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Memorandum

Prepared for: File
Project Title: Florence Copper
Project No.: 149050

Subject: Florence Copper Project, Temporary APP and UIC Permits, Ambient Event 2
Date: May 11, 208
To: Ian Ream
From: Barb Sylvester

Groundwater sampling at the Florence Copper Project site took place August 15 through August 17, 2017. Ten Point-of-Compliance (POC) and Supplemental wells were sampled as part of the ambient monitoring program for the Temporary APP and UIC permits. Two of the twelve new APP/UIC wells (MW-01-O, MW-01-LBF) had not been installed at this time. Eleven total samples were collected, including one duplicate sample. Table 1 summarizes the sampling activities.

Ambient samples were to be analyzed for metals, inorganics, organics, and radionuclides (Table 2). Samples for metal analysis were filtered in the field.

Table 1. Summary of August 2017 Ambient Event

Date	Sample Identification	Pump Style	Analyses
August 15, 2017	M54-LBF	Low-Flow	Level II
	M54-O	Low-Flow	Level II
	M58-O	Low-Flow	Level II
August 16, 2017	M55-UBF	Low-Flow	Level II
	M56-LBF	Low-Flow	Level II
	M60-O	Low-Flow	Level II
	M61-LFB	Low-Flow	Level II
August 17, 2017	M52-UBF M63.0 (Duplicate)	Low-Flow	Level II
	M57-O	Low-Flow	Level II

Table 1. Summary of August 2017 Ambient Event			
Date	Sample Identification	Pump Style	Analyses
	M59-O	Low-Flow	Level II
	MW-01-LFB		Not Constructed
	MW-01-O		Not Constructed

Table 2. Analytical Parameters		
Analysis	Method	Preservative
Inorganic Common Ions		
pH (lab)	SM 4500H+	None
Electroconductivity (EC) (lab)	SM 2510B	None
Bicarbonate Alkalinity	SM 2320B	None
Carbonate Alkalinity	SM 2320B	None
Hydroxide Alkalinity	SM 2320B	None
Total Alkalinity	SM 2320B	None
Chloride	EPA 300.0	None
Fluoride (Level I)	EPA 300.0	None
Nitrate as N	EPA 300.0	None
Nitrite as N	EPA 300.0	None
Sulfate (Level I)	EPA 300.0	None
Total Dissolved Solids (Level I)	SM 2540C	None
Cation/Anion Balance	Calculation	-
Cyanide	EPA 335.4	NaOH
Formation-Related Radiochemicals		
Gross Alpha	600/00-02	None
Gross Beta	900.0	None
Radium 226	903/GammaRay HPGE	None
Radium 228	904/GammaRay HPGE	None
Total Uranium Isotopes (if G. Alpha >12.0)	ASTM 6239	None
Radon 222	7500-Rn	None (Voas)
Total Uranium (unfiltered total as mg/L)	EPA 200.8	HNO3
Process-Related Organics		
Extractable Fuel Hydrocarbons (Diesel Range Organics)	EPA 8015D	None
Benzene	EPA 8260B	HCl Voas
Ethylbenzene	EPA 8260B	HCl Voas
Toluene	EPA 8260B	HCl Voas
Total Xylene	EPA 8260B	HCl Voas

Table 2. Analytical Parameters		
Analysis	Method	Preservative
Carbon Disulfide	EPA 8260B	HCl Voas
Napthalene	EPA 8260B	HCl Voas
Octane	EPA 8260B	HCl Voas
Trace Metals and Cations (Filtered-Dissolved)		
Aluminum	EPA 200.8	HNO3
Antimony	EPA 200.8	HNO3
Arsenic	EPA 200.8	HNO3
Barium	EPA 200.8	HNO3
Beryllium	EPA 200.8	HNO3
Calcium	EPA 200.7	HNO3
Cadmium	EPA 200.8	HNO3
Chromium	EPA 200.8	HNO3
Cobalt	EPA 200.8	HNO3
Copper	EPA 200.8	HNO3
Iron	EPA 200.7	HNO3
Lead	EPA 200.8	HNO3
Magnesium (Level I)	EPA 200.7	HNO3
Manganese	EPA 200.8	HNO3
Mercury	EPA 245.1	HNO3
Nickel	EPA 200.8	HNO3
Potassium	EPA 200.7	HNO3
Selenium	EPA 200.8	HNO3
Sodium	EPA 200.7	HNO3
Thallium	EPA 200.8	HNO3
Zinc	EPA 200.8	HNO3

Observations/Problems

1. Turbidity measurements above 5 NTUs were observed in M55-UBF and M56-LBF.

Table 3. Summary of Water Levels						
Sample Event:	Ambient Event 2				Measured By:	M. Orcutt
Well ID	Sample Date	Depth to Water (feet bls)	Description of Measuring Point	Elevation of Measuring Point (feet amsl)	Water Level Elevation (feet amsl)	Comments
M52-UBF	8/17/2017	232.29	TOC	1485.04	1252.75	
M54-LBF	8/15/2017	236.84	TOC	1481.89	1245.05	
M54-O	8/15/2017	238.44	TOC	1482.40	1243.96	
M55-UBF	8/16/2017	231.68	TOC	1479.21	1247.53	
M56-LBF	8/16/2017	233.35	TOC	1478.69	1245.34	
M57-O	8/17/2017	233.55	TOC	1478.75	1245.20	
M58-O	8/15/2017	236.96	TOC	1481.16	1244.20	
M59-O	8/17/2017	235.52	TOC	1480.26	1244.74	
M60-O	8/16/2017	233.08	TOC	1477.45	1244.37	
M61-LBF	8/16/2017	239.13	TOC	1480.80	1241.67	
MW-01-LBF	Not Constructed					
MW-01-O	Not Constructed					

amsl = Above Mean Sea Level

TOC = Top of Casing

TOM = Top of Monument

NM = Not Measured

Table 4. Summary of Field Parameters						
Sample Event:	Ambient Event 2		Measured By:	M. Orcutt		
Well ID	Sample Date	Temperature (°C)	pH	Conductivity (µmhos/cm)	Turbidity (NTU)	Comments
M52-UBF	8/17/2017	24.9	7.37	1,454	0.89	
M54-LBF	8/15/2017	24.5	7.42	1,507	0.12	
M54-O	8/15/2017	24.1	8.08	749	0.17	
M55-UBF	8/16/2017	24.1	7.23	1,727	9.69	
M56-LBF	8/16/2017	25.5	7.43	1,493	20.4	
M57-O	8/17/2017	23.4	7.90	784	2.00	
M58-O	8/15/2017	25.0	7.76	1,293	0.74	
M59-O	8/17/2017	24.3	7.95	838	2.34	
M60-O	8/16/2017	23.7	7.89	928	1.49	
M61-LBF	8/16/2017	27.5	8.33	797	1.25	
MW-01-LBF	Not Constructed					
MW-01-O	Not Constructed					

°C = degrees Celsius

°F = degrees Fahrenheit

µmhos/cm = Micromhos per Centimeter

NTU = Nephlometric Tubidity Units

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SITE VISITATION

JOB NAME: Florence Copper **JOB NUMBER:** 150342

PERSONNEL: M. Green II **DATE:** 8-15-2017

COMMENTS:

0730 On site and signed in at front office
Spoke with Greg. Greg showed me to Nitrogen
Staging area in the Eastern Warehouse,
Picked up QED equipment and sample bottles
Warmed up BC's WQ Meters for APP Calibration
* Nitrogen delivery *
0912 Sampled MS4-0
1055 Sampled MS4-CBF
1150 Mob for short lunch and pick up Nitrogen + Ice.
Return and micropurged MS8-0

1345 Sampled MS8-0
1430 Ian to mob to lab @ 1530 so too close.
Mob back and return QED equipment
and sign over COC/Samples to Ian
for Turner labs Tucson, AZ.
1255
~~1255~~ Sign out, off site.

Brown AND Caldwell

SITE VISITATION

JOB NAME: Florence Copper **JOB NUMBER:** 150342

PERSONNEL: M. Oratt **DATE:** 8-16-2017

COMMENTS:

0700 On site and signed in at front office. Picked up sample bottles and QED equipment.
Mob to wells and warmed up BC's WQ meters for APP calibration

0835 Sampled M60-0
10:07 Sampled M55-UBF
Mob back to pick up more sample cont.

1215 Sampled M61-LBF
1315 Mob to next well

1410 Sampled M56-LBF
1500 Mob to shop and returned QED equipment and handed over COC/samples to Jan for Turner labs Tucson, Az

1515 Signed out, offsite

E.J
8-16-17

Brown AND Caldwell

SITE VISITATION

JOB NAME: Florence Copper **JOB NUMBER:** 150342

PERSONNEL: M. Orcutt **DATE:** 8-17-2017

COMMENTS:

0730 On site, signed in at front office and pkg QED equipment, loaded up Nitrogen and sample bottles. Spoke w/ Greg and mob to Ambient wells and warmed up BC's WQ meters for AFP Calib.

0912 Sampled MST-0
1102 Sampled MS8-0

1145 Short lunch then return to last well MS2 w/ Dup

1310 Sampled MS2-UBF w/ Dup
1325 M63.0 Dup at MS2-UBF

1430 Mob back to shop and return QED equip. and hand over samples/COC to Ian for Turner Labs, Tucson AZ.
Rad Chem by M. Orcutt (BC) to Rad Safety Labs Chandler, AZ.

1550 Signed out

8/17/17
Ord

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M52-UBF

SAMPLED BY: M. Orcutt

DATE : 8/17/2017

WELL INFORMATION

TD Casing: 275 feet

Static Depth to Water: 232.29 feet

System Purge before Params 2.6 liters

Time Purge Start: 1232 hours

Time Sample Start: 1309 hours

Time Purged: 37 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 237.5'
1244	24.7	7.34	1456	6.20	2.49	0.25	3.0	0.01	clear, NO ODORS
1248	24.8	7.34	1457	6.59	0.95	0.25	4.0	0.00	
1252	24.8	7.36	1460	6.32	1.03	0.25	5.0	0.00	
1256	24.8	7.37	1458	6.40	1.04	0.25	6.0	0.00	
1300	24.8	7.37	1458	6.00	1.00	0.25	7.0	0.00	Per Ian purge xtra
1304	24.7	7.37	1454	5.97	0.85	0.25	8.0	↓	from new wells.
1309	24.9	7.37	1454	5.92	0.89	0.25	9.0		
									Lowered flow for VOC's

Sample ID: M52-UBF Sample Time, 13:10 Duplicate (ID = M63.0, Time 13:25) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M54-LBF

SAMPLED BY: M. Orcutt

DATE: 8/15/2017

WELL INFORMATION

TD Casing: 630 feet

Static Depth to Water: 236.84 feet

System Purge before Params 3.9 liters

Time Purge Start: 10:13 hours

Time Sample Start: 10:55 hours

Time Purged: 42 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 470'
1029	24.2	7.37	1509	4.75	0.31	0.25	4.0	0.00	Clear, NO odors
1033	24.2	7.39	1506	4.87	0.42	0.25	5.0	0.00	
1037	24.4	7.40	1507	5.08	0.19	0.25	6.0	0.00	
1041	24.5	7.41	1506	5.15	0.36	0.25	7.0	0.00	Per Jan purge
1045	24.3	7.40	1506	5.19	0.24	0.25	8.0	↓	additional Volume
1049	24.5	7.43	1508	5.25	0.18	0.25	9.0		
1053	24.5	7.42	1507	4.95	0.12	0.25	10.0		
									Lowered flow for
									VOC's

Sample ID: M54-LBF Sample Time, 1055 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M54-O

SAMPLED BY: M. Orcutt

DATE : 8 / 15 /2017

WELL INFORMATION

TD Casing: 1,200 feet

Static Depth to Water: 238.44 feet

System Purge before Params 9.2 liters

Time Purge Start: 0811 hours

Time Sample Start: 0912 hours

Time Purged: 61 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 1000'
0845	23.9	8.13	746	0.29	0.81	0.27	9.5	0.00	Clear, no odors
0850	24.0	8.11	747	0.27	0.91	0.20	10.5	0.01	
0855	24.0	8.10	747	0.27	0.19	0.20	11.5	0.01	
0859	23.9	8.09	748	0.31	0.16	0.25	12.5	0.01	Per Ian purge additional
0903	24.0	8.08	749	0.34	0.24	0.25	13.5	0.01	Volume
0907	23.9	8.08	748	0.38	0.20	0.25	14.5	0.01	
0911	24.1	8.08	749	0.40	0.17	0.25	15.5	0.02	
									Layered flow
									for VOC's
									2, 4, 6, 8

Sample ID: M54-O Sample Time, 0912 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M55-UBF

SAMPLED BY: M. Orcutt

DATE : 8/16/2017

WELL INFORMATION

TD Casing: 260 feet

Static Depth to Water: 231.68 feet

System Purge before Params 2.8 liters

Time Purge Start: 0928 hours

Time Sample Start: 1007 hours

Time Purged: 39 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 250'
0941	24.3	7.21	1722	3.32	19.3	0.23	3.0	0.00	LT. Cldy, NO ODORS
0945	24.2	7.21	1725	3.57	14.5	0.25 ~~0.29~~	4.0	0.00	
0949	24.1	7.21	1724	3.81	11.3	0.25	5.0	0.00	
0953	24.0	7.22	1724	3.77	11.2	0.25	6.0	0.00	
0957	23.9	7.22	1725	3.78	10.9	0.25	7.0	0.00	
1001	24.1	7.22	1729	3.70	10.8	0.25	8.0	0.00	
1005	24.1	7.23	1727	3.69	9.69	0.25	9.0	0.00	

Sample ID: M55-UBF Sample Time, 10:07 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M56-LBF

SAMPLED BY: M. Orcutt

DATE : 8/16/2017

WELL INFORMATION

TD Casing: 340 feet

Static Depth to Water: 233.35 feet

System Purge before Params 2.4 liters

Time Purge Start: 1327 hours

Time Sample Start: 1410 hours

Time Purged: 43 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments LT. cldy to QED Bladder Pump Intake 330'
1337	25.7	7.54	1485	1.45	13.3	2.5	0.25	0.25	Clear, NO ODORS
1341	25.7	7.43	1490	2.10	20.1	3.5	0.25	0.28	
1345	25.8	7.42	1495	2.30	25.0	4.5	0.25	0.30	
1349	26.2	7.42	1492	2.40	23.5	5.5	0.25	0.29	
1354	26.8	7.42	1493	2.30	21.6	6.5	0.20	0.28	Per Ian purge x-tra
1400	26.2	7.41	1495	2.60	23.6	7.5	~~0.30~~ 0.16	0.15	Volume on new wells
1405	25.5	7.43	1496	2.58	22.7	8.5	0.20	0.25	Lowered flow for
1409	25.5	7.43	1493	2.56	20.4	9.5	0.25	0.25	VOC's
									Switch Nitro cyl
									1358

Sample ID: M56-LFB Sample Time, 1410 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M57-O

SAMPLED BY: M. Orcutt

DATE : 8 /17 /2017

WELL INFORMATION

TD Casing: 1,200 feet

Static Depth to Water: 233.55 feet

System Purge before Params 8.7 liters

Time Purge Start: 0812 hours

Time Sample Start: 0912 hours

Time Purged: 60 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 950'
0846	23.4	7.64	809	1.27	8.29	0.26	9.0	0.00	Clear No odors
0850	23.4	7.76	794	1.24	4.31	0.25	10.0	0.00	
0854	23.4	7.84	787	1.23	2.35	0.25	11.0	0.00	
0858	23.4	7.86	786	1.22	3.40	0.25	12.0	0.00	
0902	23.4	7.88	784	1.26	1.97	0.25	13.0	0.00	
0906	23.4	7.90	784	1.23	1.14	0.25	14.0	↓	Per Ian purge xtra
0910	23.4	7.90	784	1.22	2.00	0.25	15.0	↓	Volume on new well
									Lowered flow for VOC's
									2, 4, 6, 8

Sample ID: M57-O Sample Time, ~~0908~~ 0912 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M58-O

SAMPLED BY: M. Orcutt

DATE : 8 /15 /2017

WELL INFORMATION

TD Casing: 1,200 feet

Static Depth to Water: 236.96 feet

System Purge before Params 8.7 liters

Time Purge Start: 12:45 hours

Time Sample Start: 13:45 hours

Time Purged: 60 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 950'
1318	24.8	7.59	1187	1.05	1.55	0.27	9.0	0.04	Clear, NO ODORS
1322	25.1	7.67	1234	0.72	1.25	0.25	10.0	0.04	
1326	24.9	7.72	1263	0.68	1.15	0.25	11.0	0.04	
1330	25.0	7.72	1284	0.70	1.08	0.25	12.0	0.04	Per Tom purge X-Tra
1334	24.8	7.73	1287	0.75	1.08	0.25	13.0	0.04	Vol on new wells
1338	25.1	7.74	1288	0.81	0.98	0.25	14.0	0.04	
1342	25.0	7.76	1293	0.82	0.74	0.25	15.0	0.04	
									Lowered flow for
									VOC's
									2,4,6,8

Sample ID: M58-O Sample Time, 1345 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M59-O

SAMPLED BY: M. Orcutt

DATE : 8/17/2017

WELL INFORMATION

TD Casing: 1,200 feet

Static Depth to Water: 235.52 feet

System Purge before Params 8.7 liters

Time Purge Start: 10:02 hours

Time Sample Start: 1101 hours

Time Purged: 59 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 950'
1036	24.4	7.73	822	0.73	3.24	0.26	9.0	0.03	Clear, NO ODORS
1040	24.2	7.83	829	0.56	3.34	0.25	10.0	0.03	
1044	24.3	7.92	833	0.54	3.14	0.25	11.0	0.03	
1048	24.3	7.93	833	0.41	2.57	0.25	12.0	0.03	
1052	24.4	7.96	835	0.43	2.39	0.25	13.0	0.03	Per Ian purge XTra
1056	24.4	7.96	836	0.43	2.22	0.25	14.0	0.03	on new wells.
1100	24.3	7.95	838	0.47	2.34	0.25	15.0	0.03	
									Lowered flow for
									VOC's
									2, 4, 6, 8

Sample ID: M59-O Sample Time, 1102 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M60-O

SAMPLED BY: M. Orcutt

DATE : 8/16/2017

WELL INFORMATION

TD Casing: 1,200 feet

Static Depth to Water: 233.08 feet

System Purge before Params 8.7 liters

Time Purge Start: 0741 hours

Time Sample Start: 935 hours

Time Purged: 54 minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 950'
0811	23.5	7.70	963	1.52	4.30	0.30	9.0	0.00	clear, No ODORS
0815	23.4	7.79	945	1.35	4.38	0.25	10.0	0.00	
0819	23.5	7.83	934	2.50	3.95	0.25	11.0	0.00	
0822	23.5	7.85	931	2.15	3.05	0.33	12.0	0.00	Per Jan purge X-Tra
0825	23.6	7.87	930	1.55	3.24	0.33	13.0	0.00	Volume on new wells
0829	23.6	7.87	931	1.27	1.71	0.25	14.0	0.00	
0833	23.7	7.89	928	1.26	1.49	0.25	15.0	0.00	
									Lowered flow for VOCs
		0835							2, 4, 6, 8

Sample ID: M60-O Sample Time, 0835 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: M61-LBF

SAMPLED BY: M. Orcutt

DATE : 8/16/2017

WELL INFORMATION

TD Casing: 635 feet

Static Depth to Water: 239.13 feet

System Purge before Params 4.5 liters

Time Purge Start: 11:20 hours

Time Sample Start: 1215 hours

Time Purged: 55 ~~55~~ minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 535'
11:38	25.1	8.30	790	0.41	2.35	0.25	4.5	0.85	clear, no odors
11:42	25.0	8.31	794	0.36	2.17	0.25	5.5	0.85	slowed flow
11:47	26.1	8.33	794	0.34	1.43	0.20	6.5	0.92	slowed flow
11:53	27.1	8.28	796	0.33	1.54	0.16	7.5	0.92	Per Ian purge x-tra
12:00	27.7	8.31	796	0.30	1.26	0.14	8.5	0.87	Volume on new wells
12:07	27.7	8.31	796	0.28	1.34	0.14	9.5	0.85	
12:14	27.5	8.33	797	0.27	1.25	0.14	10.5	0.85	
									Lowered flow for VOC's

Sample ID: M61-LFB Sample Time, 1215 Duplicate (ID = N/A, Time N/A) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: MW-01-LBF

SAMPLED BY: M. Orcutt

DATE : 7 / 16/2017

WELL INFORMATION

TD Casing: 630 feet

Static Depth to Water: feet

System Purge before Params 5.0 liters

Time Purge Start: hours

Time Sample Start: hours

Time Purged: minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 580'
									Not yet constructed

Sample ID: MW-01-LBF Sample Time, _____ Duplicate (ID = _____, Time _____) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

GROUNDWATER SAMPLING FIELD DATA

PROJECT: Florence Copper

WELL ID: MW-01-O

SAMPLED BY: M. Orcutt

DATE : 8/16/2017

WELL INFORMATION

TD Casing: 1,200 feet

Static Depth to Water: feet

System Purge before Params 9.2 liters

Time Purge Start: hours

Time Sample Start: hours

Time Purged: minutes

Time	Temperature (°C) +/- 3%	pH +/- 0.1	EC (umhos/cm) +/- 3%	DO (mg/L) 10% or <.5	Turbidity (NTU) 10% or <5	Pump Rate (L/min) <0.5L/min	Purge Volume (L)	Pulldown DTW (feet) <0.5 ft	Comments QED Bladder Pump Intake 1000'
									Not yet constructed

Sample ID: MW-01-O Sample Time, _____ Duplicate (ID = _____, Time _____) Analyses Requested: Level II – Metals, Inorgs, Radios, BTEX, TPH-D

pH and TEMP CALIBRATION RECORD

Florence Copper Project

Instrument: BC's YSI 556
SN: 15A102406
Probe SN: 600336

APP Sampling Event
Month: Aug
Year: 2017

Calibration Procedures:

-pH calibration/measurement should be performed in accordance with protocols set forth by ***Standard Methods for the Examination of Water and Wastewater – 4500 H pH.*** Gentle agitation or stirring of sample should maintained during pH calibration and sample analysis.

-Temperature measurement should be performed in accordance with protocols set forth by ***Standard Methods for the Examination of Water and Wastewater – 2550 Temperature*** using an NIST traceable thermometer.

Calibration Standards Used:

Standard	Manufacturer	Lot#	Received	Expiration
4.00	EnviSupply	6G777	8/15/17	Dec/18
7.00	↓	7GA250	8/15/17	Jan 19
10.00		6GF797	8/15/17	Jun 18
7.00 Chk		7GB009	8/15/17	Feb 19

Calibration Record

Date	Time	Sampler	pH 4.00		pH 7.00		pH 10.00		pH 7.00Chk		Temp Chk*	Notes**
			T (°C)	Cal.	T (°C)	Cal.	T (°C)	Cal.	T (°C)	Cal.	T (°C)	
8/15/17	0815	Orcutt	28.3	4.00	28.9	7.00	27.9	10.02	29.3	7.02		
8/15/17	1250	"	—		—		—		30.5	7.01		Was 7.06
8/16/17	0745	"	27.2	4.00	26.7	7.00	26.5	10.02	28.0	7.02		
8/16/17	1130	"	—		—		—		33.0	7.02		
8/17/17	0815	"	25.8	4.01	27.1	7.00	25.7	10.02	25.4	7.01		
8/17/17	1225	"	—		—		—		33.4	7.01		Was 7.05

* Temperature check performed with second NIST thermometer.
** If meter does not provide slope, ensure that the calibration is confirmed with a recheck of pH 7.0 in the column "pH 7.00Chk".
***Perform 7-Check every 10 measurements or if Temperature increases by 15 °F.
**** All maintenance to instrument during the field event should be logged on this form. All maintenance should also be logged on the "Preventative Maintenance" log.

EC and DO CALIBRATION RECORD

Florence Copper Project

Instrument: BC's YSI 556
SN: 15A102406
Probe SN: 600336

APP Sampling Event
Month: Aug
Year: 2017

Calibration Procedures:

-EC calibration/measurement should be performed in accordance with protocols set forth by ***Standard Methods for the Examination of Water and Wastewater – 2510 Conductivity.***

-Temperature measurement should be performed in accordance with protocols set forth by ***Standard Methods for the Examination of Water and Wastewater – 2550 Temperature*** using an NIST traceable thermometer.

-DO calibration/measurement should be performed as per manufacturer recommendations.

Calibration Standards Used:

Standard Conc.	Manufacturer	Lot#	Received	Expiration
	Env. Supply	76C297	8-15-17	Mar/17
(check)	N/A			

Calibration Record

Date	Time	Sampler	Specific Conductance						DO calibration performed?	Notes*
			EC 1413		EC 1413		EC 1413 Chk			
			T (°C)	Cal.	T (°C)	Cal.	T (°C)	Cal.	Yes/No	
8-15-17	0825	Orcutt			29.8	1414		N/A	Yes	100% SAT 764.5 mm/Hg
8-16-17	0800	"			28.5	1413		N/A	Yes	100% SAT 767.0 mm/Hg
8-17-17	0	"			26.3	1412		N/A	Yes	100% SAT 767.2 mm/Hg

* All maintenance to instrument during the field event should be logged on this form. All maintenance should also be logged on the "Preventative Maintenance" log.

TURBIDITY CALIBRATION RECORD

Florence Copper Project

Instrument: BC's La Motte 2020e
SN: 10969
Probe SN: N/A

APP Sampling Event
Month: Aug
Year: 2017

Calibration Procedures:

-Calibration/measurement should be performed in accordance with protocols set forth by ***USEPA Method 180.1*** using an NIST traceable thermometer.

Calibration Standards Used:

Standard	Manufacturer	Lot#	Received	Expiration
0 NTU	Amco	C691307	2/13/17	5/18
1 NTU	↓	C5827178	5-1-17	1/18
10 NTU		C6898408	2/13/17	5/18
1 NTU Chk		C5827178	5/1/17	

Calibration Record

Date	Time	Sampler	0 NTU	1 NTU	10 NTU	1 NTU Chk	Notes**
8-15-17	0830	Orcutt	0.00	1.02	10.02	0.99	
8-16-17	0750	"	0.00	0.98	10.01	1.01	
8-17-17	0830	"	0.00	1.01	10.02	0.98	

YSI 556 NEW JAN 28, 2015

1/28/15

No Maint. Required

3/26/15

5/4/2015 DO not calibrating -
M. Orcutt Replaced DO Sensor membrane
Recalibration OK. (Florence).

5/7/2015 NIST Thermometer check.
M. Orcutt BC-1A Model 4146 Exp 11/8/2015
1°C from YSI 556 Temp.

8/10/2015
M. Orcutt pH not calibrating.
F.C. Forced readings -
Uncalibrated and pH 7.0
Re Calib. check OK. MV +140
at pH 7.0

8/13/2015 Replaced pH/ORP Sensor
M. Orcutt +0.6 MV - good

Scale: 1 square = _____

2016

Aug 9, - Ernies
M. Orcutt D.O. Fluid Replace
and D.O. Tip replaced

Aug 26 Replaced DO Tip
w/ new fluid.
M. Orcutt Andrews property

Sept. 6 M. Orcutt NWR
YSI pH failure.
Replaced pH/ORP Sensor
Equipco - repair.

Nov 10, 2016 M. Orcutt
Florence
Replaced YSI 556 pH/ORP Sensor

Nov 11, 2016 NIST Thermometer
check @ Florence (W15859378)
18.4°C - YSI / 19.4°C NIST (1°C)

Scale: 1 square = _____

Rite in the Rain

OLD pH Sensor report

pH	mV	Reading	Temp
pH 7	·29	7.00	24.8 °C
4	+85.9	4.00	8524.4 °C
10	-141.4	10.01	24.6

* pH 7 ok,
pH 4, 10 forced,

Changed Sensor (pH, ORP)

Scale: 1 square = _____

Scale: 1 square = _____

Calibration Certificate No. 1750.01

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 4353-7200114

Traceable® Certificate of Calibration for Extra-Long-Stem Thermometer

Instrument Identification:

Model: 4353 S/N: 151850378 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-179	A45240		
Thermistor Module	A17118	3/03/16	1000371058
Temperature Probe	3039	4/02/16	15--A0P2S-20-1
Temperature Calibration Bath TC-231	A79341		
Digital Thermometer	130070752	2/20/16	4000-6561724

Certificate Information:

Technician: 68 Procedure: CAL-03 Cal Date: 11/10/15 Due Date: 11/10/17

Test Conditions: 24.7°C 46.0 %RH 1018 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C		N.A.		0.000	0.3	Y	-1.0	1.0	0.10	>4:1
°C		N.A.		100.000	99.9	Y	99.0	101.0	0.059	>4:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Extra-Long-Stem Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Extra-Long-Stem Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Traceable® is a registered trademark of Control Company

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BROWN AND CALDWELL

Acknowledgement Form

Name of Project/Site: Curis/ Florence Copper	**Project No:** 149505
Project/Site Location: Florence, Arizona	**Permit Type (APP, AZPDES):** APP
Employee Completing Form: (Print and Sign): Michael Orcutt	**Date:** 1/31/2017

Employee Acknowledgement:

The following signatures indicate that these personnel have read and/or been briefed on the documents indicated and understand the work to be performed:

- [x] pH by SM 4500 H-B
- [x] temperature by SM 2550B
- [x] specific conductance by SM 2510 B
- [x] dissolved oxygen by SM 4500 O-G
- [x] turbidity by EPA 180.1
- [ ] Manufacturer Info for Instrument _____
- [ ] Manufacturer Info for Instrument _____

Print	Sign
M. Orcutt	

Comments

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 17H0601 DATE 8-15-2017 PAGE 1 OF 1

PROJECT NAME Florence Copper # _____
CONTACT NAME: Bob Sylvester
COMPANY NAME: Brown + Caldwell
ADDRESS: 201 E. Washington #500
CITY Phoenix STATE Az ZIP CODE 85004
PHONE 602.567.4000 FAX -4001
SAMPLER'S SIGNATURE _____

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	VOC's 8260B	Inorganics (13+)	Diss. Metals (13+)	RadioChem (13+)	Radium 222	Cyanide (free)	8015 TPHD
MS4-0	8-15-17	0912		GW	11	X	X	X	X	X	X	X
MS4-LBF	8-15-17	1055		GW	11	X	X	X	X	X	X	X
MS8-0	8-15-17	1345		GW	11	X	X	X	X	X	X	X
TB	8-15-17	—		DI	1	X						

1. RELINQUISHED BY: Signature _____ Printed Name Michael Orcutt Firm Brown + Caldwell Date/Time 8-15-2017 @ 1450

2. RECEIVED BY: Signature _____ Printed Name Ian Ream FC Firm 8-15-17 Date/Time 1450

TURNAROUND REQUIREMENTS:
X Standard (approx.10 days)*
___Next day ___2 Day ___5 Day*
___ Email Preliminary Results To:
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
X II. Report (includes DUP,MS,MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data)
Add 10% to invoice

INVOICE INFORMATION:
Account X Y ___ N
P.O. # Florence Copper
Bill to: Cuenca Res. Direct.

SAMPLE RECEIPT:
Total Containers 34
Temperature 6.1
☒ Wet Ice ☐ Blue Ice

3. RELINQUISHED BY: Signature _____ Printed Name Ian Ream FC Firm 8-15-17 Date/Time 1641

4. RECEIVED BY: Signature _____ Printed Name Max DiSante Firm TURNER LABORATORIES, INC. Date/Time 8/15/17 1641

*LEGEND
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

SPECIAL INSTRUCTIONS/COMMENTS:

Compliance Analysis:	☐ Yes	☐ No	Custody Seals	☐	Preservation Confirmation	☒
ADEQ Forms:	☐ Yes	☐ No	Container Intact	☒	Appropriate Head Space	☒
Mail ADEQ Forms:	☐ Yes	☐ No	COC/Labels Agree	☒	Received Within Hold Time	☒

*See Analysis list attach w/ COC
* Diss metals Field Filtered.

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 17H0627 DATE 8-16-17 PAGE 1 OF 1

PROJECT NAME Florence Copper#
CONTACT NAME: Barb Sylvester
COMPANY NAME: Brown + Caldwell
ADDRESS 201 E. Washington #500
CITY Phoenix STATE Az ZIP CODE 85004
PHONE 602.567.4000 FAX -4001
SAMPLER'S SIGNATURE

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	VOC's 8260B/organics	Inorganic (13+)	Cyanide (free)	TPH D 8015	Diss Metals (13+)	Radionuclides (13+)	Radon 222
M60-0	8-16-17	0835		GW	11	X	X	X	X	X	X	X
M55-UBF	8-16-17	1007		GW	11	X	X	X	X	X	X	X
M61-LBF	8-16-17	1215		GW	11	X	X	X	X	X	X	X
M56-LBF	8-16-17	1210		GW	11	X	X	X	X	X	X	X
TB	8-16-17	—		DI	1	X						

1. RELINQUISHED BY:
Signature
Printed Name Michael Orrell
Firm Brown + Caldwell
Date/Time 8-16-2017 @1510

2. RECEIVED BY:
Signature
Printed Name Ian Ream
Firm FC
Date/Time 8-16-17 / 1510 8-16-17 FC

TURNAROUND REQUIREMENTS:
X Standard (approx.10 days)*
___ Next day ___ 2 Day ___ 5 Day*
___ Email Preliminary Results To:
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
X II. Report (includes DUP,MS,MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data)
Add 10% to invoice

INVOICE INFORMATION:
Account X Y ___ N
P.O. # Florence Copper
Bill to: Curis Res Direct Bill

SAMPLE RECEIPT:
Total Containers 45
Temperature 9.4
☑ Wet Ice ☐ Blue Ice

3. RELINQUISHED BY:
Signature
Printed Name Ian Ream
Firm FC
Date/Time 8-17-17/0800

4. RECEIVED BY:
Signature
Printed Name Joseph Catalano
Firm TURNER LABORATORIES, INC.
Date/Time 8/17/17 0800

*LEGEND
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

SPECIAL INSTRUCTIONS/COMMENTS:

Compliance Analysis:	☐ Yes	☐ No	Custody Seals	☐	Preservation Confirmation	☑
ADEQ Forms:	☐ Yes	☐ No	Container Intact	☑	Appropriate Head Space	☑
Mail ADEQ Forms:	☐ Yes	☐ No	COC/Labels Agree	☑	Received Within Hold Time	☑

SEE Attached Analytical list of COC
Diss. Metals field filtered

TURNER LABORATORIES INC
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Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # _____ DATE 8-17-2017 PAGE 1 OF 1

PROJECT NAME Florence Copper # _____
CONTACT NAME: Barb Sylvester
COMPANY NAME: Brown + Caldwell
ADDRESS: 201 E. Washington #500
CITY Phoenix, STATE Az ZIP CODE 85004
PHONE 602.567.4000 FAX -4001
SAMPLER'S SIGNATURE _____

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	VOC's 8260B/Organics	TPH-D 8015	Inorganics (134)	Cyanide (free)	Diss. Metals (134)	Rad Chem (134)	Radon 222
MS7-0	8-17-17	0912		GW	11	X	X	X	X	X	X	X
MS9-0	|	1102		GW	11	X	X	X	X	X	X	X
MS2-WBF	|	1310		GW	11	X	X	X	X	X	X	X
MS3.0	|	1325		GW	11	X	X	X	X	X	X	X
TB	|	-		DI	2	X						

1. RELINQUISHED BY:
Signature Michael Orcutt
Printed Name
Firm Brown + Caldwell
Date/Time 8-17-2017

2. RECEIVED BY:
Signature Michelle Hatten
Printed Name Michelle Hatten RSE
Firm
Date/Time 8/17/17 550

TURNAROUND REQUIREMENTS:
X Standard (approx.10 days)*
___ Next day ___ 2 Day ___ 5 Day*
___ Email Preliminary Results To:
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
X II. Report (includes DUP,MS,MSD, as required, may be charged as samples)
___ III. Date Validation Report (includes All Raw Data)
Add 10% to Invoice

INVOICE INFORMATION:
Account X Y ___ N
P.O. # Florence Copper
Bill to: Corris Bus. Direct Billing

SAMPLE RECEIPT:
Total Containers _____
Temperature _____
☐ Wet Ice ☐ Blue Ice

3. RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

4. RECEIVED BY:
Signature
Printed Name
Firm TURNER LABORATORIES, INC.
Date/Time

*LEGEND
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

SPECIAL INSTRUCTIONS/COMMENTS:

Compliance Analysis:	☐ Yes	☐ No	Custody Seals	☐	Preservation Confirmation	☐
ADEQ Forms:	☐ Yes	☐ No	Container Intact	☐	Appropriate Head Space	☐
Mail ADEQ Forms:	☐ Yes	☐ No	COC/Labels Agree	☐	Received Within Hold Time	☐

See Analytical List Attach. w/ COC
Diss. Mg field filtered.
Metals

Rad Chem to Rad Safety by M. Orcutt