Rio Tinto

Kennecott South Facilities Groundwater Remediation 2009 Progress Report

Stakeholder Forum

17 March 2010

Kennecott Utah Copper Environmental Restoration Group

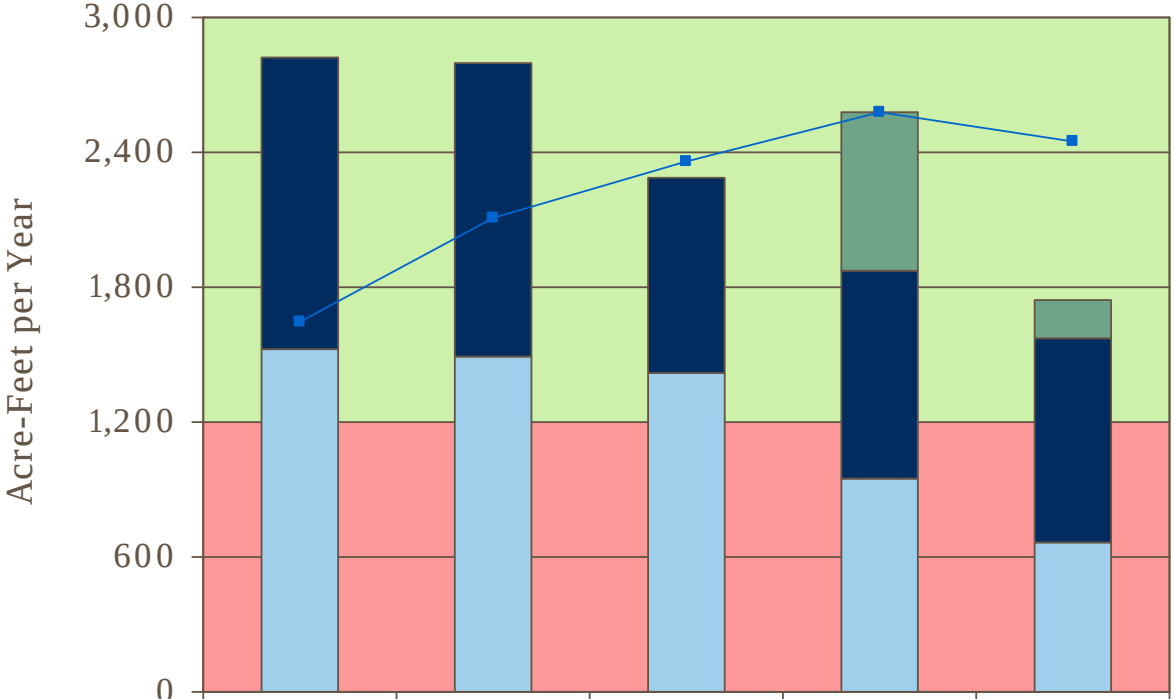
Tonight's Discussion

- Compliance with performance standards
- Zone A remediation progress

Performance Standards—CERCLA

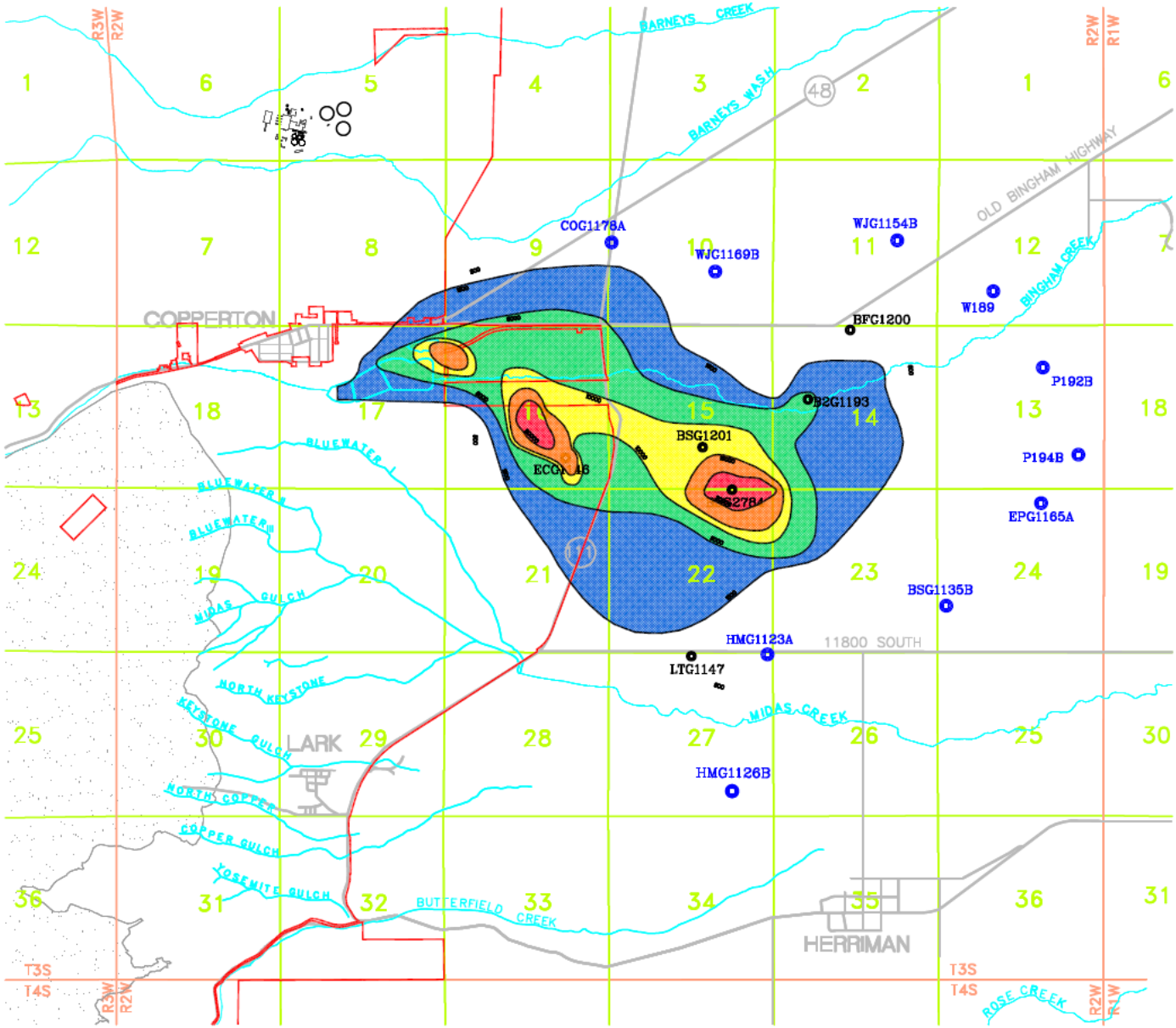
- Extract a minimum of 1,200 acre-feet per year from the core of the acidic water plume on a five-year rolling average (ESD, June 2007)
- Maintain groundwater sulfate concentrations at Compliance Wells at or below 1,500 mg/l (ESD, June 2007)

Acidic Water Extraction



	2005	2006	2007	2008	2009
BFG2784			1	706	171
BFG1201	1,292	1,300	869	927	910
ECG1146	1,527	1,495	1,419	947	665
Total	2,819	2,796	2,289	2,579	1,746
5-Year Avg	1,648	2,108	2,361	2,576	2,446

PROVISIONAL



LEGEND

2009 SO4 CONCENTRATIONS

- 20,000+ SO4 mg/L
- 15,000 – 19,999 SO4 mg/L
- 10,000 – 14,999 SO4 mg/L
- 5,000 – 9,999 SO4 mg/L
- 1,500 – 4,999 SO4 mg/L

BSG1201 KUCC PRODUCTION WELL

EPG1165A COMPLIANCE WELL

N

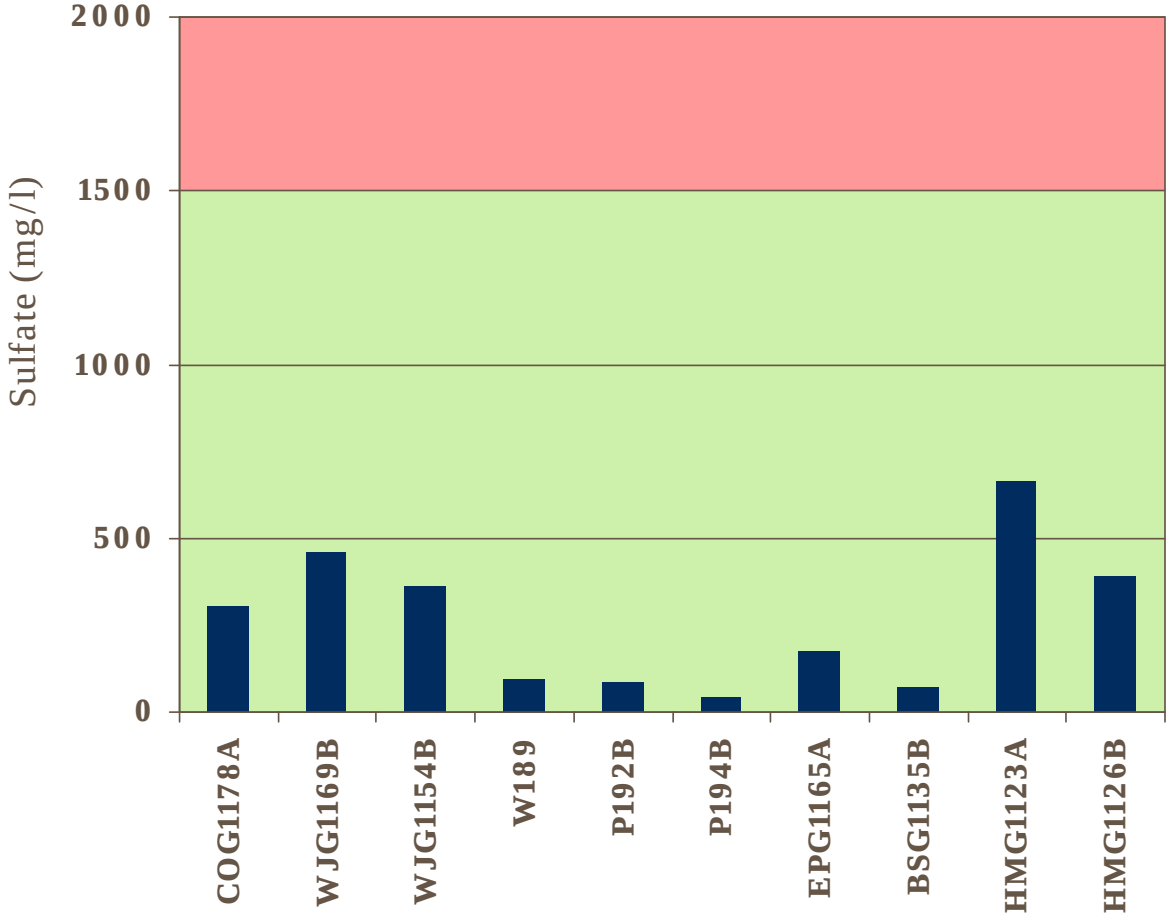
GRAPHIC SCALE

2500 0 1250 2500 5000

(IN FEET)

ENVIRONMENTAL RESTORATION GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=5000'	DATE	FIGURE 3–1 COMLIANCE WELL NETWORK
DRAWN BY KP	4/2009	
CHECKED BY JI	4/2009	
PROJECT ENGINEER KP		
PROJECT MANAGER KP		Job No. --- Dwg. No. 454-T-0403 REV 1

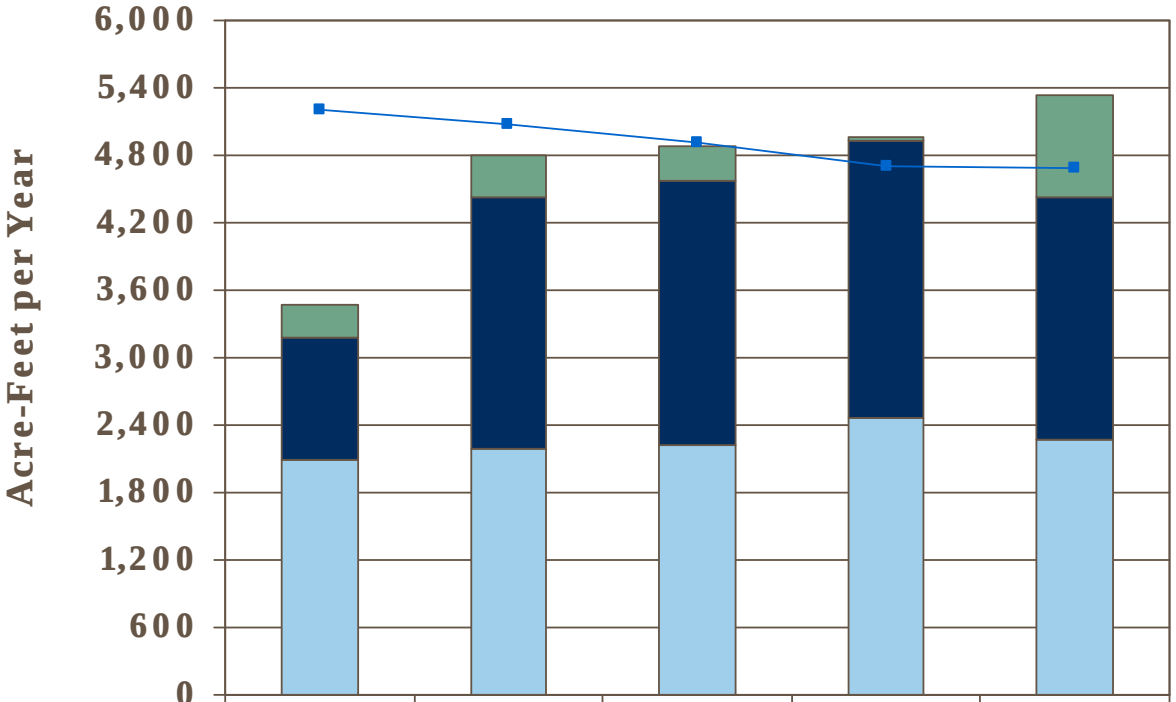
Sulfate in Compliance Wells 3Q09



Performance Standards—NRD

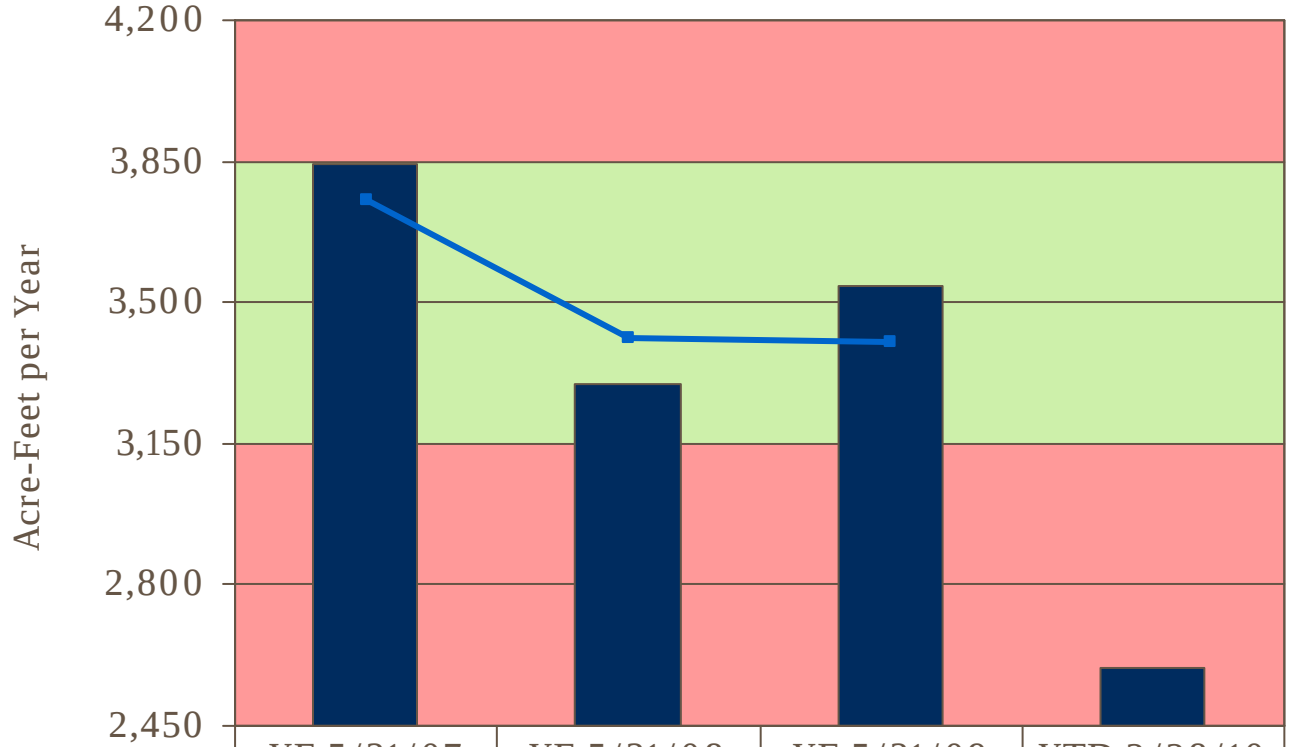
- Extract a minimum of 400 acre-feet per year from the core of the acidic water plume on a five-year rolling average (Consent Decree, August 1995)
- Deliver between 3,150 and 3,850 acre-feet of municipal quality water annually to Jordan Valley Water Conservancy District (Three Party Agreement, August 2004)
- Deliver 3,500 acre-feet of municipal quality water on a five-year rolling average to Jordan Valley (Three Party Agreement, August 2004)
- Provide water to Jordan Valley that has concentrations at or below 250 mg/l total dissolved solids (Project Agreement, August 2004)

Barrier Well Extraction



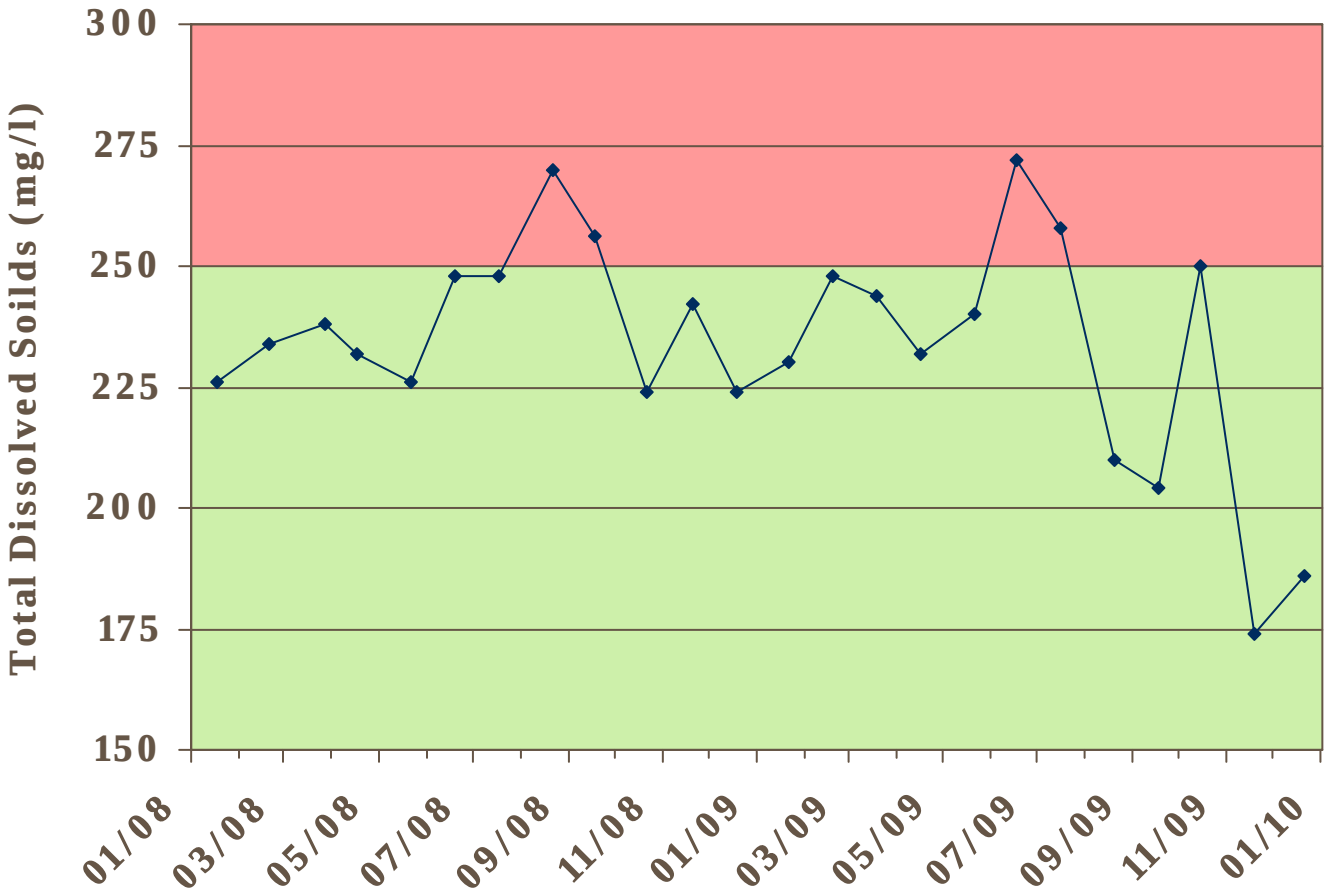
	2005	2006	2007	2008	2009
LTG1147	292	374	307	30	896
BFG1200	1,080	2,244	2,353	2,464	2,164
B2G1193	2,093	2,188	2,225	2,464	2,268
Total	3,465	4,806	4,885	4,958	5,328
5-Year Avg	5,207	5,071	4,910	4,709	4,688

Zone A Treatment Plant Water Delivery



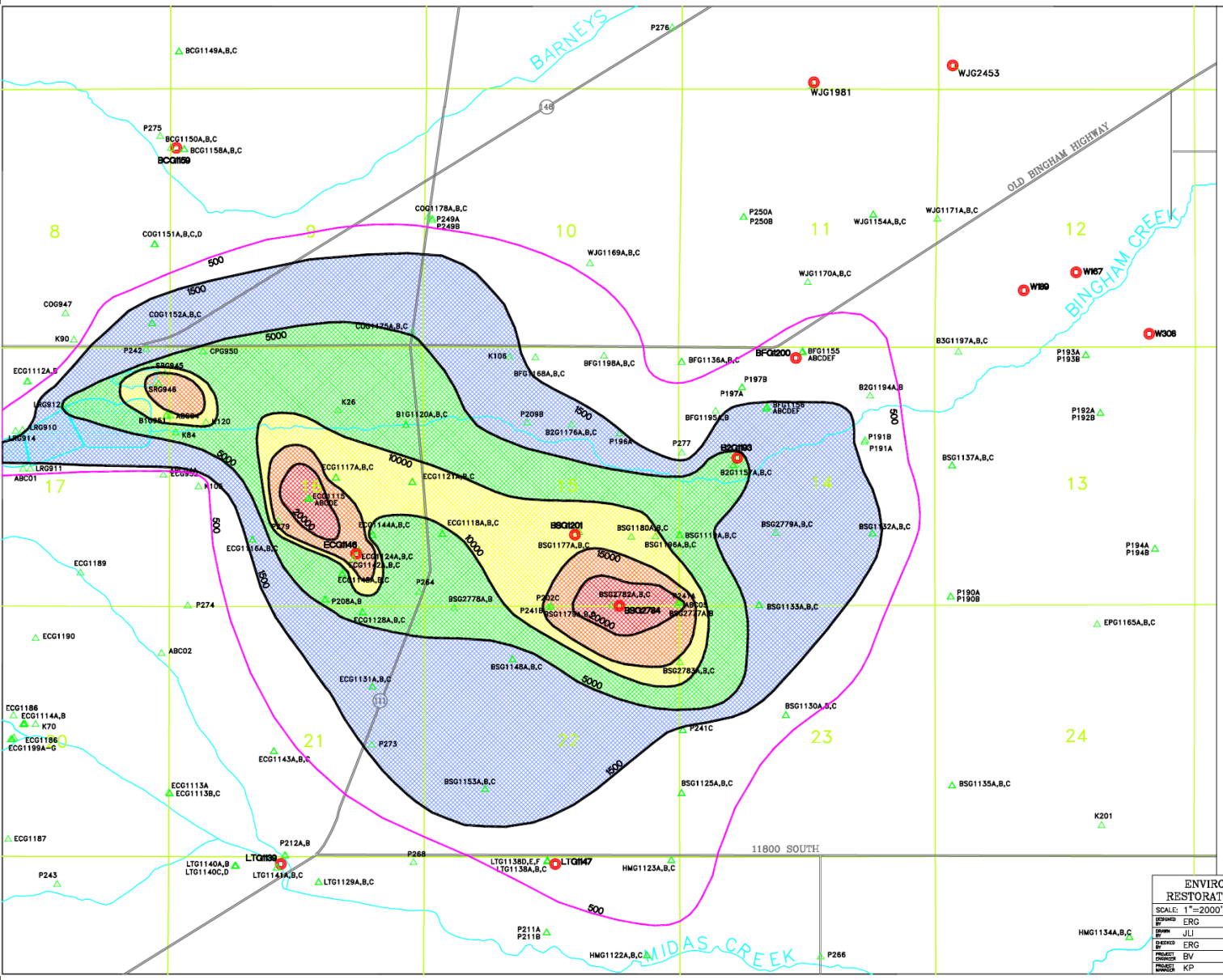
	YE 5/31/07	YE 5/31/08	YE 5/31/09	YTD 2/28/10
Annual	3,843	3,299	3,543	2,592
Rolling Avg	3,843	3,571	3,562	

Zone A Treatment Plant Delivered Water Quality



Zone A Remedial Progress

PROVISIONAL



LEGEND

SULFATE CONCENTRATIONS

- 20,000+ SO4 mg/L
- 15,000 - 19,999 mg/L
- 10,000 - 14,999 mg/L
- 5,000 - 9,999 mg/L
- 1,500 - 4,999 mg/L
- 500 - 1,499 mg/L

ECG1146 — EXTRACTION WELL

B1G951 — MONITORING WELL SITE

Notes: In wells with multiple completions, the completion with the highest, most recent concentration was used. If no 2009 samples were collected, then the most recent analyses of samples collected within the last five years were used.

GRAPHIC SCALE

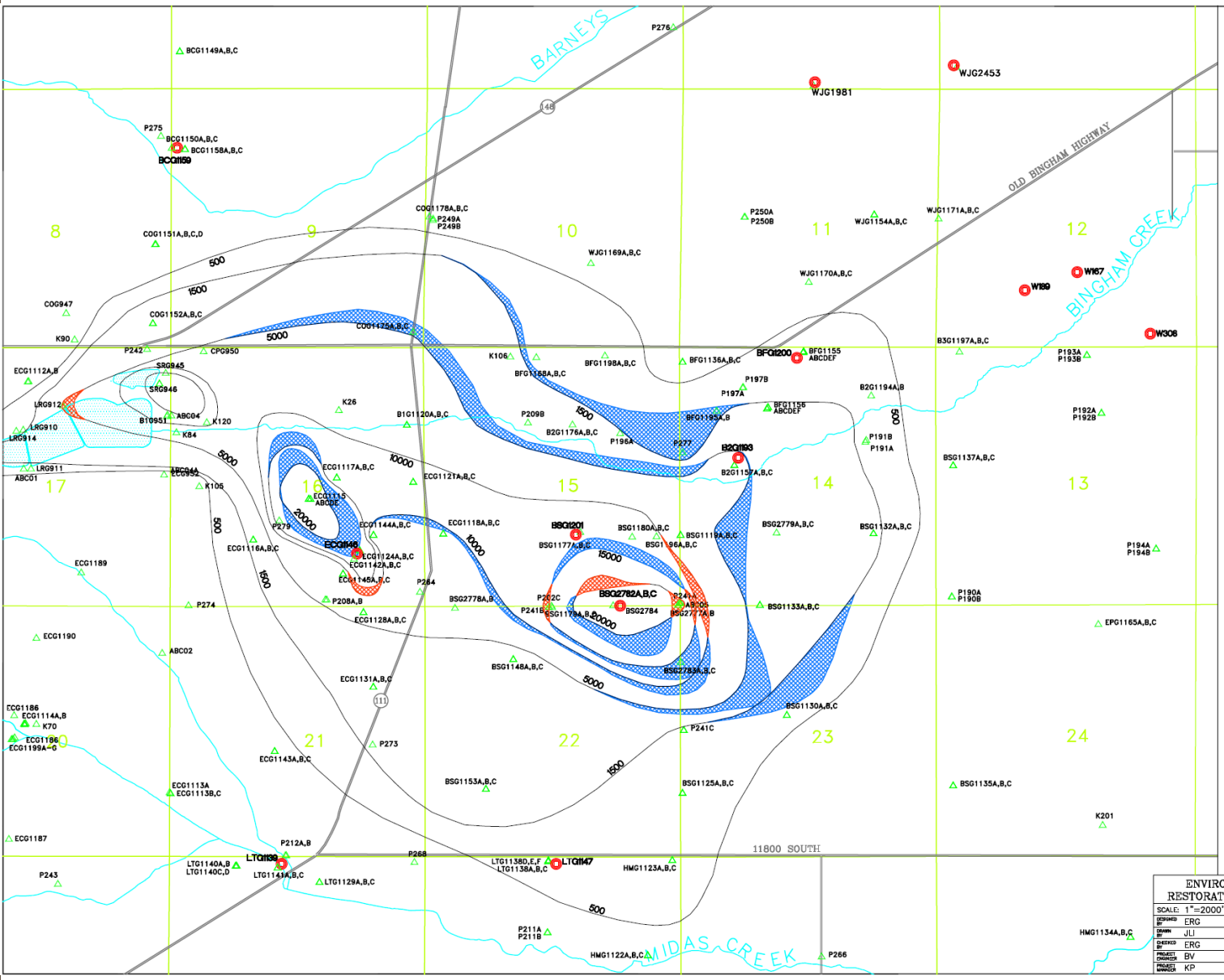
1000 0 500 1000 2000

(IN FEET)

N

ENVIRONMENTAL RESTORATION GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=2000'	DATE	FIGURE ??? 2009 SULFATE CONCENTRATIONS
DESIGNED BY ERG	3/11/2009	
DRAWN BY JLI	3/11/2009	
CHECKED BY ERG		
PROJECT ENGINEER BV		
PROJECT MANAGER KP		
Job No. ---	Dwg. No. 454-T-????	REV BY

PROVISIONAL



LEGEND

2009 SO4 CONTOURS

DECREASE IN SO4 BETWEEN 2009 AND 2008

INCREASE IN SO4 BETWEEN 2009 AND 2008

ECG1146 — EXTRACTION WELL

B1G951 — MONITORING WELL SITE

Notes: In wells with multiple completions, the completion with the highest, most recent concentration was used. If no 2009 samples were collected, then the most recent analyses of samples collected within the last five years were used.

GRAPHIC SCALE

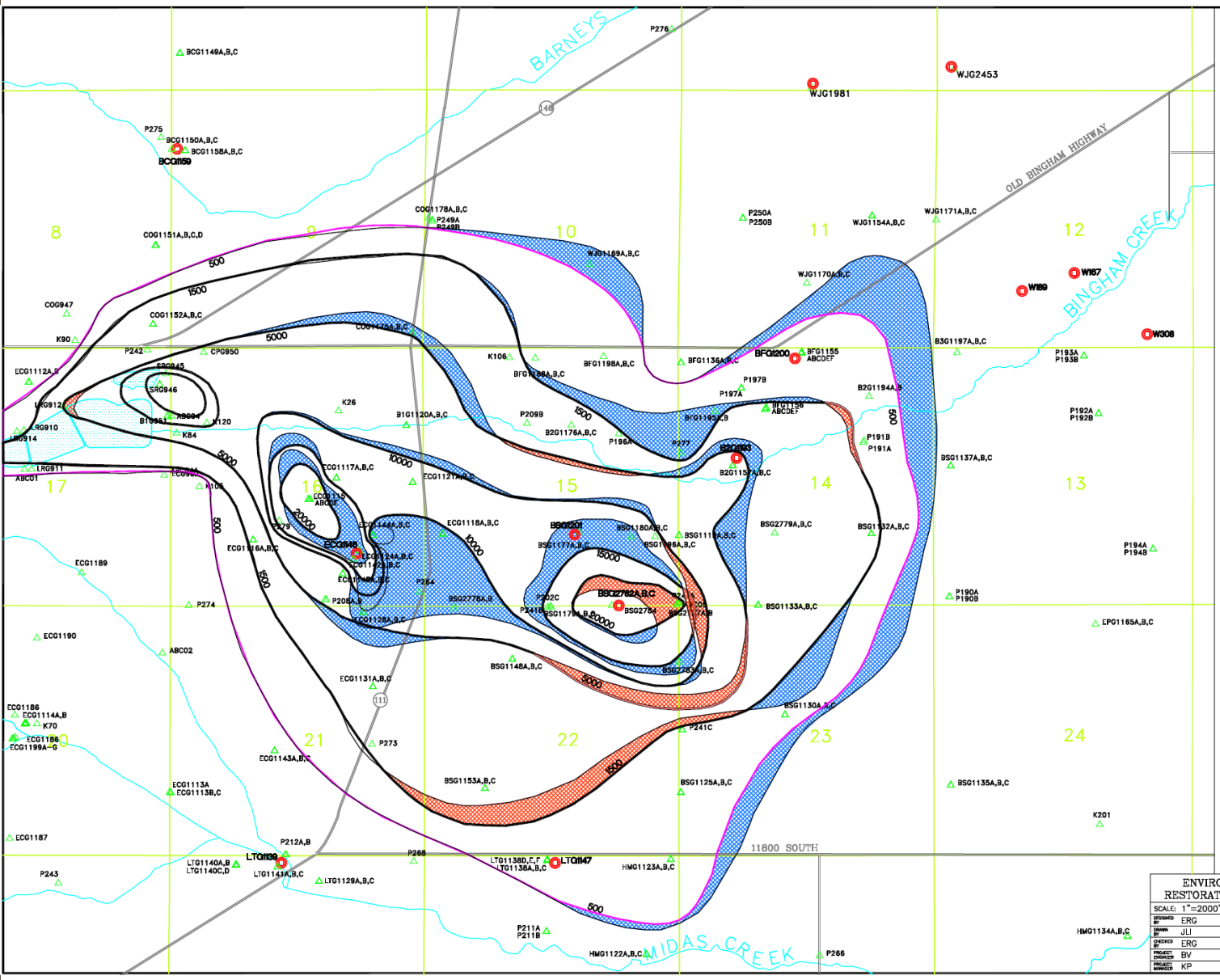
1000 0 500 1000 2000

(IN FEET)

N

ENVIRONMENTAL RESTORATION GROUP			KENNECOTT UTAH COPPER
SCALE: 1"=2000'		DATE	FIGURE ???
DESIGNED BY	ERG	3/11/2009	CHANGE IN SO4 CONCENTRATIONS BETWEEN 2008 & 2009
DRAWN BY	JLI	3/11/2009	
CHECKED BY	ERG		
PROJECT ENGINEER	BV		
PROJECT MANAGER	KP		Job No. --- Dwg. No. 454-T-???? REV DATE

PROVISIONAL



LEGEND

2009 ph CONTOUR

INCREASE IN SO4 BETWEEN 2006 – 2009

DECREASE IN SO4 BETWEEN 2006 – 2009

ECG1146 — EXTRACTION WELL

B1G951 — MONITORING WELL SITE

Notes: In wells with multiple completions, the completion with the highest, most recent concentration was used. If no 2009 samples were collected, then the most recent analyses of samples collected within the last five years were used.

GRAPHIC SCALE

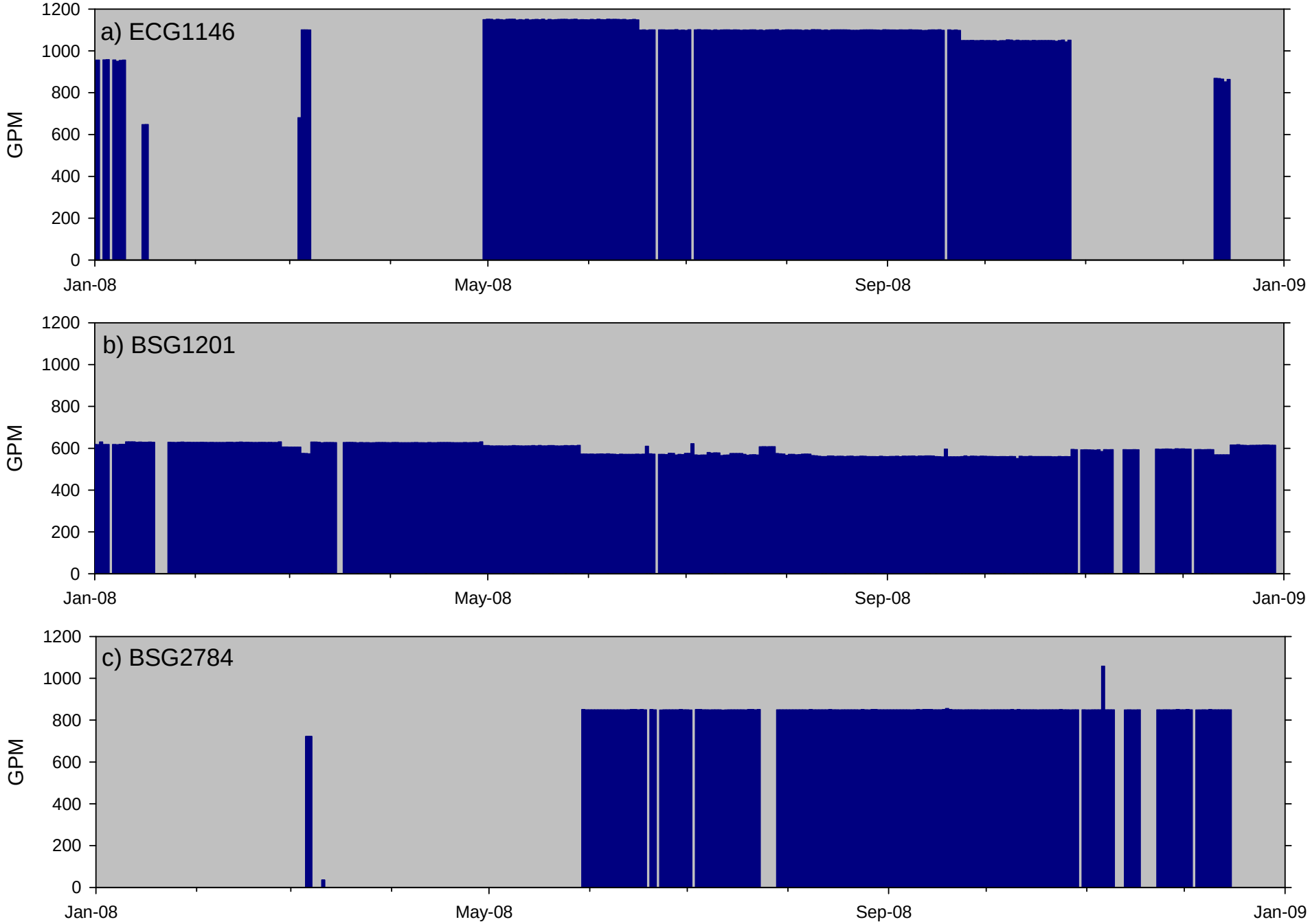
1000 0 500 1000 2000

(IN FEET)

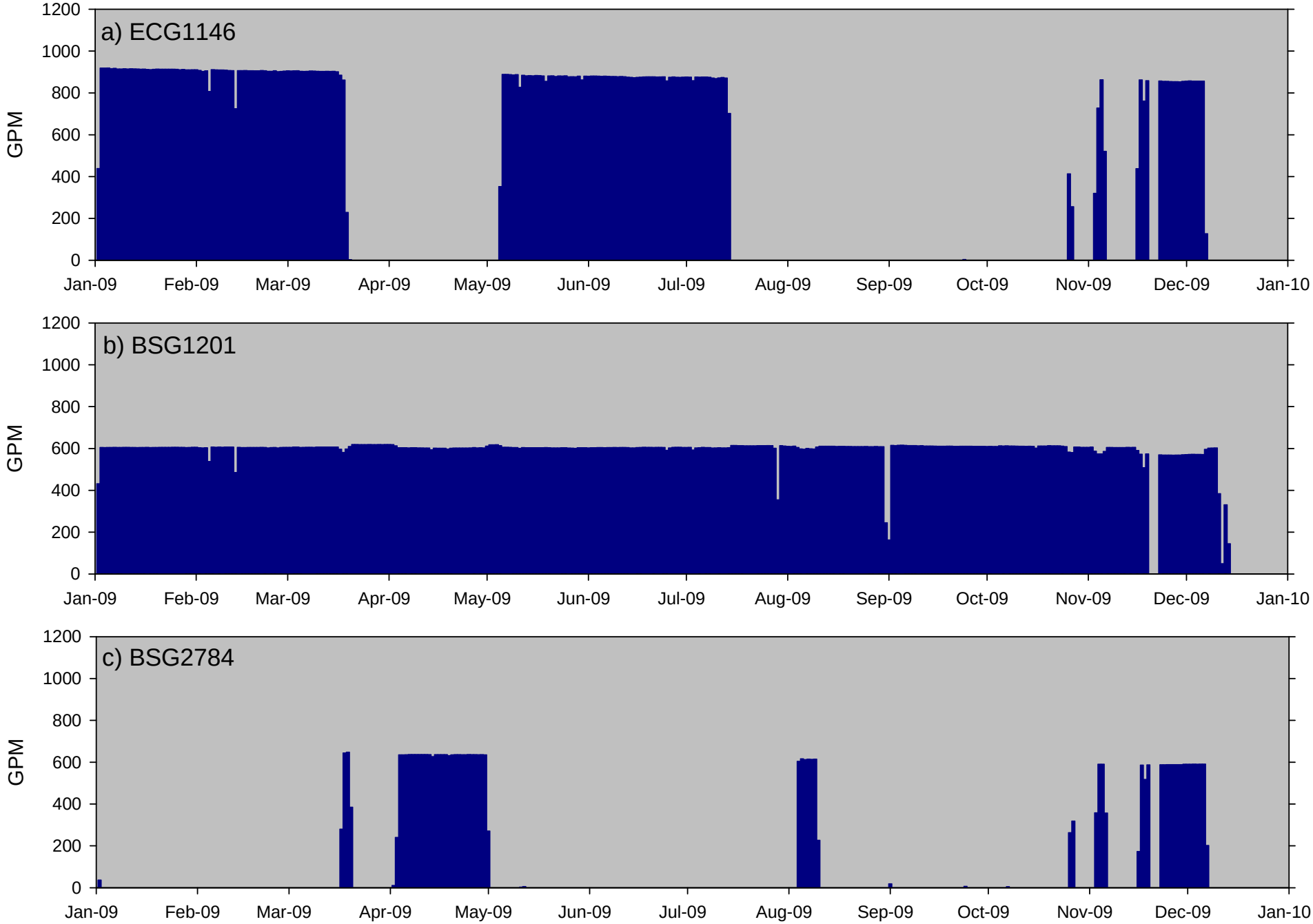
N

ENVIRONMENTAL RESTORATION GROUP			KENNECOTT UTAH COPPER
SCALE: 1"=2000'		DATE	FIGURE ???
DESIGNED BY	ERG	3/11/2009	CHANGE IN SO4 CONCENTRATIONS BETWEEN 2006 & 2009
DRAWN BY	JLI	3/11/2009	
CHECKED BY	ERG		
PROJECT ENGINEER	BV		
PROJECT MANAGER	KP		
Job No. ---	Dwg. No. 454–T–????		REV

PROVISIONAL

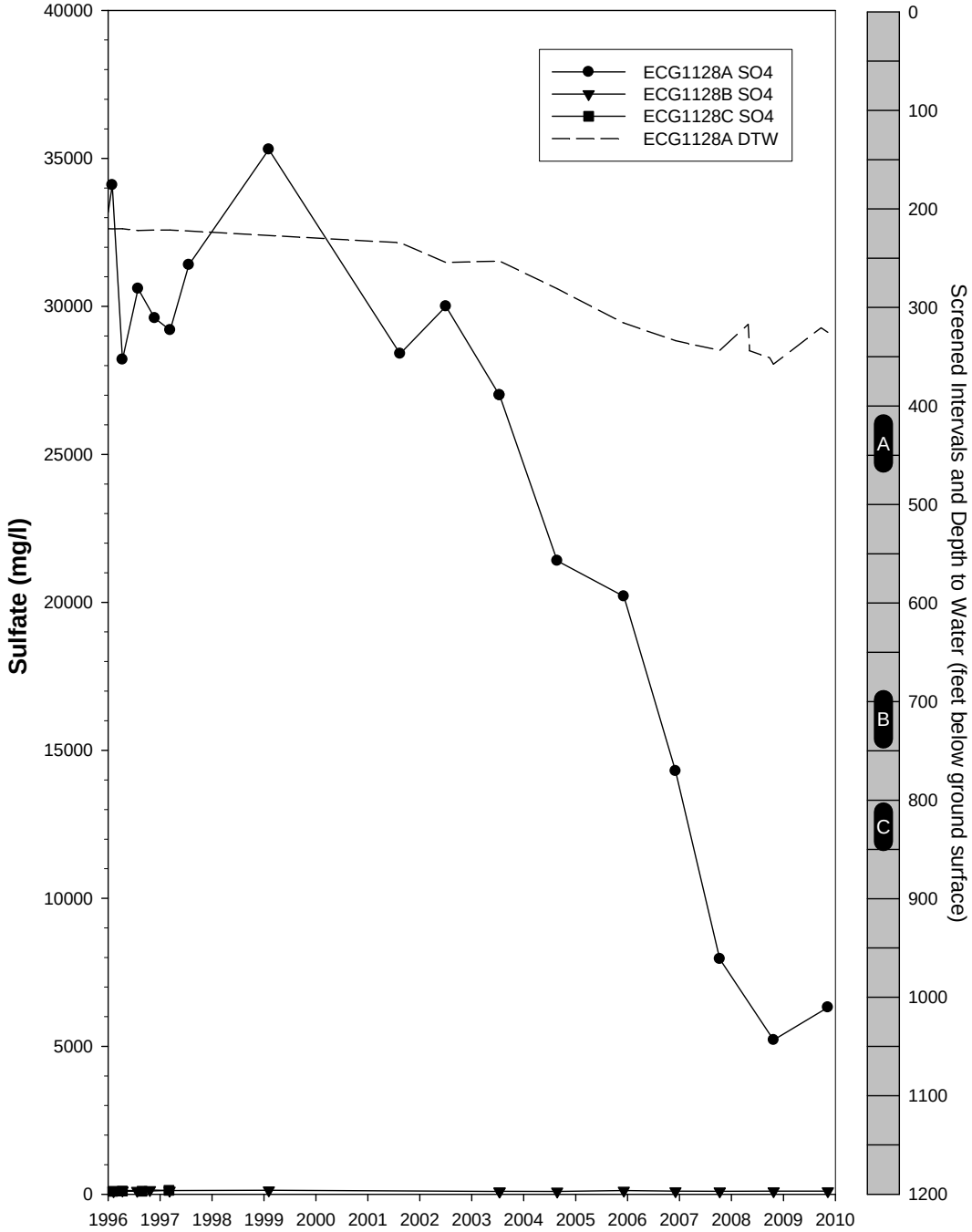


PROVISIONAL



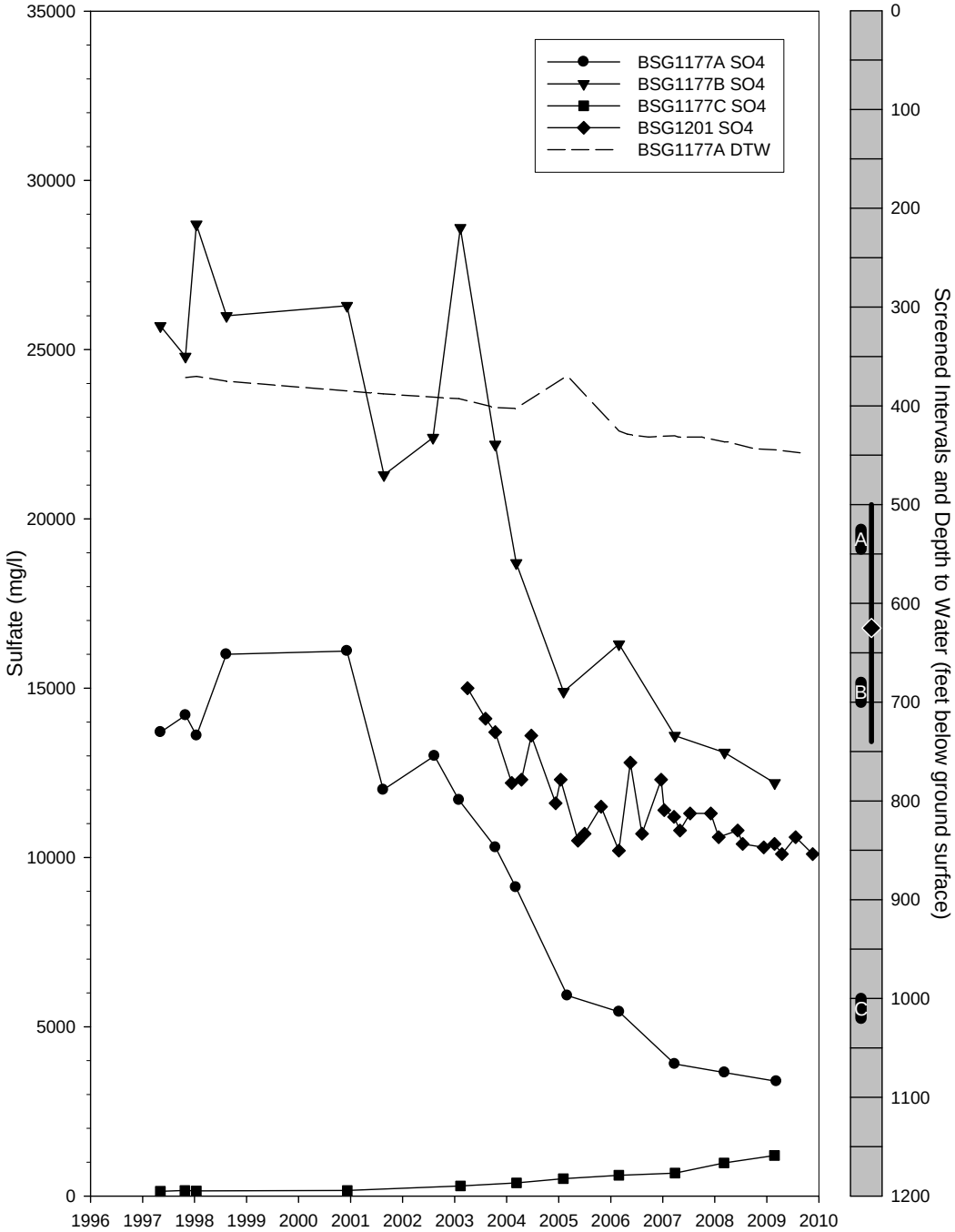
ECG1128 ABC

PROVISIONAL



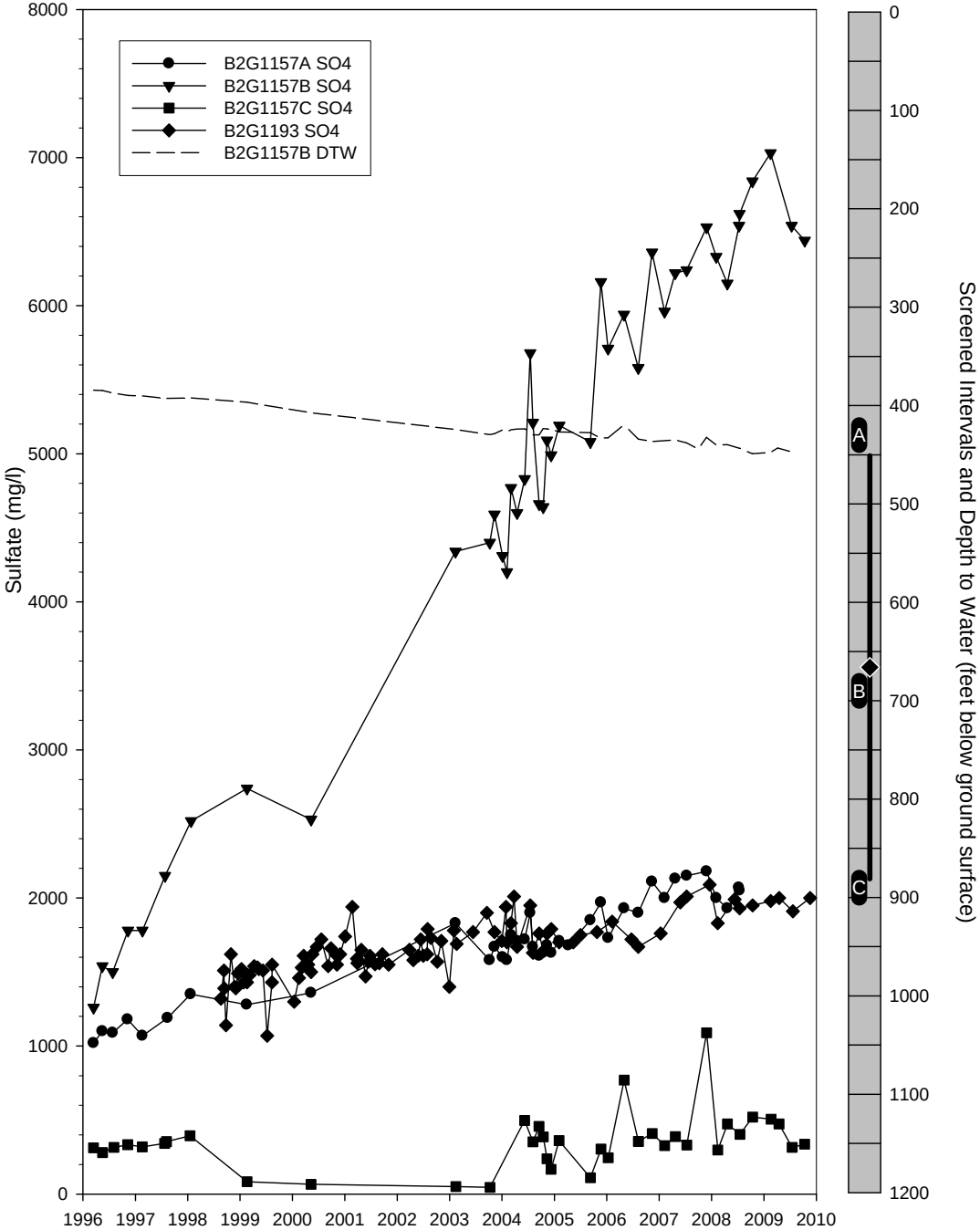
BSG1177 ABC - BSG1201

PROVISIONAL



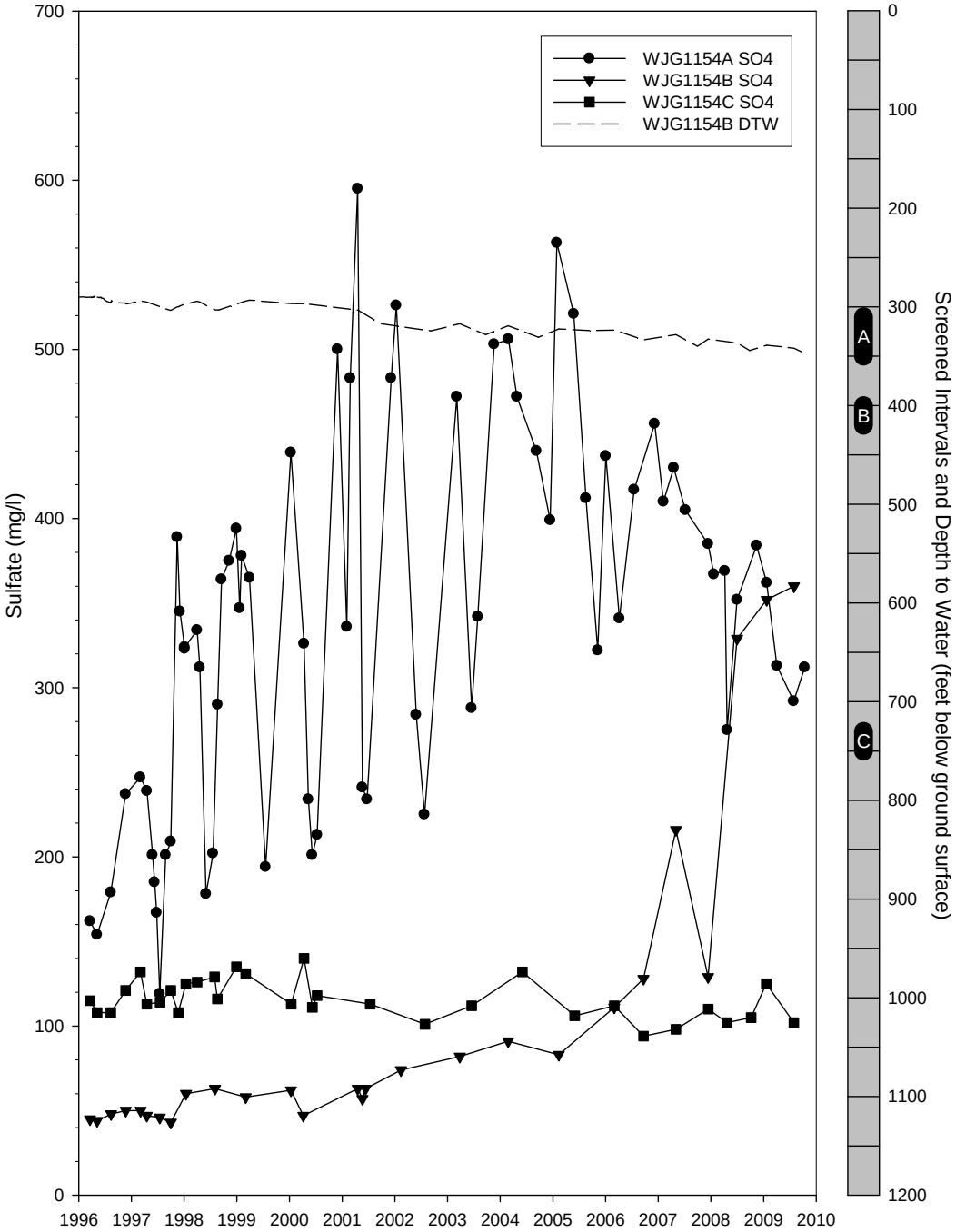
B2G1157 ABC

PROVISIONAL

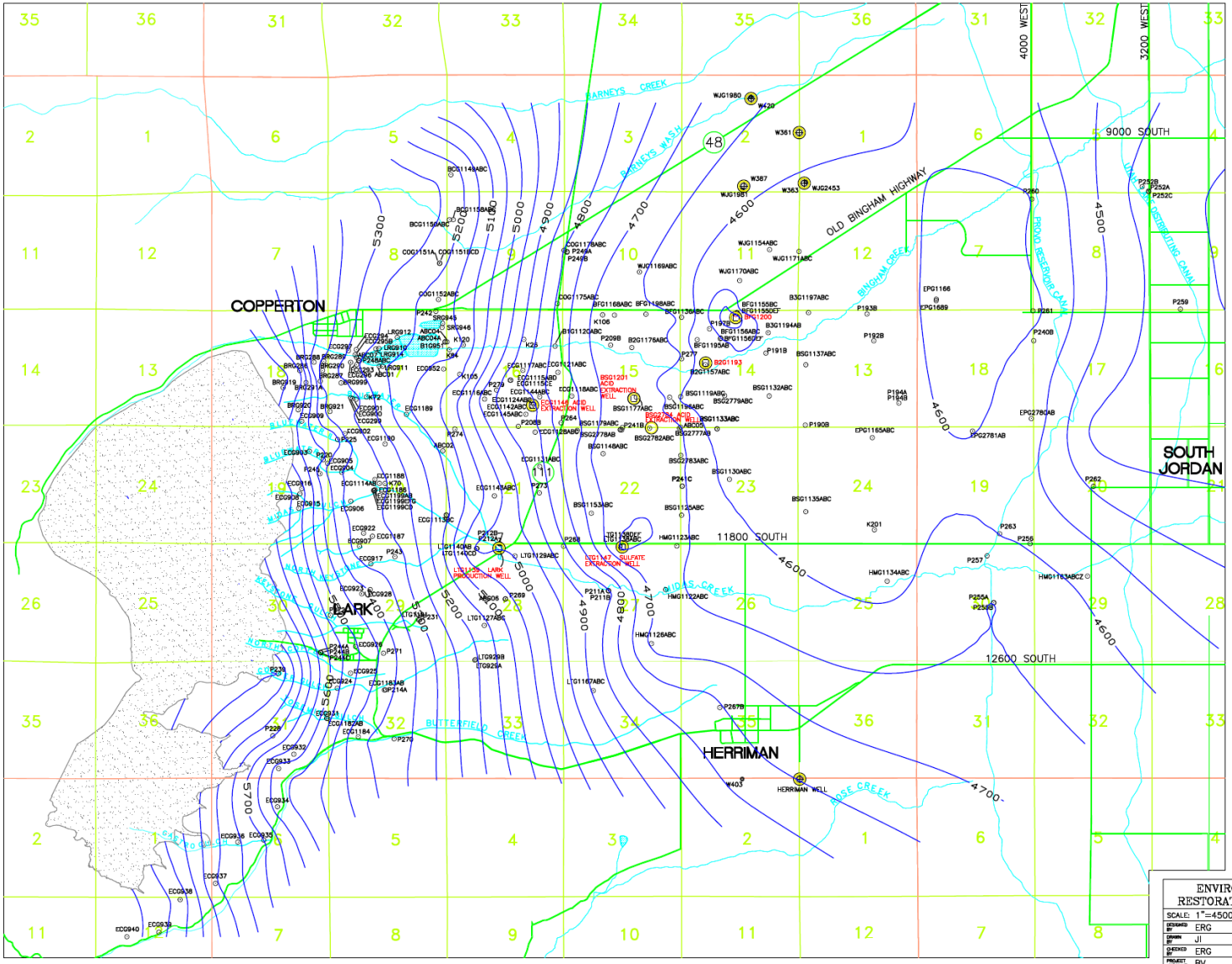


WJG1154 ABC

PROVISIONAL



PROVISIONAL



WELL SYMBOLS

- K26 — KUC MONITORING WELL
- BSG1201 — KUC PRODUCTION WELL
- W361 — MUNICIPAL WATER SUPPLY WELL
- WATER ELEVATION (Feet AMSL)

CONTOUR INTERVAL = 50FT

GRAPHIC SCALE

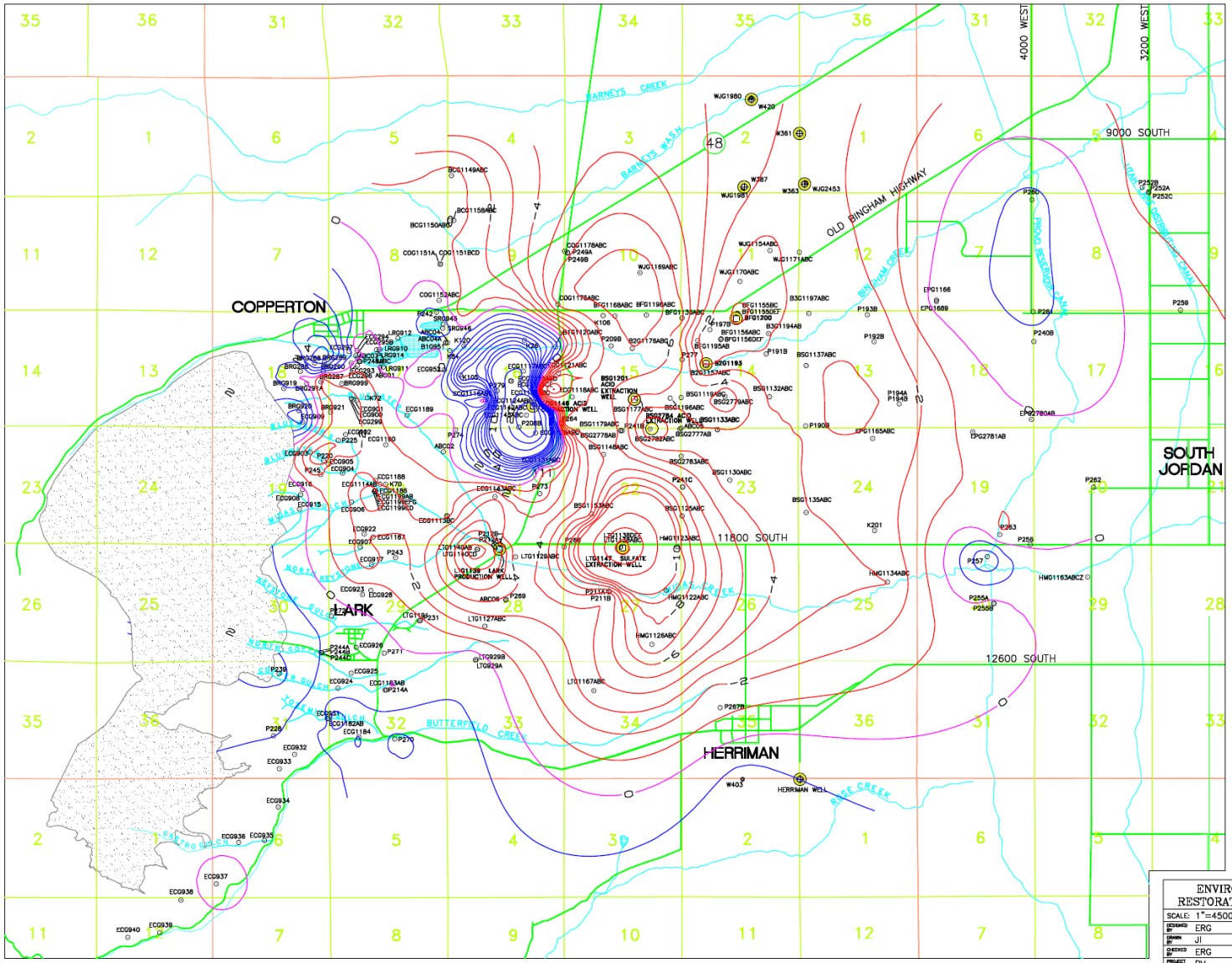
2250 0 1125 2250 4500

(IN FEET)

N

ENVIRONMENTAL RESTORATION GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=4500'	DATE	FIGURE ??
DESIGNED BY ERG	2/20/2010	WATER TABLE SURFACE ELEVATION CONTOURS SEPTEMBER 2009
DRAWN BY JI	2/20/2010	
CHECKED BY ERG		
PROJECT ENGINEER BV		
PROJECT MANAGER KP		Job No. --- Dwg. No. ???? REV

PROVISIONAL



WELL SYMBOLS

- K26 — KUC MONITORING WELL
- BSG1201 — KUC PRODUCTION WELL
- W361 — MUNICIPAL WATER SUPPLY WELL

WATER ELEVATION CHANGE CONTOUR LINE. RED DENOTES DROP IN WATER LEVEL.

BLUE DENOTES INCREASE IN WATER LEVEL INTERVALS

CONTOUR INTERVAL IS 1' FROM 10' TO −10' AND 5' FOR CHANGES GREATER THEN 10'

GRAPHIC SCALE

2250 0 1125 2250 4500

(IN FEET)

N

ENVIRONMENTAL RESTORATION GROUP		KENNECOTT UTAH COPPER
SCALE: 1"=4500'	DATE	FIGURE ??? CHANGES IN WATER SURFACE ELEVATION SEPT 2008 TO SEPT 2009
DESIGNED BY ERG	2/12/2010	
DRAWN BY JJI	2/12/2010	
CHECKED BY ERG		
PROJECT CHEMIST BV		
PROJECT MANAGER KP		
		Job No. --- Dwg. No. 454-T-???? REV

Want more information?

- www.kennecott.com/cleanup/southend/
  - Decision documents
  - Work plans
  - Annual groundwater remedial progress reports
  - Annual reporting on NRD activities
- www.deq.utah.gov/Issues/nrd/index.htm