Official Draft Public Notice Version **December 14, 2016**
The findings, determinations, and assertions contained in this document are not final and subject to change following the public comment period.

FACT SHEET / STATEMENT OF BASIS
JORDAN VALLEY WATER CONSERVANCY DISTRICT
SOUTHWEST GROUNDWATER TREATMENT PLANT
PERMIT MODIFICATION: CHRONIC WET TESTING
UPDES PERMIT NUMBER: UT0025836
MAJOR INDUSTRIAL

1.0 FACILITY CONTACTS

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2.0 SUMMARY OF MODIFICATION

UPDES Permit No. UT0025836 issued to Jordan Valley Water Conservancy District (Jordan Valley Water) on April 1, 2014, required Jordan Valley to conduct chronic whole effluent toxicity (WET) testing at the end- of –pipe at Outfall 001 on a quarterly basis. The permit specified that quarterly monitoring alternate between *Americamysis bahia* (mysid shrimp) and *Cyprinodon variegatus* (sheepshead minnow).

As a result of completion of a Phase I Toxicity Identification Evaluation (TIE), this permit is being modified to require that only sheepshead minnow be used for Outfall 001 WET testing.

Further, to better align Jordan Valley Water's WET requirements to reflect newly adopted permitting guidance for Great Salt Lake and statewide dischargers, Acute biomonitoring requirements have been added to Outfall 001, with results of Chronic WET testing being used as an indicator only of toxicity.

Language has also been added to Section I.D.6 which provides an option for the Director to remove sediment sampling and analysis from the Delta Monitoring Plan, as well as language to clarify the minimum sample size to determine selenium concentrations of bird eggs.

3.0 JUSTIFICATION

Chronic WET testing organism

During project construction and prior to discharging directly to Great Salt Lake, Jordan Valley Water conducted (7) chronic WET tests using RO plant effluent as a surrogate for end-of-pipe, Outfall 001, effluent. All 7 WET tests were conducted on both sheepshead minnow, and mysid

shrimp. During this investigation, no chronic effects were observed for the sheepshead minnow but were observed during some of the mysid shrimp tests. Preliminary Toxicity Identification Tests were then conducted to identify the potential toxicants. In some cases, the toxic effects could not be repeated but the results suggested that copper and/or ions could be the cause of the observed effects. Results of the 7 WET tests are summarized in Table 1.

Copper was measured sporadically at concentrations potentially high enough to be a cause of the chronic effects. Jordan Valley Water submitted a study plan to the Division of Water Quality (DWQ) to identify and further characterize copper in the effluent. Elevated copper concentrations were not found in the water from the source wells prior to RO treatment or in the effluent prior to discharging to either Rio Tinto Kennecott's tailings pond or Great Salt Lake. The effluent pipe is nonmetallic and is not anticipated to be a source of copper. Further testing isolated the sampling port at the end of the pipe as the likely source of copper and showed that the previously elevated copper concentrations were a sampling artifact and not representative of the effluent. The report provided by Jordan Valley Water is provided as Attachment 1.

To confirm ion imbalance as the primary toxicant, Jordan Valley Water commissioned two mock effluent studies to further characterize the effects of the ion concentrations on mysid shrimp. These studies were conducted on effluent collected from outfall 001, and compared to a mock effluent which mimicked the ionic characteristics of the effluent, but did not contain any other potential toxicants.

In summary, the results of the chemical analysis for the Outfall 001 effluent and mock effluent indicated that the ionic composition of the two samples were very similar in both studies. Other potential toxicants (i.e., Copper) were absent from the mock effluent samples, and as expected, were present in the Outfall 001 samples. Even with the presence of other potential toxicants in the Outfall 001 samples, the 7-day IC25 (inhibitory concentration at 25% effluent) for biomass in the mock effluent was similar (almost identical) to the 7-day IC25 for the Outfall 001 effluent. The other WET endpoints (e.g. LC50, IC25) for the mock effluent were not different and were within the expected precision of the tests when compared to the results using effluent collected at Outfall 001 at 7, 48 and 96 days for survival. The conclusion is that an ion imbalance was the primary cause of the effects. Study results and further discussion are available as Attachment 2.

The results from these studies support the conclusions of the Phase I chronic TIEs conducted for Jordan Valley Water, which indicated that ion imbalance as the major toxicant contributing to unsatisfactory whole effluent toxicity performance when mysid shrimp is the subject organism.

Ion toxicity is an appropriate endpoint for measuring potential toxicity to Utah's fresh waters but Gilbert Bay is not fresh water. Gilbert Bay has much higher ion concentrations (currently >15% salinity) than the effluent (~3.0% salinity). The organisms that inhabit the transitional waters and Gilbert Bay are anticipated to be much more tolerant of ions than the USEPA standard WET test organism mysid shrimp. Mysid shrimp are intended to be representative of seawater which has a salinity of ~3.5%, much less than Gilbert Bay. The testing completed to support this modification demonstrates that this organism is not effective for evaluating WET for this effluent and receiving waters. Therefore, this permit is being modified to replace *Americamysis bahia* (mysid shrimp) with *Cyprinodon variegatus* (sheepshead minnow), for all quarterly chronic WET tests on effluent collected at Outfall 001.

Outfall 001- New chronic and acute WET testing guidance

Since the issuance of this permit, the *Utah Division of Water Quality Interim Methods for Evaluating Use Support For Great Salt Lake, Utah Pollution Discharge Elimination System (UDPES) Permits, Review Draft Permitting Implementation Guidance for Great Salt Lake (January 4, 2016),* has been adopted. This guidance recommends that the results of chronic WET testing on the GSL be used as an indicator of toxicity only. This change to Jordan Valley Water's WET requirements will reflects this, with the addition of adding Acute WET testing to reflect statewide WET guidance. With this change, Jordan Valley Water's permit requirements will better reflect both statewide and GSL WET guidance.

Option of removing sediment sampling from annual Delta Monitoring Plan.

During the required annual tri-lateral agreement meeting in 2016, the results of the monitoring in the delta were reviewed and discussed. Sediments have not been demonstrated to be useful and a decision was made to potentially shift these resources to additional bird egg collection efforts. Jordan Valley Water has collected several years of baseline (prior to discharging) sediment data and if necessary, sediment can be sampled in the future to evaluate the potential impacts of the effluent. Sediments will continue to be investigated by the Utah Division of Emergency Response and Remediation as part of the historic tailing causeway investigation to the east of the discharge location. The permit is being modified to allow Jordan Valley Water to request removal of sediment sampling from the Delta Monitoring plan, which must be approved by the Director.

Drafted by

Nate Nichols- Discharge
Chris Bittner- Great Salt Lake WET

13.0 PUBLIC NOTICE

Began: XXXX
Ended: XXXX
Public Noticed in the Salt Lake Tribune and Desert News.

Table 1.

WET Test Results		
Testing Date Chronic Endpoints	Mysid Shrimp (Control / 100%)	Sheepshead Minnow (Control / 100%)
Dec. 8-13, 2013 (test was collected on the entry point of the pipeline instead of end-of-pipe)		
48 hr % Survival	90 / 65	90 / 100
96 hr % Survival	90 / 43	not evaluated
7 day % Survival	88 / 35	not evaluated
Mean Biomass (mg/organism)	0.276 / 0.097	not evaluated
Mean Fecundity (%)	76 / 53	not evaluated
Apr. 15-21, 2014		
48 hr % Survival	100 / 65	100 / 100
96 hr % Survival	100 / 40	100 / 100
7 day % Survival	98 / 10	98 / 100
Mean Biomass (mg/organism)	0.271 / 0.012	0.925 / 1.089
Mean Fecundity (%)	27 / 0	not evaluated
Sep. 14-19, 2014		
48 hr % Survival	100 / 100	100 / 100
96 hr % Survival	100 / 98	100 / 100
7 day % Survival	100 / 93	100 / 100
Mean Biomass (mg/organism)	0.405 / 0.351	0.843 / 0.928
Mean Fecundity (%)	97 / 55	not evaluated
Dec. 02-08, 2014 *		
48 hr % Survival	93 / 90	100 / 100
96 hr % Survival	90 / 70	100 / 100
7 day % Survival	80 / 35	100 / 100
Mean Biomass (mg/organism)	0.285 / 0.111	0.692 / 0.796
Mean Fecundity (%)	75 / 40	not evaluated
Mar. 10-16, 2015 *		
48 hr % Survival	100 / 83	100 / 100
96 hr % Survival	98 / 65	100 / 100
7 day % Survival	90 / 55	100 / 100
Mean Biomass (mg/organism)	0.264 / 0.150	0.587 / 0.659
Mean Fecundity (%)	17 / 0	not evaluated
Jun. 23-29, 2015 *		
48 hr % Survival	93 / 78	100 / 100
96 hr % Survival	88 / 63	100 / 100
7 day % Survival	80 / 60	100 / 100
Mean Biomass (mg/organism)	0.272 / 0.164	1.110 / 1.177
Mean Fecundity (%)	35 / 17	not evaluated
Sep. 8-14, 2015 *		
48 hr % Survival	98 / 20	100 / 100
96 hr % Survival	95 / 8	100 / 100
7 day % Survival	93 / 3	100 / 100
Mean Biomass (mg/organism)	0.277 / 0.004	0.829 / 0.866
Mean Fecundity (%)	60 / 0	not evaluated

*TIE study was run subsequent to WET test.

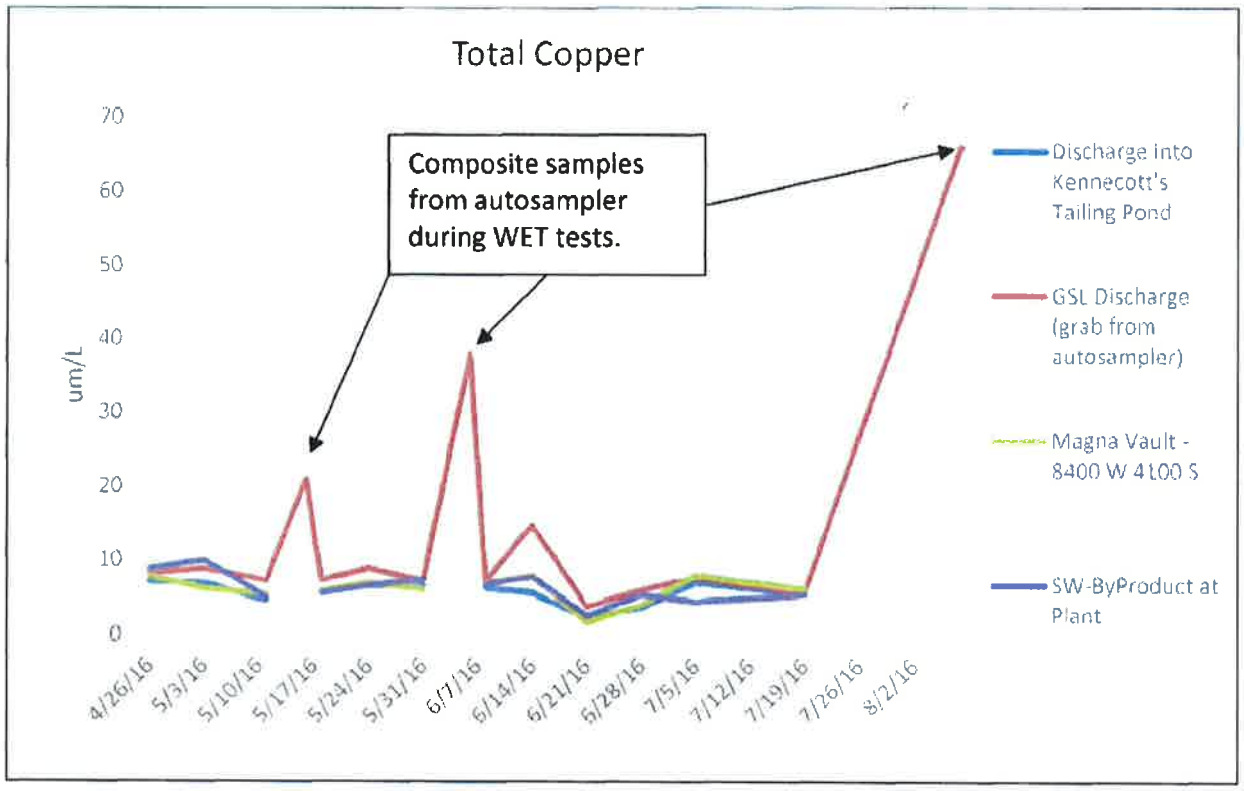
Attachment 1

Results of JVWCD Copper source isolation study

Characterization of intermittent high copper levels in composite effluent samples collected for investigative WET tests of JVWCD RO effluent

Four sample sites, within Jordan Valley's effluent system were sampled for copper beginning in April, 2016. A total of 15 sampling events occurred, including during collection of composite sampling conducted in May, June and July 2016. The data presented in Figure 1 demonstrates that the intermittent copper found during previous WET testing is not representative of the actual discharge water and suggests that copper is being released from the brass pressure reducer that is necessary to make the auto sampler work on a high pressure line.

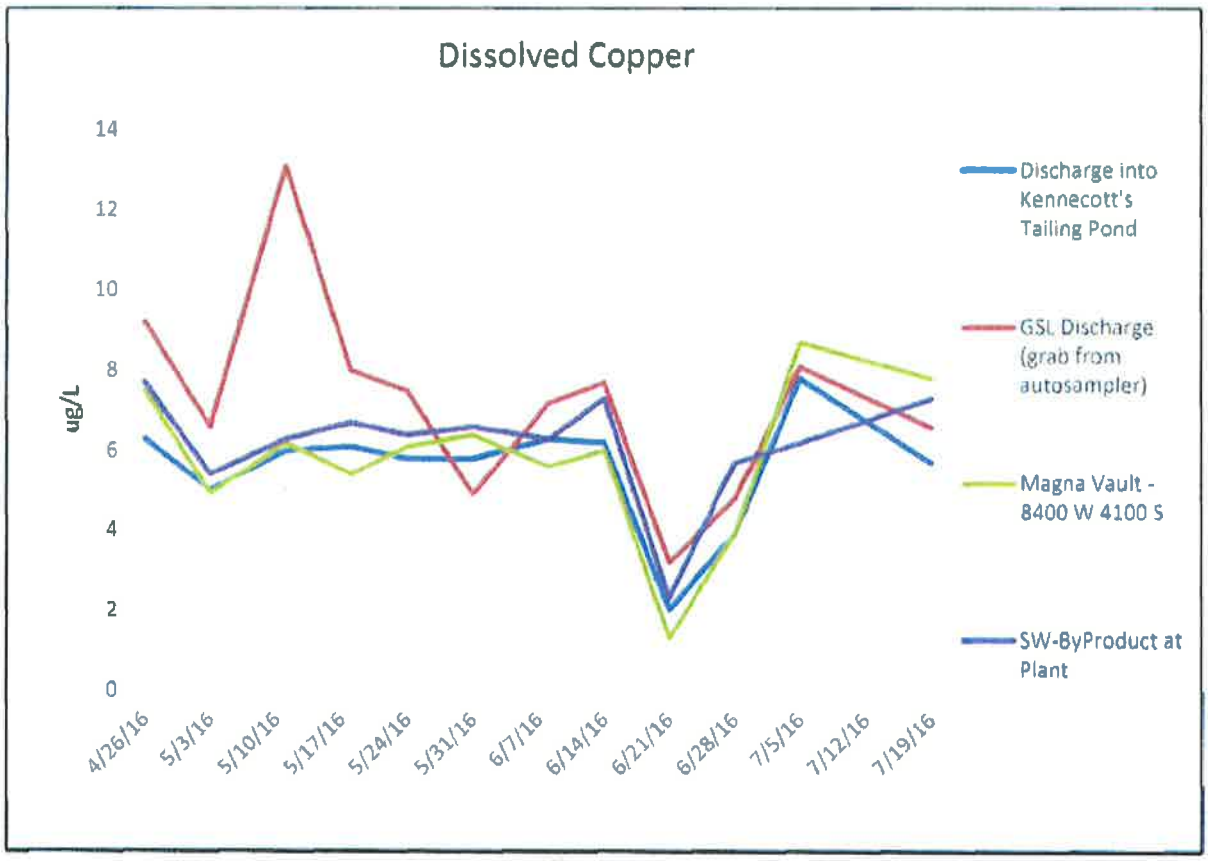
Figure 1- Total Copper



Attachment 2

Results of Mock effluent Studies of July and September 2016.
Effluent samples from Jordan Valley Water Conservancy District.

Figure 2- Dissolved Copper



RESULTS OF A MOCK EFFLUENT STUDY WITH *Americamysis bahia* ON AN AUGUST 2016 EFFLUENT SAMPLE FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

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Results relate only to the items tested or to the samples as received by the laboratory.

This report contains 15 pages plus 3 attachments.

Wayne L. McCulloch
Laboratory Director

13 September 2016
Date

EA Project Number 70005.15

ACCREDITED IN ACCORDANCE WITH nelac ID# E87550

EA Report Number 7392

1. INTRODUCTION

At the request of the Jordan Valley Water Conservancy District, EA Engineering, Science, and Technology performed a mock effluent study to confirm the conclusions of previous toxicity identification evaluations (TIEs), which indicated an ion imbalance of dissolved ions as the major toxicants of concern contributing to unsatisfactory whole effluent toxicity test performance. This study was conducted on Outfall 001 effluent discharged from Jordan Valley Water Conservancy District's (JVWCD) Southwest Groundwater Treatment Plant (SWGWTP), using *Americamysis bahia* (opossum shrimp) as the test species. Copies of the chain of custody, raw data sheets and statistics are included in Attachment I, and the results of the chemistry analyses are presented in Attachment II. The Report Quality Assurance Record is included in Attachment III.

2. MATERIALS AND METHODS

2.1 EFFLUENT SAMPLE COLLECTION

Five gallons of Outfall 001 effluent were collected from the Jordan Valley Water Conservancy District's West Jordan Facility on 7-8 August 2016. The sample was shipped to EA's Ecotoxicology Laboratory in Hunt Valley, Maryland via overnight express carrier. Upon receipt at EA on 9 August 2016 the sample was visually inspected and assigned EA Ecotoxicology Laboratory accession number AT6-391. The sample was stored in the dark at 4°C when not being used for testing. Table 1 summarizes sample collection, receipt information and selected chemical analyses measured on the effluent as described in APHA (2012) and US EPA (2002).

2.2 TEST ORGANISMS

Americamysis bahia (Opossum shrimp) were acquired from Aquatic BioSystems in Fort Collins, Colorado. Lot AB-896 (4 days old) was received at EA on 12 August 2016 and were held until 15 August 2016 for the mock effluent study. The organisms were 7 days old at test initiation.

2.3 DILUTION WATER

The dilution water used in the acute toxicity tests was artificial seawater, prepared by mixing Crystal Sea synthetic sea salts with laboratory water to a final salinity of 30 ppt. The source of the laboratory water was the City of Baltimore municipal tap water that was passed through a high-capacity, activated carbon filtration system. This synthetic seawater formulation has proven acceptable for aquatic toxicological studies, and has been used successfully at EA for maintaining multigeneration cultures of test organisms, and for holding healthy populations of estuarine and marine species. Batches of artificial seawater were aerated and aged at least 24 hours prior to use in testing.

2.4 MOCK EFFLUENT STUDY PROCEDURES

Upon receipt of the sample, the Outfall 001 effluent sample was salinity adjusted with US EPA GP2 formulation (US EPA 2002). Following salinity adjustment the sample was sent via overnight carrier to TestAmerica, Pittsburgh, Pennsylvania for chemical analyses, including a rapid turn-around time ion scan. It was determined that salinity adjustment prior to chemical analysis was required, due to Outfall 001 being deficient in sodium, relative to the concentrations of other ionic constituents.

The results of the chemical analyses performed on the salinity adjusted Outfall 001 sample and the prepared mock effluent sample for the mock effluent study can be found in Table 2. Using the results of the ion scan, formulations were developed for the mock effluent study using the Gas Research Institute (GRI) Salinity Toxicity Relationship (STR) Model (GRI 1999) (Table 3). A mock effluent was prepared by matching concentrations of seven major ions: calcium, sodium, potassium, magnesium, chloride, sulfate and bicarbonate. The mock effluent sample was prepared by adding reagent grade salts to deionized water. The salts utilized to prepare the mock effluent were NaCl (sodium chloride), Na_2SO_4 (sodium sulfate), KCl (potassium chloride), NaBr (sodium bromide), $Na_2B_4O_7 \cdot 10H_2O$ (sodium borate), $MgCl_2 \cdot 6H_2O$ (magnesium chloride), $CaCl_2 \cdot 2H_2O$ (calcium chloride), $SrCl_2 \cdot 6H_2O$ (strontium chloride) and $NaHCO_3$ (sodium bicarbonate). Following mock effluent sample preparation, the salinity adjusted Outfall 001 effluent and the mock effluent samples were tested concurrently.

2.5 TOXICITY TEST OPERATIONS AND PERFORMANCE

The chronic toxicity tests on the mock effluent and Outfall 001 samples were performed in accordance with US EPA (2002) and EA's protocols (EA 2013) for *A. bahia* (AB-CH-03). Test concentrations were prepared by measuring small volumes of sample in glass pipettes, adding to a graduated cylinder, and bringing to volume with dilution water. All tests were performed using the target temperature of 26±1°C and a 16-hour light/8-hour dark photoperiod. The chronic toxicity tests consisted of three exposure concentrations (100, 75, 50 percent effluent) and a

laboratory dilution water control of synthetic seawater.

The *A. bahia* chronic toxicity test was performed with eight replicates per test concentration, with five organisms per replicate. Test solutions were renewed daily by carefully siphoning the old solution from each chamber and replacing it with freshly prepared test solution. Water quality parameters (temperature, pH, dissolved oxygen, and salinity) were monitored daily before and after renewal for each test. If dissolved oxygen in any test chamber fell below 4 mg/L, then all test chambers were gently aerated, or other corrective action was implemented (e.g., reducing solution volume). The organisms were fed *Artemia* nauplii twice per day.

At test termination, each organism was viewed under a microscope to determine its sex and, in the case of females, the number of individuals with eggs in the oviducts or brood pouch. Growth of the surviving organisms is expressed as mean biomass. Surviving organisms from each replicate test chamber were rinsed with deionized water and placed in pre-tared weigh pans, one pan for each replicate. The pans were dried overnight at 100°C in a drying oven. The tared weight of the pan (pan only) was subtracted from the total weight (pan and dried opossum shrimp) to yield a net organism dry weight. Mean dry weights were calculated based on the number of surviving organisms (to evaluate the test acceptability criterion), and based on the original number of exposed organisms (biomass).

Survival, biomass, and fecundity were analyzed using appropriate statistical analyses according to EPA guidance (US EPA 2002) to determine if any test concentration was significantly ($p=0.05$) different from the control. The short-term chronic test endpoints are reported as the No Observed Effect Concentration (NOEC), the Lowest Observed Effect Concentration (LOEC), and the Chronic Value (ChV). The 25 percent inhibition concentration (IC25) was calculated, with Chronic Toxic Units (TUc) also calculated for each IC25 value. The term Chronic Toxic Unit is defined as: Chronic Toxic Unit (TUc) = 100/IC25. In addition, the 48 and 96-hour LC50 values were calculated for each chronic toxicity test.

The definitions of these endpoints follow US EPA (2002) and are as follows:

- The NOEC is the highest concentration of toxicant to which organisms are exposed in a full or partial life-cycle test, which causes no statistically significant adverse effect on the observed parameter (usually hatchability, survival, growth, and/or reproduction).

- The LOEC is the lowest concentration of toxicant to which organisms are exposed in a full or partial life-cycle test, which causes a statistically significant adverse effect on the observed parameters (usually hatchability, survival, growth, and/or reproduction).

- The ChV is a value lying between the NOEC and the LOEC, derived by calculating the geometric mean of the NOEC and LOEC. The term is sometimes used interchangeably with Maximum Acceptable Toxicant Concentration.

- The IC value is a point estimate of the toxicant concentration that causes a given percent reduction in a non-quantal biological measurement such as fecundity or growth.

- The LC50 (Median Lethal Concentration) is an estimate of the effluent concentration which is lethal to 50 percent of the test organisms in the time period prescribed by the test.

2.6 REFERENCE TOXICANT TEST

In conformance with EA's quality assurance/quality control program, monthly reference toxicant tests using potassium chloride (KCl) were performed on the test species. The reference toxicant test data for *A. bahia* was supplied by the organism vendor.

2.7 ARCHIVES

Original data sheets, records, memoranda, notes, and computer printouts are archived at EA's Office in Hunt Valley, Maryland. These data will be retained for a period of 5 years unless Jordan Valley Water Conservancy District requests a longer period of time.

3. RESULTS AND DISCUSSION

The results of the toxicity test conducted with the salinity adjusted Outfall 001 effluent sample are summarized in Table 4. At 48 hours, there was 3 and 30 percent survival in the 100 and 75 percent effluent concentrations, respectively, while the 50 percent effluent concentration had 90 percent survival. The dilution water control had 93 percent survival. The 48-hour LC50 was 69.2 percent effluent. At 96 hours, there was 0 and 23 percent survival in the 100 and 75 percent effluent concentrations, respectively, while the 50 percent effluent concentration had 90 percent survival. The dilution water control had 88 percent survival. The 96-hour LC50 was 66.9 percent effluent. At test termination on day 7, the 100 and 75 percent effluent concentrations had 0 and 15 percent survival, respectively, and were significantly less ($p=0.05$) than the control, which had 88 percent survival. There was 73 percent survival in the 50 percent effluent concentration, which was not statistically different from the control. Mean biomass in the 50 percent effluent concentration was 0.190 mg/organism, which was significantly different than the control mean biomass of 0.253 mg/organism. Fecundity could not be used as an endpoint due to less than 50 percent (27 percent females with eggs) of the control females producing eggs. The NOEC for the chronic toxicity test, based on biomass as the most sensitive chronic endpoint, was <50 percent effluent. The LOEC was 50 percent effluent and the ChV was <50 percent effluent. The IC25 (for biomass) was 49.7 percent effluent.

The results of the toxicity test conducted on the mock effluent, which was designed to mimic the salinity adjusted Outfall 001 effluent, were similar to the same as the Outfall 001 toxicity test, and are presented in Table 5. At 48 hours, there was 58 and 70 percent survival in the 100 and 75 percent effluent concentrations, respectively. The 50 percent effluent concentration had 95 percent survival, while the dilution water control had 98 percent survival. The 48-hour LC50 was >100 percent effluent. At 96 hours, there was 28 and 58 percent survival in the 100 and 75 percent effluent concentrations, respectively, while the 50 percent effluent concentrations had 90 percent survival. The dilution water control had 98 percent survival. The 96-hour LC50 was 81.6 percent effluent. At test termination on day 7, the 100 and 75 percent effluent concentrations had 28 and 58 percent survival, respectively, and were significantly less ($p=0.05$)

than the control, which had 98 percent survival. There was 90 percent survival in the 50 percent effluent concentration, which was not statistically different from the control. Mean biomass in the 50 percent effluent concentration was 0.271 mg/organism, which was significantly different than the control mean biomass of 0.323 mg/organism. Fecundity could not be used as an endpoint due to less than 50 percent (20 percent females with eggs) of the control females producing eggs. The NOEC for the chronic toxicity test, based on biomass as the most sensitive chronic endpoint, was <50 percent effluent. The LOEC was 50 percent effluent and the ChV was <50 percent effluent. The IC25 (for biomass) was 56.0 percent effluent.

In summary, the results of the chemical analyses for the salinity adjusted Outfall 001 and mock effluent (Table 2) indicated that the ionic composition of the two samples was very similar, with the exception of calcium which was lower in the mock effluent. It should be noted that the TSS measurements for the mock were substantially higher than the salinity adjusted Outfall 001 sample indicating the possible presence of undissolved salts (most likely calcium). The presence of other potential toxicants (i.e. metals) was absent from the mock effluent sample, and as expected, were present in the salinity adjusted Outfall 001 sample. Even with the presence of other potential toxicants in the salinity adjusted Outfall 001 sample and the differences in calcium, the 7-day IC25 for biomass (56.0 percent effluent) in the mock effluent prepared to mimic the salinity adjusted Outfall 001 ion scan was similar to the 7-day IC25 for the Outfall 001 effluent (49.7 percent effluent). The point estimates (e.g. LC50, IC25) for the mock effluent were more variable for the survival endpoint, compared to the ones generated for the salinity adjusted Outfall 001 at 48, 96 and 7 days, possibly due to the lower calcium measurement in the mock effluent. However, even though we see differences in the survival values, Jordan Valley would have been unable to have an acceptable test result based on the permit required IC25 of >100 percent effluent in both samples. In summary, the results from this study support the conclusions of the Phase I chronic TIEs conducted for Jordan Valley Water Conservancy District, which indicated that ion imbalance of dissolved ions was the major toxicants of concern contributing to unsatisfactory whole effluent toxicity test performance.

A monthly reference toxicant test was conducted on *A. bahia* by the organism supplier using potassium chloride (KCl) as the reference toxicant. The 7-day IC25 for the August 2016 *A. bahia* reference toxicant test was 599 mg/L KCl. The acceptable control chart limits for *A. bahia* were 388 – 734 mg/L KCl.

REFERENCES

American Public Health Association, American Water Works Association, Water Environment Federation. 2012, Standard Methods for the Examination of Water and Wastewater. 22nd Edition. APHA, Washington, D.C.

EA. 2013. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Hunt Valley, Maryland.

Gas Research Institute. 1999. Marine Salinity Toxicity Relationship Model. Chicago, Illinois.

US EPA. 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. Third Edition. EPA-821-R-02-014. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

TABLE 1 SUMMARY OF SAMPLE COLLECTION, RECEIPT DATA AND WATER QUALITY PARAMETERS MEASURED ON AN OUTFALL 001 EFFLUENT FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Sample Description:	Outfall 001
EA Accession Number:	AT6-391
Sample Collection:	1400, 7 August 2016 to 0802, 8 August 2016
Sample Receipt:	1035, 9 August 2016

Chemical Analyses:

Temperature (°C):	0.7
Alkalinity (mg/L as $CaCO_3$):	786
Hardness (mg/L as $CaCO_3$):	2,336
Conductivity (µS/cm):	5,573
Salinity (ppt):	3.0
pH:	8.0
Total Residual Chlorine (TRC):	<0.01

TABLE 2 CHEMICAL ANALYSES PERFORMED ON THE SALINITY ADJUSTED OUTFALL 001 AND MOCK EFFLUENT STUDY SAMPLES

ANALYTE	UNITS	OUTFALL 001 (AT6-391)	MOCK EFFLUENT (AT6-407)
Sodium	mg/L	8,000	8,400
Potassium	mg/L	410	480
Calcium	mg/L	980	720
Magnesium	mg/L	1,500	1,300
Strontium	mg/L	10.0	9.9
Barium	mg/L	0.26[a]	0.079[a]
Chloride	mg/L	17,000	16,000
Bicarbonate	mg/L	1,100	800
Sulfate	mg/L	3,200	5,600
Bromide	mg/L	85	93
Boron	mg/L	2.9	1.2[a]
Alkalinity - Carbonate (CO_3)	mg/L	<2.4	<4.0
Alkalinity - Hydroxide (OH)	mg/L	<1.4	<4.0
Alkalinity - Total (as $CaCO_3$)	mg/L	870	660
Hardness - Total (as $CaCO_3$)	mg/L	8,700	7,100
Fluoride	mg/L	0.6[b]	<1.2
Nitrate as N	mg/L	9.4[b]	<1.1
Nitrite as N	mg/L	<0.1[b]	<1.2
Phosphate, ortho as P	mg/L	0.6[b]	<7.7
Total Dissolved Solids (TDS)	mg/L	36,000	35,000
Total Suspended Solids (TSS)	mg/L	2.2	170
Antimony, Total	µg/L	<3.0	3.3[a]
Arsenic, Total	µg/L	19	<0.74
Beryllium, Total	µg/L	<0.64	<0.64
Cadmium, Total	µg/L	<1.6	<1.6
Chromium, Total	µg/L	24	2.8
Copper, Total	µg/L	59	<4.0
Iron, Total	µg/L	<94	<94
Lead, Total	µg/L	3.1	3.5[a]
Mercury, Total	µg/L	2.7	4.8
Manganese, Total	µg/L	15[a]	26[a]
Nickel, Total	µg/L	20	4.4[a]
Selenium, Total	µg/L	31	<3.2
Silver, Total	µg/L	<0.88	<0.88
Thallium, Total	µg/L	<0.24	<0.24
Zinc, Total	µg/L	96	19[a]

(a) Results less than reporting limit but greater than or equal to MDL.
(b) Analyte not measured by EA contracted analytical laboratory. Values reported were performed by alternate laboratory on unadjusted effluent.

TABLE 3 FORMULATIONS DEVELOPED FOR THE MOCK EFFLUENT STUDY USING THE GRI MARINE SALINITY TOXICITY RELATIONSHIP PROGRAM

Salt	Mock Effluent (g/L)	Mock Effluent (g/20L)
NaCl	16.554	331.07
Na_2SO_4	4.7330	94.659
KCl	0.7817	15.634
NaBr	0.1094	2.1889
$Na_2B_4O_7 \cdot 10H_20$	0.0071	0.14249
$MgCl_2 \cdot 6H_2O$	12.543	250.86
$CaCl_2 \cdot 2H_2O$	3.5946	71.891
$SrCl_2 \cdot 6H_2O$	0.0304	0.6086
$NaHCO_3$	1.4618	29.236

TABLE 4 RESULTS OF *Americamysis bahia* TOXICITY TEST CONDUCTED ON A 7-8 AUGUST 2016 OUTFALL 001 EFFLUENT SAMPLE FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Test Species:	***Americamysis bahia* (opossum shrimp)**
Client Name:	**Jordan Valley Water Conservancy District**
Sample Description:	Outfall 001
EA Accession Number:	AT6-391
Sample Dates:	7-8 August 2016
EA Test Number:	TN-16-247

Test Concentration (% effluent)	48-Hour % Survival	96-Hour % Survival	7-Day % Survival	Mean Biomass as mg/organism (±S.D.)	Mean Fecundity as females with eggs (%)
Control	93	88	88	0.253 (±0.077)	27
50	90	90	73	0.190 (±0.048 [a]	6
75	30[a]	23[a]	15[a]	0.037 (±0.041)[b]	0
100	3[a]	0[a]	0[a]	0.000 (±0.000)[b]	0

Acute and Chronic Endpoints (expressed as percent effluent)	
48-Hour LC50:	69.2 (60.5 – 74.6)[c]
96-Hour LC50:	66.9 (63.7 – 70.1)
7-Day NOEC (Survival):	50
7-Day LOEC (Survival):	75
7-Day ChV (Survival):	61.2
7-Day IC25 (Survival):	53.0 (36.5 – 57.8)
7-Day NOEC (Biomass):	<50
7-Day LOEC (Biomass):	50
7-Day ChV (Biomass):	<50
7-Day IC25 (Biomass):	49.7 (NC)[d][e]

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	25.0 – 25.9
pH:	7.0 – 8.5
Dissolved Oxygen (mg/L):	4.0 – 7.1
Salinity (ppt):	28.8 – 31.2

(a) Significantly different (p=0.05) from the control.
(b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.
(c) Values in parentheses represent the 95 percent confidence limits for the dataset.
(d) The 95 percent confidence limits are not calculable for the dataset.
(e) Calculated IC25 is below the lowest test concentration.

TABLE 5 RESULTS OF *Americamysis bahia* TOXICITY TEST CONDUCTED ON A MOCK EFFLUENT SAMPLE PREPARED TO MIMIC OUTFALL 001 EFFLUENT FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Test Species:	***Americamysis bahia* (opossum shrimp)**
Client Name:	**Jordan Valley Water Conservancy District**
Sample Description:	Mock Effluent
EA Accession Number:	AT6-407
Preparation Date:	15 August 2016
EA Test Number:	TN-16-248

Test Concentration (% effluent)	48-Hour % Survival	96-Hour % Survival	7-Day % Survival	Mean Biomass as mg/organism (±S.D.)	Mean Fecundity as females with eggs (%)
Control	98	98	98	0.323 (±0.031)	20
50	95	90	90	0.271 (±0.051)[a]	10
75	70[a]	58[a]	58[a]	0.152 (±0.083)[b]	7
100	58[a]	28[a]	28[a]	0.074 (±0.107)[b]	11

Acute and Chronic Endpoints (expressed as percent effluent)	
48-Hour LC50:	>100 (NC)[c]
96-Hour LC50:	81.6 (73.4 – 91.0)[d]
7-Day NOEC (Survival):	50
7-Day LOEC (Survival):	75
7-Day ChV (Survival):	61.2
7-Day IC25 (Survival):	63.0 (56.3 – 75.0)
7-Day NOEC (Biomass):	<50
7-Day LOEC (Biomass):	50
7-Day ChV (Biomass):	<50
7-Day IC25 (Biomass):	56.0 (46.4 – 64.1)

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	25.0 – 25.9
pH:	7.0 – 8.5
Dissolved Oxygen (mg/L):	4.0 – 7.1
Salinity (ppt):	28.3 – 30.9

(a) Significantly different (p=0.05) from the control.
(b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.
(c) The 95 percent confidence limits are not calculable for the dataset.
(d) Values in parentheses represent the 95 percent confidence limits for the dataset.

ATTACHMENT I

Chain of Custody, Data and Statistical Analyses
(33 pages)

Chain-of-Custody Record

EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory
231 Schilling Circle
Hunt Valley, Maryland 21031
Telephone: 410-584-7000
Fax: 410-584-1057

Sample Shipped By: (circle)
Fed. Ex. UPS Other: _____
Tracking #: 8095 1033 6849

Client: JVWCD Project No.: _____

NPDES Number: _____ Client Purchase Order Number: _____

City/State Collected: Salt Lake City, UT

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Collection Start Date/Time	Collection End Date/Time	Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
A16-391		X	8/7/16	8/8/16	GSL Discharge	2-2.5gal.
			0200 PM	0802 AM	Outfall 001	

Sampled By:	Date/Time	Received By:	Date/Time
[signature]	8/8/16 1151		
Sampler's Printed Name: Given McIntyre	Title: WQ Tech	Relinquished By:	Date/Time
Relinquished By: [signature]	Date/Time 8/8/16 1315	Received By Laboratory [signature]	Date/Time 8/9/16 1035

Was Sample Chilled During Collection? (Yes) / No

Comments:

Sample Collection Parameters

Visual Description:

Temperature (°C): 9.4°C

pH: 8.44

TRC (mg/L):

Other:

White-Report Production
EA 0534 F&B Rev.9/12

Yellow-Laboratory

Pink-Client/Sampler

SAMPLE CHECK-IN FOR TESTING

Client: Jordan Valley

EA Accession Number: ATU-391

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	0.7	8/9/16	1040	KB
Is ice present?	—	yes	↓	↓	↓
pH	6.0-9.0	8.0			
TRC (mg/L)	<0.01	<0.01			
Visual Description	—	clear	↓	↓	↓

***If outside acceptable range, contact project manager.**

***OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN)*:**

Parameter	Acceptable Range	(✓)	Date	Time	Initials
Ammonia (preserve aliquot)	—				
Parameter	**Acceptable Range**	**Measurement***	**Date**	**Time**	**Initials**
Salinity (ppt)	—				

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-247

TEST ORGANISM INFORMATION

Common Name: Opossum shrimp

Scientific Name: *A. bahia*

Lot Number: AB- 8916

Source: EA

Adults Isolated (Time, Date): —

Neonates Pulled & Fed (Time, Date): —

Acclimation: <24 hrs Age: 7 days

Culture Water (T/S): 25.9 °C 30.2 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
8/15/16	1040	JB	Dilutions Made
	1315		Test Vessels Filled
	1320		Organisms Transferred
			Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Mod Hard Control	0ml	1200ml
50%	600ml	
75%	900ml	
100%	1200ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	8/15/16	1040	JB	AT6-391 / LD6-369
1	8/16/16	0944	MJ	AT6-391 / LD6-369
2	8/17/16	1145	MJ	AT6-391 / LD6-369
3	8/18/16	1455	MJ	AT6-391 / LD6-369
4	8/19/16	0919	MJ	AT6-391 / LD6-369
5	8/20/16	0922	MJ	AT6-391 / LD6-369
6	8/21/16	0946	JB	AT6-391 / LD6-369

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			1630 JB 5drops
1	0830 MJ 5drops	+PE	1720 JB 5drops 8/16 JB
2	0830 JB 5drops		1625 JB 5drops
3	0815 JB 5drops		1510 MJ 5drops
4	0755 MJ 5drops		1530 MJ 5drops
5	0815 MJ 5drops		1533 MJ 5drops
6	0815 JB 5drops		1620 JB 5drops

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-247
Test Material: Effluent
Accession Number: ATC -391
Dilution Water: 30 ppt CS
Accession Number: LDC -369

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 l, 8 d Light Intensity: 50 - 100 fc

Beginning Date: 8/15/16 Time: ~~1350~~ 1315 SB 8/15 MJ
Ending Date: 8/22/16 Time: 1411

Test Container: 4" Bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	5	5	5	5	5	5	5	5
	B	5	2	2	2	2	2	2	2
	C	5	5	5	5	5	5	5	5
	D	5	5	5	4	4	4	4	4
	E	5	5	5	4	4	4	4	4
	F	5	5	5	5	5	5	5	5
	G	5	5	5	5	5	5	5	5
	H	5	5	5	5	5	6	5	5
50%	A	5	5	5	5	5	5	5	4
	B	5	5	5	5	5	5	5	4
	C	5	5	4	4	4	4	4	4
	D	5	5	5	5	5	5	4 *	3
	E	5	4	3	3	3	3	2	2
	F	5	6	5	5	5	5	5	5
	G	5	5	4	4	4	4	~~4~~ 3	3
	H	5	6	5	5	5	5	5	4
Time / Initials		1320 MK	1009 MJ	1314 MJ	1510 MJ	1014 MJ	1533 MJ	1040 SB	1411 MJ

8/22 MJ

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0)____ Cyprinodon: (1004.0)____ Menidia: (1006.0)____ Americamysis:(1007.0) X OTHER:____

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN-16-247
Test Material: Effluent
Accession Number: ATG -311
Dilution Water: 30 ppt CS
Accession Number: LDG -349

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 8/15/16 Time: 1315
Ending Date: 8/22/16 Time: 1411

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 L, 8 d Light Intensity: 50 - 100 fc

Test Container: 4" Bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	A	5	4	2	2	2	2	2	2
	B	5	4	2	1	1	1	1	1
	C	5	4	3	3	3	2	2	2
	D	5	2	0	–	–	–	–	–
	E	5	5	2	1	1	0	–	–
	F	5	4	1	1	1	1	Ø 1	1
	G	5	4	0	–	–	–	–	–
	H	5	4	2	1	1	1	0	–
100%	A	5	3	0	–	–	–	–	–
	B	5	3	1	0	–	–	–	–
	C	5	2	0	–	–	–	–	–
	D	5	2	0	–	–	–	–	–
	E	5	3	0	–	–	–	–	–
	F	5	2	0	–	–	–	–	–
	G	5	3	0	–	–	–	–	–
	H	5	3	0	–	–	–	–	–
Time / Initials		1320 MM	1009 MJ	1314 MJ	1510 MJ	1014 MJ	1533 MJ	1040 JB	1411 MJ

8/16/16

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0)____ Cyprinodon: (1004.0)____ Menidia: (1006.0)____ Americamysis:(1007.0) X OTHER:____

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	8/22/16	1411	MJ
Loaded tins placed in oven:	8/22/16	1438	MJ
Loaded tins removed from oven:	8/25/16	1446	MJ
Loaded tins weighed:	8/25/16	1506	MJ

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-Ko-247

Tin Lot: Blue 162

Oven Temp (°C): Start: 98 98° 8/22 MJ End: 94°

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
Control	A	47	II	I	II		5	31.09	32.62	1.53	0.306	0.306
	B	65		II			2	29.83	30.39	0.56	0.280	0.112
	C	71			IIII		5	29.31	31.18	1.87	0.374	0.374
	D	63		I	III		4	28.19	29.25	1.06	0.265	0.212
	E	54		II	II		4	31.34	32.61	1.27	0.318	0.254
	F	68	I		IIII		5	28.59	30.05	1.46	0.292	0.292
	G	119		II	III		5	29.21	30.40	1.19	0.238	0.238
	H	89	I	III	I		5	29.44	30.63	1.19	0.238	0.238
50%	A	124		II	II		4	30.11	31.25	1.14	0.285	0.228
	B	133		II	II		4	31.55	32.65	1.10	0.275	0.220
	C	73		III			4	29.75	31.05	1.30	0.325	0.260
	D	56		II	I		3	28.82	29.81	0.99	0.330	0.198
	E	49		II			2	29.97	30.62	0.65	0.325	0.130
	F	108		III	II		5	28.34	29.35	1.01	0.202	0.202
	G	64	I	I	I		3	33.61	34.33	0.72	0.240	0.144
	H	118		III	I		4	29.95	30.62	0.67	0.168	0.134

Dry wt. calculations checked (date, initials): 9/7/16 MJ

Biomass calculations checked (date, initials): 9/7/16 MJ

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	8/22/16	1411	MJ
Loaded tins placed in oven:	8/22/16	1438	MJ
Loaded tins removed from oven:	8/25/16	1446	MJ
Loaded tins weighed:	8/25/16	1506	MJ

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-247

Tin Lot: Blue 162

Oven Temp (°C): Start: 98° End: 94°

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
75%	A	111		11			2	~~29.56~~ 29.510	~~29.85~~ ~~29.66~~	0.34	0.170	0.068
	B	59			1		1	30.17	30.48	0.31	~~0.051~~ 0.31	0.062
	C	17		11			2	28.04	28.55	0.51	0.225	0.102
	D	–										
	E	–										
	F	123		1			1	30.41	30.72	0.31	0.310	0.062
	G	–										
	H	–										
100%	A	–										
	B	–										
	C	–										
	D	–										
	E	–										
	F	–										
	G	–										
	H	–										

8/29/MJ

Dry wt. calculations checked (date, initials): 9/7/16 MD

Biomass calculations checked (date, initials): 9/7/16 MD

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-247

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 8/15/16 Time: 1315 1350 8/15 JB
Ending Date: 8/22/16 Time: 1411

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 ℓ, 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Control		25.2	24.9 25.1	25.0	25.0	25.1	25.1	26.4	7.1	8.3	7.3	8.4	7.1	8.2	7.3	7.0	7.0	6.9	6.7	6.6	6.7	6.9	30.7	30.7	30.8	29.9	30.3	29.4	30.2
50%		25.4	25.0	25.1	25.0	25.1	25.1	26.4	7.1	8.0	7.3	8.2	7.1	8.1	7.3	6.9	7.1	7.0	6.9	6.8	6.9	6.8	30.7	30.8	31.0	30.1	30.5	29.8	30.6
75%		25.4	25.2	25.2	25.0	25.0	25.2	25.6	7.0	8.0	7.2	8.1	7.0	8.1	7.2	6.9	7.1	7.0	7.0	6.7	7.0	6.9	30.9	30.9	31.1	30.1	30.5	29.9	30.6
100%		25.9	25.2	25.3	25.0	—	—	—	7.0	7.9	7.2	8.1	—	—	—	6.9	7.1	7.1	7.0	—	—	—	30.9	31.0	31.2	30.1	—	—	—
Meter Number		679	678	679	678	679	678	679	679	678	679	678	679	678	679	679	678	679	678	679	678	679	679	678	679	678	679	678	679
Time		1042	0951	1149	1459	0923	0928	0950	1042	0951	1149	1459	0923	0929	0950	1042	0951	1149	1459	0923	0928	0950	1042	0951	1149	1459	0923	0926	0950
Initials		JB	MJ	MJ	MJ	MJ	MJ	JB	JB	MJ	MJ	MJ	MJ	MJ	JB	JB	MJ	MJ	MJ	MJ	MJ	JB	JB	MJ	MJ	MJ	MJ	MJ	JB

8/16 MJ

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- No-247

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 8/15/16 Time: 1315
Ending Date: 8/22/16 Time: 1411

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control		25.2	25.2	25.0	25.0	25.4	25.6	25.6	8.1	7.5	8.3	7.4	8.1	7.0	8.1	5.3	6.0	6.1	6.0	5.7	6.1	4.0	30.5	30.8	29.8	30.4	29.5	30.3	28.8
50%		25.4	25.5	25.6	25.4	25.7	25.7	25.7	8.3	7.5	8.3	7.3	8.2	7.0	8.5	4.2	5.3	5.0	5.8	5.6	5.2	4.1	30.5	31.0	29.9	30.7	30.1	30.7	29.6
75%		25.3	25.5	25.7	25.5	25.9	25.8	25.5	8.4	7.5	8.4	7.3	8.4	7.0	8.5	4.8	5.1	5.1	5.3	5.8	5.3	5.3	30.6	31.0	29.9	30.6	30.0	30.7	29.0
100%		25.4	25.6	25.7	—	—	—	—	8.3	7.5	8.4	—	—	—	—	4.9	5.2	5.2	-	—	-	-	30.7	31.1	29.9	—	—	—	—
Meter Number		678	679	678	679	678	679	678	678	679	678	679	678	679	678	678	679	678	679	678	679	678	678	679	678	679	678	679	678
Time		1023	1326	1516	1021	1535	1043	1432	1023	1326	1516	1021	1535	1043	1432	1023	1326	1516	1021	1535	1043	1432	1023	1326	1516	1021	1535	1043	1432
Initials		MJ	MJ	MJ	MJ	MJ	JB	MJ	MJ	MJ	MJ	MJ	MJ	JB	MJ	MJ	MJ	MJ	MJ	MJ	JB	MJ	MJ	MJ	MJ	MJ	MJ	JB	MJ

ATS-T14
06/21/06

RANDOMIZATION CHART

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 10-247

5	6	2	3	1	4
4	3	2	1	5	6
2	1	4	3	5	6
1	6	3	2	5	4

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 16-247

Date/Time/Initials	Comments/Activity
8/21/16 1040 SB	* organism missing.

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 16-247

Aliquot of sample warmed to test temperature, then aerated if supersaturated:

		ON AIR			OFF AIR		
Date	Sample #	Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
8/15/16	ATG-391	9.2	1006	JB	6.8	1016	JB
8/16/16	ATG-391	9.3	0906	JB	7.1	0916	JB
8/17/16	ATG-391	9.0	0932	JB	7.3	0942	JB
8/18/16	ATG-391	9.4	1318	MJ	6.9	1328	MJ
8/19/16	ATG-391	9.3	0746	MJ	6.9	0756	MJ
8/20/16	ATG-391	9.4	0855	MJ	6.8	0905	MJ
8/21/16	ATG-391	8.3	0929	JB	7.0	0939	JB

Mysid Survival, Growth and Fecundity Test-48 Hr Survival

Start Date:	8/15/2016	Test ID:	TN-16-247	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-391	Sample Type:	Outfall 001
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	0.4000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	0.8000	1.0000	0.6000	1.0000	0.8000	1.0000
75	0.4000	0.4000	0.6000	0.0000	0.4000	0.2000	0.0000	0.4000
100	0.0000	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

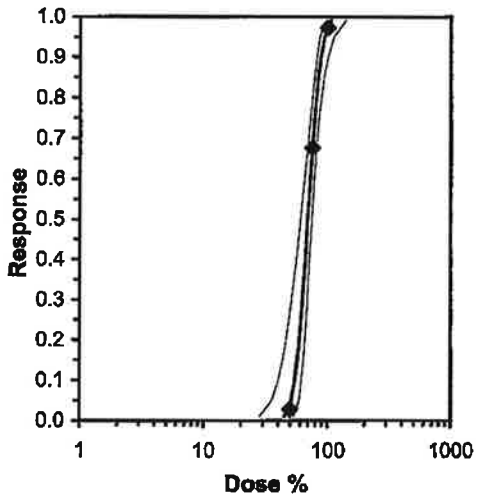
			Transform: Arcsin Square Root					Rank	1-Tailed	Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
Control	0.9250	1.0000	1.2627	0.6847	1.3453	18.495	8			3	40
50	0.9000	0.9730	1.2283	0.8861	1.3453	14.264	8	61.50	48.00	4	40
*75	0.3000	0.3243	0.5675	0.2255	0.8861	42.186	8	39.00	48.00	28	40
*100	0.0250	0.0270	0.2553	0.2255	0.4636	32.981	8	36.00	48.00	39	40

Auxiliary Tests					Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)					0.84108	0.904	-1.4306	2.42832
Bartlett's Test indicates equal variances (p = 0.07)					6.98707	11.3449		
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**				
Steel's Many-One Rank Test	50	75	61.2372	2				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	12.4705	2.86587	6.85342	18.0876	0.075	0.06011	3.84146	0.81	1.84034	0.08019	4
Intercept	-17.95	5.39369	-28.522	-7.3784							
TSCR	0.07095	0.0375	-0.0025	0.14444							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	45.0601	28.4361	53.9827
EC05	3.355	51.1023	35.6509	59.0433
EC10	3.718	54.6478	40.1878	61.9787
EC15	3.964	57.178	43.5494	64.0725
EC20	4.158	59.2721	46.4017	65.8137
EC25	4.326	61.1298	48.9781	67.3713
EC40	4.747	66.0729	55.9814	71.6419
EC50	5.000	69.2372	60.4901	74.5588
EC60	5.253	72.5529	65.1047	77.9012
EC75	5.674	78.4198	72.4988	85.0274
EC80	5.842	80.8776	75.1761	88.6006
EC85	6.036	83.8397	78.0842	93.3576
EC90	6.282	87.7214	81.4874	100.217
EC95	6.645	93.8077	86.2392	112.052
EC99	7.326	106.387	94.9762	139.517



Reviewed by:

Mysid Survival, Growth and Fecundity Test-96 Hr Survival

Start Date:	8/15/2016	Test ID:	TN-16-247	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-391	Sample Type:	Outfall 001
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

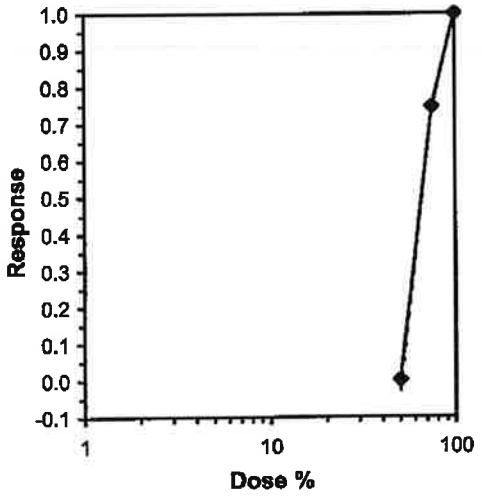
Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	0.4000	1.0000	0.8000	0.8000	1.0000	1.0000	1.0000
50	1.0000	1.0000	0.8000	1.0000	0.6000	1.0000	0.8000	1.0000
75	0.4000	0.2000	0.6000	0.0000	0.2000	0.2000	0.0000	0.2000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.8750	1.0000	1.2032	0.6847	1.3453	19.573	8				5	40
50	0.9000	1.0286	1.2283	0.8861	1.3453	14.264	8	-0.238	2.024	0.2142	4	40
*75	0.2250	0.2571	0.4846	0.2255	0.8861	45.298	8	6.792	2.024	0.2142	31	40
100	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	8				40	40

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)					0.92377		0.884		-0.7143	0.82652
Bartlett's Test indicates equal variances (p = 0.74)					0.59509		9.21034			
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	50	75	61.2372	2	0.17281	0.19845	1.42706	0.04478	4.3E-07	2, 21

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	66.861	63.748	70.126
5.0%	66.501	63.115	70.069
10.0%	66.176	62.549	70.014
20.0%	65.695	61.729	69.916
Auto-0.0%	66.861	63.748	70.126



Reviewed by

Mysid Survival, Growth and Fecundity Test-7 Day Survival

Start Date:	8/15/2016	Test ID:	TN-16-247	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-391	Sample Type:	Outfall 001
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	0.4000	1.0000	0.8000	0.8000	1.0000	1.0000	1.0000
50	0.8000	0.8000	0.8000	0.6000	0.4000	1.0000	0.6000	0.8000
75	0.4000	0.2000	0.4000	0.0000	0.0000	0.2000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.8750	1.0000	1.2032	0.6847	1.3453	19.573	8				0.8750	1.0000
50	0.7250	0.8286	1.0288	0.6847	1.3453	19.572	8	1.627	2.024	0.2169	0.7250	0.8286
*75	0.1500	0.1714	0.3998	0.2255	0.6847	51.081	8	7.499	2.024	0.2169	0.1500	0.1714
100	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	8				0.0000	0.0000

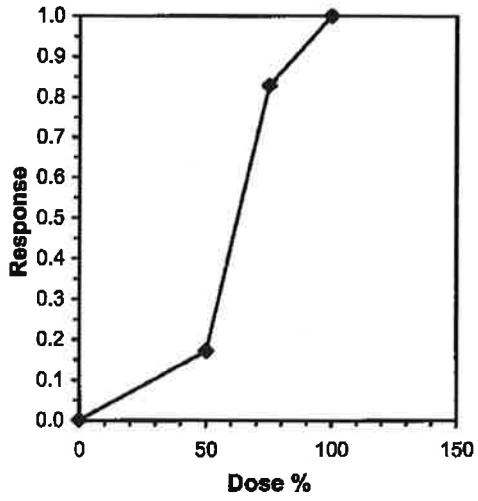
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93096	0.884	-0.6311	0.30558
Bartlett's Test indicates equal variances (p = 0.90)	0.20322	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	75	61.2372	2	0.17528	0.20128	1.42849	0.04591	5.3E-07	2, 21

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	14.583	13.212	7.308	51.519	1.4571
IC10*	29.167	12.820	14.615	53.038	0.4241
IC15*	43.750	10.650	21.923	54.557	-0.3374
IC20	51.087	7.654	29.231	56.250	-1.0567
IC25	52.989	5.111	36.538	57.813	-1.6983
IC40	58.696	2.528	53.144	63.336	-0.3295
IC50	62.500	2.252	57.885	66.680	-0.0392

* indicates IC estimate less than the lowest concentration



Mysid Survival, Growth and Fecundity Test-Fecundity

Start Date:	8/15/2016	Test ID: TN-16-247	Sample ID: Jordan Valley
End Date:	8/22/2016	Lab ID: AT6-391	Sample Type: Outfall 001
Sample Date:		Protocol: EPAM 87-EPA Marine	Test Species: MY-Mysidopsis bahia
Comments:			

Conc-%	1	2	3	4	5	6	7	8
Control	0.6667	0.0000	0.0000	0.0000	1.0000	0.0000	0.2500	
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	0.0000
75	0.0000	0.0000	0.0000					

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
Control	0.2738	1.0000	0.5905	0.3614	1.0472	49.278	7			0.2667	1.0000
*50	0.0625	0.2283	0.3837	0.2527	0.7854	43.730	8	47.00	49.00	0.0500	0.1875
75	0.0000	0.0000	0.4154	0.3614	0.5236	22.546	3			0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.79265	0.835	1.22564	0.38852
F-Test indicates equal variances (p = 0.18)	3.00868	9.15534		

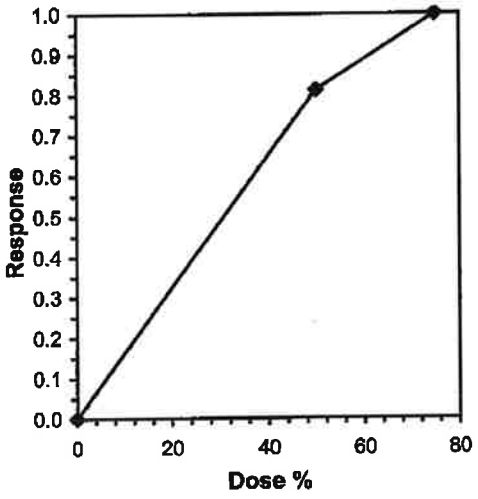
Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates significant differences

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05*	3.077			
IC10*	6.154			
IC15*	9.231			
IC20*	12.308			
IC25*	15.385			
IC40*	24.615			
IC50*	30.769			

* Indicates IC estimate less than the lowest concentration



Reviewed by:

Mysid Survival, Growth and Fecundity Test-Biomass

Start Date:	8/15/2016	Test ID:	TN-16-247
End Date:	8/22/2016	Lab ID:	AT6-391
Sample Date:		Protocol:	EPAM 87-EPA Marine
Comments:			
Sample ID:	Jordan Valley		
Sample Type:	Outfall 001		
Test Species:	MY-Mysidopsis bahia		

Conc-%	1	2	3	4	5	6	7	8	S.D.
Control	0.3060	0.1120	0.3740	0.2120	0.2540	0.2920	0.2380	0.2380	0.07652
50	0.2280	0.2200	0.2600	0.1980	0.1300	0.2020	0.1440	0.1340	0.04826
75	0.0680	0.0620	0.1020	0.0000	0.0000	0.0620	0.0000	0.0000	0.04125
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0

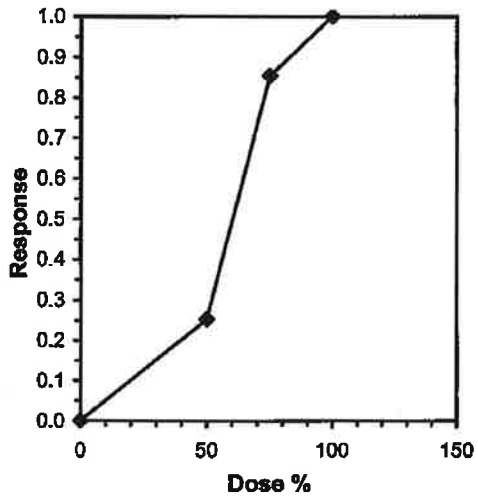
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.2533	1.0000	0.2533	0.1120	0.3740	30.214	8				0.2533	1.0000
*50	0.1895	0.7483	0.1895	0.1300	0.2600	25.466	8	1.993	1.761	0.0563	0.1895	0.7483
75	0.0368	0.1451	0.0368	0.0000	0.1020	112.248	8	7.543	2.024	0.0581	0.0368	0.1451
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8				0.0000	0.0000

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97884		0.844		-0.3123	0.92116
F-Test indicates equal variances (p = 0.25)	2.51402		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences	0.05633	0.22244	0.01626	0.00409	0.0661	1, 14

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	9.931	10.470	6.152	50.667	2.5267
IC10*	19.863	11.708	12.305	52.414	1.3310
IC15*	29.794	11.579	18.457	54.154	0.5743
IC20*	39.725	10.252	24.610	55.611	0.0604
IC25*	49.657	8.126	30.762	57.069	-0.3784
IC40	56.146	3.479	49.220	62.346	-0.2775
IC50	60.291	2.877	55.009	65.851	0.1236

* indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by:

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 110-248

TEST ORGANISM INFORMATION

Common Name: Opossum shrimp

Scientific Name: *A. bahia*

Lot Number: AB-8906

Source: EA

Adults Isolated (Time, Date): —

Neonates Pulled & Fed (TIme, Date): —

Acclimation: <24 hrs Age: 7days

Culture Water (T/S): 25.9 °C 30.2 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
8/15/16	1550	JB	Dilutions Made
			Test Vessels Filled
	1625		Organisms Transferred
	1630	MKC	Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Mod Hard Control	0ml	1200ml
50%	600ml	
75%	900ml	
100%	1200ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	8/15/16	1550	JB	ATG-407 LD6-369
1	8/16/16	0942	MJ	ATG-407 LD6-369
2	8/17/16	1143	MJ	ATG-407 LD6-369
3	8/18/16	1454	MJ	ATG-407 LD6-369
4	8/19/16	0917	MJ	ATG-407 LD6-369
5	8/20/16	0924	MJ	ATG-407 LD6-369
6	8/21/16	0920	JB	ATG-407 LD6-369

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			1625 MKC 5Drops
1	0830 MJ 5drops		1720 JB 5Drops
2	0830 JB 5Drops		1625 JB 5drops
3	0815 JB 5drops		1600 5drops
4	0755 MJ 5drops		1530 MJ 5drops
5	0815 MJ 5drops		1545 MJ 5drops
6	0815 JB 5drops		1615 JB 5drops

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN-16-248
Test Material: Effluent
Accession Number: A16-407
Dilution Water: 30 ppt CS
Accession Number: 416-309

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 8/15/16 Time: 1625
Ending Date: 8/22/16 Time: 1525

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 l, 8 d Light Intensity: 50 - 100 fc

Test Container: 4" Bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	5	5	5	5	5	5	5	5
	B	5	5	5	5	5	5	5	5
	C	5	5	5	5	5	5	5	5
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	5	5	5	5
	F	5	5	6	5	5	6	5	5
	G	5	5	4	4	4	4	4	4
	H	5	5	5	5	5	5	5	5
50%	A	5	4S	4S	4S	5	5	5	5
	B	5	5	5	5	5	5	5	5
	C	5	5	5	5	5	5	5	5
	D	5	5	5	5	5	5	5	5
	E	5	5	5	4	4	4	4	4
	F	5	5	5	5	5	5	5	5
	G	5	5	6	5	4	4	4	4
	H	5	3	3	3	3	3	3	3
Time / Initials		1630 MLL	1047 MJ	1331 MJ	1553 M 8/18 MJ	1030 MJ	1545 MJ	NO OB	1525 MJ

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0)____ Cyprinodon: (1004.0)____ Menidia: (1006.0)____ Americamysis:(1007.0) X OTHER:____

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN-16-248
Test Material: Effluent
Accession Number: A16-407
Dilution Water: 30 ppt CS
Accession Number: D16-309

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 l, 8 d Light Intensity: 50 - 100 fc

Beginning Date: 8/15/16 Time: 1025
Ending Date: 8/22/16 Time: 1525

Test Container: 4" Bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	A	5	5	2	2	2	2	2	2
	B	5	5	2	2	2	2	2	2
	C	5	5	4	3	3	3	3	3
	D	5	5	4	4	4	4	4	4
	E	5	5	4	4	4	4	4	4
	F	5	5	5	4	4	4	4	4
	G	5	5	4	3	3	3	3	3
	H	5	4	3	1	1	1	1	1
100%	A	5	4	3	1	1	1	1	1
	B	5	5	4	2	2	2	2	2
	C	5	5	5	5	5	5	5	5
	D	5	3	3	0	—	—	—	—
	E	5	3	2	1	1	1	1	1
	F	5	4	2	1	1	1	1	1
	G	5	2	2	1	1	1	1	1
	H	5	2	2	0	—	—	—	—
Time / Initials		1030 MC	1047 MJ	1337 MJ	1553 MJ	1030 MJ	1545 MJ	1010 SB	1525 MJ

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0)____ Cyprinodon: (1004.0)____ Menidia: (1006.0)____ Americamysis:(1007.0) X OTHER:____

ATS-T10
12/02/08

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	8/22/16	1525	MJ
Loaded tins placed in oven:	8/22/16	1551	MJ
Loaded tins removed from oven:	8/25/16	1413	NM
Loaded tins weighed:	8/25/16	1443	NM

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-248

Tin Lot: Blue162

Oven Temp (°C): Start: 100° End: 92°

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
Control	A	53			5		5	29.73	31.36	1.63	0.326	0.326
	B	23			5		5	30.03	31.57	1.54	0.308	0.308
	C	109		1	4		5	30.44	32.18	1.74	0.348	0.348
	D	83		4	1		5	31.00	32.57	1.57	0.314	0.314
	E	99	2		3		5	29.94	31.62	1.68	0.336	0.336
	F	84		2	3		5	30.10	32.57	1.87	0.374	0.374
	G	88			4		4	30.31	31.65	1.34	0.335	0.268
	H	95		5			5	27.76	29.31	1.55	0.310	0.310
50%	A	14		3	2		5	30.34	31.56	1.22	0.244	0.244
	B	101		4	1		5	30.18	31.54	1.36	0.272	0.272
	C	77		4	1		5	34.47	36.04	1.57	0.314	0.314
	D	135	1	2	2		5	31.96	33.66	1.70	0.340	0.340
	E	103		3	1		4	32.41	33.63	1.22	0.305	0.244
	F	105		4	1		5	30.53	32.15	1.62	0.324	0.324
	G	100		2	2		4	30.19	31.36	1.17	0.293	0.234
	H	117	1	1	1		3	29.20	30.17	0.97	0.323	0.194

Dry wt. calculations checked (date, initials): 9/7/16 MD

Biomass calculations checked (date, initials): 9/7/16 MD

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	8/22/16	1525	MS
Loaded tins placed in oven:	8/22/16	1557	MS
Loaded tins removed from oven:	8/25/16	1413	MS
Loaded tins weighed:	8/25/16	1443	MS

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 160-248

Tin Lot: Blue 162

Oven Temp (°C): Start: 100° End: 92°

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
75%	A	98		1	1		2	31.12	31.59	0.47	0.235	0.094
	B	116		11			2	34.00	34.46	0.46	0.230	0.092
	C	66		1	11		3	28.57	29.53	0.96	0.320	0.192
	D	90		111	1		4	34.16	35.44	1.28	0.320	0.256
	E	110		111	1		4	29.54	30.13 ~~30.36~~	0.59	0.148	0.118
	F	61		111	1		4	28.45	29.80	~~1.35~~ 1.35	0.330	0.270
	G	70	1	1	1		3	29.84	30.62	0.78	0.260	0.156
	H	112			1		1	30.64	30.82	0.18	0.180	0.036
100%	A	141			1		1	29.58	30.00	0.42	0.420	0.084
	B	130		11			2	29.63	30.13	0.50	0.250	0.100
	C	129	1	11	11		5	33.50	35.11	1.61	0.322	0.322
	D	—					—	—				—
	E	82		1			1	31.11	31.28	0.17	0.170	0.034
	F	120			1		1	30.41	30.63	0.22	0.220	0.044
	G	97			1		1	29.84	29.89	0.05	0.050	0.010
	H	—					—	—				—

8/30 SB

9/12 M

Dry wt. calculations checked (date, initials): 9/7/16 MD Biomass calculations checked (date, initials): 9/7/16 MD

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN-116 - 298

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 8/15/16 Time: 1625
Ending Date: 8/22/16 Time: 1525

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Control		25.1	24.8	24.9	25.1	25.0	25.0	25.3	8.1	8.1	7.3	8.3	7.0	7.9	7.2	6.9	6.9	7.0	6.9	6.8	7.1	6.8	30.1	30.6	30.7	29.9	30.4	29.9	30.2
			25.1	25.0					8.4																				
50%		25.0	25.1	25.1	25.0	25.0	25.1	25.3	8.0	8.0	7.3	8.1	7.0	7.9	7.3	6.8	7.0	7.0	7.0	6.8	7.1	6.8	30.2	30.2	30.5	29.5	29.9	29.6	30.3
									8.1																				
75%		25.0	25.2	25.1	25.0	25.0	25.2	25.3	8.0	7.9	7.3	8.0	7.0	7.8	7.3	7.0	7.0	7.0	7.0	6.8	7.0	6.8	30.0	30.0	30.3	29.2	29.7	29.3	30.0
									8.0																				
100%		25.0	25.3	25.1	25.0	25.0	25.3	25.1	8.0	7.8	7.2	7.9	7.0	7.8	7.2	7.1	7.0	6.9	7.0	6.8	7.0	6.8	29.8	29.7	30.0	29.0	29.4	29.1	29.9
									7.8																				
Meter Number		679	678	679	678	679	678	679	679	679	679	678	679	678	679	679	678	679	678	679	678	679	679	678	679	678	679	678	679
Time		1800	0948	1148	1458	0921	0926	0952	1600	0948	1148	1458	0921	0926	0952	1600	0948	1148	1458	0921	0926	0952	1600	0948	1148	1458	0921	0926	0952
Initials		SB	MJ	MJ	MJ	MJ	MJ	SB	SB	MJ	MJ	MJ	MJ	MJ	SB	SB	MJ	MJ	MJ	MJ	MJ	SB	SB	MJ	MJ	MJ	MJ	MJ	SB

8/16 MJ 8/17 MJ

8/15 SB

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15 | TEST ORGANISM | Beginning Date: 8/15/16 Time: 1625

Client: Jordan Valley | Common Name: Opossum shrimp | Ending Date: 8/22/16 Time: 1525

QC Test Number: TN- 16-248 | Scientific Name: *A. bahia*

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control		~~24.6~~ 25.1	25.1	25.4	25.0	~~25.6~~	25.5	~~25.5~~	8.2	7.9	8.2	7.7	8.3	7.0	8.5	5.5	5.6	5.7	6.0	5.6	5.8	5.3	30.7	30.8	30.9	30.5	29.1	30.3	29.5
50%		25.1	25.4	25.6	25.2	25.3	25.8	25.6	8.1	7.9	8.0	7.7	8.3	7.0	8.4	5.0	5.1	5.2	5.2	4.5	5.0	4.6	30.2	30.5	30.4	30.1	29.1	30.0	29.3
75%		25.7	25.6	25.6	25.4	25.9	25.8	25.8	8.1	7.9	8.0	7.6	8.1	7.1	8.2	4.5	4.1	5.2	4.1	4.1	5.5	4.1	29.9	30.2	30.1	29.8	28.6	29.8	29.0
100%		25.4	25.6	25.6	25.4	25.9	25.8	25.6	7.9	7.9	8.0	7.6	7.9	7.1	8.1	4.2	4.2	4.9	4.1	4.0	4.7	4.6	29.7	29.9	29.9	29.5	28.3	29.6	28.9
Meter Number		678	679	676	679	679	679	678	678	679	676	679	679	679	678	678	679	676	679	679	679	678	678	679	676	679	679	679	678
Time		1104	1351	1559	1046	1553	1023	1525	1104	1351	1559	1046	1553	1023	1525	1104	1351	1559	1046	1553	1023	1525	1104	1351	1559	1046	1553	1023	1525
Initials		MJ	MJ	~	MJ	MJ	JB	MJ	MJ	MJ	~	MJ	MJ	JB	MJ	MJ	MJ	~	MJ	MJ	JB	MJ	MJ	MJ	~	MJ	MJ	JB	MJ

8/16 MJ

RANDOMIZATION CHART

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 116-248

5	6	2	3	1	4
4	3	2	1	5	6
2	1	4	3	5	6
1	6	3	2	5	4

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 110-248

Date/Time/Initials	Comments/Activity

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-110-248

Aliquot of sample warmed to test temperature, then aerated if supersaturated:

Date	Sample #	ON AIR			OFF AIR		
		Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
8/16/16	ATG-407	7.9	0906	JB	6.8	0916	JB
8/17/16	ATG-407	8.4	0932	JB	6.8	0942	JB
8/18/16	ATG-407	9.1	1318	MJ	6.9	1328	MJ
8/19/16	ATG-407	9.5	0746	MJ	7.1	0756	MJ
8/20/16	ATG-407	9.2	0855	MJ	6.8	0905	MJ
8/21/16	ATG-407	8.4	0905	JB	6.6	0915	JB

Mysid Survival, Growth and Fecundity Test-48 Hr Survival

Start Date:	8/15/2016	Test ID:	TN-16-248	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-407	Sample Type:	Mock Effluent
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000
50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.6000
75	0.4000	0.4000	0.8000	0.8000	0.8000	1.0000	0.8000	0.6000
100	0.6000	0.8000	1.0000	0.6000	0.4000	0.4000	0.4000	0.4000

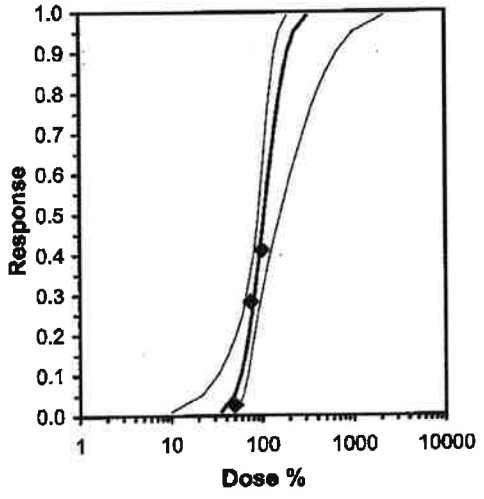
			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.9750	1.0000	1.3155	1.1071	1.3453	6.400	8				1	40
50	0.9500	0.9744	1.2879	0.8861	1.3453	12.606	8	0.288	2.156	0.2068	2	40
*75	0.7000	0.7179	1.0037	0.6847	1.3453	23.117	8	3.250	2.156	0.2068	12	40
*100	0.5750	0.5897	0.8704	0.6847	1.3453	28.140	8	4.639	2.156	0.2068	17	40

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)					0.90732		0.904		0.00049	0.99635
Bartlett's Test indicates equal variances (p = 0.06)					7.35726		11.3449			
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	50	75	61.2372	2	0.135	0.14419	0.37927	0.03682	9.7E-05	3, 28

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	4.90768	1.48225	2.00247	7.81289	0.025	1.19216	3.84146	0.27	2.02728	0.20376	7
Intercept	-4.9492	2.83861	-10.513	0.61446							
TSCR	0.02142	0.02267	-0.023	0.06585							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	35.7482	10.0556	50.207
EC05	3.355	49.2172	21.7747	62.0548
EC10	3.718	58.3639	32.6488	69.9498
EC15	3.964	65.4772	42.5933	76.4003
EC20	4.158	71.744	52.1057	82.7507
EC25	4.326	77.5963	61.0904	89.8543
EC40	4.747	94.5483	81.9188	123.124
EC50	5.000	106.482	91.6514	158.684
EC60	5.253	119.922	100.612	208.432
EC75	5.674	146.121	115.663	333.147
EC80	5.842	158.04	121.943	402.28
EC85	6.036	173.166	129.573	501.641
EC90	6.282	194.271	139.718	662.883
EC95	6.645	230.375	156.034	1003.23
EC99	7.326	317.175	191.512	2187.64



Reviewed by:

Mysid Survival, Growth and Fecundity Test-96 Hr Survival

Start Date:	8/15/2016	Test ID:	TN-16-248	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-407	Sample Type:	Mock Effluent
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000
50	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	0.8000	0.6000
75	0.4000	0.4000	0.6000	0.8000	0.8000	0.8000	0.6000	0.2000
100	0.2000	0.4000	1.0000	0.0000	0.2000	0.2000	0.2000	0.0000

			Transform: Arcsin Square Root					Rank	1-Tailed	Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
Control	0.9750	1.0000	1.3155	1.1071	1.3453	6.400	8			1	40
50	0.9000	0.9231	1.2283	0.8861	1.3453	14.264	8	59.50	48.00	4	40
*75	0.5750	0.5897	0.8658	0.4636	1.1071	27.708	8	37.50	48.00	17	40
*100	0.2750	0.2821	0.5420	0.2255	1.3453	65.813	8	40.50	48.00	29	40

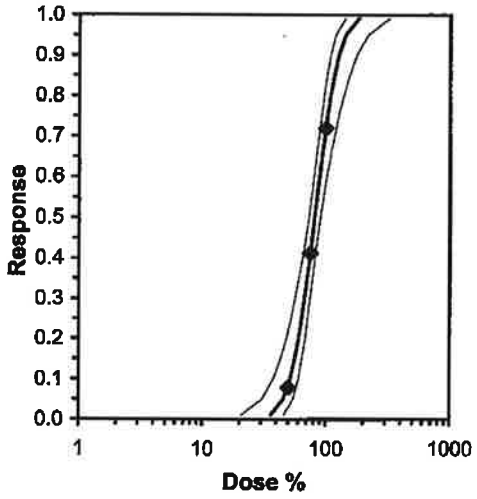
Auxiliary Tests					Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)					0.90037	0.904	1.15066	4.32238
Bartlett's Test indicates unequal variances (p = 7.90E-03)					11.8541	11.3449		
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**				
Steel's Many-One Rank Test	50	75	61.2372	2				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	6.62465	1.35849	3.96201	9.2873	0.025	0.00942	3.84146	0.92	1.91148	0.15095	3
Intercept	-7.6629	2.57912	-12.718	-2.6078							
TSCR	0.02467	0.0243	-0.0229	0.07229							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	36.3338	20.9395	46.3541
EC05	3.355	46.0451	30.9341	55.2082
EC10	3.718	52.2426	38.0014	60.7374
EC15	3.964	56.8886	43.5834	64.8924
EC20	4.158	60.8741	48.516	68.5136
EC25	4.326	64.5151	53.0909	71.9152
EC40	4.747	74.685	65.6825	82.4199
EC50	5.000	81.5598	73.4061	90.9856
EC60	5.253	89.0675	80.7378	102.059
EC75	5.674	103.108	92.2001	126.718
EC80	5.842	109.275	96.7087	138.766
EC85	6.036	116.93	102.049	154.556
EC90	6.282	127.329	108.982	177.338
EC95	6.645	144.467	119.851	217.935
EC99	7.326	183.08	142.697	322.063

Significant heterogeneity detected (p < 0.01)



Reviewed by:

Mysid Survival, Growth and Fecundity Test-7 Day Survival

Start Date:	8/15/2016	Test ID:	TN-16-248	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-407	Sample Type:	Mock Effluent
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000
50	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	0.8000	0.6000
75	0.4000	0.4000	0.6000	0.8000	0.8000	0.8000	0.6000	0.2000
100	0.2000	0.4000	1.0000	0.0000	0.2000	0.2000	0.2000	0.0000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
Control	0.9750	1.0000	1.3155	1.1071	1.3453	6.400	8			0.9750	1.0000
50	0.9000	0.9231	1.2283	0.8861	1.3453	14.264	8	59.50	48.00	0.9000	0.9231
*75	0.5750	0.5897	0.8658	0.4636	1.1071	27.708	8	37.50	48.00	0.5750	0.5897
*100	0.2750	0.2821	0.5420	0.2255	1.3453	65.813	8	40.50	48.00	0.2750	0.2821

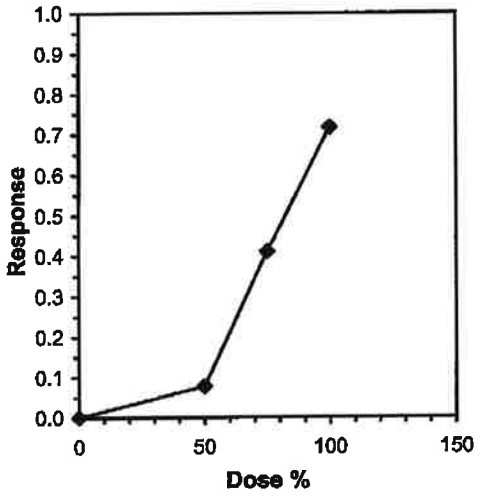
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.90037	0.904	1.15066	4.32238
Bartlett's Test indicates unequal variances (p = 7.90E-03)	11.8541	11.3449		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	50	75	61.2372	2

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	32.500	14.143	14.277	53.854	0.0623
IC10	51.731	8.332	28.554	57.778	-1.3075
IC15	55.481	4.934	42.830	63.060	-1.4940
IC20	59.231	4.361	52.269	68.781	0.0396
IC25	62.981	4.560	56.250	75.015	0.6321
IC40	74.231	5.110	65.902	84.329	0.1763
IC50	82.292				

* indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by:

Mysid Survival, Growth and Fecundity Test-Fecundity

Start Date:	8/15/2016	Test ID:	TN-16-248	Sample ID:	Jordan Valley
End Date:	8/22/2016	Lab ID:	AT6-407	Sample Type:	Mock Effluent
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	0.0000	0.0000	1.0000	0.0000	0.0000			
50	0.0000	0.0000	0.0000	0.3333	0.0000	0.0000	0.0000	0.5000
75	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	
100	0.0000	0.3333	0.0000					

			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.2000	1.0000	0.5145	0.2255	1.2094	78.860	5				0.1429	1.0000
50	0.1042	0.5208	0.3882	0.2527	0.7854	51.828	8	0.757	1.796	0.2996	0.1044	0.7311
75	0.0714	0.3571	0.4389	0.2928	0.7854	42.052	7				0.1044	0.7311
100	0.1111	0.5556	0.5001	0.3614	0.6155	25.726	3				0.1044	0.7311

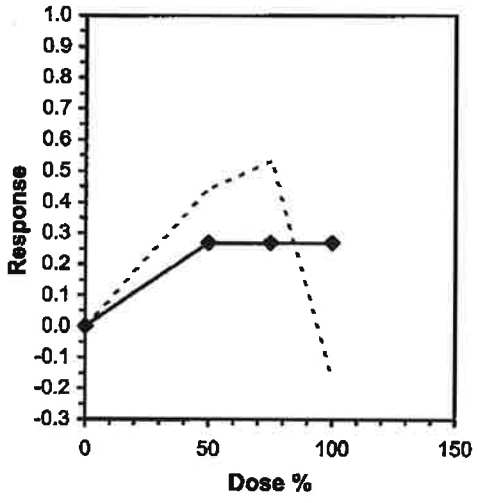
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.81643	0.814	1.58992	2.20734
F-Test indicates equal variances (p = 0.10)	4.06602	10.0505		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.19669	0.81219	0.04906	0.08563	0.46501	1, 11

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05*	9.298			
IC10*	18.595			
IC15*	27.893			
IC20*	37.190			
IC25*	46.488			
IC40	>100			
IC50	>100			

* indicates IC estimate less than the lowest concentration



Reviewed by:

Mysid Survival, Growth and Fecundity Test-Biomass

Start Date:	8/15/2016	Test ID: TN-16-248	Sample ID: Jordan Valley
End Date:	8/22/2016	Lab ID: AT6-407	Sample Type: Mock Effluent
Sample Date:		Protocol: EPAM 87-EPA Marine	Test Species: MY-Mysidopsis bahia
Comments:			

Conc-%	1	2	3	4	5	6	7	8	S.D.
Control	0.3260	0.3080	0.3480	0.3140	0.3360	0.3740	0.2680	0.3100	0.03141
50	0.2440	0.2720	0.3140	0.3400	0.2440	0.3240	0.2340	0.1940	0.05096
75	0.0940	0.0920	0.1920	0.2560	0.1180	0.2700	0.1560	0.0360	0.08275
100	0.0840	0.1000	0.3220	0.0000	0.0340	0.0440	0.0100	0.0000	0.10679

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.3230	1.0000	0.3230	0.2680	0.3740	9.723	8				0.3230	1.0000
*50	0.2708	0.8382	0.2708	0.1940	0.3400	18.820	8	2.469	1.761	0.0373	0.2708	0.8382
75	0.1518	0.4698	0.1518	0.0360	0.2700	54.530	8	4.636	2.156	0.0796	0.1518	0.4698
100	0.0743	0.2299	0.0743	0.0000	0.3220	143.824	8	6.734	2.156	0.0796	0.0743	0.2299

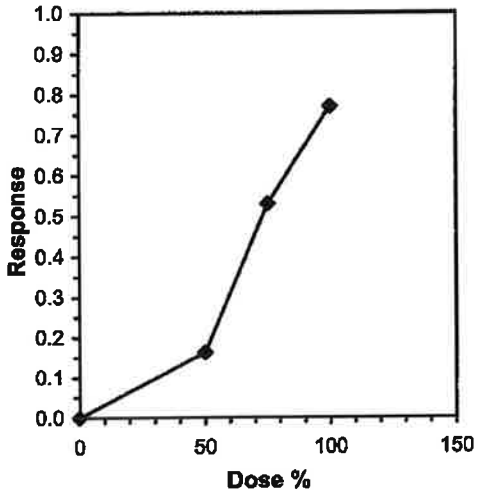
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97757	0.844	0.002	-0.5544
F-Test indicates equal variances (p = 0.22)	2.6326	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.03727	0.1154	0.01092	0.00179	0.02704	1, 14

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	15.455	10.072	9.270	50.520	1.8827
IC10*	30.909	11.273	18.540	53.512	0.4826
IC15*	46.364	8.964	27.810	55.924	-0.4159
IC20	52.595	6.023	37.080	59.300	-1.0648
IC25	55.987	4.304	46.350	64.131	-0.6819
IC40	66.166	4.706	59.106	77.552	0.8176
IC50	72.952				

* indicates IC estimate less than the lowest concentration



ATTACHMENT II

Chemical Analyses
(61 pages)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-57381-1
Client Project/Site: Jordan Valley

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Authorized for release by:
8/15/2016 2:08:06 PM

Carrie Gamber, Senior Project Manager
(412)963-2428
carrie.gamber@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 180-57381-1

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-57381-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 08/10/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.6 C.

METALS
The following sample was diluted to bring the concentration of sodium to within the instrument's linear range: ATB-391 (SALINITY ADJUSTED OUTFALL 001) (180-57381-1). Elevated reporting limits (RLs) are provided.

Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following sample: ATB-391 (SALINITY ADJUSTED OUTFALL 001) (180-57381-1).

GENERAL CHEMISTRY
Samples ATB-391 (SALINITY ADJUSTED OUTFALL 001) (180-57381-1) required dilution prior to analysis for IC. The reporting limits have been adjusted accordingly.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure for TDS: ATB-391 (SALINITY ADJUSTED OUTFALL 001) (180-57381-1), (180-57389-A-2) and (180-57389-A-2 DU). The reporting limits (RLs) have been adjusted proportionately.

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4	200.7	Water	Barium
200.7 Rev 4.4	200.7	Water	Boron
200.7 Rev 4.4	200.7	Water	Calcium
200.7 Rev 4.4	200.7	Water	Magnesium
200.7 Rev 4.4	200.7	Water	Potassium
200.7 Rev 4.4	200.7	Water	Sodium
200.7 Rev 4.4	200.7	Water	Strontium
300.0		Water	Bromide
300.0		Water	Chloride
300.0		Water	Sulfate
SM 2540C		Water	Total Dissolved Solids
SM 2540D		Water	Total Suspended Solids

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-17
Arizona	State Program	9	AZ0671	10-13-16
California	LA Cty Sanitation Districts	9	10256	01-31-17 *
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 12.002r	01-23-17
Hawaii	State Program	9	N/A	01-29-17
Kansas	NELAP Secondary AB	7	E-10420	07-31-16 *
Nevada	State Program	9	CA015312016-2	07-31-17 *
New Mexico	State Program	6	N/A	01-29-17
Northern Mariana Islands	State Program	9	MP0002	01-29-17
Oregon	NELAP	10	4028	01-29-17
USDA	Federal		P330-09-00080	07-08-18
Washington	State Program	10	C900	09-03-16

* Certification renewal pending - certification considered valid.

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Water	08/09/16 13:47	08/10/16 09:00

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
SM 2320B	Alkalinity	SM	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Client Sample ID: ATB-391 (SALINITY ADJUSTED OUTFALL 001)
Lab Sample ID: 180-57381-1
Date Collected: 08/09/16 13:47
Date Received: 08/10/16 09:00
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			184367	08/10/16 11:53	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	300.0		500			184367	08/10/16 12:11	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.7			50 mL	50 mL	184513	08/11/16 07:13	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		5			184669	08/12/16 07:34	RJR	TAL PIT
	Instrument ID: Q									
Total Recoverable	Prep	200.7			50 mL	50 mL	184513	08/11/16 07:13	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		50			184669	08/12/16 07:39	RJR	TAL PIT
	Instrument ID: Q									
Total/NA	Analysis	SM 2320B		1			349122	08/14/16 09:32	YZ	TAL IRV
	Instrument ID: MANTECH01									
Total/NA	Analysis	SM 2540C		1	4 mL	100 mL	184485	08/10/16 15:29	JWS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	184494	08/10/16 17:31	JWS	TAL PIT
	Instrument ID: NOEQUIP									

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL IRV

Batch Type: Analysis

YZ = Yuriy Zakhrabov

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

Batch Type: Analysis

JWS = Jim Swanson

MJH = Matthew Hartman

RJR = Ron Rosenbaum

Client Sample Results

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Client Sample ID: ATB-391 (SALINITY ADJUSTED OUTFALL 001)
Date Collected: 08/09/16 13:47
Date Received: 08/10/16 09:00

Lab Sample ID: 180-57381-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	85		25	2.9	mg/L			08/10/16 11:53	50
Chloride	17000		500	170	mg/L			08/10/16 12:11	500
Sulfate	3200		50	17	mg/L			08/10/16 11:53	50

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2900		1000	22	ug/L		08/11/16 07:13	08/12/16 07:34	5
Barium	260	J	1000	4.5	ug/L		08/11/16 07:13	08/12/16 07:34	5
Calcium	980000		25000	360	ug/L		08/11/16 07:13	08/12/16 07:34	5
Potassium	410000		25000	4200	ug/L		08/11/16 07:13	08/12/16 07:34	5
Magnesium	1500000		25000	200	ug/L		08/11/16 07:13	08/12/16 07:34	5
Sodium	8000000		250000	11000	ug/L		08/11/16 07:13	08/12/16 07:39	50
Strontium	10000		250	26	ug/L		08/11/16 07:13	08/12/16 07:34	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	870		4.0	4.0	mg/L			08/14/16 09:32	1
Bicarbonate Alkalinity as CaCO3	870		4.0	4.0	mg/L			08/14/16 09:32	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/14/16 09:32	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/14/16 09:32	1
Bicarbonate ion as HCO3	1100		4.8	4.8	mg/L			08/14/16 09:32	1
Carbonate as CO3	ND		2.4	2.4	mg/L			08/14/16 09:32	1
Hydroxide as OH	ND		1.4	1.4	mg/L			08/14/16 09:32	1
Total Dissolved Solids	36000		250	250	mg/L			08/10/16 15:29	1
Total Suspended Solids	2.2		0.50	0.50	mg/L			08/10/16 17:31	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-184367/6
Matrix: Water
Analysis Batch: 184367

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.50	0.058	mg/L			08/10/16 07:33	1
Chloride	ND		1.0	0.33	mg/L			08/10/16 07:33	1
Sulfate	ND		1.0	0.34	mg/L			08/10/16 07:33	1

Lab Sample ID: LCS 180-184367/5
Matrix: Water
Analysis Batch: 184367

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	10.0	10.4		mg/L		104	90 - 110
Chloride	50.0	51.3		mg/L		103	90 - 110
Sulfate	50.0	50.5		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-184513/1-A
Matrix: Water
Analysis Batch: 184639

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 184513

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	4.4	ug/L		08/11/16 07:13	08/11/16 13:26	1
Barium	ND		200	0.89	ug/L		08/11/16 07:13	08/11/16 13:26	1
Calcium	ND		5000	73	ug/L		08/11/16 07:13	08/11/16 13:26	1
Potassium	ND		5000	840	ug/L		08/11/16 07:13	08/11/16 13:26	1
Magnesium	ND		5000	41	ug/L		08/11/16 07:13	08/11/16 13:26	1
Sodium	ND		5000	230	ug/L		08/11/16 07:13	08/11/16 13:26	1
Strontium	ND		50	5.3	ug/L		08/11/16 07:13	08/11/16 13:26	1

Lab Sample ID: LCS 180-184513/2-A
Matrix: Water
Analysis Batch: 184639

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 184513

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	1070		ug/L		107	85 - 115
Barium	2000	2000		ug/L		100	85 - 115
Calcium	50000	51200		ug/L		102	85 - 115
Potassium	50000	52400		ug/L		105	85 - 115
Magnesium	50000	51500		ug/L		103	85 - 115
Sodium	50000	52800		ug/L		106	85 - 115
Strontium	1000	1000		ug/L		100	85 - 115

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 440-349122/4
Matrix: Water
Analysis Batch: 349122

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/14/16 07:10	1
Bicarbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/14/16 07:10	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/14/16 07:10	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/14/16 07:10	1
Bicarbonate ion as HCO3	ND		4.8	4.8	mg/L			08/14/16 07:10	1
Carbonate as CO3	ND		2.4	2.4	mg/L			08/14/16 07:10	1
Hydroxide as OH	ND		1.4	1.4	mg/L			08/14/16 07:10	1

Lab Sample ID: LCS 440-349122/2
Matrix: Water
Analysis Batch: 349122

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3	63.4	64.5		mg/L		102	80 - 120

Lab Sample ID: LCSD 440-349122/3
Matrix: Water
Analysis Batch: 349122

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity as CaCO3	63.4	66.5		mg/L		105	80 - 120	3	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-184485/2
Matrix: Water
Analysis Batch: 184485

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/10/16 15:29	1

Lab Sample ID: LCS 180-184485/1
Matrix: Water
Analysis Batch: 184485

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	216	244		mg/L		113	80 - 120

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 180-184494/2
Matrix: Water
Analysis Batch: 184494

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		0.50	0.50	mg/L			08/10/16 17:31	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 180-184494/1
Matrix: Water
Analysis Batch: 184494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	78.0	82.0		mg/L		105	80 - 120

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

HPLC/IC

Analysis Batch: 184367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total/NA	Water	300.0	
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total/NA	Water	300.0	
MB 180-184367/6	Method Blank	Total/NA	Water	300.0	
LCS 180-184367/5	Lab Control Sample	Total/NA	Water	300.0	

Metals

Prep Batch: 184513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total Recoverable	Water	200.7	
MB 180-184513/1-A	Method Blank	Total Recoverable	Water	200.7	
LCS 180-184513/2-A	Lab Control Sample	Total Recoverable	Water	200.7	

Analysis Batch: 184639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-184513/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	184513
LCS 180-184513/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	184513

Analysis Batch: 184669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total Recoverable	Water	200.7 Rev 4.4	184513
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total Recoverable	Water	200.7 Rev 4.4	184513

General Chemistry

Analysis Batch: 184485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total/NA	Water	SM 2540C	
MB 180-184485/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-184485/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 184494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total/NA	Water	SM 2540D	
MB 180-184494/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 180-184494/1	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 349122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57381-1	ATB-391 (SALINITY ADJUSTED OUTFALL 001)	Total/NA	Water	SM 2320B	
MB 440-349122/4	Method Blank	Total/NA	Water	SM 2320B	
LCS 440-349122/2	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 440-349122/3	Lab Control Sample Dup	Total/NA	Water	SM 2320B	

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica

Client Information	Sampler	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-31222-6905.1
Client Contact: Mike Chanov	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology				Job #:
Address: 225 Schilling Circle Suite 400	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Hunt Valley	TAT Requested (days):			
State, Zip: MD, 21031				
Phone: 410-329-5120(Tel)	PO #: Purchase Order Requested			
Email: mchanov@eaest.com	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

180-57381 Chain of Custody

ydrate

N - EDTA
L - EDA
W - ph 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewat, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	METALS	IC Cl, SO4 (Hold Time)	TSS	TDS	Alkalinity (Time)	Total Number of containers	Special Instructions/Note:
			Preservation Code:										
AT6-391 (Salinity Adjusted Outfall001)	8/2/16	1347	G	W			X	X	X	X	X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: TA	Date:	Time:		Method of Shipment: Courier			
Relinquished by:	Date/Time: 8/2/16 1431	Company	Received by:	Date/Time: 8/10/16 11:00	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:


MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031
32 LBS
1 OF 1
SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907
PA 152 9-22
UPS NEXT DAY AIR
1
TRACKING #: 1Z 288 682 01 9131 8531
Uncorrected temp
Thermometer ID
CF
Initials
PT-WI-SR-001 effective 7/26/13
BILLING: P/P
UPS CARBON NEUTRAL SHIPMENT
Department Code: 2122
Project Phase AND Task: TOXLAB
GS 18 5 39
WN2W50 78.0A 07/2016


180-57381 Waybill

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-250923.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		**Analysis Requested**		Job #: 180-57381-1
Address: 17461 Derian Ave. Suite 100,	Due Date Requested: 8/15/2016			**Preservation Codes:** A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #:			
Email:	WO #:			Other:
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	2320B/ (MOD) Alkalinity all forms	Total Number of containers	Special Instructions/Note:
			Preservation Code:					
ATB-391 (SALINITY ADJUSTED OUTFALL 001) (180-57381-1)	8/9/16	13:47 Eastern		Water		X	1	

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: FedEx 6479 2545 6073
Relinquished by:	Date/Time: 8/11/16	Company	Received by:	Date/Time: 8/12/16 9:50	Company: TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: (3) 3.2/2.5 IR-77		

8/15/2016

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-57381-1

Login Number: 57381
List Number: 1
Creator: Kovitch, Christina M

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-57381-1

Login Number: 57381
List Number: 2
Creator: Ornelas, Olga

List Source: TestAmerica Irvine
List Creation: 08/12/16 12:23 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-58161-1
Client Project/Site: Jordan Valley

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Carrie A. Gamber

Authorized for release by:
9/6/2016 8:57:19 AM

Carrie Gamber, Senior Project Manager
(412)963-2428
carrie.gamber@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 180-58161-1

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-58161-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The sample was received on 8/10/2016 11:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° C.

This sample is a re-log of sample 180-57381.

METALS
The following sample was diluted due to the nature of the sample matrix: AT6-391 (SALINTY ADJUSTED OUTFALL 001) (180-58161-1). Elevated reporting limits (RLs) are provided.

Definitions/Glossary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.8	200.8	Water	Antimony
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Beryllium
200.8	200.8	Water	Cadmium
200.8	200.8	Water	Chromium
200.8	200.8	Water	Copper
200.8	200.8	Water	Hardness as calcium carbonate
200.8	200.8	Water	Iron
200.8	200.8	Water	Lead
200.8	200.8	Water	Manganese
200.8	200.8	Water	Nickel
200.8	200.8	Water	Selenium
200.8	200.8	Water	Silver
200.8	200.8	Water	Thallium
200.8	200.8	Water	Zinc
245.1	245.1	Water	Mercury

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-58161-1	AT6-391 (SALINTY ADJUSTED OUTFALL 001)	Water	08/09/16 13:47	08/10/16 11:00

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Method	Method Description	Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL PIT
245.1	Mercury (CVAA)	EPA	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Client Sample ID: AT6-391 (SALINTY ADJUSTED OUTFALL 001)

Lab Sample ID: 180-58161-1

Date Collected: 08/09/16 13:47

Matrix: Water

Date Received: 08/10/16 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	200.8			50 mL	50 mL	186700	09/01/16 08:09	ANA	TAL PIT
Total Recoverable	Analysis	200.8		10			186819	09/01/16 21:28	CNF	TAL PIT
	Instrument ID: A									
Total/NA	Prep	245.1			50 mL	50 mL	186696	09/01/16 12:03	EVR	TAL PIT
Total/NA	Analysis	245.1		1			186923	09/02/16 10:02	EVR	TAL PIT
	Instrument ID: K									

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

EVR = Emilie Reichenbach

Batch Type: Analysis

CNF = Caitlin Ferguson

EVR = Emilie Reichenbach

Client Sample Results

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Client Sample ID: AT6-391 (SALINTY ADJUSTED OUTFALL 001)
Date Collected: 08/09/16 13:47
Date Received: 08/10/16 11:00

Lab Sample ID: 180-58161-1
Matrix: Water

Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		10	0.88	ug/L		09/01/16 08:09	09/01/16 21:28	10
Arsenic	**19**		10	0.74	ug/L		09/01/16 08:09	09/01/16 21:28	10
Beryllium	ND		10	0.64	ug/L		09/01/16 08:09	09/01/16 21:28	10
Cadmium	ND		10	1.6	ug/L		09/01/16 08:09	09/01/16 21:28	10
Chromium	**24**		20	0.90	ug/L		09/01/16 08:09	09/01/16 21:28	10
Copper	**59**		20	4.0	ug/L		09/01/16 08:09	09/01/16 21:28	10
Iron	ND		500	94	ug/L		09/01/16 08:09	09/01/16 21:28	10
Manganese	**15**	**J**	50	2.1	ug/L		09/01/16 08:09	09/01/16 21:28	10
Nickel	**20**		10	2.4	ug/L		09/01/16 08:09	09/01/16 21:28	10
Lead	**3.1**	**J**	10	0.60	ug/L		09/01/16 08:09	09/01/16 21:28	10
Antimony	ND		20	3.0	ug/L		09/01/16 08:09	09/01/16 21:28	10
Selenium	**31**	**J**	50	3.2	ug/L		09/01/16 08:09	09/01/16 21:28	10
Thallium	ND		10	0.24	ug/L		09/01/16 08:09	09/01/16 21:28	10
Zinc	**96**		50	18	ug/L		09/01/16 08:09	09/01/16 21:28	10
Hardness as calcium carbonate	**8700**		0.033	0.71	mg/L		09/01/16 08:09	09/01/16 21:28	10

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**2.7**		0.20	0.039	ug/L		09/01/16 12:03	09/02/16 10:02	1

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 180-186700/1-A
Matrix: Water
Analysis Batch: 186819

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 186700

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.088	ug/L		09/01/16 08:09	09/01/16 21:11	1
Arsenic	ND		1.0	0.074	ug/L		09/01/16 08:09	09/01/16 21:11	1
Beryllium	ND		1.0	0.064	ug/L		09/01/16 08:09	09/01/16 21:11	1
Cadmium	ND		1.0	0.16	ug/L		09/01/16 08:09	09/01/16 21:11	1
Chromium	ND		2.0	0.090	ug/L		09/01/16 08:09	09/01/16 21:11	1
Copper	ND		2.0	0.40	ug/L		09/01/16 08:09	09/01/16 21:11	1
Iron	ND		50	9.4	ug/L		09/01/16 08:09	09/01/16 21:11	1
Manganese	ND		5.0	0.21	ug/L		09/01/16 08:09	09/01/16 21:11	1
Nickel	ND		1.0	0.24	ug/L		09/01/16 08:09	09/01/16 21:11	1
Lead	ND		1.0	0.060	ug/L		09/01/16 08:09	09/01/16 21:11	1
Antimony	ND		2.0	0.30	ug/L		09/01/16 08:09	09/01/16 21:11	1
Selenium	ND		5.0	0.32	ug/L		09/01/16 08:09	09/01/16 21:11	1
Thallium	ND		1.0	0.024	ug/L		09/01/16 08:09	09/01/16 21:11	1
Zinc	ND		5.0	1.8	ug/L		09/01/16 08:09	09/01/16 21:11	1
Hardness as calcium carbonate	ND		0.0033	0.071	mg/L		09/01/16 08:09	09/01/16 21:11	1

Lab Sample ID: LCS 180-186700/2-A
Matrix: Water
Analysis Batch: 186819

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 186700

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	54.1		ug/L		108	85 - 115
Arsenic	40.0	42.4		ug/L		106	85 - 115
Beryllium	50.0	51.0		ug/L		102	85 - 115
Cadmium	50.0	53.9		ug/L		108	85 - 115
Chromium	200	205		ug/L		103	85 - 115
Copper	250	251		ug/L		100	85 - 115
Iron	1000	1070		ug/L		107	85 - 115
Manganese	500	507		ug/L		101	85 - 115
Nickel	500	494		ug/L		99	85 - 115
Lead	20.0	20.4		ug/L		102	85 - 115
Antimony	500	514		ug/L		103	85 - 115
Thallium	50.0	48.0		ug/L		96	85 - 115
Zinc	500	517		ug/L		103	85 - 115

Lab Sample ID: LCS 180-186700/2-A
Matrix: Water
Analysis Batch: 186819

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 186700

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	10.0	8.76		ug/L		88	85 - 115

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 180-186696/1-A
Matrix: Water
Analysis Batch: 186923

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 186696

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.039	ug/L		09/01/16 07:32	09/02/16 09:39	1

Lab Sample ID: LCS 180-186696/2-A
Matrix: Water
Analysis Batch: 186923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 186696

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.50		ug/L		100	85 - 115

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

Metals

Prep Batch: 186696

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-58161-1	AT6-391 (SALINTY ADJUSTED OUTFALL 001)	Total/NA	Water	245.1	
MB 180-186696/1-A	Method Blank	Total/NA	Water	245.1	
LCS 180-186696/2-A	Lab Control Sample	Total/NA	Water	245.1	

Prep Batch: 186700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-58161-1	AT6-391 (SALINTY ADJUSTED OUTFALL 001)	Total Recoverable	Water	200.8	
MB 180-186700/1-A	Method Blank	Total Recoverable	Water	200.8	
LCS 180-186700/2-A	Lab Control Sample	Total Recoverable	Water	200.8	

Analysis Batch: 186819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-58161-1	AT6-391 (SALINTY ADJUSTED OUTFALL 001)	Total Recoverable	Water	200.8	186700
MB 180-186700/1-A	Method Blank	Total Recoverable	Water	200.8	186700
LCS 180-186700/2-A	Lab Control Sample	Total Recoverable	Water	200.8	186700
LCS 180-186700/2-A	Lab Control Sample	Total Recoverable	Water	200.8	186700

Analysis Batch: 186923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-58161-1	AT6-391 (SALINTY ADJUSTED OUTFALL 001)	Total/NA	Water	245.1	186696
MB 180-186696/1-A	Method Blank	Total/NA	Water	245.1	186696
LCS 180-186696/2-A	Lab Control Sample	Total/NA	Water	245.1	186696

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica

Client Information	Sampler	Lab PM: Gamber, Carrie L	Carrier Tracking No(s)	COC No: 180-31222-6905.1
Client Contact: Mike Chanov	Phone	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology		Analysis Requested		Job #:
Address: 225 Schilling Circle Suite 400	Due Date Requested:			Preservation Codes:
City: Hunt Valley	TAT Requested (days):			
State, Zip: MD 21031	PO #: Purchase Order Requested			
Phone: 410-329-5120(Tel)	WO #:			
Email: mchanov@eaest.com	Project #: 18015970			
Project Name: Jordan Valley	SSOW#:			
Site:				

180-58161 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	METALS	16 CFR 436 Hold Time	TSS	TDS	Alkalinity (Trace)	Total Number of containers	Special Instructions/Note:
			Preservation Code:										Other:
AT6-371 (Salinity Adjusted Outfall001)	8/2/10	1347	G	W			X	X	X	X	X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by: TA	Date:	Time:	Method of Shipment: Courier

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	8/2/10 1431			8/10/10 11:00	
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks


MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031
32 LBS
1 OF 1
SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907
PA 152 9-22
UPS NEXT DAY AIR
1
TRACKING #: 1Z 288 682 01 9131 8531
Uncorrected temp
Thermometer ID
CF
Initials
BILLING: P/P
UPS CARBON NEUTRAL SHIPMENT
Department Code: 2122
Project Phase AND Task: TOXLAB


180-56161 Waybill

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-58161-1

Login Number: 58161
List Number: 1
Creator: Neri, Tom

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CHEMTECH-FORD
LABORATORIES

8/30/2016

Work Order: 16H0441

Jordan Valley Water Conservancy District

Attn: Marie Owens

15305 South 3200 West

Herriman, UT 84065

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

Approved By: Dave Gayer, Laboratory Director

CHEMTECH-FORD
LABORATORIES

Certificate of Analysis

Lab Sample No.: 16H0441-01

Name: Jordan Valley Water Conservancy District
Sample Site: GSL Discharge
Comments:
Sample Matrix: Water
PO Number:

Sample Date: 8/8/2016 11:51 AM
Receipt Date: 8/8/2016 12:51 PM
Sampler: Glen McIntyre
Project:

Parameter	Sample Result	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Calculations							
Hardness, Total as CaCO3	2880	1.3	mg/L	SM 2340B	08/13/2016 10:54	8/13/2016 14:30	
Inorganic							
Alkalinity - Bicarbonate (HCO3)	1020	1.0	mg/L	SM 2320 B	08/17/2016 09:30	8/17/2016 13:47	
Alkalinity - Carbonate (CO3)	ND	1.0	mg/L	SM 2320 B	08/17/2016 09:30	8/17/2016 13:47	
Alkalinity - CO2	741	1.0	mg/L	SM 2320 B	08/17/2016 09:30	8/17/2016 13:47	
Alkalinity - Hydroxide (OH)	ND	1.0	mg/L	SM 2320 B	08/17/2016 09:30	8/17/2016 13:47	
Alkalinity - Total (as CaCO3)	834	1.0	mg/L	SM 2320 B	08/17/2016 09:30	8/17/2016 13:47	
Chloride	862	10	mg/L	EPA 300.0	08/09/2016 13:55	8/9/2016 14:04	
Conductivity	5640	1	umho/cm	EPA 120.1	08/12/2016 10:10	8/12/2016 10:10	
Cyanide, Total	0.002	0.002	mg/L	SM 4500 CN-E	08/11/2016 09:50	8/11/2016 16:25	
Fluoride	0.6	0.1	mg/L	EPA 300.0	08/08/2016 23:32	8/9/2016 6:11	
Nitrate as N	9.4	0.5	mg/L	SM 4500 NO3- F	08/08/2016 15:52	8/8/2016 18:24	
Nitrite as N	ND	0.1	mg/L	SM 4500 NO2-B	08/08/2016 16:44	8/8/2016 18:44	
pH	7.9	0.1	pH Units	SM 4500 H-B	08/08/2016 13:00	8/8/2016 13:00	
Phosphate, ortho as P	0.06	0.01	mg/L	SM 4500 P-E	08/09/2016 15:41	8/9/2016 15:41	
Sulfate	1470	10	mg/L	EPA 300.0	08/09/2016 11:28	8/9/2016 14:04	
Turbidity	0.39	0.02	NTU	EPA 180.1	08/08/2016 15:15	8/8/2016 15:15	
Metals							
Antimony, Total	0.0006	0.0005	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Arsenic, Total	0.0213	0.0005	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Barium, Total	0.272	0.005	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Beryllium, Total	ND	0.001	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Calcium, Total	707	0.2	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Cadmium, Total	0.0002	0.0002	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Chromium, Total	0.022	0.005	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Copper, Total	0.066	0.005	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Iron, Total	ND	0.02	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Lead, Total	0.0013	0.0005	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Mercury, Total	ND	0.0002	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Magnesium, Total	271	0.2	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Manganese, Total	ND	0.005	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Nickel, Total	ND	0.005	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Potassium, Total	15.9	0.5	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	
Selenium, Total	0.0382	0.0005	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Silver, Total	ND	0.0005	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Sodium, Total	355	0.5	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	

9632 South 500 West
Sandy, UT 84070
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CHEMTECH-FORD
LABORATORIES

Certificate of Analysis

Lab Sample No.: 16H0441-01

Name:	**Jordan Valley Water Conservancy District**	***Sample Date:***	8/8/2016 11:51 AM
Sample Site:	GSL Discharge	***Receipt Date:***	8/8/2016 12:51 PM
Comments:		***Sampler:***	Glen McIntyre
Sample Matrix:	Water	***Project:***	
PO Number:			

Parameter	Sample Result	Minimum Reporting Limit	Units	Analytical Method	Preparation Date/Time	Analysis Date/Time	Flag
Metals							
Thallium, Total	ND	0.0002	mg/L	EPA 200.8	08/09/2016 16:21	8/9/2016 23:10	
Zinc, Total	0.11	0.01	mg/L	EPA 200.7	08/13/2016 10:54	8/13/2016 14:30	

9632 South 500 West
Sandy, UT 84070
801-262-7299 Office

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: Jordan Valley WCD
ADDRESS: 15305 S 3200 W
CITY/STATE/ZIP: Herriman, UT 84065
PHONE #: _____ PROJECT: _____
CONTACT: _____
EMAIL _____

BILLING CONTACT: Jordan Valley WCD
BILLING ADDRESS: 15305 S 3200 W
BILLING CITY/STATE/ZIP: Herriman, UT 84065

TURNAROUND REQUIRED*: _____
* Expedited turnaround subject to additional charge

☐ Mark "X" here if you want a copy sent toe DEQ Division of Drinking Water

★ TDS ? TSS CANCELLED DUE TO LOW SAMPLE VOLUME PER GLEN @ 08-08-16

PWSID #: 18027

MATRIX	SAMPLE TYPE	
DW - Drinking Water	R - Routine	TG - Trigger Source
WW - Wastewater	C - Compliance	CO - Confirmation
W - Water	I - Investigative	OR - Original
S - Soil	SP - Special Project	UP - Upstream
SO - Solid		DN - Downstream
SL - Sludge		

Lab ID #	SAMPLE LOCATION	CUSTOMER ID #	SAMPLE DATE	SAMPLE TIME	Drinking Water Only: SAMPLE SOURCE CODE	Drinking Water Only: SAMPLE POINT CODE	MATRIX	ANALYTICAL TESTS REQUESTED	SAMPLE TYPE	FIELD Chlorine Residual
H0441										
01	1 - GSL Discharge	16080808-01	8/8/2016	1151	H5		W	Complete Inorganics Source	SP	

Sampled by: [print] MCINTYRE, GLEN
Sampled by: [signature] [signature]

ON ICE ☐ NOT ON ICE ☐ Temp (C): 8.3

Special Instructions _____

Relinquished by: [signature] [signature]	Date/Time 8/8/16 1251	Received by: [signature] [signature]	Date/Time 8-8-16 1251
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

CHEMTECH-FORD 9632 South 500 West Sandy, UT 84070 Phone: 801-262-7299 FAX: 866-792-0093 www.chemtechford.com

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

CHEMTECH FORD LABORATORIES
Sample Receipt

CHEMTECH-FORD LABORATORIES

Work Order # H0441

Delivery Method:

- ☐ UPS
- ☐ USPS
- ☐ FedEx
- ☐ Chemtech Courier
- ☒ Walk-in
- ☐ Customer Courier

Receiving Temperature 8.3 °C

Sample #	Container	Chemtech Lot # or Preservative	Number of Subsamples	Preserved by Client/Third Party	Preserved in Receiving Laboratory	Filtered in Field by Client	Misc Volume (oz/mL)	Comments
01	M	692						
	Amb							
	L	715						

Sample Condition (check if yes)

- ☐ Custody Seals
- ☒ Containers Intact
- ☒ COC/Labels Agree
- ☒ Preservation Confirmed
- ☒ Received on Ice
- ☒ Correct Containers(s)
- ☒ Sufficent Sample Volume
- ☐ Headspace Present (VOC)
- ☐ Temperature Blank
- ☒ Received within Holding Time

Plastic Containers

A- Plastic Unpreserved
B- Miscellaneous Plastic
C- Cyanide Qt (NaOH)
E- Coliform/Ecoli/HPC
F- Sulfide Qt (Zn Acetate)
L- Mercury 1631
M- Metals Pint (HNO3)
N- Nutrient Pint (H2SO4)
R- Radiological (HNO3)
S- Sludge Cups/Tubs
Q- Plastic Bag

Glass Containers

D- 625 (Na2S2O3)
G- Glass Unpreserved
H- HAAs (NH4Cl)
J- 508/515/525 (Na2SO3)
K- 515.3 Herbicides
O- Oil & Grease (HCl)
P- Phenols (H2SO4)
T- TOC/TOX (H3PO4)
U- 531 (MCAA, Na2S2O3)
V- 524/THMs (Ascorbic Acid)
W- 8260 VOC (1:1 HCl)
X- Vial Unpreserved
Y- 624/504 (Na2S2O3)
Z- Miscellaneous Glass

CHEMTECH-FORD
LABORATORIES

Certificate of Analysis

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit.
1 mg/L = one milligram per liter or 1 mg/Kg = one milligram per kilogram = 1 part per million.
1 ug/L = one microgram per liter or 1 ug/Kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/Kg = one nanogram per kilogram = 1 part per trillion.

Flag Descriptions

9632 South 500 West
Sandy, UT 84070
801-262-7299 Office

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-57624-1
Client Project/Site: Jordan Valley

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Authorized for release by:
8/18/2016 4:22:45 PM
Julie Unger, Project Management Assistant I
julie.unger@testamericainc.com

Designee for

Carrie Gamber, Senior Project Manager
(412)963-2428
carrie.gamber@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 180-57624-1

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-57624-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The sample was received on 8/16/2016 10:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3° C.

METALS

The following sample was diluted due to the nature of the sample matrix: MOCK (AT6-407) (180-57624-1). Elevated reporting limits (RLs) are provided.

The following samples were diluted due to the nature of the sample matrix: MOCK (AT6-407) (180-57624-1) and (180-57624-F-1-C SD ^). Elevated reporting limits (RLs) are provided. Sample was initially analyzed at a 10x dilution due to suspected matrix.

The following samples were diluted to bring the concentration of sodium within the linear range of the instrument: MOCK (AT6-407) (180-57624-1) and (180-57624-F-1-C SD ^). Elevated reporting limits (RLs) are provided.

Strontium was detected in method blank MB 180-185016/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

GENERAL CHEMISTRY

Sample MOCK (AT6-407) (1)[50X] required dilution prior to Method 300 analysis. The reporting limits have been adjusted accordingly.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure for Method 2540C: MOCK (AT6-407) (180-57624-1), (180-57449-E-1) and (180-57449-A-1 DU). The reporting limits (RLs) have been adjusted proportionately.

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4	200.7	Water	Barium
200.7 Rev 4.4	200.7	Water	Boron
200.7 Rev 4.4	200.7	Water	Calcium
200.7 Rev 4.4	200.7	Water	Magnesium
200.7 Rev 4.4	200.7	Water	Potassium
200.7 Rev 4.4	200.7	Water	Sodium
200.7 Rev 4.4	200.7	Water	Strontium
200.8	200.8	Water	Antimony
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Beryllium
200.8	200.8	Water	Cadmium
200.8	200.8	Water	Chromium
200.8	200.8	Water	Copper
200.8	200.8	Water	Hardness as calcium carbonate
200.8	200.8	Water	Iron
200.8	200.8	Water	Lead
200.8	200.8	Water	Manganese
200.8	200.8	Water	Nickel
200.8	200.8	Water	Selenium
200.8	200.8	Water	Silver
200.8	200.8	Water	Thallium
200.8	200.8	Water	Zinc
245.1	245.1	Water	Mercury
300.0		Water	Bromide
300.0		Water	Chloride
300.0		Water	Fluoride
300.0		Water	Nitrate as N
300.0		Water	Nitrite as N
300.0		Water	Orthophosphate as P
300.0		Water	Sulfate
SM 2540C		Water	Total Dissolved Solids
SM 2540D		Water	Total Suspended Solids

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-17
Arizona	State Program	9	AZ0671	10-13-16
California	LA Cty Sanitation Districts	9	10256	01-31-17 *
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 12.002r	01-23-17
Hawaii	State Program	9	N/A	01-29-17
Kansas	NELAP Secondary AB	7	E-10420	07-31-16 *
Nevada	State Program	9	CA015312016-2	07-31-17 *
New Mexico	State Program	6	N/A	01-29-17
Northern Mariana Islands	State Program	9	MP0002	01-29-17

* Certification renewal pending - certification considered valid.

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Laboratory: TestAmerica Irvine (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Oregon	NELAP	10	4028	01-29-17
USDA	Federal		P330-09-00080	07-08-18
Washington	State Program	10	C900	09-03-16

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-57624-1	MOCK (AT6-407)	Water	08/15/16 16:00	08/16/16 10:15

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
200.8	Metals (ICP/MS)	EPA	TAL PIT
245.1	Mercury (CVAA)	EPA	TAL PIT
SM 2320B	Alkalinity	SM	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Client Sample ID: MOCK (AT6-407)

Date Collected: 08/15/16 16:00
Date Received: 08/16/16 10:15

Lab Sample ID: 180-57624-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			184925	08/16/16 12:18	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	300.0		500			184925	08/16/16 12:33	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	185016	08/16/16 13:21	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		10			185127	08/17/16 08:04	RJG	TAL PIT
	Instrument ID: C									
Total Recoverable	Prep	200.7			50 mL	50 mL	185016	08/16/16 13:21	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		25			185127	08/17/16 08:15	RJG	TAL PIT
	Instrument ID: C									
Total Recoverable	Prep	200.8			50 mL	50 mL	185009	08/16/16 12:26	ANA	TAL PIT
Total Recoverable	Analysis	200.8		10			185074	08/16/16 19:06	CNF	TAL PIT
	Instrument ID: A									
Total/NA	Prep	245.1			50 mL	50 mL	184723	08/16/16 12:21	EVR	TAL PIT
Total/NA	Analysis	245.1		1			185073	08/16/16 14:48	EVR	TAL PIT
	Instrument ID: K									
Total/NA	Analysis	SM 2320B		1			349918	08/17/16 13:28	YZ	TAL IRV
	Instrument ID: MANTECH01									
Total/NA	Analysis	SM 2540C		1	2 mL	100 mL	185039	08/16/16 15:21	JWS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	185048	08/16/16 17:15	JWS	TAL PIT
	Instrument ID: NOEQUIP									

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL IRV

Batch Type: Analysis

YZ = Yuriy Zakhrabov

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

EVR = Emilie Reichenbach

Batch Type: Analysis

CNF = Caitlin Ferguson

EVR = Emilie Reichenbach

JWS = Jim Swanson

MJH = Matthew Hartman

RJG = Rob Good

Client Sample ID: MOCK (AT6-407)

Date Collected: 08/15/16 16:00
Date Received: 08/16/16 10:15

Lab Sample ID: 180-57624-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	**93**		25	2.9	mg/L			08/16/16 12:18	50
Nitrate as N	ND		5.0	1.1	mg/L			08/16/16 12:18	50
Chloride	**16000**		500	170	mg/L			08/16/16 12:33	500
Nitrite as N	ND		2.5	1.4	mg/L			08/16/16 12:18	50
Fluoride	ND		5.0	1.2	mg/L			08/16/16 12:18	50
Sulfate	**5600**		50	17	mg/L			08/16/16 12:18	50
Orthophosphate as P	ND		25	7.7	mg/L			08/16/16 12:18	50

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1200**	**J**	2000	44	ug/L		08/16/16 13:21	08/17/16 08:04	10
Barium	**79**	**J**	2000	8.9	ug/L		08/16/16 13:21	08/17/16 08:04	10
Calcium	**720000**		50000	730	ug/L		08/16/16 13:21	08/17/16 08:04	10
Potassium	**480000**		50000	8400	ug/L		08/16/16 13:21	08/17/16 08:04	10
Magnesium	**1300000**		50000	410	ug/L		08/16/16 13:21	08/17/16 08:04	10
Sodium	**8400000**		130000	5700	ug/L		08/16/16 13:21	08/17/16 08:15	25
Strontium	**9900**	**B**	500	53	ug/L		08/16/16 13:21	08/17/16 08:04	10

Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		10	0.88	ug/L		08/16/16 12:26	08/16/16 19:06	10
Arsenic	ND		10	0.74	ug/L		08/16/16 12:26	08/16/16 19:06	10
Beryllium	ND		10	0.64	ug/L		08/16/16 12:26	08/16/16 19:06	10
Cadmium	ND		10	1.6	ug/L		08/16/16 12:26	08/16/16 19:06	10
Chromium	**2.8**	**J**	20	0.90	ug/L		08/16/16 12:26	08/16/16 19:06	10
Copper	ND		20	4.0	ug/L		08/16/16 12:26	08/16/16 19:06	10
Iron	ND		500	94	ug/L		08/16/16 12:26	08/16/16 19:06	10
Manganese	**26**	**J**	50	2.1	ug/L		08/16/16 12:26	08/16/16 19:06	10
Nickel	**4.4**	**J**	10	2.4	ug/L		08/16/16 12:26	08/16/16 19:06	10
Lead	**3.5**	**J**	10	0.60	ug/L		08/16/16 12:26	08/16/16 19:06	10
Antimony	**3.3**	**J**	20	3.0	ug/L		08/16/16 12:26	08/16/16 19:06	10
Selenium	ND		50	3.2	ug/L		08/16/16 12:26	08/16/16 19:06	10
Thallium	ND		10	0.24	ug/L		08/16/16 12:26	08/16/16 19:06	10
Zinc	**19**	**J**	50	18	ug/L		08/16/16 12:26	08/16/16 19:06	10
Hardness as calcium carbonate	**7100**		0.033	0.71	mg/L		08/16/16 12:26	08/16/16 19:06	10

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**4.8**		0.20	0.039	ug/L		08/16/16 12:21	08/16/16 14:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**660**		4.0	4.0	mg/L			08/17/16 13:28	1
Bicarbonate Alkalinity as CaCO3	**660**		4.0	4.0	mg/L			08/17/16 13:28	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/17/16 13:28	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/17/16 13:28	1
Bicarbonate ion as HCO3	**800**		4.8	4.8	mg/L			08/17/16 13:28	1
Carbonate as CO3	ND		2.4	2.4	mg/L			08/17/16 13:28	1
Hydroxide as OH	ND		1.4	1.4	mg/L			08/17/16 13:28	1
Total Dissolved Solids	**35000**		500	500	mg/L			08/16/16 15:21	1

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Client Sample ID: MOCK (AT6-407)
Date Collected: 08/15/16 16:00
Date Received: 08/16/16 10:15

Lab Sample ID: 180-57624-1
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	170		0.50	0.50	mg/L			08/16/16 17:15	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-184925/17
Matrix: Water
Analysis Batch: 184925

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.022	mg/L			08/16/16 08:22	1
Nitrite as N	ND		0.050	0.028	mg/L			08/16/16 08:22	1
Fluoride	ND		0.10	0.024	mg/L			08/16/16 08:22	1
Orthophosphate as P	ND		0.50	0.15	mg/L			08/16/16 08:22	1

Lab Sample ID: LCS 180-184925/16
Matrix: Water
Analysis Batch: 184925

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.45		mg/L		98	90 - 110
Nitrite as N	2.50	2.57		mg/L		103	90 - 110
Fluoride	2.50	2.46		mg/L		98	90 - 110
Orthophosphate as P	2.50	2.60		mg/L		104	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-185016/1-A
Matrix: Water
Analysis Batch: 185127

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 185016

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	4.4	ug/L		08/16/16 13:21	08/17/16 07:50	1
Barium	ND		200	0.89	ug/L		08/16/16 13:21	08/17/16 07:50	1
Calcium	ND		5000	73	ug/L		08/16/16 13:21	08/17/16 07:50	1
Potassium	ND		5000	840	ug/L		08/16/16 13:21	08/17/16 07:50	1
Magnesium	ND		5000	41	ug/L		08/16/16 13:21	08/17/16 07:50	1
Sodium	ND		5000	230	ug/L		08/16/16 13:21	08/17/16 07:50	1
Strontium	5.46	J	50	5.3	ug/L		08/16/16 13:21	08/17/16 07:50	1

Lab Sample ID: LCS 180-185016/2-A
Matrix: Water
Analysis Batch: 185127

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 185016

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	1060		ug/L		106	85 - 115
Barium	2000	1980		ug/L		99	85 - 115
Calcium	50000	49200		ug/L		98	85 - 115
Potassium	50000	49100		ug/L		98	85 - 115
Magnesium	50000	49300		ug/L		99	85 - 115
Sodium	50000	50500		ug/L		101	85 - 115
Strontium	1000	1010		ug/L		101	85 - 115

Lab Sample ID: LCSD 180-185016/3-A
Matrix: Water
Analysis Batch: 185127

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 185016

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1000	1070		ug/L		107	85 - 115	1	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-185016/3-A
Matrix: Water
Analysis Batch: 185127

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 185016

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	2000	2000		ug/L		100	85 - 115	1	20
Calcium	50000	49600		ug/L		99	85 - 115	1	20
Potassium	50000	49800		ug/L		100	85 - 115	1	20
Magnesium	50000	49900		ug/L		100	85 - 115	1	20
Sodium	50000	51200		ug/L		102	85 - 115	1	20
Strontium	1000	1020		ug/L		102	85 - 115	1	20

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 180-185009/1-A
Matrix: Water
Analysis Batch: 185074

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 185009

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.088	ug/L		08/16/16 12:26	08/16/16 19:00	1
Arsenic	ND		1.0	0.074	ug/L		08/16/16 12:26	08/16/16 19:00	1
Beryllium	ND		1.0	0.064	ug/L		08/16/16 12:26	08/16/16 19:00	1
Cadmium	ND		1.0	0.16	ug/L		08/16/16 12:26	08/16/16 19:00	1
Chromium	ND		2.0	0.090	ug/L		08/16/16 12:26	08/16/16 19:00	1
Copper	ND		2.0	0.40	ug/L		08/16/16 12:26	08/16/16 19:00	1
Iron	ND		50	9.4	ug/L		08/16/16 12:26	08/16/16 19:00	1
Manganese	ND		5.0	0.21	ug/L		08/16/16 12:26	08/16/16 19:00	1
Nickel	ND		1.0	0.24	ug/L		08/16/16 12:26	08/16/16 19:00	1
Lead	ND		1.0	0.060	ug/L		08/16/16 12:26	08/16/16 19:00	1
Antimony	ND		2.0	0.30	ug/L		08/16/16 12:26	08/16/16 19:00	1
Selenium	ND		5.0	0.32	ug/L		08/16/16 12:26	08/16/16 19:00	1
Thallium	ND		1.0	0.024	ug/L		08/16/16 12:26	08/16/16 19:00	1
Zinc	ND		5.0	1.8	ug/L		08/16/16 12:26	08/16/16 19:00	1
Hardness as calcium carbonate	ND		0.0033	0.071	mg/L		08/16/16 12:26	08/16/16 19:00	1

Lab Sample ID: LCS 180-185009/2-A
Matrix: Water
Analysis Batch: 185074

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 185009

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	48.0		ug/L		96	85 - 115
Arsenic	40.0	41.9		ug/L		105	85 - 115
Beryllium	50.0	52.1		ug/L		104	85 - 115
Cadmium	50.0	53.7		ug/L		107	85 - 115
Chromium	200	203		ug/L		101	85 - 115
Copper	250	259		ug/L		104	85 - 115
Iron	1000	1040		ug/L		104	85 - 115
Manganese	500	496		ug/L		99	85 - 115
Nickel	500	514		ug/L		103	85 - 115
Lead	20.0	20.6		ug/L		103	85 - 115
Antimony	500	528		ug/L		106	85 - 115
Selenium	10.0	11.0		ug/L		110	85 - 115
Thallium	50.0	49.1		ug/L		98	85 - 115

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 180-185009/2-A
Matrix: Water
Analysis Batch: 185074

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 185009

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	500	527		ug/L		105	85 - 115

Lab Sample ID: LCSD 180-185009/3-A
Matrix: Water
Analysis Batch: 185074

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 185009

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	50.0	46.5		ug/L		93	85 - 115	3	20
Arsenic	40.0	40.9		ug/L		102	85 - 115	3	20
Beryllium	50.0	50.0		ug/L		100	85 - 115	4	20
Cadmium	50.0	52.0		ug/L		104	85 - 115	3	20
Chromium	200	198		ug/L		99	85 - 115	2	20
Copper	250	251		ug/L		100	85 - 115	3	20
Iron	1000	1020		ug/L		102	85 - 115	2	20
Manganese	500	481		ug/L		96	85 - 115	3	20
Nickel	500	501		ug/L		100	85 - 115	3	20
Lead	20.0	19.9		ug/L		100	85 - 115	3	20
Antimony	500	516		ug/L		103	85 - 115	2	20
Selenium	10.0	10.7		ug/L		107	85 - 115	3	20
Thallium	50.0	47.5		ug/L		95	85 - 115	3	20
Zinc	500	508		ug/L		102	85 - 115	4	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 180-184723/1-A
Matrix: Water
Analysis Batch: 185073

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 184723

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.039	ug/L		08/12/16 13:55	08/16/16 14:38	1

Lab Sample ID: LCS 180-184723/2-A
Matrix: Water
Analysis Batch: 185073

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184723

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.56		ug/L		102	85 - 115

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 440-349918/4
Matrix: Water
Analysis Batch: 349918

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/17/16 12:50	1
Bicarbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/17/16 12:50	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/17/16 12:50	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			08/17/16 12:50	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: MB 440-349918/4
Matrix: Water
Analysis Batch: 349918

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate ion as HCO3	ND		4.8	4.8	mg/L			08/17/16 12:50	1
Carbonate as CO3	ND		2.4	2.4	mg/L			08/17/16 12:50	1
Hydroxide as OH	ND		1.4	1.4	mg/L			08/17/16 12:50	1

Lab Sample ID: LCS 440-349918/2
Matrix: Water
Analysis Batch: 349918

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3	162	158		mg/L		98	80 - 120

Lab Sample ID: LCSD 440-349918/3
Matrix: Water
Analysis Batch: 349918

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity as CaCO3	162	158		mg/L		97	80 - 120	0	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-185039/2
Matrix: Water
Analysis Batch: 185039

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/16/16 15:21	1

Lab Sample ID: LCS 180-185039/1
Matrix: Water
Analysis Batch: 185039

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	216	224		mg/L		104	80 - 120

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 180-185048/2
Matrix: Water
Analysis Batch: 185048

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		0.50	0.50	mg/L			08/16/16 17:15	1

Lab Sample ID: LCS 180-185048/1
Matrix: Water
Analysis Batch: 185048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	78.0	80.0		mg/L		103	80 - 120

HPLC/IC

Analysis Batch: 184925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total/NA	Water	300.0	
180-57624-1	MOCK (AT6-407)	Total/NA	Water	300.0	
MB 180-184925/17	Method Blank	Total/NA	Water	300.0	
LCS 180-184925/16	Lab Control Sample	Total/NA	Water	300.0	

Metals

Prep Batch: 184723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total/NA	Water	245.1	
MB 180-184723/1-A	Method Blank	Total/NA	Water	245.1	
LCS 180-184723/2-A	Lab Control Sample	Total/NA	Water	245.1	

Prep Batch: 185009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total Recoverable	Water	200.8	
MB 180-185009/1-A	Method Blank	Total Recoverable	Water	200.8	
LCS 180-185009/2-A	Lab Control Sample	Total Recoverable	Water	200.8	
LCSD 180-185009/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.8	

Prep Batch: 185016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total Recoverable	Water	200.7	
MB 180-185016/1-A	Method Blank	Total Recoverable	Water	200.7	
LCS 180-185016/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-185016/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	

Analysis Batch: 185073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total/NA	Water	245.1	184723
MB 180-184723/1-A	Method Blank	Total/NA	Water	245.1	184723
LCS 180-184723/2-A	Lab Control Sample	Total/NA	Water	245.1	184723

Analysis Batch: 185074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total Recoverable	Water	200.8	185009
MB 180-185009/1-A	Method Blank	Total Recoverable	Water	200.8	185009
LCS 180-185009/2-A	Lab Control Sample	Total Recoverable	Water	200.8	185009
LCSD 180-185009/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.8	185009

Analysis Batch: 185127

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total Recoverable	Water	200.7 Rev 4.4	185016
180-57624-1	MOCK (AT6-407)	Total Recoverable	Water	200.7 Rev 4.4	185016
MB 180-185016/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	185016
LCS 180-185016/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	185016
LCSD 180-185016/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	185016

General Chemistry

Analysis Batch: 185039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total/NA	Water	SM 2540C	
MB 180-185039/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-185039/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 185048

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total/NA	Water	SM 2540D	
MB 180-185048/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 180-185048/1	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 349918

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-57624-1	MOCK (AT6-407)	Total/NA	Water	SM 2320B	
MB 440-349918/4	Method Blank	Total/NA	Water	SM 2320B	
LCS 440-349918/2	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 440-349918/3	Lab Control Sample Dup	Total/NA	Water	SM 2320B	

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmeric

Client Information	Sampler: M. CHANOV	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-32438-8905.1
Client Contact: Mike Chanov	Phone: 410-329-5120	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology				Job #:
Address: 225 Schilling Circle Suite 400	Due Date Requested:			
City: Hunt Valley	TAT Requested (days):			
State, Zip: MD, 21031				
Phone: 410-329-5120(Tel)	PO #: 15356			
Email: mchanov@eaest.com	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Metals	EC (48hr)	TSS	TDS	Alkalinity (Titrn)	Total Number of containers	Special Instructions/Note:
			Preservation Code										
MOCK (A16-407)	8/15/16	1600	G	W			X	X	X	X	X		

180-57624 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: TA	Date: 8/15/16	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		8/15/16 1630	EA		8-16-16 10:15	TAP
2	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No: | Cooler Temperature(s) °C and Other Remarks:

Baltimore
180325

MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031

20 LBS

1 OF 1

SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907

PA 152 9-22

UPS NEXT DAY AIR

1

TRACKING #: 1Z 28[illegible] 01 9557 9716

180-57624 Waybill

BILLING: P/P
UPS CARBON NEUTRAL SHIPMENT

Department Code: 2122
Project Phase AND Task: TOXLAB

CS 18 5 39 WNTNV50 78 0A 07/2016

Uncorrected temp
Thermometer ID
CF -0.1
PT-WI-SR-001 effective 7/26/13
Initials CMP
2.4 °C

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-251430.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Analysis Requested		Job #: 180-57624-1
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 8/17/2016			Preservation Codes:
City: Irvine	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #:			Other:
Email	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	2320B/ (MOD) Alkalinity all forms	Total Number of containers	Special Instructions/Note:
			Preservation Code:					
MOCK (AT6-407) (180-57624-1)	8/15/16	16:00 Eastern		Water		X	1	

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		8/16/16			08/17/16 9:25	TAL
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.6°/2.0 IR-74

TRK-6459 2545 1.1.26

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8/18/2016

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-57624-1

Login Number: 57624
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-57624-1

Login Number: 57624
List Number: 2
Creator: Salas, Margarita

List Source: TestAmerica Irvine
List Creation: 08/17/16 11:35 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT III

Report Quality Assurance Record
(2 pages)

REPORT QUALITY ASSURANCE RECORD

Client: Jordan Valley Project Number: 70005-15

Author: Michael Chanov EA Report Number: 7372

REPORT CHECKLIST

QA/QC ITEM	REVIEWER	DATE
1. Samples collected, transported, and received according to study plan requirements.		8/30/16
2. Samples prepared and processed according to study plan requirements.		8/30/16
3. Data collected using calibrated instruments and equipment.		8/30/16
4. Calculations checked:		
- Hand calculations checked		8/30/16
- Documented and verified statistical procedure used.		8/30/16
5. Data input/statistical analyses complete and correct.		9/7/16
6. Reported results and facts checked against original sources.		9/7/16
7. Data presented in figures and tables correct and in agreement with text.		9/7/16
8. Results reviewed for compliance with study plan requirements.		8/30/16

	AUTHOR	DATE
9. Commentary reviewed and resolved.		9/13/16

10. All study plan and quality assurance/control requirements have been met and the report is approved:

PROJECT MANAGER	9/13/16 DATE
QUALITY CONTROL OFFICER	9/7/16 DATE
SENIOR TECHNICAL REVIEWER	9/13/16 DATE

RESULTS OF A MOCK EFFLUENT STUDY WITH *Americamysis bahia* ON A JUNE 2016 EFFLUENT SAMPLE FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Prepared for:

Jordan Valley Water Conservancy District
15305 South 3200 West
Herriman, Utah 84065

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031
For questions, please contact Michael Chanov
ph: 410-584-7000

Results relate only to the items tested or to the samples as received by the laboratory.

This report contains 14 pages plus 3 attachments.

Wayne L. McCulloch
Laboratory Director

15 July 2016
Date

EA Project Number 70005.15

ACCREDITED IN ACCORDANCE WITH nelac ID# E87550

EA Report Number 7347

1. INTRODUCTION

At the request of the Jordan Valley Water Conservancy District, EA Engineering, Science, and Technology performed a mock effluent study to confirm the conclusions of previous toxicity identification evaluations (TIEs), which indicated an ion imbalance of dissolved ions as the major toxicants of concern contributing to unsatisfactory whole effluent toxicity performance. This study was conducted on Outfall 001 effluent discharged from Jordan Valley Water Conservancy District's (JVWCD) Southwest Groundwater Treatment Plant (SWGWTP), using *Americamysis bahia* (opossum shrimp) as the test species. Copies of the chain of custody, raw data sheets and statistics are included in Attachment I, and the results of the chemistry analyses are presented in Attachment II. The Report Quality Assurance Record is included in Attachment III.

2. MATERIALS AND METHODS

2.1 EFFLUENT SAMPLE COLLECTION

Five gallons of effluent were collected from the Jordan Valley Water Conservancy District's West Jordan Facility on 5-6 June 2016. The sample was shipped to EA's Ecotoxicology Laboratory in Hunt Valley, Maryland via overnight express carrier. Upon receipt at EA on 7 June 2016 the sample was visually inspected and assigned EA Ecotoxicology Laboratory accession number AT6-271. The sample was stored in the dark at 4°C when not being used for testing. Table 1 summarizes sample collection, receipt information and selected chemical analyses measured on the effluent as described in APHA (2012) and US EPA (2002).

2.2 TEST ORGANISMS

Americamysis bahia (Opossum shrimp) were acquired from Aquatic BioSystems in Fort Collins, Colorado. Lot AB-893 (7 days old) was received at EA on 10 June 2016 and used the same day for the mock effluent study.

2.3 DILUTION WATER

The dilution water used in the acute toxicity tests was artificial seawater, prepared by mixing Crystal Sea synthetic sea salts with laboratory water to a final salinity of 30 ppt. The source of the laboratory water was the City of Baltimore municipal tap water that was passed through a high-capacity, activated carbon filtration system. This synthetic seawater formulation has proven acceptable for aquatic toxicological studies, and has been used successfully at EA for maintaining multigeneration cultures of test organisms, and for holding healthy populations of estuarine and marine species. Batches of artificial seawater were aerated and aged at least 24 hours prior to use in testing.

2.4 MOCK EFFLUENT STUDY PROCEDURES

Upon receipt of the sample, the effluent sample was salinity adjusted with US EPA GP2 formulation (US EPA 2002). Following salinity adjustment the sample was sent via overnight carrier to TestAmerica, Pittsburgh, Pennsylvania for chemical analyses, including a rapid turn-around time ion scan. It was determined that salinity adjustment prior to chemical analysis was required, due to Outfall 001 being deficient in sodium, relative to the other concentrations of ionic constituents.

The results of the chemical analyses performed on the Outfall 001 sample and mock effluent sample for the mock effluent study can be found in Table 2. Using the results of the ion scan, formulations were developed for the mock effluent study using the Gas Research Institute (GRI) Salinity Toxicity Relationship (STR) Model (GRI 1999) (Table 3). A mock effluent was prepared by matching concentrations of seven major ions: calcium, sodium, potassium, magnesium, chloride, sulfate and bicarbonate. The mock effluent sample was prepared by adding reagent grade salts to deionized water. The salts utilized to prepare the mock effluent were NaCl (sodium chloride), Na_2SO_4 (sodium sulfate), KCl (potassium chloride), NaBr (sodium bromide), $Na_2B_4O_7 \cdot 10H_2O$ (sodium borate), $MgCl_2 \cdot 6H_2O$ (magnesium chloride), $CaCl_2 \cdot 2H_2O$ (calcium chloride), $SrCl_2 \cdot 6H_2O$ (strontium chloride) and $NaHCO_3$ (sodium bicarbonate). Following mock effluent sample preparation, the salinity adjusted Outfall 001 effluent and the mock effluent samples were tested concurrently.

2.5 TOXICITY TEST OPERATIONS AND PERFORMANCE

The chronic toxicity tests on the mock effluent and Outfall 001 samples were performed in accordance with US EPA (2002) and EA's protocols (EA 2013) for *A. bahia* (AB-CH-03). Test concentrations were prepared by measuring small volumes of sample in glass pipettes, adding to a graduated cylinder, and bringing to volume with dilution water. All tests were performed using the target temperature of 26±1°C and a 16-hour light/8-hour dark photoperiod. The chronic toxicity tests consisted of three exposure concentrations (100, 75, 50 percent effluent) and a

laboratory dilution water control of synthetic seawater.

The *A. bahia* chronic toxicity test was performed with eight replicates per test concentration, with five organisms per replicate. Test solutions were renewed daily by carefully siphoning the old solution from each chamber and replacing it with freshly prepared test solution. Water quality parameters (temperature, pH, dissolved oxygen, and salinity) were monitored daily before and after renewal for each test. If dissolved oxygen in any test chamber fell below 4 mg/L, then all test chambers were gently aerated, or other corrective action was implemented (e.g., reducing solution volume). The organisms were fed *Artemia* nauplii twice per day.

At test termination, each organism was viewed under a microscope to determine its sex and, in the case of females, the number of individuals with eggs in the oviducts or brood pouch. Growth of the surviving organisms is expressed as mean biomass. Surviving organisms from each replicate test chamber are rinsed with deionized water and placed in pre-tared weigh pans, one pan for each replicate. The pans were dried overnight at 100°C in a drying oven. The tared weight of the pan (pan only) is subtracted from the total weight (pan and dried opossum shrimp) to yield a net organism dry weight. Mean dry weights were calculated based on the number of surviving organisms (to evaluate the test acceptability criterion), and based on the original number of exposed organisms (biomass).

Survival, biomass, and fecundity were analyzed using appropriate statistical analyses according to EPA guidance (US EPA 2002) to determine if any test concentration was significantly ($p=0.05$) different from the control. The short-term chronic test endpoints are reported as the No Observed Effect Concentration (NOEC), the Lowest Observed Effect Concentration (LOEC), and the Chronic Value (ChV). The 25 percent inhibition concentration (IC25) was calculated, with Chronic Toxic Units (TUc) also calculated for each IC25 value. The term Chronic Toxic Unit is defined as: Chronic Toxic Unit (TUc) = 100/IC25. In addition, the 48 and 96-hour LC50 values were calculated for each chronic toxicity test.

The definitions of these endpoints follow US EPA (2002) and are as follows:

- The NOEC is the highest concentration of toxicant to which organisms are exposed in a full or partial life-cycle test, which causes no statistically significant adverse effect on the observed parameter (usually hatchability, survival, growth, and/or reproduction).

- The LOEC is the lowest concentration of toxicant to which organisms are exposed in a full or partial life-cycle test, which causes a statistically significant adverse effect on the observed parameters (usually hatchability, survival, growth, and/or reproduction).

- The ChV is a value lying between the NOEC and the LOEC, derived by calculating the geometric mean of the NOEC and LOEC. The term is sometimes used interchangeably with Maximum Acceptable Toxicant Concentration.

- The IC value is a point estimate of the toxicant concentration that causes a given percent reduction in a non-quantal biological measurement such as fecundity or growth.

- The LC50 (Median Lethal Concentration) is an estimate of the effluent concentration which is lethal to 50 percent of the test organisms in the time period prescribed by the test.

2.6 REFERENCE TOXICANT TEST

In conformance with EA's quality assurance/quality control program, monthly reference toxicant tests using potassium chloride (KCl) were performed on the test species. The reference toxicant test data for *A. bahia* was supplied by the organism vendor.

2.7 ARCHIVES

Original data sheets, records, memoranda, notes, and computer printouts are archived at EA's Office in Hunt Valley, Maryland. These data will be retained for a period of 5 years unless Jordan Valley Water Conservancy District requests a longer period of time.

3. RESULTS AND DISCUSSION

The results of the toxicity test conducted with the salinity adjusted Outfall 001 effluent sample are summarized in Table 4. At 48 hours, there was 38 percent survival in the 100 percent effluent concentration, while the remaining percent effluent concentrations had a minimum of 88 percent survival. The dilution water control had 95 percent survival. The 48-hour LC50 was 95.1 percent effluent. At 96 hours, there was 5 percent survival in the 100 percent effluent concentration, while the remaining percent effluent concentrations had a minimum of 78 percent survival. The dilution water control had 88 percent survival. The 96-hour LC50 was 84.0 percent effluent. At test termination on day 7, the 100 and 75 percent effluent concentrations had 0 and 55 percent survival, respectively, and were significantly less ($p=0.05$) than the control, which had 88 percent survival. There was 95 percent survival in the 50 percent effluent concentration, which was not statistically different from the control. Mean biomass in the 50 percent effluent concentration was 0.321 mg/organism, which was not significantly different than the control mean biomass of 0.283 mg/organism. Fecundity could not be used as an endpoint due to less than 50 percent (28 percent females with eggs) of the control females producing eggs. The NOEC for the chronic toxicity test, based on survial as the most sensitive chronic endpoint, was 50 percent effluent. The LOEC was 75 percent effluent and the ChV was 61.2 percent effluent. The IC25 (for biomass) was 61.8 percent effluent.

The results of the toxicity test conducted on the mock effluent, which was designed to mimic the salinity adjusted Outfall 001 effluent, were almost the same as the Outfall 001 toxicity test, and are presented in Table 5. At 48 hours, there was 53 percent survival in the 100 percent effluent concentration, while the remaining percent effluent concentrations had a minimum of 85 percent survival. The dilution water control had 100 percent survival. The 48-hour LC50 was >100 percent effluent. At 96 hours, there was 20 percent survival in the 100 percent effluent concentration, while the remaining percent effluent concentrations had a minimum of 75 percent survival. The dilution water control had 98 percent survival. The 96-hour LC50 was 87.3 percent effluent. At test termination on day 7, the 100 and 75 percent effluent concentrations had 12 and 65 percent survival, respectively, and were significantly less ($p=0.05$) than the

control, which had 98 percent survival. There was 88 percent survival in the 50 percent effluent concentration, which was not statistically different from the control. Mean biomass in the 50 percent effluent concentration was 0.265 mg/organism, which was significantly different than the control mean biomass of 0.330 mg/organism. Fecundity could not be used as an endpoint due to less than 50 percent (38 percent females with eggs) of the control females producing eggs. The NOEC for the chronic toxicity test, based on biomass as the most sensitive chronic endpoint, was <50 percent effluent. The LOEC was 50 percent effluent and the ChV was <50 percent effluent. The IC25 (for biomass) was 61.3 percent effluent.

In summary, the results of the chemical analyses for the salinity adjusted Outfall 001 and mock effluent (Table 2) indicated that the ionic composition of the two samples was very similar. The presence of other potential toxicants (i.e. metals) was absent from the mock effluent sample, and as expected, were present in the salinity adjusted Outfall 001 sample. Even with the presence of other potential toxicants in the salinity adjusted Outfall 001 sample, the 7-day IC25 for biomass (61.3 percent effluent) in the mock effluent prepared to mimic the salinity adjusted Outfall 001 ion scan was almost identical to the 7-day IC25 for the Outfall 001 effluent (61.8 percent effluent). The point estimates (e.g. LC50, IC25) for the mock effluent were very comparable to the ones generated for the salinity adjusted Outfall 001 at 48, 96 and 7 days for survival. Therefore, the results from this study support the conclusions of the Phase I chronic TIEs conducted for Jordan Valley Water Conservancy District, which indicated that ion imbalance of dissolved ions was the major toxicants of concern contributing to unsatisfactory whole effluent toxicity performance.

A monthly reference toxicant test was conducted on *A. bahia* by the organism supplier using potassium chloride (KCl) as the reference toxicant. The 7-day IC25 for the June 2016 *A. bahia* reference toxicant test was 625 mg/L KCl. The acceptable control chart limits for *A. bahia* were 381-731 mg/L KCl.

REFERENCES

American Public Health Association, American Water Works Association, Water Environment Federation. 2012, Standard Methods for the Examination of Water and Wastewater. 22nd Edition. APHA, Washington, D.C.

EA. 2013. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Hunt Valley, Maryland.

Gas Research Institute. 1999. Marine Salinity Toxicity Relationship Model. Chicago, Illinois.

US EPA. 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. Third Edition. EPA-821-R-02-014. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

TABLE 1 SUMMARY OF SAMPLE COLLECTION, RECEIPT DATA AND WATER QUALITY PARAMETERS MEASURED ON AN OUTFALL 001 EFFLUENT FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Sample Description:	Outfall 001
EA Accession Number:	AT6-271
Sample Collection:	1400, 5 June 2016 to 0800, 6 June 2016
Sample Receipt:	1112, 7 June 2016

Chemical Analyses:

Temperature (°C):	2.3
Alkalinity (mg/L as $CaCO_3$):	782
Hardness (mg/L as $CaCO_3$):	2,644
Conductivity (µS/cm):	5,636
Salinity (ppt):	3.0
pH:	7.6
Total Residual Chlorine (TRC):	<0.01

TABLE 2 CHEMICAL ANALYSES PERFORMED ON THE SALINITY ADJUSTED OUTFALL 001 AND MOCK EFFLUENT STUDY SAMPLES

ANALYTE	UNITS	OUTFALL 001 (AT6-271)	MOCK EFFLUENT (AT6-277)
Sodium	mg/L	7,500	8,500
Potassium	mg/L	290	350
Calcium	mg/L	870	860
Magnesium	mg/L	1,100	1,100
Strontium	mg/L	9.4	10
Barium	mg/L	0.25[(a)]	0.11[(a)]
Chloride	mg/L	15,000	15,000
Bicarbonate	mg/L	1,100	970
Sulfate	mg/L	3,500	3,600
Bromide	mg/L	90	97
Boron	mg/L	3.7	1.3
Alkalinity - Carbonate (CO_3)	mg/L	<4.0	<4.0
Alkalinity - Hydroxide (OH)	mg/L	<4.0	<4.0
Alkalinity - Total (as $CaCO_3$)	mg/L	920	800
Hardness - Total (as $CaCO_3$)	mg/L	7,400	7,300
Cyanide, Total	mg/L	<0.0038	<0.0038
Fluoride	mg/L	<1.2	0.88
Nitrate as N	mg/L	8.0	<0.54
Nitrite as N	mg/L	<1.4	<0.70
Phosphate, ortho as P	mg/L	<7.7	<3.9
Total Dissolved Solids (TDS)	mg/L	32,000	31,000
Total Suspended Solids (TSS)	mg/L	2.0	1.3
Antimony, Total	µg/L	1.1[(a)]	<0.40
Arsenic, Total	µg/L	28	7.4[(a)]
Beryllium, Total	µg/L	<0.18	<0.36
Cadmium, Total	µg/L	<0.37	<0.74
Chromium, Total	µg/L	29	<2.3
Copper, Total	µg/L	58	3.2[(a)]
Iron, Total	µg/L	<29	<57
Lead, Total	µg/L	3.2[(a)]	<0.57
Mercury, Total	µg/L	<0.039	<0.039
Manganese, Total	µg/L	1.7[(a)]	16[(a)]
Nickel, Total	µg/L	47	2.2[(a)]
Selenium, Total	µg/L	25	<2.0
Silver, Total	µg/L	<0.23	<0.47
Thallium, Total	µg/L	<0.066	<4.0
Zinc, Total	µg/L	98	<4.0

(a) Results less than reporting limit but greater than or equal to MDL.

TABLE 3 FORMULATIONS DEVELOPED FOR THE MOCK EFFLUENT STUDY USING THE GRI MARINE SALINITY TOXICITY RELATIONSHIP PROGRAM

Salt	Mock Effluent (g/L)	Mock Effluent (g/20L)
NaCl	15.3635	307.27
Na_2SO_4	5.1765	103.53
KCl	0.5529	11.058
NaBr	0.1159	2.3177
$Na_2B_4O_7 \cdot 10H_20$	0.0091	0.18179
$MgCl_2 \cdot 6H_2O$	9.1985	183.97
$CaCl_2 \cdot 2H_2O$	3.1911	63.822
$SrCl_2 \cdot 6H_2O$	0.0286	0.57205
$NaHCO_3$	1.5156	30.312

TABLE 4 RESULTS OF *Americamysis bahia* TOXICITY TEST CONDUCTED ON A 5-6 JUNE 2016 OUTFALL 001 EFFLUENT SAMPLE FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Test Species:	***Americamysis bahia* (opossum shrimp)**
Client Name:	**Jordan Valley Water Conservancy District**
Sample Description:	Outfall 001
EA Accession Number:	AT6-271
Sample Dates:	5-6 June 2016
EA Test Number:	TN-16-205

Test Concentration (% effluent)	48-Hour % Survival	96-Hour % Survival	7-Day % Survival	Mean Biomass as mg/organism (±S.D.)	Mean Fecundity as females with eggs (%)
Control	95	88	88	0.283 (±0.044)	28
50	98	95	95	0.321 (±0.052)	42
75	88	78	55[a]	0.143 (±0.066)[b]	20[b]
100	38[a]	5[a]	0[a]	0.000 (±0.000)[b]	0[b]

Acute and Chronic Endpoints (expressed as percent effluent)	
48-Hour LC50:	95.1 (88.9 – >100)[c]
96-Hour LC50:	84.0 (79.1 – 88.5)
7-Day NOEC (Survival):	50
7-Day LOEC (Survival):	75
7-Day ChV (Survival):	61.2
7-Day IC25 (Survival):	65.7 (60.7 – 77.2)
7-Day NOEC (Biomass):	50
7-Day LOEC (Biomass):	75
7-Day ChV (Biomass):	61.2
7-Day IC25 (Biomass):	61.8 (59.0 – 65.7)

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	25.0 – 27.0
pH:	6.8 – 8.2
Dissolved Oxygen (mg/L):	4.8 – 7.4
Salinity (ppt):	27.3 – 29.0

(a) Significantly different (p=0.05) from the control.
(b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.
(c) Values in parentheses represent the 95 percent confidence limits for the dataset.

TABLE 5 RESULTS OF *Americamysis bahia* TOXICITY TEST CONDUCTED ON A MOCK EFFLUENT SAMPLE PREPARED TO MIMIC OUTFALL 001 EFFLUENT FROM JORDAN VALLEY WATER CONSERVANCY DISTRICT

Test Species:	***Americamysis bahia* (opossum shrimp)**
Client Name:	**Jordan Valley Water Conservancy District**
Sample Description:	Mock Effluent
EA Accession Number:	AT6-277
Preparation Date:	10 June 2016
EA Test Number:	TN-16-206

Test Concentration (% effluent)	48-Hour % Survival	96-Hour % Survival	7-Day % Survival	Mean Biomass as mg/organism (±S.D.)	Mean Fecundity as females with eggs (%)
Control	100	98	98	0.330 (±0.058)	38
50	90	88	88	0.265 (±0.054)[a]	60
75	85	75[a]	65[a]	0.227 (±0.115)[b]	14[b]
100	53[a]	20[a]	12[a]	0.080 (±0.173)[b]	0[b]

Acute and Chronic Endpoints (expressed as percent effluent)	
48-Hour LC50:	>100 (NC)[c]
96-Hour LC50:	87.3 (80.8 – 93.1)[d]
7-Day NOEC (Survival):	50
7-Day LOEC (Survival):	75
7-Day ChV (Survival):	61.2
7-Day IC25 (Survival):	66.0 (56.2 – 77.6)
7-Day NOEC (Biomass):	<50
7-Day LOEC (Biomass):	50
7-Day ChV (Biomass):	<50
7-Day IC25 (Biomass):	61.3 (NC)

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	25.0 – 26.7
pH:	7.1 – 8.5
Dissolved Oxygen (mg/L):	4.6 – 7.2
Salinity (ppt):	27.0 – 28.6

(a) Significantly different (p=0.05) from the control.
(b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.
(c) The 95 percent confidence limits are not calculable for the dataset.
(d) Values in parentheses represent the 95 percent confidence limits for the dataset.

ATTACHMENT I

Chain of Custody, Data and Statistical Analyses
(31 pages)

Chain-of-Custody Record

EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory
231 Schilling Circle
Hunt Valley, Maryland 21031
Telephone: 410-584-7000
Fax: 410-584-1057

Sample Shipped By: (circle)
Fed. Ex. UPS Other: _____
Tracking #: 8095 1033 6911

Client: JVWCD Project No.: _____

NPDES Number: _____ Client Purchase Order Number: _____

City/State Collected: Salt Lake City, UT

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Collection Start Date/Time	Collection End Date/Time	Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
AT16-271		X	6/5/16 1200 PM	6/6/16 0600 AM	GSL Discharge outfall 001	2/2.5 gal

Sampled By: Marie E. Owens	Date/Time 6/6/16 1200	Received By:	Date/Time
Sampler's Printed Name: Marie E. Owens	Title: WQ Mngr	Relinquished By: Marie E. Owens	Date/Time 6/6/16 1200
Relinquished By:	Date/Time	Received By Laboratory:	Date/Time 6/7/16 1112

Was Sample Chilled During Collection? Yes / No

Comments:

Sample Collection Parameters

Visual Description:
Temperature (°C): 9.6
pH: 7.71
TRC (mg/L):
Other:

White-Report Production
EA 0534 F&B Rev.9/12

Yellow-Laboratory

Pink-Client/Sampler

SAMPLE CHECK-IN FOR TESTING

Client: Jordan Valley

EA Accession Number: ATG-271

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.3	6/7/16	1112	JB
Is ice present?	—	yes	↓	↓	↓
pH	6.0-9.0	7.6	↓	↓	↓
TRC (mg/L)	<0.01	<0.01	↓	↓	↓
Visual Description	—	clear	↓	↓	↓

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✓)	Date	Time	Initials
Ammonia (preserve aliquot)	–				
Parameter	**Acceptable Range**	**Measurement***	**Date**	**Time**	**Initials**
Salinity (ppt)	–	3.0	6/7/16	1112	JB

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-205

TEST ORGANISM INFORMATION

Common Name: Opossum shrimp

Scientific Name: *A.bahia*

Lot Number: AB-893

Source: ABS

Adults Isolated (Time, Date): _____

Neonates Pulled & Fed (Time, Date): _____

Acclimation: <24 hrs Age: 7days

Culture Water (T/S): 25.0 °C 30.0 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
6/10/16	1300	MJ	Dilutions Made
	1316	MJ	Test Vessels Filled
	1500		Organisms Transferred
			Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Mod Hard Control	0ml	1200ml
50%	600ml	
75%	900ml	
100%	1200 ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	6/10/16	1300	MJ	ATG-271 / LDG-281
1	6/11/16	0948	JB	ATG-271 / LDG-281
2	6/12/16	0943	MJ	ATG-271 / LDG-281
3	6/13/16	0922	JB	ATG-271 / LDG-281
4	6/14/16	0858	MJ	ATG-271 / LDG-281
5	6/15/16	0923	JB	ATG-271 / LDG-281
6	6/16/16	0909	MJ	ATG-271 / LDG-281

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			1625 MJ / 5 drops
1	0825 NM / 5 drops		1600 NM / 5 drops
2	0835 MJ / 5 drops		1615 MJ / 5 drops
3	0805 NM / 5 drops		1600 NM / 5 drops
4	0817 NM / 5 drops		1600 NM / 5 drops
5	0815 NM / 5 drops		1600 NM / 5 drops
6	0820 JB / 5 drops		1625 JB / 5 drops

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 10-205
Test Material: Effluent
Accession Number: AT16-271
Dilution Water: 30 ppt CS
Accession Number: 1D16-231

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 6/10/16 Time: 1310
Ending Date: 6/17/16 Time: 1441

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 h, 8 d Light Intensity: 50 - 100 fc

Test Container: 4" bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	5	4 *	4	4	4	4	4	4
	B	5	5	5	4	3	3	3	3
	C	5	4*	4	4	4	4	4	4
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	4	4	4	4
	F	5	5	5	5	5	5	5	5
	G	5	5	5	5	5	5	5	5
	H	5	5	5	5	5	5	5	5
50%	A	5	5	4	4	4	4	4	4
	B	5	5	5	5	5	5	5	5
	C	5	5	5	5	5	5	5	5
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	5	5	5	5
	F	5	5	5	4*	4	4	4	4
	G	5	5	5	5	5	5	5	5
	H	5	5	5	5	5	5	5	5
Time / Initials		1500 MC	1300 JB	1038 MJ	1000 JB	0916 MJ	0955 JB	0928 MJ	1441 MJ

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0)____ Cyprinodon: (1004.0)____ Menidia: (1006.0)____ Americamysis:(1007.0) X____ OTHER:____

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-205
Test Material: Effluent
Accession Number: A16-271
Dilution Water: 30 ppt CS
Accession Number: LD6-281

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Beginning Date: 6/10/16 Time: 1316
Ending Date: 6/17/16 Time: 1441

Test Container: 4" bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	A	5	5	4	4	4	4	4	4
	B	5	5	5	5	5	5	5	5
	C	5	5	5	5	5	3	2	2
	D	5	4	4	4	4	4	2	2
	E	5	5	5	5	4	4	4	3
	F	5	5	4	4	3	2	2	1
	G	5	5	4	4	3	3	3	3
	H	5	5	4	3	3	2	2	2
100%	A	5	5	1	0	-	-	-	-
	B	5	3	0	-	-	-	-	-
	C	5	3	2	1	1	0	-	-
	D	5	4	1	0	-	-	-	-
	E	5	4	1	0	-	-	-	-
	F	5	5	3	0	-	-	-	-
	G	5	3	3	2	1	1	0	-
	H	5	4	4	2	0	-	-	-
Time / Initials		1500 JM	1300 JB	1038 MJ	1100 JB	0916 MJ	0955 JB	0928 MJ	1441 MJ

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0) Ceriodaphnia: (1002.0) Menidia: (1006.0) Americamysis: (1007.0) X OTHER:

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN-16-205
Tin Lot: Black 160
Oven Temp (°C): Start: 99.5° End: 99.0°

	Date	Time	Initials
Organisms sexed:	6/17/16	1441	MJ
Loaded tins placed in oven:	6/17/16	1453	MJ
Loaded tins removed from oven:	6/18/16	1551	MM
Loaded tins weighed:	6/18/16	1605	MM

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
Control	A	95		I	III		4	26.99	28.15	1.16	0.290	0.232
	B	210	I	I	I		3	30.15	31.41	1.26	0.420	0.252
	C	3		I	III		4	29.45	30.80	1.35	0.338	0.270
	D	197	II	II	I		5	28.77	30.39	1.62	0.324	0.324
	E	149		II	II		4	27.73	28.88	1.15	0.288	0.230
	F	223		I	IIII		5	27.14	28.89	1.75	0.380	0.350
	G	198	II		III		5	28.53	29.97	1.44	0.288	0.288
	H	143	I	III	I		5	25.69	27.26	1.57	0.314	0.314
50%	A	208		II	II		4	29.56	30.71	1.13	0.283	0.226
	B	199	I	I	III		5	26.88	28.57	1.69	0.338	0.338
	C	237	II		III		5	27.85	29.53	1.68	0.336	0.336
	D	129		II	III		5	27.64	29.32	1.68	0.336	0.336
	E	212	I	I	III		5	28.56	30.51	1.95	0.390	0.390
	F	175		I	III		4	28.29	29.60	1.31	0.328	0.262
	G	173	I		IIII		5	26.84	28.49	1.65	0.330	0.330
	H	213	I	II	II		5	28.00	29.75	1.75	0.350	0.350

Dry wt. calculations checked (date, initials): 6/20/16 MM Biomass calculations checked (date, initials): 6/20/16 MM

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	6/17/16	1441	MJ
Loaded tins placed in oven:	6/17/16	1453	MJ
Loaded tins removed from oven:	6/18/16	1551	MM
Loaded tins weighed:	6/18/16	1605	MM

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-205

Tin Lot: Black160

Oven Temp (°C): Start: 99.5° End: 99.0°

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
75%	A	209		1	III		4	29.12	30.18	1.06	0.265	0.212
	B	239		1	IIII		5	25.94	27.23	1.29	0.258	0.258
	C	127			II		2	26.82	27.40	0.58	0.290	0.116
	D	108			II		2	29.22	29.92	0.70	0.350	0.140
	E	93		II	I		3	25.46	26.13	0.67	0.223	0.134
	F	125			I		1	25.79	25.98	0.19	0.190	0.038
	G	112		II	I		3	30.16	30.77	0.61	0.203	0.122
	H	249	I		I		2	29.19	29.79	0.60	0.300	0.120
100%	A	—	—	—	—	—	—	—	—	—	—	—
	B	—	—	—	—	—	—	—	—	—	—	—
	C	—	—	—	—	—	—	—	—	—	—	—
	D	—	—	—	—	—	—	—	—	—	—	—
	E	—	—	—	—	—	—	—	—	—	—	—
	F	—	—	—	—	—	—	—	—	—	—	—
	G	—	—	—	—	—	—	—	—	—	—	—
	H	—	—	—	—	—	—	—	—	—	—	—

Dry wt. calculations checked (date, initials): 6/20/16 MM Biomass calculations checked (date, initials): 6/20/16 MM

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN-16-205

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 6/10/16 Time: 1316
Ending Date: 6/17/16 Time: 1441

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Control		25.2	26.0	27.0	26.5	26.6	27.0	26.8	7.2	8.0	7.4	7.7	6.8	7.5	7.4	6.9	6.5	6.4	6.9	6.9	6.7	6.7	27.8	27.5	27.3	28.1	28.1	27.7	28.0
										8.0																			
50%		25.3	25.4	26.6	25.5	26.3	26.4	26.3	7.0	7.9	7.3	7.5	6.8	7.4	7.3	6.9	6.8	6.4	7.0	6.8	6.9	6.8	27.8	27.6	27.5	28.3	28.2	27.8	28.2
75%		25.4	25.0	26.2	25.0	25.5	26.2	25.7	7.0	7.8	7.3	7.6	6.8	7.4	7.3	6.9	6.8	6.5	7.1	6.9	7.1	6.8	27.9	27.6	27.6	28.4	28.2	27.9	28.2
100%		25.6	24.9	25.1	25.0	25.0	25.5	—	6.9	7.8	7.3	7.5	6.8	7.4	—	6.9	6.9	6.7	7.3	6.9	7.4	—	28.1	27.6	27.6	28.3	28.1	27.8	—
			25.0																										
Meter Number		678	679	679	678	678	678	678	678	679	679	678	678	678	678	678	679	679	678	678	678	678	678	679	679	678	678	678	678
Time		1304	1000	0951	0927	0903	0930	0914	1304	1000	0951	0927	0903	0930	0914	1304	1000	0951	0927	0903	0930	0914	1304	1000	0951	0927	0903	0930	0914
Initials		MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ

6/14 JB

6/11 JB

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15 | TEST ORGANISM | Beginning Date: 6/10/16 Time: 1316

Client: Jordan Valley | Common Name: Opossum shrimp | Ending Date: 6/17/16 Time: 1441

QC Test Number: TN- 16-205 | Scientific Name: *A. bahia*

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control		25.2	25.5	25.0	25.0	25.0	25.2	25.0	8.2	8.2	8.0	7.4	7.9	7.8	7.5	6.0	6.3	6.7	6.2	6.3	6.0	6.4	27.8	27.9	28.5	28.5	28.3	28.1	28.3
50%		25.2	25.7	25.0	25.0	25.0	25.2	25.0	8.0	8.0	7.9	7.4	7.8	7.7	7.5	6.0	5.7	6.6	6.1	6.3	5.0	6.1	28.0	27.9	28.8	28.6	28.4	28.4	28.3
75%		25.4	25.7	25.0	25.0	25.0	25.6	25.1	7.9	8.0	7.9	7.3	7.8	7.7	7.6	5.5	5.6	6.5	5.9	6.2	4.9	6.0	27.9	27.9	28.6	28.6	28.3	28.4	28.4
100%		25.4	25.7	25.0	25.0	25.0	25.1	—	8.0	8.0	7.9	7.4	7.8	7.7	—	5.7	5.3	6.5	5.7	5.6	4.8	—	28.2	27.9	29.0	28.5	28.2	28.3	—
Meter Number		679	679	678	678	678	678	679	679	679	678	678	678	678	679	679	679	678	678	678	678	679	679	679	678	678	678	678	679
Time		1315	1112	1005	0925	1000	0954	1505	1315	1112	1005	0925	1000	0954	1505	1315	1112	1005	0925	1000	0954	1505	1315	1112	1005	0925	1000	0954	1505
Initials		JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 16-205

Date/Time/Initials	Comments/Activity
* 6/11/16 1300 SB	organisms missing;
* 6/13/16 1000 SB	missing organism

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 16-205

Aliquot of sample warmed to test temperature, then aerated if supersaturated:

		ON AIR			OFF AIR		
Date	Sample #	Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
6/10/16	AT6-271	6.8	—	MJ	—	—	—
6/11/16	AT6-271	7.6	0902	JB	7.0	0912	JB
6/12/16	AT6-271	8.4	0921	MJ	6.7	0931	MJ
6/13/16	AT6-271	9.2	0902	JB	7.2	0912	JB
6/14/16	AT6-271	9.2	0840	MJ	7.0	0850	MJ
6/15/16	AT6-271	9.7	0850	JB	7.4	0900	JB
6/16/16	AT6-271	8.7	0855	MJ	7.1	0905	MJ

Mysid Survival, Growth and Fecundity Test-48 Hr Survival

Start Date:	6/10/2016	Test ID:	TN-16-205	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	0.8000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000
50	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
75	0.8000	1.0000	1.0000	0.8000	1.0000	0.8000	0.8000	0.8000
100	0.2000	0.0000	0.4000	0.2000	0.2000	0.6000	0.6000	0.8000

			Transform: Arcsin Square Root					Rank	1-Tailed	Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
Control	0.9500	1.0000	1.2857	1.1071	1.3453	8.574	8			2	40
50	0.9750	1.0263	1.3155	1.1071	1.3453	6.400	8	72.00	48.00	1	40
75	0.8750	0.9211	1.1964	1.1071	1.3453	10.301	8	56.00	48.00	5	40
*100	0.3750	0.3947	0.6476	0.2255	1.1071	45.436	8	37.00	48.00	25	40

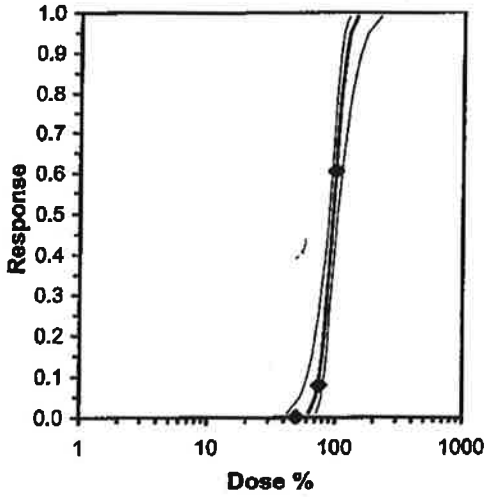
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94631	0.904	0.13537	1.51382
Bartlett's Test indicates unequal variances (p = 4.19E-03)	13.2164	11.3449		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	75	100	86.6025	1.33333

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	12.9504	3.24813	6.5841	19.3168	0.05	0.17634	3.84146	0.67	1.97832	0.07722	3
Intercept	-20.62	6.38532	-33.135	-8.1048							
TSCR	0.0375	0.02134	-0.0043	0.07931							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	62.9045	42.5992	72.3321
EC05	3.355	71.0077	53.832	78.7912
EC10	3.718	75.7458	60.8774	82.6131
EC15	3.964	79.12	66.0503	85.4178
EC20	4.158	81.9085	70.3737	87.8388
EC25	4.326	84.379	74.1911	90.1117
EC40	4.747	90.9398	83.7491	97.2564
EC50	5.000	95.1299	88.9051	103.173
EC60	5.253	99.513	93.3711	110.63
EC75	5.674	107.25	99.785	126.121
EC80	5.842	110.485	102.167	133.222
EC85	6.036	114.379	104.904	142.157
EC90	6.282	119.474	108.335	154.422
EC95	6.645	127.447	113.475	174.811
EC99	7.326	143.864	123.499	221.1



Reviewed by:

Mysid Survival, Growth and Fecundity Test-96 Hr Survival

Start Date:	6/10/2016	Test ID:	TN-16-205	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	0.8000	0.6000	0.8000	1.0000	0.8000	1.0000	1.0000	1.0000
50	0.8000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	1.0000
75	0.8000	1.0000	1.0000	0.8000	0.8000	0.6000	0.6000	0.6000
100	0.0000	0.0000	0.2000	0.0000	0.0000	0.0000	0.2000	0.0000

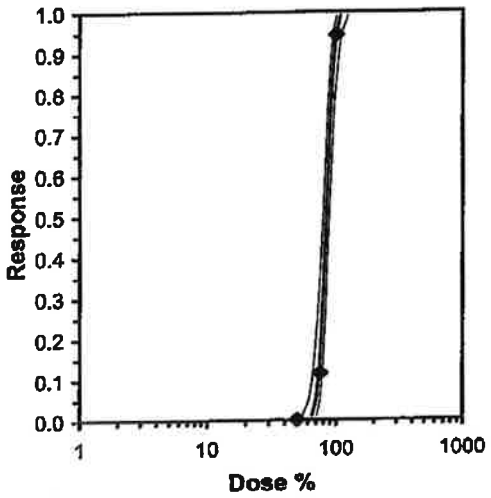
			Transform: Arcsin Square Root					1-Tailed			Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.8750	1.0000	1.1986	0.8861	1.3453	14.410	8				5	40
50	0.9500	1.0857	1.2857	1.1071	1.3453	8.574	8	-1.158	2.156	0.1623	2	40
75	0.7750	0.8857	1.0838	0.8861	1.3453	17.634	8	1.525	2.156	0.1623	9	40
*100	0.0500	0.0571	0.2850	0.2255	0.4636	38.672	8	12.136	2.156	0.1623	38	40

Auxiliary Tests							Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)							0.96366	0.904	-0.0888	-0.5336
Bartlett's Test indicates equal variances (p = 0.35)							3.26879	11.3449		
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	75	100	86.6025	1.33333	0.12722	0.14661	1.69033	0.02266	1.8E-13	3, 28

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	21.079	3.7833	13.6637	28.4942	0.125	0.70454	3.84146	0.4	1.92409	0.04744	3
Intercept	-35.558	7.31165	-49.889	-21.227							
TSCR	0.0875	0.03159	0.02558	0.14942							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	65.1222	55.176	70.976
EC05	3.355	70.1551	61.6517	75.2851
EC10	3.718	72.9953	65.3423	77.7677
EC15	3.964	74.9762	67.913	79.5394
EC20	4.158	76.5888	69.9931	81.0167
EC25	4.326	77.9999	71.7962	82.3428
EC40	4.747	81.672	76.3586	85.9946
EC50	5.000	83.9638	79.0629	88.4686
EC60	5.253	86.32	81.6918	91.2044
EC75	5.674	90.3838	85.8387	96.4081
EC80	5.842	92.049	87.4079	98.7059
EC85	6.036	94.0289	89.1923	101.546
EC90	6.282	96.5806	91.3855	105.354
EC95	6.645	100.491	94.5723	111.456
EC99	7.326	108.257	100.508	124.297



Reviewed by: MW

Mysid Survival, Growth and Fecundity Test-7 Day Survival

Start Date:	6/10/2016	Test ID:	TN-16-205	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	0.8000	0.6000	0.8000	1.0000	0.8000	1.0000	1.0000	1.0000
50	0.8000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	1.0000
75	0.8000	1.0000	0.4000	0.4000	0.6000	0.2000	0.6000	0.4000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

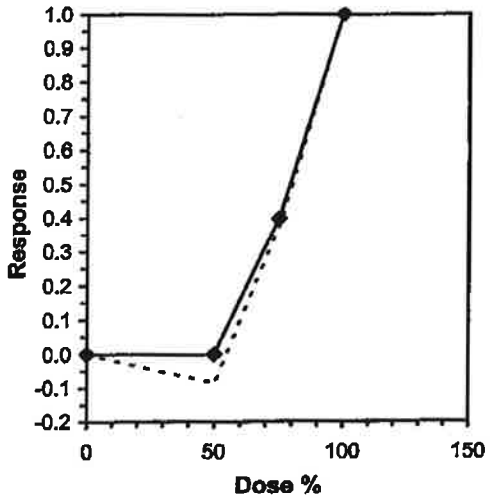
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.8750	1.0000	1.1986	0.8861	1.3453	14.410	8				0.9125	1.0000
50	0.9500	1.0857	1.2857	1.1071	1.3453	8.574	8	-0.872	2.024	0.2023	0.9125	1.0000
*75	0.5500	0.6286	0.8428	0.4636	1.3453	33.103	8	3.561	2.024	0.2023	0.5500	0.6027
100	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	8				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94729	0.884	0.33266	1.01877
Bartlett's Test indicates equal variances (p = 0.07)	5.3608	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	75	61.2372	2	0.16303	0.18788	0.44051	0.03994	5.3E-04	2, 21

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	53.147	3.083	51.295	57.094	-4.4034
IC10	56.293	2.907	54.130	64.188	3.2388
IC15	59.440	3.596	56.362	71.281	2.1019
IC20	62.586	4.084	58.483	75.721	1.3862
IC25	65.733	4.428	60.692	77.239	0.8620
IC40	75.114	3.923	67.111	81.791	-0.1550
IC50	79.261	3.369	71.389	84.826	-0.4432



Reviewed by:

Mysid Survival, Growth and Fecundity Test-Biomass

Start Date:	6/10/2016	Test ID: TN-16-205	Sample ID: Jordan Valley
End Date:	6/17/2016	Lab ID:	Sample Type:
Sample Date:		Protocol: EPAM 87-EPA Marine	Test Species: MY-Mysidopsis bahia
Comments:			

Conc-%	1	2	3	4	5	6	7	8	S.D.
Control	0.2320	0.2520	0.2700	0.3240	0.2300	0.3500	0.2880	0.3140	0.04423
50	0.2260	0.3380	0.3360	0.3360	0.3900	0.2620	0.3300	0.3500	0.052
75	0.2120	0.2580	0.1160	0.1400	0.1340	0.0380	0.1220	0.1200	0.06633
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0

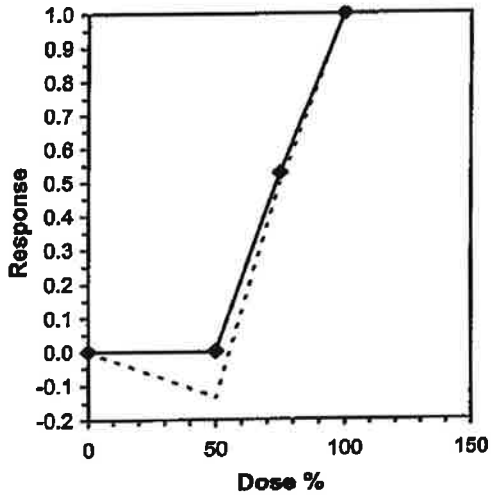
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.2825	1.0000	0.2825	0.2300	0.3500	15.657	8				0.3018	1.0000
50	0.3210	1.1363	0.3210	0.2260	0.3900	16.199	8	-1.595	1.761	0.0425	0.3018	1.0000
75	0.1425	0.5044	0.1425	0.0380	0.2580	46.548	8				0.1425	0.4722
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95375	0.844	-0.4439	-0.405
F-Test indicates equal variances (p = 0.68)	1.38221	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.04251	0.15048	0.00593	0.00233	0.133	1, 14

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	52.369	1.904	51.209	53.049	-10.1373
IC10	54.737	0.807	53.490	56.098	-0.4388
IC15	57.106	1.111	55.380	59.147	0.2631
IC20	59.474	1.444	57.173	62.203	0.5008
IC25	61.843	1.791	59.043	65.677	0.6142
IC40	68.948	2.749	64.821	75.054	0.4788
IC50	73.685	3.019	68.527	79.211	0.1006



Reviewed by:

Mysid Survival, Growth and Fecundity Test-Fecundity

Start Date:	6/10/2016	Test ID:	TN-16-205	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	0.0000	0.5000	0.0000	0.5000	0.0000	0.0000	1.0000	0.2500
50	0.0000	0.5000	1.0000	0.0000	0.5000	0.0000	1.0000	0.3333
75	0.0000	0.0000	0.0000	0.0000	1.0000			

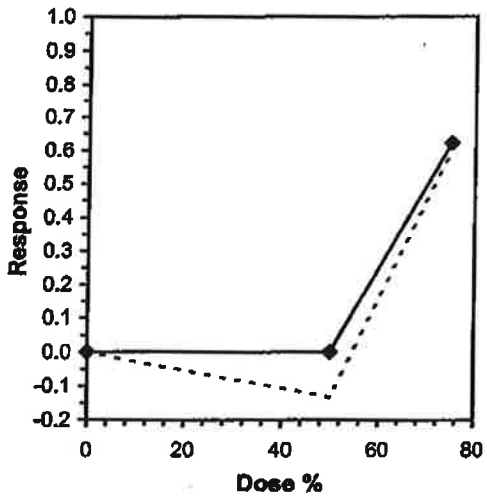
			Transform: Arcsin Square Root						1-Tailed		Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.2813	1.0000	0.6545	0.3614	1.2094	40.699	8				0.3765	1.0000
50	0.4167	1.4815	0.7112	0.3614	1.2094	43.219	8	-0.396	2.101	0.3009	0.3765	1.0000
75	0.2000	0.7111	0.5634	0.3614	1.0472	50.111	5	0.558	2.101	0.3431	0.1429	0.3795

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90011	0.873	0.84615	-0.1912
Bartlett's Test indicates equal variances (p = 0.94)	0.13421	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	75	>75		1.33333	0.2767	0.74663	0.03358	0.08204	0.67019	2, 18

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	52.014			
IC10	54.029			
IC15	56.043			
IC20	58.058			
IC25	60.072			
IC40	66.115			
IC50	70.144			



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-206

TEST ORGANISM INFORMATION

Common Name: Opossum shrimp

Scientific Name: A. bahia

Lot Number: AB-893

Source: ABS

Adults Isolated (Time, Date): _____

Neonates Pulled & Fed (Time, Date): _____

Acclimation: ≤24 hrs Age: 7 days

Culture Water (T/S): 25.0 °C 30.0 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
6/10/16	1358	MJ	Dilutions Made
	↓	↓	Test Vessels Filled
	1411	MJ	Organisms Transferred
	1450	MM	Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Mod Hard Control	0ml	1200ml
50%	600ml	↓
75%	900ml	
100%	1200 ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	6/10/16	1358	MJ	ATG-277 / LDG-281
1	6/11/16	0945	JB	ATG-277 / LDG-281
2	6/12/16	0947	MJ	ATG-277 / LDG-281
3	6/13/16	0920	JB	ATG-277 / LDG-281
4	6/14/16	0901	MJ	ATG-277 / LDG-281
5	6/15/16	0920	JB	ATG-277 / LDG-281
6	6/16/16	0912	MJ	ATG-277 / LDG-281

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			1625 MJ 5 drops
1	0825 NM 5 drops		1600 NM 5 drops
2	0835 MJ 5 drops		1615 MJ 5 drops
3	0805 NM 5 drops		1600 NM 5 drops
4	0817 MJ 5 drops		1610 MJ 5 drops
5	0815 NM 5 drops		1605 NM 5 drops
6	0820 JB 5 drops		1625 JB 5 drops

6/14 MJ

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-200
Test Material: Effluent
Accession Number: ATG-277
Dilution Water: 30 ppt CS
Accession Number: LDG-281

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 h, 8 d Light Intensity: 50 - 100 fc

Beginning Date: 6/10/16 Time: 1411
Ending Date: 6/17/16 Time: 1331

Test Container: 4" bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	5	5	5	5	5	5	5	5
	B	5	5	5	5	5	5	5	5
	C	5	5	5	4	4	4	4	4
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	5	5	5	5
	F	5	5	5	5	5	5	5	5
	G	5	5	5	5	5	5	5	5
	H	5	5	5	5	5	5	5	5
50%	A	5	5	4	4	4	4	4	4
	B	5	5	5	5	5	5	5	5
	C	5	5	4	4	4	4	4	4
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	6	5	5	5
	F	5	5	4	4	4	4	4	4
	G	5	4	4	3	3	3	3	3
	H	5	5	5	5	5	5	5	5
Time / Initials		1450	1350 JB	1101 MJ	1035 JB	1632 MJ	1024 JB	0944 MJ	1331 MJ

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0) Cyprinodon: (1004.0) Menidia: (1006.0) Americamysis:(1007.0) X OTHER:

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-206
Test Material: Effluent
Accession Number: ATG-271
Dilution Water: 30 ppt CS
Accession Number: LDG-281

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Photoperiod: 16 ℓ, 8 d Light Intensity: 50 - 100 fc

Beginning Date: 6/10/16 Time: 1411
Ending Date: 6/17/16 Time: 1331
Test Container: 4" bowl
Test Volume: 150 ml
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	A	5	5	5	5	5	5	5	5
	B	5	5	3	3	3	3	3	3
	C	5	5	4	4	4	4	4	4
	D	5	5	5	4	4	4	4	4
	E	5	4	4	3	3	3	3	3
	F	5	5	3	3	3	2	2	2
	G	5	5	5	3	3	3	1	1
	H	5	5	5	5	5	5	5	4
100%	A	5	4	4	3	2	2	2	2
	B	5	5	3	2	2	1	1	1
	C	5	4	3	2	0	—	—	—
	D	5	3	1	0	—	—	—	—
	E	5	3	3	2	0	—	—	—
	F	5	5	3	3	3	3	2	2
	G	5	5	3	2	0	—	—	—
	H	5	2	1	1	1	0	—	—
Time / Initials		1450 JM	1350 JB	1101 MS	1035 SB	1632 MS	1024 SB	0944 MS	1331 MS

EPA TEST METHOD: (FW) EPA 821-R-02-013/(SW) EPA 821-R-02-012(CHECK ONE):
Fathead: (1000.0) Cyprinodon: (1004.0) Menidia: (1006.0) Americamysis:(1007.0) X OTHER:

ATS-T10
12/02/08

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	6/17/16	1331	MJ
Loaded tins placed in oven:	6/17/16	1357	MJ
Loaded tins removed from oven:	6/18/16	1515	NM
Loaded tins weighed:	6/18/16	1531	NM

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-206

Tin Lot: Black 160, Blue 159 (B)

Oven Temp (°C): Start: 99.5° End: 101.0°

Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(If applicable) Mean Biomass (mg/exp. org.)
Control	A	157		1	IIII		5	26.47	27.80	1.33	0.266	0.266
	B	174(B)	1	1	III		5	27.85	29.38	1.53	0.306	0.306
	C	152	1	II	I		4	26.92	~~30.57~~ 28.54	1.62	0.405	0.324
	D	61(B)	I	II	II		5	25.86	27.86	2.00	0.400	0.400
	E	112(B)	II		III		5	25.24	27.06	1.82	0.364	0.364
	F	236	1	II	II		5	26.84	28.49	1.65	0.330	0.330
	G	6	1	1	III		5	30.95	32.97	2.02	0.404	0.404
	H	241		1	IIII		5	28.43	29.66	1.23	0.246	0.246
50%	A	136	II	1	1		4	26.41	27.53	1.12	0.280	0.224
	B	160		1	IIII		5	29.02	30.57	1.55	0.310	0.310
	C	171 ~~161~~		1	III		4	~~27.95~~ 27.95	~~28.10~~ 28.67	~~0.64~~ 1.02	~~0.160~~ 0.255	0.204
	D	137	1		IIII		5	26.64	28.49	1.85	0.370	0.370
	E	109			~~IIII~~		5	25.78	26.96	1.18	0.236	0.236
	F	104	1	1	II		4	28.13	29.39	1.26	0.315	0.252
	G	122	1		II		3	28.15	29.36	1.21	0.403	0.242
	H	176	II		III		5	29.87	31.26	1.39	0.278	0.278

NM 6/20

NM 6/16

Dry wt. calculations checked (date, initials): 6/20/16 m

Biomass calculations checked (date, initials): 6/20/16 m

REPRODUCTION AND WEIGHT DATA (Test Species: *A. bahia*)

	Date	Time	Initials
Organisms sexed:	6/17/16	1331	MS
Loaded tins placed in oven:	6/17/16	1357	MS
Loaded tins removed from oven:	6/18/16	1515	NM
Loaded tins weighed:	6/18/16	1531	NM

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 110-2060
Tin Lot: Batch 160
Oven Temp (°C): Start: 99.5 End: 101
Oven Number: BLM-01 Balance Number: P0115825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(if applicable) Mean Biomass (mg/exp. org.)
75%	A	135		II	III		5	25.73	27.10	1.37	0.274	0.274
	B	182		II	I		3	28.61	30.14	1.53	0.510	0.306
	C	56	I		III		4	27.11	29.29	2.18	0.545	0.436
	D	183		IIII			4	27.23	28.21	0.98	0.245	0.196
	E	243		II	I		3	29.27	30.07	0.80	0.267	0.160
	F	148		II			2	25.70	26.45	0.75	0.375	0.150
	G	189			I		1	26.66	26.94	0.28	0.280	0.056
	H	245		I	III		4	30.22	31.41	1.19	0.298	0.238
100%	A	161			II		2	27.46	29.96	2.50	1.25	0.500
	B	205			I		1	31.53	31.73	0.20	0.200	0.040
	C	–	–	–	–	–	–					
	D	–	–	–	–	–	–					
	E	–	–	–	–	–	–					
	F	201			II		2	29.07	29.55	0.48	0.240	0.096
	G	–	–	–	–	–	–					
	H	–	–	–	–	–	–					

Dry wt. calculations checked (date, initials): 6/20/16 M Biomass calculations checked (date, initials): 6/20/16 M

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-2006

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 6/10/16 Time: 1411
Ending Date: 6/17/16 Time: 1331

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Control		25.0	26.0	26.6	26.1	26.2	26.7	26.3	7.2	8.4	8.0	8.0	7.1	7.3	7.6	7.0	6.6	6.4	6.9	6.7	6.7	6.5	27.7	27.5	27.5	28.2	28.2	27.8	28.0
50%		25.0	25.6	26.6	25.7	26.1	26.1	26.3	7.2	8.0	7.8	7.9	7.2	7.2	7.6	6.9	6.7	6.5	6.9	6.8	6.8	6.7	27.4	27.2	27.3	27.9	27.7	27.6	27.6
75%		25.1	25.1	26.7	26.0	25.9	25.5	25.7	7.2	7.8	7.8	7.7	7.2	7.1	7.6	6.9	6.9	6.6	7.1	6.8	6.9	6.9	27.3	27.0	27.0	27.7	27.4	27.2	27.4
100%		25.1	24.8	25.8	25.0	25.0	26.0	25.6	7.2	7.7	7.7	7.7	7.1	7.1	7.5	6.8	6.9	6.6	7.2	6.9	6.8	6.8	27.2	27.0	27.0	27.4	27.3	27.0	27.0
			25.0																										
Meter Number		678	679	679	678	678	678	678	678	679	679	678	678	678	678	678	679	679	678	678	678	678	678	679	679	678	678	679	678
Time		1401	1005	0952	0930	0905	0927	0917	1401	1005	0952	0930	0905	0927	0917	1401	1005	0952	0930	0905	0927	0917	1401	1005	0952	0930	0905	0927	0917
Initials		MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ

6/11 JB

6/13 JB

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15
Client: Jordan Valley
QC Test Number: TN- 16-2006

TEST ORGANISM
Common Name: Opossum shrimp
Scientific Name: *A. bahia*

Beginning Date: 6/10/16 Time: 1411
Ending Date: 6/17/16 Time: 1331

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

Test Conc	Rep	Temperature (°C)							pH							Dissolved Oxygen (mg/L)							Conductivity (µS/cm) Salinity (ppt)						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control		26.0	25.8	25.1	25.1	25.1	25.0	25.0	8.5	8.5	8.2	7.8	8.3	8.0	7.1	6.5	5.6 6.9	7.0	6.5	5.8	6.0	6.5	27.7	27.7	28.5	28.6	28.3	28.2	27.9
50%		26.0	25.9	25.1	25.2	25.2	25.3	25.0	8.1	8.3	8.1	7.8	8.2	8.0	7.1	6.5	5.1 6.2	6.5	6.0	5.4	5.1	6.2	27.5	27.5	28.2	28.2	27.8	27.9	27.8
75%		26.0	25.7	25.9	25.1	25.3	25.3	25.1	8.0	8.1	8.1	7.8	8.1	8.0	7.2	4.9	5.6	6.4	5.3	5.0	4.8	5.7	27.2	27.2	27.9	28.0	27.5	27.7	27.6
100%		26.0	25.8	25.0	25.0	25.1	25.3	25.1	8.0	8.1	8.1	7.8	8.1	8.0	7.3	4.8	5.0	6.5	5.2	5.4	4.6	5.7	27.1	27.1	28.0	27.9	27.3	27.0	27.3
Meter Number		679	679	678	678	678	679	679	679	679	678	678	678	679	679	679	679	678	678	678	678	679	679	679	678	678	678	678	679
Time		1355	1115	1045	1644	1025	0957	1504	1355	1115	1045	1644	1025	0957	1504	1355	1115	1045	1644	1025	0957	1504	1355	1115	1045	1644	1025	0957	1504
Initials		JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ	JB	MJ	JB	MJ	JB	MJ	MJ

6/15

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN- 16-206

Date/Time/Initials	Comments/Activity
6/14/16 0842 MJ	100% samples produced a salt deposit on glass test vessels

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: Jordan Valley

QC Test Number: TN-16-206

Aliquot of sample warmed to test temperature, then aerated if supersaturated:

		ON AIR			OFF AIR		
Date	Sample #	Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
6/10/16	AT6-277	6.7	—	MJ	—	—	—
6/11/16	AT6-277	7.6	0902	JB	6.7	0912	JB
6/12/16	AT6-277	8.3	0921	MJ	6.7	0931	MJ
6/13/16	AT6-277	9.1	0902	JB	7.1	0912	JB
6/14/16	AT6-277	9.0	0840	MJ	6.9	0850	MJ
6/15/16	AT6-277	9.7	0850	JB	7.2	0900	JB
6/16/16	AT6-277	9.3	0855	MJ	7.0	0905	MJ

Mysid Survival, Growth and Fecundity Test-48 Hr Survival

Start Date:	6/10/2016	Test ID:	TN-16-206	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50	0.8000	1.0000	0.8000	1.0000	1.0000	0.8000	0.8000	1.0000
75	1.0000	0.6000	0.8000	1.0000	0.8000	0.6000	1.0000	1.0000
100	0.8000	0.6000	0.6000	0.2000	0.6000	0.6000	0.6000	0.2000

			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	8			1.0000	1.0000
50	0.9000	0.9000	1.2262	1.1071	1.3453	10.381	8	52.00	48.00	0.9000	0.9000
75	0.8500	0.8500	1.1709	0.8861	1.3453	17.443	8	52.00	48.00	0.8500	0.8500
*100	0.5250	0.5250	0.8081	0.4636	1.1071	27.951	8	36.00	48.00	0.5250	0.5250

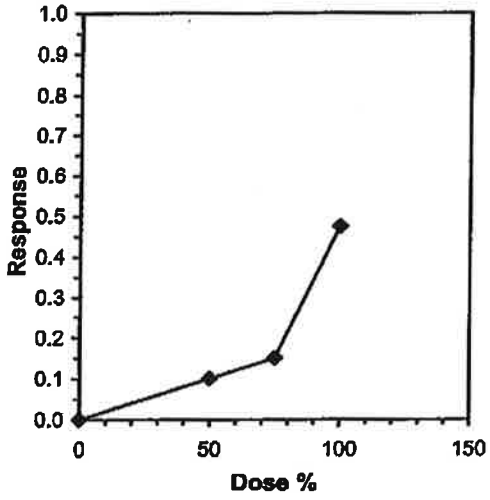
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92724	0.904	-0.6973	0.23513
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	75	100	86.6025	1.33333

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	25.000	11.429	16.667	53.586	1.1194
IC10	50.000	13.076	33.333	77.150	0.4123
IC15	75.000	8.943	50.000	80.769	-0.8034
IC20	78.846	5.006	66.625	84.783	-0.9554
IC25	82.692	4.012	75.000	89.286	-0.1258
IC40	94.231				
IC50	>100				

* indicates IC estimate less than the lowest concentration



Reviewed by:

Mysid Survival, Growth and Fecundity Test-96 Hr Survival

Start Date:	6/10/2016	Test ID:	TN-16-206	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia

Comments:

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000
50	0.8000	1.0000	0.8000	1.0000	1.0000	0.8000	0.6000	1.0000
75	1.0000	0.6000	0.8000	0.8000	0.6000	0.6000	0.6000	1.0000
100	0.4000	0.4000	0.0000	0.0000	0.0000	0.6000	0.0000	0.2000

			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.9750	1.0000	1.3155	1.1071	1.3453	6.400	8				1	40
50	0.8750	0.8974	1.1986	0.8861	1.3453	14.410	8	1.209	2.156	0.2086	5	40
*75	0.7500	0.7692	1.0561	0.8861	1.3453	19.209	8	2.681	2.156	0.2086	10	40
*100	0.2000	0.2051	0.4527	0.2255	0.8861	59.165	8	8.918	2.156	0.2086	32	40

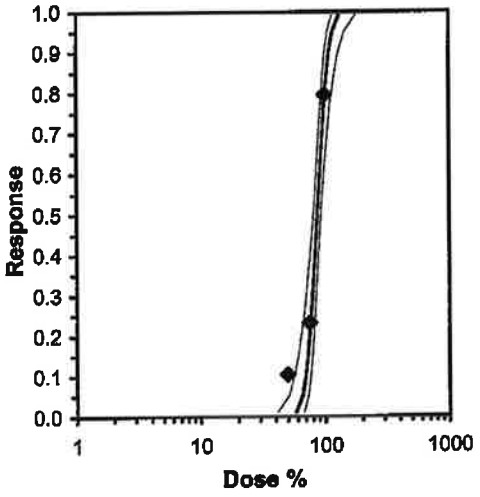
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95115	0.904	0.32872	-0.4883
Bartlett's Test indicates equal variances (p = 0.06)	7.58303	11.3449		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	75	61.2372	2	0.13641	0.1457	1.17759	0.03745	4.2E-09	3, 28

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	13.1795	2.92689	7.44281	18.9162	0.025	1.4643	3.84146	0.23	1.94077	0.07588	10
Intercept	-20.578	5.70125	-31.753	-9.4039							
TSCR	0.07407	0.02958	0.01609	0.13205							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	58.1106	41.2877	66.8966
EC05	3.355	65.4582	50.7891	72.9534
EC10	3.718	69.7477	56.6467	76.4997
EC15	3.964	72.7995	60.92	79.0616
EC20	4.158	75.3199	64.4918	81.2259
EC25	4.326	77.5516	67.665	83.2004
EC40	4.747	83.4728	75.9194	88.9169
EC50	5.000	87.2505	80.8041	93.1828
EC60	5.253	91.1991	85.36	98.3891
EC75	5.674	98.1624	92.033	109.422
EC80	5.842	101.071	94.4574	114.579
EC85	6.036	104.57	97.2003	121.1
EC90	6.282	109.146	100.591	130.061
EC95	6.645	116.298	105.606	144.889
EC99	7.326	131.003	115.289	178.043



Reviewed by:_____

Mysid Survival, Growth and Fecundity Test-7 Day Survival

Start Date:	6/10/2016	Test ID:	TN-16-206	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	1.0000	0.8000	1.0000	1.0000	1.0000	1.0000	1.0000
50	0.8000	1.0000	0.8000	1.0000	1.0000	0.8000	0.6000	1.0000
75	1.0000	0.6000	0.8000	0.8000	0.6000	0.4000	0.2000	0.8000
100	0.4000	0.2000	0.0000	0.0000	0.0000	0.4000	0.0000	0.0000

			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.9750	1.0000	1.3155	1.1071	1.3453	6.400	8				0.9750	1.0000
50	0.8750	0.8974	1.1986	0.8861	1.3453	14.410	8	1.172	2.156	0.2151	0.8750	0.8974
*75	0.6500	0.6667	0.9484	0.4636	1.3453	29.432	8	3.679	2.156	0.2151	0.6500	0.6667
*100	0.1250	0.1282	0.3701	0.2255	0.6847	56.978	8	9.475	2.156	0.2151	0.1250	0.1282

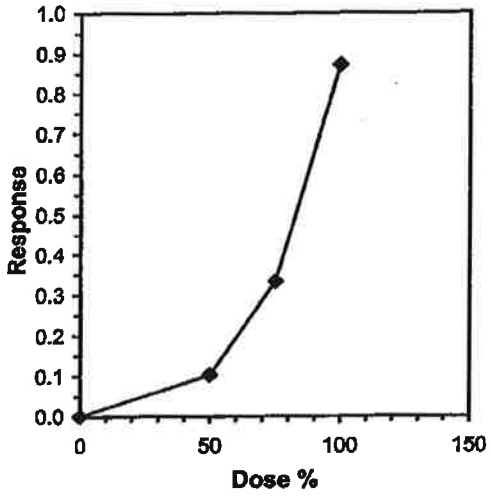
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97311	0.904	-0.198	0.38266
Bartlett's Test indicates equal variances (p = 0.04)	8.15012	11.3449		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	75	61.2372	2	0.14165	0.15129	1.41717	0.03982	1.1E-09	3, 28

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	24.375	13.798	12.500	54.205	0.5982
IC10*	48.750	10.352	25.000	58.418	-0.6508
IC15	55.139	7.395	37.500	69.263	-0.8053
IC20	60.556	6.535	50.000	75.772	-0.0133
IC25	65.972	6.093	56.233	77.648	-0.0668
IC40	78.095	3.628	69.679	82.971	-0.6188
IC50	82.738	2.879	76.238	87.031	-0.4792

* Indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by:

Mysid Survival, Growth and Fecundity Test-Biomass

Start Date:	6/10/2016	Test ID: TN-16-206	Sample ID: Jordan Valley
End Date:	6/17/2016	Lab ID:	Sample Type:
Sample Date:		Protocol: EPAM 87-EPA Marine	Test Species: MY-Mysidopsis bahia

Comments:

Conc-%	1	2	3	4	5	6	7	8	S.D.
Control	0.2660	0.3060	0.3240	0.4000	0.3640	0.3300	0.4040	0.2460	0.05769
50	0.2240	0.3100	0.2040	0.3700	0.2360	0.2520	0.2420	0.2780	0.05366
75	0.2740	0.3060	0.4360	0.1960	0.1600	0.1500	0.0560	0.2380	0.11518
100	0.5000	0.0400	0.0000	0.0000	0.0000	0.0960	0.0000	0.0000	0.17331

			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.3300	1.0000	0.3300	0.2460	0.4040	17.481	8				0.3300	1.0000
*50	0.2645	0.8015	0.2645	0.2040	0.3700	20.288	8	2.351	1.761	0.0491	0.2645	0.8015
75	0.2270	0.6879	0.2270	0.0560	0.4360	50.742	8	49.000	48.000		0.2270	0.6879
100	0.0795	0.2409	0.0795	0.0000	0.5000	218.000	8	44.000	48.000		0.0795	0.2409

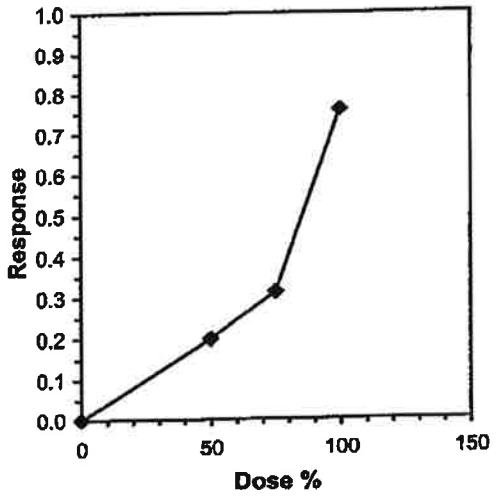
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9677	0.844	0.42276	-0.5335
F-Test indicates equal variances (p = 0.85)	1.15567	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.04906	0.14868	0.01716	0.0031	0.03388	1, 14

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05*	12.595	9.600	8.294	49.676	2.2649
IC10*	25.191				
IC15*	37.786				
IC20	50.333				
IC25	61.333				
IC40	79.915				
IC50	85.508				

* indicates IC estimate less than the lowest concentration



ToxCalc v5.0.23

Reviewed by:

Mysid Survival, Growth and Fecundity Test-Fecundity

Start Date:	6/10/2016	Test ID:	TN-16-206	Sample ID:	Jordan Valley
End Date:	6/17/2016	Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAM 87-EPA Marine	Test Species:	MY-Mysidopsis bahia
Comments:					

Conc-%	1	2	3	4	5	6	7	8
Control	0.0000	0.5000	0.3333	0.3333	1.0000	0.3333	0.5000	0.0000
50	0.6667	0.0000	0.0000	1.0000	0.5000	1.0000	1.0000	
75	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	

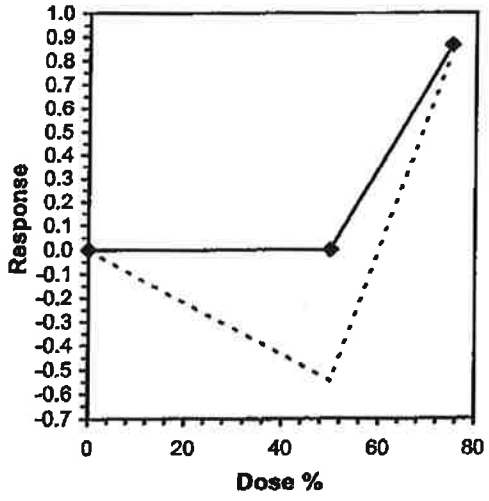
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.3750	1.0000	0.7092	0.5236	1.2094	31.846	8				0.5241	1.0000
50	0.5952	1.5873	0.8702	0.5236	1.2094	30.849	7	-1.228	2.093	0.2745	0.5241	1.0000
75	0.1429	0.3810	0.4670	0.2527	1.0472	57.352	7	1.847	2.093	0.2745	0.0714	0.1363

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9054	0.878	0.9671	0.75356
Bartlett's Test indicates equal variances (p = 0.89)	0.2351	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	75	>75		1.33333	0.24673	0.58174	0.28878	0.06421	0.02517	2, 19

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	51.447			
IC10	52.895			
IC15	54.342			
IC20	55.789			
IC25	57.236			
IC40	61.578			
IC50	64.473			



Reviewed by:

ATTACHMENT II

Chemical Analyses
(72 pages)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-55503-2
Client Project/Site: Jordan Valley

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Authorized for release by:
6/10/2016 10:24:15 AM

Carrie Gamber, Senior Project Manager
(412)963-2428
carrie.gamber@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 180-55503-2

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-55503-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 06/08/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

METALS

Due to sample matrix effect on the internal standard (ISTD); both indium & yttrium were suppressed; a dilution was required for the following samples: AT6-271 (SALINITY ADJUSTED) (180-55503-1) and (180-55503-E-1-A SD ^).

The following samples were diluted to bring the concentration of sodium to within the instrument's linear range: AT6-271 (SALINITY ADJUSTED) (180-55503-1) and (180-55503-E-1-A SD ^). Elevated reporting limits (RLs) are provided.

GENERAL CHEMISTRY

Samples AT6-271 (SALINITY ADJUSTED) (180-55503-1) required dilution prior to IC analysis. The reporting limits have been adjusted accordingly.

Definitions/Glossary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4	200.7	Water	Barium
200.7 Rev 4.4	200.7	Water	Boron
200.7 Rev 4.4	200.7	Water	Calcium
200.7 Rev 4.4	200.7	Water	Magnesium
200.7 Rev 4.4	200.7	Water	Potassium
200.7 Rev 4.4	200.7	Water	Sodium
200.7 Rev 4.4	200.7	Water	Strontium
300.0		Water	Bromide
300.0		Water	Chloride
300.0		Water	Sulfate

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-16
Arizona	State Program	9	AZ0671	10-13-16
California	LA Cty Sanitation Districts	9	10256	01-31-17 *
California	State Program	9	CA ELAP 2706	06-30-16
Guam	State Program	9	Cert. No. 12.002r	01-23-17
Hawaii	State Program	9	N/A	01-29-17
Kansas	NELAP Secondary AB	7	E-10420	07-31-16
Nevada	State Program	9	CA015312016-2	07-31-16
New Mexico	State Program	6	N/A	01-29-17
Northern Mariana Islands	State Program	9	MP0002	01-29-17
Oregon	NELAP	10	4028	01-29-17
USDA	Federal		P330-09-00080	07-08-18
Washington	State Program	10	C900	09-03-16

* Certification renewal pending - certification considered valid.

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Water	06/07/16 13:00	06/08/16 11:30

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
SM 2320B	Alkalinity	SM	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

Client Sample ID: AT6-271 (SALINITY ADJUSTED)

Date Collected: 06/07/16 13:00
Date Received: 06/08/16 11:30

Lab Sample ID: 180-55503-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50	1 mL		178539	06/08/16 18:19	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	300.0		500	1 mL		178539	06/08/16 18:37	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.7			50 mL	50 mL	178640	06/08/16 12:35	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		5	50 mL	50 mL	178721	06/09/16 08:03	RJR	TAL PIT
	Instrument ID: Q									
Total Recoverable	Prep	200.7			50 mL	50 mL	178640	06/08/16 12:35	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		25	50 mL	50 mL	178721	06/09/16 08:14	RJR	TAL PIT
	Instrument ID: Q									
Total/NA	Analysis	SM 2320B		1			335663	06/09/16 12:16	YZ	TAL IRV
	Instrument ID: MANTECH01									

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL IRV

Batch Type: Analysis

YZ = Yuriy Zakhrabov

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

Client Sample ID: AT6-271 (SALINITY ADJUSTED)

Date Collected: 06/07/16 13:00
Date Received: 06/08/16 11:30

Lab Sample ID: 180-55503-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	**90**		25	2.9	mg/L			06/08/16 18:19	50
Chloride	**15000**		500	170	mg/L			06/08/16 18:37	500
Sulfate	**3500**		50	17	mg/L			06/08/16 18:19	50

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**3700**		1000	22	ug/L		06/08/16 12:35	06/09/16 08:03	5
Barium	**250**	**J**	1000	4.5	ug/L		06/08/16 12:35	06/09/16 08:03	5
Calcium	**870000**		25000	360	ug/L		06/08/16 12:35	06/09/16 08:03	5
Potassium	**290000**		25000	4200	ug/L		06/08/16 12:35	06/09/16 08:03	5
Magnesium	**1100000**		25000	200	ug/L		06/08/16 12:35	06/09/16 08:03	5
Sodium	**7500000**		130000	5700	ug/L		06/08/16 12:35	06/09/16 08:14	25
Strontium	**9400**		250	26	ug/L		06/08/16 12:35	06/09/16 08:03	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**920**		4.0	4.0	mg/L			06/09/16 12:16	1
Bicarbonate Alkalinity as CaCO3	**920**		4.0	4.0	mg/L			06/09/16 12:16	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/09/16 12:16	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/09/16 12:16	1
Bicarbonate ion as HCO3	**1100**		4.8	4.8	mg/L			06/09/16 12:16	1
Carbonate as CO3	ND		2.4	2.4	mg/L			06/09/16 12:16	1
Hydroxide as OH	ND		1.4	1.4	mg/L			06/09/16 12:16	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-178539/44
Matrix: Water
Analysis Batch: 178539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.50	0.058	mg/L			06/08/16 18:02	1
Chloride	ND		1.0	0.33	mg/L			06/08/16 18:02	1
Sulfate	ND		1.0	0.34	mg/L			06/08/16 18:02	1

Lab Sample ID: LCS 180-178539/43
Matrix: Water
Analysis Batch: 178539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	10.0	10.3		mg/L		103	90 - 110
Chloride	50.0	51.4		mg/L		103	90 - 110
Sulfate	50.0	50.9		mg/L		102	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-178640/1-A
Matrix: Water
Analysis Batch: 178721

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 178640

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	4.4	ug/L		06/08/16 12:35	06/09/16 07:35	1
Barium	ND		200	0.89	ug/L		06/08/16 12:35	06/09/16 07:35	1
Calcium	ND		5000	73	ug/L		06/08/16 12:35	06/09/16 07:35	1
Potassium	ND		5000	840	ug/L		06/08/16 12:35	06/09/16 07:35	1
Magnesium	ND		5000	41	ug/L		06/08/16 12:35	06/09/16 07:35	1
Sodium	ND		5000	230	ug/L		06/08/16 12:35	06/09/16 07:35	1
Strontium	ND		50	5.3	ug/L		06/08/16 12:35	06/09/16 07:35	1

Lab Sample ID: LCS 180-178640/2-A
Matrix: Water
Analysis Batch: 178721

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 178640

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	1080		ug/L		108	85 - 115
Barium	2000	2000		ug/L		100	85 - 115
Calcium	50000	47900		ug/L		96	85 - 115
Potassium	50000	47400		ug/L		95	85 - 115
Magnesium	50000	50500		ug/L		101	85 - 115
Sodium	50000	48300		ug/L		97	85 - 115
Strontium	1000	993		ug/L		99	85 - 115

Lab Sample ID: LCSD 180-178640/3-A
Matrix: Water
Analysis Batch: 178721

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 178640

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1000	1060		ug/L		106	85 - 115	2	20
Barium	2000	2000		ug/L		100	85 - 115	0	20
Calcium	50000	49600		ug/L		99	85 - 115	4	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-178640/3-A
Matrix: Water
Analysis Batch: 178721

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 178640

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Potassium	50000	48400		ug/L		97	85 - 115	2	20
Magnesium	50000	51000		ug/L		102	85 - 115	1	20
Sodium	50000	49900		ug/L		100	85 - 115	3	20
Strontium	1000	1010		ug/L		101	85 - 115	2	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 440-335663/4
Matrix: Water
Analysis Batch: 335663

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/09/16 12:01	1
Bicarbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/09/16 12:01	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/09/16 12:01	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/09/16 12:01	1
Bicarbonate ion as HCO3	ND		4.8	4.8	mg/L			06/09/16 12:01	1
Carbonate as CO3	ND		2.4	2.4	mg/L			06/09/16 12:01	1
Hydroxide as OH	ND		1.4	1.4	mg/L			06/09/16 12:01	1

Lab Sample ID: LCS 440-335663/3
Matrix: Water
Analysis Batch: 335663

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3	63.4	64.2		mg/L		101	80 - 120

Lab Sample ID: 180-55503-1 DU
Matrix: Water
Analysis Batch: 335663

Client Sample ID: AT6-271 (SALINITY ADJUSTED)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity as CaCO3	920		933		mg/L		1	20
Bicarbonate Alkalinity as CaCO3	920		933		mg/L		1	20
Carbonate Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Hydroxide Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Bicarbonate ion as HCO3	1100		1140		mg/L		1	20
Carbonate as CO3	ND		ND		mg/L		NC	20
Hydroxide as OH	ND		ND		mg/L		NC	20

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

HPLC/IC

Analysis Batch: 178539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	300.0	
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	300.0	
LCS 180-178539/43	Lab Control Sample	Total/NA	Water	300.0	
MB 180-178539/44	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 178640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.7	
LCS 180-178640/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-178640/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-178640/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 178721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.7 Rev 4.4	178640
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.7 Rev 4.4	178640
LCS 180-178640/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	178640
LCSD 180-178640/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	178640
MB 180-178640/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	178640

General Chemistry

Analysis Batch: 335663

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	SM 2320B	
180-55503-1 DU	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	SM 2320B	
LCS 440-335663/3	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 440-335663/4	Method Blank	Total/NA	Water	SM 2320B	

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

180325

TestAmerica

BALTIMORE

Client Information	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-31129-6905.1
Client Contact: Mike Chanov	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology				Job #:
Address: 225 Schilling Circle Suite 400	Due Date Requested:	Analysis Requested		Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3
City: Hunt Valley	TAT Requested (days):			
State, Zip: MD, 21031				
Phone: 410-329-5120(Tel)	PO #: Purchase Order Requested			
Email: mchanov@eaest.com	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

180-55503 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Metals	1L (48 hr Hold Time)	TSS	TDS	Alkalinity (Irvine)	Total Number	Special Instructions/Note:
			Preservation Code:				D	W	W	W	W		
ATo-271 (Salinity Adjusted)	6/7/16	1300	G	W			X	X	X	X	X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: TA Date: 6/7/16 Time: 1200 Method of Shipment: Carrier

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6/7/16 1600	EA	Deluwe Watson	6-8-16	TXP
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9:30	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031

33 LBS

F 1

SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH P[illegible]2907

180-55503 Waybill

PA 152 9-22

UPS NEXT DAY AIR

1

TRACKING #: 1Z 288 682 01 9863 2367

BILLING: P/P
UPS CARBON NEUTRAL SHIPMENT

Department Code: 2122
Project Phase AND Task: TOXLAB

CS 18.1.17. WINNV50 75.0A 04/2016

TM

baltimore

Uncorrected temp 3.2 °C
Thermometer ID 5
CF _____ Initials cwl

PT-WI-SR-001 effective 7/26/13

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-244283.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc				Job #: 180-55503-2
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 6/9/2016			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #:			
Email:	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	2320B/ (MOD) Alkalinity all forms	Total Number of containers	Special Instructions/Note:
			Preservation Code:					
AT6-271 (SALINITY ADJUSTED) (180-55503-1)	6/7/16	13:00 Eastern		Water		X		

Possible Hazard Identification	**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**		
Unconfirmed	☐ Return To Client	☐ Disposal By Lab	☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:		

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 6/8/16 1700	Company TAL	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: Maryann Dales	Date/Time: 6/9/16 935	Company TAL
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: #6479-2544-7550		Cooler Temperature(s) °C and Other Remarks: 3.3/3.0 #74		

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55503-2

Login Number: 55503
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55503-2

Login Number: 55503
List Number: 2
Creator: Salas, Margarita

List Source: TestAmerica Irvine
List Creation: 06/09/16 11:27 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-55503-1
Client Project/Site: Jordan Valley

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Authorized for release by:
6/22/2016 9:12:32 AM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 180-55503-1

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-55503-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 06/08/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

METALS

Sample AT6-271 (SALINITY ADJUSTED) (180-55503-1) required dilution prior to metals analysis. The reporting limits have been adjusted accordingly.

Hardness as calcium carbonate, Lead, Manganese, Antimony and Thallium were detected in method blank MB 180-178688/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Copper failed the recovery criteria high for the MS of sample AT6-271 (SALINITY ADJUSTED) (180-55503-1) in batch 180-179553. Copper exceeded the RPD

Mercury was detected in method blank MB 180-178784/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

GENERAL CHEMISTRY

Sample AT6-271 (SALINITY ADJUSTED) (180-55503-1) required dilution prior to IC analysis. The reporting limits have been adjusted accordingly.

The following sample was received with insufficient preservation at a pH of 7.80: AT6-271 (SALINITY ADJUSTED) (180-55503-1). The sample was preserved to the appropriate pH in the laboratory.

Due to the sample matrix, the initial volumes used for the following samples deviated from the standard procedure for TDS: AT6-271 (SALINITY ADJUSTED) (180-55503-1). The reporting limits (RLs) have been adjusted proportionately.

Definitions/Glossary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.8	200.8	Water	Antimony
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Beryllium
200.8	200.8	Water	Cadmium
200.8	200.8	Water	Chromium
200.8	200.8	Water	Copper
200.8	200.8	Water	Hardness as calcium carbonate
200.8	200.8	Water	Iron
200.8	200.8	Water	Lead
200.8	200.8	Water	Manganese
200.8	200.8	Water	Nickel
200.8	200.8	Water	Selenium
200.8	200.8	Water	Silver
200.8	200.8	Water	Thallium
200.8	200.8	Water	Zinc
245.1	245.1	Water	Mercury
300.0		Water	Fluoride
300.0		Water	Nitrate as N
300.0		Water	Nitrite as N
300.0		Water	Orthophosphate as P
SM 2540C		Water	Total Dissolved Solids
SM 2540D		Water	Total Suspended Solids
SM 4500 CN E	SM 4500 CN C	Water	Cyanide, Total

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Water	06/07/16 13:00	06/08/16 11:30

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.0	Metals (ICP/MS)	EPA	TAL PIT
245.1	Mercury (CVAA)	EPA	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL PIT
SM 4500 CN E	Cyanide, Total	SM	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Client Sample ID: AT6-271 (SALINITY ADJUSTED)

Date Collected: 06/07/16 13:00
Date Received: 06/08/16 11:30

Lab Sample ID: 180-55503-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50	1 mL		178678	06/09/16 09:06	CMR	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Analysis	300.0		50	1 mL		178539	06/08/16 18:19	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.8			50 mL	50 mL	178688	06/09/16 07:09	ANA	TAL PIT
Total Recoverable	Analysis	200.8		5	50 mL	50 mL	179457	06/15/16 22:58	WTR	TAL PIT
	Instrument ID: X									
Total Recoverable	Prep	200.8			50 mL	50 mL	178688	06/09/16 07:09	ANA	TAL PIT
Total Recoverable	Analysis	200.8		5	50 mL	50 mL	179553	06/16/16 22:34	WTR	TAL PIT
	Instrument ID: X									
Total/NA	Prep	245.1			50 mL	50 mL	178784	06/09/16 13:46	EVR	TAL PIT
Total/NA	Analysis	245.1		1	50 mL	50 mL	178913	06/10/16 10:05	EVR	TAL PIT
	Instrument ID: K									
Total/NA	Analysis	SM 2540C		1	2 mL	100 mL	178788	06/09/16 14:07	JWS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	178797	06/09/16 15:45	JWS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	SM 4500 CN C			50 mL	50 mL	179152	06/14/16 11:45	JAS	TAL PIT
Total/NA	Analysis	SM 4500 CN E		1	50 mL	50 mL	179193	06/14/16 15:00	JAS	TAL PIT
	Instrument ID: SEAL2									

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

EVR = Emilie Reichenbach

JAS = Joshua Schmidt

Batch Type: Analysis

CMR = Carl Reagle

EVR = Emilie Reichenbach

JAS = Joshua Schmidt

JWS = Jim Swanson

MJH = Matthew Hartman

WTR = Bill Reinheimer

Client Sample Results

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Client Sample ID: AT6-271 (SALINITY ADJUSTED)

Date Collected: 06/07/16 13:00
Date Received: 06/08/16 11:30

Lab Sample ID: 180-55503-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	8.0		5.0	1.1	mg/L			06/08/16 18:19	50
Nitrite as N	ND		2.5	1.4	mg/L			06/08/16 18:19	50
Fluoride	ND		5.0	1.2	mg/L			06/08/16 18:19	50
Orthophosphate as P	ND		25	7.7	mg/L			06/09/16 09:06	50

Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		5.0	0.23	ug/L		06/09/16 07:09	06/16/16 22:34	5
Arsenic	28		5.0	0.59	ug/L		06/09/16 07:09	06/15/16 22:58	5
Beryllium	ND		5.0	0.18	ug/L		06/09/16 07:09	06/16/16 22:34	5
Cadmium	ND		5.0	0.37	ug/L		06/09/16 07:09	06/15/16 22:58	5
Chromium	29		10	1.1	ug/L		06/09/16 07:09	06/16/16 22:34	5
Copper	58	F2 F1	10	1.3	ug/L		06/09/16 07:09	06/16/16 22:34	5
Iron	ND		250	29	ug/L		06/09/16 07:09	06/16/16 22:34	5
Manganese	1.7	J B	25	0.23	ug/L		06/09/16 07:09	06/15/16 22:58	5
Nickel	47		5.0	0.47	ug/L		06/09/16 07:09	06/16/16 22:34	5
Lead	3.2	J B	5.0	0.28	ug/L		06/09/16 07:09	06/15/16 22:58	5
Antimony	1.1	J B	10	0.20	ug/L		06/09/16 07:09	06/16/16 22:34	5
Selenium	25		25	0.98	ug/L		06/09/16 07:09	06/16/16 22:34	5
Thallium	ND		5.0	0.066	ug/L		06/09/16 07:09	06/16/16 22:34	5
Zinc	98		25	2.0	ug/L		06/09/16 07:09	06/16/16 22:34	5
Hardness as calcium carbonate	7400	B	17	0.13	mg/L		06/09/16 07:09	06/15/16 22:58	5

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.039	ug/L		06/09/16 13:46	06/10/16 10:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	32000		500	500	mg/L			06/09/16 14:07	1
Total Suspended Solids	2.0		0.50	0.50	mg/L			06/09/16 15:45	1
Cyanide, Total	ND		0.010	0.0038	mg/L		06/14/16 11:45	06/14/16 15:00	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-178539/44
Matrix: Water
Analysis Batch: 178539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.022	mg/L			06/08/16 18:02	1
Nitrite as N	ND		0.050	0.028	mg/L			06/08/16 18:02	1
Fluoride	ND		0.10	0.024	mg/L			06/08/16 18:02	1

Lab Sample ID: LCS 180-178539/43
Matrix: Water
Analysis Batch: 178539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.56		mg/L		102	90 - 110
Nitrite as N	2.50	2.52		mg/L		101	90 - 110
Fluoride	2.50	2.32		mg/L		93	90 - 110

Lab Sample ID: MB 180-178678/6
Matrix: Water
Analysis Batch: 178678

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.50	0.15	mg/L			06/09/16 08:17	1

Lab Sample ID: LCS 180-178678/5
Matrix: Water
Analysis Batch: 178678

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P	2.50	2.39		mg/L		95	90 - 110

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 180-178688/1-A
Matrix: Water
Analysis Batch: 179457

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.12	ug/L		06/09/16 07:09	06/15/16 22:12	1
Cadmium	ND		1.0	0.074	ug/L		06/09/16 07:09	06/15/16 22:12	1
Manganese	0.136	J	5.0	0.046	ug/L		06/09/16 07:09	06/15/16 22:12	1
Lead	0.0940	J	1.0	0.057	ug/L		06/09/16 07:09	06/15/16 22:12	1
Antimony	ND		2.0	0.040	ug/L		06/09/16 07:09	06/15/16 22:12	1
Selenium	ND		5.0	0.20	ug/L		06/09/16 07:09	06/15/16 22:12	1
Hardness as calcium carbonate	0.0264	J	3.3	0.026	mg/L		06/09/16 07:09	06/15/16 22:12	1

Lab Sample ID: MB 180-178688/1-A
Matrix: Water
Analysis Batch: 179553

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.047	ug/L		06/09/16 07:09	06/16/16 22:08	1
Beryllium	ND		1.0	0.036	ug/L		06/09/16 07:09	06/16/16 22:08	1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 180-178688/1-A
Matrix: Water
Analysis Batch: 179553

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		2.0	0.23	ug/L		06/09/16 07:09	06/16/16 22:08	1
Copper	ND		2.0	0.27	ug/L		06/09/16 07:09	06/16/16 22:08	1
Iron	ND		50	5.7	ug/L		06/09/16 07:09	06/16/16 22:08	1
Nickel	ND		1.0	0.093	ug/L		06/09/16 07:09	06/16/16 22:08	1
Antimony	0.417	J	2.0	0.040	ug/L		06/09/16 07:09	06/16/16 22:08	1
Selenium	ND		5.0	0.20	ug/L		06/09/16 07:09	06/16/16 22:08	1
Thallium	0.0260	J	1.0	0.013	ug/L		06/09/16 07:09	06/16/16 22:08	1
Zinc	ND		5.0	0.40	ug/L		06/09/16 07:09	06/16/16 22:08	1

Lab Sample ID: LCS 180-178688/2-A
Matrix: Water
Analysis Batch: 179457

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	42.3		ug/L		106	85 - 115
Cadmium	50.0	56.4		ug/L		113	85 - 115
Manganese	500	520		ug/L		104	85 - 115
Lead	20.0	19.7		ug/L		99	85 - 115

Lab Sample ID: LCS 180-178688/2-A
Matrix: Water
Analysis Batch: 179553

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	43.3		ug/L		87	85 - 115
Beryllium	50.0	56.2		ug/L		112	85 - 115
Chromium	200	200		ug/L		100	85 - 115
Copper	250	254		ug/L		102	85 - 115
Iron	1000	1050		ug/L		105	85 - 115
Nickel	500	504		ug/L		101	85 - 115
Antimony	500	550		ug/L		110	85 - 115
Selenium	10.0	11.2		ug/L		112	85 - 115
Thallium	50.0	48.8		ug/L		98	85 - 115
Zinc	500	514		ug/L		103	85 - 115

Lab Sample ID: 180-55503-1 MS
Matrix: Water
Analysis Batch: 179457

Client Sample ID: AT6-271 (SALINITY ADJUSTED)
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	28		40.0	63.1		ug/L		88	70 - 130
Cadmium	ND		50.0	51.1		ug/L		102	70 - 130
Manganese	1.7	J B	500	408		ug/L		81	70 - 130
Lead	3.2	J B	20.0	19.0		ug/L		79	70 - 130
Antimony	0.99	J *	500	532		ug/L		106	70 - 130
Selenium	24	J *	10.0	32.7		ug/L		83	70 - 130

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: 180-55503-1 MS
Matrix: Water
Analysis Batch: 179553

Client Sample ID: AT6-271 (SALINITY ADJUSTED)
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	ND		50.0	40.4		ug/L		81	70 - 130
Beryllium	ND		50.0	57.4		ug/L		115	70 - 130
Chromium	29		200	264		ug/L		117	70 - 130
Copper	58	F2 F1	250	647	F1	ug/L		235	70 - 130
Iron	ND		1000	1210		ug/L		121	70 - 130
Nickel	47		500	577		ug/L		106	70 - 130
Antimony	1.1	J B	500	536		ug/L		107	70 - 130
Selenium	25		10.0	35.4		ug/L		107	70 - 130
Thallium	ND		50.0	49.8		ug/L		100	70 - 130
Zinc	98		500	587		ug/L		98	70 - 130

Lab Sample ID: 180-55503-1 MSD
Matrix: Water
Analysis Batch: 179457

Client Sample ID: AT6-271 (SALINITY ADJUSTED)
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	28		40.0	63.1		ug/L		88	70 - 130	0	20
Cadmium	ND		50.0	50.4		ug/L		101	70 - 130	1	20
Manganese	1.7	J B	500	423		ug/L		84	70 - 130	4	20
Lead	3.2	J B	20.0	20.6		ug/L		87	70 - 130	8	20
Antimony	0.99	J *	500	534		ug/L		107	70 - 130	0	20
Selenium	24	J *	10.0	32.0		ug/L		76	70 - 130	2	20

Lab Sample ID: 180-55503-1 MSD
Matrix: Water
Analysis Batch: 179553

Client Sample ID: AT6-271 (SALINITY ADJUSTED)
Prep Type: Total Recoverable
Prep Batch: 178688

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	ND		50.0	40.0		ug/L		80	70 - 130	1	20
Beryllium	ND		50.0	61.5		ug/L		123	70 - 130	7	20
Chromium	29		200	243		ug/L		107	70 - 130	8	20
Copper	58	F2 F1	250	309	F2	ug/L		100	70 - 130	71	20
Iron	ND		1000	1130		ug/L		113	70 - 130	7	20
Manganese	2.0	J	500	470		ug/L		94	70 - 130	11	20
Nickel	47		500	548		ug/L		100	70 - 130	5	20
Antimony	1.1	J B	500	540		ug/L		108	70 - 130	1	20
Selenium	25		10.0	34.7		ug/L		100	70 - 130	2	20
Thallium	ND		50.0	49.1		ug/L		98	70 - 130	1	20
Zinc	98		500	559		ug/L		92	70 - 130	5	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 180-178784/1-A
Matrix: Water
Analysis Batch: 178913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 178784

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0457	J	0.20	0.039	ug/L		06/09/16 13:46	06/10/16 09:59	1

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 180-178784/2-A
Matrix: Water
Analysis Batch: 178913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 178784

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.53		ug/L		101	85 - 115

Lab Sample ID: LCSD 180-178784/3-A
Matrix: Water
Analysis Batch: 178913

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 178784

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	2.50	2.49		ug/L		100	85 - 115	2	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-178788/2
Matrix: Water
Analysis Batch: 178788

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			06/09/16 14:07	1

Lab Sample ID: LCS 180-178788/1
Matrix: Water
Analysis Batch: 178788

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	596	600		mg/L		101	80 - 120

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 180-178797/2
Matrix: Water
Analysis Batch: 178797

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		0.50	0.50	mg/L			06/09/16 15:45	1

Lab Sample ID: LCS 180-178797/1
Matrix: Water
Analysis Batch: 178797

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	49.0	48.0		mg/L		98	80 - 120

Method: SM 4500 CN E - Cyanide, Total

Lab Sample ID: MB 180-179152/4-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179152

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.010	0.0038	mg/L		06/14/16 11:45	06/14/16 14:23	1

Lab Sample ID: HLCS 180-179152/2-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179152

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.250	0.239		mg/L		96	90 - 110

Lab Sample ID: LCS 180-179152/3-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.200	0.196		mg/L		98	90 - 110

Lab Sample ID: LLCS 180-179152/1-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179152

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.0500	0.0495		mg/L		99	90 - 110

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

HPLC/IC

Analysis Batch: 178539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	300.0	
LCS 180-178539/43	Lab Control Sample	Total/NA	Water	300.0	
MB 180-178539/44	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 178678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	300.0	
LCS 180-178678/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-178678/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 178688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	
180-55503-1 MS	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	
180-55503-1 MSD	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	
LCS 180-178688/2-A	Lab Control Sample	Total Recoverable	Water	200.8	
MB 180-178688/1-A	Method Blank	Total Recoverable	Water	200.8	

Prep Batch: 178784

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	245.1	
LCS 180-178784/2-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 180-178784/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	
MB 180-178784/1-A	Method Blank	Total/NA	Water	245.1	

Analysis Batch: 178913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	245.1	178784
LCS 180-178784/2-A	Lab Control Sample	Total/NA	Water	245.1	178784
LCSD 180-178784/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	178784
MB 180-178784/1-A	Method Blank	Total/NA	Water	245.1	178784

Analysis Batch: 179457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	178688
180-55503-1 MS	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	178688
180-55503-1 MSD	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	178688
LCS 180-178688/2-A	Lab Control Sample	Total Recoverable	Water	200.8	178688
MB 180-178688/1-A	Method Blank	Total Recoverable	Water	200.8	178688

Analysis Batch: 179553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	178688
180-55503-1 MS	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	178688
180-55503-1 MSD	AT6-271 (SALINITY ADJUSTED)	Total Recoverable	Water	200.8	178688
LCS 180-178688/2-A	Lab Control Sample	Total Recoverable	Water	200.8	178688
MB 180-178688/1-A	Method Blank	Total Recoverable	Water	200.8	178688

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

General Chemistry

Analysis Batch: 178788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	SM 2540C	
LCS 180-178788/1	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 180-178788/2	Method Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 178797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	SM 2540D	
LCS 180-178797/1	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 180-178797/2	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 179152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	SM 4500 CN C	
HLCS 180-179152/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN C	
LCS 180-179152/3-A	Lab Control Sample	Total/NA	Water	SM 4500 CN C	
LLCS 180-179152/1-A	Lab Control Sample	Total/NA	Water	SM 4500 CN C	
MB 180-179152/4-A	Method Blank	Total/NA	Water	SM 4500 CN C	

Analysis Batch: 179193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55503-1	AT6-271 (SALINITY ADJUSTED)	Total/NA	Water	SM 4500 CN E	179152
HLCS 180-179152/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	179152
LCS 180-179152/3-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	179152
LLCS 180-179152/1-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	179152
MB 180-179152/4-A	Method Blank	Total/NA	Water	SM 4500 CN E	179152

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

180325

TestAmerica

BALTIMORE

Client Information	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-31129-6905.1
Client Contact: Mike Chanov	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology				Job #:
Address: 225 Schilling Circle Suite 400	Due Date Requested:			
City: Hunt Valley	TAT Requested (days):			
State, Zip: MD, 21031	PO #: Purchase Order Requested			
Phone: 410-329-5120(Tel)	WO #:			
Email: mchanov@eaest.com	Project #: 18015970			
Project Name: Jordan Valley	SSOW#:			
Site:				

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3

180-55503 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Metals	1L (48 hr Hold Time)	TSS	TDS	Alkalinity (Irvine)	Total Number	Special Instructions/Note:
			Preservation Code:				D	N	P	P	N		
ATB-271 (Salinity Adjusted)	6/7/16	1300	G	W			X	X	X	X	X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: TA	Date: 6/7/16	Time: 1200		Method of Shipment: Courier		
Relinquished by:	Date/Time: 6/7/16 1600	Company: EA	Received by: Melissa Watson	Date/Time: 6-8-16 9:30	Company: TAP	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031

33 LBS

F 1

SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH P. -2907

180-55503 Waybill

PA 152 9-22

UPS NEXT DAY AIR **1**

TRACKING #: 1Z 288 682 01 9863 2367

BILLING: P/P
UPS CARBON NEUTRAL SHIPMENT

Department Code: 2122
Project Phase AND Task: TOXLAB

CS 18.1.17. WNTNV50 75.0A 04/2016

Baltimore

Uncorrected temp 3.2 °C
Thermometer ID 1
CF______ Initials

PT-WI-SR-001 effective 7/26/13

[redacted]

12

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55503-1

Login Number: 55503
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-55632-1
Client Project/Site: Jordan Valley

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Authorized for release by:
6/15/2016 9:56:59 AM

Carrie Gamber, Senior Project Manager
(412)963-2428
carrie.gamber@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 180-55632-1

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-55632-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 06/11/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.1 C.

METALS
The following sample was diluted, based on historical results of similar samples from this client, to bring the concentration of sodium and calcium to within the instrument's linear range as well as for the suppression of the internal standard: AT6-277 (MOCK) (180-55632-1). This sample was further diluted for the sodium concentration. Elevated reporting limits (RLs) are provided.

GENERAL CHEMISTRY
Samples AT6-277 (MOCK) (180-55632-1) required dilution prior to IC analysis. The reporting limits have been adjusted accordingly.

Definitions/Glossary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4	200.7	Water	Barium
200.7 Rev 4.4	200.7	Water	Boron
200.7 Rev 4.4	200.7	Water	Calcium
200.7 Rev 4.4	200.7	Water	Magnesium
200.7 Rev 4.4	200.7	Water	Potassium
200.7 Rev 4.4	200.7	Water	Sodium
200.7 Rev 4.4	200.7	Water	Strontium
300.0		Water	Bromide
300.0		Water	Chloride
300.0		Water	Sulfate

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-16
Arizona	State Program	9	AZ0671	10-13-16
California	LA Cty Sanitation Districts	9	10256	01-31-17 *
California	State Program	9	CA ELAP 2706	06-30-16
Guam	State Program	9	Cert. No. 12.002r	01-23-17
Hawaii	State Program	9	N/A	01-29-17
Kansas	NELAP Secondary AB	7	E-10420	07-31-16
Nevada	State Program	9	CA015312016-2	07-31-16
New Mexico	State Program	6	N/A	01-29-17
Northern Mariana Islands	State Program	9	MP0002	01-29-17
Oregon	NELAP	10	4028	01-29-17
USDA	Federal		P330-09-00080	07-08-18
Washington	State Program	10	C900	09-03-16

* Certification renewal pending - certification considered valid.

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-55632-1	AT6-277 (MOCK)	Water	06/10/16 13:45	06/11/16 09:00

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
SM 2320B	Alkalinity	SM	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

Client Sample ID: AT6-277 (MOCK)

Date Collected: 06/10/16 13:45
Date Received: 06/11/16 09:00

Lab Sample ID: 180-55632-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		25	1 mL		178924	06/11/16 17:46	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	300.0		250	1 mL		178924	06/11/16 18:03	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.7			50 mL	50 mL	178988	06/13/16 07:55	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		5	50 mL	50 mL	179123	06/14/16 08:57	RJR	TAL PIT
	Instrument ID: Q									
Total Recoverable	Prep	200.7			50 mL	50 mL	178988	06/13/16 07:55	ANA	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		25	50 mL	50 mL	179123	06/14/16 09:03	RJR	TAL PIT
	Instrument ID: Q									
Total/NA	Analysis	SM 2320B		1			336412	06/14/16 12:12	YZ	TAL IRV
	Instrument ID: MANTECH01									

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL IRV

Batch Type: Analysis

YZ = Yuriy Zakhrabov

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

Client Sample ID: AT6-277 (MOCK)

Date Collected: 06/10/16 13:45
Date Received: 06/11/16 09:00

Lab Sample ID: 180-55632-1

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	**97**		13	1.5	mg/L			06/11/16 17:46	25
Chloride	**15000**		250	83	mg/L			06/11/16 18:03	250
Sulfate	**3600**		25	8.6	mg/L			06/11/16 17:46	25

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1300**		1000	22	ug/L		06/13/16 07:55	06/14/16 08:57	5
Barium	**110**	**J**	1000	4.5	ug/L		06/13/16 07:55	06/14/16 08:57	5
Calcium	**860000**		25000	360	ug/L		06/13/16 07:55	06/14/16 08:57	5
Potassium	**350000**		25000	4200	ug/L		06/13/16 07:55	06/14/16 08:57	5
Magnesium	**1100000**		25000	200	ug/L		06/13/16 07:55	06/14/16 08:57	5
Sodium	**8500000**		130000	5700	ug/L		06/13/16 07:55	06/14/16 09:03	25
Strontium	**10000**		250	26	ug/L		06/13/16 07:55	06/14/16 08:57	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	**800**		4.0	4.0	mg/L			06/14/16 12:12	1
Bicarbonate Alkalinity as CaCO3	**800**		4.0	4.0	mg/L			06/14/16 12:12	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/14/16 12:12	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/14/16 12:12	1
Bicarbonate ion as HCO3	**970**		4.8	4.8	mg/L			06/14/16 12:12	1
Carbonate as CO3	ND		2.4	2.4	mg/L			06/14/16 12:12	1
Hydroxide as OH	ND		1.4	1.4	mg/L			06/14/16 12:12	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-178924/6
Matrix: Water
Analysis Batch: 178924

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.50	0.058	mg/L			06/11/16 11:22	1
Chloride	ND		1.0	0.33	mg/L			06/11/16 11:22	1
Sulfate	ND		1.0	0.34	mg/L			06/11/16 11:22	1

Lab Sample ID: LCS 180-178924/5
Matrix: Water
Analysis Batch: 178924

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	10.0	10.3		mg/L		103	90 - 110
Chloride	50.0	50.8		mg/L		102	90 - 110
Sulfate	50.0	51.2		mg/L		102	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-178988/1-A
Matrix: Water
Analysis Batch: 179123

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 178988

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	4.4	ug/L		06/13/16 07:55	06/14/16 08:42	1
Barium	ND		200	0.89	ug/L		06/13/16 07:55	06/14/16 08:42	1
Calcium	ND		5000	73	ug/L		06/13/16 07:55	06/14/16 08:42	1
Potassium	ND		5000	840	ug/L		06/13/16 07:55	06/14/16 08:42	1
Magnesium	ND		5000	41	ug/L		06/13/16 07:55	06/14/16 08:42	1
Sodium	ND		5000	230	ug/L		06/13/16 07:55	06/14/16 08:42	1
Strontium	ND		50	5.3	ug/L		06/13/16 07:55	06/14/16 08:42	1

Lab Sample ID: LCS 180-178988/2-A
Matrix: Water
Analysis Batch: 179123

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 178988

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	1110		ug/L		111	85 - 115
Barium	2000	2080		ug/L		104	85 - 115
Calcium	50000	51200		ug/L		102	85 - 115
Potassium	50000	50500		ug/L		101	85 - 115
Magnesium	50000	51000		ug/L		102	85 - 115
Sodium	50000	53200		ug/L		106	85 - 115
Strontium	1000	1040		ug/L		104	85 - 115

Lab Sample ID: LCSD 180-178988/3-A
Matrix: Water
Analysis Batch: 179123

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 178988

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1000	1100		ug/L		110	85 - 115	1	20
Barium	2000	2110		ug/L		105	85 - 115	1	20
Calcium	50000	52600		ug/L		105	85 - 115	3	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-178988/3-A
Matrix: Water
Analysis Batch: 179123

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 178988

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Potassium	50000	51700		ug/L		103	85 - 115	2	20
Magnesium	50000	52100		ug/L		104	85 - 115	2	20
Sodium	50000	54100		ug/L		108	85 - 115	2	20
Strontium	1000	1060		ug/L		106	85 - 115	2	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 440-336412/4
Matrix: Water
Analysis Batch: 336412

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/14/16 11:59	1
Bicarbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/14/16 11:59	1
Carbonate Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/14/16 11:59	1
Hydroxide Alkalinity as CaCO3	ND		4.0	4.0	mg/L			06/14/16 11:59	1
Bicarbonate ion as HCO3	ND		4.8	4.8	mg/L			06/14/16 11:59	1
Carbonate as CO3	ND		2.4	2.4	mg/L			06/14/16 11:59	1
Hydroxide as OH	ND		1.4	1.4	mg/L			06/14/16 11:59	1

Lab Sample ID: LCS 440-336412/3
Matrix: Water
Analysis Batch: 336412

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity as CaCO3	63.4	63.7		mg/L		100	80 - 120

Lab Sample ID: 180-55632-1 DU
Matrix: Water
Analysis Batch: 336412

Client Sample ID: AT6-277 (MOCK)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity as CaCO3	800		798		mg/L		0	20
Bicarbonate Alkalinity as CaCO3	800		798		mg/L		0	20
Carbonate Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Hydroxide Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Bicarbonate ion as HCO3	970		973		mg/L		0	20
Carbonate as CO3	ND		ND		mg/L		NC	20
Hydroxide as OH	ND		ND		mg/L		NC	20

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

HPLC/IC

Analysis Batch: 178924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55632-1	AT6-277 (MOCK)	Total/NA	Water	300.0	
180-55632-1	AT6-277 (MOCK)	Total/NA	Water	300.0	
LCS 180-178924/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-178924/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 178988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55632-1	AT6-277 (MOCK)	Total Recoverable	Water	200.7	
LCS 180-178988/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-178988/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-178988/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 179123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55632-1	AT6-277 (MOCK)	Total Recoverable	Water	200.7 Rev 4.4	178988
180-55632-1	AT6-277 (MOCK)	Total Recoverable	Water	200.7 Rev 4.4	178988
LCS 180-178988/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	178988
LCSD 180-178988/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	178988
MB 180-178988/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	178988

General Chemistry

Analysis Batch: 336412

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55632-1	AT6-277 (MOCK)	Total/NA	Water	SM 2320B	
180-55632-1 DU	AT6-277 (MOCK)	Total/NA	Water	SM 2320B	
LCS 440-336412/3	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 440-336412/4	Method Blank	Total/NA	Water	SM 2320B	

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Garnber, Carrie L	Carrier Tracking No(s):	COC No: 180-30634-6905.1
Client Contact: Mike Chanov	Phone:	E-Mail: carrie.garnber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology				Job #:
Address: 225 Schilling Circle	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Hunt Valley	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA
State, Zip: MD, 21031				
Phone: 410-329-5120(Tel)	PO #: Purchase Order Requested			
Email: mchanov@eaest.com	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

180-55632 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	METALS	IC (Cyanide Hold Time)	TSS	TDS	Alkalinity (Titrime)	Total Number of containers	Special Instructions/Note:
	Preservation Code:												
AT6-277 (Mock)	6/10/16	1345	G	W			X	X	X	X	X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: TA Date: — Time: — Method of Shipment: Carrier

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	6/10/16 1100	EA		6-10	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6-11-16	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9.00	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031

33 LBS

1 OF 1

SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907

PA 152 9-22

UPS NEXT DAY AIR

1 S

TRACKING #: 1Z 288 682 44 9133 2051

Uncorrected temp 2.1 °C
Thermometer ID 1
CF 0 Initials DJ

PT-WI-SR-001 effective 7/26/13

BILLIN(
UPS CA

Department Code: 2122
Project Phase AND Task: TOXLAB

GS 18.1.17. WINJNV50 75.0A 04/2016

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-244802.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc				Job #: 180-55632-1
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 6/14/2016			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #:			
Email:	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	2320B/ (MOD) Alkalinity all forms	Total Number of containers	Special Instructions/Note:
			Preservation Code:					
AT6-277 (MOCK) (180-55632-1)	6/10/16	13:45 Eastern		Water		X		

Possible Hazard Identification
Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: Fed: 6479 2544 8248			
Relinquished by:	Date/Time: 6/13/16 1700	Company TAP	Received by:	Date/Time: 6/14/16 9:30	Company TAI
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: (CS) 3.8/3.5 IR-74

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55632-1

Login Number: 55632
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55632-1

Login Number: 55632
List Number: 2
Creator: Ornelas, Olga

List Source: TestAmerica Irvine
List Creation: 06/14/16 10:54 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-55633-1
Client Project/Site: Jordan Valley
Revision: 1

For:
EA Engineering, Science, and Technology
225 Schilling Circle
Suite 400
Hunt Valley, Maryland 21031

Attn: Mike Chanov

Authorized for release by:
7/14/2016 3:35:23 PM

Carrie Gamber, Senior Project Manager
(412)963-2428
carrie.gamber@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 180-55633-1

Laboratory: TestAmerica Pittsburgh

Narrative

CASE NARRATIVE

Client: EA Engineering, Science, and Technology

Project: Jordan Valley

Report Number: 180-55633-1 REVISED

NOTE: This report has been revised to include the rerun of the sample for Copper.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 06/11/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.1 C.

METALS

The following sample was diluted due to the nature of the sample matrix: AT6-277 (MOCK) (180-55633-1). Elevated reporting limits (RLs) are provided.

Hardness as calcium carbonate was detected in method blank MB 180-179366/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

GENERAL CHEMISTRY

The sample was initially analyzed with bracketed failing CCV's. The sample was reanalyzed outside of holding time for ortho-phosphate. Both results are reported. AT6-277 (MOCK) (180-55633-1), (CCV 180-178994/15) and (CCV 180-178994/27)

The reference method requires samples to be preserved to a pH of >12. The following sample was received with insufficient preservation at a pH of 7.55: AT6-277 (MOCK) (180-55633-1). The sample was preserved to the appropriate pH in the laboratory.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure for TDS: AT6-277 (MOCK) (180-55633-1). The reporting limits (RLs) have been adjusted proportionately.

Definitions/Glossary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Utah	NELAP	8	PA001462015-4	05-31-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
200.8	200.8	Water	Antimony
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Beryllium
200.8	200.8	Water	Cadmium
200.8	200.8	Water	Chromium
200.8	200.8	Water	Copper
200.8	200.8	Water	Hardness as calcium carbonate
200.8	200.8	Water	Iron
200.8	200.8	Water	Lead
200.8	200.8	Water	Manganese
200.8	200.8	Water	Nickel
200.8	200.8	Water	Selenium
200.8	200.8	Water	Silver
200.8	200.8	Water	Thallium
200.8	200.8	Water	Zinc
245.1	245.1	Water	Mercury
300.0		Water	Fluoride
300.0		Water	Nitrate as N
300.0		Water	Nitrite as N
300.0		Water	Orthophosphate as P
SM 2540C		Water	Total Dissolved Solids
SM 2540D		Water	Total Suspended Solids
SM 4500 CN E	SM 4500 CN C	Water	Cyanide, Total

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-55633-1	AT6-277 (MOCK)	Water	06/10/16 13:45	06/11/16 09:00

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.8	Metals (ICP/MS)	EPA	TAL PIT
245.1	Mercury (CVAA)	EPA	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL PIT
SM 4500 CN E	Cyanide, Total	SM	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Client Sample ID: AT6-277 (MOCK)

Date Collected: 06/10/16 13:45
Date Received: 06/11/16 09:00

Lab Sample ID: 180-55633-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		25	1 mL		178969	06/13/16 08:19	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Analysis	300.0		25	1 mL		178994	06/11/16 17:46	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.8			50 mL	50 mL	179366	06/16/16 07:21	ANA	TAL PIT
Total Recoverable	Analysis	200.8		10	50 mL	50 mL	181861	07/13/16 20:40	CNF	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	200.8			50 mL	50 mL	179366	06/16/16 07:21	ANA	TAL PIT
Total Recoverable	Analysis	200.8		10	50 mL	50 mL	179847	06/21/16 18:31	CNF	TAL PIT
	Instrument ID: X									
Total Recoverable	Prep	200.8			50 mL	50 mL	179366	06/16/16 07:21	ANA	TAL PIT
Total Recoverable	Analysis	200.8		10	50 mL	50 mL	179986	06/22/16 14:52	CNF	TAL PIT
	Instrument ID: X									
Total/NA	Prep	245.1			50 mL	50 mL	179534	06/17/16 12:53	RJR	TAL PIT
Total/NA	Analysis	245.1		1	50 mL	50 mL	179692	06/20/16 16:10	RJR	TAL PIT
	Instrument ID: K									
Total/NA	Analysis	SM 2540C		1	2 mL	100 mL	179168	06/14/16 13:11	JWS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	179061	06/13/16 16:16	JWS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	SM 4500 CN C			50 mL	50 mL	179152	06/14/16 11:45	JAS	TAL PIT
Total/NA	Analysis	SM 4500 CN E		1	50 mL	50 mL	179193	06/14/16 15:04	JAS	TAL PIT
	Instrument ID: SEAL2									

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

Batch Type: Prep

ANA = Alexis Anderson

JAS = Joshua Schmidt

RJR = Ron Rosenbaum

Batch Type: Analysis

CNF = Caitlin Ferguson

JAS = Joshua Schmidt

JWS = Jim Swanson

MJH = Matthew Hartman

RJR = Ron Rosenbaum

Client Sample Results

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Client Sample ID: AT6-277 (MOCK)

Date Collected: 06/10/16 13:45
Date Received: 06/11/16 09:00

Lab Sample ID: 180-55633-1

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		2.5	0.54	mg/L			06/11/16 17:46	25
Nitrite as N	ND		1.3	0.70	mg/L			06/11/16 17:46	25
Fluoride	**0.88**	**J**	2.5	0.60	mg/L			06/11/16 17:46	25
Orthophosphate as P	ND		13	3.9	mg/L			06/11/16 17:46	25
Orthophosphate as P	ND	H	13	3.9	mg/L			06/13/16 08:19	25

Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		10	0.47	ug/L		06/16/16 07:21	06/22/16 14:52	10
Arsenic	**7.4**	**J**	10	1.2	ug/L		06/16/16 07:21	06/21/16 18:31	10
Beryllium	ND		10	0.36	ug/L		06/16/16 07:21	06/21/16 18:31	10
Cadmium	ND		10	0.74	ug/L		06/16/16 07:21	06/21/16 18:31	10
Chromium	ND		20	2.3	ug/L		06/16/16 07:21	06/21/16 18:31	10
Copper	**3.2**	**J**	20	2.7	ug/L		06/16/16 07:21	07/13/16 20:40	10
Iron	ND		500	57	ug/L		06/16/16 07:21	06/21/16 18:31	10
Manganese	**16**	**J**	50	0.46	ug/L		06/16/16 07:21	06/21/16 18:31	10
Nickel	**2.2**	**J**	10	0.93	ug/L		06/16/16 07:21	06/21/16 18:31	10
Lead	ND		10	0.57	ug/L		06/16/16 07:21	06/21/16 18:31	10
Antimony	ND		20	0.40	ug/L		06/16/16 07:21	06/21/16 18:31	10
Selenium	ND		50	2.0	ug/L		06/16/16 07:21	06/21/16 18:31	10
Thallium	ND		10	0.13	ug/L		06/16/16 07:21	06/21/16 18:31	10
Zinc	ND		50	4.0	ug/L		06/16/16 07:21	06/21/16 18:31	10
Hardness as calcium carbonate	**7300**	**B**	33	0.26	mg/L		06/16/16 07:21	06/21/16 18:31	10

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.039	ug/L		06/17/16 12:53	06/20/16 16:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**31000**		500	500	mg/L			06/14/16 13:11	1
Total Suspended Solids	**1.3**		0.50	0.50	mg/L			06/13/16 16:16	1
Cyanide, Total	ND		0.010	0.0038	mg/L		06/14/16 11:45	06/14/16 15:04	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-178969/6
Matrix: Water
Analysis Batch: 178969

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.50	0.15	mg/L			06/13/16 07:50	1

Lab Sample ID: LCS 180-178969/5
Matrix: Water
Analysis Batch: 178969

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P	2.50	2.64		mg/L		105	90 - 110

Lab Sample ID: LCSD 180-178969/8
Matrix: Water
Analysis Batch: 178969

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	2.50	2.66		mg/L		106	90 - 110	1	20

Lab Sample ID: MB 180-178994/6
Matrix: Water
Analysis Batch: 178994

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.022	mg/L			06/11/16 11:22	1
Nitrite as N	ND		0.050	0.028	mg/L			06/11/16 11:22	1
Fluoride	ND		0.10	0.024	mg/L			06/11/16 11:22	1
Orthophosphate as P	ND		0.50	0.15	mg/L			06/11/16 11:22	1

Lab Sample ID: LCS 180-178994/5
Matrix: Water
Analysis Batch: 178994

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.58		mg/L		103	90 - 110
Nitrite as N	2.50	2.54		mg/L		102	90 - 110
Fluoride	2.50	2.38		mg/L		95	90 - 110
Orthophosphate as P	2.50	2.30		mg/L		92	90 - 110

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 180-179366/1-A
Matrix: Water
Analysis Batch: 179847

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 179366

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.047	ug/L		06/16/16 07:21	06/21/16 12:38	1
Arsenic	ND		1.0	0.12	ug/L		06/16/16 07:21	06/21/16 12:38	1
Beryllium	ND		1.0	0.036	ug/L		06/16/16 07:21	06/21/16 12:38	1
Cadmium	ND		1.0	0.074	ug/L		06/16/16 07:21	06/21/16 12:38	1
Chromium	ND		2.0	0.23	ug/L		06/16/16 07:21	06/21/16 12:38	1
Copper	ND		2.0	0.27	ug/L		06/16/16 07:21	06/21/16 12:38	1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 180-179366/1-A
Matrix: Water
Analysis Batch: 179847

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 179366

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	5.7	ug/L		06/16/16 07:21	06/21/16 12:38	1
Manganese	ND		5.0	0.046	ug/L		06/16/16 07:21	06/21/16 12:38	1
Nickel	ND		1.0	0.093	ug/L		06/16/16 07:21	06/21/16 12:38	1
Lead	ND		1.0	0.057	ug/L		06/16/16 07:21	06/21/16 12:38	1
Antimony	ND		2.0	0.040	ug/L		06/16/16 07:21	06/21/16 12:38	1
Selenium	ND		5.0	0.20	ug/L		06/16/16 07:21	06/21/16 12:38	1
Thallium	ND		1.0	0.013	ug/L		06/16/16 07:21	06/21/16 12:38	1
Zinc	ND		5.0	0.40	ug/L		06/16/16 07:21	06/21/16 12:38	1
Hardness as calcium carbonate	0.0966	J	3.3	0.026	mg/L		06/16/16 07:21	06/21/16 12:38	1

Lab Sample ID: LCS 180-179366/2-A
Matrix: Water
Analysis Batch: 179847

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 179366

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	50.4		ug/L		101	85 - 115
Arsenic	40.0	41.3		ug/L		103	85 - 115
Beryllium	50.0	51.5		ug/L		103	85 - 115
Cadmium	50.0	54.6		ug/L		109	85 - 115
Chromium	200	192		ug/L		96	85 - 115
Copper	250	247		ug/L		99	85 - 115
Iron	1000	964		ug/L		96	85 - 115
Manganese	500	509		ug/L		102	85 - 115
Nickel	500	497		ug/L		99	85 - 115
Lead	20.0	20.4		ug/L		102	85 - 115
Antimony	500	559		ug/L		112	85 - 115
Selenium	10.0	11.2		ug/L		112	85 - 115
Thallium	50.0	49.9		ug/L		100	85 - 115
Zinc	500	516		ug/L		103	85 - 115

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 180-179534/1-A
Matrix: Water
Analysis Batch: 179692

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179534

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.039	ug/L		06/17/16 12:53	06/20/16 16:05	1

Lab Sample ID: LCS 180-179534/2-A
Matrix: Water
Analysis Batch: 179692

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179534

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.34		ug/L		93	85 - 115

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 180-179534/3-A
Matrix: Water
Analysis Batch: 179692

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 179534

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	2.50	2.15		ug/L		86	85 - 115	9	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-179168/2
Matrix: Water
Analysis Batch: 179168

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			06/14/16 13:11	1

Lab Sample ID: LCS 180-179168/1
Matrix: Water
Analysis Batch: 179168

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	596	628		mg/L		105	80 - 120

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 180-179061/2
Matrix: Water
Analysis Batch: 179061

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		0.50	0.50	mg/L			06/13/16 16:16	1

Lab Sample ID: LCS 180-179061/1
Matrix: Water
Analysis Batch: 179061

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	49.0	44.0		mg/L		90	80 - 120

Method: SM 4500 CN E - Cyanide, Total

Lab Sample ID: MB 180-179152/4-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 179152

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.010	0.0038	mg/L		06/14/16 11:45	06/14/16 14:23	1

Method: SM 4500 CN E - Cyanide, Total (Continued)

Lab Sample ID: HLCS 180-179152/2-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179152

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.250	0.239		mg/L		96	90 - 110

Lab Sample ID: LCS 180-179152/3-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.200	0.196		mg/L		98	90 - 110

Lab Sample ID: LLCS 180-179152/1-A
Matrix: Water
Analysis Batch: 179193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 179152

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.0500	0.0495		mg/L		99	90 - 110

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

HPLC/IC

Analysis Batch: 178969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	300.0	
LCS 180-178969/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 180-178969/8	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 180-178969/6	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 178994

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	300.0	
LCS 180-178994/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-178994/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 179366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total Recoverable	Water	200.8	
LCS 180-179366/2-A	Lab Control Sample	Total Recoverable	Water	200.8	
MB 180-179366/1-A	Method Blank	Total Recoverable	Water	200.8	

Prep Batch: 179534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	245.1	
LCS 180-179534/2-A	Lab Control Sample	Total/NA	Water	245.1	
LCSD 180-179534/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	
MB 180-179534/1-A	Method Blank	Total/NA	Water	245.1	

Analysis Batch: 179692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	245.1	179534
LCS 180-179534/2-A	Lab Control Sample	Total/NA	Water	245.1	179534
LCSD 180-179534/3-A	Lab Control Sample Dup	Total/NA	Water	245.1	179534
MB 180-179534/1-A	Method Blank	Total/NA	Water	245.1	179534

Analysis Batch: 179847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total Recoverable	Water	200.8	179366
LCS 180-179366/2-A	Lab Control Sample	Total Recoverable	Water	200.8	179366
MB 180-179366/1-A	Method Blank	Total Recoverable	Water	200.8	179366

Analysis Batch: 179986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total Recoverable	Water	200.8	179366

Analysis Batch: 181861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total Recoverable	Water	200.8	179366

QC Association Summary

Client: EA Engineering, Science, and Technology
Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

General Chemistry

Analysis Batch: 179061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	SM 2540D	
LCS 180-179061/1	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 180-179061/2	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 179152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	SM 4500 CN C	
HLCS 180-179152/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN C	
LCS 180-179152/3-A	Lab Control Sample	Total/NA	Water	SM 4500 CN C	
LLCS 180-179152/1-A	Lab Control Sample	Total/NA	Water	SM 4500 CN C	
MB 180-179152/4-A	Method Blank	Total/NA	Water	SM 4500 CN C	

Analysis Batch: 179168

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	SM 2540C	
LCS 180-179168/1	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 180-179168/2	Method Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 179193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-55633-1	AT6-277 (MOCK)	Total/NA	Water	SM 4500 CN E	179152
HLCS 180-179152/2-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	179152
LCS 180-179152/3-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	179152
LLCS 180-179152/1-A	Lab Control Sample	Total/NA	Water	SM 4500 CN E	179152
MB 180-179152/4-A	Method Blank	Total/NA	Water	SM 4500 CN E	179152

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-30634-6905.1
Client Contact: Mike Chanov	Phone:	E-Mail: carrie.gamber@testamericainc.com		Page: Page 1 of 1
Company: EA Engineering, Science, and Technology		Analysis Requested		Job #:
Address: 225 Schilling Circle	Due Date Requested:			
City: Hunt Valley	TAT Requested (days):			
State, Zip: MD, 21031				
Phone: 410-329-5120(Tel)	PO #: Purchase Order Requested			
Email: mchanov@eaest.com	WO #:			
Project Name: Jordan Valley	Project #: 18015970			
Site:	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA

180-55633 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	METALS	14 Cyan Hold Time	TSS	TDS	Alkalinity (Strong)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D						
AT6-277 (Mock)	6/10/16	1345	G	W			X	X	X	X	X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: TA		Date: —	Time: —	Method of Shipment: Courier			
Relinquished by:	Date/Time: 6/10/16 1100	Company EA	Received by:	Date/Time: 6-10	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6-11-16	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9.00	Company		

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

180-55633 Waybill

MICHAEL CHANOV
4105847000 5120
EA ENG SCIENCE TECH
225 SCHILLING CIRCLE
HUNT VALLEY MD 21031

33 LBS

1 OF 1

SHIP TO:
SAMPLE CUSTODY
TESTAMERICA
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907

PA 152 9-22

UPS NEXT DAY AIR **1 S**

TRACKING #: 1Z 288 682 44 9133 2051

Uncorrected temp 2.1 °C
Thermometer ID C
CF 0 Initials DW

PT-WI-SR-001 effective 7/26/13

BILLIN
UPS CA

Department Code: 2122
Project Phase AND Task: TOXLAB

CS 18.1.17. WININV50 75.0A 04/2016

12

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55633-1

Login Number: 55633
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT III

Report Quality Assurance Record
(2 pages)

REPORT QUALITY ASSURANCE RECORD

Client: Jordan Valley Project Number: 7005.15

Author: Michael Chanar EA Report Number: 7347

REPORT CHECKLIST

QA/QC ITEM	REVIEWER	DATE
1. Samples collected, transported, and received according to study plan requirements.		6/22/16
2. Samples prepared and processed according to study plan requirements.		6/22/16
3. Data collected using calibrated instruments and equipment.		6/22/16
4. Calculations checked:		
- Hand calculations checked		6/22/16
- Documented and verified statistical procedure used.		6/22/16
5. Data input/statistical analyses complete and correct.		7/7/16
6. Reported results and facts checked against original sources.		7/7/16
7. Data presented in figures and tables correct and in agreement with text.		7/7/16
8. Results reviewed for compliance with study plan requirements.		6/22/16

	AUTHOR	DATE
9. Commentary reviewed and resolved.		7/12/16

10. All study plan and quality assurance/control requirements have been met and the report is approved:

PROJECT MANAGER	7/12/16 DATE
QUALITY CONTROL OFFICER	7/8/16 DATE
SENIOR TECHNICAL REVIEWER	7/11/16 DATE