
Process Memorandum to File

Addendum #1 to October 18, 2016 Process Memo “Summary of Hydrologic, Hydrochemical, and Geochemical Data Received to Date”

This document is deliberative and is prepared by the third-party contractor in compliance with the National Environmental Policy Act and other laws, regulations, and policies to document ongoing process and analysis steps. This document does not take the place of any Line Officer’s decision space related to this project.

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Project Manager**

Purpose of Process Memorandum

The purpose of this process memorandum is to provide an addendum to a process memo dated October 18, 2016 titled "Summary of Hydrologic, Hydrochemical, and Geochemical Data Received to Date". The previous process memo served as a high-level overview of baseline hydrology, hydrogeology, hydrochemical, and geochemical data received from Resolution Copper.

This process memo provides further detail on the number and type of samples contained in electronic databases for:

- Hydrochemical samples for surface water and groundwater
- Geochemical samples associated with in-situ rock samples (termed the "block cave geochemical database")

Hydrochemistry Database Contents

Attachment 1 contains a detailed listing of the categories of samples contained in the hydrochemical database, by sample location, by quarter. Constituents are grouped into the following categories for the purposes of summarization:

- General hydrochemistry
- Metals
- Radionuclides
- Isotopes
- Field parameters
- Biological

The exact parameters included under each category are listed in Attachment 1. The locations of these samples are shown on the figure included as Attachment 2.

Block-Cave Geochemistry Database Contents

The block-cave geochemistry database has been described elsewhere in the project record (see process memo dated August 8, 2017).

Attachment 3 contains a detailed listing of the number of samples analyzed for each lithology type and alteration type, for the following categories:

- Acid base accounting (ABA)

- Net acid generation (NAG)
- Synthetic Precipitate Leaching Procedure (SPLP)
- Whole Rock Analysis (WRA) by ICP-MX
- X-Ray Fluorescence Analysis (XRF)

Attachment 3 also contains a listing of humidity cell and saturated column tests that have been run, and how many dates were sampled for each cell/column test.

ATTACHMENT 1

SUMMARY OF HYDROCHEMISTRY DATABASE SAMPLES

The following abbreviations are used in this attachment to classify general categories of water quality analyses. The specific analytes included are listed below for each category.

“FP” – Field Parameters

Analyte	Analyte
Depth of Water	pH (Field)
Electrical Conductivity (Field)	Specific Conductance (Field)
Flow Rate	Temperature (Field)
Oxidation-Reduction Potential (Field)	Turbidity (Field)

“GC” – General Chemistry

Analyte	Analyte	Analyte	Analyte
Alkalinity (as CaCO ₃)	Chloride	Ion Balance (Laboratory)	Silica
Alkalinity, Phenolphthalein	Color	Nitrate as N	Specific Conductance (Laboratory)
Anions (Laboratory)	Dissolved Organic Carbon	Nitrate+Nitrite as N	Sulfate
Bicarbonate Alkalinity (as CaCO ₃)	Dissolved oxygen	Nitrite as N	Sulfide
Bicarbonate Ion	Fluoride	Ortho-Phosphate	Temperature (Laboratory)
Carbonate Alkalinity (as CaCO ₃)	Hardness (as CaCO ₃)	Orthophosphate as P	Total Dissolved Solids (Calc by Lab)
Cations (Laboratory)	Hydroxide Alkalinity (as CaCO ₃)	pH (Laboratory)	Total Dissolved Solids (Laboratory)
			Total Suspended Solids

“Iso” – Isotopes

Analyte	Analyte
Carbon 14	Delta Oxygen-18 of Sulfate
Delta Carbon-13 of DIC	Delta Sulfur-34
Delta Deuterium	Strontium 87/86
Delta Oxygen-18	Tritium

“Rad” – Radionuclides

Analyte	Analyte	Analyte
Gross Alpha	Radium 228	Uranium 238
Gross Alpha, Adjusted	Radon 222	Uranium Activity (Calc 200.8)
Gross Beta	Uranium 234	Uranium Activity (Calc 907.0)
Radium 226	Uranium 235	

“Met” – Metals

Analyte	Analyte	Analyte	Analyte
Aluminum	Chromium	Lithium	Silicon
Antimony	Cobalt	Magnesium	Silver
Arsenic	Copper	Manganese	Sodium
Barium	Cyanide, Amenable	Mercury	Strontium
Beryllium	Cyanide, Free	Mercury, Low Level	Strontium (by isotope dilution)
Boron	Cyanide, Total	Molybdenum	Thallium
Bromide	Cyanide, weak acid dissociable	Nickel	Uranium
Cadmium	Iron	Potassium	Zinc
Calcium	Lead	Selenium	

“Bio” – Biological

Analyte
E. Coli
Total Coliforms

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11			
Spring - Queen Creek		Boulder Hole (QC 23.6 C)		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met								-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso						-FP -GC -Met			-FP -GC -Met -Iso -Rad			
Groundwater		BTA-01																																
Groundwater		Cottonwood Well																																
Groundwater	Tal Aquifer	CT Well																															-FP -GC -Met -Iso -Rad	
Surface Water - Devil's Canyon		DC 10.9 C		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio																					
Surface Water - Devil's Canyon		DC 13.5 C		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio			-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio								-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso									-FP -GC -Met		
Surface Water - Devil's Canyon		DC 14.7 C					-FP -GC -Met -Bio														-FP -GC -Met -Iso -Rad												-FP -GC -Met	
Surface Water - Devil's Canyon		DC 15.2 C									-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio																					
Surface Water - Devil's Canyon		DC 15.5 C																			-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso										-FP -GC -Met	

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11		
Spring - Devil's Canyon		DC 4.1 E		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio																										
Surface Water - Devil's Canyon		DC 5.5 C				-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio								-FP												
Spring - Devil's Canyon		DC 6.1 E		-Iso				-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio							-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met -Iso					-FP -GC -Met					
Surface Water - Devil's Canyon		DC 6.14 C																			-FP -GC -Met -Iso -Rad -Bio	-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Iso									
Spring - Devil's Canyon		DC 6.6 W (DCT 6.6 W)		-FP -GC -Met -Iso -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio																				
Surface Water - Devil's Canyon		DC 7.1 C		-FP -GC -Met -Rad -Bio		-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio																				
Surface Water - Devil's Canyon		DC 8.1 C																			-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met -Iso							-FP -GC -Met		
Spring - Devil's Canyon		DC 8.2 W		-FP -GC -Met -Iso -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio					-GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Rad	-FP -GC -Met -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso							-FP -GC -Met			
Surface Water - Devil's Canyon		DC 8.8 C		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio								-FP												

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11		
Groundwater	Deep Groundwater System	DHRES-01																			-FP -GC -Met -Iso -Rad												
Groundwater	Deep Groundwater System	DHRES-02																															
Groundwater	Deep Groundwater System	DHRES-04																							-FP -GC -Met -Iso -Rad								
Groundwater	Deep Groundwater System	DHRES-06																													-FP -GC -Met -Iso -Rad		
Groundwater	Deep Groundwater System	DHRES-09																															
Groundwater	Deep Groundwater System	DHRES-11																														-FP -GC -Met -Iso -Rad	
Groundwater	Deep Groundwater System	DHRES-13																															-FP -GC -Met -Iso -Rad
Groundwater		DHRES-15																															
Groundwater - Far West Tailings Facility		FW15-R																															

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11					
Groundwater		Herron Irrigation Well																																		
Spring		Hidden Spring		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio																							
Groundwater	Tal Aquifer	HRES-01					-FP -GC -Met -Iso																													
Groundwater	Tal Aquifer	HRES-02					-FP -GC -Met -Iso																													
Groundwater	Tal Aquifer	HRES-03d					-FP -GC -Met -Iso																													
Groundwater	Tal Aquifer	HRES-04					-GC -Met -Iso								-FP -GC -Met -Iso -Rad -Bio																					
Groundwater	Tal Aquifer	HRES-05					-FP -GC -Met -Iso								-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso																
Groundwater	Tal Aquifer	HRES-06													-FP -GC -Met -Iso -Rad -Bio																					
Groundwater	Tal Aquifer	HRES-07													-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso						-FP -GC -Met -Iso -Rad										

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11		
Groundwater	Tal Aquifer	HRES-08																															
Groundwater	Tal Aquifer	HRES-09																															
Groundwater	Tal Aquifer	HRES-10																															
Groundwater	Tal Aquifer	HRES-11																															
Groundwater	Tal Aquifer	HRES-12																															
Groundwater	Tal Aquifer	HRES-13																															
Groundwater	Tal Aquifer	HRES-14																															
Groundwater		HRES-15																															
Groundwater		HRES-17																															

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11			
Surface Water - Iron Creek		IC 1.0 C																		-FP -GC -Met -Iso -Rad -Bio		-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Met	-FP -GC -Met									
Groundwater		J Tameron Well																																
Groundwater	Completed in alluvium and upper, weathered Tal	Jl Ranch Corral Well														-FP -GC -Met -Rad -Bio			-FP -GC -Met -Iso -Rad	-FP -GC -Met -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Met												
Groundwater	Tal Aquifer	Jl Ranch House Well														-FP -GC -Met -Iso -Rad -Bio																		
Groundwater	Completed in alluvium and upper, weathered Tal	Jl Ranch Middle Well																		-FP -GC -Met -Iso -Rad	-FP -GC -Met -Rad	-FP -GC -Met -Met	-FP -GC -Met -Iso											
Spring		Kane Spring		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio		-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio								-FP -GC -Met -Iso -Rad	-FP -GC -Met -Met	-FP -GC -Met -Met							-FP -GC -Met -Rad	-FP -GC -Met -Met				
Spring		LF 0.2 C																			-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Rad	-FP -GC -Met -Met	-FP -GC -Met -Iso -Rad							-FP -GC -Met -Rad	-FP -GC -Met -Met	-FP -GC -Met -Met
Groundwater		Lucke Eveland Well																																
Surface Water - Mineral Creek		MC 3.3 C (Lower Mineral)																			-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Rad	-FP -GC -Met -Met	-FP -GC -Met -Iso -Rad							-FP -GC -Met -Rad	-FP -GC -Met -Met	-FP -GC -Met -Met

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11				
Spring - Mineral Creek		MC 3.4 W (Wet Leg Spring)																			-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Rad	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso -Rad					-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso -Rad		
Surface Water - Mineral Creek		MC 5.2 C																															-FP -GC -Met -Iso -Rad		
Surface Water - Mineral Creek		MC 6.8 C (Upper Mineral)																																	
Spring - Mineral Creek		MC 8.4 C																				-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Rad	-FP -GC -Met	-FP -GC -Met -Iso -Rad					-FP -GC -Met	-FP -GC -Met	-FP -GC -Met		
Groundwater - West Plant Site		MCC-4																																	
Groundwater - West Plant Site		MCC-9A																																	
Groundwater	Tal Aquifer	MJ-11																				-FP -GC -Met -Iso -Rad -Bio	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Rad	-FP -GC -Met										
Surface Water		Number 9 Wash																				-FP -GC -Met -Iso -Rad -Bio	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met								-FP -GC -Met		
Groundwater		O Castleberry Well																																	

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11			
Surface Water		Oak Flat Wash																		-FP -GC -Met -Iso -Rad		-FP -GC -Met -Iso	-FP -GC -Met -Iso											
Groundwater	Tal Aquifer	Oak Flat Well												-FP -GC -Met																				
Spring		Patterson Spring																																
Spring		Perlite Spring																																
Spring		Pump Station Spring (QC 30.7 C)		-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Rad -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio	-FP -GC -Met -Bio							-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso	-FP -GC -Met -Iso	-FP -GC -Met -Iso									-FP -GC -Met -Iso -Rad		
Surface Water - Queen Creek		QC 19.7 C																			-FP -GC -Met -Iso -Rad -Bio		-FP -GC -Met -Iso											
Surface Water - Queen Creek		QC 21.7 C (Magma Avenue)																			-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met -Iso									-FP -GC -Met	
Spring - Queen Creek		QC 22.6 E (Karst Spring)											-FP -GC -Met -Bio								-FP -GC -Met -Iso -Rad		-FP -GC -Met -Iso											
Surface Water - Queen Creek		QC 27.3 C										-FP -GC -Met -Bio	-FP -GC -Met								-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met -Iso									-FP -GC -Met	

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	2Q86	2Q03	3Q03	4Q03	1Q04	2Q04	3Q04	4Q04	1Q05	2Q05	3Q05	3Q06	4Q06	2Q07	3Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11		
Groundwater		Valles 1 Well																															
Surface Water - Queen Creek		Whitlow Dam Outlet																															

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15		
Groundwater		88 Well																			-FP -GC -Met -Iso -Rad	
Groundwater		A Gomez Well																				-FP -GC -Met -Iso -Rad
Groundwater	Tal Aquifer	A-06				-FP -GC -Met -Iso																
Surface Water - Arnett Creek		AC 4.5 C				-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met							-FP -GC -Met -Iso -Rad
Spring		Bear Tank Canyon Spring							-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met -Iso -Rad											
Spring		Benson Spring									-FP -GC -Met	-FP -GC -Met					-FP -GC -Met			-FP -GC -Met	-FP -GC -Met -Iso -Rad	
Groundwater		Bitter Spring Well																				-FP -GC -Met -Iso -Rad
Spring		Blue Spring				-FP -GC -Met -Iso				-FP												-FP -GC -Met
Spring		Bored Spring				-FP -GC -Met -Iso																

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
Spring - Queen Creek		Boulder Hole (QC 23.6 C)				-FP -GC -Met -Iso														
Groundwater		BTA-01																		-FP -GC -Met -Iso -Rad
Groundwater		Cottonwood Well																		-FP -GC -Met -Iso -Rad
Groundwater	Tal Aquifer	CT Well																		-FP -GC -Met -Iso -Rad
Surface Water - Devil's Canyon		DC 10.9 C				-FP -GC -Met -Iso				-FP	-FP -GC			-Met						-FP -GC -Met
Surface Water - Devil's Canyon		DC 13.5 C				-FP -GC -Met -Iso				-FP										
Surface Water - Devil's Canyon		DC 14.7 C											-FP -GC -Met							
Surface Water - Devil's Canyon		DC 15.2 C																		
Surface Water - Devil's Canyon		DC 15.5 C	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met													

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15	
Spring - Devil's Canyon		DC 4.1 E												-FP -GC -Met		-FP -GC -Met					-FP -GC -Met
Surface Water - Devil's Canyon		DC 5.5 C	-FP -GC -Met		-FP -GC -Met					-FP	-FP -GC										-FP -GC -Met
Spring - Devil's Canyon		DC 6.1 E					-FP -GC -Met														-FP -GC -Met
Surface Water - Devil's Canyon		DC 6.14 C		-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso		-FP -GC -Met	-FP -GC -Met	-FP -GC -Met											-FP -GC -Met
Spring - Devil's Canyon		DC 6.6 W (DCT 6.6 W)				-FP -GC -Met -Iso															-FP -GC -Met
Surface Water - Devil's Canyon		DC 7.1 C		-FP -GC -Met		-FP -GC -Met -Iso				-FP -GC	-FP										-FP -GC -Met
Surface Water - Devil's Canyon		DC 8.1 C	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met														-FP -GC -Met
Spring - Devil's Canyon		DC 8.2 W				-FP -GC -Met -Iso				-FP -GC	-FP										-FP -GC -Met
Surface Water - Devil's Canyon		DC 8.8 C				-FP -GC -Met -Iso				-FP -GC	-FP -GC										-FP -GC -Met

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
Groundwater	Deep Groundwater System	DHRES-01																		
Groundwater	Deep Groundwater System	DHRES-02	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad																
Groundwater	Deep Groundwater System	DHRES-04																		
Groundwater	Deep Groundwater System	DHRES-06																		
Groundwater	Deep Groundwater System	DHRES-09	-FP -GC -Met -Iso -Rad				-FP -GC -Met -Iso -Rad													
Groundwater	Deep Groundwater System	DHRES-11					-FP -GC -Met -Iso -Rad													
Groundwater	Deep Groundwater System	DHRES-13					-FP -GC -Met -Iso -Rad													
Groundwater		DHRES-15													-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad			
Groundwater - Far West Tailings Facility		FW15-R				-FP -GC -Met														

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
Groundwater - Far West Tailings Facility		FW3-R				-FP -GC -Met														
Groundwater - Far West Tailings Facility		FW4-R				-FP -GC -Met														
Groundwater - Far West Tailings Facility		FW7-R				-FP -GC -Met														
Groundwater - Far West Tailings Facility		FW9-S				-FP -GC -Met														
Groundwater		G Martinez Well																		-FP -GC -Met -Iso -Rad
Spring		Government Springs	-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC									-FP -GC -Met -Iso -Rad
Surface Water - Hackberry Creek		H 0.1 C	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met													-FP -GC -Met
Groundwater	Completion unknown but likely completed in alluvium and upper, weathered	Hackberry Windmill Well				-FP -GC -Met -Iso														-FP -GC -Met
Spring		Happy Camp Spring							-FP -GC -Met -Iso -Rad		-FP -GC -Met		-FP -GC -Met							

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15		
Groundwater		Herron Irrigation Well																			-FP -GC -Met -Iso -Rad	
Spring		Hidden Spring																				-FP -GC -Met
Groundwater	Tal Aquifer	HRES-01																				
Groundwater	Tal Aquifer	HRES-02				-FP -GC -Met -Iso																
Groundwater	Tal Aquifer	HRES-03d																				
Groundwater	Tal Aquifer	HRES-04				-FP -GC -Met -Iso																
Groundwater	Tal Aquifer	HRES-05				-FP -GC -Met -Iso																
Groundwater	Tal Aquifer	HRES-06				-FP -GC -Met -Iso																
Groundwater	Tal Aquifer	HRES-07				-FP -GC -Met -Iso -Rad																

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15	
Groundwater	Tal Aquifer	HRES-08	-FP -GC -Met -Iso -Rad			-FP -GC -Met -Iso															
Groundwater	Tal Aquifer	HRES-09	-FP -GC -Met -Iso -Rad												-FP -GC -Met						
Groundwater	Tal Aquifer	HRES-10				-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad												-FP -GC -Met -Iso -Rad	
Groundwater	Tal Aquifer	HRES-11				-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad													
Groundwater	Tal Aquifer	HRES-12	-FP -GC -Met -Iso -Rad			-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad													
Groundwater	Tal Aquifer	HRES-13				-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad													
Groundwater	Tal Aquifer	HRES-14	-FP -GC -Met -Iso -Rad			-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad													
Groundwater		HRES-15				-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad														
Groundwater		HRES-17				-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad													

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
Surface Water - Iron Creek		IC 1.0 C		-FP -GC -Met	-FP -GC -Met				-FP -GC -Met											
Groundwater		J Tameron Well																		-FP -GC -Met -Iso -Rad
Groundwater	Completed in alluvium and upper, weathered Tal	Jl Ranch Corral Well				-FP -GC -Met -Iso														
Groundwater	Tal Aquifer	Jl Ranch House Well																		
Groundwater	Completed in alluvium and upper, weathered Tal	Jl Ranch Middle Well				-FP -GC -Met -Iso														-FP -GC -Met
Spring		Kane Spring				-FP -GC -Met -Iso														-FP -GC -Met
Spring		LF 0.2 C	-FP -GC -Met			-FP -GC -Met -Iso														
Groundwater		Lucke Eveland Well																		-FP -GC -Met -Iso -Rad
Surface Water - Mineral Creek		MC 3.3 C (Lower Mineral)	-FP -GC -Met			-FP -GC -Met -Iso			-FP											-FP -GC -Met -Iso -Rad

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15	
Spring - Mineral Creek		MC 3.4 W (Wet Leg Spring)	-FP -GC -Met			-FP -GC -Met -Iso					-FP -GC									-FP -GC -Met -Iso -Rad	
Surface Water - Mineral Creek		MC 5.2 C	-FP -GC -Met -Iso -Rad	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met									-FP -GC -Met -Iso -Rad	
Surface Water - Mineral Creek		MC 6.8 C (Upper Mineral)																			-FP -GC -Met -Iso -Rad
Spring - Mineral Creek		MC 8.4 C		-FP -GC -Met		-FP -GC -Met -Iso															
Groundwater - West Plant Site		MCC-4																			-FP -Iso
Groundwater - West Plant Site		MCC-9A																			-FP -Iso
Groundwater	Tal Aquifer	MJ-11				-FP -GC -Met -Iso															
Surface Water		Number 9 Wash	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso															-FP -GC -Met
Groundwater		O Castleberry Well																			-FP -GC -Met -Iso -Rad

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15
Surface Water		Oak Flat Wash	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met		-FP -GC -Met	-FP -GC -Met	-FP -GC -Met											
Groundwater	Tal Aquifer	Oak Flat Well																		
Spring		Patterson Spring																		
Spring		Perlite Spring								-FP -GC -Met										
Spring		Pump Station Spring (QC 30.7 C)				-FP -GC -Met -Iso														
Surface Water - Queen Creek		QC 19.7 C		-FP -GC -Met				-FP -GC -Met	-FP -GC -Met				-FP -GC -Met		-FP -GC -Met	-FP -GC -Met				
Surface Water - Queen Creek		QC 21.7 C (Magma Avenue)	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met													
Spring - Queen Creek		QC 22.6 E (Karst Spring)			-FP -GC -Met			-FP -GC -Met	-FP -GC -Met											
Surface Water - Queen Creek		QC 27.3 C	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso														

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

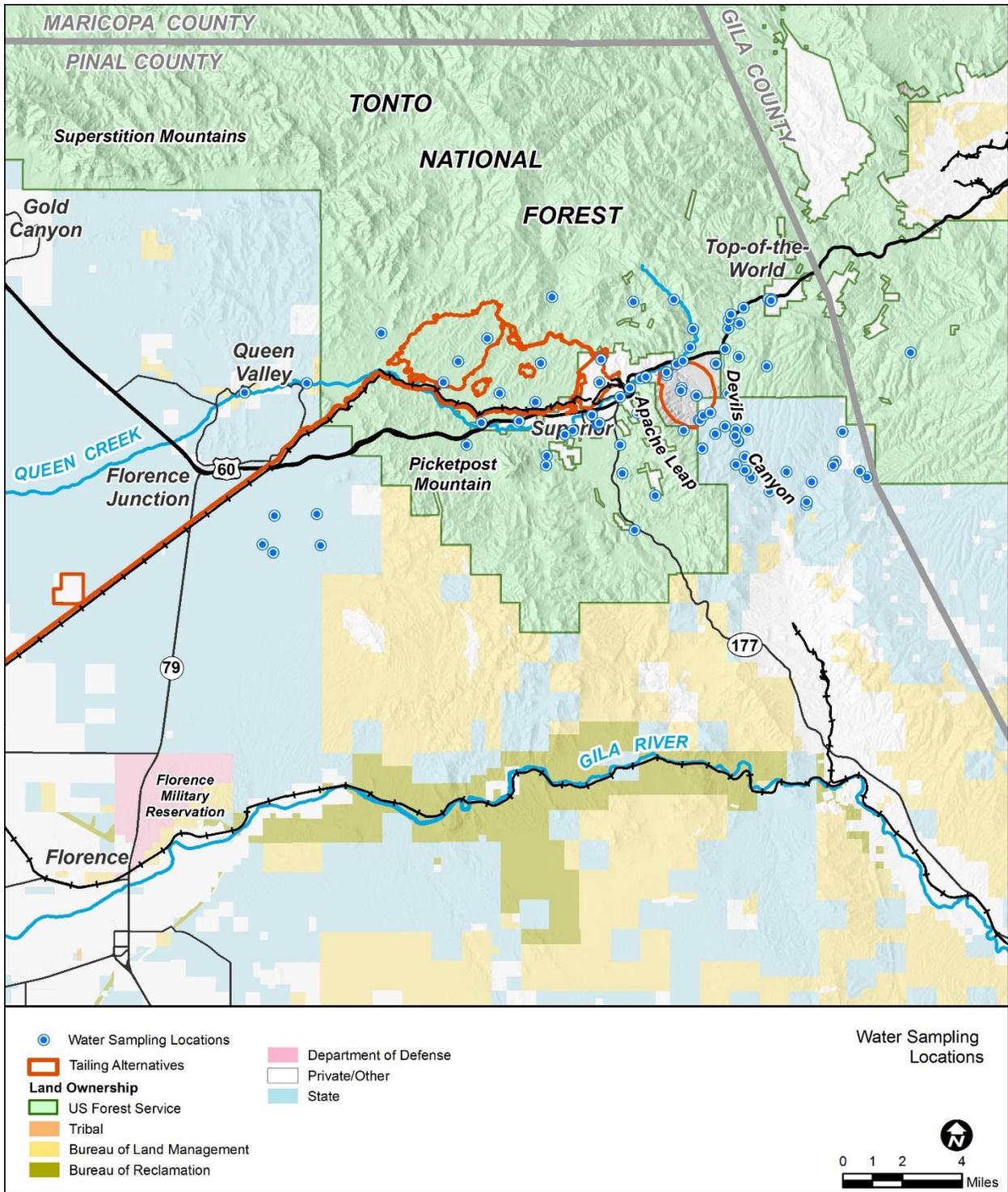
Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15		
Groundwater	Tal Aquifer	QV-5																			-FP -GC -Met -Iso -Rad	
Groundwater	Deep Groundwater System	RES-09																				
Groundwater		Rice Water Well																				-FP -GC -Met -Iso -Rad
Surface Water - Rancho Rio Creek		RR 1.5 C		-FP -GC -Met	-FP -GC -Met	-FP -GC -Met -Iso	-FP -GC -Met			-FP				-Met								
Groundwater	Deep Groundwater System	Shaft No. 9 Discharge	-FP -GC -Met -Iso -Rad	-FP -GC -Met -Iso -Rad																		
Groundwater		Smith Well																				-FP -GC -Met -Iso -Rad
Surface Water - Stormwater Runoff (Shaft 9 Wash)		SS-1																				
Surface Water - Telegraph Canyon		TC 0.5 C			-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met	-FP -GC -Met							-FP -GC -Met
Surface Water - Queen Creek		Upper Carbonate (QC 23.9 C)																				-FP -GC -Met

Summary of Available Hydrochemistry Samples - Surface Water and Groundwater
Resolution Copper Project and Land Exchange EIS

Water Type	RCM Characterization	Station	3Q11	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14	1Q15	2Q15	3Q15	4Q15	
Groundwater		Valles 1 Well																			-FP -GC -Met -Iso -Rad
Surface Water - Queen Creek		Whitlow Dam Outlet															-FP -GC -Met	-FP -GC -Met	-FP -GC -Met		-FP -GC -Met -Iso -Rad

ATTACHMENT 2

GROUNDWATER AND SURFACE WATER SAMPLING LOCATIONS



ATTACHMENT 3

SUMMARY OF BLOCK-CAVE GEOCHEMISTRY DATABASE SAMPLES

**Summary of Available Geochemistry Samples by Lithology/Alteration Type
Resolution Copper Project and Land Exchange EIS**

Lithology	Alteration	Number of Individual ABA Samples	Number of ABA Records in Database	Number of Individual NAG Samples	Number of NAG Records in Database	Number of Individual SPLP Samples	Number of SPLP Records in Database	Number of Individual WRA Samples	Number of WRA Records in Database	Number of Individual XRF Samples	Number of XRF Records in Database
And	POT	1	7	1	34	1	40	1	51	1	18
BRECCIA	AA	1	7	1	34	1	40	1	42	1	18
BRECCIA	PHY	2	14	2	68	2	80	1	42	2	36
Diab	PHY	2	14	2	68	2	80	2	84	2	36
Diab	POT	18	126	18	612	18	720	18	827	18	324
Diab	PRO	1	7	1	34	1	40	1	51	1	18
Dm	HFLRET	6	42	6	204	6	240	6	306	6	108
Dm	SKRET	15	105	15	510	16	640	16	804	16	288
FAULT	ARG	1	7	1	34	1	40	1	42	1	18
FAULT	POT	1	7	1	34	1	40	1	42	1	18
Kvs	AA	11	77	10	340	11	440	11	498	11	198
Kvs	PHY	65	455	61	2,074	65	2,600	65	3,047	65	1,170
Kvs	POT	3	21	3	102	3	120	3	153	3	54
Kvs	PRO	14	98	13	442	14	560	14	649	14	252
Kvs	SA	7	49	7	238	7	280	7	490	7	126
QEP	AA	3	21	3	102	3	120	3	126	3	54
QEP	PHY	32	224	31	1,054	32	1,280	30	1,312	32	576
QEP	POT	4	28	4	136	4	160	4	184	4	72
QEP	SIL	1	7	1	34	1	40	1	51	1	18
Qzite	AA	4	28	4	136	4	160	3	150	4	72
Qzite	PHY	10	70	10	340	10	400	10	446	10	180
Qzite	POT	2	14	2	68	2	80	2	101	2	36
Qzite	ZEO	1	7	1	34	1	40	1	42	1	18
Tal	UNALT	7	49	6	204	7	280	7	490	7	126
Tw	UNALT	11	77	10	340	11	440	11	658	11	198

**Summary of Available Humidity Cell/Saturated Column Tests
Resolution Copper Project and Land Exchange EIS**

Sample	Number of Individual Dates with Results for Humidity Cell Tests	Number or Individual Dates with Results for Saturated Column Tests
RES-001C TEST 2	53	
RES-001C TEST 1	12	
RES-001C TEST 1S	15	
RES-001C TEST 3	26	
RES-001C TEST 4	11	
RES-001C TEST 4S	7	
RES-001C TEST 5	18	
RES-001C TEST 6	53	
RES-001C TEST 7	26	
RES-001C TEST 8	26	
RES-001C TEST SC2	12	12
RES-002A TEST 10	11	
RES-002A TEST 10S	7	
RES-002A TEST 11	26	12
RES-002A TEST 12	75	12
RES-002A TEST 13	26	
RES-002A TEST 14	53	11
RES-002A TEST 9	11	
RES-002A TEST 9S	7	
RES-002A TEST SC11	12	
RES-002A TEST SC12	12	
RES-002A TEST SC14	11	
RES-005I TEST 22	11	
RES-005I TEST 17S	7	
RES-005I TEST 18	11	
RES-005I TEST 18S	7	
RES-005I TEST 19	11	
RES-005I TEST 19S	7	
RES-005I TEST 20	10	
RES-005I TEST 20S	15	
RES-005I TEST 21	53	12
RES-005I TEST 22S	15	
RES-005I TEST 23	53	
RES-005I TEST 24	26	
RES-005I TEST 25	12	
RES-005I TEST 25S	15	
RES-005I TEST SC21	12	
RES-005J TEST 26	75	
RES-006D TEST 27	26	
RES-006D TEST SC28	12	12
RES-008A TEST SC34	12	12
RES-009 TEST SC38	12	12
RES-009 TEST SC39		9
RES-009E TEST SC44	12	12
RES-009E TEST SC49	12	12
RES-009E TEST SC50	12	12
RES-009E TEST SC52	12	12
RES-009E TEST SC54	12	12