SOUTH FACILITIES GROUNDWATER
OPERATION, MAINTENANCE, AND REPLACEMENT PLAN
OCTOBER 2006

1.0 INTRODUCTION

Kennecott Utah Copper Corporation (KUCC) is currently conducting groundwater remediation at its South Facilities as selected by the U.S. Environmental Protection Agency (EPA) and the Utah Department of Environmental Quality (UDEQ) in a Record of Decision (ROD) dated December 13, 2000 for the Kennecott South Zone, Operable Unit 2. In response to the ROD, KUCC submitted a Final Design for Remedial Action (RDRA) in December 2002. EPA approved the RDRA and issued an Explanation of Significant Differences (ESD) in June 2003. EPA and UDEQ are proposing to issue a second ESD in December 2006 modifying certain aspects of the selected remedy.

KUCC has completed construction of facilities required to implement the selected remedy. EPA and UDEQ are expected to certify Construction Completion for these facilities before the end of 2006. This Operation, Maintenance, and Replacement (OM&R) Plan addresses post-construction remedial aspects of the ROD and has been prepared as an attachment to the Consent Decree for the South Facilities Groundwater. This OM&R Plan supersedes the RDRA.

Groundwater contamination at the South Facilities, referred to as Zone A Plume, is immediately downgradient of the old Bingham Reservoir and Bingham Canyon Mine waste-rock dumps and consists of a core area with low pH and elevated metals which is surrounded by a partially to fully neutralized zone of elevated-sulfate groundwater.

Post-construction OM&R activities include:

- Containing the plume using barrier wells and wells in the core of the plume,
- Remediating the aquifer through extraction of contaminated water and natural attenuation,
- Management of extracted groundwater and disposal of treatment residuals,
- Mitigating, as appropriate, impacts to third parties,
- Maintaining institutional controls to prevent public exposure, and
- Monitoring and reporting progress.

Maintenance of source control measures, namely the East Side Collection System, is a related activity that is being addressed under state permitting controls.

2.0 OM&R PLAN CHANGES

South Facilities Groundwater OM&R activities are expected to last for several decades. Given the length of time over which this remedy will be conducted, it is likely that changing conditions in the aquifer, advancements in treatment technology, eventual cessation of mining and milling operations, or other factors will, from time to time, warrant adjustments to this OM&R Plan.

EPA and UDEQ may approve modification of this OM&R Plan. Such modification shall not require court approval or amendment to the Consent Decree so long as the modification does not fundamentally change or materially alter the basic components of the remedy selected or modified in accordance with CERCLA or the NCP.

3.0 OM&R PROJECT MANAGEMENT

3.1 KUCC Project Coordinator

KUCC will designate a Project Coordinator who will have direct responsibility for day-to-day OM&R oversight. The Project Coordinator is KUCC's main point of contact for communications between KUCC and the agencies.

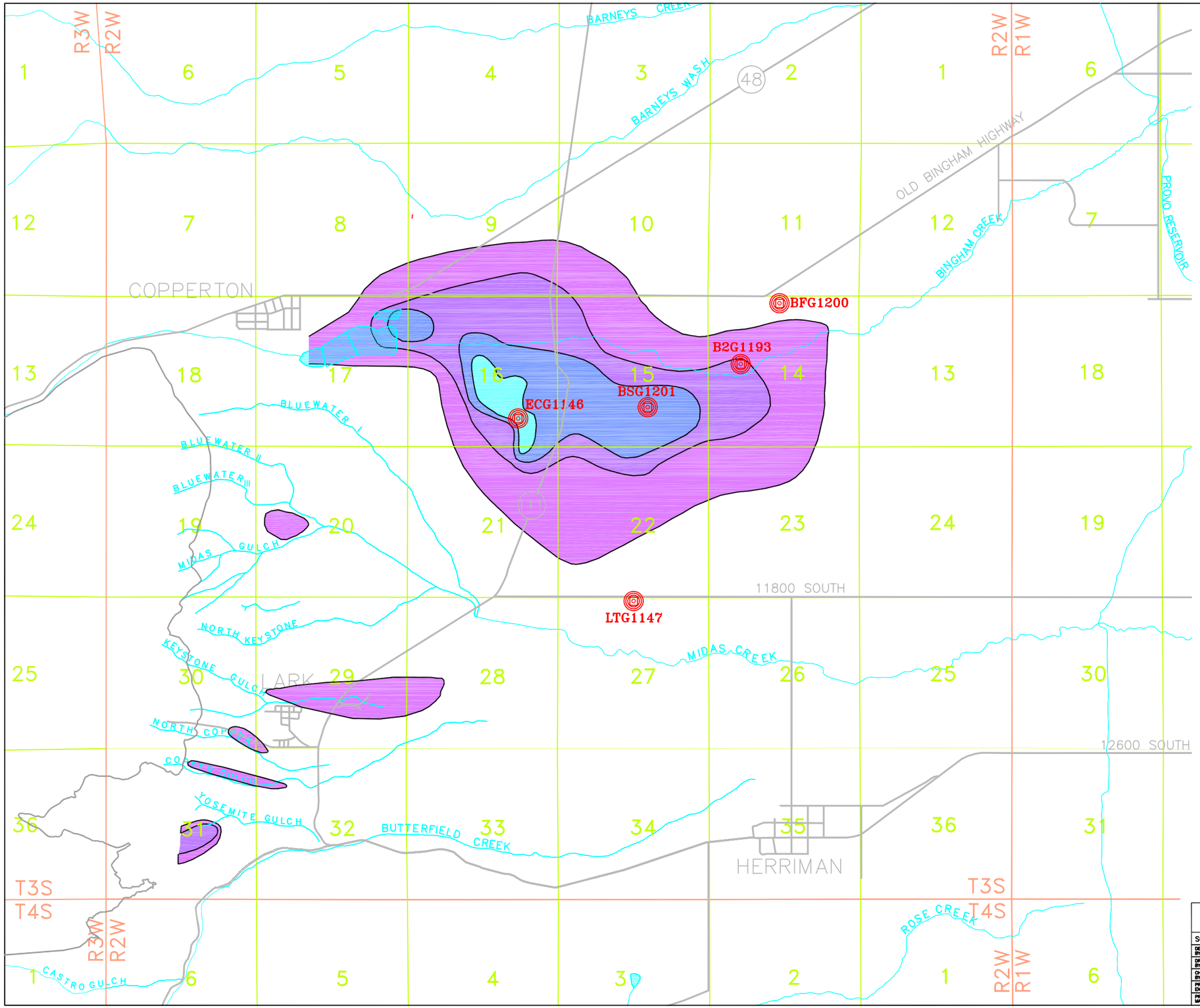
If the designated KUCC Project Coordinator is changed, KUCC will inform EPA and UDEQ of the identity of the successor at least 15 working days before the change is made, unless impracticable, but in no event later than the actual day the change is made.

3.2 Supervising Contractor

In the event KUCC delegates complete OM&R oversight to a Supervising Contractor, KUCC will notify EPA and UDEQ in writing of the name, title, and qualifications of any contractor proposed to be the Supervising Contractor. KUCC will demonstrate that the proposed contractor has a quality system that complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's Quality Management Plan (QMP). The QMP will be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA and UDEQ.

4.0 CONTAINMENT AND EXTRACTION OF CONTAMINATED GROUNDWATER

KUCC has constructed five wells and associated infrastructure for the purpose of containment and extraction of Zone A contaminated groundwater. These include two wells in the core of the Zone A plume (acid wells) and three barrier wells located along the leading edge of the Zone A plume (Figure 4.1). KUCC is currently and will continue to extract groundwater from the Zone A Plume until Final Clean-up levels as outlined in the December 2006 ESD are achieved.



STRATEGIC RESOURCES GROUP	KENNECOTT UTAH COPPER
SCALE: 1"=3500' / DATE	SOUTH FACILITIES OM&R PLAN
DESIGNED BY	FIGURE 4.1
DRAWN BY	ZONE A EXTRACTION WELLS AND
CHECKED BY	2005 SULFATE COUTOURS
PROJECT ENGINEER	
PROJECT MANAGER	
Job No. --- / Dwg. No.	REV BY DATE

4.1 Operation and Maintenance

KUCC will operate and maintain the barrier wells in order to extract groundwater at a rate that is at least sufficient to contain the Zone A plume and meet the performance standard of maintaining groundwater sulfate concentration in the Compliance Wells at or below 1,500 mg/l. KUCC may pump at a greater rate than is necessary for containment as needed to provide feed water to the RO Plant or to provide water for other uses within the scope of KUCC water rights assigned to the barrier wells.

KUCC will operate and maintain the acid wells to extract groundwater from the plume core at a rate sufficient to meet or exceed the minimum extraction criterion of 1,200 acre-feet per year, calculated on a 5-year rolling average.

KUCC will set and adjust extraction rates and well-field geometry as necessary according to monitoring and modeling results in order to contain the plume, optimize contaminant extraction, and balance the hydraulic response of the aquifer (drawdown) with the need to protect the ability of the aquifer to transmit plume water to the wells.

4.2 Replacement

Based on modeling results and monitoring data, KUCC has demonstrated that the present well field geometry is adequate to meet the performance standards for containment and remediation. However, KUCC may construct replacement, alternatively located, or additional extraction wells or reduce the number of extraction wells as warranted to optimize groundwater remediation and assure containment.

5.0 MANAGEMENT OF EXTRACTED GROUNDWATER

5.1 Barrier Well Water

For the duration of KUCC's obligation under an agreement with the State of Utah and the Jordan Valley Water Conservancy District (JVWCD) dated August 31, 2004, KUCC plans to manage barrier well water primarily by providing it as feed water to a reverse osmosis (RO) treatment plant. KUCC may also utilize barrier well water in its process water system, as it has done for many years. Other management options for water extracted from the barrier wells could include providing the water for secondary use (irrigation), or any other lawful use and disposition of such water. KUCC will advise EPA and UDEQ of any changes in the use and disposition of barrier extraction well water.

5.2 Acid Well Groundwater

During operation of the Bingham Canyon Mine, KUCC will rely on operating milling facilities for treatment of acid plume water, specifically a) the tailings pipeline, which serves as a 17-mile treatment reactor; b) the Copperton Concentrator lime plant, which has ability to add hydrated lime directly to the tailings line as needed, and c) the North Tailings Impoundment, which provides a repository for non-hazardous treatment residuals. Management of treatment residuals in the North Tailings Impoundment is

subject to compliance with State of Utah UPDES Permit UT0000051 and Groundwater Discharge Permit UGW350011.

5.2.1 Operation and Maintenance

Acid plume water is conveyed from the acid wells to the tailings line where it is neutralized by 1) available alkalinity of the tailings (primarily present as calcite in the limestone portion of the ore), and 2) residual hydrated lime added as a milling reagent. KUCC may also add lime directly to the tailings pipeline if needed for neutralization. Acid water pipelines and other conveyance structures will be inspected and maintained as needed to prevent release of extracted acid water.

5.2.2 Replacement

Treatment of acid plume water is expected to continue beyond closure of the Bingham Canyon Mine (currently anticipated between 2018 and 2030). The current KUCC plan for post-mining management of acidic flows is based on lime treatment of acidic waters with disposal of reaction products (i.e., gypsum sludge) in a prepared facility.

KUCC will continue to investigate alternative treatment technologies, particularly ones that have the potential to decrease both lime consumption and sludge volumes. The plan for post-mining water management and disposal of treatment residuals will be updated formally as part of the 5-Year Reviews during Remedial Action. At least three years prior to closure, KUCC will prepare a preliminary engineering design for all aspects of post-closure acid plume water treatment. Prior to mine closure a replacement treatment system and repository for treatment residuals will be designed and constructed.

6.0 MITIGATION OF IMPACTS TO THIRD-PARTIES

KUCC will maintain a program to evaluate and address concerns by third-party water rights holders related to Zone A groundwater quality or extractions. If a complaint is received, either directly by KUCC or indirectly through a regulatory agency, KUCC will gather and evaluate water quality and quantity data and water right seniority information related to the issue. KUCC may also refer the matter for an independent review by a consultant. The results of this evaluation will be reviewed and discussed with the third party, EPA, UDEQ, and the Utah Division of Water Rights (State Engineer). If a third-party impact is attributable to KUCC's remedial program, KUCC or the independent consultant will recommend potential mitigation with the water right holder and regulatory agencies. If acceptable to the water right owner, the mitigation will be implemented.

This process is designed to address concerns of third-party water right holder regarding potential interference with pre-existing water rights utilizing criteria consistent with Utah law. Nothing in the process is intended to create, modify, expand, limit, or restrict the legal rights or remedies of either the water right owner or Kennecott.

7.0 MAINTENANCE OF INSTITUTIONAL CONTROLS

KUCC has initiated institutional controls to prevent public exposure to contaminated groundwater. First, a drilling restriction on certain lands (Figure 7.1) owned by KUCC will be utilized to restrict the drilling of any well that would extract, or is capable of extracting, water. This restriction will be consistent with the Utah Environmental Institutional Control Act, which provides UDEQ with authority to enforce the restriction.

Second, the Utah Division of Water Rights Salt Lake Valley Groundwater Management Plan provides for critical review of any application to change point-of-diversion or drill a replacement well in the contaminated area defined in the Management Plan so as not to interfere with the remediation process.

KUCC will assist with maintenance of these institutional controls by actively monitoring applications filed with the Division of Water Rights in the contaminated area and working proactively with the Division of Water Rights and the UDEQ as appropriate, to control the drilling of wells that would interfere with the remedy.

8.0 MONITORING AND REPORTING

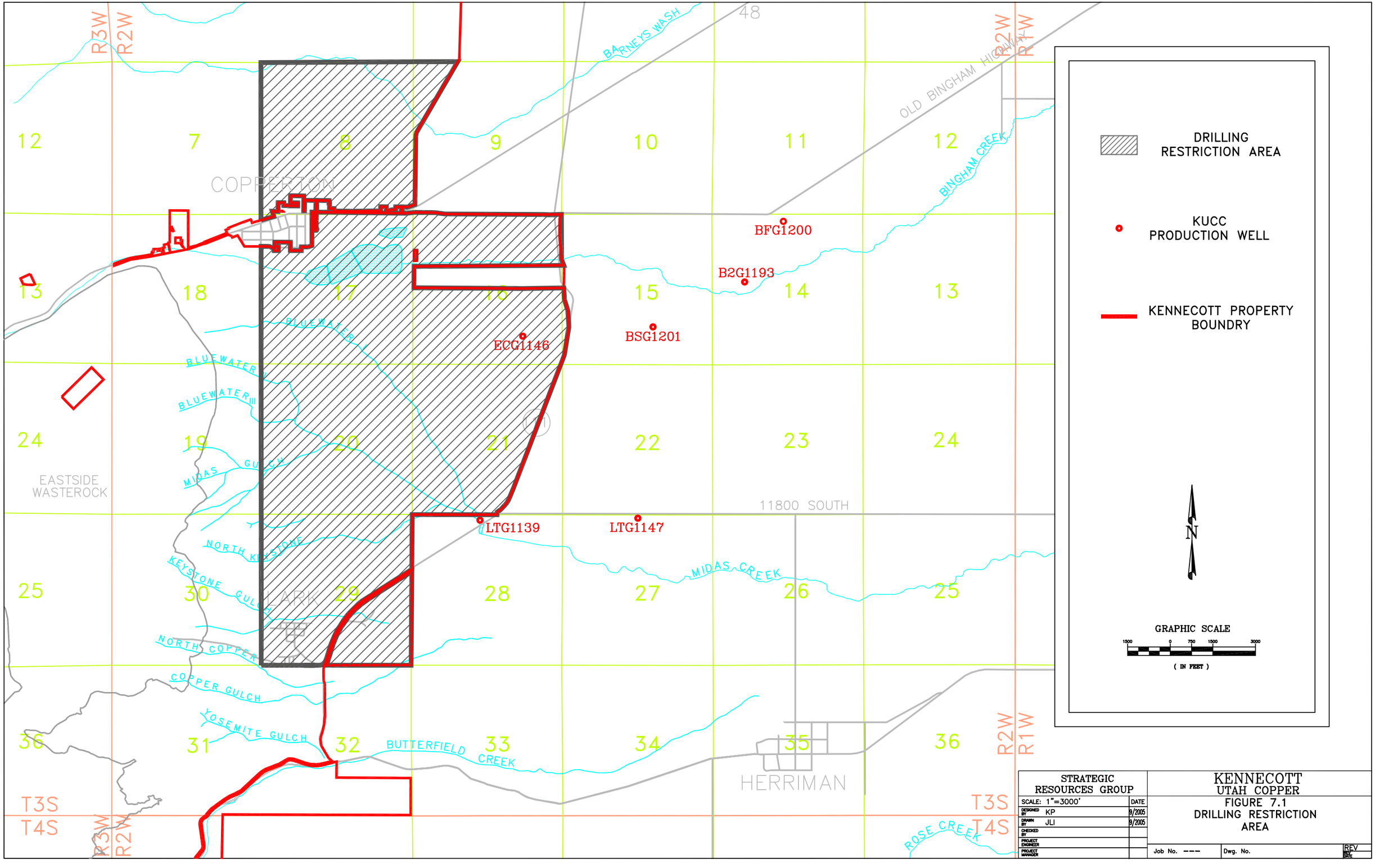
KUCC will conduct water quality monitoring at a network of compliance wells to demonstrate compliance with the performance standard for containment of the Zone A plume and at the remedial extraction wells to measure progress towards achieving final clean-up levels. KUCC may also conduct supplemental monitoring at its discretion. A monitoring plan is included as Appendix A. Monitoring will continue until final clean-up levels are achieved.

KUCC will prepare and submit annual reports on OM&R monitoring, remedial activities, and remedial progress. All groundwater monitoring information collected as part of the remedial effort will be included in the annual report. Annual reporting (in a format to be specified by the agencies) will be prepared on a calendar-year basis, and an annual report will be submitted to EPA and UDEQ by April 15 of the following year. The annual report will include a summary of monitoring results and other compliance activities for the source control measures.

Separate from the report described above, KUCC will prepare and submit to EPA and UDEQ by April 15 of each year an annual summary of activities related to 1) third-party inquiries and KUCC's responses, and 2) maintenance of institutional controls.

KUCC will make timely notifications or submit ad hoc reports as needed to inform EPA and UDEQ of significant changes in either operating strategy or groundwater conditions.

To support completion of Five-Year Reviews by the agencies, KUCC will provide timely response to reasonable requests from EPA or UDEQ for information relevant to Zone A plume remedial activities.



STRATEGIC RESOURCES GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=3000'	DATE	FIGURE 7.1 DRILLING RESTRICTION AREA
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DRAWN BY JLI	9/2005	
CHECKED BY		
PROJECT ENGINEER		
PROJECT MANAGER		
Job No. ---	Dwg. No.	REV BY DATE

8.1 Determination of Achievement of Final Clean-Up Levels

Final clean-up levels to be achieved as a result of the Zone A plume remedial activities are specified in the December 2006 ESD. At a future date when KUCC believes that final-clean up levels have been achieved or could soon be achieved, KUCC will propose to EPA and UDEQ appropriate statistical, analytical, and/or other methodology for determination of achievement of the final clean-up levels.

9.0 SOURCE CONTROLS

KUCC has constructed source control measures that include a series of cut-off walls, french drains, pipelines, and canals to capture and convey meteoric leach water from the waste rock dumps. Maintenance and monitoring of source controls is addressed in KUCC's Utah Ground Water Discharge Permit UGW350006 for the Bingham Canyon Mine and Water Collection System.

The source control measures will be operated pursuant to the state Ground Water Discharge Permit conditions. Any non-conformance with the permit will be addressed solely as specified in the permit and state groundwater protection permitting rules. As part of the five-year review process, EPA and UDEQ will evaluate the effectiveness of the groundwater protection permit in assuring maintenance of source controls

10.0 RECORDS RETENTION

Until 10 years after KUCC receives a notification from EPA of Certification of Completion of the Work pursuant to the terms of the Consent Decree, KUCC will maintain the following records and types of records:

1. The final version of the Remedial Investigation/Feasibility Study and appendices dated March 16, 1998.
2. The final version of the Final Design for Remedial Action at South Facilities Groundwater dated December 2002.
3. All final versions of subsequent design documents related to replacement of extraction or treatment systems necessary to implement the post-construction requirements
4. EPA's Record of Decision dated December 13, 2000 for Kennecott South Zone, Operable Unit 2.
5. EPA's Explanation of Significant Differences, Kennecott South Zone Operable Unit 2, signed by EPA on June 23, 2003.
6. Any subsequent Record of Decision amendments or Explanation of Significant Differences documents.
7. The Remedial Action Consent Decree.
8. Any subsequent Consent Decree modifications or amendments.
9. This OM&R Plan and any subsequent revisions or replacements.

10. All final versions of annual OM&R reports, which will include all relevant groundwater monitoring data.
11. All subsequent agency approvals of plans, modifications, reports, etc.
12. Annual groundwater extraction records for KUCC wells and any available extraction records for neighboring wells that are needed for calibration of groundwater models.
13. Well drilling and construction records.
14. Key geologic data and evaluations including geologic maps, geologic cross sections, geophysical survey results, geologic and geophysical well logs.
15. Any other scientific or technical data or studies relating to geology, hydrogeology, or water treatment that may be deemed to have enduring relevance to the project and are so designated by the KUCC Project Coordinator.

Until the completion of each five-year review, KUCC will maintain all reports submitted during the five-year review period pursuant to compliance with the state permits referenced in this OM&R plan.

For purposes of this section, records, reports, or documents (records) can include either electronic or written/paper documents; however, the requirement to retain such records does not apply to both forms, but to either form at the discretion of KUCC.

11.0 REFERENCES

Kennecott Utah Copper Corporation, 2002, Final Design for Remedial Action at South Facilities, Groundwater, December.

Kennecott Utah Copper Corporation, 2005a, Groundwater Characterization and Monitoring Plan, Revision 7, February.

Kennecott Utah Copper Corporation, 2005b, Standard Operating Procedures for Water Sampling, Revision 5, March.

Kennecott Utah Copper Corporation, 2005c, Quality Assurance Project Plan for the Groundwater Characterization and Monitoring Plan, Revision 6, March.

United States Environmental Protection Agency, 2000, Record of Decision for Kennecott South Zone, Operable Unit 2, Southwest Jordan River Valley Ground Water Plumes, December 13, 2000.

United States Environmental Protection Agency, 2003, Explanation of Significant Differences, Kennecott (South Zone) OU2, June 23, 2003.

United States Environmental Protection Agency, 2006, Explanation of Significant Differences, Kennecott (South Zone) OU2, December.

APPENDIX A

MONITORING PLAN

SOUTH FACILITIES GROUNDWATER MONITORING PLAN

VERSION	PREPARED	APPROVED	EFFECTIVE
1.0	October 2006	October 2006	October 1, 2006

1.0 PURPOSE

This plan describes the monitoring that KUCC will conduct as part of the South Facilities Groundwater Operation, Maintenance, and Replacement Plan (OM&R Plan). This monitoring plan is based on and replaces in whole the monitoring plan presented in the *Final Design for Remedial Action at South Facilities Groundwater* (RDRA) dated December 2002.

The purpose of monitoring at South Facilities Groundwater is to:

1) demonstrate compliance with the performance standard for containment of the Zone A plume,
2) measure progress toward achieving final clean-up levels, and
3) gather supplemental monitoring data which benefits KUCC in managing and optimizing its groundwater remediation and treatment program.

It is expected that this monitoring plan will be revised on a regular basis in response to changes observed in the plume over time.

2.0 METHODS

KUCC's Groundwater Characterization and Monitoring Plan (GCMP), as updated, and associated Standard Operating Procedures (SOPs), as updated, will be followed for all water quality sampling and water level measurements. The GCMP has been approved by the Utah Division of Water Quality and is updated on an annual basis. Procedures for documentation and sample handling, equipment maintenance and decontamination, quality control sampling, field measurements, and groundwater sampling are detailed in the SOPs. All water quality analyses will be conducted by Kennecott Environmental Laboratory or another state-certified environmental laboratory.

3.0 REQUIRED MONITORING

The monitoring described in this section fulfills the monitoring needs specified in the December 2006 ESD to demonstrate compliance with performance standards and monitor progress of remediation. Performance of this monitoring is subject to enforcement under the Consent Decree.

3.1 Locations

Required monitoring consists of sampling at a network of Compliance Wells on the perimeter of the Zone A plume and at the remedial Extraction Wells within the plume. These wells are listed in Table 3.1 and shown on Figure 3.1.

Table 3.1 Required Monitoring Locations

Well	Type
COG1178A	Compliance
WJG1169A	Compliance
WJG1154A	Compliance
W189	Compliance
P192B	Compliance
P194B	Compliance
EPG1165A	Compliance
BSG1135A	Compliance
HMG1123A	Compliance
HMG1126A	Compliance
ECG1146	Extraction
BSG1201	Extraction
B2G1193	Extraction
BFG1200	Extraction
LTG1147	Extraction

3.2 Sample Frequency and Timing

The sampling frequency and timing for Compliance Wells is dependant on sulfate concentration as shown in Table 3.2.

Table 3.2 Compliance Well Sampling Frequency and Timing

Sulfate (mg/l)	Frequency	Timing*
<1,000	Annually	3rd Quarter
1,000-1,250	Semi-annually	1st and 3rd Quarters
>1,250	Quarterly	Each Quarter

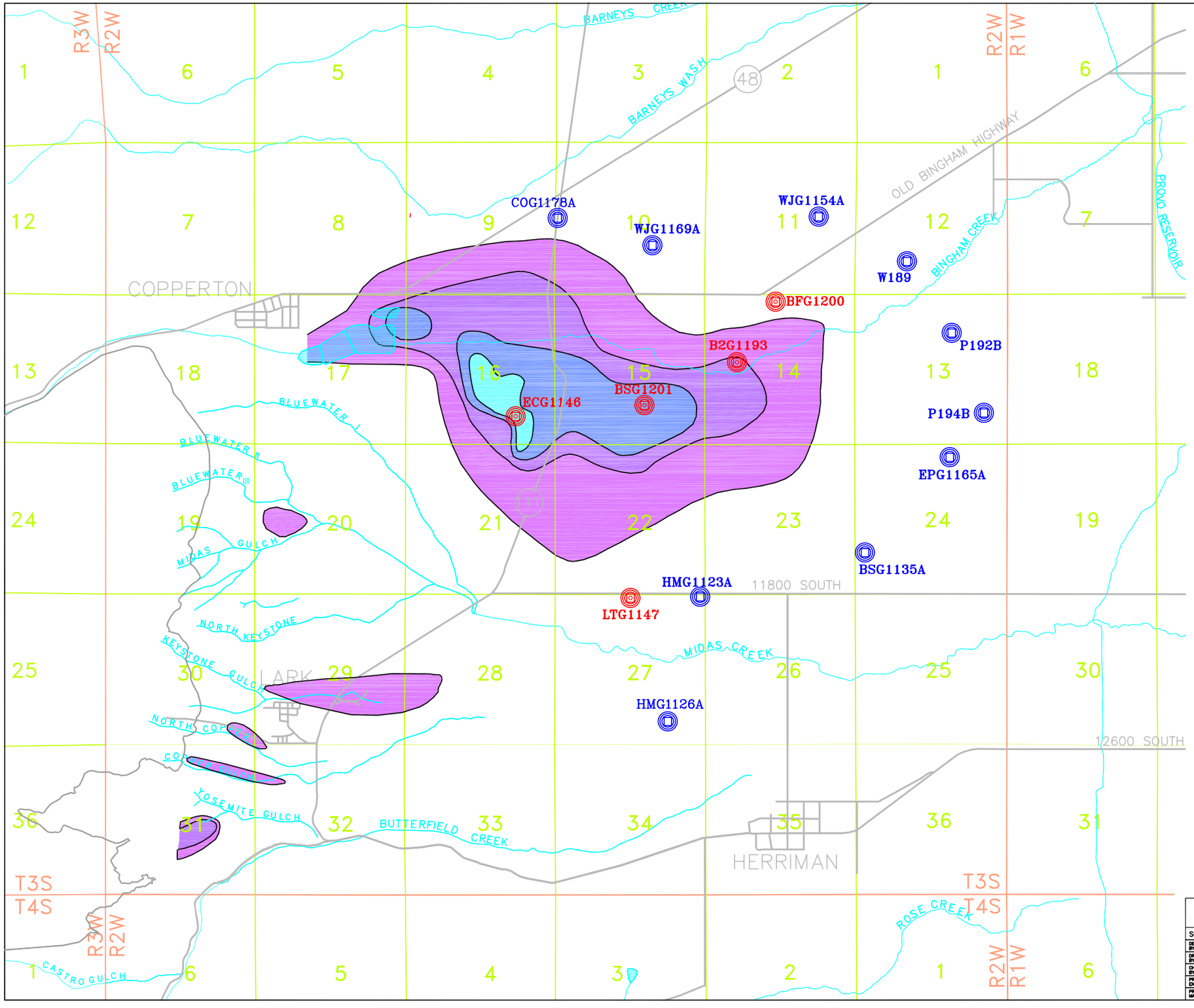
*Reference to quarters here and subsequently are based on calendar-year quarters

When sulfate concentrations decrease from a higher sulfate range to a lower sulfate range, required sampling frequency will decrease after two consecutive periods with sulfate concentrations in the lower range.

Extraction wells will be sampled semi-annually in 1st and 3rd quarters.

3.3 Parameters

The parameters to be monitored at the Compliance Wells and Extraction Wells are those listed in the December 2006 ESD for which a final clean-up level is specified. These parameters are listed in Table 3.3.



STRATEGIC RESOURCES GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=3500'	DATE	SOUTH FACILITIES MONITORING PLAN FIGURE 3.1 MONITORING WELL LOCATIONS AND 2005 SULFATE CONTOURS
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PROJECT ENGINEER		
PROJECT MANAGER		
Job No. ---	Dwg. No.	REV NO. DATE

Table 3.3 Compliance and Extraction Well Monitoring Parameters*

pH
Arsenic (D)
Barium (D)
Cadmium (D)
Copper (D)
Fluoride
Lead (D)
Selenium (D)
Nickel (D)
Sulfate

*(D) means dissolved

3.4 Reporting

All monitoring data for Compliance and Extraction Wells will be reported annually as described in the OM&R Plan.

If any water sample from a Compliance Well exceeds the 1,500 mg/l sulfate criterion, KUCC will notify in writing EPA/DEQ of probable out-of-compliance status within 10 working days of receiving official laboratory analytical results. (Informal verbal notification will be provided as soon as practical after KUCC becomes aware of the results.) KUCC will have the opportunity to re-sample the well within 5 working days of making written notification to EPA/DEQ.

3.5 Replacement

KUCC will make diligent and reasonable effort to retain designated Compliance Wells; however, it is recognized that development pressures and other factors may require abandonment of some Compliance Wells. Prior to abandonment of any Compliance Well, KUCC will recommend to and seek approval from EPA/DEQ for a replacement well, which may be a reasonably adjacent existing well or a new well within reasonable proximity of the well to be abandoned.

4.0 SUPPLEMENTAL MONITORING

The purpose of the supplemental monitoring described below is to benefit KUCC in managing and optimizing its groundwater remediation program. Performance of this monitoring is not subject to enforcement under the Consent Decree. Supplemental monitoring data may also be used to demonstrate, at an appropriate future date, achievement of the final clean-up levels.

4.1 Water Quality and Water Level Monitoring

Within and adjacent to the Zone A plume are over 300 monitoring wells, in addition to the Extraction and Compliance wells listed above. KUCC may select

and conduct water quality and/or water level monitoring on any number of these wells each year. Water quality samples will be analyzed for those parameters that KUCC believes useful to managing the remedial program.

4.2 Ground Surface Elevation Monitoring

KUCC monitors ground surface elevation at selected locations on a regular basis to detect land surface elevation changes that may be caused from groundwater extraction. Current surface elevation monitoring points are listed in Table 4.4. KUCC may add or remove sites from this list as necessary.

Table 4.4 Locations for Ground Surface Elevation Monitoring

Well Site ID
K105
ECG1116
ECG1124
BSG1180
BFG1156
WJG1170
BSG1137
1973 West
¼ Section 13/14
¼ Section 15/22

4.3 Tailings Monitoring

KUCC monitors the solid and aqueous chemistry in the tailings system to assure that acid plume waters and other mining-affected waters which are managed in the tailings line do not adversely impact the process water system or the long-term acid-generating potential of the tailings.

4.3.1 Locations

Monitoring of the solid and aqueous phases of the tailings slurry and discharged water to the tailings slurry is conducted by sampling at two locations in the tailings system. Composite samples for solid and aqueous phase monitoring are collected once a month over a 24-hour period 1) at the GMT (general mill tailings; BCP1483) entering the Tailings Thickeners Distribution Box and 2) at the NSB (North Splitter Box; MCP2536). The GMT sample is collected from the automated sample cutters that sample Copperton Concentrator tailings. The GMT sampler automatically samples the waste stream every 20 to 30 minutes. The NSB composite sample is collected using a peristaltic sampling pump on the tailings line approximately 200 feet upstream of the NSB. The pump is programmed to sample every 20 minutes.

The aqueous pH of tailings is monitored continuously at the North Splitter Box.

4.3.2 Parameters

Solid tailings samples are analyzed for neutralization potential (NP) following standard methods. Aqueous samples are analyzed for the parameters listed in Table 4.7.

Table 4.7 Process and Tailings System Aqueous Monitoring Parameters

pH
Alkalinity/Acidity
Aluminum (D)
Cadmium (D)
Copper (D)
Iron (D)
Manganese (D)
Zinc (D)

4.3.3 Management Criteria

KUCC utilizes the following management criteria in management of acidic waters in the tailings system:

1. The neutralization potential (NP) value of samples collected from the tailings North Splitter Box should be either greater than or equal to the NP of Copperton Mill Tailings for the month or at least 5 t CaCO3 eq/kt. The monthly NP values will be determined based upon a 24-hour composite sample and using a six-month rolling average. In making comparisons, the uncertainty in both GMT and NSB will be taken to be 10% of the average value, and a significant difference must lie outside the joint uncertainty.

2. Aqueous alkalinity should be greater than or equal to 10 mg CaCO3 eq/L at least 90% of the time. Aqueous alkalinity will be evaluated as a rolling six-month average.

3. The aqueous pH at the North Splitter Box should be greater than or equal to 6.7 during at least 90% of the time over a calendar year.

5.0 REGISTER OF CHANGES

Version	Date	Changes
1	Oct. 2006	Initial release