	11/3/2010	Sodium	69	mg/L
SW	NWS	11/3/2010	Vanadium	<0.05	mg/L
SW	NWS	11/3/2010	Zinc	<0.01	mg/L
SW	NWS	11/3/2010	Antimony	<0.001	mg/L
SW	NWS	11/3/2010	Arsenic	0.0062	mg/L
SW	NWS	11/3/2010	Selenium	<0.001	mg/L
SW	NWS	11/3/2010	Thallium	<0.001	mg/L
SW	NWS	11/3/2010	Uranium	0.001	mg/L
SW	NWS	11/3/2010	Mercury	<0.0002	mg/L
SW	NWS	11/3/2010	Fluoride	1.7	mg/L
SW	NWS	11/3/2010	Chloride	74	mg/L
SW	NWS	11/3/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	NWS	11/3/2010	Sulfate	28	mg/L
SW	NWS	11/3/2010	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	NWS	11/3/2010	Carbonate	<2	mg/L CaCO3
SW	NWS	11/3/2010	Bicarbonate	170	mg/L CaCO3
SW	NWS	11/3/2010	Specific Conductance	590	µmhos/cm
SW	NWS	11/3/2010	pH	7.74	pH units
SW	NWS	11/3/2010	TDS	339	mg/L
SW	NWS	11/3/2010	Suspended Solids	<10	mg/L
SW	NWS	11/3/2010	Cyanide	<0.01	mg/L
SW	CSCS-B	11/4/2010	Aluminum	<0.02	mg/L
SW	CSCS-B	11/4/2010	Barium	0.015	mg/L
SW	CSCS-B	11/4/2010	Beryllium	<0.002	mg/L
SW	CSCS-B	11/4/2010	Boron	0.048	mg/L
SW	CSCS-B	11/4/2010	Cadmium	<0.002	mg/L
SW	CSCS-B	11/4/2010	Calcium	40	mg/L
SW	CSCS-B	11/4/2010	Chromium	<0.006	mg/L
SW	CSCS-B	11/4/2010	Cobalt	<0.006	mg/L
SW	CSCS-B	11/4/2010	Copper	<0.006	mg/L
SW	CSCS-B	11/4/2010	Iron	<0.02	mg/L
SW	CSCS-B	11/4/2010	Lead	<0.005	mg/L

SW	CSCS-B	11/4/2010	Magnesium	6	mg/L
SW	CSCS-B	11/4/2010	Manganese	0.0079	mg/L
SW	CSCS-B	11/4/2010	Molybdenum	0.012	mg/L
SW	CSCS-B	11/4/2010	Nickel	<0.01	mg/L
SW	CSCS-B	11/4/2010	Potassium	4.2	mg/L
SW	CSCS-B	11/4/2010	Silicon	33	mg/L
SW	CSCS-B	11/4/2010	Silver	<0.005	mg/L
SW	CSCS-B	11/4/2010	Sodium	110	mg/L
SW	CSCS-B	11/4/2010	Vanadium	<0.05	mg/L
SW	CSCS-B	11/4/2010	Zinc	<0.01	mg/L
SW	CSCS-B	11/4/2010	Antimony	<0.001	mg/L
SW	CSCS-B	11/4/2010	Arsenic	0.0045	mg/L
SW	CSCS-B	11/4/2010	Selenium	0.0011	mg/L
SW	CSCS-B	11/4/2010	Thallium	<0.001	mg/L
SW	CSCS-B	11/4/2010	Uranium	0.0014	mg/L
SW	CSCS-B	11/4/2010	Mercury	<0.0002	mg/L
SW	CSCS-B	11/4/2010	Fluoride	6.3	mg/L
SW	CSCS-B	11/4/2010	Chloride	16	mg/L
SW	CSCS-B	11/4/2010	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	CSCS-B	11/4/2010	Nitrogen, Nitrate (As N)	0.36	mg/L
SW	CSCS-B	11/4/2010	Sulfate	70	mg/L
SW	CSCS-B	11/4/2010	Alkalinity, Total (As CaCO3)	250	mg/L CaCO3
SW	CSCS-B	11/4/2010	Carbonate	<2	mg/L CaCO3
SW	CSCS-B	11/4/2010	Bicarbonate	250	mg/L CaCO3
SW	CSCS-B	11/4/2010	Specific Conductance	690	µmhos/cm
SW	CSCS-B	11/4/2010	pH	7.49	pH units
SW	CSCS-B	11/4/2010	TDS	490	mg/L
SW	CSCS-B	11/4/2010	Suspended Solids	130	mg/L
SW	CSCS-B	11/4/2010	Cyanide	<0.01	mg/L
SW	LAC-D	11/4/2010	Aluminum	<0.02	mg/L
SW	LAC-D	11/4/2010	Barium	0.019	mg/L
SW	LAC-D	11/4/2010	Beryllium	<0.002	mg/L
SW	LAC-D	11/4/2010	Boron	<0.04	mg/L
SW	LAC-D	11/4/2010	Cadmium	<0.002	mg/L
SW	LAC-D	11/4/2010	Calcium	55	mg/L
SW	LAC-D	11/4/2010	Chromium	<0.006	mg/L
SW	LAC-D	11/4/2010	Cobalt	<0.006	mg/L
SW	LAC-D	11/4/2010	Copper	<0.006	mg/L
SW	LAC-D	11/4/2010	Iron	<0.02	mg/L
SW	LAC-D	11/4/2010	Lead	<0.005	mg/L
SW	LAC-D	11/4/2010	Magnesium	8.9	mg/L
SW	LAC-D	11/4/2010	Manganese	0.0048	mg/L
SW	LAC-D	11/4/2010	Molybdenum	<0.008	mg/L
SW	LAC-D	11/4/2010	Nickel	<0.01	mg/L
SW	LAC-D	11/4/2010	Potassium	2.2	mg/L
SW	LAC-D	11/4/2010	Silicon	18	mg/L
SW	LAC-D	11/4/2010	Silver	<0.005	mg/L
SW	LAC-D	11/4/2010	Sodium	28	mg/L
SW	LAC-D	11/4/2010	Vanadium	<0.05	mg/L
SW	LAC-D	11/4/2010	Zinc	<0.01	mg/L
SW	LAC-D	11/4/2010	Antimony	<0.001	mg/L
SW	LAC-D	11/4/2010	Arsenic	0.0022	mg/L
SW	LAC-D	11/4/2010	Selenium	<0.001	mg/L
SW	LAC-D	11/4/2010	Thallium	<0.001	mg/L
SW	LAC-D	11/4/2010	Uranium	<0.001	mg/L
SW	LAC-D	11/4/2010	Mercury	<0.0002	mg/L
SW	LAC-D	11/4/2010	Fluoride	0.55	mg/L
SW	LAC-D	11/4/2010	Chloride	15	mg/L
SW	LAC-D	11/4/2010	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	LAC-D	11/4/2010	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	LAC-D	11/4/2010	Sulfate	13	mg/L
SW	LAC-D	11/4/2010	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	LAC-D	11/4/2010	Carbonate	<2	mg/L CaCO3
SW	LAC-D	11/4/2010	Bicarbonate	200	mg/L CaCO3
SW	LAC-D	11/4/2010	Specific Conductance	450	µmhos/cm
SW	LAC-D	11/4/2010	pH	8.32	pH units
SW	LAC-D	11/4/2010	TDS	300	mg/L
SW	LAC-D	11/4/2010	Suspended Solids	<10	mg/L
SW	LAC-D	11/4/2010	Cyanide	<0.01	mg/L
SW	WS	11/4/2010	Aluminum	<0.02	mg/L
SW	WS	11/4/2010	Barium	0.0098	mg/L
SW	WS	11/4/2010	Beryllium	<0.002	mg/L
SW	WS	11/4/2010	Boron	0.066	mg/L
SW	WS	11/4/2010	Cadmium	<0.002	mg/L
SW	WS	11/4/2010	Calcium	7.4	mg/L
SW	WS	11/4/2010	Chromium	<0.006	mg/L

SW	WS	11/4/2010	Cobalt	<0.006	mg/L
SW	WS	11/4/2010	Copper	<0.006	mg/L
SW	WS	11/4/2010	Iron	<0.02	mg/L
SW	WS	11/4/2010	Lead	<0.005	mg/L
SW	WS	11/4/2010	Magnesium	<1	mg/L
SW	WS	11/4/2010	Manganese	0.015	mg/L
SW	WS	11/4/2010	Molybdenum	<0.008	mg/L
SW	WS	11/4/2010	Nickel	<0.01	mg/L
SW	WS	11/4/2010	Potassium	11	mg/L
SW	WS	11/4/2010	Silicon	62	mg/L
SW	WS	11/4/2010	Silver	<0.005	mg/L
SW	WS	11/4/2010	Sodium	160	mg/L
SW	WS	11/4/2010	Vanadium	<0.05	mg/L
SW	WS	11/4/2010	Zinc	<0.01	mg/L
SW	WS	11/4/2010	Antimony	<0.001	mg/L
SW	WS	11/4/2010	Arsenic	<0.001	mg/L
SW	WS	11/4/2010	Selenium	<0.001	mg/L
SW	WS	11/4/2010	Thallium	<0.001	mg/L
SW	WS	11/4/2010	Uranium	<0.001	mg/L
SW	WS	11/4/2010	Mercury	<0.0002	mg/L
SW	WS	11/4/2010	Fluoride	15	mg/L
SW	WS	11/4/2010	Chloride	18	mg/L
SW	WS	11/4/2010	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	WS	11/4/2010	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	WS	11/4/2010	Sulfate	88	mg/L
SW	WS	11/4/2010	Alkalinity, Total (As CaCO3)	230	mg/L CaCO3
SW	WS	11/4/2010	Carbonate	<2	mg/L CaCO3
SW	WS	11/4/2010	Bicarbonate	230	mg/L CaCO3
SW	WS	11/4/2010	Specific Conductance	760	µmhos/cm
SW	WS	11/4/2010	pH	7.88	pH units
SW	WS	11/4/2010	TDS	592	mg/L
SW	WS	11/4/2010	Suspended Solids	<10	mg/L
SW	WS	11/4/2010	Cyanide	<0.01	mg/L
SW	PC-A	11/8/2010	Aluminum	<0.02	mg/L
SW	PC-A	11/8/2010	Barium	0.035	mg/L
SW	PC-A	11/8/2010	Beryllium	<0.002	mg/L
SW	PC-A	11/8/2010	Boron	<0.04	mg/L
SW	PC-A	11/8/2010	Cadmium	<0.002	mg/L
SW	PC-A	11/8/2010	Calcium	70	mg/L
SW	PC-A	11/8/2010	Chromium	<0.006	mg/L
SW	PC-A	11/8/2010	Cobalt	<0.006	mg/L
SW	PC-A	11/8/2010	Copper	<0.006	mg/L
SW	PC-A	11/8/2010	Iron	<0.02	mg/L
SW	PC-A	11/8/2010	Lead	<0.005	mg/L
SW	PC-A	11/8/2010	Magnesium	15	mg/L
SW	PC-A	11/8/2010	Manganese	0.0046	mg/L
SW	PC-A	11/8/2010	Molybdenum	<0.008	mg/L
SW	PC-A	11/8/2010	Nickel	<0.01	mg/L
SW	PC-A	11/8/2010	Potassium	<1	mg/L
SW	PC-A	11/8/2010	Silicon	13	mg/L
SW	PC-A	11/8/2010	Silver	<0.005	mg/L
SW	PC-A	11/8/2010	Sodium	16	mg/L
SW	PC-A	11/8/2010	Vanadium	<0.05	mg/L
SW	PC-A	11/8/2010	Zinc	0.013	mg/L
SW	PC-A	11/8/2010	Antimony	<0.001	mg/L
SW	PC-A	11/8/2010	Arsenic	0.0012	mg/L
SW	PC-A	11/8/2010	Selenium	<0.001	mg/L
SW	PC-A	11/8/2010	Thallium	<0.001	mg/L
SW	PC-A	11/8/2010	Uranium	0.0021	mg/L
SW	PC-A	11/8/2010	Mercury	<0.0002	mg/L
SW	PC-A	11/8/2010	Fluoride	0.45	mg/L
SW	PC-A	11/8/2010	Chloride	8.5	mg/L
SW	PC-A	11/8/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-A	11/8/2010	Sulfate	69	mg/L
SW	PC-A	11/8/2010	Alkalinity, Total (As CaCO3)	180	mg/L CaCO3
SW	PC-A	11/8/2010	Carbonate	<2	mg/L CaCO3
SW	PC-A	11/8/2010	Bicarbonate	180	mg/L CaCO3
SW	PC-A	11/8/2010	Specific Conductance	490	µmhos/cm
SW	PC-A	11/8/2010	pH	8.23	pH units
SW	PC-A	11/8/2010	TDS	316	mg/L
SW	PC-A	11/8/2010	Suspended Solids	<10	mg/L
SW	PC-A	11/8/2010	Cyanide	<0.01	mg/L
SW	PC-B	11/8/2010	Aluminum	<0.02	mg/L
SW	PC-B	11/8/2010	Barium	0.037	mg/L
SW	PC-B	11/8/2010	Beryllium	<0.002	mg/L
SW	PC-B	11/8/2010	Boron	<0.04	mg/L

SW	PC-B	11/8/2010	Cadmium	<0.002	mg/L
SW	PC-B	11/8/2010	Calcium	70	mg/L
SW	PC-B	11/8/2010	Chromium	<0.006	mg/L
SW	PC-B	11/8/2010	Cobalt	<0.006	mg/L
SW	PC-B	11/8/2010	Copper	<0.006	mg/L
SW	PC-B	11/8/2010	Iron	<0.02	mg/L
SW	PC-B	11/8/2010	Lead	<0.005	mg/L
SW	PC-B	11/8/2010	Magnesium	12	mg/L
SW	PC-B	11/8/2010	Manganese	0.0046	mg/L
SW	PC-B	11/8/2010	Molybdenum	<0.008	mg/L
SW	PC-B	11/8/2010	Nickel	<0.01	mg/L
SW	PC-B	11/8/2010	Potassium	2.9	mg/L
SW	PC-B	11/8/2010	Silicon	19	mg/L
SW	PC-B	11/8/2010	Silver	<0.005	mg/L
SW	PC-B	11/8/2010	Sodium	44	mg/L
SW	PC-B	11/8/2010	Vanadium	<0.05	mg/L
SW	PC-B	11/8/2010	Zinc	<0.01	mg/L
SW	PC-B	11/8/2010	Antimony	<0.001	mg/L
SW	PC-B	11/8/2010	Arsenic	0.0013	mg/L
SW	PC-B	11/8/2010	Selenium	<0.001	mg/L
SW	PC-B	11/8/2010	Thallium	<0.001	mg/L
SW	PC-B	11/8/2010	Uranium	0.0019	mg/L
SW	PC-B	11/8/2010	Mercury	<0.0002	mg/L
SW	PC-B	11/8/2010	Fluoride	2.1	mg/L
SW	PC-B	11/8/2010	Chloride	11	mg/L
SW	PC-B	11/8/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-B	11/8/2010	Sulfate	70	mg/L
SW	PC-B	11/8/2010	Alkalinity, Total (As CaCO3)	220	mg/L CaCO3
SW	PC-B	11/8/2010	Carbonate	<2	mg/L CaCO3
SW	PC-B	11/8/2010	Bicarbonate	220	mg/L CaCO3
SW	PC-B	11/8/2010	Specific Conductance	580	µmhos/cm
SW	PC-B	11/8/2010	pH	8.23	pH units
SW	PC-B	11/8/2010	TDS	378	mg/L
SW	PC-B	11/8/2010	Suspended Solids	<10	mg/L
SW	PC-B	11/8/2010	Cyanide	<0.01	mg/L
SW	PC-C	11/9/2010	Aluminum	0.066	mg/L
SW	PC-C	11/9/2010	Barium	0.032	mg/L
SW	PC-C	11/9/2010	Beryllium	<0.002	mg/L
SW	PC-C	11/9/2010	Boron	<0.04	mg/L
SW	PC-C	11/9/2010	Cadmium	<0.002	mg/L
SW	PC-C	11/9/2010	Calcium	59	mg/L
SW	PC-C	11/9/2010	Chromium	<0.006	mg/L
SW	PC-C	11/9/2010	Cobalt	<0.006	mg/L
SW	PC-C	11/9/2010	Copper	<0.006	mg/L
SW	PC-C	11/9/2010	Iron	<0.02	mg/L
SW	PC-C	11/9/2010	Lead	<0.005	mg/L
SW	PC-C	11/9/2010	Magnesium	10	mg/L
SW	PC-C	11/9/2010	Manganese	0.0068	mg/L
SW	PC-C	11/9/2010	Molybdenum	<0.008	mg/L
SW	PC-C	11/9/2010	Nickel	<0.01	mg/L
SW	PC-C	11/9/2010	Potassium	3.2	mg/L
SW	PC-C	11/9/2010	Silicon	20	mg/L
SW	PC-C	11/9/2010	Silver	<0.005	mg/L
SW	PC-C	11/9/2010	Sodium	56	mg/L
SW	PC-C	11/9/2010	Vanadium	<0.05	mg/L
SW	PC-C	11/9/2010	Zinc	0.026	mg/L
SW	PC-C	11/9/2010	Antimony	<0.001	mg/L
SW	PC-C	11/9/2010	Arsenic	0.0022	mg/L
SW	PC-C	11/9/2010	Selenium	<0.001	mg/L
SW	PC-C	11/9/2010	Thallium	<0.001	mg/L
SW	PC-C	11/9/2010	Uranium	0.0018	mg/L
SW	PC-C	11/9/2010	Mercury	<0.0002	mg/L
SW	PC-C	11/9/2010	Fluoride	3.7	mg/L
SW	PC-C	11/9/2010	Chloride	10	mg/L
SW	PC-C	11/9/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-C	11/9/2010	Sulfate	70	mg/L
SW	PC-C	11/9/2010	Alkalinity, Total (As CaCO3)	220	mg/L CaCO3
SW	PC-C	11/9/2010	Carbonate	2	mg/L CaCO3
SW	PC-C	11/9/2010	Bicarbonate	220	mg/L CaCO3
SW	PC-C	11/9/2010	Specific Conductance	580	µmhos/cm
SW	PC-C	11/9/2010	pH	8.36	pH units
SW	PC-C	11/9/2010	TDS	371	mg/L
SW	PC-C	11/9/2010	Suspended Solids	<10	mg/L
SW	PC-D	11/9/2010	Aluminum	<0.02	mg/L
SW	PC-D	11/9/2010	Barium	0.027	mg/L
SW	PC-D	11/9/2010	Beryllium	<0.002	mg/L

SW	PC-D	11/9/2010	Boron	<0.04	mg/L
SW	PC-D	11/9/2010	Cadmium	<0.002	mg/L
SW	PC-D	11/9/2010	Calcium	56	mg/L
SW	PC-D	11/9/2010	Chromium	<0.006	mg/L
SW	PC-D	11/9/2010	Cobalt	<0.006	mg/L
SW	PC-D	11/9/2010	Copper	<0.006	mg/L
SW	PC-D	11/9/2010	Iron	<0.02	mg/L
SW	PC-D	11/9/2010	Lead	<0.005	mg/L
SW	PC-D	11/9/2010	Magnesium	11	mg/L
SW	PC-D	11/9/2010	Manganese	0.013	mg/L
SW	PC-D	11/9/2010	Molybdenum	<0.008	mg/L
SW	PC-D	11/9/2010	Nickel	<0.01	mg/L
SW	PC-D	11/9/2010	Potassium	2.8	mg/L
SW	PC-D	11/9/2010	Silicon	16	mg/L
SW	PC-D	11/9/2010	Silver	<0.005	mg/L
SW	PC-D	11/9/2010	Sodium	37	mg/L
SW	PC-D	11/9/2010	Vanadium	<0.05	mg/L
SW	PC-D	11/9/2010	Zinc	<0.01	mg/L
SW	PC-D	11/9/2010	Antimony	<0.001	mg/L
SW	PC-D	11/9/2010	Arsenic	0.0022	mg/L
SW	PC-D	11/9/2010	Selenium	<0.001	mg/L
SW	PC-D	11/9/2010	Thallium	<0.001	mg/L
SW	PC-D	11/9/2010	Uranium	0.0022	mg/L
SW	PC-D	11/9/2010	Mercury	<0.0002	mg/L
SW	PC-D	11/9/2010	Fluoride	2	mg/L
SW	PC-D	11/9/2010	Chloride	9.7	mg/L
SW	PC-D	11/9/2010	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-D	11/9/2010	Sulfate	63	mg/L
SW	PC-D	11/9/2010	Alkalinity, Total (As CaCO3)	190	mg/L CaCO3
SW	PC-D	11/9/2010	Carbonate	<2	mg/L CaCO3
SW	PC-D	11/9/2010	Bicarbonate	190	mg/L CaCO3
SW	PC-D	11/9/2010	Specific Conductance	500	µmhos/cm
SW	PC-D	11/9/2010	pH	8.3	pH units
SW	PC-D	11/9/2010	TDS	316	mg/L
SW	PC-D	11/9/2010	Suspended Solids	<10	mg/L
SW	PC-D	11/9/2010	Cyanide	<0.005	mg/L
SW	LAC-C	1/18/2011	Aluminum	<0.02	mg/L
SW	LAC-C	1/18/2011	Barium	0.015	mg/L
SW	LAC-C	1/18/2011	Beryllium	<0.002	mg/L
SW	LAC-C	1/18/2011	Boron	<0.04	mg/L
SW	LAC-C	1/18/2011	Cadmium	<0.002	mg/L
SW	LAC-C	1/18/2011	Calcium	51	mg/L
SW	LAC-C	1/18/2011	Chromium	<0.006	mg/L
SW	LAC-C	1/18/2011	Cobalt	<0.006	mg/L
SW	LAC-C	1/18/2011	Copper	<0.006	mg/L
SW	LAC-C	1/18/2011	Iron	<0.02	mg/L
SW	LAC-C	1/18/2011	Lead	<0.005	mg/L
SW	LAC-C	1/18/2011	Magnesium	7.9	mg/L
SW	LAC-C	1/18/2011	Manganese	0.0027	mg/L
SW	LAC-C	1/18/2011	Molybdenum	<0.008	mg/L
SW	LAC-C	1/18/2011	Nickel	<0.01	mg/L
SW	LAC-C	1/18/2011	Potassium	1.9	mg/L
SW	LAC-C	1/18/2011	Silicon	19	mg/L
SW	LAC-C	1/18/2011	Silver	<0.005	mg/L
SW	LAC-C	1/18/2011	Sodium	22	mg/L
SW	LAC-C	1/18/2011	Vanadium	<0.05	mg/L
SW	LAC-C	1/18/2011	Zinc	0.01	mg/L
SW	LAC-C	1/18/2011	Antimony	<0.001	mg/L
SW	LAC-C	1/18/2011	Arsenic	0.002	mg/L
SW	LAC-C	1/18/2011	Selenium	<0.001	mg/L
SW	LAC-C	1/18/2011	Thallium	<0.001	mg/L
SW	LAC-C	1/18/2011	Uranium	<0.001	mg/L
SW	LAC-C	1/18/2011	Mercury	<0.0002	mg/L
SW	LAC-C	1/18/2011	Fluoride	0.48	mg/L
SW	LAC-C	1/18/2011	Chloride	12	mg/L
SW	LAC-C	1/18/2011	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	LAC-C	1/18/2011	Phosphorus, Orthophosphate (As	<0.5	mg/L
SW	LAC-C	1/18/2011	Sulfate	18	mg/L
SW	LAC-C	1/18/2011	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	LAC-C	1/18/2011	Carbonate	<2	mg/L CaCO3
SW	LAC-C	1/18/2011	Bicarbonate	170	mg/L CaCO3
SW	LAC-C	1/18/2011	Specific Conductance	410	µmhos/cm
SW	LAC-C	1/18/2011	Ammonia	<1	mg/L
SW	LAC-C	1/18/2011	pH	8.06	pH units
SW	LAC-C	1/18/2011	TDS	266	mg/L
SW	LAC-C	1/18/2011	Suspended Solids	10	mg/L

SW	LAC-C	1/18/2011	Cyanide	<0.005	mg/L
SW	LAC-E	1/19/2011	Aluminum	<0.02	mg/L
SW	LAC-E	1/19/2011	Barium	0.021	mg/L
SW	LAC-E	1/19/2011	Beryllium	<0.002	mg/L
SW	LAC-E	1/19/2011	Boron	<0.04	mg/L
SW	LAC-E	1/19/2011	Cadmium	<0.002	mg/L
SW	LAC-E	1/19/2011	Calcium	60	mg/L
SW	LAC-E	1/19/2011	Chromium	<0.006	mg/L
SW	LAC-E	1/19/2011	Cobalt	<0.006	mg/L
SW	LAC-E	1/19/2011	Copper	<0.006	mg/L
SW	LAC-E	1/19/2011	Iron	<0.02	mg/L
SW	LAC-E	1/19/2011	Lead	<0.005	mg/L
SW	LAC-E	1/19/2011	Magnesium	8.5	mg/L
SW	LAC-E	1/19/2011	Manganese	<0.002	mg/L
SW	LAC-E	1/19/2011	Molybdenum	<0.008	mg/L
SW	LAC-E	1/19/2011	Nickel	<0.01	mg/L
SW	LAC-E	1/19/2011	Potassium	1.3	mg/L
SW	LAC-E	1/19/2011	Silicon	20	mg/L
SW	LAC-E	1/19/2011	Silver	<0.005	mg/L
SW	LAC-E	1/19/2011	Sodium	24	mg/L
SW	LAC-E	1/19/2011	Vanadium	<0.05	mg/L
SW	LAC-E	1/19/2011	Zinc	<0.01	mg/L
SW	LAC-E	1/19/2011	Antimony	<0.001	mg/L
SW	LAC-E	1/19/2011	Arsenic	0.0017	mg/L
SW	LAC-E	1/19/2011	Selenium	<0.001	mg/L
SW	LAC-E	1/19/2011	Thallium	<0.001	mg/L
SW	LAC-E	1/19/2011	Uranium	0.0012	mg/L
SW	LAC-E	1/19/2011	Mercury	<0.0002	mg/L
SW	LAC-E	1/19/2011	Fluoride	0.5	mg/L
SW	LAC-E	1/19/2011	Chloride	13	mg/L
SW	LAC-E	1/19/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	LAC-E	1/19/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	LAC-E	1/19/2011	Phosphorus, Orthophosphate (As	<0.5	mg/L
SW	LAC-E	1/19/2011	Sulfate	13	mg/L
SW	LAC-E	1/19/2011	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	LAC-E	1/19/2011	Carbonate	<2	mg/L CaCO3
SW	LAC-E	1/19/2011	Bicarbonate	200	mg/L CaCO3
SW	LAC-E	1/19/2011	Specific Conductance	450	µmhos/cm
SW	LAC-E	1/19/2011	Ammonia	<1	mg/L
SW	LAC-E	1/19/2011	pH	8.35	pH units
SW	LAC-E	1/19/2011	TDS	295	mg/L
SW	LAC-E	1/19/2011	Suspended Solids	<10	mg/L
SW	LAC-E	1/19/2011	Cyanide	<0.005	mg/L
SW	CSCS-B	1/20/2011	Aluminum	0.038	mg/L
SW	CSCS-B	1/20/2011	Barium	0.013	mg/L
SW	CSCS-B	1/20/2011	Beryllium	<0.002	mg/L
SW	CSCS-B	1/20/2011	Boron	0.045	mg/L
SW	CSCS-B	1/20/2011	Cadmium	<0.002	mg/L
SW	CSCS-B	1/20/2011	Calcium	43	mg/L
SW	CSCS-B	1/20/2011	Chromium	<0.006	mg/L
SW	CSCS-B	1/20/2011	Cobalt	<0.006	mg/L
SW	CSCS-B	1/20/2011	Copper	<0.006	mg/L
SW	CSCS-B	1/20/2011	Iron	0.044	mg/L
SW	CSCS-B	1/20/2011	Lead	<0.005	mg/L
SW	CSCS-B	1/20/2011	Magnesium	6	mg/L
SW	CSCS-B	1/20/2011	Manganese	0.0045	mg/L
SW	CSCS-B	1/20/2011	Molybdenum	0.012	mg/L
SW	CSCS-B	1/20/2011	Nickel	<0.01	mg/L
SW	CSCS-B	1/20/2011	Potassium	3.8	mg/L
SW	CSCS-B	1/20/2011	Silicon	32	mg/L
SW	CSCS-B	1/20/2011	Silver	<0.005	mg/L
SW	CSCS-B	1/20/2011	Sodium	100	mg/L
SW	CSCS-B	1/20/2011	Vanadium	<0.05	mg/L
SW	CSCS-B	1/20/2011	Zinc	<0.01	mg/L
SW	CSCS-B	1/20/2011	Antimony	<0.001	mg/L
SW	CSCS-B	1/20/2011	Arsenic	0.0038	mg/L
SW	CSCS-B	1/20/2011	Selenium	0.0015	mg/L
SW	CSCS-B	1/20/2011	Thallium	<0.001	mg/L
SW	CSCS-B	1/20/2011	Uranium	0.0023	mg/L
SW	CSCS-B	1/20/2011	Mercury	<0.0002	mg/L
SW	CSCS-B	1/20/2011	Fluoride	6.8	mg/L
SW	CSCS-B	1/20/2011	Chloride	17	mg/L
SW	CSCS-B	1/20/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	CSCS-B	1/20/2011	Nitrogen, Nitrate (As N)	0.2	mg/L
SW	CSCS-B	1/20/2011	Sulfate	78	mg/L
SW	CSCS-B	1/20/2011	Alkalinity, Total (As CaCO3)	250	mg/L CaCO3

SW	CSCS-B	1/20/2011	Carbonate	<2	mg/L CaCO3
SW	CSCS-B	1/20/2011	Bicarbonate	250	mg/L CaCO3
SW	CSCS-B	1/20/2011	Specific Conductance	730	µmhos/cm
SW	CSCS-B	1/20/2011	Ammonia	<5	mg/L
SW	CSCS-B	1/20/2011	pH	7.8	pH units
SW	CSCS-B	1/20/2011	TDS	482	mg/L
SW	CSCS-B	1/20/2011	Suspended Solids	78	mg/L
SW	CSCS-B	1/20/2011	Cyanide	<0.01	mg/L
SW	WS	1/20/2011	Cyanide	<0.01	mg/L
SW	WS	1/20/2011	Aluminum	<0.02	mg/L
SW	WS	1/20/2011	Barium	0.01	mg/L
SW	WS	1/20/2011	Beryllium	<0.002	mg/L
SW	WS	1/20/2011	Boron	0.069	mg/L
SW	WS	1/20/2011	Cadmium	<0.002	mg/L
SW	WS	1/20/2011	Calcium	7.5	mg/L
SW	WS	1/20/2011	Chromium	<0.006	mg/L
SW	WS	1/20/2011	Cobalt	<0.006	mg/L
SW	WS	1/20/2011	Copper	<0.006	mg/L
SW	WS	1/20/2011	Iron	<0.02	mg/L
SW	WS	1/20/2011	Lead	<0.005	mg/L
SW	WS	1/20/2011	Magnesium	<1	mg/L
SW	WS	1/20/2011	Manganese	0.0093	mg/L
SW	WS	1/20/2011	Molybdenum	<0.008	mg/L
SW	WS	1/20/2011	Nickel	<0.01	mg/L
SW	WS	1/20/2011	Potassium	10	mg/L
SW	WS	1/20/2011	Silicon	65	mg/L
SW	WS	1/20/2011	Silver	<0.005	mg/L
SW	WS	1/20/2011	Sodium	160	mg/L
SW	WS	1/20/2011	Vanadium	<0.05	mg/L
SW	WS	1/20/2011	Zinc	<0.01	mg/L
SW	WS	1/20/2011	Antimony	<0.001	mg/L
SW	WS	1/20/2011	Arsenic	<0.001	mg/L
SW	WS	1/20/2011	Selenium	<0.001	mg/L
SW	WS	1/20/2011	Thallium	<0.001	mg/L
SW	WS	1/20/2011	Uranium	<0.001	mg/L
SW	WS	1/20/2011	Mercury	<0.0002	mg/L
SW	WS	1/20/2011	Fluoride	15	mg/L
SW	WS	1/20/2011	Chloride	18	mg/L
SW	WS	1/20/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	WS	1/20/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	WS	1/20/2011	Sulfate	100	mg/L
SW	WS	1/20/2011	Alkalinity, Total (As CaCO3)	240	mg/L CaCO3
SW	WS	1/20/2011	Carbonate	<2	mg/L CaCO3
SW	WS	1/20/2011	Bicarbonate	240	mg/L CaCO3
SW	WS	1/20/2011	Specific Conductance	800	µmhos/cm
SW	WS	1/20/2011	Ammonia	<1	mg/L
SW	WS	1/20/2011	pH	8.13	pH units
SW	WS	1/20/2011	TDS	581	mg/L
SW	WS	1/20/2011	Suspended Solids	<10	mg/L
SW	WSCS-A	1/20/2011	Aluminum	0.18	mg/L
SW	WSCS-A	1/20/2011	Barium	0.063	mg/L
SW	WSCS-A	1/20/2011	Beryllium	<0.002	mg/L
SW	WSCS-A	1/20/2011	Boron	0.043	mg/L
SW	WSCS-A	1/20/2011	Cadmium	<0.002	mg/L
SW	WSCS-A	1/20/2011	Calcium	50	mg/L
SW	WSCS-A	1/20/2011	Chromium	<0.006	mg/L
SW	WSCS-A	1/20/2011	Cobalt	<0.006	mg/L
SW	WSCS-A	1/20/2011	Copper	<0.006	mg/L
SW	WSCS-A	1/20/2011	Iron	0.12	mg/L
SW	WSCS-A	1/20/2011	Lead	<0.005	mg/L
SW	WSCS-A	1/20/2011	Magnesium	6.3	mg/L
SW	WSCS-A	1/20/2011	Manganese	0.006	mg/L
SW	WSCS-A	1/20/2011	Molybdenum	0.011	mg/L
SW	WSCS-A	1/20/2011	Nickel	<0.01	mg/L
SW	WSCS-A	1/20/2011	Potassium	11	mg/L
SW	WSCS-A	1/20/2011	Silicon	13	mg/L
SW	WSCS-A	1/20/2011	Silver	<0.005	mg/L
SW	WSCS-A	1/20/2011	Sodium	290	mg/L
SW	WSCS-A	1/20/2011	Vanadium	<0.05	mg/L
SW	WSCS-A	1/20/2011	Zinc	<0.01	mg/L
SW	WSCS-A	1/20/2011	Antimony	<0.001	mg/L
SW	WSCS-A	1/20/2011	Arsenic	0.0031	mg/L
SW	WSCS-A	1/20/2011	Selenium	0.0018	mg/L
SW	WSCS-A	1/20/2011	Thallium	<0.001	mg/L
SW	WSCS-A	1/20/2011	Uranium	0.0054	mg/L
SW	WSCS-A	1/20/2011	Mercury	<0.0002	mg/L

SW	WSCS-A	1/20/2011	Fluoride	6.4	mg/L
SW	WSCS-A	1/20/2011	Chloride	50	mg/L
SW	WSCS-A	1/20/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	WSCS-A	1/20/2011	Nitrogen, Nitrate (As N)	2.7	mg/L
SW	WSCS-A	1/20/2011	Sulfate	300	mg/L
SW	WSCS-A	1/20/2011	Alkalinity, Total (As CaCO3)	400	mg/L CaCO3
SW	WSCS-A	1/20/2011	Carbonate	<2	mg/L CaCO3
SW	WSCS-A	1/20/2011	Bicarbonate	400	mg/L CaCO3
SW	WSCS-A	1/20/2011	Specific Conductance	1600	µmhos/cm
SW	WSCS-A	1/20/2011	Ammonia	<1	mg/L
SW	WSCS-A	1/20/2011	pH	8.26	pH units
SW	WSCS-A	1/20/2011	TDS	1000	mg/L
SW	WSCS-A	1/20/2011	Suspended Solids	900	mg/L
SW	WSCS-A	1/20/2011	Cyanide	<0.01	mg/L
SW	PC-C	1/25/2011	Cyanide	<0.01	mg/L
SW	PC-C	1/25/2011	Sodium	38	mg/L
SW	PC-C	1/25/2011	Vanadium	<0.05	mg/L
SW	PC-C	1/25/2011	Zinc	<0.01	mg/L
SW	PC-C	1/25/2011	Antimony	<0.001	mg/L
SW	PC-C	1/25/2011	Arsenic	0.0021	mg/L
SW	PC-C	1/25/2011	Selenium	<0.001	mg/L
SW	PC-C	1/25/2011	Thallium	<0.001	mg/L
SW	PC-C	1/25/2011	Uranium	0.0022	mg/L
SW	PC-C	1/25/2011	Mercury	<0.0002	mg/L
SW	PC-C	1/25/2011	Fluoride	4	mg/L
SW	PC-C	1/25/2011	Chloride	10	mg/L
SW	PC-C	1/25/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	PC-C	1/25/2011	Nitrogen, Nitrate (As N)	0.27	mg/L
SW	PC-C	1/25/2011	Sulfate	68	mg/L
SW	PC-C	1/25/2011	Alkalinity, Total (As CaCO3)	220	mg/L CaCO3
SW	PC-C	1/25/2011	Carbonate	2.4	mg/L CaCO3
SW	PC-C	1/25/2011	Bicarbonate	210	mg/L CaCO3
SW	PC-C	1/25/2011	Specific Conductance	560	µmhos/cm
SW	PC-C	1/25/2011	Ammonia	<1	mg/L
SW	PC-C	1/25/2011	pH	8.35	pH units
SW	PC-C	1/25/2011	TDS	378	mg/L
SW	PC-C	1/25/2011	Suspended Solids	<10	mg/L
SW	PC-C	1/25/2011	Aluminum	<0.02	mg/L
SW	PC-C	1/25/2011	Barium	0.025	mg/L
SW	PC-C	1/25/2011	Beryllium	<0.002	mg/L
SW	PC-C	1/25/2011	Boron	<0.04	mg/L
SW	PC-C	1/25/2011	Cadmium	<0.002	mg/L
SW	PC-C	1/25/2011	Calcium	62	mg/L
SW	PC-C	1/25/2011	Chromium	<0.006	mg/L
SW	PC-C	1/25/2011	Cobalt	<0.006	mg/L
SW	PC-C	1/25/2011	Copper	<0.006	mg/L
SW	PC-C	1/25/2011	Iron	0.03	mg/L
SW	PC-C	1/25/2011	Lead	<0.005	mg/L
SW	PC-C	1/25/2011	Magnesium	11	mg/L
SW	PC-C	1/25/2011	Manganese	0.0039	mg/L
SW	PC-C	1/25/2011	Molybdenum	<0.008	mg/L
SW	PC-C	1/25/2011	Nickel	<0.01	mg/L
SW	PC-C	1/25/2011	Potassium	2.5	mg/L
SW	PC-C	1/25/2011	Silicon	21	mg/L
SW	PC-C	1/25/2011	Silver	<0.005	mg/L
SW	PC-D	1/25/2011	Cyanide	<0.01	mg/L
SW	PC-D	1/25/2011	Aluminum	<0.02	mg/L
SW	PC-D	1/25/2011	Barium	0.031	mg/L
SW	PC-D	1/25/2011	Beryllium	<0.002	mg/L
SW	PC-D	1/25/2011	Boron	<0.04	mg/L
SW	PC-D	1/25/2011	Cadmium	<0.002	mg/L
SW	PC-D	1/25/2011	Calcium	60	mg/L
SW	PC-D	1/25/2011	Chromium	<0.006	mg/L
SW	PC-D	1/25/2011	Cobalt	<0.006	mg/L
SW	PC-D	1/25/2011	Copper	<0.006	mg/L
SW	PC-D	1/25/2011	Iron	<0.02	mg/L
SW	PC-D	1/25/2011	Lead	<0.005	mg/L
SW	PC-D	1/25/2011	Magnesium	9.8	mg/L
SW	PC-D	1/25/2011	Manganese	0.0024	mg/L
SW	PC-D	1/25/2011	Molybdenum	0.0096	mg/L
SW	PC-D	1/25/2011	Nickel	<0.01	mg/L
SW	PC-D	1/25/2011	Potassium	2.9	mg/L
SW	PC-D	1/25/2011	Silicon	16	mg/L
SW	PC-D	1/25/2011	Silver	<0.005	mg/L
SW	PC-D	1/25/2011	Sodium	60	mg/L
SW	PC-D	1/25/2011	Vanadium	<0.05	mg/L

SW	PC-D	1/25/2011	Zinc	<0.01	mg/L
SW	PC-D	1/25/2011	Antimony	<0.001	mg/L
SW	PC-D	1/25/2011	Arsenic	0.0021	mg/L
SW	PC-D	1/25/2011	Selenium	<0.001	mg/L
SW	PC-D	1/25/2011	Thallium	<0.001	mg/L
SW	PC-D	1/25/2011	Uranium	0.0029	mg/L
SW	PC-D	1/25/2011	Mercury	<0.0002	mg/L
SW	PC-D	1/25/2011	Fluoride	2	mg/L
SW	PC-D	1/25/2011	Chloride	9.3	mg/L
SW	PC-D	1/25/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	PC-D	1/25/2011	Nitrogen, Nitrate (As N)	0.22	mg/L
SW	PC-D	1/25/2011	Sulfate	65	mg/L
SW	PC-D	1/25/2011	Alkalinity, Total (As CaCO3)	190	mg/L CaCO3
SW	PC-D	1/25/2011	Carbonate	<2	mg/L CaCO3
SW	PC-D	1/25/2011	Bicarbonate	190	mg/L CaCO3
SW	PC-D	1/25/2011	Specific Conductance	490	µmhos/cm
SW	PC-D	1/25/2011	Ammonia	<1	mg/L
SW	PC-D	1/25/2011	pH	8.37	pH units
SW	PC-D	1/25/2011	TDS	330	mg/L
SW	PC-D	1/25/2011	Suspended Solids	<10	mg/L
SW	PL-A	1/26/2011	Cyanide	<0.005	mg/L
SW	PC-A	1/26/2011	Aluminum	<0.1	mg/L
SW	PC-A	1/26/2011	Barium	0.029	mg/L
SW	PC-A	1/26/2011	Beryllium	<0.01	mg/L
SW	PC-A	1/26/2011	Boron	<0.2	mg/L
SW	PC-A	1/26/2011	Cadmium	<0.01	mg/L
SW	PC-A	1/26/2011	Calcium	67	mg/L
SW	PC-A	1/26/2011	Chromium	<0.03	mg/L
SW	PC-A	1/26/2011	Cobalt	<0.03	mg/L
SW	PC-A	1/26/2011	Copper	<0.03	mg/L
SW	PC-A	1/26/2011	Iron	<0.02	mg/L
SW	PC-A	1/26/2011	Lead	<0.025	mg/L
SW	PC-A	1/26/2011	Magnesium	13	mg/L
SW	PC-A	1/26/2011	Manganese	<0.01	mg/L
SW	PC-A	1/26/2011	Molybdenum	<0.04	mg/L
SW	PC-A	1/26/2011	Nickel	<0.05	mg/L
SW	PC-A	1/26/2011	Potassium	1	mg/L
SW	PC-A	1/26/2011	Silicon	12	mg/L
SW	PC-A	1/26/2011	Silver	<0.025	mg/L
SW	PC-A	1/26/2011	Sodium	15	mg/L
SW	PC-A	1/26/2011	Vanadium	<0.25	mg/L
SW	PC-A	1/26/2011	Zinc	<0.05	mg/L
SW	PC-A	1/26/2011	Antimony	<0.001	mg/L
SW	PC-A	1/26/2011	Arsenic	<0.001	mg/L
SW	PC-A	1/26/2011	Selenium	<0.001	mg/L
SW	PC-A	1/26/2011	Thallium	<0.001	mg/L
SW	PC-A	1/26/2011	Uranium	0.0025	mg/L
SW	PC-A	1/26/2011	Mercury	<0.0002	mg/L
SW	PC-A	1/26/2011	Fluoride	0.47	mg/L
SW	PC-A	1/26/2011	Chloride	8.2	mg/L
SW	PC-A	1/26/2011	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	PC-A	1/26/2011	Sulfate	71	mg/L
SW	PC-A	1/26/2011	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	PC-A	1/26/2011	Carbonate	<2	mg/L CaCO3
SW	PC-A	1/26/2011	Bicarbonate	170	mg/L CaCO3
SW	PC-A	1/26/2011	Specific Conductance	470	µmhos/cm
SW	PC-A	1/26/2011	Ammonia	<1	mg/L
SW	PC-A	1/26/2011	pH	8.3	pH units
SW	PC-A	1/26/2011	TDS	298	mg/L
SW	PC-A	1/26/2011	Suspended Solids	10	mg/L
SW	CSCS-B	4/19/2011	Aluminum	<0.02	mg/L
SW	CSCS-B	4/19/2011	Barium	0.014	mg/L
SW	CSCS-B	4/19/2011	Beryllium	<0.002	mg/L
SW	CSCS-B	4/19/2011	TDS	491	mg/L
SW	CSCS-B	4/19/2011	Suspended Solids	62	mg/L
SW	CSCS-B	4/19/2011	Boron	0.043	mg/L
SW	CSCS-B	4/19/2011	Cadmium	<0.002	mg/L
SW	CSCS-B	4/19/2011	Calcium	43	mg/L
SW	CSCS-B	4/19/2011	Chromium	<0.006	mg/L
SW	CSCS-B	4/19/2011	Cobalt	<0.006	mg/L
SW	CSCS-B	4/19/2011	Copper	<0.006	mg/L
SW	CSCS-B	4/19/2011	Iron	<0.02	mg/L
SW	CSCS-B	4/19/2011	Lead	<0.005	mg/L
SW	CSCS-B	4/19/2011	Magnesium	6.2	mg/L
SW	CSCS-B	4/19/2011	Manganese	<0.002	mg/L
SW	CSCS-B	4/19/2011	Molybdenum	0.012	mg/L

SW	CSCS-B	4/19/2011	Nickel	<0.01	mg/L
SW	CSCS-B	4/19/2011	Potassium	3.7	mg/L
SW	CSCS-B	4/19/2011	Silicon	29	mg/L
SW	CSCS-B	4/19/2011	Silver	<0.005	mg/L
SW	CSCS-B	4/19/2011	Sodium	110	mg/L
SW	CSCS-B	4/19/2011	Vanadium	<0.05	mg/L
SW	CSCS-B	4/19/2011	Zinc	0.017	mg/L
SW	CSCS-B	4/19/2011	Antimony	<0.001	mg/L
SW	CSCS-B	4/19/2011	Arsenic	0.0043	mg/L
SW	CSCS-B	4/19/2011	Selenium	<0.001	mg/L
SW	CSCS-B	4/19/2011	Thallium	<0.001	mg/L
SW	CSCS-B	4/19/2011	Uranium	0.003	mg/L
SW	CSCS-B	4/19/2011	Mercury	<0.0002	mg/L
SW	CSCS-B	4/19/2011	Fluoride	6.8	mg/L
SW	CSCS-B	4/19/2011	Chloride	17	mg/L
SW	CSCS-B	4/19/2011	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	CSCS-B	4/19/2011	Sulfate	79	mg/L
SW	CSCS-B	4/19/2011	Alkalinity, Total (As CaCO3)	250	mg/L CaCO3
SW	CSCS-B	4/19/2011	Carbonate	<2	mg/L CaCO3
SW	CSCS-B	4/19/2011	Bicarbonate	250	mg/L CaCO3
SW	CSCS-B	4/19/2011	Specific Conductance	690	µmhos/cm
SW	CSCS-B	4/19/2011	Ammonia	<1	mg/L
SW	CSCS-B	4/19/2011	pH	7.64	pH units
SW	CSCS-B	4/19/2011	Cyanide	<0.01	mg/L
SW	WS	4/19/2011	Aluminum	<0.02	mg/L
SW	WS	4/19/2011	Barium	0.012	mg/L
SW	WS	4/19/2011	Beryllium	<0.002	mg/L
SW	WS	4/19/2011	Boron	0.071	mg/L
SW	WS	4/19/2011	Cadmium	<0.002	mg/L
SW	WS	4/19/2011	Calcium	7.5	mg/L
SW	WS	4/19/2011	Chromium	<0.006	mg/L
SW	WS	4/19/2011	Cobalt	<0.006	mg/L
SW	WS	4/19/2011	Copper	<0.006	mg/L
SW	WS	4/19/2011	Iron	<0.02	mg/L
SW	WS	4/19/2011	Lead	<0.005	mg/L
SW	WS	4/19/2011	Magnesium	<1	mg/L
SW	WS	4/19/2011	Manganese	0.03	mg/L
SW	WS	4/19/2011	Molybdenum	<0.008	mg/L
SW	WS	4/19/2011	Nickel	<0.01	mg/L
SW	WS	4/19/2011	Potassium	11	mg/L
SW	WS	4/19/2011	Silicon	65	mg/L
SW	WS	4/19/2011	Silver	<0.005	mg/L
SW	WS	4/19/2011	Sodium	160	mg/L
SW	WS	4/19/2011	Vanadium	<0.05	mg/L
SW	WS	4/19/2011	Zinc	<0.01	mg/L
SW	WS	4/19/2011	Antimony	<0.001	mg/L
SW	WS	4/19/2011	Arsenic	<0.001	mg/L
SW	WS	4/19/2011	Selenium	<0.001	mg/L
SW	WS	4/19/2011	Thallium	<0.001	mg/L
SW	WS	4/19/2011	Uranium	<0.001	mg/L
SW	WS	4/19/2011	Mercury	<0.0002	mg/L
SW	WS	4/19/2011	Fluoride	19	mg/L
SW	WS	4/19/2011	Chloride	18	mg/L
SW	WS	4/19/2011	Nitrate (As N)+Nitrite (As N)	<1	mg/L
SW	WS	4/19/2011	Sulfate	120	mg/L
SW	WS	4/19/2011	Alkalinity, Total (As CaCO3)	240	mg/L CaCO3
SW	WS	4/19/2011	Carbonate	<2	mg/L CaCO3
SW	WS	4/19/2011	Bicarbonate	240	mg/L CaCO3
SW	WS	4/19/2011	Specific Conductance	750	µmhos/cm
SW	WS	4/19/2011	Ammonia	<1	mg/L
SW	WS	4/19/2011	pH	8.08	pH units
SW	WS	4/19/2011	TDS	617	mg/L
SW	WS	4/19/2011	Suspended Solids	<10	mg/L
SW	WS	4/19/2011	Cyanide	<0.01	mg/L
SW	PC-A	4/20/2011	Aluminum	<0.02	mg/L
SW	PC-A	4/20/2011	Barium	0.038	mg/L
SW	PC-A	4/20/2011	Beryllium	<0.002	mg/L
SW	PC-A	4/20/2011	Boron	<0.04	mg/L
SW	PC-A	4/20/2011	Cadmium	<0.002	mg/L
SW	PC-A	4/20/2011	Calcium	73	mg/L
SW	PC-A	4/20/2011	Chromium	<0.006	mg/L
SW	PC-A	4/20/2011	Cobalt	<0.006	mg/L
SW	PC-A	4/20/2011	Copper	<0.006	mg/L
SW	PC-A	4/20/2011	Iron	<0.02	mg/L
SW	PC-A	4/20/2011	Lead	<0.005	mg/L
SW	PC-A	4/20/2011	Magnesium	13	mg/L

SW	PC-A	4/20/2011	Manganese	<0.002	mg/L
SW	PC-A	4/20/2011	Molybdenum	<0.008	mg/L
SW	PC-A	4/20/2011	Nickel	<0.01	mg/L
SW	PC-A	4/20/2011	Potassium	<1	mg/L
SW	PC-A	4/20/2011	Silicon	13	mg/L
SW	PC-A	4/20/2011	Silver	<0.005	mg/L
SW	PC-A	4/20/2011	Sodium	14	mg/L
SW	PC-A	4/20/2011	Vanadium	<0.05	mg/L
SW	PC-A	4/20/2011	Zinc	0.029	mg/L
SW	PC-A	4/20/2011	Antimony	<0.001	mg/L
SW	PC-A	4/20/2011	Arsenic	<0.001	mg/L
SW	PC-A	4/20/2011	Selenium	<0.001	mg/L
SW	PC-A	4/20/2011	Thallium	<0.001	mg/L
SW	PC-A	4/20/2011	Uranium	0.0025	mg/L
SW	PC-A	4/20/2011	Mercury	<0.0002	mg/L
SW	PC-A	4/20/2011	Fluoride	0.5	mg/L
SW	PC-A	4/20/2011	Chloride	7.3	mg/L
SW	PC-A	4/20/2011	Sulfate	74	mg/L
SW	PC-A	4/20/2011	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PC-A	4/20/2011	Carbonate	<2	mg/L CaCO3
SW	PC-A	4/20/2011	Bicarbonate	190	mg/L CaCO3
SW	PC-A	4/20/2011	Cyanide	<0.005	mg/L
SW	PC-A	4/20/2011	Specific Conductance	510	µmhos/cm
SW	PC-A	4/20/2011	Ammonia	<1	mg/L
SW	PC-A	4/20/2011	pH	8.35	pH units
SW	PC-A	4/20/2011	TDS	330	mg/L
SW	PC-A	4/20/2011	Suspended Solids	<10	mg/L
SW	PC-C	4/20/2011	Aluminum	0.37	mg/L
SW	PC-C	4/20/2011	Aluminum	<0.02	mg/L
SW	PC-C	4/20/2011	Barium	0.03	mg/L
SW	PC-C	4/20/2011	Barium	0.0079	mg/L
SW	PC-C	4/20/2011	Beryllium	<0.002	mg/L
SW	PC-C	4/20/2011	Beryllium	<0.002	mg/L
SW	PC-C	4/20/2011	Boron	<0.04	mg/L
SW	PC-C	4/20/2011	Boron	<0.04	mg/L
SW	PC-C	4/20/2011	Cadmium	<0.002	mg/L
SW	PC-C	4/20/2011	Cadmium	<0.002	mg/L
SW	PC-C	4/20/2011	Calcium	9.8	mg/L
SW	PC-C	4/20/2011	Calcium	47	mg/L
SW	PC-C	4/20/2011	Chromium	<0.006	mg/L
SW	PC-C	4/20/2011	Chromium	<0.006	mg/L
SW	PC-C	4/20/2011	Cobalt	<0.006	mg/L
SW	PC-C	4/20/2011	Cobalt	<0.006	mg/L
SW	PC-C	4/20/2011	Copper	0.0096	mg/L
SW	PC-C	4/20/2011	Copper	<0.006	mg/L
SW	PC-C	4/20/2011	Iron	0.21	mg/L
SW	PC-C	4/20/2011	Iron	<0.02	mg/L
SW	PC-C	4/20/2011	Lead	<0.005	mg/L
SW	PC-C	4/20/2011	Lead	<0.005	mg/L
SW	PC-C	4/20/2011	Magnesium	1.2	mg/L
SW	PC-C	4/20/2011	Magnesium	8.5	mg/L
SW	PC-C	4/20/2011	Manganese	0.017	mg/L
SW	PC-C	4/20/2011	Manganese	0.0038	mg/L
SW	PC-C	4/20/2011	Molybdenum	0.0087	mg/L
SW	PC-C	4/20/2011	Molybdenum	<0.008	mg/L
SW	PC-C	4/20/2011	Nickel	<0.01	mg/L
SW	PC-C	4/20/2011	Nickel	<0.01	mg/L
SW	PC-C	4/20/2011	Potassium	3.1	mg/L
SW	PC-C	4/20/2011	Potassium	<1	mg/L
SW	PC-C	4/20/2011	Silicon	20	mg/L
SW	PC-C	4/20/2011	Silicon	4.3	mg/L
SW	PC-C	4/20/2011	Silver	<0.005	mg/L
SW	PC-C	4/20/2011	Silver	<0.005	mg/L
SW	PC-C	4/20/2011	Sodium	58	mg/L
SW	PC-C	4/20/2011	Sodium	16	mg/L
SW	PC-C	4/20/2011	Vanadium	<0.05	mg/L
SW	PC-C	4/20/2011	Vanadium	<0.05	mg/L
SW	PC-C	4/20/2011	Zinc	<0.01	mg/L
SW	PC-C	4/20/2011	Zinc	0.036	mg/L
SW	PC-C	4/20/2011	Antimony	<0.001	mg/L
SW	PC-C	4/20/2011	Antimony	<0.001	mg/L
SW	PC-C	4/20/2011	Arsenic	0.0021	mg/L
SW	PC-C	4/20/2011	Arsenic	0.0021	mg/L
SW	PC-C	4/20/2011	Selenium	<0.001	mg/L
SW	PC-C	4/20/2011	Selenium	<0.001	mg/L
SW	PC-C	4/20/2011	Thallium	<0.001	mg/L

SW	PC-C	4/20/2011	Thallium	<0.001	mg/L
SW	PC-C	4/20/2011	Uranium	<0.001	mg/L
SW	PC-C	4/20/2011	Uranium	0.0018	mg/L
SW	PC-C	4/20/2011	Mercury	<0.0002	mg/L
SW	PC-C	4/20/2011	Mercury	<0.0002	mg/L
SW	PC-C	4/20/2011	Fluoride	3.7	mg/L
SW	PC-C	4/20/2011	Chloride	11	mg/L
SW	PC-C	4/20/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	PC-C	4/20/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	PC-C	4/20/2011	Sulfate	70	mg/L
SW	PC-C	4/20/2011	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PC-C	4/20/2011	Carbonate	<2	mg/L CaCO3
SW	PC-C	4/20/2011	Bicarbonate	200	mg/L CaCO3
SW	PC-C	4/20/2011	Cyanide	<0.005	mg/L
SW	PC-C	4/20/2011	Specific Conductance	560	µmhos/cm
SW	PC-C	4/20/2011	Mercury	<0.033	mg/Kg
SW	PC-C	4/20/2011	Mercury	<0.0002	mg/L
SW	PC-C	4/20/2011	Ammonia	<1	mg/L
SW	PC-C	4/20/2011	pH	8.39	pH units
SW	PC-C	4/20/2011	TDS	373	mg/L
SW	PC-C	4/20/2011	Suspended Solids	<10	mg/L
SW	PC-D	4/21/2011	Aluminum	<0.02	mg/L
SW	PC-D	4/21/2011	Barium	0.024	mg/L
SW	PC-D	4/21/2011	Beryllium	<0.002	mg/L
SW	PC-D	4/21/2011	Boron	<0.04	mg/L
SW	PC-D	4/21/2011	Cadmium	<0.002	mg/L
SW	PC-D	4/21/2011	Calcium	59	mg/L
SW	PC-D	4/21/2011	Chromium	<0.006	mg/L
SW	PC-D	4/21/2011	Cobalt	<0.006	mg/L
SW	PC-D	4/21/2011	Copper	<0.006	mg/L
SW	PC-D	4/21/2011	Iron	<0.02	mg/L
SW	PC-D	4/21/2011	Lead	<0.005	mg/L
SW	PC-D	4/21/2011	Magnesium	10	mg/L
SW	PC-D	4/21/2011	Manganese	0.0057	mg/L
SW	PC-D	4/21/2011	Molybdenum	<0.008	mg/L
SW	PC-D	4/21/2011	Nickel	<0.01	mg/L
SW	PC-D	4/21/2011	Potassium	2	mg/L
SW	PC-D	4/21/2011	Silicon	17	mg/L
SW	PC-D	4/21/2011	Silver	<0.005	mg/L
SW	PC-D	4/21/2011	Sodium	35	mg/L
SW	PC-D	4/21/2011	Vanadium	<0.05	mg/L
SW	PC-D	4/21/2011	Zinc	0.015	mg/L
SW	PC-D	4/21/2011	Antimony	<0.001	mg/L
SW	PC-D	4/21/2011	Arsenic	0.0022	mg/L
SW	PC-D	4/21/2011	Selenium	<0.001	mg/L
SW	PC-D	4/21/2011	Thallium	<0.001	mg/L
SW	PC-D	4/21/2011	Uranium	0.0026	mg/L
SW	PC-D	4/21/2011	Mercury	<0.0002	mg/L
SW	PC-D	4/21/2011	Fluoride	1.9	mg/L
SW	PC-D	4/21/2011	Chloride	9.7	mg/L
SW	PC-D	4/21/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	PC-D	4/21/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	PC-D	4/21/2011	Sulfate	62	mg/L
SW	PC-D	4/21/2011	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	PC-D	4/21/2011	Carbonate	<2	mg/L CaCO3
SW	PC-D	4/21/2011	Bicarbonate	200	mg/L CaCO3
SW	PC-D	4/21/2011	Cyanide	<0.005	mg/L
SW	PC-D	4/21/2011	Specific Conductance	520	µmhos/cm
SW	PC-D	4/21/2011	Ammonia	<1	mg/L
SW	PC-D	4/21/2011	pH	8.27	pH units
SW	PC-D	4/21/2011	TDS	340	mg/L
SW	PC-D	4/21/2011	Suspended Solids	<10	mg/L
SW	LAC-A	4/26/2011	Aluminum	<0.02	mg/L
SW	LAC-A	4/26/2011	Barium	0.014	mg/L
SW	LAC-A	4/26/2011	Beryllium	<0.002	mg/L
SW	LAC-A	4/26/2011	Boron	<0.04	mg/L
SW	LAC-A	4/26/2011	Cadmium	<0.002	mg/L
SW	LAC-A	4/26/2011	Calcium	43	mg/L
SW	LAC-A	4/26/2011	Chromium	<0.006	mg/L
SW	LAC-A	4/26/2011	Cobalt	<0.006	mg/L
SW	LAC-A	4/26/2011	Copper	<0.006	mg/L
SW	LAC-A	4/26/2011	Iron	<0.02	mg/L
SW	LAC-A	4/26/2011	Lead	<0.005	mg/L
SW	LAC-A	4/26/2011	Magnesium	8.5	mg/L
SW	LAC-A	4/26/2011	Manganese	0.004	mg/L
SW	LAC-A	4/26/2011	Molybdenum	<0.008	mg/L

SW	LAC-A	4/26/2011	Nickel	<0.01	mg/L
SW	LAC-A	4/26/2011	Potassium	2.1	mg/L
SW	LAC-A	4/26/2011	Silicon	21	mg/L
SW	LAC-A	4/26/2011	Silver	<0.005	mg/L
SW	LAC-A	4/26/2011	Sodium	17	mg/L
SW	LAC-A	4/26/2011	Vanadium	<0.05	mg/L
SW	LAC-A	4/26/2011	Zinc	0.06	mg/L
SW	LAC-A	4/26/2011	Antimony	<0.001	mg/L
SW	LAC-A	4/26/2011	Arsenic	0.0012	mg/L
SW	LAC-A	4/26/2011	Selenium	<0.001	mg/L
SW	LAC-A	4/26/2011	Thallium	<0.001	mg/L
SW	LAC-A	4/26/2011	Uranium	0.0012	mg/L
SW	LAC-A	4/26/2011	Mercury	<0.0002	mg/L
SW	LAC-A	4/26/2011	Fluoride	0.44	mg/L
SW	LAC-A	4/26/2011	Chloride	4.4	mg/L
SW	LAC-A	4/26/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	LAC-A	4/26/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	LAC-A	4/26/2011	Sulfate	11	mg/L
SW	LAC-A	4/26/2011	Alkalinity, Total (As CaCO3)	160	mg/L CaCO3
SW	LAC-A	4/26/2011	Carbonate	4.3	mg/L CaCO3
SW	LAC-A	4/26/2011	Bicarbonate	160	mg/L CaCO3
SW	LAC-A	4/26/2011	Cyanide	<0.01	mg/L
SW	LAC-A	4/26/2011	Specific Conductance	330	µmhos/cm
SW	LAC-A	4/26/2011	pH	8.47	pH units
SW	LAC-A	4/26/2011	TDS	241	mg/L
SW	LAC-A	4/26/2011	Suspended Solids	<10	mg/L
SW	LAC-C	4/26/2011	Aluminum	<0.02	mg/L
SW	LAC-C	4/26/2011	Barium	0.014	mg/L
SW	LAC-C	4/26/2011	Beryllium	<0.002	mg/L
SW	LAC-C	4/26/2011	Boron	<0.04	mg/L
SW	LAC-C	4/26/2011	Cadmium	<0.002	mg/L
SW	LAC-C	4/26/2011	Calcium	55	mg/L
SW	LAC-C	4/26/2011	Chromium	<0.006	mg/L
SW	LAC-C	4/26/2011	Cobalt	<0.006	mg/L
SW	LAC-C	4/26/2011	Copper	<0.006	mg/L
SW	LAC-C	4/26/2011	Iron	<0.02	mg/L
SW	LAC-C	4/26/2011	Lead	<0.005	mg/L
SW	LAC-C	4/26/2011	Magnesium	8.5	mg/L
SW	LAC-C	4/26/2011	Manganese	<0.002	mg/L
SW	LAC-C	4/26/2011	Molybdenum	<0.008	mg/L
SW	LAC-C	4/26/2011	Nickel	<0.01	mg/L
SW	LAC-C	4/26/2011	Potassium	2	mg/L
SW	LAC-C	4/26/2011	Silicon	19	mg/L
SW	LAC-C	4/26/2011	Silver	<0.005	mg/L
SW	LAC-C	4/26/2011	Sodium	23	mg/L
SW	LAC-C	4/26/2011	Vanadium	<0.05	mg/L
SW	LAC-C	4/26/2011	Zinc	0.042	mg/L
SW	LAC-C	4/26/2011	Antimony	<0.001	mg/L
SW	LAC-C	4/26/2011	Arsenic	0.0018	mg/L
SW	LAC-C	4/26/2011	Selenium	<0.001	mg/L
SW	LAC-C	4/26/2011	Thallium	<0.001	mg/L
SW	LAC-C	4/26/2011	Uranium	0.0011	mg/L
SW	LAC-C	4/26/2011	Mercury	<0.0002	mg/L
SW	LAC-C	4/26/2011	Fluoride	0.48	mg/L
SW	LAC-C	4/26/2011	Chloride	19	mg/L
SW	LAC-C	4/26/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	LAC-C	4/26/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	LAC-C	4/26/2011	Sulfate	20	mg/L
SW	LAC-C	4/26/2011	Alkalinity, Total (As CaCO3)	180	mg/L CaCO3
SW	LAC-C	4/26/2011	Carbonate	<2	mg/L CaCO3
SW	LAC-C	4/26/2011	Bicarbonate	180	mg/L CaCO3
SW	LAC-C	4/26/2011	Cyanide	<0.01	mg/L
SW	LAC-C	4/26/2011	Specific Conductance	420	µmhos/cm
SW	LAC-C	4/26/2011	pH	8.23	pH units
SW	LAC-C	4/26/2011	TDS	287	mg/L
SW	LAC-C	4/26/2011	Suspended Solids	<10	mg/L
SW	NWS	4/26/2011	Aluminum	<0.02	mg/L
SW	NWS	4/26/2011	Barium	0.023	mg/L
SW	NWS	4/26/2011	Beryllium	<0.002	mg/L
SW	NWS	4/26/2011	Boron	<0.04	mg/L
SW	NWS	4/26/2011	Cadmium	<0.002	mg/L
SW	NWS	4/26/2011	Calcium	40	mg/L
SW	NWS	4/26/2011	Chromium	<0.006	mg/L
SW	NWS	4/26/2011	Cobalt	<0.006	mg/L
SW	NWS	4/26/2011	Copper	<0.006	mg/L
SW	NWS	4/26/2011	Iron	<0.02	mg/L

SW	NWS	4/26/2011	Lead	<0.005	mg/L
SW	NWS	4/26/2011	Magnesium	13	mg/L
SW	NWS	4/26/2011	Manganese	<0.002	mg/L
SW	NWS	4/26/2011	Molybdenum	<0.008	mg/L
SW	NWS	4/26/2011	Nickel	<0.01	mg/L
SW	NWS	4/26/2011	Potassium	3.8	mg/L
SW	NWS	4/26/2011	Silicon	12	mg/L
SW	NWS	4/26/2011	Silver	<0.005	mg/L
SW	NWS	4/26/2011	Sodium	67	mg/L
SW	NWS	4/26/2011	Vanadium	<0.05	mg/L
SW	NWS	4/26/2011	Zinc	0.046	mg/L
SW	NWS	4/26/2011	Antimony	<0.001	mg/L
SW	NWS	4/26/2011	Arsenic	0.007	mg/L
SW	NWS	4/26/2011	Selenium	<0.001	mg/L
SW	NWS	4/26/2011	Thallium	<0.001	mg/L
SW	NWS	4/26/2011	Uranium	0.0013	mg/L
SW	NWS	4/26/2011	Mercury	<0.0002	mg/L
SW	NWS	4/26/2011	Fluoride	1.7	mg/L
SW	NWS	4/26/2011	Chloride	64	mg/L
SW	NWS	4/26/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	NWS	4/26/2011	Nitrogen, Nitrate (As N)	0.21	mg/L
SW	NWS	4/26/2011	Sulfate	28	mg/L
SW	NWS	4/26/2011	Alkalinity, Total (As CaCO3)	170	mg/L CaCO3
SW	NWS	4/26/2011	Carbonate	<2	mg/L CaCO3
SW	NWS	4/26/2011	Bicarbonate	170	mg/L CaCO3
SW	NWS	4/26/2011	Cyanide	<0.01	mg/L
SW	NWS	4/26/2011	Specific Conductance	600	µmhos/cm
SW	NWS	4/26/2011	pH	7.84	pH units
SW	NWS	4/26/2011	TDS	357	mg/L
SW	NWS	4/26/2011	Suspended Solids	<10	mg/L
SW	LAC-E	4/27/2011	Chromium	<0.006	mg/L
SW	LAC-E	4/27/2011	Cobalt	<0.006	mg/L
SW	LAC-E	4/27/2011	Copper	<0.006	mg/L
SW	LAC-E	4/27/2011	Iron	<0.02	mg/L
SW	LAC-E	4/27/2011	Lead	<0.005	mg/L
SW	LAC-E	4/27/2011	Magnesium	8.3	mg/L
SW	LAC-E	4/27/2011	Manganese	<0.002	mg/L
SW	LAC-E	4/27/2011	Molybdenum	<0.008	mg/L
SW	LAC-E	4/27/2011	Nickel	<0.01	mg/L
SW	LAC-E	4/27/2011	Potassium	1.3	mg/L
SW	LAC-E	4/27/2011	Silicon	19	mg/L
SW	LAC-E	4/27/2011	Silver	<0.005	mg/L
SW	LAC-E	4/27/2011	Sodium	23	mg/L
SW	LAC-E	4/27/2011	Vanadium	<0.05	mg/L
SW	LAC-E	4/27/2011	Zinc	0.037	mg/L
SW	LAC-E	4/27/2011	Antimony	<0.001	mg/L
SW	LAC-E	4/27/2011	Arsenic	0.0017	mg/L
SW	LAC-E	4/27/2011	Selenium	<0.001	mg/L
SW	LAC-E	4/27/2011	Thallium	<0.001	mg/L
SW	LAC-E	4/27/2011	Uranium	0.0012	mg/L
SW	LAC-E	4/27/2011	Mercury	<0.0002	mg/L
SW	LAC-E	4/27/2011	Fluoride	0.53	mg/L
SW	LAC-E	4/27/2011	Chloride	15	mg/L
SW	LAC-E	4/27/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	LAC-E	4/27/2011	Nitrogen, Nitrate (As N)	<0.1	mg/L
SW	LAC-E	4/27/2011	Sulfate	14	mg/L
SW	LAC-E	4/27/2011	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	LAC-E	4/27/2011	Carbonate	3.4	mg/L CaCO3
SW	LAC-E	4/27/2011	Bicarbonate	200	mg/L CaCO3
SW	LAC-E	4/27/2011	Cyanide	<0.01	mg/L
SW	LAC-E	4/27/2011	Specific Conductance	430	µmhos/cm
SW	LAC-E	4/27/2011	pH	8.41	pH units
SW	LAC-E	4/27/2011	TDS	291	mg/L
SW	LAC-E	4/27/2011	Suspended Solids	<10	mg/L
SW	LAC-E	4/27/2011	Aluminum	<0.02	mg/L
SW	LAC-E	4/27/2011	Barium	0.021	mg/L
SW	LAC-E	4/27/2011	Beryllium	<0.002	mg/L
SW	LAC-E	4/27/2011	Boron	<0.04	mg/L
SW	LAC-E	4/27/2011	Cadmium	<0.002	mg/L
SW	LAC-E	4/27/2011	Calcium	60	mg/L
SW	LAC-E	4/27/2011	Aluminum	<0.02	mg/L
SW	LAC-E	4/27/2011	Barium	0.021	mg/L
SW	LAC-E	4/27/2011	Beryllium	<0.002	mg/L
SW	LAC-E	4/27/2011	Boron	<0.04	mg/L
SW	LAC-E	4/27/2011	Cadmium	<0.002	mg/L
SW	LAC-E	4/27/2011	Calcium	60	mg/L

SW	LAC-E	4/27/2011	Chromium	<0.006	mg/L
SW	LAC-E	4/27/2011	Cobalt	<0.006	mg/L
SW	LAC-E	4/27/2011	Copper	<0.006	mg/L
SW	LAC-E	4/27/2011	Iron	<0.02	mg/L
SW	LAC-E	4/27/2011	Lead	<0.005	mg/L
SW	LAC-E	4/27/2011	Magnesium	8.4	mg/L
SW	LAC-E	4/27/2011	Manganese	<0.002	mg/L
SW	LAC-E	4/27/2011	Molybdenum	<0.008	mg/L
SW	LAC-E	4/27/2011	Nickel	<0.01	mg/L
SW	LAC-E	4/27/2011	Potassium	1.4	mg/L
SW	LAC-E	4/27/2011	Silicon	19	mg/L
SW	LAC-E	4/27/2011	Silver	<0.005	mg/L
SW	LAC-E	4/27/2011	Sodium	23	mg/L
SW	LAC-E	4/27/2011	Vanadium	<0.05	mg/L
SW	LAC-E	4/27/2011	Zinc	0.043	mg/L
SW	LAC-E	4/27/2011	Antimony	<0.001	mg/L
SW	LAC-E	4/27/2011	Arsenic	0.0017	mg/L
SW	LAC-E	4/27/2011	Selenium	<0.001	mg/L
SW	LAC-E	4/27/2011	Thallium	<0.001	mg/L
SW	LAC-E	4/27/2011	Uranium	0.0012	mg/L
SW	LAC-E	4/27/2011	Mercury	<0.0002	mg/L
SW	LAC-E	4/27/2011	Fluoride	0.51	mg/L
SW	LAC-E	4/27/2011	Chloride	15	mg/L
SW	LAC-E	4/27/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	LAC-E	4/27/2011	Nitrogen, Nitrate (As N)	0.78	mg/L
SW	LAC-E	4/27/2011	Sulfate	14	mg/L
SW	LAC-E	4/27/2011	Alkalinity, Total (As CaCO3)	200	mg/L CaCO3
SW	LAC-E	4/27/2011	Carbonate	2.6	mg/L CaCO3
SW	LAC-E	4/27/2011	Bicarbonate	200	mg/L CaCO3
SW	LAC-E	4/27/2011	Cyanide	<0.01	mg/L
SW	LAC-E	4/27/2011	Specific Conductance	440	µmhos/cm
SW	LAC-E	4/27/2011	Mercury	<0.033	mg/Kg
SW	LAC-E	4/27/2011	pH	8.36	pH units
SW	LAC-E	4/27/2011	TDS	298	mg/L
SW	LAC-E	4/27/2011	Suspended Solids	<10	mg/L
SW	SWQ-3	4/27/2011	Aluminum	<0.02	mg/L
SW	SWQ-3	4/27/2011	Aluminum	0.079	mg/L
SW	SWQ-3	4/27/2011	Barium	0.032	mg/L
SW	SWQ-3	4/27/2011	Barium	0.023	mg/L
SW	SWQ-3	4/27/2011	Beryllium	<0.002	mg/L
SW	SWQ-3	4/27/2011	Beryllium	<0.002	mg/L
SW	SWQ-3	4/27/2011	Boron	0.075	mg/L
SW	SWQ-3	4/27/2011	Boron	<0.04	mg/L
SW	SWQ-3	4/27/2011	Cadmium	<0.002	mg/L
SW	SWQ-3	4/27/2011	Cadmium	<0.002	mg/L
SW	SWQ-3	4/27/2011	Calcium	610	mg/L
SW	SWQ-3	4/27/2011	Calcium	73	mg/L
SW	SWQ-3	4/27/2011	Chromium	<0.006	mg/L
SW	SWQ-3	4/27/2011	Chromium	<0.006	mg/L
SW	SWQ-3	4/27/2011	Cobalt	<0.006	mg/L
SW	SWQ-3	4/27/2011	Cobalt	<0.006	mg/L
SW	SWQ-3	4/27/2011	Copper	0.011	mg/L
SW	SWQ-3	4/27/2011	Copper	<0.006	mg/L
SW	SWQ-3	4/27/2011	Iron	0.033	mg/L
SW	SWQ-3	4/27/2011	Iron	<0.02	mg/L
SW	SWQ-3	4/27/2011	Lead	<0.005	mg/L
SW	SWQ-3	4/27/2011	Lead	<0.005	mg/L
SW	SWQ-3	4/27/2011	Magnesium	10	mg/L
SW	SWQ-3	4/27/2011	Magnesium	210	mg/L
SW	SWQ-3	4/27/2011	Manganese	0.027	mg/L
SW	SWQ-3	4/27/2011	Manganese	<0.002	mg/L
SW	SWQ-3	4/27/2011	Molybdenum	0.011	mg/L
SW	SWQ-3	4/27/2011	Molybdenum	0.022	mg/L
SW	SWQ-3	4/27/2011	Nickel	<0.01	mg/L
SW	SWQ-3	4/27/2011	Nickel	<0.01	mg/L
SW	SWQ-3	4/27/2011	Potassium	<1	mg/L
SW	SWQ-3	4/27/2011	Potassium	3.8	mg/L
SW	SWQ-3	4/27/2011	Silicon	2.9	mg/L
SW	SWQ-3	4/27/2011	Silicon	18	mg/L
SW	SWQ-3	4/27/2011	Silver	<0.005	mg/L
SW	SWQ-3	4/27/2011	Silver	<0.005	mg/L
SW	SWQ-3	4/27/2011	Sodium	410	mg/L
SW	SWQ-3	4/27/2011	Sodium	25	mg/L
SW	SWQ-3	4/27/2011	Vanadium	<0.05	mg/L
SW	SWQ-3	4/27/2011	Vanadium	<0.05	mg/L
SW	SWQ-3	4/27/2011	Zinc	0.031	mg/L

SW	SWQ-3	4/27/2011	Zinc	<0.01	mg/L
SW	SWQ-3	4/27/2011	Antimony	<0.001	mg/L
SW	SWQ-3	4/27/2011	Antimony	<0.001	mg/L
SW	SWQ-3	4/27/2011	Arsenic	<0.001	mg/L
SW	SWQ-3	4/27/2011	Arsenic	<0.001	mg/L
SW	SWQ-3	4/27/2011	Selenium	0.0013	mg/L
SW	SWQ-3	4/27/2011	Selenium	0.0065	mg/L
SW	SWQ-3	4/27/2011	Thallium	<0.001	mg/L
SW	SWQ-3	4/27/2011	Thallium	<0.001	mg/L
SW	SWQ-3	4/27/2011	Uranium	0.012	mg/L
SW	SWQ-3	4/27/2011	Uranium	0.0014	mg/L
SW	SWQ-3	4/27/2011	Mercury	<0.0002	mg/L
SW	SWQ-3	4/27/2011	Mercury	<0.0002	mg/L
SW	SWQ-3	4/27/2011	Fluoride	1.4	mg/L
SW	SWQ-3	4/27/2011	Chloride	74	mg/L
SW	SWQ-3	4/27/2011	Nitrogen, Nitrite (As N)	<0.1	mg/L
SW	SWQ-3	4/27/2011	Nitrogen, Nitrate (As N)	0.15	mg/L
SW	SWQ-3	4/27/2011	Sulfate	2900	mg/L
SW	SWQ-3	4/27/2011	Alkalinity, Total (As CaCO3)	430	mg/L CaCO3
SW	SWQ-3	4/27/2011	Carbonate	<2	mg/L CaCO3
SW	SWQ-3	4/27/2011	Bicarbonate	430	mg/L CaCO3
SW	SWQ-3	4/27/2011	Cyanide	<0.01	mg/L
SW	SWQ-3	4/27/2011	Specific Conductance	4400	µmhos/cm
SW	SWQ-3	4/27/2011	Mercury	<0.033	mg/Kg
SW	SWQ-3	4/27/2011	pH	7.92	pH units
SW	SWQ-3	4/27/2011	TDS	4590	mg/L
SW	SWQ-3	4/27/2011	Suspended Solids	23	mg/L
SW	SWQ-2	4/28/2011	Aluminum	<0.02	mg/L
SW	SWQ-2	4/28/2011	Barium	0.019	mg/L
SW	SWQ-2	4/28/2011	Beryllium	<0.002	mg/L
SW	SWQ-2	4/28/2011	Boron	<0.04	mg/L
SW	SWQ-2	4/28/2011	Cadmium	<0.002	mg/L
SW	SWQ-2	4/28/2011	Calcium	79	mg/L
SW	SWQ-2	4/28/2011	Chromium	<0.006	mg/L
SW	SWQ-2	4/28/2011	Cobalt	<0.006	mg/L
SW	SWQ-2	4/28/2011	Copper	0.014	mg/L
SW	SWQ-2	4/28/2011	Iron	<0.02	mg/L
SW	SWQ-2	4/28/2011	Lead	<0.005	mg/L
SW	SWQ-2	4/28/2011	Magnesium	15	mg/L
SW	SWQ-2	4/28/2011	Manganese	0.0029	mg/L
SW	SWQ-2	4/28/2011	Molybdenum	0.0082	mg/L
SW	SWQ-2	4/28/2011	Nickel	<0.01	mg/L
SW	SWQ-2	4/28/2011	Potassium	2.9	mg/L
SW	SWQ-2	4/28/2011	Silicon	3.3	mg/L
SW	SWQ-2	4/28/2011	Silver	<0.005	mg/L
SW	SWQ-2	4/28/2011	Sodium	41	mg/L
SW	SWQ-2	4/28/2011	Vanadium	<0.05	mg/L
SW	SWQ-2	4/28/2011	Zinc	<0.01	mg/L
SW	SWQ-2	4/28/2011	Antimony	<0.001	mg/L
SW	SWQ-2	4/28/2011	Arsenic	<0.001	mg/L
SW	SWQ-2	4/28/2011	Selenium	0.0022	mg/L
SW	SWQ-2	4/28/2011	Thallium	<0.001	mg/L
SW	SWQ-2	4/28/2011	Uranium	<0.001	mg/L
SW	SWQ-2	4/28/2011	Mercury	<0.0002	mg/L
SW	SWQ-2	4/28/2011	Mercury	<0.033	mg/Kg
SW	LAC-E	5/4/2011	Aluminum	0.48	mg/L
SW	LAC-E	5/4/2011	Barium	0.01	mg/L
SW	LAC-E	5/4/2011	Beryllium	<0.002	mg/L
SW	LAC-E	5/4/2011	Boron	0.073	mg/L
SW	LAC-E	5/4/2011	Cadmium	<0.002	mg/L
SW	LAC-E	5/4/2011	Calcium	8.5	mg/L
SW	LAC-E	5/4/2011	Chromium	<0.006	mg/L
SW	LAC-E	5/4/2011	Cobalt	<0.006	mg/L
SW	LAC-E	5/4/2011	Copper	<0.006	mg/L
SW	LAC-E	5/4/2011	Iron	0.24	mg/L
SW	LAC-E	5/4/2011	Lead	<0.005	mg/L
SW	LAC-E	5/4/2011	Magnesium	<1	mg/L
SW	LAC-E	5/4/2011	Manganese	0.022	mg/L
SW	LAC-E	5/4/2011	Molybdenum	<0.008	mg/L
SW	LAC-E	5/4/2011	Nickel	<0.01	mg/L
SW	LAC-E	5/4/2011	Potassium	<1	mg/L
SW	LAC-E	5/4/2011	Silicon	4.6	mg/L
SW	LAC-E	5/4/2011	Silver	<0.005	mg/L
SW	LAC-E	5/4/2011	Sodium	13	mg/L
SW	LAC-E	5/4/2011	Vanadium	<0.05	mg/L
SW	LAC-E	5/4/2011	Zinc	<0.01	mg/L

SW	LAC-E	5/4/2011	Antimony	<0.001	mg/L
SW	LAC-E	5/4/2011	Arsenic	<0.001	mg/L
SW	LAC-E	5/4/2011	Selenium	<0.001	mg/L
SW	LAC-E	5/4/2011	Thallium	<0.001	mg/L
SW	LAC-E	5/4/2011	Uranium	<0.001	mg/L
SW	LAC-E	5/4/2011	Mercury	<0.0002	mg/L
SW	LAC-E	5/4/2011	Cyanide	<0.01	mg/L
SW	SWQ-2	5/4/2011	Cyanide	<0.01	mg/L
SW	SWQ-3	5/4/2011	Cyanide	<0.01	mg/L