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.

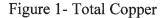
Testing Date	Mysid Shrimp	Sheepshead Minnow	
Chronic Endpoints	(Control / 100%)	(Control / 100%)	
Dec. 8-13, 2013 (test was collected on the	ne entry point of the pipeline	instead of end-of-pipe)	
48 hr % Survival	90 / 65	90 / 100	
96 hr % Survival	90 / 43	not evaluated	
7 day % Survival	88 / 35	not 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	

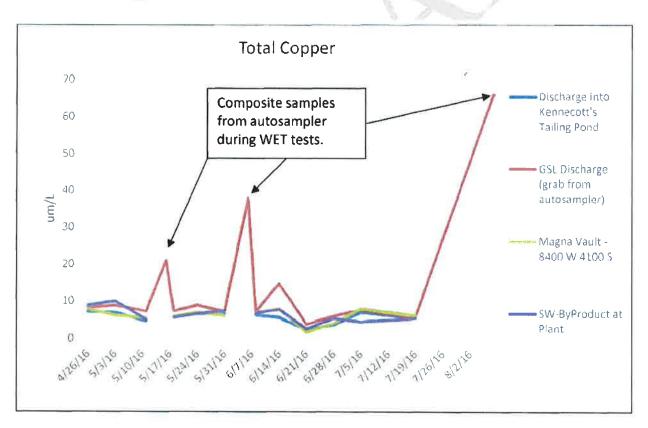
# Attachment 1

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.



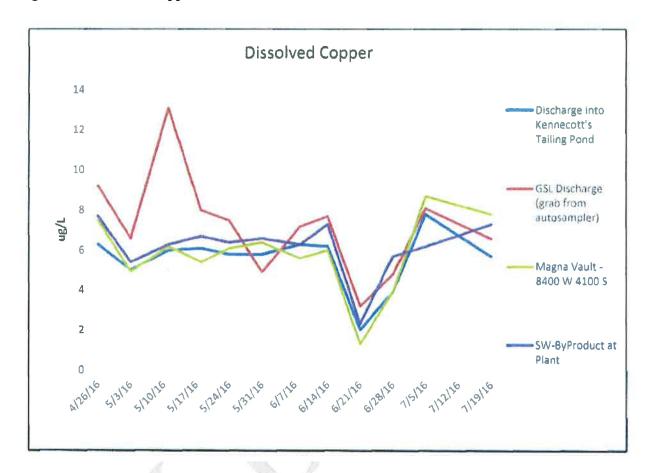


# Attachment 2

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

	*		

Figure 2- Dissolved Copper



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## RESULTS OF A MOCK EFFLUENT STUDY WITH Americamysis bahia ON AN AUGUST 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:

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

This report shall not be reproduced, except in full, without written approval of EA Engineering, Science, and Technology, Inc., PBC

This report contains 15 pages plus 3 attachments.

Wayne L. McCalloch Laboratory Director Date

13 September 2016



#### 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 EPΛ GP2 formulation (US EPΛ 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<sub>2</sub>SO<sub>4</sub> (sodium sulfate), KCl (potassium chloride), NaBr (sodium bromide), Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> · 10H<sub>2</sub>O (sodium borate), MgCl<sub>2</sub> · 6H<sub>2</sub>O (magnesium chloride), CaCl<sub>2</sub> · 2H<sub>2</sub>O (calcium chloride), SrCl<sub>2</sub> · 6H<sub>2</sub>O (strontium chloride) and NaHCO<sub>3</sub> (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 <u>NOEC</u> 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 <u>LOEC</u> 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 <u>ChV</u> 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 <u>IC</u> 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 <u>LC50</u> (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. 22<sup>nd</sup> 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

< 0.01

#### Chemical Analyses:

Total Residual Chlorine (TRC):

Temperature (°C): 0.7Alkalinity (mg/L as CaCO<sub>3</sub>): 786Hardness (mg/L as CaCO<sub>3</sub>): 2,336Conductivity ( $\mu$ S/cm): 5,573Salinity (ppt): 3.0pH: 8.0

CHEMICAL ANALYSES PERFORMED ON THE SALINITY ADJUSTED TABLE 2 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 <sup>(a)</sup>
Alkalinity - Carbonate (CO <sub>3</sub> )	mg/L	<2.4	<4.0
Alkalinity - Hydroxide (OH)	mg/L	<1.4	<4.0
Alkalinity - Total (as CaCO <sub>3</sub> )	mg/L	870	660
Hardness - Total (as CaCO <sub>3</sub> )	mg/L	8,700	7,100
Fluoride	mg/L	$0.6^{(b)}$	<1.2
Nitrate as N	mg/L	9.4 <sup>(b)</sup>	<1.1
Nitrite as N	mg/L	<0.1 <sup>(b)</sup>	<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 <sup>(a)</sup>
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 <sup>(a)</sup>	26 <sup>(a)</sup>
Nickel, Total	μg/L	20	4.4 <sup>(a)</sup>
Selenium, Total	μg/L	31	<3.2
Silver, Total	μg/L	< 0.88	< 0.88
Thallium, Total	μg/L	< 0.24	< 0.24
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<sup>(</sup>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
$Na_2B_4O_7 \cdot 10H_2O$	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 <sub>3</sub>	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	$0.190 (\pm 0.048^{(a)})$	6
75	30 <sup>(a)</sup>	23 <sup>(a)</sup>	15 <sup>(a)</sup>	$0.037 (\pm 0.041)^{(b)}$	0
100	3 <sup>(a)</sup>	$0^{(a)}$	$0^{(a)}$	$0.000 (\pm 0.000)^{(b)}$	0

Acute and Chronic Endpoints (expressed as percent effluent)

48-Hour LC50:	69.2 (60.5 – 74.6) <sup>(c)</sup>
96-Hour LC50:	66.9 (63.7 – 70.1)
7 Day MOEC (Survival):	50

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)

T.D. MODG (D')	< 50
7-Day NOEC (Biomass):	<30
7-Day LOEC (Biomass):	50
7-Day ChV (Biomass):	< 50
7-Day IC25 (Biomass):	49.7 (NC) <sup>(d)(e)</sup>

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.

(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.

<sup>(</sup>b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.

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	$0.323 (\pm 0.031)$	20
50	95	90	90	$0.271 (\pm 0.051)^{(a)}$	10
75	70 <sup>(a)</sup>	58 <sup>(a)</sup>	58 <sup>(a)</sup>	$0.152 (\pm 0.083)^{(b)}$	7
100	58 <sup>(a)</sup>	28 <sup>(a)</sup>	28 <sup>(a)</sup>	$0.074 (\pm 0.107)^{(b)}$	11

Acute and Chronic Endpoints (expressed as percent effluent)

and mine contente Enterpoints (expr	essed as percent criticity
48-Hour LC50:	>100 (NC) <sup>(c)</sup>
96-Hour LC50:	81.6 (73.4 – 91.0) <sup>(d)</sup>
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

<sup>(</sup>a) Significantly different (p=0.05) from the control.

<sup>(</sup>b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.

<sup>(</sup>c) The 95 percent confidence limits are not calculable for the dataset.

<sup>(</sup>d) Values in parentheses represent the 95 percent confidence limits for the dataset.

# ATTACHMENT I

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



# ® EA Engineering, Science, and Technology

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



Sample Shi	pped By: (	circle)	
Fed Ex	UPS	Other:	

Client: \_\_\_\_\_\_ Project No.:\_\_\_\_\_\_

NPDES Number: \_\_\_\_\_ Client Purchase Order Number: \_\_\_\_\_\_

Tracking #: 8095 1033 6849

City/State Collected: Salt Lake City, U

#### PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Coll Start Date/Time	ection End Date/Time	Sample Description (including Site, State) Number, and Outfall Number,	tion	Number/Volume of Container
Atto-391		_X		8/8/16 0802 AM	Outfall ool	e	2-2.5 gg/,
	17010-100-						
				*			
						-	
Sampled By:	<u></u>	50 http://doi.org/10.100/	/Time		Received By:	Date/Time	

Sampled By:	Dațe/Time	Received By:	Date/Time
24WBIF	8/8/16 1151		
Sampler's Printed Name:	Title:	Relinquished By:	Date/Time
aven material	WQ Tech	W.	
Relinquished By:	818/16 [315	Received By Laboratory	Date/Time 8   9    (6 1035

Was Sample Chilled During Collection? (6) No

Comments:

Sample Collection Parameters

Visual Description:

Temperature (°C): Q 4

pH: **8,44**TRC (mg/L):

Other:



# SAMPLE CHECK-IN FOR TESTING

Client: Joydan Valley	
EA Accession Number: ATU-39)	

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	<u>≤</u> 4	0-7	819116	1040	YB.
Is ice present?	_	yes	1		
рН	6.0-9.0	8.0			
TRC (mg/L)	<0.01	TO:01			
Visual Description		Clear	1		4

<sup>\*</sup>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**

Client: Jordan Valley	•:
QC Test Number: TN-16-247	• •
TEST ORGANISM IN	FORMATION

TEST	ORGANISM INFORMATION
Common Name: Opossum shrimp	Adults Isolated (Time, Date):
Scientific Name: A. bahia	Neonates Pulled & Fed (Time, Date):
Lot Number: <u>A6- 896</u>	Acclimation: <24 hrs Age: 7 days
Source: EA	Culture Water (T/S): <u>25.9</u> °C <u>30.2</u> ppt

TEST INITIATION			CONC	NTRATION SERI	ES	
Date 8/15/16	Time	Initials	Activity	Test Concentration Mod Hard Control	Volume <u>Test Material</u> 0ml	Final <u>Volume</u> 1200ml
1	1116 1040 2B		Dilutions Made	50%	600ml	
ł				75%	900ml	
1	V	1	Test Vessels Filled	100%	1200ml	
	1315	1	Organisms Transferred			$\downarrow$
	1320	MAL	Head Counts			1

	A PROPERTY OF A PARTY	* INTE	RMEDIATE	DILUTION P	REPAR	RATION AND FE	EDING	to a the same
DILUTION PREPARATION							FEEDING	
					Food:	Artemia		
_				Sample /		Time, Initials,	Time, Initials,	Time, Initials,
<u>Day</u>	<u>Date</u>	<u>Time</u>	<u>Initials</u>	<u>Diluent</u>	<u>Day</u>	<u>Amount</u>	<u>Amount</u>	<u>Amount</u>
0	8151Kg	1090	<b>1</b> 33	406-3691 606-369	0			163038 500Ps
1	8116116	0944	M	AT6-391 LDG-369	1	- Edrops	+72	50005
2	8/17/16	1145	MJ	ATG-391 LDG-369	2	26300B 5210PS		1625 arg Sdrcps
3	8/18/16	1455	MT	10634	3	58150B		1510 NoT
4	8/19/16	0919	MJ	EDG369	4	50mm		1530MG 5 WUS
5	8/20/16	0922	MJ	476-391 EDG-369	5	0815145 5draps		153340 3dings
6	Blalic	09460	38	ATG-391 LDG-369	6	0815513 52005		1620 518

373



Accession Number: LD6 ~ 349

**TOXICITY TEST OBSERVATION DATA SHEET** Beginning Date: 8 15/10 Time: 135 Project Number: 70005.15 **TEST ORGANISM** Common Name: Opossum shrimp Ending Date: १८२०। Time: यूरी Client: Jordan Valley Scientific Name: A. bahia QC Test Number: TN-16-247 Test Material: Effluent

Photoperiod: 16 \( \ell \), 8 \( \delta \) Light Intensity: 50 - 100 fc Test Duration: 7 days

TEST TYPE: Static / Flowthrough Test Container: \_\_\_ 4" Bowl Accession Number: Atta - 39 1 Test Volume: 150 ml Renewal )/ Non-renewal Dilution Water: 30 ppt CS

Number of Surviving Organisms Day 4 Day 5 Day 6 Day 7 Day 2 Day 3 Day 0 Day 1 Concentration Rep 5 5 5 Control 5 5 5 5 5 5 5 5 4 5 5 5 50% Α 5 5 5 В 5 4 5 4 \$ 5 E 5 5 G 5 1510MS 1533MJ 1314 MJ 1014 MJ 1411 MJ 1320MM 1009 MJ 1040 SB Time / Initials

8/22

ATS-T10 12/02/08



Accession Number: Line -349

**TOXICITY TEST OBSERVATION DATA SHEET** Project Number: Beginning Date: 8/15/16 70005.15 **TEST ORGANISM** Time: 1315 Client: \_\_\_\_ Jordan Valley Common Name: Opossum shrimp **Ending Date:** Time: [4]] QC Test Number: TN-16-247 Scientific Name: \_\_\_\_A. bahla Test Material: Effluent Accession Number: ATC ~311 TEST TYPE: Static Flowthrough Test Container: 4" Bowl Dilution Water: 30 ppt CS Renewal Non-renewal Test Volume: 150 ml

Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc

					Number of Sun	viving Organisms	3			٦
Concentration	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	1
75%	Α	5	4	2	2	2	1	2,	2	┨
	В	5	4	2	i	l	1	1	1	┨
	С	5	4	3	3	3	2	2	2	┨
	D	5	2	0		-			-	┨
	E	5	5	2			0	_		┨
	F	5	ц	1		1	1	ØI		3/z
	G	5	4	O	-		-	21		-
	Н	5	4	2		1		0		
100%	A	5	3	0						1
	В	5	3	1	0					4
	С	5	2	0						-
	D	5	2	0						4
	E	5	3	0						
	F	5	7	0		_				
	G	5	7	0						
	Н	5	3	0					~	$\dashv$
Tim	e / Initials	1220 wu	CM P001	1314 MJ	1510 Mg	1014 MJ	1533 MJ	1040 75	1411 MT	┨

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:

**Test Duration:** 

7 days

ATS-T10 12/02/08



# REPRODUCTION AND WEIGHT DATA (Test Species: A. bahia

									24	<u>Date</u>	<u>Time</u>	<u>Initials</u>
Project	Numbe	ər: 7	0005.15				Orga	nisms sexed:		8/22/10	0 1411	MJ
-							Load	ed tins place	d in oven:			MJ
				0-247			Load	ed tins remov	ved from oven:	8/25/18	6 1446	m
			111					weighed:		8/25/18	1506	M
Oven T	emp (	°C): S	tart: 96	98°	End:	94°		Number:		Balan	ce Number: PC	115825
Test Conc.	Rep		# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Welghed	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	Α.	47	114	,	11		5	31.09	3262	1.53	0.306	0.306
	В	65		11			2	29.83	30,39	0.56	0.280	0.112
	С	71		*	JH1		5	29.31	31.18	1-87	0.374	0.374
	D.	63		1	111		4	28,19	29.25	1.06	0.265	0.212
	E	54		11	(1)		4	31.34	32.61	1.27	0.316	0.254
	F	68	1 .		1111		5	28.59	30.05	1.76	0.212	0-212
	G	119		и	111		5	29.21	30.40	1.19	0.236	0-238
Conc. R. Control A B C C D D E F C C D D C C C C C C C C C C C C C C C	Н	89	1	111	1		5	29.44	30.63	1.19	0.236	0.238
*		0.1			\							
50%	Α	124		11	- 11		4	30.11	31.25	1-14	0.285	0.228
	В	133		11	11		4	31.55	32.65	1.10	0.275	0.220
	С	73		mi			4	29.75	31.05		0.275	0.260
	D	56		11	1		.3	28.82	29.81		0.330	0.198
	E	49		111			2	29.97	30.62		0.325	0.130
	F	108		111	11		5	28.34	29.35		0.202	0.202
	G	CH	1		1	<del>                                     </del>	3	33,61	34,33		0.240	0.144

Dry wt. calculations checked (date, initials): 9/7//6 | Biomass calculations checked (date, initials): 9/7//6

111

118

Н

29.95

30.62

0.67

0.168

0.134



# REPRODUCTION AND WEIGHT DATA (Test Species: A. bahia

Project	t Numb	er:	70005.15						l:			MJ
Client:	Joi	dan Va	alley	111111111111111111111111111111111111111			Load	ded tins place	ed in oven:	8/22	16 1432	3 MJ
QC Te	st Num	ber: _	TN- 1	6-247					ved from oven:			Mm
Tin Lot							Loaded tins	weighed:		8/25/1	6 1506	MM
Oven 1	Temp (	(°C): S	tart:q	<u>ς°</u>	_End:	940					nce Number: P(	0115825
Test Conc.	Rep	Tin #	# Females with Eggs	# Fernales without Eggs	# Males	# Immatures	C # Orgs. Welghed	A Wt. of Tin (mg)	B Wt. of Tin & Dried Orgs. (mg)	B-A Total Dry Org. Weight (mg)	( <b>B-A)/C</b> Mean Dry Org. Welght (mg)	(if applicable) Mean Biomass (mg/exp. org.)
75%	Α	111		IJ			2	29.36 00	29.85 29.66	0,34	0.170	0.068
	В	59					- { *	30.17	30,48	0.31	0-051 0.31	0.062
	С	17		11			2	28.04	28.55	0.51	0.225	0.102
	D	_										
·-·	E	_										
	G	123		l				30.41	30.72	0.31	0.3/0	0.062
	Н	-				-						
	''											
100%	A	_									•	
	В	_									-	
	С	~										
	D	-						2				
	Е	-										-
	F	_										
	G	_	3-311									
	Н	-										

8/29Mg

Biomass calculations checked (date, initials): 971/6

<u>Date</u>

**Time** 

**Initials** 

ATS-T45



alsitinl

Meter Number

JYM emiT

						34.5																							
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## **TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS**

Project Number:	TEST ORGANISM	Beginning Date:
Client: Jordan Valley	Common Name: Opossum shrimp	Ending Date: 8 22 16 Time: 411
QC Test Number: TN- No-247	Scientific Name: A. bahia	
TARGET VALUES: Temp: <u>26±1</u> °C pH: <u>6.0 - 9</u>	<u>.0</u> DO: <u>≥4.0</u> mg/L Salinity: <u>30±2</u> ppt	Photoperiod: 16 4 8 4 Light Intensity: 50 - 100 fc

				Temp	eratu	ire (°C	<b>&gt;</b> )					рΗ					Dis	solvec	l Oxy	gen (r	ng/L)			C	ondu	tivity inity (	(#S/c ppt)		
Test Conc	Rep	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	25.7	250	25.D	25,1	256	2560	8.1	1.5	8.3	7.4	8.1	7.0	8.1	5.3	60	6.1	0.ي	5.7	6.1	4.0	30.5	30.8	24.8	30.4	29.5	30.3	28.9
50%		25.4	<b>15</b> 15	154	25.4	25.7	26:1	257	83	1.5	83	7.3	32	7.0	<b>%.</b> 5	4.2	5.3	5,0	58	5.6	5.2	4.1	20.5	31.0	299	30.7	30.	307	29.6
75%		路想	25.5	267	255	259	25%	25.5	8,4	7.5	8.4	1.3	8.4	7.0	<b>8</b> .5	48	5.1	8.)	5.3	5.8	53	5.3	30.6	310	29.9	20.G	30.0	30.7	29.0
100%		25.4				_	_	-			84		_	~				5.2		_	-	V	30.7			-	_		_
																													n
																			United										
Meter N	umber	678	ษาๆ	618	619	678	679	6H	618	619	676	619	678	6g	678	618	679	GY8	619	678	1079	678	618	619	ins	619	678	64	i/18
	Time Initials	1023	13/16	16W	1021	153	1000	1432	1023	1326	1516	1021	1535	MA	1432	1023	15760	196	1021	1535	1102	1432	1/02	12/20/	100	11/21	1535	043 0B	1432



### **RANDOMIZATION CHART**

Project N	umber:70	0005.15	
Client:	Jordan V	/alley	
OC Test I	Number: Ti	N-110-247	

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

ATS-T48d 03/01/00



### **TOXICOLOGY LABORATORY BENCH SHEET**

Project Number:		N- N-	
Client:Jord	an Valley		
QC Test Number:	TN-16-247		
Date/Time/Initials		Comments/Activity	
8/21/16 1040 OB	* Organia	m misso	



## TOXICOLOGY LABORATORY BENCH SHEET

Project Number: _	70005.15	
Client:Jord	an 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
8/16/14	ATLE - 391	9.2	1006	చకి	6.8	1016	JB
क्षा ग्लाफ	Arc -391	9.3	0906	JB	٦, ١	0916	ac
8/17/16	AT6-391	0.9	0932	<b>3</b> 3	7.3	0942	513
ક મકાદ	A76-391	વ.ધ	1318	MJ	6.9	1328	M
જાાવાહ	ATG-391	9.3	0746	Mo	6.9	0756	MT
व्याक्ती	476-391	9.4	0855	MT	6-8	0905	M
8/21/16	ATG-391	8.3	0929	JB	7.0	૦૧૩૧	JB

			Mysid	Survival,	Growth a	nd Fecu	ndity Test	-48 Hr St	ırvival
Start Date:	8/15/2016		Test ID:	TN-16-24	7		Sample ID	);	Jordan Valley
End Date:	8/22/2016		Lab ID:	AT6-391			Sample Ty	/pe:	Outfall 001
Sample Date:			Protocol:	<b>EPAM 87-</b>	EPA Mari	ne	Test Spec	ies:	MY-Mysidopsis bahia
Comments:									
Conc-%	1	2	3	4	5	6	7	8	2
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	

-			Tra	ansform:	Arcsin So	uare Root	t)	Rank	1-Tailed	Number	Total
Сопс-%	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		3,117	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 nor	-normal di	stribution	$(p \le 0.01)$	15.	0.84108	0.904	-1.4306	2.42832
Bartlett's Test indicates equal var	iances (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				

				Ma	xlmum Likeliho	od-Probli			7		
Parameter	Value	SE	95% Fidu	cial Limits	Control	Chi-Sq	Critical	P-value	Mu	Sigma	Ite
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		1.0 -					
Point	Probits	%	95% Fidu	cial Limits					17/		
EC01	2.674	45.0601	28.4361	53.9827		0.9			1/		
EC05	3.355	51.1023	35.6509	59.0433		0.8			#		
EC10	3.718	54.6478	40.1878	61.9787		0.7			H	1	
EC15	3.964	57.178	43.5494	64.0725		-4			#	- 1	
EC20	4.158	59.2721	46.4017	65.8137		<b>8</b> 0.6 -			III		
EC25	4.326	61.1298	48.9781	67.3713		95 0.6 0.5 0.4			111		
EC40	4.747	66.0729	55.9814	71.6419		뮻			11		
EC50	5.000	69.2372	60.4901	74.5588		₽ 0.4			11	- 1	
EC60	5.253	72.5529	65.1047	77.9012		0.3			11		
EC75	5.674	78.4198	72.4988	85.0274		0.2				- 1	
EC80	5.842	80.8776	75.1761	88.6006		0.2		- 1	H		
EC85	6.036	83.8397	78.0842	93.3576		0.1		1	11		
EC90	6.282	87.7214	81.4874	100.217		0.0 1		/ / /	<i>V</i>		
EC95	6.645	93.8077	86.2392	112.052		1		10	100	1000	
EC99	7.326	106.387	94.9762	139.517		•		Dose		1000	

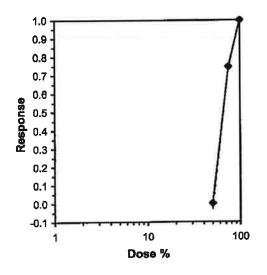


			Mysid	Survival,	Growth a	nd Fecu	ndity Test-	96 Hr Su	ırvival
Start Date: End Date: Sample Date:	8/15/2016 8/22/2016		Lab ID:	TN-16-247 AT6-391 EPAM 87-		ne	Sample ID Sample Ty Test Spec	/pe:	Jordan Valley Outfall 001 MY-Mysidopsis bahia
Comments:	1	2	3	4	5	6	7	8	
Contro	1.0000	0.4000	1.0000	0.8000	0.8000	1.0000	1.0000	1.0000	*
50		1.0000	0.8000	1.0000	0.6000	1.0000	0.8000	1.0000	
75		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	

			Tr	ansform:	Arcsin Sc	uare 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		1.2283	0.8861	1.3453	14.264	8	-0.238	2.024	0.2142	4	40
*75	0.2250		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 nor	mal distribu	ution (p >	0.01)		0.92377		0.884		-0.7143	0.82652
Bartlett's Test indicates equal var	iances (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	1.0 <sub>T</sub>
20.0%	<b>65.69</b> 5	61.729	69.916	e.o
Auto-0.0%	66.861	63.748	70.126	





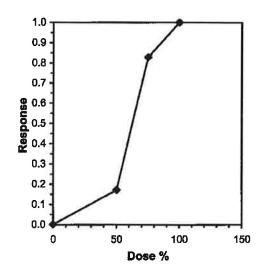
-014	200		Mysid	Survival,	Growth a	nd Fecu	ndity Test-	7 Day Su	ırvival
Start Date:	8/15/2016		Test ID:	TN-16-247	7		Sample ID	:	Jordan Valley
End Date:	8/22/2016		Lab ID:	AT6-391			Sample Ty	/pe:	Outfall 001
Sample Date:			Protocol:	<b>EPAM 87-</b>	EPA Mari	ne	Test Spec	ies:	MY-Mysidopsis bahia
Comments:									
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	

			Tra	ansform:	Arcsin So	uare Root	t		1-Tailed		Isot	onic
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
<del>*</del> 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 nor	mal distribu	ution (p >	0.01)		0.93096		0.884		-0.6311	0.30558
Bartlett's Test indicates equal var	riances (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

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	on (200 Resamples)
IC10* 29.167 12.820 14.615 53.038 0.4241	
10455 40550 40550 04550 04550	
IC15* 43.750 10.650 21.923 54.557 -0.3374	1.0
IC20 51.087 7.654 29.231 56.250 -1.0567	
IC25 52.989 5.111 36.538 57.813 -1.6983	0.9
IC40 58.696 2.528 53.144 63.336 -0.3295	- 8.0
IC50 62.500 2.252 57.885 66.680 -0.0392	0.7

<sup>\*</sup> indicates IC estimate less than the lowest concentration



			Mvs	id Surviva	l, Growth	and Fe	cundity Te	st-Fecur	dity
Start Date: End Date: Sample Date	8/15/2016 8/22/2016		Test ID: Lab ID:	TN-16-247 AT6-391 EPAM 87-			Sample ID Sample Ty Test Spec	ype: ):	Jordan Valley Outfall 001 MY-Mysidopsis bahia
Conc-%	1	2	3	4	5	6	7	8	
Contro	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	0.5000	0.0000	
7!	0.0000	0.0000	0.0000						

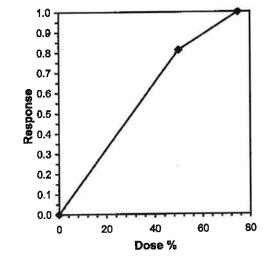
			Tr	ansform:	Arcsin Sc	uare Roof		Rank	1-Talled	Isot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
Control	0.2738	1.0000	0.5905	0.3614	1.0472	49.278	7	72		0.2667	1.0000
*50	0.0625	0.2283	0.3837	0.2527	0.7854	43.730	8	47.00	49.00	0.0500	0.1875
75	0.0000	0.0000	0.4154	0.3614	0.5236	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)				

Hypothesis Test (1-tail, 0.05)
Wilcoxon Two-Sample Test indicates significant differences

			Line	ear Interpolation (200 Resamples)
Point	%	SD	95% CL(Exp)	Skew
IC05*	3.077			
IC10*	6.154			
IC15*	9.231			1.0
1C20*	12.308			0.9 -
IC25*	15.385			4
IC40*	24.615			0.8 ]
IC50*	30,769			0.7 -

\* Indicates IC estimate less than the lowest concentration



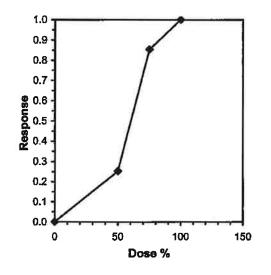
			My	sid Surviv	al, Growt	h and Fe	cundity Te	st-Biom	ass	
Start Date:	8/15/2016		Test ID:	TN-16-247	7		Sample ID	);	Jordan Valley	
End Date:	8/22/2016		Lab ID:	AT6-391			Sample Ty	/pe:	Outfall 001	
Sample Date:			Protocol:	<b>EPAM 87-</b>	EPA Mari	ne	Test Spec	ies:	MY-Mysidopsis bahla	
Comments:							•		-	
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	

				Transfort	n: Untran	sformed			1-Talled		Isot	onic
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	775	Critical	-3-	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

				Linea	ar Interpolatio	n (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	1.0
IC20*	39.725	10.252	24.610	55.611	0.0604	201
IC25*	49.657	8.126	30.762	57.069	-0.3784	0.9
IC40	56.146	3.479	49.220	62.346	-0.2775	0.8 -
IC50	60.291	2.877	55.009	65.851	0.1236	0.7

\* indicates IC estimate less than the lowest concentration





## **TOXICITY TEST SET-UP BENCH SHEET**

Project Number:70005.15	
Client:Jordan Valley	· · · · · · · · · · · · · · · · · · ·
QC Test Number: TN-10-248	<u> </u>
en e	ST ORGANISM INFORMATION
Common Name: Opossum shrimp	Adults Isolated (Time, Date):
Scientific Name: A. bahla	Neonates Pulled & Fed (Time, Date):
Lot Number: AB-890	Acclimation: <24 hrs Age: 7204S
Source: EA	Culture Water (T/S): 25.9 °C 30.7 ppt

	Т	EST INITIAT	ION	CONCENTRATION SERIES					
Date 8/15/16	Time	Initials	Activity	Test Concentration Mod Hard Control	Volume <u>Test Material</u> 0ml	Final <u>Volume</u> 1200ml			
8/1511 <b>6</b>	1550 	SB 1	Dilutions Made	50% 75%	600ml 900ml				
	1		Test Vessels Filled	100%	1200ml				
	1625	1	Organisms Transferred			<b>1</b>			
	1630	MKE	Head Counts						

	<b>生性的现象数别</b>	SINTER	RMEDIATE	DILUTION	REPAF	ATION AND FE	EDING					
	DILUTION	ON PREP	ARATION		FEEDING							
				Sample /		Artemia Time, Initials,	Time, Initials,	Time, Initials,				
<u>Day</u>	<u>Date</u>	<u>Time</u>	<u>Initials</u>	Diluent AG-407	<u>Day</u>	<u>Amount</u>	Altiouni	1625 MKC				
0	8/15/16	1550_	JB_	206-369	0	0830 NAT		501095				
1	4/10/10	0942	MJ	416-407 - LTXD-364	1	Sdrops		500095 1625JB				
2	8/17/16	1143	TM	106-309 106-309	2	50005 50005		5draps				
3	ક્રી છી છ	1454	MO	476401 LD6369	3	<u> २९४८२</u>		5 dops				
4	કો!9 ો ઉઠ		MJ	476-407 LD0-309	- 4	Fdraps		5 drugs				
5	વાંટલાંહ			476-369 EDG-369	5	OSIGNIT Edvops		1545MI 5drgs				
6	8/21/16	0920	44	ATTE-407	6	0815 OB 50000		295762 1612 418				



525 Time: 1625 Time: शान्त्राह 4" Bowl 7 days 150 ml Beginning Date: Test Container: Test Duration: Ending Date: \_ Test Volume: **TOXICITY TEST OBSERVATION DATA SHEET** Photoperiod: 16 4, 8 4 Light Intensity: 50 - 100 fc Common Name: Opossum shrimp Static / Flowthrough (Renewal )/ Non-renewal A. bahia Scientific Name: TEST ORGANISM TEST TYPE: Accession Number: 4No-369 Accession Number: And -407 TN-16-248 70005.15 30 ppt CS Jordan Valley Effluent QC Test Number: Project Number: Dilution Water: Test Material: Client:

	Day 7		0 3	^	V	2	1	, V	7 4	7		1	r V	V	) 4	7	- &	N 3	-10	ISSSMO	
	Day 6	L C	) (	Ω	ĸ	15	เก	LC)	7	رک ا		ic	T.	ď	1	) =	ی ا	) 3	40	CAC OR	
	Day 5	5	1	n	ρť	2	V	2	) <del>-</del>	7	)	٥	\v	2	S	3	\s\ \	3-	10	1845MT	
Number of Surviving Organisms	Day 4	v	, ,	n	V)	80	ν.	. V.	) ਹ	S		V	, V	\sqrt{0}	S	3		7	£()	103	
Number of Survi	Day 3	(,	(,		ک	5	4	5	7	<b>~</b>		٧٠ ٢		~	<b>٧</b>	3	<u>ر</u>	6	3	~ (SS)	2/8/18
	Day 2	γr.		n	v	Ŋ	N	æ	4	\$		75	מע	n	શ	r.	พ	0	3	BY MS	
	Day 1	S	8		·S	S	٧,	S)	<b>4</b> 5)	>		*5	V	S	S	₩.	S	<b>~</b>	£0	SM LHDI	
	Day 0	М	ď	7	ĸ	S	Ŋ	٧	ഗ	S		ເດຍ	5	5	2	15	\$	រភ	2	sless mill	
	Rep	¥	В	c	) I	۵	Ш	ш	9	Ξ		A	В	၁	D	ш	ı.	<b>9</b>	ェ	Time / Initials	
	Concentration	Control										20%								Tim	

Americamysis:(1007.0) X

OTHER:

ATS-T10 12/02/08



**TOXICITY TEST OBSERVATION DATA SHEET** Time: 1005 Beginning Date: Project Number: \_\_\_\_\_70005.15 **TEST ORGANISM** 8 22 16 Client: Jordan Valley Common Name: Opossum shrimp Ending Date: QC Test Number: TN-16-248 Scientific Name: A. bahia Test Material: Effluent TEST TYPE: Static Accession Number: ATIO - 407 Flowthrough Test Container: 4" Bowl 150 ml Non-renewal Test Volume: \_\_\_ Dilution Water: 30 ppt CS Renewal

Accession Number: 114-369 Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc Test Duration: 7 days

					Number of Survi	ving Organisms			
Concentration	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	Α	5	5	2	7	2	2	2	2
	В	5	5	2	2	2	2	2	2
	С	5	5	4	3	3	3	3	3
	D	5	5	4	4	ઘ	4	4	4
	E	5	5	4	4'	Ч	¥	Щ	4
	F	5	5	5	4	4	4	Ly	4
	G	5	5	4	3	3	3	3	3
- side - minics - are	Н	5	4	3	\	1		1	
100%	A	5	4	3	1	1	1	1	(
	В	5	5	4	z	2	2	2	2
	С	5	5	5	5	5	5	5	5
	D	5	3	3	0	_	-		
	E	5	3	2		0 L			1
	F	5	4	2	1		ì	i	Ĭ
	G	5	2	2		(		ı	(
	Н	5	2	2	0			_	
T	ime / Initials	MOSONIC	1047 MJ	1337 MJ	1553~	1030MJ	1545MJ	85 OIG	1525 MJ

EPA TEST METH	<u> OD</u> : (FW) EPA 821-R-02-013/(SW) EP	PA 821-R-02-012(CHECK ONE)
Fathead: (1000.0	)) <u>Cyprinodon:</u> (1004.0)	<u>Menidla</u> : (1006.0)



# REPRODUCTION AND WEIGHT DATA (Test Species: A. bahia

		<u>Date</u>	<u>Time</u>	<u>Initials</u>
Project Number:70005.15	Organisms sexed;	8/22/16	1525	MJ
Client:Jordan Valley	Loaded tins placed in oven:	8/22/14	1551	M
QC Test Number: TN-16-248	Loaded tins removed from oven:	8/25/16	1413	NM
Tin Lot: Blue 162	Loaded tins weighed:	8/25/10	1443	NA
Oven Temp (°C): Start: 100° End: 92°	Oven Number: BLM-01	Balance Nu		15825

Test Conc.	Rep	Tin #	# Females with Eggs	# Females without	# Malaa	# 1	C # Orgs.	A Wt, of Tin	B Wt. of Tin & Dried Orgs.	B <b>-A</b> Total Dry Org. Weight	(B-A)/C Mean Dry Org. Weight	(if applicable) Mean Blomass
Control	A	_	Lggs	Eggs	# Males	# Immatures	Weighed	(mg)	(mg)	(mg)	(mg)	(mg/exp. org.)
	В	53			سللا		5	29.73	31.36	1.63	0.326	0.326
		23			JHY .			30.03	31.57	1.54	0.308	0.308
	С	169			ali		5	30.44	32,18	1,74	0.348	0.348
	D	83		yal	1		5	31.00	32.57	1.57	0.314	0.3/4
	E	99	11		ill		5	29.94	31.62	1.68	0.336	0.334
	F	524		н	111		6	30.10	32.51	1.87	0.374	0.374
	G	48			1111		4	30.31	31.65	1,34	0.335	0.268
	Н	95		JH.	•		5	27.76	29.31	1,55	0.310	0.30
50%	Α	14		nt	11		5	36.34	01.64	1.22	o duti	A 2011
	В	101		1111	1				31.%		0.244	0.244
	C	77	-				5	30.18	31,54	1.36	0.272	0.272
	D			1111			5	34.47	36.04	1.57	0.314	0.34
		135			_///		5	31.96	33.66	1.70	0.340	0.240
	E	103		111	1		થ	32.41	33.63	1,22	0.305	0.244
	F	105	***	nti	1		3	30.53	32,15	1.62	0.324	0.329
	G	100		11	Ŋ		Ц	30.19	31.36	1.17	0.793	0.234
	Н	117	(	Ī	1		3	29.20	30,17	0.97	0.323	0-194

Biomass calculations checked (date, Initials): 9/7/14



## REPRODUCTION AND WEIGHT DATA (Test Species: A. bahia

										<u>Date</u>	<u>Time</u>	Initials Mo	
Project	Numbe	er: <u>7</u>	0005.15				Orga	nisms sexed	d:	6 22 1	1525		
Client:	Jor	dan Va	lley						ed in oven:				
QC Tes	st Numi	ber: _	TN- id	0-248			Load	led tins remo	ved from oven:	)		M	
Tin Lot	: <u>B</u> \	ve 162					Loaded tins	weighed:		8/25	-/16 1943	M	
Oven T	emp (	°C): S	tart: <u></u>	)O°	End:9	Z°	Over	Number:	BLM-01	Balan	ce Number: P	0115825	
Test Conc.	Rep		# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Welghed	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%	Α	98		1	1		2	31.12	31.59	0.47	0.235	0.084	
	В	116		11			2	34.00	34.46	0.46	0.230	0.092	]
	С	66		1	11		3	28.57	29.53	0.96	0.320	0.192	
	D	90		IN	- 1		4	34.16	35.44	1.28	0.320	0.25%	]
	E	110		111	1		4	29,54	30.1338.76	0.59	0.148	0.118	als
	F	61		111	1		पं	28.45	29.80	135 1.35	0.330	0.270	J °
	G	70	l	1	1		3	29.84	30.62	0.78	0.260	0.156	
	Н	117					Ĭ	30.64	30.82	0'18,	0.180	0.036	_
100%	A	141				-		29.5%	30.00	0.42	0.420	0.084	1
	В	130		H	<b>'</b>		2	29.63		0,50	0.250	0.100	1
	С	129		11	11		5	33.50	35,11	1.61	0.322	0.322	1
	D	-						_					1
	E	82		1			1	31.11	31.28	פ.וס	0.170	0.034	1
	F	120			1		١,	38.41		0.22	0.220	0.044	
	G	97			1		,	29.84		0.05	0.050	0.010	
	Н	-					-						



## **TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS**

Project Number:	TEST ORGANISM	Beginning Date: 815/10	Time:	1625
Client:Jordan Valley	Common Name: Opossum shrimp	Ending Date: 8 2216	Time:	1525
QC Test Number:TN-ilo - 248'	Scientific Name: A. bahia			

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

				Гетр	eratu	re (°C	;)					рН					Dis	solved	d Oxyg	jen (n	ng/L)			Š	ondu Sa	ctivity	(μS/c	m)	
Test Conc	Rep	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	2140	25.1	250	25.0	25,3	61	8.1	1.3	8.3	1.0	7.9	7,2	69	6.9	7.0	69	68	7.1	60%	30.1	38.6	207	29 C	no il	29 9	34.
			25.1	253					34											1				00.00	ω.,	-	30.1	2")	ببحق
50%		25.0	25.1	25.1	250	250	25.1	253	618	8.0	7.3	81	20	7.9	7.3	6.8	7.0	7.0	70	0.8	7.1	6.8	20.2	20.2	20.5	29.5	500 0	29 %	200
									8.1					72									,,,,,,	50-	50.0		21.1	2 114	ررس
75%		1510	25.2	25.\	250	250	252	25.3	618	7.9	7.3	80	10	7.8	13	7.0	7.0	1.0	7.0	6.8	10	6.8	20,0	30.0	26.2	292	29.1	29.3	30
			œ						8'0													1		Cons	0-15		1.1	0.0	
100%		15N	253	25.1	250	25.0	25:3	25,1	WK	7.8	7.2	7.9	7.0	7.8	7.2	7.1	1.0	6.9	7.0	6.8	2.0	6.8	29.8	29.7	30.0	29.0	29.4	291	29.9
		*							7,8																				
	-																												
																											auraic ar		
Meter No	ımber	WA	678	øη	616	ଜ୍ୟ	હાજ	629	Prw	619	679	<b>ଜୀ</b> 8	619	618	609	679	ษาช	679	ଧ୍ୟ	<i>G</i> 19	678	(હર્ધ	679	616	679	(B)E	619	675	6529
	ime	INDO	(1999	111/8	WA	0921	1926	0452	1600	0948	1148	145%	0921	0920	OUSZ	RW)	0948	1148	1458	1,590	0926	0152	(CO4)	MUR	1148	1455	0921	na26	040
1	nitials	38	MJ	MS	MS	MS	MZ	10	ഷ	M	M	ANS	MT	MS	ATA.	10	MI	M	MZ	MT	MI	/CB	100	44.0	Aser	WA	M	MY	Sh



### **TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS**

Project Number: 70005.15	<b>TEST ORGANISM</b>		Beginning Date:	8/15/110	Time:	1625
Client: <u>Jordan Valley</u>	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 € Light Intensity: 50 - 100 fc

			1	emp	eratur	e (°C	)					рН					Diss	olved	Oxyg	en (m	g/L)			Co		tivity ( nity (p	uS/cr	n)	
Test Conc	Rep	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		UA 25.1	<b>1</b> 5.1	25.4	250	156	25,5	25.5	4.2	19	8.2	7.7	83	7.0	8,5	55	5.6	5.7	660	54	5,8	5,3	30:7	30.8	30.9	<i>3</i> 0.5	29.1	<b>3</b> 0.3	29.5
50%		26-1	<b>25</b> 4	25.6	25:2	<b>25</b> 3	<b>758</b>	25.50	8-1	1.9	¥.0	1.7	8.3	7.0	8.4	50	5.1	5.2	52	4.5	5.0	4.6	30.2	<i>30</i> .5	30.4	<b>30.</b> [	29.1	300	29.3
75%		157	<b>1</b> 5/Q	25.6	e5.4	259	25.4	25.8	<b>8</b> .1	7.9	8.0	76	8.1	7.1	8.2	45	<b>4.</b> l	5.2	4.[	4.1	5.5	4.1	299	30.2	30.1	A8	<i>3</i> 3.60	29.8	29.Q
100%		25.U	25 TQ	25.6	25.4	259	25.%	25.CO	79	7.9	8.0	7.6	7.9	7.1	1.8	4.2	4.2	4.9	4.1	4.0	4.1	<b>ા</b> . છ	29.7	29.9	29.9	295	28.3	29.6	289
							<u> </u>																						
Meter	Number	_											-		1					1						1			
	Time	_	2221		NO		102°	1525 MJ	1102	1351 MO	1559	104C	15. M	1027	1525 MS	MJ	1351 MJ	1557	MI	1553 MJ	1023	152°	7	1351 Mb		NET	K	1023 183	1525 MS

4116



### **RANDOMIZATION CHART**

Project Nu	ımber:	70005.15	
Client: _	Jorda	an Valley	
OC Test N	lumber	TN-110-248	

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: <u>Jordan Valley</u>	
QC Test Number: TN-110-248	
Date/Time/Initials	Comments/Activity



### **TOXICOLOGY LABORATORY BENCH SHEET**

Project N	Number:	70005.15	
Client: _	Jor	dan Valley	
QC Test	Number:	TN-110-248	

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

i a	T*********	r	ON AIR		T	OFF AIR	
		Initial DO	I	· · · · · · ·	Final DO	OI I AIIX	1
Date	Sample #	(mg/L)	Time	Initials	(mg/L)	Time	Initials
adi. e.a	<b> </b>	7.9	-Co(-			-0/0	
8116116	ATU-407		0906	<b>3</b> 8	હે.જ	09160	JB
811116	ATG-407	8,4	0932	<i>3</i> B	6.8	0942	<b>333</b>
8/18/16	AT6-407	9.1	1318	MT	6.9	1328	TM
8/19/16	ATG-407	9.5	0746	UJ			MJ
812016	AT6-407	9.2	0853	MT	7.1	0756 0905	MU
8/21/16	ATW - 407	8.4	0905	5B		0915	JB
Blow			8		6.60	0 1,5	
							1
	5%			*1			
				7	**		
¥							
							*

			Mysic	Survival,	Growth a	nd Fecu	ndity Test-	48 Hr St	urvival
Start Date: End Date: Sample Date:	8/15/2016 8/22/2016			TN-16-248 AT6-407 EPAM 87-		ne	Sample ID Sample Ty Test Spec	/be:	Jordan Valley Mock Effluent MY-Mysidopsis bahia
Comments:	- 1	2	3	4	5	6	7	8	- Alik
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	
50	1.0000	1.0000	51000000	1.0000	1.0000	1.0000	1.0000	0.6000	
75	0.4000	0.4000		0.8000	0.8000	1.0000	0.8000	0.6000	
100		0.8000		0.6000	0.4000	0.4000	0.4000	0.4000	

			Tra	ansform:	Arcsin Sc	uare 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

Augillant Toota					Statistic	(	Critical		Skew	Kurt
Auxiliary Tests Shapiro-Wilk's Test indicates nor	mal distribu	rtion (p >	0.01)		0.90732		0.904		0.00049	0.99635
Bartlett's Test indicates equal var	iances (p =	0.06)			7.35726		11.3449	***	F O b	A.E
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

				Ma	ximum Likeliho	od-Probit					
Parameter	Value	SE	95% Fidu	cial Limits	Control	Chi-Sq	Critical	P-value		Sigma	Ite
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		0.06585		1.0 7			11 /		
Point	Probits	%	95% Fidu	cial Limits		0.9	(i)	- 1	/ / .		
EC01	2.674	35.7482	10.0556	50.207		-	7.	1	1 /		
EC05	3.355	49.2172	21.7747	62.0548		0.8 -		- 11			
EC10	3.718	58.3639	32.6488	69.9498		0.7 -		- 11		- 1	
EC15	3.964	65.4772	42.5933	76.4003		<b>9</b> 0.6 -		H	1		
EC20	4.158	71.744	52.1057	82.7507		SE 0.0		- 11	/		
EC25	4.326	77.5963	61.0904	89.8543		980005 0.5 0.4		11/	/		
EC40	4.747	94.5483	81.9188	123.124		<b>8</b> 0.4		₩.	ii E		
EC50	5.000	106.482	91.6514	158.684				///		1	
EC60	5.253	119.922	100.612	208.432		0.3 -		<b>/4/</b>			
EC75	5.674	146.121	115.663	333.147		0.2 -		/#			
EC80	5.842	158.04	121.943	402.28		8	0	/			
EC85	6.036	173.166	129.573	501.641		0.1	1	/1			
EC90	6.282	194.271	139.718			0.0 -				********	
EC95	6.645	230.375					1 10	100	1000	10000	
EC99	7.326	317.175	191.512	2187.64				Dose	%		

			Mysid	Survival,	Growth a	ind Fecu	ndity Test	-96 Hr St	ırvival
Start Date:	8/15/2016		Test ID:	TN-16-248	3		Sample ID	):	Jordan Valley
End Date:	8/22/2016		Lab ID:	AT6-407			Sample Ty	vpe:	Mock Effluent
Sample Date:			Protocol:	EPAM 87-	EPA Mari	пе	Test Spec	ies:	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	

			Tra	ansform:	Arcsin So	quare Roof	t	Rank	1-Tailed	Number	Total
Conc-%	Mean	N-Mean <sup>*</sup>	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 nor	-normal dis	stribution	$(p \le 0.01)$		0.90037	0.904	1.15066	4.32238
Bartlett's Test Indicates unequal	0 = 7.90E	-03)		11.8541	11.3449			
Hypothesis Test (1-tall, 0.05)	NOEC	LOEC	ChV	TU		74-		
Steel's Many-One Rank Test	50	75	61.2372	2			347	

				Maxir	num Likeliho	od-Probit	1				
Parameter	Value	SE	95% Fldu	cial Limits	Control	Chi-Sq	Critical	P-value	Mu	Sigma	Ite
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		1.0					
Point	Probits	%	95% Fidu	cial Limits				,	1//	1	
EC01	2.674	36.3338	20.9395	46.3541		0.9			11/		
EC05	3.355	46.0451	30.9341	55.2082		0.8 -			11/		
EC10	3.718	52.2426	38.0014	60.7374		0.7			14/		
EC15	3.964	56.8886	43.5834	64.8924		-			11/		
EC20	4.158	60.8741	48.516	68.5136		98000 0.5 0.4			11/		
EC25	4.326	64.5151	53.0909	71.9152		5 0.5 d			111		
EC40	4.747	74.685	65.6825	82.4199		<u>8</u>			Ш		
EC50	5.000	81.5598	73.4061	90.9856		<b>2</b> 0.4			M		
EC60	5.253	89.0675	80.7378	102.059		0.3 -			/#		
EC75	5.674	103.108	92.2001	126.718		0.2			/ <b>!</b>		
EC80	5.842	109.275	96.7087	138.766		0.2]		1	#		
EC85	6.036	116.93	102.049	154.556		0.1		/.	U		
EC90	6.282	127.329	108.982	177.338		0.0 1		//	/		
EC95	6.645	144.467	119.851	217.935		1		10	100	1000	
EC99	7.326	183.08	142.697	322.063		5.5				1000	
Significant he	terogeneity	detected	(p < 0.01)					Dose	%		



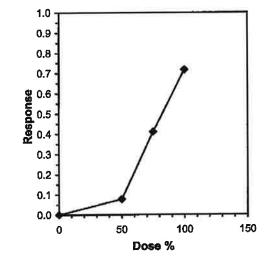
			Mysic	i Survival,	Growth a	nd Fecu	ndity Test-	7 Day St	
Start Date: End Date: Sample Date:	8/15/2016 8/22/2016		Test ID: Lab ID: Protocol:	TN-16-248 AT6-407 EPAM 87-		ne	Sample ID Sample Ty Test Spec	ype:	Jordan Valley Mock Effluent MY-Mysidopsis bahia
Conc-%	1	2	3	4	5	6	7	8	tenco an an analysis
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	
50		1.0000	1.0000	1.0000	0.8000	1.0000	0.8000	0.6000	
75		0.4000	0.6000	0.8000	0.8000	0.8000	0.6000	0.2000	
100		0.4000	1,0000	0.0000	0.2000	0.2000	0.2000	0.0000	

			Tr	ansform:	Arcsin So	uare Roof	ŧ	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 nor	n-normal dis	stribution	$(p \le 0.01)$		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 Res							
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	1.0				
IC20	59.231	4.361	52.269	68.781	0.0396	0.9				
IC25	62,981	4.560	56.250	75.015	0.6321	4				
IC40	74.231	5.110	65.902	84.329	0.1763	0.8				
IC50	82.292					0.7				

<sup>\*</sup> indicates IC estimate less than the lowest concentration



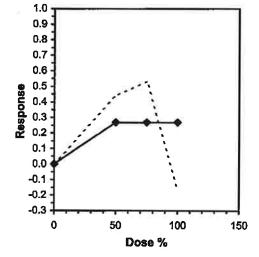
			Mys	sid Surviva	al, Growth	and Fe	cundity Te	st-Fecur	idity
Start Date: End Date: Sample Date: Comments:	8/15/2016 8/22/2016		Lab ID:	TN-16-248 AT6-407 EPAM 87-		ne	Sample II Sample Ty Test Spec	ype:	Jordan Valley Mock Effluent MY-Mysidopsis bahia
Conc-%	1	2	3	4	5 =	6	7	8	1
Control	0.0000	0.0000	1.0000	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-Talled			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

			Line	Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL(Exp)	Skew				
IC05*	9.298		***************************************					
IC10*	18.595							
IC15*	27.893			1.0				
IC20*	37.190			0.9				
IC25*	46.488			0.8				
IC40	>100			4				
IC50	>100			0.7 -				

<sup>\*</sup> indicates IC estimate less than the lowest concentration



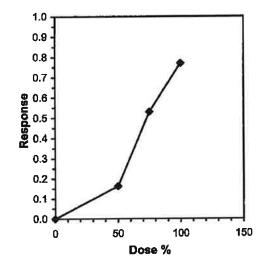
			My	sid Surviv	al, Growt	h and Fe	cundity Te	st-Biom	
End Date: Sample Date:	8/15/2016 8/22/2016	8/22/2016 L		Test ID: TN-16-248 Lab ID: AT6-407 Protocol: EPAM 87-EPA Marine		ne	Sample ID: Sample Type: Test Species:		Jordan Valley Mock Effluent MY-Mysidopsis bahia
Conc-%	1	2	3	4	5	6	7	8	S.D.
Control	0.3260	0.3080	0.3480	0.3140	0.3360	0.3740	0.2680	0.3100	0.03141
50		0.2720		1-015	0.2440	0.3240	0.2340	0.1940	0.05096
75	•	0.0920			0.1180	0.2700	0.1560	0.0360	0.08275
100		0.1000			0.0340	0.0440	0.0100	0.0000	0.10679

				Transform	n: Untran	sformed		=	1-Tailed		Isot	onic
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	1.0			
IC20	52.595	6.023	37.080	59.300	-1.0648	0.9			
IC25	55.987	4.304	46.350	64.131	<i>-</i> 0.6819	0.8 ]			
IC40	66.166	4.706	59.106	77.552	0.8176	0.8 -			
IC50	72.952					0.7			

<sup>\*</sup> indicates IC estimate less than the lowest concentration



## **ATTACHMENT II**

Chemical Analyses (61 pages)









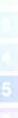










































































































Suite 400













For:









































8/15/2016 2:08:06 PM

Carrie Gamber, Senior Project Manager

(412)963-2428

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Hunt Valley, Maryland 21031

TestAmerica Pittsburgh

Pittsburgh, PA 15238 Tel: (412)963-7058

225 Schilling Circle

301 Alpha Drive RIDC Park

**ANALYTICAL REPORT** 

EA Engineering, Science, and Technology

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.

Expert

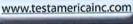
..... LINKS .....

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#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

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.

3

TestAmerica Job ID: 180-57381-1

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TestAmerica Pittsburgh 8/15/2016

### **Definitions/Glossary**

Client: EA Engineering, Science, and Technology

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

### 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.

Relative Percent Difference, a measure of the relative difference between two points

### **Glossary**

RPD TEF

TEQ

<u> </u>	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
a	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
ONF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Oil 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
<b>IDA</b>	Minimum detectable activity
DL	Estimated Detection Limit
MDC	Minimum detectable concentration
/IDL	Method Detection Limit
/IL	Minimum Level (Dioxin)
IC	Not Calculated
ID	Not detected at the reporting limit (or MDL or EDL if shown)
QL	Practical Quantitation Limit
C	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)

## **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		<b>EPA Region</b>	Certification ID	Expiration Date	
Jtah	NELAP		8	PA001462015-4	05-31-17	
The following analytes	s are included in this repo	rt, but are not certifi	ed under this certifica	tion:		
Analysis Method	Prep Method	Matrix	Analyte	e		
200.7 Rev 4.4	200.7	Water	Bariun	1		
200.7 Rev 4.4	200.7	Water	Boron			
200.7 Rev 4.4	200.7	Water	Calciu	m		
200.7 Rev 4.4	200.7	Water	Magne	esium		
200.7 Rev 4.4	200.7	Water	Potass	sium		
200.7 Rev 4.4	200.7	Water	Sodiur	n		
200.7 Rev 4.4	200.7	Water	Stronti	um		
300.0		Water	Bromio	de		
300.0		Water	Chloric	ie		
300.0		Water	Sulfate	)		
SM 2540C		Water	Total [	Dissolved Solids		
SM 2540D		Water	Total S	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

<sup>\*</sup> 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

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Lab Sample 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 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 Instrumen	300.0 t ID: CHICS2100B		50			184367	08/10/16 11:53	MJH	TAL PIT
Total/NA	Analysis Instrumen	300.0 t ID: CHICS2100B		500			184367	08/10/16 12:11	MJH	TAL PIT
Total Recoverable	Prep	200.7			50 mL	50 mL	184513	08/11/16 07:13	ANA	TAL PIT
Total Recoverable	Analysis Instrumen	200.7 Rev 4.4 t ID: Q		5			184669	08/12/16 07:34	RJR	TAL PIT
Total Recoverable	Prep	200.7			50 mL	50 mL	184513	08/11/16 07:13	ANA	TAL PIT
Total Recoverable	Analysis Instrumen	200.7 Rev 4.4 t ID: Q		50			184669	08/12/16 07:39	RJR	TAL PIT
Total/NA	Analysis Instrumen	SM 2320B t ID: MANTECH01		1			349122	08/14/16 09:32	YZ	TAL IRV
Total/NA	Analysis Instrument	SM 2540C t ID: NOEQUIP		1	4 mL	100 mL	184485	08/10/16 15:29	JWS	TAL PIT
Total/NA	Analysis Instrument	SM 2540D t ID: NOEQUIP		1	1000 mL	1000 mL	184494	08/10/16 17:31	JWS	TAL PIT

#### 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

Lab Sample ID: 180-57381-1

Client Sample ID: ATB-391 (SALINITY ADJUSTED OUTFALL

ND

ND

ND

2.2

36000

1100

001)

Date Collected: 08/09/16 13:47 Date Received: 08/10/16 09:00

Hydroxide Alkalinity as CaCO3

Bicarbonate ion as HCO3

**Total Dissolved Solids** 

**Total Suspended Solids** 

Carbonate as CO3

Hydroxide as OH

Matrix: Water

08/14/16 09:32

08/14/16 09:32

08/14/16 09:32

08/14/16 09:32

08/10/16 15:29

08/10/16 17:31

1

1

1

1

1

1

Method: 300.0 - Anions, Ion Ch Analyte		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) - Tot	al Recover	able						
Analyte		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
									124

4.0

4.8

2.4

1.4

250

0.50

4.0 mg/L

4.8 mg/L

2.4 mg/L

1.4 mg/L

250 mg/L

0.50 mg/L

### 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

		MB	MR							
Analyte		Result	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	81	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

•	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%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

-	MB	MB						Trop Datom	
Analyte	Result	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

Analyon	, 54.011. 104000	Spike	LCS	LCS				%Rec.
Analyte		Added	Result	Qualifier	Unit	D	%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
Magnesiur	n	50000	51500		ug/L		103	85 - 115
Sodium		50000	52800		ug/L		106	85 - 115
Strontium		1000	1000		ug/L		100	85 - 115

TestAmerica Pittsburgh

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 440-349122/4

**Matrix: Water** 

Analysis Batch: 349122

Client	Sample	ID:	<b>Method</b>	<b>Blank</b>
			Гуре: То	

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Method Blank

Analysis Buton: 040122	MB MB							
Analyte	Result Qua	lifier 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

ı		Spike L	US LUS				WKec.	
١	Analyte	Added Res	ult Qualifier	Unit	D	%Rec	Limits	
	Alkalinity as CaCO3	63.4	4.5	mg/L	_	102	80 - 120	

Lab Sample ID: LCSD 440-349122/3

Matrix: Water

Analysis Batch: 349122

Analysis Daton: 040122	Spike	LCSD	LCSD				%Rec.		RPD
Analyte Alkalinity as CaCO3	Added 63.4	Result 66.5	Qualifier	Unit mg/L	<u>D</u>	<b>%Rec</b> 105	80 - 120	$\frac{\text{RPD}}{3}$	Limit 20

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

Lab Sample ID: MB 180-184485/2

**Matrix: Water** 

Analysis Batch: 184485

	MB	MR							
Analyte	Result	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: 164465	Spike	LCS	LCS				%Rec.	
Analyte Total Dissolved Solids	Added 216	Result 244	Qualifier	Unit mg/L	_ D	%Rec 113	80 - 120	

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

Lab Sample ID: MB 180-184494/2

**Matrix: Water** 

Analysis Batch: 184494

Analysis Batom 10 110 1	МВ	MB							
Analyte	Result	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

TestAmerica Pittsburgh

# **QC Sample Results**

Spike

Added

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

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

Lab Sample ID: LCS 180-184494/1

**Matrix: Water** 

Analysis Batch: 184494

Total Suspended Solids

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

%Rec.

Unit D %Rec Limits 78.0 82.0 mg/L 105 80 - 120

LCS LCS

Result Qualifier

# **QC Association Summary**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57381-1

	m	10
п	М	IU

Analy	/sis	Batch:	184367
ALIMI)	7010	Dutoii.	10401

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)		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

Ì	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)			200.7 Rev 4.4	184513

#### **General Chemistry**

#### Analysis Batch: 184485

Lab Sample ID	Client Sample ID	Ргер Туре	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

1	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
ı	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

#### TestAmerica Pittsburgh

301 Alpha Drive RIDC Park

Pittsburgh, PA 15238

Phone (412) 963-7058 Fax (412) 963-2468

# **Chain of Custody Record**



Client left work in	Sampler				PM	_	_					-	Samer Tra	acking h	10(3)	-		COC No		_		
Client Information	Phone			Ga 6-M		Car	ne L											180-3122	22-6905	5.1		
Mike Chanov						ambe	r@te	estan	nerica	inc co	om							Page Page 1 o	11			
Company EA Engineering, Science, and Technology					Γ					Ала	ılysi	Requ	Jested			_		Job II				
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Email mchanov@eaest.com	WO #				ò	9		140/11		1	1/2	11		18	0-5738	31 Ct	nain c	of Custod	у			nane
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8/9/2016

Page 1 of 1





Department Code: 2122
Project Phase AND Task: TOXLAB
CS 18 5 39 WNINV50 78 0A 07/2016









# Page 16 of 18

#### TestAmerica Pittsburgh

301 Alpha Drive RIDC Park Pittsburgh, PA 15238

**Chain of Custody Record** 





Phone (412) 963-7058 Fax (412) 963-2468	10			1000						_									
Client Information (Sub Contract Lab)	Sampler	Gamber, Carrie L						ber, Carrie L						COC No: 180-250923.1					
Client Contact: Shipping/Receiving	Phone:											Page: Page 1 of 1							
Company: TestAmerica Laboratories, Inc							Analysis Requested						Job #: 180-57381-1						
Address: 17461 Derian Ave, Suite 100,	Due Date Request 8/15/2016	ed:					Т							П	Т	Preserva	tion Co		
City. Irvine	TAT Requested (d	ays):					1					11	-			A - HCL B - NaOH C - Zn Ac		M - Hexan N - None O - AsNaO	_
State, Zip: CA, 92614-5817	1															D - Nitric	Acid O4	P - Na2O4 Q - Na2SC	S 03
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO#:									1	11		1			F - MeOH G - Amchi H - Ascori	lor	R - Na2S2 S - H2SQ4 T - TSP De	
Email:	WO#,				2							1 1				I - Ice J - DI Wat	ter	U - Aceton V - MCAA	e
Project Name Jordan Valley	Project #: 18015970					forms ile									plan	K - EDTA L - EDA		W - ph 4-5 Z - other (s	
Srie:	SSOW#.				1	Alkallolla								1	100	Other:			
		Sample	Sample Type (C=comp,	Matrix (Wowater, Smooth, Owwate/oil,	d Filtered	2326B/ (MOD) AI									Number				
Sample Identification - Client ID (Lab ID)	Sample Date	Time	G=grab)	BT-Tissue, A-A		3	4		_			$\perp$	$\perp$	$\perp$	Total	Sp	ecial In	structions	a/Note:
		13:47	Preserva	tion Code:	$\bowtie$	XI_	1	$\vdash$	_	_	$\vdash$	11	_	$\perp$	$\mathbb{P}$		=		
ATB-391 (SALINITY ADJUSTED OUTFALL 001) (180-57381-1)	8/9/16	Eastern		Water	#	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	4	Н	_		Ш	$\sqcup$		$\perp$	1				
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Relinquished by:	Date/Time:			Company		L	ceived I				-	Date/Time:						Company	
									Jampany										
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No					Cooler Temperature(s) *C and Other Remarks: (3) 3.7/2.5 IR-7					<u>-77</u>									



#### **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.</td <td>True</td> <td></td>	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.</td <td>True</td> <td></td>	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

TestAmerica Laboratories, Inc.

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

EA Engineering, Science, and Technology

TestAmerica Pittsburgh

Pittsburgh, PA 15238 Tel: (412)963-7058

225 Schilling Circle

Attn: Mike Chanov

(412)963-2428

Hunt Valley, Maryland 21031

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

Drw G. Camber

Carrie Gamber, Senior Project Manager

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.

carrie.gamber@testamericainc.com

Suite 400

301 Alpha Drive RIDC Park

**ANALYTICAL REPORT** 





































































.....LINKS .....

**Review your project** 

results through Total Access













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Method Summary	
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#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-58161-1

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.

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

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

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

#### Glossary

RPD TEF

TEQ

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
ti	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)

# **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.

uthority	Program		<b>EPA Region</b>	Certification ID	Expiration Date
tah	NELAP		8	PA001462015-4	05-31-17
The following analyte:	s are included in this repo	rt, but are not certifi	ed under this certifica	ation:	
Analysis Method	Prep Method	Matrix	Analy	te	
200.8	200.8	Water	Antim	ony	
200.8	200.8	Water	Arsen	ic	
200.8	200.8	Water	Beryll	ium	
200.8	200.8	Water	Cadm	ium	
200.8	200.8	Water	Chron	nium	
200.8	200.8	Water	Сорре	ər	
200.8	200.8	Water	Hardr	ness as calcium carbona	te
200.8	200.8	Water	Iron		
200.8	200.8	Water	Lead		
200.8	200.8	Water	Mang	anese	
200.8	200.8	Water	Nicke	l	
200.8	200.8	Water	Selen	ium	
200.8	200.8	Water	Water Silver		
200.8	200.8	Water	Thalli	um	
200.8	200.8	Water	Zinc		
245.1	245.1	Water	Mercu	ury	

# **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)

Date Collected: 08/09/16 13:47 Date Received: 08/10/16 11:00 Lab Sample ID: 180-58161-1

**Matrix: Water** 

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	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	t 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

TestAmerica Pittsburgh

# **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) 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		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** 

	MB	MB							
Analyte	Result	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
Соррег	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** 

Analysis batch. 100015	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%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 <sub>-</sub> 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 <sub>-</sub> 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** 

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

TestAmerica Pittsburgh

# **QC Sample Results**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

Analysis Batch: 186923

Mercury

TestAmerica Job ID: 180-58161-1

Method:	245.1 -	Mercury	(CVAA)
modioa.		moroury	(

Client Sample ID: Method Blank Lab Sample ID: MB 180-186696/1-A Prep Type: Total/NA **Matrix: Water** Prep Batch: 186696 Analysis Batch: 186923

мв мв

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

Client Sample ID: Lab Control Sample Lab Sample ID: LCS 180-186696/2-A Prep Type: Total/NA **Matrix: Water Prep Batch: 186696** 

2.50

LCS LCS %Rec. **Spike** D %Rec Limits Added Result Qualifier Unit Analyte

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: 1	86696
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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

201 Alpha Drive RIDC Park Pittsburgh - PA 15238

# **Chain of Custody Record**

TestAmerica

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8/9/2016





# **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.</td <td>True</td> <td></td>	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	



8/30/2016

#### Work Order: 16

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



# **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
alculations							
Hardness, Total as CaCO3	2880	1.3	mg/L	SM 2340B	08/13/2016 10:54	8/13/2016 14:30	
norganic							
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				EDA 200 9	08/09/2016 16:21	8/9/2016 23:10	
Antimony, Total	0.0006	0.0005	mg/L	EPA 200 8		8/9/2016 23:10	
Arsenic, Total	0.0213	0.0005	mg/L	EPA 200.8	08/09/2016 16:21		
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	



# **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			100				
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	



# CHEMTECH - FORD ANALYTICAL LABORATORY

9632 South 500 West

#### **CHAIN OF CUSTODY**

COMPANY:	Jordan Valley WCD			BILLE	NG CONTACT:	Jordan Valle	y WCD			
ADDRESS:	15305 S 3200 W			BILLI	NG ADDRESS:	15305 S 320	00 W			
	P: Herriman, UT 84065			BILLII	NG CITY/STATE/ZIP:	Herriman, U	T 84065			
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EMAIL	9. — — — — — — — — — — — — — — — — — — —			* Expedi	led turnaround subject to additi	ional charge				
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Hoyul	SAMPLE LOCATION	CUSTOMER ID#	SAMPLE DATE	SAMPLE TIME	SAMPLE SAM SOURCE CODE POINT		ANALYTIC	AL TESTS REQU	DESTED	idual
01	1 - GSL Discharge	16080808-01	8/8/2016	1151	H5le	W	Complete Inorg	ganies Source		SP
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ļ	CHEMTECH-FORD 9632 South 500 Wes	t Sandy, UT	84070	Phone: 801-262	2-7299 FAX: 86	6-792-0093	www.ch	emtechford.com		

CHEMTECH-FORD 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.

Sandy, UT 84070

#### **CHEMTECH FORD LABORATORIES**

# Work Order # # WY1

Sample Receipt

CHEMTECH-FORD

#### **Delivery Method:**

□ UPS

□ USPS

□ FedEx

☐ Chemtech Courier

walk-in

Sample #

□ Customer Courier

Container

Chemtech Lot#

Preservative

Receiving Temperature 😉 🌛 \*\*C

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

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Misc Volume

(oz/mL)

Comments

# **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)

5- Sludge Cups/Tubs Q- Plastic Bag

#### Glass Containers

D-625 (Na252O3)

G-Glass Unpreserved

H- HAAs (NH4CI)

J- 508/515/525 (Na2SO3)

K- 515.3 Herbicides

O- Oil & Grease (HCI)

P- Phenois (H2SO4)

T- TOC/TOX (H3PO4)

U- 531 (MCAA, Na2S2O3) V- 524/THMs (Ascorbic Acid)

W- 8260 VOC (1:1 HCI)

X- Via! Unpreserved

Y- 624/504 (Na25203)

Z- Miscellaneous Glass



#### **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 mg/L = one microgram per liter or 1 mg/Kg = one microgram per kilogram = 1 part per billion.

1 mg/L = one nanogram per liter or 1 mg/Kg = one nanogram per kilogram = 1 part per billion.

#### Flag Descriptions































































































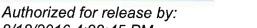












8/18/2016 4:22:45 PM Julie Unger, Project Management Assistant I

EA Engineering, Science, and Technology

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

TestAmerica Pittsburgh

Pittsburgh, PA 15238 Tel: (412)963-7058

225 Schilling Circle

Attn: Mike Chanov

Hunt Valley, Maryland 21031

301 Alpha Drive RIDC Park

For:

Suite 400

**ANALYTICAL REPORT** 

julie.unger@testamericainc.com

Designee for Carrie Gamber, Senior Project Manager (412)963-2428

carrie.gamber@testamericainc.com



**Review your project** results through



Visit us at:

www.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.

Project/Site: Jordan Valley

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#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

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.

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TestAmerica Job ID: 180-57624-1

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# Definitions/Glossary

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

#### Qualifiers

Metals
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Qualitier	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.
0	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)

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.

thority ah	Program NELAP		EPA Region	PA001462015-4	Expiration Date 05-31-17
					05-31-17
The following analytes	s are included in this repor	t, but are not certifie	ed under this certifica	tion:	
Analysis Method	Prep Method	Matrix	Analyte	е	
200.7 Rev 4.4	200.7	Water	Barium	1	
200.7 Rev 4.4	200.7	Water	Boron		
200.7 Rev 4.4	200.7	Water	Calciur	m	
200.7 Rev 4.4	200.7	Water	Magne	sium	
200.7 Rev 4.4	200.7	Water	Potass	sium	
200.7 Rev 4.4	200.7	Water	Sodiun	n	
200.7 Rev 4.4	200.7	Water	Stronti	um	
200.8	200.8	Water	Antimo	ony	
200.8	200.8	Water	Arsenio	С	
200.8	200.8	Water	Berylliu	ım	
200.8	200.8	Water	Cadmir	um	
200.8	200.8	Water	Chrom	ium	
200.8	200.8	Water	Coppe	r	
200.8	200.8	Water	Hardne	ess as calcium carbonate	e
200.8	200.8	Water	Iron		
200.8	200.8	Water	Lead		
200.8	200.8	Water	Manga	nese	
200.8	200.8	Water	Nickel		
200.8	200.8	Water	Seleniu	ım	
200.8	200.8	Water	Silver		
200.8	200.8	Water	Thalliu	m	
200.8	200.8	Water	Zinc		
245.1	245.1	Water	Mercur	у	
300.0		Water	Bromid	e	
300.0		Water	Chlorid	e	
300.0		Water	Fluoride	е	
300.0		Water	Nitrate	as N	
300.0		Water	Nitrite a	as N	
300.0		Water	Orthop	hosphate as P	
300.0		Water	Sulfate		
SM 2540C		Water	Total D	issolved Solids	
SM 2540D		Water	Total S	uspended Solids	

#### Laboratory: TestAmerica Irvine

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

Authority	Program	<b>EPA Region</b>	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

<sup>\*</sup> Certification renewal pending - certification considered valid.

TestAmerica Pittsburgh

# **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	<b>Expiration Date</b>
Oregon	NELAP	10	4028	01-29-17
USDA	Federal		P330-09-00080	07 <b>-</b> 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

Lab Sample ID: 180-57624-1

TestAmerica Job ID: 180-57624-1

**Matrix: Water** 

## Client Sample ID: MOCK (AT6-407)

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

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

#### **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 Results**

Client: EA Engineering, Science, and Technology

Client Sample ID: MOCK (AT6-407)

Project/Site: Jordan Valley

Lab Sample ID: 180-57624-1

Matrix: Water

TestAmerica Job ID: 180-57624-1

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

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

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	В	500	53	ug/L		08/16/16 13:21	08/17/16 08:04	10

Method: 200.8 - Metals (ICP/MS	) - Total Re	ecoverable							
Analyte		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	u <b>g</b> /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		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

	r RL	MDL Unit	D Prepared	Analyzed 08/16/16 14:48	Dil Fac
Mercury 4.8  General Chemistry	0.20	0.039 ug/L	06/10/10 12.21	06/10/10 14.40	,

General Chemistry  Analyte	Result Qu	ıalifier	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

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## **Client Sample Results**

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
 0.50
 mg/L
 08/16/16 17:15
 1

a

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

## 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

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

Lab Sample ID: LCS 180-184925/16

**Matrix: Water** 

Analysis Batch: 184925

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

Analysis Batch. 104323	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%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** 

yzed Dil Fac
6 07:50 1
6 07:50 1
6 07:50
6 07:50 1
6 07:50 1
6 07:50 1
6 07:50 1
10

Lab Sample ID: LCS 180-185016/2-A

Matrix: Water

Analysis Batch: 185127

Client Sample ID: Lab Control Sample **Prep Type: Total Recoverable** 

Client Sample ID: Lab Control Sample Dup

**Prep Batch: 185016** 

ı		Spike	LCS	LCS				%Rec.	
l	Analyte	Added	Result	Qualifier	Unit	D	%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	
ı	Magnesium	50000	49300		ug/L		99	85 - 115	
	Sodium	50000	50500		ug/L		101	85 - 115	
	Strontium	1000	1010		ug/L		101	85 - 115	
1	Ottonium				•				

Lab Sample ID: LCSD 180-185016/3-A

**Matrix: Water** 

Analyte

Boron

Analysis Batch: 185127

**Prep Batch: 185016** LCSD LCSD %Rec. Spike Result Qualifier Unit D %Rec Limits **RPD** Limit Added 1070 ug/L 107 85 - 115 1000

TestAmerica Pittsburgh

**Prep Type: Total Recoverable** 

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**RPD** 

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

Lab Sample ID: LCSD 180-185016/3-A Client Sample ID: Lab Control Sample Dup **Matrix: Water Prep Type: Total Recoverable** Analysis Batch: 185127 **Prep Batch: 185016** LCSD LCSD Spike %Rec. **RPD** Analyte Added Result Qualifier Unit RPD Limit D %Rec Limits Barium 2000 2000 ug/L 100 85 - 115 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 20 1 Strontium 1000 1020 ug/L 102 85 - 115 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

-	МВ	MB							
Analyte	Result	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

Analysis Baton. 100074	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Silver	50.0	48.0		ug/L		96	85 - 115
Arsenic	40.0	41.9		ug/L		105	85 <sub>-</sub> 115
Beryllium	50.0	52.1		ug/L		104	85 <sub>-</sub> 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 <sub>-</sub> 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

TestAmerica Pittsburgh

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%Rec. Limits

Prep Batch: 185009

Project/Site: Jordan Valley

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

Client Sample ID: Lab Control Sample Lab Sample ID: LCS 180-185009/2-A Prep Type: Total Recoverable

**Matrix: Water** 

Analysis Batch: 185074

Spike LCS LCS Added Result Qualifier Unit Analyte 500 527 Zinc

ug/L 105 85 - 115 Client Sample ID: Lab Control Sample Dup

%Rec

Lab Sample ID: LCSD 180-185009/3-A

Matrix: Water

**Prep Type: Total Recoverable** Prep Batch: 185009

Analysis Batch: 185074 LCSD LCSD %Rec. **Spike** RPD Limit Result Qualifier Limits D %Rec Added Unit Analyte 3 20 85 - 115 50.0 46.5 ug/L 93 Silver 102 85 - 115 3 20 40.0 40.9 ug/L Arsenic 85 - 115 20 100 50.0 50.0 ug/L Beryllium 85\_115 20 3 50.0 52.0 ug/L 104 Cadmium 20 200 198 ug/L 99 85 - 115 2 Chromium 85 - 115 100 3 20 250 251 ug/L Copper 102 85 - 115 2 20 1000 1020 ug/L Iron 3 20 96 85 - 115 500 481 ug/L Manganese 85 - 115 3 100 500 501 ug/L Nickel 100 85 - 115 3 20 20.0 19.9 ug/L Lead 2 20 85 - 115 516 ug/L 103 500 Antimony 107 85 - 115 3 20 10.7 ug/L 10.0 Selenium 20 95 85 - 115 3 50.0 47.5 ug/L Thallium 20 85 - 115 102 500 508 ug/L Zinc

## 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

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

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

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

#### 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

randiye.e Datem e ree re	MB MB							
Analyte	Result 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

TestAmerica Pittsburgh

8/18/2016

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

Lab Sample ID: MB 440-349918/4

Matrix: Water

Analyte

Analysis Batch: 349918

Bicarbonate ion as HCO3

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

MR MR Result Qualifier RL **MDL** Unit Prepared **Analyzed** Dil Fac ND 4.8 4.8 mg/L 08/17/16 12:50 ND 24 2.4 mg/L 08/17/16 12:50 1 ND 1.4 1.4 mg/L 08/17/16 12:50

Lab Sample ID: LCS 440-349918/2

**Matrix: Water** 

Carbonate as CO3

Hydroxide as OH

Analysis Batch: 349918

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

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

158

Spike

Added

162

Lab Sample ID: LCSD 440-349918/3

**Matrix: Water** 

Alkalinity as CaCO3

**Analyte** 

Analysis Batch: 349918

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

LCSD LCSD %Rec. **RPD** Result Qualifier Unit D %Rec Limits RPD Limit mg/L 80 - 120 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

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

Lab Sample ID: LCS 180-185039/1

**Matrix: Water** 

Total Dissolved Solids

Analyte

Analysis Batch: 185039

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

LCS LCS Spike %Rec. Added Result Qualifier Unit %Rec Limits 216 224 104 mg/L 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

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

Lab Sample ID: LCS 180-185048/1

Matrix: Water

Analysis Batch: 185048

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

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

## **QC Association Summary**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

## HPLC/IC

<b>Analysi</b>	s Bat	ch: 1	84925
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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-		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

## **QC Association Summary**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-57624-1

## **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	

#### restAmerica Pittsburgh

301 Alpha Drive RIDC Park Pittsburgh, PA 15238 **Chain of Custody Record** 

**TestAmeric** 

Pnone (412) 963-7058 Fax (412) 963-2468 Camer Tracking Noisi M- CHANON Gamber: Carrie L. 180-32438-6905 1 Client Information E-Mail Client Contact 710-327-5120 carrie gamber@testamericainc.com Mike Chanov Page 1 of 1 JUD # Company **Analysis Requested** EA Engineering, Science, and Technology Due Date Requested Preservation Codes: 225 Schilling Circle Suite 400 TAT Requested (days) E NaCH N - None C - Zn Acetate Hunt Valley Q ASNaOR D - Nitric Acid P - Na2045 State Zip E - NaHSO4 Q = Na25Q3 MD, 21031 F - MeOH R - Na2\$203 PO# Phone G Amentor S H2SQ4 15358 410-329-5120(Tel) H - Ascorbic Acid T - TSP Dodecahydrale U - Acetone L. Ice # CW V - MCAA J - DI Water mchanov@eaest.com Total Numbar of containers R EDTA W - ph 4-5 Project Name MS/MSD (Yes or roject # L-EDA Z - other (specify) 18015970 Jordan Valley SSOW Meta Matrix Sample 4 (W-Walle! Type 3-seed Sample (C=Comp. Gawastelos Special Instructions/Note: Sample Identification Sample Date Time G=grab) BT-Tissue, A-Page Preservation Code XXX MOCK (ATG 407) 8/15/16 1600 28 으 22 Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) Possible Hazard Identification Unknown Radiological Disposal By Lab Non-Hazard Flammable Skin irritant Poison B Archive For Return To Client Months Deliverable Requested | II, III, IV, Other (specify) Special Instructions/QC Requirements Empty Kit Relinquished by stille Relinquished by Company 6/10//L 8/18/2016 Company Rehnquished by elequished by Date/T-me Company Received by Custody Seals Intact Custody Seal No Cooler Temperature(s): "C and Other Remarks 1 Yes 1 No







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

TRACKING #: 1Z 28º 49? 01 9557 9716



BILLING: P/P UPS CARBON NEUTRAL SHIPMENT

Department Code: 2122 Project Phase AND Task: TOXLAB

WNTNVS0 78 0A 07/2016



Uncorrected temp Thermometer ID

CF\_QU\_ Initials PT-WI-SR-001 effective 7/26/13



UPS CampusShip: Shipment Label

## TestAmerica Pittsburgh

301 Alpha Drive RIDC Park
Pittsburgh, PA 15238

## **Chain of Custody Record**



<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

Phone (412) 963-7058 Fax (412) 963-2468	Sampler.			Lab		_					Carrie	r Trackin	g No(s)		$\neg$	COC No:	
Client Information (Sub Contract Lab)					nber, C	агтіе	L				1					180-251430.1	
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Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO#.				9	1	1						1 1	1		H - Ascarbic Acid	S - H2SO4 T - TSP Dodecahydrate U - Acetone
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	Slo Dete	Sample	Sample Type (C=comp,	Matrix (Wesself, 6-solid, O-wastefoli,	Feld Filtered	2320B/ (MOD) Alkalinity									<b>Total Number</b>	Special Ins	structions/Note:
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Possible Hazard Identification					S		ie Disp Return			may be	T	ssed if a		are re	Arch	ed longer than 1 i	Months
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8/18/2016

Page 20 of 22

## **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.</td <td>True</td> <td></td>	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	w
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	

#### 13

## **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.</td <td>True</td> <td></td>	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

PATE PORT CHECKLIST  QA/QC ITEM  1. Samples collected, transported, and received according to study plan requirements.  2. Samples prepared and processed according to study plan requirements.  3. Data collected using calibrated instruments and equipment.	
<ol> <li>Samples collected, transported, and received according to study plan requirements.</li> <li>Samples prepared and processed according to study plan requirements.</li> <li>Data collected using calibrated instruments and</li> </ol>	
according to study plan requirements.  2. Samples prepared and processed according to study plan requirements.  3. Data collected using calibrated instruments and	Ē
study plan requirements.  3. Data collected using calibrated instruments and	116
	116
	1/6
4. Calculations checked:  - Hand calculations checked  6/34	1/6
- Documented and verified statistical procedure used.  - Documented and verified statistical	116
5. Data input/statistical analyses complete and correct.	6
Reported results and facts checked against original sources.	116
7. Data presented in figures and tables correct and in agreement with text.	1/6
8. Results reviewed for compliance with study plan requirements.  6/30/	14
<u>AUTHOR</u> <u>DATI</u>	<del></del>
9. Commentary reviewed and resolved.	
10. All study plan and quality assurance/control requirements have been met and the report is	
approved: 4/13/	1/2
PROJECT MANAGER DATE	10
MMM/Nell 9/7/	16
QUALITY CONTROL OFFICER DATE	Ξ
SENIOR TECHNICAL REVIEWER DATE	<u></u>



## 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 shall not be reproduced, except in full, without written approval of EA Engineering, Science, and Technology, Inc., PBC

This report contains 14 pages plus 3 attachments.

Wayne L. McCalloch Laboratory Director

15 July 2016

Date



#### 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 turnaround 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<sub>2</sub>SO<sub>4</sub> (sodium sulfate), KCl (potassium chloride), NaBr (sodium bromide), Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> · 10H<sub>2</sub>O (sodium borate), MgCl<sub>2</sub> · 6H<sub>2</sub>O (magnesium chloride), CaCl<sub>2</sub> · 2H<sub>2</sub>O (calcium chloride), SrCl<sub>2</sub> · 6H<sub>2</sub>O (strontium chloride) and NaHCO<sub>3</sub> (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  $26\pm1^{\circ}$ 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 <u>NOEC</u> 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 <u>LOEC</u> 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 <u>ChV</u> 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 <u>IC</u> 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 <u>LC50</u> (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. 22<sup>nd</sup> 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.

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

Sample Description:	Outfall 001
EA Accession Numbers	AT6-271

1400, 5 June 2016 to 0800, 6 June 2016 Sample Collection:

Sample Receipt: 1112, 7 June 2016

**Chemical Analyses:** 

Total Residual Chlorine (TRC):

EA Accession Number:

2.3 Temperature (°C): 782 Alkalinity (mg/L as CaCO<sub>3</sub>): 2,644 Hardness (mg/L as CaCO<sub>3</sub>): 5,636 Conductivity (µS/cm): 3.0 Salinity (ppt): 7.6 pH:

< 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 <sub>3</sub> )	mg/L	<4.0	<4.0
Alkalinity - Hydroxide (OH)	mg/L	<4.0	<4.0
Alkalinity - Total (as CaCO <sub>3</sub> )	mg/L	920	800
Hardness - Total (as CaCO <sub>3</sub> )	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 <sup>(a)</sup>	< 0.40
Arsenic, Total	μg/L	28	7.4 <sup>(a)</sup>
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 <sup>(a)</sup>
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

<sup>(</sup>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 <sub>2</sub> SO <sub>4</sub>	5.1765	103.53
KCl	0.5529	11.058
NaBr	0.1159	2.3177
$Na_{2}B_{4}O_{7}\cdot 10H_{2}O$	0.0091	0.18179
MgCl <sub>2</sub> ·6H <sub>2</sub> O	9.1985	183.97
CaCl <sub>2</sub> ·2H <sub>2</sub> O	3.1911	63.822
SrCl <sub>2</sub> ·6H <sub>2</sub> O	0.0286	0.57205
NaHCO <sub>3</sub>	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				Mean Biomass as	Mean Fecundity
Concentration	48-Hour	96-Hour	7-Day	mg/organism	as females with
(% effluent)	% Survival	% Survival	% Survival	(±S.D.)	eggs (%)
Control	95	88	88	0.283 (±0.044)	28
50	98	95	95	$0.321 (\pm 0.052)$	42
75	88	78	55 <sup>(a)</sup>	$0.143 (\pm 0.066)^{(b)}$	20 <sup>(b)</sup>
100	38 <sup>(a)</sup>	5 <sup>(a)</sup>	$0^{(a)}$	$0.000(\pm 0.000)^{(b)}$	$0^{(b)}$

Acute and Chronic Endpoints (expressed as percent effluent)

48-Hour LC50:	95.1 (88.9 –>100) <sup>(c)</sup>
96-Hour LC50:	84.0 (79.1 – 88.5)
A.D. MOEG (A	
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

<sup>(</sup>a) Significantly different (p=0.05) from the control.

<sup>(</sup>b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.

<sup>(</sup>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				Mean Biomass as	Mean Fecundity
Concentration	48-Hour	96-Hour	7-Day	mg/organism	as females with
(% effluent)	% Survival	% Survival	% Survival	(±S.D.)	eggs (%)
Control	100	98	98	0.330 (±0.058)	38
50	90	88	88	$0.265 \ (\pm 0.054)^{(a)}$	60
75	85	75 <sup>(a)</sup>	65 <sup>(a)</sup>	$0.227 (\pm 0.115)^{(b)}$	14 <sup>(b)</sup>
100	53 <sup>(a)</sup>	$20^{(a)}$	12 <sup>(a)</sup>	$0.080 \ (\pm 0.173)^{(b)}$	$0_{(p)}$

Acute and Chronic Endpoints (expressed as percent effluent)

48-Hour LC50:	>100 (NC) <sup>(c)</sup>
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.

(c) The 95 percent confidence limits are not calculable for the dataset.

<sup>(</sup>b) Concentrations which have statistically significant mortality are omitted from hypotheses testing for biomass and fecundity, per US EPA guidance.

<sup>(</sup>d) Values in parentheses represent the 95 percent confidence limits for the dataset.

# ATTACHMENT I

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



## ® EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory 231 Schilling Circle Hunt Valley, Maryland 21031



Sample Shipped By: (circle)

Fed. Ex.

Other:

Tolephone: 410-584-7000 Fax: 410-584-1057		Tracking #: 8095 1033 69'11	<u>.</u>
Client: JVWLD	Project No.:	_	10
NPDES Number:	Client Purchase Order Number:	_	1
City/State Collected: Salt	Lake (114, U)		-

PLEASE BEAD SAMPLING INSTRUCTIONS ON BACK OF FORM

		PLEASE	HEAD SAMI	LING INS I NOC	TIONS ON BACK OF FURM	
Accession Number (office use only)	Grab	Composite	Colle Start Date/Time	End Date/Time	Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
A16-271		X	B/st/110	(0/6/Vb)	GSL DISCHARAP	2/25 ans
no ch		$\sim$	D200 PM	OGOO AM	GSL Discharge	7, 7,
		ļ			the state of the s	
					94004	<b></b>
						9
			Calif.			
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				•		

Sampled By:	Date/Time	Received By:	Date/Time	
Man Mun	2 6/6/16 1200			
Sampler's Printed Name:	Title:	Relinquished By:	Date/Time	19
Marie E. Owen	WO Maar	Mant Min	(16116 1da)	
Relinquished By:	Date/Time	Received By Laboratory	Date/Time Grille UIZ	
Dillion Division Co.	Wastiang Van / No	Comments:	9.00	

Was Sample Chilled During Collection? Yes / No

Sample Collection Parameters

Visual Description:

Temperature (°C): 96

pH:

TRC (mg/L):

Other:



# SAMPLE CHECK-IN FOR TESTING

EA Accession Number: MG-271

	7				
Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2,3	6/7/16	1112	33
Is ice present?		yes			
рН	6.0-9.0	7.6			
TRC (mg/L)	<0.01	40.01			
Visual Description	_	Clear	<b>J</b>		

<sup>\*</sup>If outside acceptable range, contact project manager.

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

Parameter	Acceptable Range	<b>(</b> ✓)	Date	Time	Initials
Ammonia (preserve aliquot)					
Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Salinity (ppt)		3.0	6/7)16	1112	513



Source: ABS

# TOXICITY TEST SET-UP BENCH SHEET

Project Number:	
Client:Jordan Valley	
QC Test Number: TN-16-205	
TEST (	DRGANISM INFORMATION
Common Name: Opossum shrimp	Adults Isolated (Time, Date):
Scientific Name: A.bahia	Neonates Pulled & Fed (Time, Date):
Lot Number: AB- 993	Acclimation: <24 hrs Age: 7dcy5
Source: ABS	Culture Water (T/S): <b>2</b> 5.0 °C <b>3</b> 0.0 ppt

	Т	EST INITIA	TION	CONCE	ENTRATION SERII	ES
late	Time	Initials	Activity	Test <u>Concentration</u> Mod Hard Control	Volume <u>Test Material</u> 0ml	Final <u>Volume</u> 1200ml
110116	1300	MJ	Dilutions Made	50%	600ml	
1	1	1		75%	900m!	*
	<b>₩</b>	1	Test Vessels Filled	100%	1200 ml	
	1316	M	Organisms Transferred			ļ
	1500	ju-	Head Counts			

- 200	DILUT	ION PRE	PARATION	l i			EDING FEEDING	
			3000		Food:	Artemia		
				Sample /		Time, Initials,	Time, Initials,	Time, Initials,
<u>Day</u>	Date	<u>Time</u>	<u>Initials</u>	Diluent #16-211	<u>Day</u>	<u>Amount</u>	Amount	Amount 1625MJ
0	6/10/16	1300	MS	LD6-281	0			5 drops
1	eluju	0948	30	AT6-271	1	5 drops		5 drops
2	6112116	0943	MT	A16-271	2	5 drops		5 drops
3	6/3/16	બરા	JB	At6-271	3	5 drops		5 drops
4	6/14/16	0858	MO	ATG-271 LDG-18	4	0817 Mm		5 drops
5	6115116	0923	313	M6-221	5	ORIS カル		i GDONIA 5 drops
6	Glielle	0909	MJ	116-271 itlo-281	6	0 ₹205B 5 drops		165503 5 drops



**TOXICITY TEST OBSERVATION DATA SHEET** 

Project Number:	TEST ORGANISM	Beginning Date: 6/10/10 Time: 13/10
Client:Jordan Valley	Common Name: Opossum shrimp	Ending Date: 617/16 Time: 144/
QC Test Number:TN- 10-20-5	Scientific Name: A. bahla	
Test Material:Effluent		
Accession Number: ATG-271	TEST TYPE: Static / Flowthrough	Test Container: 4" bowl
Dilution Water:30 ppt CS	Renewal / Non-renewal	Test Volume: 150 ml
Accession Number: 156 - 281	Photoperiod: 16 (8 d Light Intensity: 50 - 100 fc	Test Duration:7 days

		Number of Surviving Organisms							
Concentration	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	Α	5	4 *	4	4	4	4	4	u
	В	5	5	5	4	3	3	3	3
	С	5	2134	4	4	4	4	4	4
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	4	4	4	u u
	F	5	5	5	5	5	5	5	5
	G	5	5	5	5	5	5	5	5
	Н	5	5	5	5	5	5	5	5
50%	A	5	5	4	4	ц	4	ų	6
	В	5	5	5	5	5	5		4
	С	5	5	5	5	5	5	5	5
	D	5	5	5	5	5	5	5	5
	E	5	5	5	5	5	5		
	F	5	5	5	47	4	4	<u>5</u>	5
	G	5	5	5	5	5	5	5	5
	Н	5	5	5	5	3	5	5	3
Tim	e / Initials	1500 MVC	1300 JB	DA BEDI	1000 378	oale mo	0455 OB	GAZB MS	1441 MJ

EPA TEST METHOD: (FW	/) EPA 821-R-02-013/(SW) E	PA 821-R-02-012(CHECK ONE)
athead: (1000.0)	Cyprinodon: (1004.0)	Menidia: (1006.0)



**TOXICITY TEST OBSERVATION DATA SHEET** 

Project Number:	TEST ORGANISM	Beginning Date: _	6/10/16	Time: <u>1316</u>
Client: Jordan Valley	Common Name: Opossum shrimp	Ending Date:	0117116	Time: 1441
QC Test Number: TN- 16-205	Scientific Name:			
Test Material: Effluent				
Accession Number: A16-271	TEST TYPE: Static / Flowthrough	Test Container: _	4" bowl	
Dilution Water: 30 ppt CS	Renewal / Non-renewal	Test Volume:	150 ml	
Accession Number: LD6-281	Photoperlod: 16 4 8 d Light Intensity: 50 - 100 fc	Test Duration:	7 days	

		Number of Surviving Organisms							
Concentration Rep	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	Α	5	5	4	4	ы	ц	4	4
	В	5	5	5	5	5	5	5	5
,	С	5	5	5	5	5	3	2	2
7.11.2	D	5	4	4	4	4	4	- 2	2
	E	5	5	5	5	4	- ц	4	3
	F	5	5	4	14	3	2	2	ł
	G	5	5	4	Ц	3	3	.3	3
	Н	6	5	4	3	3	2	2	2
100%	A	6	5	1	0	_			_
397	В	5	3	0	_	_	_	_	
	С	5	3	2	1	1	0	_	_
31	D	5	4	1	0				
	E	5	4	ì	0	-	-		
	F	5	5	3	0	_	_		
	G	5	3	3	2	f	I	0	-
	Н	5	4	4	2	0	-		-
Tir	ne / Initials	1507h	1300 085	1038 MJ	80 COV	0916 MJ	ouss ob	0928 MJ	144 1 MJ

EPA TEST METHOD: (	(FW) EPA 821-R-02	2-013/(SW) EPA	821-R-02-012(C	HECK ONE)
Fathead: (4000 0)	Guzzinodon			(1008.0)



REPRODUCTION AND WEIGHT DATA (Test Species: \_\_\_\_\_\_ A. bahia

Project Number:70005.15		<u>Date</u>	Time	Initials
Client:Jordan Valley	Organisms sexed:	6/17/16	1441	MJ
	Loaded tins placed in oven:	617116	1453	M
	Loaded tins removed from oven:	6/18/16	1551	Ne
Tin Lot:	Loaded tins weighed: լլեն ինչ և	605 M	Λ	
Oven Temp (°C): Start: 99.5° End: 99.0°	Oven Number: BLM-01	Ralance	Number DO	45005

									DEWITO	Daiai	ice Mumber. F	<u>0115825</u>
Test Conc.	Rep	Tin#	# Females with Eggs	# Females without Eggs	# Males	# Immatures	C # Orgs. Weighed	Wt. of Tin	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 Biomas
Control	Α	95		į t	HU		4	26.99	28,15	1.16		(mg/exp. org.
	В	210	ì		1		3	30.15	31,41	1.26	0.290	0.232
	С	3		1	m		4	29.45	30.80		0.420	0.252
	D	197	U	ii	i	-	5			1.35	0.338	0.270
	E	149		11	1(			28.77	30.39	1.62	0.324	0.324
	F	223					4	27.13	28.88	1.15	0.788	0.230
	G				1111		5	27.14	28.8	1.75	0,380	0.350
	Н	143	1[		lu f	č .	_ 5	28.53	29.97	1.44	0.288	0.288
-	ļ	143		111			5	25.69	27.26	1.57	0.314	0.314
50%	A	208		h	11		de	00 56	3.			
	В	199		1	1[		4	29.56	30.71	1,13	0.283	0.226
	С				itt		5	76.88	28.57	1.69	0.338	0.338
	D	237	n		111		5	77.85	29.53	1.68	0.336	0.336
	E	129		n	111		<u> </u>	27.64	29.32	1.68	O.336	0.336
		212	1		m		5	28.56	30.51	1.95	0.390	0.390
	F	175		1	tu		4	25.29	29.60	1.31		
	G	173			htt		5	26.84	28.49		0.328	0.262
	Н	213	1	11	II.		5			1.65	0.330	0.330
				<u> </u>	- 11			28.00	29.75	1.75	0.350	0.350

Dry wt. calculations checked (date, initials): 6/20/14 MBiomass calculations checked (



# REPRODUCTION AND WEIGHT DATA (Test Species: \_\_\_\_\_\_A. bahia\_\_\_\_)

		<u>Date</u>	<u>Time</u>	<u>Initials</u>
Project Number: 70005.15	Organisms sexed:	6/17/16	1441	MJ
Client:	Loaded tins placed in oven:	6117/16	1453	MJ
QC Test Number: TN- 16-205	Loaded tins removed from oven:	6/18/16	1551	pm
Tin Lot: Biack 160	Loaded tins weighed:Cell 8/16	1605		pm
Oven Temp (°C): Start: 99.5° End: 99.0°	Oven Number: BLM-01	Balance N	Number: P0	115825

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 Blomass (mg/exp. org.)
75%	Α	209		1	111		4	29.12	30.18	1.06	0.265	0.212
	В	239		1	III		5	25.44	21.23	1.29	0.258	0.258
	С	127			- 11		2	26.82	27.40	0.5%	0.290	0.116
	D	108			11		2	29.22	79.92	0.70	0.350	0.170
	E	93		R	1		3	25.46	26.13	0.67	0.723	0.134
	F	125			1		1	25.79	25.98	e.19	0.190	0.038
	G	112		11	[		3	30.16	30.17	0.61	0.203	0.122
	H	249			1		2	29.19	29.79	0.60	0.300	0.120
100%	A	_					_					_
	В	_			_		_					_
,,	С	-		-	_		_		_			_
	D			_		-		_	_			
	E	-		_	~	-	_	_		_		
	F	-	_	_	_		_	_	_	_		
	G	-		-				_	_	_	_	_
	Н	-	_	-	_		_	_	-	_	_	

Dry wt. calculations checked (date, initials):	6/20/16m	Biomass calculations checked (date, initials):	6/20/	1. mm
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# **TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS**

Project Number:	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: <u>26±1</u> °C pH: <u>6.0 - 9.0</u> DO: <u>≥4.0</u> mg/L Salinity: <u>30±2</u> ppt Photoperiod: <u>16 & 8 &</u> Light Intensity: <u>50 - 100</u> fc

				Temp	oeratı	ne (°C	<b>;</b> )					рН					Dis	solved	l Охуд	gen (n	ng/L)			С	onduc	ctivity linity (	(μS/c	m) >	
Test Conc	Rep	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.C	27.5	210.5	266	17.0	268	7.2	20	7.4	7.1	68	<b>7.5</b>	7.4	6.9	65	6.4	G.9	69	10,7	6.7	27.8	275	27.3	28,1	281	27.1	28.0
50%			_							80	1											1	ı					27.8	
75%						1				1	1						1		l .			ı						27.9	
100%				25.1		250						2,5					6.9											27.8	
																					2								
Meter Nu	mber	.00	1.76	1700		200.00									1														
Meter Nu	Time	619	6 P4	(17	678	618	1018 1018	ሬግኝ	678	७७७१	619	618	ଟେନ୍ତ	618	678	678	679	64	678	618	678	678	618	679	619	678	678	678	678
	Time nitials	1304	ION	UB.	וטוט	MUS	02	7114	1304	8	0951	0921	0903	1450	6914	1304	COO	0951	042	0903	OSP	1914	1334	COM	(95)	SA27	11903	0936 IB	AGILL

5



### **TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS**

Project Number:	TEST ORGANISM	Beginning Date: _	6/10/16	Time:	1316
Client: Jordan Valley	Common Name: Opossum shrimp	Ending Date:	anllo	Time:	1441
QC Test Number:TN- 16-205	Scientific Name: A. bahla				

TARGET VALUES: Temp: 26±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: 30±2 ppt Photoperiod: 16 4 8 4 Light Intensity: 50 - 100 fc Conductivity (µS/cm) Temperature (°C) Dissolved Oxygen (mg/L) pН Salinity (ppt) **Test Conc** 2 2 7 Rep Control 25.225 × 250 250 150 150 151 150 18.2 18.2 18.0 7.4 179 78 75 6.0 6.3 6.7 6.2 63 60 61 278 27.9 28.5 28.5 283 281 50% 25.2 75.7 75.0 25.0 75.0 75.0 8.0 8.0 8.0 7.9 7.4 7.8 7.7 7.5 60 5.7 6.6 61 6.3 50 6.1 28.0 27.9 28.8 28.6 26.4 28.4 28.3 75% 254 257 350 250 250 26 26 29 29 79 7.3 7.877 7.6 5.5 5.6 6.5 5.9 62 49 6.0 275 279 28.6 28 6 28 328 284 100% 18.0 80 7.9 74 7.8 7.7 - 5.7 5.3 6.5 5.7 5.0 48 25.4 25.7 25.0 25.0 25.0 25.1 28.2 21.9 29.0 28.5 28.2 28.3 Time 3K 1112 1015 1975 1000 0994 1505 1315 1112 1005 1975 1000 1994 1505 1315 1112 1005 1975 1000 19754 1505 1315 1112 1005 1975 1000 19754 1505 1315 1112 1005 1975 1000 19754 1505

> ATS-T14 06/21/06



## **TOXICOLOGY LABORATORY BENCH SHEET**

Project Number:	70005.15		
Client:Jor	dan Valley		
QC Test Number:	TN- 16-205		
			$\tilde{\mathfrak{D}}$
Date/Time/Initials		Comments/Activity	
* 6/11/10 1300 JB * 6/13/16 1000 JB	Organisms missing:		



## TOXICOLOGY LABORATORY BENCH SHEET

Project Number: _	70005.15	
Client: Jord	an Valley	
QC Test Number:	TN-16-205	

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

	1		ON AIR			OFF AIR	
		Initial DO			Final DO		
Date	Sample #	(mg/L)	Time	Initials	(mg/L)	Time	Initials
6110116	AT6-271	6.8	_	MJ	_	_	
Glulib	AT6-271	7.6	5090	<b>%</b>	7.0	0912	25
6112/16	ATG-271	8.4	0921	MJ	6.7	०१३।	TM
6/13/16	AT6-271	9.2	0402	58	7.2	2912	5B
હાવાહ	ATG- 271	9.2	0840	MJ	7.0	0850	MT
6/15/16	AT6-271	9.7	08 <i>5</i> C	<b>ර</b> පි	7.4	\$70°	JB
હોાહોાહ	ATG-271	୫.ግ	0855	MJ	٦.١	0905	MJ
							Ì
				)			
		ĺ					

Start Date: End Date:	6/10/2016 6/17/2016			TN-16-205			ndity Test Sample ID Sample Ty	); /pe:	Jordan Valley	
Sample Date:			Protocol:	EPAM 87-	EPA Mari	ne	Test Spec	ies:	MY-Mysidopsis bahia	
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		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		

			Tr	ansform:	Arcsin Sc	uare Roof		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 non Bartlett's Test indicates unequal					0.94631 13.2164	0.904 11.3449	0.13537	1.51382
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	13.2104	11.0449		
Steel's Many-One Rank Test	75	100	86.6025	1.33333				

				Maxii	mum Likeliho	od-Probit	ł .				
Parameter	Value	SE	95% Fidu	cial Limits	Control	Chl-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		1.0 7			11.7		
Point	Probits	%	95% Fldu	cial Limits		0.9			III		
EC01	2.674	62.9045	42.5992	72.3321		0.0			11/		
EC05	3.355	71.0077	53.832	78.7912		0.8			#/	l le	
EC10	3.718	75.7458	60.8774	82.6131		0.7			111	ľ	
EC15	3.964	79.12	66.0503	85.4178		4			U		
EC20	4.158	81.9085	70.3737	87.8388		g 0.6 -			I		
EC25	4.326	84.379	74.1911	90.1117		98 0.6 - 0.5 - 0.4 -			W		
EC40	4.747	90.9398	83.7491	97.2564		8,1			, 11		
EC50	5.000	95.1299	88.9051	103.173		₽ 0.4		9	·		
EC60	5.253	99.513	93,3711	110.63		0.3 -			11	f	
EC75	5.674	107.25	99.785	126.121		0.2			//	1	
EC80	5.842	110.485	102.167	133.222		-4			//	1	
EC85	6.036	114.379	104.904	142.157		0.1			/#	1	
EC90	6.282	119.474	108.335	154.422		0.0 1		<del></del>	//	******	
EC95	6.645	127.447	113.475	174.811		1	950 6 6 7 6 7	10	100	1000	
EC99	7.326	143.864	123.499	221.1				Dose '			

			Mysic	Survival.	Growth a	and Fecu	ndity Test	96 Hr Su	ırvival	
Start Date:	6/10/2016			TN-16-20			Sample ID	):	Jordan Valley	
End Date: Sample Date:	6/17/2016			EPAM 87-	EPA Mari	ne	Test Spec	ies:	MY-Mysidopsis bahia	1
Comments:		2	- 3	4	5	6	7	8		
Conc-%	0.0000	0.6000	0.8000	1.0000	0.8000	1.0000	1.0000	1.0000		
Control	2000 00 00 00 00 00 00 00 00 00 00 00 00				1.0000	0.8000	1,0000	1.0000		
50	0.8000	1.0000	1.0000	1,0000				0.6000		0.0
75	0.8000	1.0000	1.0000	0.8000	0.8000	0.6000				- 3
100		0.0000	0.2000	0.0000	0.0000	0.0000	0.2000	0.0000		- 4
100	0.000	<b></b>	-							

	191		Tra	ansform:	Arcsin So	uare Roo	ŧ		1-Tailed	(Section 1977)	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			0.4000	5	40
50	0.9500	1.0857	1,2857	1.1071	1.3453	8.574	8	-1.158	2.156	0.1623	4	
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

					Statistic		Critical		Skew	Kurt
Auxiliary Tests Shapiro-Wilk's Test indicates nor	mal distribu	ution (p >	0.01)		0.96366		0.904 11.3449	-	-0.0888	-0.5336
Bartlett's Test indicates equal var	iances (p =	: 0.35)	ChV	TÜ	3.20079 MSDu	MSDp	MSB	MSE	F-Prob	df
Hypothesis Test (1-tall, 0.05)	NOEC 75	100						0.02266	1.8E-13	3, 28
Dunnett's Test	15	100	00.0020							

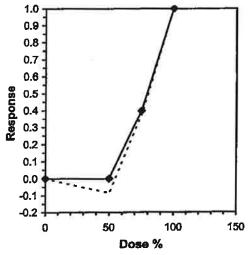
				Maxir	num Likeliho						10
Parameter	Value	SE	95% Fldu	clai Limits	Control		Critical	P-value	Mu	Sigma	iter 3
Slope	21.079	3.7833	13.6637	28.4942	0.125	0.70454	3.84146	0.4	1.92409	0.04744	3
Intercept	-35.558	7.31165		-21.227							
TSCR	0.0875	0.03159				1.0 ]					
Point	Probits	%	95% Fidu	cial Limits		0.9			I		
EC01	2.674	65.1222	55.176	70.976					II.	- 1	
EC05	3.355	70.1551	61.6517	75.2851		0.8					
EC10	3.718	72.9953	65.3423	77.7677		0.7			ı	- 1	
EC15	3.964	74.9762	67.913	79.5394		w n s 1			ı	1	
EC20	4.158	76.5888		81.0167		ğ v.			1	- 1	
EC25	4.326	77.9999	71.7962			Response - 9.0			1		
EC40	4.747	81.672	76.3586	85.9946		<b>8</b> 0.4			i i		
EC50	5.000	83.9638		88.4686		17			1	1	
EC60	5.253	86.32	81.6918	91.2044		0.3			1		
EC75	5.674	90.3838	85.8387	96.4081		0.2 -			H		
EC80	5.842	92.049	87.4079	98.7059		0.4			₩.		
EC85	6.036	94.0289	89.1923	101.546		0.1			//		
EC90	6.282	96.5806	91.3855	105.354		0.0	<del></del>	<del></del>	<del>••••••</del> ••		
EC95	6.645	100.491	94.5723	111.456		1		10	100	1000	
EC99	7.326	108.257	100.508	124.297				Dose	%		

Start Date:	6/10/2016		Test ID:	TN-16-20		iid i oou	ndity Test Sample II	):	Jordan Valley	
End Date: Sample Date:	6/17/2016		Lab ID: Protocol:	EPAM 87-	EPA Mari	ne	Sample Ty Test Spec	•	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		1.0000	1.0000	1.0000	1.0000	0.8000	1.0000	1.0000		
75		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		

			Tr	ansform:	Arcsin Sc	uare Root	t T		1-Talled		Isot	onic :
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 nor Bartlett's Test indicates equal var			0.01)		0.94729 5.3608		0.884 9.21034	0	0.33266	1.01877
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

					Linea	ar Interpolat	ion (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	1.0
IC20		62.586	4.084	58.483	75.721	1.3862	0.9
IC25		65.733	4.428	60.692	77.239	0.8620	0.8
IC40	(*)	75.114	3.923	67.111	81.791	-0.1550	4
IC50		79.261	3.369	71.389	84.826	-0.4432	0.7

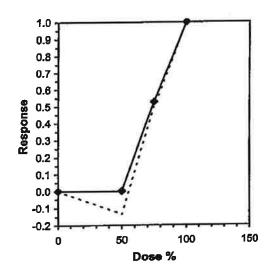


Start Date:	6/10/2016			TN-16-20			Sample ID Sample Ty	):	Jordan Valley	
End Date: Sample Date:	6/17/2016			EPAM 87-	EPA Mari	ne	Test Spec		MY-Mysidopsis bahia	
Comments:	- 1	2	3	4	5	6	7	8	S.D.	
Conc-%	0.2220	0.2520	0.2700	0.3240	0.2300	0.3500	0.2880	0.3140	0.04423	
Contro			0.2760	0.3360	0.3900	0.2820		0.3500	0.052	
50	0.2260	0.3380		• - •	0.1340	0.0380		0.1200	0.06633	
-								V. 1200		
75	0.2120	0.2580	0,1160 0.0000	0.1400	0.0000	0.0000		0.0000	n	

			Transform	n: Untran	sformed			1-Tailed			onic
Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD		N-Mean
		0.2825	0.2300	0.3500	15.657	8					. Same and a fine
	1,1363	0.3210	0.2260	0.3900	16.199	8	-1.595	1.761	0.0425		
•	0.5044	0.1425	0.0380	0.2580	46.548	8				•	
0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8				0.0000	0.0000
	Mean 0.2825 0.3210 0.1425 0.0000	0.2825 1.0000 0.3210 1.1363 0.1425 0.5044	Mean         N-Mean         Mean           0.2825         1.0000         0.2825           0.3210         1.1363         0.3210           0.1425         0.5044         0.1425	Mean         N-Mean         Mean         Min           0.2825         1.0000         0.2825         0.2300           0.3210         1.1363         0.3210         0.2260           0.1425         0.5044         0.1425         0.0380	Mean         N-Mean         Mean         Min         Max           0.2825         1.0000         0.2825         0.2300         0.3500           0.3210         1.1363         0.3210         0.2260         0.3900           0.1425         0.5044         0.1425         0.0380         0.2580	0.2825         1.0000         0.2825         0.2300         0.3500         15.657           0.3210         1.1363         0.3210         0.2260         0.3900         16.199           0.1425         0.5044         0.1425         0.0380         0.2580         46.548	Mean         N-Mean         Mean         Min         Max         CV%         N           0.2825         1.0000         0.2825         0.2300         0.3500         15.657         8           0.3210         1.1363         0.3210         0.2260         0.3900         16.199         8           0.1425         0.5044         0.1425         0.0380         0.2580         46.548         8	Mean         N-Mean         Mean         Min         Max         CV%         N         t-Stat           0.2825         1.0000         0.2825         0.2300         0.3500         15.657         8           0.3210         1.1363         0.3210         0.2260         0.3900         16.199         8         -1.595           0.1425         0.5044         0.1425         0.0380         0.2580         46.548         8	Mean         N-Mean         Mean         Min         Max         CV%         N         t-Stat         Critical           0.2825         1.0000         0.2825         0.2300         0.3500         15.657         8           0.3210         1.1363         0.3210         0.2260         0.3900         16.199         8         -1.595         1.761           0.1425         0.5044         0.1425         0.0380         0.2580         46.548         8	Mean         N-Mean         Mean         Min         Max         CV%         N         t-Stat         Critical         MSD           0.2825         1.0000         0.2825         0.2300         0.3500         15.657         8           0.3210         1.1363         0.3210         0.2260         0.3900         16.199         8         -1.595         1.761         0.0425           0.1425         0.5044         0.1425         0.0380         0.2580         46.548         8	Mean         N-Mean         Mean         Min         Max         CV%         N         t-Stat         Critical         MSD         Mean           0.2825         1.0000         0.2825         0.2300         0.3500         15.657         8         0.3210         0.3210         0.2260         0.3900         16.199         8         -1.595         1.761         0.0425         0.3018           0.1425         0.5044         0.1425         0.0380         0.2580         46.548         8         -1.595         1.761         0.0425         0.0000           0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000

T. 111 T. 1-1-1	Statistic		Critical		Skew	Kurt
Auxiliary Tests  Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95375 1.38221		0.844 8.88539		-0.4439	-0.405
F-Test indicates equal variances (p = 0.68)  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

			75-15-11-11	Line	ar Interpolat	ion (200 Resamples)
Point	%	SD	95%		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	1.0
IC20	59,474	1.444	57.173	62.203	0.5008	0.9 -
IC25	61.843	1.791	59.043	65.677	0.6142	0.8
IC40	68.948	2.749	64.821	75.054	0.4788	4
IC50	73.685	3.019	68.527	79.211	0.1006	0.7

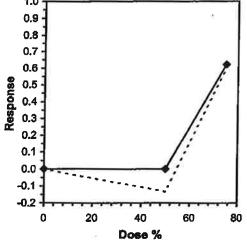


-			Mvs	ld Surviv	al. Growti	and Fe	cundity Te	st-Fecur	dity	- 1
Start Date: End Date:	6/10/2016 6/17/2016	-1)):		TN-16-20			Sample III Sample Ty	):	Jordan Valley	(H
Sample Date: Comments:			Protocol:	EPAM 87-	EPA Mari	ne	Test Spec	ies:	MY-Mysidopsis pahia	
Conc-%	1	2	3	4	5	6	7	8		
Control	0.0000	0.5000	0.0000	0.5000	0.0000	0.0000	1.0000	0.2500		9
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					

			Tr	ansform:	Arcsin Sc	uare Roo			1-Tailed		Isot	onic :
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 nor	mal distribu	ıtion (p > 0	).01)		0.90011		0.873		0.84615	-0.1912
Bartlett's Test indicates equal var	iances (p =	· 0.94)			0.13421		9.21034			0 (*
Hypothesis Test (1-tall, 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

			Line	ar interpolation	(200 Resamples)
Point	%	SD	95% CL(Exp)	Skew	
IC05	52.014				
IC10	54.029				
IC15	56.043				1.0
IC20	58.058				0.9
IC25	60.072				
IC40	66.115				0.8 -
IC50	70.144				0.7 -
					0.6





# TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15	
Client:Jordan Valley	
QC Test Number: TN-16-20	
TEST	ORGANISM INFORMATION
Common Name: Opossum shrimp	Adults Isolated (Time, Date):
Scientific Name: A.bahia	Neonates Pulled & Fed (Time, Date):
Lot Number: AB-993	Acclimation: <u>\$24 hrs</u> Age: <u>7 dayS</u>
Source: ABS	Culture Water (T/S): °C ppt

	TI	EST INITIA	TION	CONCE	ENTRATION SERI	ES
Date	<u>Time</u>	<u>Initials</u>	Activity	Test Concentration Mod Hard Control	Volume <u>Test Material</u> 0ml	Final <u>Volume</u> 1200ml
oliol 16	1358	MJ	Dilutions Made	50%	600ml	
1		.1		75%	900ml	
1	4	<b>¥</b>	Test Vessels Filled	100%	1200 ml	
	1411	MJ	Organisms Transferred			1
$\downarrow$	1450	Me	Head Counts			

	DILUT	ION PREF	PARATION		PREPARATION AND FEEDING FEEDING							
					Food:	Artemia						
<u>Day</u> 0	<u>Date</u> 611016	<u>Time</u> 1358	Initials MJ	Sample / Diluent PTG - 217	<u>Day</u> 0	Time, Initials, <u>Amount</u>	Time, Initials, <u>Amount</u>	Time, Initials, Amount 1625MT 5 drops				
1	6/11/16	0945	JB	AT6-277 LDG-261	1	5 drops		1600 NM 5 drops				
2	6112/16	0947	TM	ATG-271	2	5 drops		1615M 5 drops				
3	Glisha	0920	38	QTG-277	3	5 drops		5 drops				
4	6/14/16	0901	MJ	ATG-211 COG-281	4	5 drops		5 drops				
5	6/15/16	0920	313	AF6-27		5 drops		5 drops				
6	6116116	0912	MJ	ATG-271 LTX0-281	6	0820JB 5 drops		16250P 5 drops				



**TOXICITY TEST OBSERVATION DATA SHEET** 

Project Number:70005.15	TEST ORGANISM	Beginning Date: _	6110116	Time: 1411
Client:Jordan Valley	Common Name: Opossum shrimp	Ending Date:	6/17/16	Time: 33
QC Test Number:TN- 16-200	Scientific Name: A. bahia			
Test Material: Effluent				
Accession Number: ATG-277	TEST TYPE: Static / Flowthrough	Test Container:	4" bowl	
Dilution Water: 30 ppt CS	Renewal / Non-renewal	Test Volume:	150 ml	
Accession Number: LDG-261	Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc	Test Duration:	7 days	

· 6:					Number of Su	rviving Organisms	3		#N-65-
Concentration	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	Α	5	5	5	5	5	5	5	5
	В	6	5	5	5	5	5	5	5
	С	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	6	5	5
50%	A	5	5	ų	4	4	Ч	ц	4
	В	5	5	5	5	5	5	5	5
	С	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
7,57,3	F	5	5	Ч	4	4	4	4	4
- A - A - A - A - A - A - A - A - A - A	G	5	ч	ц	3	3	3	3	3
	Н	5	5	5	5	5	5	3	7
Tlm	ne / Initials	1450/-	1250 213	1101 MJ	1035 76	1632MT	1004 273	0944 MJ	1331 MJ

EPA TEST METHOD: (I	FW) EPA 821-R-0	2-013/(SW) EPA	821-R-	02-012(CH	ECK ONE
Fathead (1000 A)		n :			/40BG-03-



**TOXICITY TEST OBSERVATION DATA SHEET** 

Project Number:	TEST ORGANISM	Beginning Date:	6110116	Time: _1411
Client:Jordan Valley	Common Name: Opossum shrimp	Ending Date:	6/17/16	Time: 1331
QC Test Number: TN- 16-206	Scientific Name: A. bahia			
Test Material: Effluent				
Accession Number: ATG- 271	TEST TYPE: Static / Flowthrough	Test Container: _	4" bowl	
Dilution Water: 30 ppt CS	Renewal / Non-renewal	Test Volume:	150 ml	
Accession Number: LDG - 281	Photoperiod: 16 & 8 d Light Intensity: 50 - 100 fc	Test Duration:	7 days	

					Number of Sur	viving Organism:	3		
Concentration	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
75%	Α	5	6	5	5	5	5	5	5
	В	6	5	3	3	3	8	3	3
	С	5	5	4	4	ц	4	ц	4
	D	5	5	5	ц	4	4	4	4
	E	5	4	d	3	3	3	3	3
	F	5	5	3	3	3	Z	2	2
	G	5	3	5	3	3	3	i	1
	Н	\$	5	5	5	5	5	5	Ц
100%	A	5	4	4	3	7	2	7	2
	В	5	5	3	2	2	343	1	1
	С	5	4	3	2	0	_	_	
	D	5	3	1	0	-			
A - 44	E	5	3	3	2	0			
	F	5	5	3	3	3	3	2	2
	G	5	5	3	2	0			
y - námás v.	H	5	2	ì			ð		
Tir	ne / Initials	1450/	135038	1101 MJ	1035 50	1632NJ	1024 08	0944 MT	1331 MA

<b>EPA TEST METHOD: (F</b>	W) EPA 821-R-02-013/(SW) EPA 82	1-R-02-012(CHECK ONE
	Cumdondon: (1004.0)	Manidia: /1006 0)



REPRODUCTION AND WEIGHT DATA (Test Species: \_\_\_\_\_\_A. bahia\_\_\_)

		<u>Date</u>	<u>Time</u>	<u>Initials</u>
Project Number:70005.15	Organisms sexed:	6/17/16	1331	MT
Client:	Loaded tins placed in oven:	6117/14	1357	MJ
QC Test Number:TN-16-200	Loaded tins removed from oven:	6/18/16	1515	NM
Tin Lot: Black 160, Blue 159 (B)	Loaded tins weighed:(  K  )	1831 MY	1	
Oven Temp (°C): Start: 99.5° End: 101.0°	Ouen Number Distant			

BLM-01 Balance Number: P0115825

									DENIOT		ice Number. Pt	1110020
Test Conc.	Rep	Tîn #	# 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		١		٠	5	26.47	21.80	1.33	0.266	0.266
	В	174(8)	ı	l	a)		5	27.85	29.38	1,53	0.306	0.306
	С	152	1	- 11	ì		4	26.92	30.572854	1.62	0.405	0.324
	D	61(8)	i	н	(l		6	25.56	27.86	2.00	0,400	0.400
	Ε	n2(B)	11	10	ne		5	25.24	21.00	1.82	0.364	0.364
	F	236	11	1)	H		5	26.84	28.49	1.65	0.330	0.330
	G	6	)	J	#(		5	30_95	32.97	2.02	0.404	0.704
	Н	241			nn		5	28.43	29.66	1.23	0.246	0.746
50%	Α	136						a( )))	22			
	В	166			f		4	26.41	27.53	1.12	0.280	0.224
	С	171					<u> </u>	29.02	30.57	1.55	0.310	0.310
	D						4 5		28.10 A.6		<del>-0.160</del> 0.255	
	E	_131			1111			26.64	25.49	1,85	0.370	0.370
	F	109			<b>JHY</b>		5	25.78	26.96	1.18	0.736	0.136
_	G	104			11		4	28.13	29.39	1.26	0.315	0.252
		112	1		_11		3	28.15	29.36	1.21		0.242
	Н	176	i),		H		5	29.87	31.26	1.39	0.278	0.178

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

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



# REPRODUCTION AND WEIGHT DATA (Test Species: A. bahia

		<u>Date</u>	<u>Time</u>	<u>Initials</u>
Project Number: 70005.15	Organisms sexed:	6/17/16	1331	MJ
Client: Jordan Valley	Loaded tins placed in oven:	6/17/16	1357	ms
QC Test Number: TN- jtg- 206	Loaded tins removed from oven: _	6/18/16	1515	NΜ
Tin Lot: 1860	Loaded tins weighed:	6/18/16	1531	NM
2 Town (20): Start 20 6 End: [6]	Oven Number: RI M.01	Balanca M	lumber P01	15825

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>B-A</b> Total Dry Org. Weight (mg)	(B-A)/C Mean Dry Org. Weight (mg)	(if applicable) Mean Biomass (mg/exp. org.)
75%	A	135		К	iil		5	25.73	27.10	1,37	0-274	8.274
	В	182		ıl	1		3	28.61	36.14	1,53	0.510	0.306
	С	56	ı		1 !{		4	27.11	29.29	2,18	0.545	0.436
0	D	183		III			4	27.23	28.21	0.98	0.245	0.196
	E	243		lı.			3	29.27	36.07	0.80	0.267	0.160
	F	148		1(			Z	25.70	26.45	0.75	0.375	0.150
	G	189			1		l	26.66	26,94	0.28	0.280	0,056
	H	245			lų		4	30.22	31.41	149	0.298	0.238
100%	A	إزوا			11		2	27.46	29.96	2.56	1.25	6.500
	В	205			ł		1	31.53	-	0.20	6.200	0.040
	С	-		,	_	_	_	,				
	D	_		-		_	_					
	E			_	_	_						
	F	201			я		2	29.07	29.55	0.48	- 0. ZW	0.096
	G	-	_	_	_	_	_					
	Н	-	_		-	_	_					

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:	TEST ORGANISM		Beginning Date:	6110/16	Time: 1411
Client:Jordan Valley	Common Name:	Opossum shrimp	Ending Date:	6117/16	Time: 13.3/
QC Test Number: TN- i6-206	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 ℓ, 8 ℓ Light Intensity: 50 - 100 fc

				Temp	eratu	re (°C	;)					pН					Diss	solved	Охуд	gen (m	ng/L)			C	Sal	tivity inity (	(US/Cr	n)	
Test Conc	Rep	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	Use	76.6	710.1	26-2	26.7	263	7.2	<b>B</b> A	8.0	8.0	1.1	7.3	7.60	7.0	6.0	64	69	6.7	6.7	<b>6</b> -5	27.1	275	27.5	28.2	28.2	zve	280
50%		25.0	25.0	Ziale	25.7	26.1	210.1	26.3	7.2	\$D	7.8	7,9	7.2	7.2.	7.6	6.9	6.7	ω <u>5</u>	6.9	68	6.8	6.7	27.4	27.2	27.3	27.9	27.7	27.6	no
75%								25.7																					
100%								25.6																					- Ant-
			250																							611	L 1(-)		2130
Meter N	umber	<i>;</i> .10	i_1a	6:10	614	ina.	ድግሄ	C.TER	178	436	(20)	A74	£=10	1-4	1170	/70			5 = 6/	1-10			1-76	66			1.00		
Meter N	Time	1401	205	MOK!	CWG	YHUS	on	CALL)	140	200	0952	1000	CACK	018	0917	LUM	105	6952	10 18	W.O	618	618	ELAS	1074 1075	679 0000	678 cens	10 10 1005	678	618
	Initials	M	58	M	36	MS	B	MJ	MJ	33	MT	JB.	M	32	MT	MIT	38	MI	7A	MAS	1/2	AAT	MIT	-9/3	AFT	74	V1(2)	42	MJ

113 313

> ATS-114 06/21/06



## **TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS**

Project Number:70005.15	TEST ORGANISM	Beginning Date:	Time: 1411
Client: Jordan Valley	Common Name: Opossum shrimp	Ending Date: 617/16	Time: 1331
QC Test Number: TN- 16-206	Scientific Name: <u>A. bahia</u>		

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

				Гетр	eratui	Э°) в	)					рН					Dis	solved	Охуд	en (m	ıg/L)			C		tivity		n)	
Test Conc	Rep	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		26D	258	25 <sup>1</sup>	251	15.N	25D	250	8.5	85	8.2	7.8	<b>f</b> .3	3.O	74	65	5.45 6.4	2.0	<b>6</b> -5	5.g	60	65	27.7	<u>የ</u> ገ.ግ	28.5	286	28.3	28.2	219
50%		730 D	259	251	<b>157</b>	Bis	25-3	<i>50</i>	8.1	୫-3	8.1	18	8.2	80	7.1		5.7 6.2		GD	5,4	5.i	62	275	ก.5	28.2	28.2	27.8	21.9	27.8
75%		20 <sup>C</sup> C	25.7	25,0	251	£3.3	253	25.)	8.0	8-1	8.1	7.8	8,1	8.0	7.2		-	_	53	5.0	43	5,7	27.2	27.2	279	28.0	215	27:7	27.6
100%		210.0	25.8	15°C	25.0	25.\	253	25.1	6.8	8.1	8.1	1.8	જ.1	80	7.3	4.8	50	65	5.2	5,4	4.6	ร.ว	27.1	27.1	28.0	21.9	213	270	T1-3
Meter	Numbe																												
	Time	_		$\overline{}$					35																		1025 OB		,

A 12.

ATS-T14 06/21/06



# **TOXICOLOGY LABORATORY BENCH SHEET**

Project Number:	70005.15	
Client: Jorda	n Valley	
QC Test Number:	TN- 16-206	
Date/Time/Initials		Comments/Activity
6/14/10 0842 MJ		1007. samples produced a salt-deposit



## **TOXICOLOGY LABORATORY BENCH SHEET**

Project Number: _	70005.15	
Client: <u>Jord</u>	an Valley	
QC Test Number:	TN-16-206	

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

		ON AIR			OFF AIR	
Sample #	Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
ATG-277	6.7		MJ		<del></del>	_
AT6-277	7.60	0902	JB	6.7	0912	SB
ATG-277	8.3	0921	MJ	6.7	0931	MS
AT6-277	9.1	0902	JB	7.1	0912	JB
ATG- 277	9.0	0840	MOT	6.9	0850	MJ
A16-277	9.7	0850	IB	7.2	0900	IB
A16-277	9.3	0855	MO	7.0	0905	MT
İ						
	A 1					
		**				
					i	
						20
						:
	ATG-277 ATG-277 ATG-277 ATG-277 ATG-277	Sample # Initial DO (mg/L)  AT6-277 6.7  AT6-277 7.6  AT6-277 8.3  AT6-277 9.1  AT6-277 9.0  AT6-277 9.7	Sample # (mg/L) Time  AT6-277 6.7 —  AT6-277 7.6 0902  AT6-277 8.3 0921  AT6-277 9.1 0902  AT6-277 9.0 0840  AT6-277 9.7 0850	Sample #   Initial DO	Initial DO	Initial DO

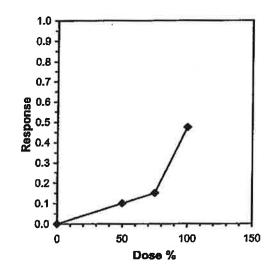
			Mysld	Survival,	Growth a	ind Fecu	ndity Test	48 Hr St	ırvival	
Start Date:	6/10/2016		Test ID:	TN-16-206	3	WH	Sample ID	):	Jordan Valley	
End Date:	6/17/2016		Lab ID:	,			Sample Ty	/pe:	3	
Sample Date:			Protocol:	<b>EPAM 87-</b>	EPA Mari	ne	Test Spec	les:	MY-Mysidopsis bahia	
Comments:										
Conc-%	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		

			ansform:	Arcsin Sc	uare Roo		Rank	1-Tailed	Isot	onic ·	
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 nor Equality of variance cannot be co		ution (p >	0.01)		0.92724	0.904	-0.6973	0.23513
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU				
Steel's Many-One Rank Test	75	100	86.6025	1.33333				

				Linea	ar 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	1.0
IC20	78.846	5.006	66.625	84.783	-0.9554	1
IC25	82.692	4.012	75.000	89.286	-0.1258	0.9
C40	94,231					0.8
C50	>100					0.7

\* indicates IC estimate less than the lowest concentration



			Mysic	Survival,	Growth a	nd Fecu	ndity Test-	96 Hr St	ırvivai
Start Date:	6/10/2016			TN-16-206			Sample ID		Jordan Valley
End Date:	6/17/2016		Lab ID:				Sample Ty	/pe:	
Sample Date:			Protocol:	<b>EPAM 87-</b>	EPA Mari	ne	Test Spec	les:	MY-Mysidopsis bahla
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		1.0000	0.8000	1.0000	1.0000	0.8000	0.6000	1.0000	
75		0.6000	0.8000	0.8000	0.6000	0.6000	0.6000	1.0000	
100	117.7.7.7	0.4000		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 non	mai distribu	rtion (p >	0.01)		0.95115		0.904		0.32872	-0.4883
Bartlett's Test indicates equal var	iances (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

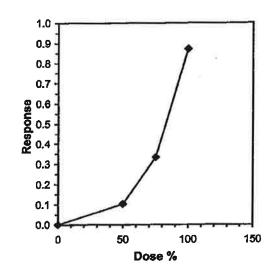
				Ma	xlmum Likeliho	od-Probit					
Parameter	Value	SE	95% Fldu	cial Limits	Control	Chl-Sq	Critical	P-value	Mu	Sigma	lter
Slope	13,1795	2,92689	7.44281	18.9162	0.025	1.4643	3.84146	0.23	1.94077	0.07588	10
Intercept	-20.578	5.70125	-31.753	-9.4039							
TSCR	0.07407	0.02958	0.01609	0.13205		1.0			117		
Point	Probits	%	95% Fidu	cial Limits		0.9			11/		
EC01	2.674	58.1106	41.2877	66.8966					#/		
EC05	3.355	65.4582	50.7891	72.9534		0.8			*	- 1	
EÇ10	3.718	69.7477	56.6467	76.4997		0.7			11		
EC15	3.964	72.7995	60.92	79.0616					#/		
EC20	4,158	75.3199	64.4918	81.2259		<b>9</b> 0.6			N .		
EC25	4.326	77.5516	67.665	83.2004		0.6 0.5 0.4	1		4		
EC40	4.747	83.4728	75.9194	88.9169		9 A	l		III	1	
EC50	5.000	87.2505	80.8041	93.1828		<b>2</b> 0.4	1		1	1	
EC60	5.253	91.1991	85.36	98.3891		0.3 -	i		11	1	
EC75	5.674	98.1624	92.033	109.422		0.2	i		M	1	
EC80	5.842	101.071	94.4574	114.579		-	ł		-/1	- 1	
EC85	6.036	104.57		121.1		0.1 -		()	71		
EC90	6.282	109.146	100.591	130.061		0.0 -		<del>m + + +</del>			
EC95	6.645	116.298	105.606	144.889		9	1	10	100	1000	
EC99	7.326	131.003	115.289	178.043				Dose	%		

				Survival,			Sample ID	)-	Jordan Valley	
Start Date:	6/10/2016			TN-16-206	2		Sample Ty		y Children	
End Date:	6/17/2016		Lab ID: Protocol:	EDAM 07	EDA Mari	ne:	Test Spec	•	MY-Mysidopsis bahia	
Sample Date:			Protocoi:	EPAM 0/-	EFA Man	IIG.	rear opeo	100.	in injuracy and a series	
Comments:										
Conc-%	1	2	3	4	5	6		_ 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		0.6000	0.8000	0.8000	0.6000	0.4000	0.2000	0.8000		
100	****	0.2000		0.0000	0.0000	0.4000	0.0000	0.0000		
100	0,.000									

			Tra	ansform:	Arcsin Sc	uare Roo	t _	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 nor	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

				Lines	r 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	1.0
IC20	60.556	6.535	50.000	75.772	-0.0133	0.9
IC25	65.972	6.093	56.233	77.648	-0.0668	0.9 ]
IC40	78.095	3.628	69.679	82.971	-0.6188	0.8
IC50	82.738	2.879	76.238	87.031	-0.4792	0.7

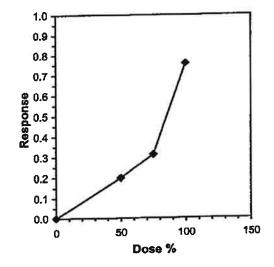


Start Date:	6/10/2016			TN-16-206			Sample ID Sample Ty	): /De:	Jordan Valley	
End Date: Sample Date:	6/17/2016		Protocol:	EPAM 87-	EPA Marii		Test Spec		MY-Mysidopsis bahia	
Comments:					5	6	7 ·	8	S.D.	
Conc-%	1		3	0.4000	0.0040	0.3300	0.4040	0.2460	0.05769	
Control	0.2660	0.3060	0.3240	0.4000	0.3640			0.2780		
50		0.3100	0.2040	0.3700	0.2360	0.2520			- 44546	
_		0.3060		0.1960	0.1600	0.1500	0.0560	0.2380		
75			• • • • •		0.0000	0.0960	0.0000	0.0000	0.17331	
100	0.5000	0.0400	0.0000	0.0000	0.0000	0.0800	0.0000	0.0		

				Transform	n: Untran	sformed			1-Tailed			onic
C 0/	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Conc-% Control *50 75 100	0.3300 0.2645 0.2270 0.0795	1.0000 0.8015 0.6879 0.2409	0.3300 0.2645 0.2270 0.0795	0.2460 0.2040 0.0560 0.0000	0.4040 0.3700 0.4360 0.5000	17.481 20.288 50.742 218.000	8 8 8	2.351 49.000 44.000	1.761 48.000 48.000	0.0491	0.3300 0.2645 0.2270 0.0795	0.6879

	Statistic		Critical		Skew	Kurt
Auxiliary Tests 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	MSDp	8.88539 MSB MSE		F-Prob	df
Hypothesis Test (1-tail, 0.05) Homoscedastic t Test indicates significant differences	MSDu ferences 0.04906		0.01716			1, 14
Linear Interpola	tion (200 Resam	ples)				

				Linea	ır interpol
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	3			1200
* indicates	IC estimate les	ss than the	lowest c	oncentrati	ion

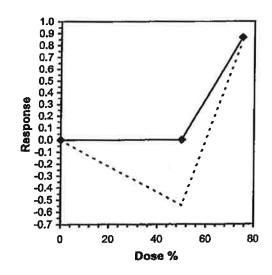


Start Date: End Date: Sample Date: Comments:	6/10/2016 6/17/2016		Lab ID:	TN-16-206 EPAM 87-		ne	Sample ID Sample Ty Test Spec	/pe:	Jordan Valley  MY-Mysidopsis bahia	
Conc-%	1	2	3	4	5	6	7	8		
Control	0.0000	0.5000	0.3333	0.3333	1.0000	0.3333	0.5000	0.0000		
50	0.6667	0.0000	0.0000	1.0000	0.5000	1.0000	1.0000			
75	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000			

			Tra	ansform:	Arcsin Sc	uare Roof	t	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		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			
Shaplro-Wilk's Test indicates nor	0.9054			0.878		0.9671	0.75356			
Bartlett's Test indicates equal var		0.2351	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

			Line	ear Interpolation (200 Resamples)
Point	%	SD	95% CL(Exp)	Skew
IC05	51.447	-184		
IC10	52.895			
IC15	54.342			1.0 -
IC20	55.789			0.9 ]
IC25	57.236			0.8 🕇
IC40	61,578			0.7 - 0.6 -
IC50	64.473			



# ATTACHMENT II

Chemical Analyses (72 pages)

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

EA Engineering, Science, and Technology

TestAmerica Pittsburgh

Pittsburgh, PA 15238 Tel: (412)963-7058

225 Schilling Circle

Attn: Mike Chanov

(412)963-2428

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Hunt Valley, Maryland 21031

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

Derw G. Samlur

Carrie Gamber, Senior Project Manager

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.

carrie.gamber@testamericainc.com

301 Alpha Drive RIDC Park

For:

Suite 400

**ANALYTICAL REPORT** 































































































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#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

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.

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TestAmerica Job ID: 180-55503-2

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TestAmerica Pittsburgh 6/10/2016

## **Definitions/Glossary**

Client: EA Engineering, Science, and Technology

Toxicity Equivalent Factor (Dioxin)
Toxicity Equivalent Quotient (Dioxin)

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

#### Qualiflers

M	eta	ls
---	-----	----

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

TEF

TEQ

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
a	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

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
Jtah	NELAP		8	PA001462015-4	05-31-17
The following analytes	s are included in this repo	rt, but are not certific	ed under this certifica	tion:	
Analysis Method	Prep Method	Matrix	Analyt		
200.7 Rev 4.4	200.7	Water	Barium		
200.7 Rev 4.4	200.7	Water	Boron		10.
200.7 Rev 4.4	200.7	Water	Calciu	m	
200.7 Rev 4.4	200.7	Water	Magne	sium	
200.7 Rev 4.4	200.7	Water	Potass	ium	
200.7 Rev 4.4	200.7	Water	Sodium	n	
200.7 Rev 4.4	200.7	Water	Stronti	um	
300.0		Water	Bromio	le	
300.0		Water	Chloric	le	
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

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<sup>\*</sup> 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

TestAmerica Pittsburgh

### **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	Anaiyst	Lab
Total/NA	Analysis Instrume	300.0 nt ID: CHICS2100B		50	1 mL		178539	06/08/16 18:19	MJH	TAL PIT
Total/NA	Analysis Instrume	300.0 nt ID: CHICS2100B		500	1 mL		178539	06/08/16 18:37	MJH	TAL PIT
Total Recoverable	Prep	200.7			50 mL	50 mL	178640	06/08/16 12:35	ANA	TAL PIT
Total Recoverable	Analysis Instrume	200.7 Rev 4.4		5	50 mL	50 mL	178721	06/09/16 08:03	RJR	TAL PIT
Total Recoverable	Prep	200.7			50 mL	50 mL	178640	06/08/16 12:35	ANA	TAL PIT
Total Recoverable	Analysis Instrume	200.7 Rev 4.4		25	50 mL	50 mL	178721	06/09/16 08:14	RJR	TAL PIT
Total/NA	Analysis Instrume	SM 2320B nt ID: MANTECH01		1			335663	06/09/16 12:16	YZ	TAL IRV

#### 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

TestAmerica Pittsburgh

6/10/2016

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 Ch Analyte	_	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) - Tot	al Recover	able					×	
Analyte		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				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		mg/L			06/09/16 12:16	1
Bicarbonate ion as HCO3	1100		4.8		mg/L			06/09/16 12:16	1
Carbonate as CO3	ND		2.4		mg/L			06/09/16 12:16	1
Hydroxide as OH	ND		1.4		mg/L			06/09/16 12:16	1

TestAmerica Pittsburgh

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

### 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

	, thaily old Batom 11 occ	MB I	МВ							
I	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
١	Bromide	ND ND		0.50	0.058	mg/L			06/08/16 18:02	1
H	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

%Rec.

	Analyte		Added	Result	Qualifier	Unit	D	%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	
1										

Spike

LCS LCS

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

ı		MB	MB							
l	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
l	Boron	ND		200	4.4	ug/L		06/08/16 12:35	06/09/16 07:35	1
١	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
		ND		5000		ug/L		06/08/16 12:35	06/09/16 07:35	1
	Magnesium	ND.		5000		ug/L		06/08/16 12:35	06/09/16 07:35	1
	Sodium			50	5.3				06/09/16 07:35	1
	Strontium	ND		50	5.5	ug/L		30,00,10 12.00	55.55 5 67.65	00.1

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

-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%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	
	1000	993		ug/L		99	85 - 115	
Strontium	1000	000		-0-				

Spike

Added

1000

2000

50000

Lab Sample ID: LCSD 180-178640/3-A

**Matrix: Water** 

Analyte

Boron

Barium

Calclum

Analysis Batch: 178721

Client Sample ID: Lab Control Sample Dup **Prep Type: Total Recoverable** 

> **Prep Batch: 178640 RPD** %Rec. Limit D %Rec Limits 85 - 115 2 20 106 20 0 100 85 - 115 85-115 20

> > TestAmerica Pittsburgh

6/10/2016

Page 10 of 17

LCSD LCSD

1060

2000

49600

Result Qualifier

Unit

ug/L

ug/L

rig/l

ND

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-2

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

Lab Sample ID: LCSD 180-178640/3-A

**Matrix: Water** 

Client Sample ID: Lab Control Sample Dup **Prep Type: Total Recoverable** 

Analysis Batch: 178721							Prep Ba	itch: 17	78640
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	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

Prep Type: Total/NA

NC

20

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	ND		4.0	4.0	mg/L		<u>_</u>	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

LCS LCS

Spike

Lab Sample ID: LCS 440-335663/3

**Matrix: Water** 

Analyte

Analysis Batch: 335663

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

%Rec. Added Result Qualifier Unit %Rec Limits 63.4 64.2 mg/L 101 80 - 120

Client Sample ID: AT6-271 (SALINITY ADJUSTED)

Lab Sample ID: 180-55503-1 DU

**Matrix: Water** 

Alkalinity as CaCO3

Analysis Batch: 335663

Sample Sample DU DU **RPD** Analyte **Result Qualifier** Result Qualifier Unit **RPD** Limit Alkalinity as CaCO3 920 933 mg/L 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

mg/L

# **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 180-55503-1 180-55503-1 LCS 180-178640/2-A LCSD 180-178640/3-A	Client Sample ID AT6-271 (SALINITY ADJUSTED) AT6-271 (SALINITY ADJUSTED) Lab Control Sample Lab Control Sample Dup	Prep Type Total Recoverable Total Recoverable Total Recoverable Total Recoverable	Water Water Water Water Water	Method 200.7 Rev 4.4 200.7 Rev 4.4 200.7 Rev 4.4 200.7 Rev 4.4	178640 178640 178640 178640 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	

301 Alpha Drive RIDC Park Pittsburgh, PA 15238

# **Chain of Custody Record**

180325

TestAmerica

Prione (412) 963-7058 Fax (412) 963-2468																					., . ,	
Client Information	Sampler:			Ga	PM: amber,	Carrie	e L	. 9	8	E	3A	CTT	MC	R	3		180-3	No: 31129-6	905.1			
Client Contact: Mike Chanov	Phone:			1000	Mail: rrie.gar	mber(	@testa	meric	ainc.c	om							Page: Page	1 of 1				
Company: EA Engineering, Science, and Technology					T				Ana	alysis	Rec	quest	ed				Job #:					
Address: 225 Schilling Circle Suite 400	Due Date Request	ed:			5.0	12		П		Ť	Т	П	T	Ţ.		343		ervation	Codes:			
City: Hunt Valley	TAT Requested (d	ays):				100 C										-1	A-HO B-No C-Zr		N - N	lexane lone IsNaO2		
State, Zip: MD, 21031							2	1		1						1	D-Ni	tric Acid HSO4	P-N	a204S b25∩3		
Phone: 410-329-5120(Tel)	PO#. Purchase Order	r Requested					Tim			$\neg$	1		111				- Libbi	u im HA	MM			
Email: mchanov@eaest.com	WO#:				disample (Yes of No)		Hold			2											Tyd	irate
Project Name: Jordan Valley	Project #: 18015970					67	1		F	£			111						1111111		)	
Site:	SSOW#:				10		18 hr		L,	2			18	30-55	503 C	hain of	Cust	ody				
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrik (W-water, S-solid, O-matstebil,	old Piltorg		(7)	€ ¢	_ <	Alfallaling						Total Number		Specia	Instruct	tions/N	Note:	
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Page 13 of 17

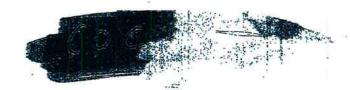
6/10/2016

PrintWindowP...

https://www.campusship.ups.com/cship/create49ccttesoffiginPair=default

Uncorrected temp Thermometer ID Initials PT-WI-SR-001 effective 7/26/13

MICHAEL CHANOV 4105847000 5120 EA ENG SCIENCE TECH 225 SCHILLING CIRCLE HUNT VALLEY MD 21031 33 LBS SHIP TO: SAMPLE CUSTODY TESTAMERICA RIDC PARK 301 ALPHA DRIVE 907كتار PITTSBURGH P. PA 152 9-22 TRACKING #: 1Z 288 682 01 9863 2367 BILLING: P/P UPS CARBON NEUTRAL SHIPMENT Department Code: 2122 Project Phase AND Task: TOXLAB GS 18.1.17.



WNIINV50 75.0A 04/2016

UPS CampusShip: Shipment Label

# TestAmerica Pittsburgh

301 Alpha Drive RIDC Park

Pittsburgh, PA 15238

Phone (412) 963-7058 Fax (412) 963-2468

# **Chain of Custody Record**



<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:				PM:	<u>.</u>					1	Carrier T	acking	No(s):		$\neg$	COC No:		
Client Contact:	Phone:			E-A	amber,	Came	L	_			_						180-244283.1		
Shipping/Receiving	300000				rrie.ga	mber@	gtesta	merica	inc.co	m							Page: Page 1 of 1		
Company: TestAmerica Laboratories, Inc	7.				T						-						Job#;		
Address:	Due Date Request	ed:			126			_	Anar	ysis	Requ	ueste	1		_	_	180-55503-2		
17461 Derian Ave, Suite 100,	6/9/2016						1 1		1	1	ш						Preservation Co		
City: Irvine	TAT Requested (d	ays):					1 1			1			1				A - HCL B - NaOH	M - Hexan	9
State, Zip:	_						1 1			1	П		1	1			C - Zn Acetate	O - AsNa0	
CA, 92614-5817					疆		11			1	ш		1				D - Nitric Acid E - NaHSO4	P - Na2O4 Q - Na2S0	
Phone:	PO#				- 18		11			1	1 1		1			20	F - MeOH	R - Na2S2	203
949-261-1022(Tel) 949-260-3297(Fax) Emait					0		1 1			1	П		1				G - Amchlor H - Ascorbic Acid	S - H2SO4 T - TSP D	4 odecahydrate
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Jordan Valley	18015970					- A	1 1			1			1			毒	L-EDA	Z - other (:	specify)
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Sample Identification - Client ID (Lab ID)	Sample Date	Time		BT=Tissue, A=A		2320	$\perp$		1 8							5	Special In	struction	s/Note:
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# Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 180-55503-2

List Source: TestAmerica Pittsburgh

LogIn Number: 55503

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment	71	
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td></td> <td></td> <td></td> <td></td>				
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.</td <td>True</td> <td></td>	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	



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# <u>TestAmerica</u>

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

Carwa Samler

Authorized for release by: 6/22/2016 9:12:32 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**

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Case Narrative	
Definitions/Glossary	
Certification Summary	5
Sample Summary	
Method Summary	7
	8
Client Sample Results	9
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	17
<b>- 1 ( <del>-</del> 1 11 )</b>	10

#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

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.

3

TestAmerica Job ID: 180-55503-1

# **Definitions/Glossary**

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

TestAmerica Job ID: 180-55503-1

# Qualifiers

Qualifier	Qualifier Description	
В	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.	
-1	MS and/or MSD Recovery is outside acceptance limits.	
-2	MS/MSD RPD exceeds control limits	

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	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.

uthority	Program		EPA Region	Certification ID	Expiration Date
tah	NELAP		8	PA001462015-4	05-31-17
The following analytes	s are included in this report	, but are not certifi	ed under this certifica	tion:	
Analysis Method	Prep Method	Matrix	Analyt	e	
200.8	200.8	Water	Antim	ony	
200.8	200.8	Water	Arsen	ic	
200.8	200.8	Water	Berylli	um	
200.8	200.8	Water	Cadm	ium	
200.8	200.8	Water	Chron	nium	
200.8	200.8	Water	Coppe	er	
200.8	200.8	Water	Hardn	ess as calcium carbona	te
200.8	200.8	Water	Iron		
200.8	200.8	Water	Lead		
200.8	200.8	Water	Mang	anese	
200.8	200.8	Water	Nicke	,	
200.8	200.8	Water	Selen	ium	
200.8	200.8	Water	Silver		
200.8	200.8	Water	Thallin	um	
200.8	200.8	Water	Zinc		
245.1	245.1	Water	Mercu	ігу	
300.0		Water	Fluori	de	
300.0		Water	Nitrat	e as N	
300.0		Water	Nitrite	as N	
300.0		Water	Ortho	phosphate as P	
SM 2540C		Water	Total	Dissolved Solids	
SM 2540D		Water	Total	Suspended Solids	
SM 4500 CN E	SM 4500 CN C	Water	Cyani	de, Total	

TestAmerica Pittsburgh

# **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

6

# **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

TestAmerica Pittsburgh

# 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 Total/NA	Type Analysis	Batch Method 300.0 nt ID: CHICS2000	Run	Factor 50	Initial Amount 1 mL	Final Amount	Batch Number 178678	Prepared or Analyzed 06/09/16 09:06	Analyst CMR	Lab TAL PIT
Total/NA	Analysis	300.0 nt ID: CHICS2100B		50	1 mL		178539	06/08/16 18:19	МЈН	TAL PIT
Total Recoverable Total Recoverable	Prep Analysis Instrumer	200.8 200.8 nt ID: X		5	50 mL 50 mL	50 mL 50 mL	178688 179457	06/09/16 07:09 06/15/16 22:58		TAL PIT TAL PIT
Total Recoverable Total Recoverable	Prep Analysis Instrumei	200.8 200.8 nt ID: X		5	50 mL 50 mL	50 mL 50 mL	178688 179553	06/09/16 07:09 06/16/16 22:34		TAL PIT TAL PIT
Total/NA Total/NA	Prep Analysis Instrumer	245.1 245.1 nt ID: K		1	50 mL 50 mL	50 mL 50 mL	178784 178913	06/09/16 13:46 06/10/16 10:05		TAL PIT TAL PIT
Total/NA	Analysis Instrumer	SM 2540C nt ID: NOEQUIP		1	2 mL	100 mL	178788	06/09/16 14:07	JWS	TAL PIT
Total/NA	Analysis Instrumer	SM 2540D nt ID: NOEQUIP		1	1000 mL	1000 mL	178797	06/09/16 15:45	JWS	TAL PIT
Total/NA Total/NA	Prep Analysis Instrumer	SM 4500 CN C SM 4500 CN E at ID: SEAL2		1	50 mL 50 mL	50 mL 50 mL	179152 179193	06/14/16 11:45 06/14/16 15:00	JAS JAS	TAL PIT TAL PIT

#### 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

TestAmerica Pittsburgh

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6/22/2016

# **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 Chr Analyte	omatogra Result	phy 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 Re	coverable				_		A -1 1	DUE
Analyte	Result	Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Silver	ND		5.0	0.23	•		06/09/16 07:09	06/16/16 22:34	5
Arsenic	28		5.0	0.59	_		06/09/16 07:09	06/15/16 22:58	5
Beryllium	ND		5.0	0.18	-		06/09/16 07:09	06/16/16 22:34	5
Cadmium	ND		5.0	0.37	ug/L		06/09/16 07:09		5
Chromium	29		10		ug/L		06/09/16 07:09		5
Copper	58	F2 F1	10	1.3	ug/L		06/09/16 07:09	06/16/16 22:34	
Iron	ND		250	29	ug/L		06/09/16 07:09		
Manganese	1.7	JB	25	0.23	ug/L		06/09/16 07:09		5
Nickel	47		5.0	0.47	ug/L		06/09/16 07:09		5
Lead	3.2	JB	5.0	0.28	ug/L			06/15/16 22:58	
Antimony	1.1	JB	10	0.20	ug/L			06/16/16 22:34	
Selenium	25		25	0.98	ug/L			06/16/16 22:34	
Thallium	ND		5.0	0.066	ug/L			06/16/16 22:34	
Zinc	98		25	2.0	ug/L		06/09/16 07:09	06/16/16 22:34	
Hardness as calcium carbonate	7400	В	17	0.13	mg/L		06/09/16 07:09	06/15/16 22:58	;
Method: 245.1 - Mercury (CVAA Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Mercury	ND		0.20	0.039	ug/L		06/09/16 13:46	06/10/16 10:05	
General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Total Dissolved Solids	32000		500	500	mg/L			06/09/16 14:07	
Total Suspended Solids	2.0		0.50	0.50	mg/L			06/09/16 15:45	i
i otai gusperiueu gorius	ND		0.010	0.0038	ma/l		06/14/16 11:45	06/14/16 15:00	3

TestAmerica Job ID: 180-55503-1

# 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

	MB	MB							
Analyte	Result	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

ĺ		Spike	LCS	LCS				%Rec.	
	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
ı	Nitrate as N	2.50	2.56		mg/L		102	90 - 110	· <del></del>
	Nitrite as N	2.50	2.52		mg/L		101	90 - 110	
	Fluoride	2.50	2.32		mg/L		93	90 - 110	

RL

0.50

Spike

Added

2.50

MDL Unit

0.15 mg/L

Unit

mg/L

LCS LCS

2.39

MB MB

Result Qualifier

Lab Sample ID: MB 180-178678/6

**Matrix: Water** 

Analyte

Analysis Batch: 178678

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

**Analyzed** 

06/09/16 08:17

Dil Fac

Lab Sample ID: LCS 180-178678/5

Matrix: Water

Orthophosphate as P

Orthophosphate as P

Analysis Batch: 178678

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

Limits

90 - 110

%Rec. Result Qualifier D %Rec

Prepared

# 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** 

		MB	MB							
	Analyte	Result	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
ı	Selenium	ND		5.0	0.20	ug/L		06/09/16 07:09	06/15/16 22:12	1
ı	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** 

ı		MB	MR							
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
١	Silver	ND		1.0	0.047	ug/L		06/09/16 07:09	06/16/16 22:08	<u> </u>
	Beryllium	ND		1.0	0.036	ug/L		06/09/16 07:09	06/16/16 22:08	1

TestAmerica Pittsburgh

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Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

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

MED MAD

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** 

	MB	MID							
Analyte	Result	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** 

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%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** 

1		Spike	LCS	LUS				70 Kec.	
ı	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
	Silver	50.0	43.3		ug/L		87	85 - 115	
ı	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	
		50.0	48.8		ug/L		98	85 - 115	
	Thallium	500	514		ug/L		103	85 <sub>-</sub> 115	
	Zinc	500	017		9				

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** 

7 many one Datom strate	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%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	JB	500	408		ug/L		81	70 - 130	
Lead	3.2	JB	20.0	19.0		ug/L		79	70 - 130	
Antimony	0.99	J*	500	532		ug/L		106	70 - 130	
Selenium	-	J*	10.0	32.7		ug/L		83	70 - 130	
Geleriidiii		-				-				

TestAmerica Pittsburgh

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

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

Lab Sample ID: 180-55503-1 MS

**Matrix: Water** 

Analysis Batch

Client Sample ID: AT6-271 (SALINITY ADJUSTED) **Prep Type: Total Recoverable** 

Analysis Batch: 1/9553	Sample	Sample	Spike	MS	MS				Prep Batch: 178688 %Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%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	JB	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

										1 10p Da	LOII. II	/ 0000
		Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte		Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic		28		40.0	63.1		ug/L		88	70 - 130		20
Cadmium		ND		50.0	50.4		ug/L		101	70 - 130	1	20
Manganese		1.7	JB	500	423		ug/L		84	70 - 130	4	20
Lead		3.2	JB	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 Ratch, 170552

Client Sample ID: AT6-271 (SALINITY ADJUSTED)

**Prep Type: Total Recoverable** 

Analysis Batch: 1/9553		_							Prep Ba	itch: 17	78688
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	ND		50.0	40.0		ug/L		80	70 - 130		20
Beryllium	ND		50.0	61.5		ug/L		123	70 - 130	7	20
Chromium	29		200	243		ug/L		107	70 <sub>-</sub> 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	JB	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		-				'	
	00		300	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** 

MB MB Analyte Result Qualifier MDL Unit Prepared Analyzed Mercury 0.0457 J 0.20 0.039 ug/L 06/09/16 13:46 06/10/16 09:59

TestAmerica Pittsburgh

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Client Sample ID: Lab Control Sample

%Rec.

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Project/Site: Jordan Valley

Method: 245.1	-	Mercury	(CVAA)	(	Continued)
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Lab Sample ID: LCS 180-178784/2-A

Matrix: Water

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

Analysis Batch: 178913

Spike LCS LCS

Rec.

 Analyte
 Added Mercury
 Result 2.50
 Qualifier 2.53
 Unit ug/L
 D %Rec value
 Limits 2.51

Lab Sample ID: LCSD 180-178784/3-A Client Sample ID: Lab Control Sample Dup

Matrix: Water
Analysis Batch: 178913

Prep Type: Total/NA
Prep Batch: 178784

%Rec. **RPD** LCSD LCSD Spike Limit RPD Added Result Qualifier Unit %Rec Limits Analyte 2.49 100 85 - 115 2 20 ug/L 2.50 Mercury

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

Lab Sample ID: MB 180-178788/2 Client Sample ID: Method Blank
Prep Type: Total/NA

Matrix: Water

Analysis Batch: 178788

 Analyte
 Result Total Dissolved Solids
 ND
 4
 MDL Unit Total Dissolved Solids
 D Prepared Total Dissolved Solids
 Analyzed Total Dissolved Solids
 D Total Dissolved Solids
 ND
 10
 10
 mg/L
 D Prepared Total Dissolved Solids
 Analyzed Total Dissolved Solids
 D 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 Spike LCS LCS

 Analyte
 Added
 Result Qualifier
 Unit mg/L
 D %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 Client Sample ID: Method Blank
Prep Type: Total/NA

Matrix: Water

Analysis Batch: 178797

MBAnalyteResultQualifierRLMDLUnitDPreparedAnalyzedDil FacTotal Suspended SolidsND0.500.50mg/L06/09/16 15:451

Lab Sample ID: LCS 180-178797/1

Matrix: Water

Analysis Batch: 178797

Spike LCS LCS 

\*Rec. | Property Constitute | Property | Propert

 Analyte
 Added
 Result Qualifier
 Unit
 D
 %Rec Limits

 Total Suspended Solids
 49.0
 48.0
 mg/L
 98
 80 - 120

Prep Type: Total/NA

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55503-1

Lab Sample ID: MB 180-179152/4-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA Analysis Batch: 179193 **Prep Batch: 179152** 

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Cyanide, Total ND 0.010 06/14/16 11:45 06/14/16 14:23 0.0038 mg/L

Lab Sample ID: HLCS 180-179152/2-A Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA Analysis Batch: 179193 **Prep Batch: 179152** 

Spike HLCS HLCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Cyanide, Total 0.250 0.239 mg/L 96 90 - 110

Lab Sample ID: LCS 180-179152/3-A Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 179193 **Prep Batch: 179152** Spike LCS LCS %Rec. **Analyte** Added Result Qualifier Unit %Rec Limits Cyanide, Total 0.200

0.196

mg/L

98

90 - 110

Lab Sample ID: LLCS 180-179152/1-A Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA Analysis Batch: 179193 **Prep Batch: 179152** Spike LLCS LLCS %Rec.

Analyte Added Result Qualifier Unit %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

<b>Analysis Batc</b>	n: 17853	y
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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	I otal/NA	Water	300.0	

# Analysis Batch: 178678

Lab Sample ID 180-55503-1 LCS 180-178678/5	Client Sample ID AT6-271 (SALINITY ADJUSTED) Lab Control Sample	Prep Type Total/NA Total/NA	Water Water	Method 300.0 300.0	Prep Batch
MB 180-178678/6	Method Blank	Total/NA	Water	300.0	

# Metals

# Prep Batch: 178688

p = access					
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	
			Water	200.8	
MB 180-178688/1-A	Method Blank	Total Recoverable	vvalei	200.0	

# 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
	•	Total Recoverable	Water	200.8	178688
MB 180-178688/1-A	Method Blank	TOTAL RECOVERABLE	vvalci	200.0	

# 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

TestAmerica Pittsburgh

# **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	- I TOP DUTON
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	- Top Buton
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

11 1

**Chain of Custody Record** 

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Email: mchanov@eaest.com	wo≠.				0 0	4	Hold			Tru		1											
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Uncorrected temp Thermometer ID Initials

PT-WI-SR-001 effective 7/26/13

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

#### SHIP TO:

SAMPLE CUSTODY TESTAMERICA RIDC PARK 301 ALPHA DRIVE

PITTSBURGH P.





PA 152 9-22



UPS NEXT DAY AIR

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. WNINVSO 75.04 04/2016











UPS CampusShip: Shipment Label

# **Login Sample Receipt Checklist**

Client: EA Engineering, Science, and Technology

Job Number: 180-55503-1

List Source: TestAmerica Pittsburgh

Login Number: 55503

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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	





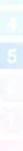


































































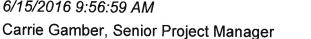














(412)963-2428

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

TestAmerica Job ID: 180-55632-1 Client Project/Site: Jordan Valley

EA Engineering, Science, and Technology

TestAmerica Pittsburgh

Pittsburgh, PA 15238 Tel: (412)963-7058

225 Schilling Circle

Attn: Mike Chanov

Hunt Valley, Maryland 21031

Authorized for release by: 6/15/2016 9:56:59 AM

Erw J. Samlu

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.

301 Alpha Drive RIDC Park

For:

Suite 400

**ANALYTICAL REPORT** 

Have a Question?





....LINKS .....

**Review your project** results through

Total Access















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#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

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.

TestAmerica Pittsburgh 6/15/2016

# **Definitions/Glossary**

Client: EA Engineering, Science, and Technology

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55632-1

# Qualifiers

R.A	260	10
W	eta	13

Qualifier Qualifier Description

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

# Glossary

TEF

TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
<del>n</del>	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

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.

uthority	Program		EPA Region	Certification ID	Expiration Date
tah	NELAP		8	PA001462015-4	05-31-17
The following analytes	s are included in this repo	rt, but are not certifi	ed under this certifica	tion:	
Analysis Method	Prep Method	Matrix	Analyt		
200.7 Rev 4.4	200.7	Water	Bariun	1	<del></del>
200.7 Rev 4.4	200.7	Water	Boron		
200.7 Rev 4.4	200.7	Water	Calciu	m	
200.7 Rev 4.4	200.7	Water	Magne	sium	
200.7 Rev 4.4	200.7	Water	Potass	sium	
200.7 Rev 4.4	200.7	Water	Sodiur	n	
200.7 Rev 4.4	200.7	Water	Stronti	um	
300.0		Water	Bromio	le	
300.0		Water	Chloric	le	
300.0		Water	Sulfate	<b>)</b>	

# Laboratory: TestAmerica Irvine

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

Authority	Program	<b>EPA Region</b>	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

TestAmerica Pittsburgh

<sup>\*</sup> 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 nt ID: CHICS2100B		25	1 mL		178924	06/11/16 17:46	MJH	TAL PIT
Total/NA	Analysis Instrume	300.0 nt ID: CHICS2100B		250	1 mL		178924	06/11/16 18:03	MJH	TAL PIT
Total Recoverable	Prep	200.7			50 mL	50 mL	178988	06/13/16 07:55	ANA	TAL PIT
Total Recoverable	Analysis Instrume	200.7 Rev 4.4		5	50 mL	50 mL	179123	06/14/16 08:57	RJR	TAL PIT
Total Recoverable	Prep	200.7			50 mL	50 mL	178988	06/13/16 07:55	ANA	TAL PIT
Total Recoverable	Analysis Instrume	200.7 Rev 4.4		25	50 mL	50 mL	179123	06/14/16 09:03	RJR	TAL PIT
Total/NA	Analysis Instrume	SM 2320B nt ID: MANTECH01		1			336412	06/14/16 12:12	YZ	TAL IRV

#### 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

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

Method: 300.0 - Anions, Ion C Analyte		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 - Metal	s (ICP) - Tot	al Recover	able						
Analyte		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			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		Qualifier	RL	MDL		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

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

# 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

ı		MR	MB							
	Analyte	Result	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
	Guilate					_				

**Spike** 

Added

10.0

50.0

50.0

Lab Sample ID: LCS 180-178924/5

Matrix: Water

Analyte

**Bromide** 

Chloride

Sulfate

Analysis Batch: 178924

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

LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
10.3		mg/L		103	90 - 110	
50.8		mg/L		102	90 - 110	
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** 

	MB	MB							
Analyte	Result	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
	ND		5000		ug/L		06/13/16 07:55	06/14/16 08:42	1
Potassium	ND.		5000		ug/L		06/13/16 07:55	06/14/16 08:42	1
Magnesium			5000		ug/L			06/14/16 08:42	1
Sodium	ND				•			06/14/16 08:42	1
Strontium	ND		50	5.3	ug/L		00/13/10 07.33	00/14/10 00.42	

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** 

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%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	
	50000	51000		ug/L		102	85 - 115	
Magnesium	50000	53200		ug/L		106	85 - 115	
Sodium	1000	1040		ug/L		104	85 - 115	
Strontium	1000	1040		-5				

Lab Sample ID: LCSD 180-178988/3-A

**Matrix: Water** 

Analysis Batch: 179123

	Client Sample ID: Lab	Control	Sample	Dup
	Prep Typ	e: Total	Recove	rable
		Prep B	atch: 17	78988
)		%Rec.		RPD
				1.1

Allalysis Datoli: 170120	Spike	LCSD LCSD			%Rec.		RPD
Analyte	Added	Result Qualifier	Unit	D %Rec	Limits	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
Calcium	*****		-				

TestAmerica Pittsburgh

6/15/2016

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: AT6-277 (MOCK)

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Project/Site: Jordan Valley

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

Lab Sample ID: LCSD 180-178988/3-A Matrix: Water Analysis Batch: 179123			C	Client Sa	_		o Control pe: Total I Prep Ba	Recove	rable
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Potassium	50000	51700		ug/L		103	85 - 115	2	20
Magnesium	50000	52100		ug/L		104	85 <sub>-</sub> 115	2	20
Sodium	50000	54100		ug/L		108	85 <sub>-</sub> 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

	MB N	MB							
Analyte	Result C	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

 Spike
 LCS
 LCS
 %Rec.

 Analyte
 Added
 Result
 Qualifier
 Unit
 D
 %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

	Sample	Sample	DU	DU				RPD	
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPI	D 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		N		
Hydroxide Alkalinity as CaCO3	ND		ND		mg/L		N	-	
Bicarbonate ion as HCO3	970		973		mg/L			0 20	
Carbonate as CO3	ND		ND		mg/L		N		
Hydroxide as OH	ND		ND		mg/L		NO		

10

### **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	Ртер Туре	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 Total Recoverable	Matrix Water	Method 200.7 Rev 4.4	Prep Batch 178988
180-55632-1 180-55632-1	AT6-277 (MOCK) AT6-277 (MOCK)	Total Recoverable	Water	200.7 Rev 4.4	178988
LCS 180-178988/2-A	Lab Control Sample	Total Recoverable Total Recoverable	Water Water	200.7 Rev 4.4 200.7 Rev 4.4	178988 178988
LCSD 180-178988/3-A MB 180-178988/1-A	Lab Control Sample Dup 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

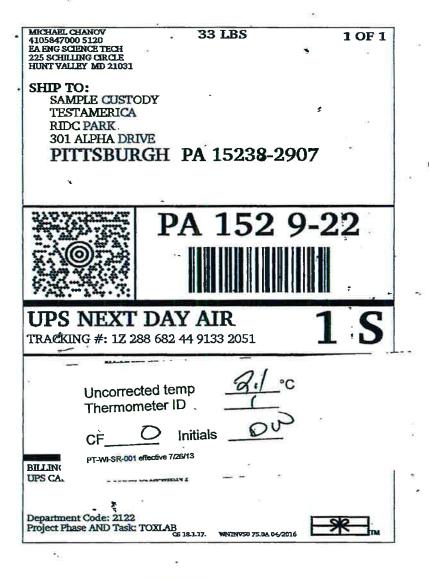
**Chain of Custody Record** 

Test/	A	hei	ic	C
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Phone (412) 963-7058 Fax (412) 963-2468											R.\$0	THE 154005 A.	ilyironnental te	37.75
Client Information	Sampler:		Lab PM: Gambe	er, Carrie	e L			t: 1	Carrier T	racking No(	5):	COC No: 180-30634-690	5.1	-
Client Contact: Mike Chanov	Phone:		E-Mail: carrie.g	E-Mail: carrie.gamber@testamericainc.com							Page: Page 1 of 1			
Company: EA Engineering, Science, and Technology							Analys	is Req	ueste	d		Job#:		
Address: 225 Schilling Circle	Due Date Requested:				TT		ΤŤ	T	T	TT	III	Preservation Co	des:	_
City: Hunt Valley	TAT Requested (days):											A - HCL B - NaOH	M - Hexane N - None	
State, Zip: MD, 21031		+			1					1 1		C - Zn Acetate D - Nitric Acid E - NaHSO4	O - AsNaO2 P - Na2O4S Q - Na2SO3	
Phone: 410-329-5120(Tel)	PO#: Purchase Order Reques	sted			11		3					F - MeOH G - Amchlor	R - Na2S2O3 S - H2SO4	
Email: mchanov@eaest.com	WO#:		F SKIND		7		tru	-				H - Ascorbic Acid	T - TSP Dodecatry U - Acatone V - MCAA	drate
Project Name: Jordan Valley	Project#: 18015970		9,0		th		17	1 1					ii cify)	
Site:	SSOW#:	*			200		3							
		Sample M	latrix	MAN MAN	4.1	4	7 3	11		180-556	2 Chain of		. =	_
	Samp	Type (v	Property, III.	N. N.	1	77	12		1		Z Criani O	Custody		
Sample Identification	Sample Date Time	A	ssue, APAIr) D.	103		*A.359	A	. Salve	Market Sec.	C) on the same		Special I	structions/Note	ii.
AT6-277 (Mack)	6/16/16 1,375	4	V		X			H 2 13		- A See			AUNCHUNI. II	
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				-		1	$\vdash$	++	-		200		<del></del>	
Possible Hazard Identification				Sample	Dispo	sal (A	fee ma	y be as:	sessed	if sample	s are retail	ned longer than 1	month)	_
Non-Hazard Flammable Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unknown	Radiological			etum T	o Clien	nt	Dis	posal E	By Lab	Arc	hive For	Months	
mpty Kit Relinquished by:	Date:			me:	ii isu uci	UOTISTC	Requ	ııı ement		and of String	nent Ca			
elinquished by W.Z.	Date/Tirop:	1600 Comp.	any		eived by	111	100	A	Jan 1		Time (	LAPO	Company	1
elinquished by	Date/Time:	Compa	EA any	Reg		M	W	M	NO.	Date	Time:	70	Company	
elinquished byd	Date/Time:	Сотърс	any	Rece	ived by:					Date	Time:	0:20	Company	
Custody Seals Intact: Custody Seal No.:				Cool	erTempe	rature(s		Other Rem	arks:			7.00	L	
Δ Yes · Δ No														











UPS CampusShip: Shipment Label

### **TestAmerica Pittsburgh**

301 Alpha Drive RIDC Park Pittsburgh, PA 15238

### **Chain of Custody Record**



**TestAmerica** 

Phone (412) 963-7058 Fax (412) 963-2468															THE LEADER IN CI	PEROPHERIAL TESTING
Client Information (Sub Contract Lab)	Sampler:				PM: mber, C	Carrie I				C	Carrier Tracking No(s): COC No: 180-24480:				COC No: 180-244802.1	
Client Contact: Shipping/Receiving Company:	Phone:			E-M car		ber@t	estame	ricainc.c	com						Page: Page 1 of 1	
TestAmerica Laboratories, Inc	012			÷		Analysis Requested						Job#: 180-55632-1				
Address: 17461 Derian Ave, Suite 100,	Due Date Requeste 6/14/2016							П		П					Preservation Cod	es: M - Hexane
City:  rvine State, Zip:	TAT Requested (da	ys):				Н									B - NaOH C - Zn Acetate D - Nitric Acid	N - None O - AsNaO2 P - Na2O4S
CA, 92614-5817 Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO#:														E - NaHSO4 F - MeOH G - Amchlor	Q - Na2SO3 R - Na2S2O3 S - H2SO4
Email:	WO#:				01/10	Ē									H - Ascorbic Acid I - Ice J - DI Water	T - TSP Dodecahydrate U - Acetone V - MCAA
Project Name: Jordan Valley Site:	Project #: 18015970 SSOW#:				Delta (New	Inity all for	ł							omerinan	K - EDTA L - EDA Other:	W - ph 4-5 Z - other (specify)
		-	Sample	Matrix	nod Sur	D) Alkal	-							DBrof		
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Type (C=comp, G=grab) в		(1550) Sales	2320B/ (MOD) Alkalinity all forms			mb 21 2 2 2 2 2	, or soon last				Total Num	Special In	structions/Note:
AT6-277 (MOCK) (180-55632-1)	6/10/16	13:45 Eastern	Preservati	Water		X	e da									
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.1														N.		7.
Possible Hazard Identification Unconfirmed					Sa	mple L	Disposa	Client	e may	be ass	essed it	sampi	es are	retaine	ed longer than 1 i	month)
Deliverable Requested: I, II, IfI, IV, Other (specify)					Spe	ecial Ir	structio	ns/QC	Requin	ements	JOSai By	Lao		Archi	ive i-or	Months
Empty Kit Relinquished by:		Date:			Time:						Method	of Ship	nent F	1	6479 25	14 8248
Relinquished by:	Date/Time: 0/13/16 Date/Time:	(7	00	TAP mpany		Receiv		Ju	Be	me	4	7-0.07	Time:	14/	6 9:30	Company
Relinquished by:	Date/Time;		Co	mpany	- 4	Receiv	ed by:					Date	/Time:			Company
Custody Seals Intact Custody Seal No.: Δ Yes - Δ No				710 July 1	16.Y.5	Cooler	Tempera	ture(s) °C	and Ott	wr Rema	rks ( e	5)	3.8	130	TX-74	
the state of the s	A STATE OF THE PARTY OF THE PAR	CONTRACTOR OF	contention activities	19 9230	G TMHOUN	VS05.39	e in which	C SHAMON P	1000	Man Venezia	1 m	Car State	- 17	120	1 17	CHARLES AND STATE OF THE STATE

Page 15 of 17

### **Login Sample Receipt Checklist**

Client: EA Engineering, Science, and Technology

Job Number: 180-55632-1

List Source: TestAmerica Pittsburgh

Login Number: 55632

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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.</td <td>True</td> <td></td>	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	































































Drw G. Camber

Hunt Valley, Maryland 21031

Authorized for release by: 7/14/2016 3:35:23 PM

carrie.gamber@testamericainc.com

Carrie Gamber, Senior Project Manager

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.

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

TestAmerica Job ID: 180-55633-1 Client Project/Site: Jordan Valley

TestAmerica Pittsburgh

Pittsburgh, PA 15238 Tel: (412)963-7058

225 Schilling Circle

Attn: Mike Chanov

(412)963-2428

301 Alpha Drive RIDC Park

Revision: 1

Suite 400

For:

ANALYTICAL REPORT

EA Engineering, Science, and Technology

LINKS ..... **Review your project** 

Total Access

results through



Ask-Expert



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#### **Case Narrative**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

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.

3

TestAmerica Job ID: 180-55633-1

### **Definitions/Glossary**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

#### Qualifiers

н	PI	C	/IC
п			

Qualifier **Qualifier Description** 

Ħ Sample was prepped or analyzed beyond the specified holding time

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

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.

В Compound was found in the blank and sample.

#### Glossary

Abbreviation	These commonly	used abbreviations may or may not be present in this report.
--------------	----------------	--

D 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.

uthority	Program		EPA Region	Certification ID	Expiration Date
ah	NELAP		8	PA001462015-4	05-31-17
The following analytes	s are included in this report	, but are not certifi	ed under this certifica	tion:	
Analysis Method	Prep Method	Matrix	Analyt		
200.8	200.8	Water	Antimo	ony	
200.8	200.8	Water	Arseni		
200.8	200.8	Water	Berylli	um	
200.8	200.8	Water	Cadmi	ium	
200.8	200.8	Water	Chrom	nium	
200.8	200.8	Water	Coppe	er	
200.8	200.8	Water	Hardn	ess as calcium carbonate	)
200.8	200.8	Water	Iron		
200.8	200.8	Water	Lead		
200.8	200.8	Water	Manga	anese	
200.8	200.8	Water	Nickel		
200.8	200.8	Water	Seleni	ium	
200.8	200.8	Water	Silver		
200.8	200.8	Water	Thalliu	mı	
200.8	200.8	Water	Zinc		
245.1	245.1	Water	Mercu	ıry	
300.0		Water	Fluorio	de	
300.0		Water	Nitrate	e as N	
300.0		Water	Nitrite	as N	
300.0		Water	Ortho	phosphate as P	
SM 2540C		Water	Total	Dissolved Solids	
SM 2540D		Water	Total	Suspended Solids	
SM 4500 CN E	SM 4500 CN C	Water	Cyani	de, 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		06/11/16 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	Cvanide. 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

1

#### **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 Instrume	300.0 nt ID: CHICS2000		25	1 mL		178969	06/13/16 08:19	MJH	TAL PIT
Total/NA	Analysis Instrumer	300.0 nt ID: CHICS2100B		25	1 mL		178994	06/11/16 17:46	MJH	TAL PIT
Total Recoverable	Prep	200.8			50 mL	50 mL	179366	06/16/16 07:21	ANA	TAL PIT
Total Recoverable	Analysis Instrumei	200.8 nt ID: A		10	50 mL	50 mL	181861	07/13/16 20:40	CNF	TAL PIT
Total Recoverable	Prep	200.8			50 mL	50 mL	179366	06/16/16 07:21	ANA	TAL PIT
Total Recoverable	Analysis Instrumer	200.8 nt ID: X		10	50 mL	50 mL	179847	06/21/16 18:31	CNF	TAL PIT
Total Recoverable	Prep	200.8			50 mL	50 mL	179366	06/16/16 07:21	ANA	TAL PIT
Total Recoverable	Analysis Instrumer	200.8 nt ID: X		10	50 mL	50 mL	179986	06/22/16 14:52	CNF	TAL PIT
Total/NA	Prep	245.1			50 mL	50 mL	179534	06/17/16 12:53	RJR	TAL PIT
Total/NA	Analysis Instrumer	245.1 nt ID: K		1	50 mL	50 mL	179692	06/20/16 16:10	RJR	TAL PIT
Total/NA	Analysis Instrumer	SM 2540C nt ID: NOEQUIP		1	2 mL	100 mL	179168	06/14/16 13:11	JWS	TAL PIT
Total/NA	Analysis Instrumer	SM 2540D nt ID: NOEQUIP		1	1000 mL	1000 mL	179061	06/13/16 16:16	JWS	TAL PIT
Γotal/NA	Prep	SM 4500 CN C			50 mL	50 mL	179152	06/14/16 11:45	JAS	TAL PIT
Total/NA	Analysis Instrumer	SM 4500 CN E nt ID: SEAL2		1	50 mL	50 mL	179193	06/14/16 15:04		TAL PIT

#### **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

TestAmerica Pittsburgh

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Client Sample ID: AT6-277 (MOCK)

Date Collected: 06/10/16 13:45

Lab Sample ID: 180-55633-1

Matrix: Water

ne di la con di la con di la Colo		m last							
Method: 300.0 - Anions, Ion Ch Analyte	romatogra Result	pny Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Nitrate as N	ND		2.5	0.54	mg/L			06/11/16 17:46	2
Nitrite as N	ND		1.3	0.70	mg/L			06/11/16 17:46	2
Fluoride	0.88	J	2.5	0.60	mg/L			06/11/16 17:46	2
Orthophosphate as P	ND		13	3.9	mg/L			06/11/16 17:46	2
Orthophosphate as P	ND	Н	13	3.9	mg/L			06/13/16 08:19	2
Method: 200.8 - Metals (ICP/MS	) - Total R	ecoverable							
Analyte	Result	Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fa
Silver	ND		10		ug/L		06/16/16 07:21	06/22/16 14:52	10
Arsenic	7.4	J	10		ug/L		06/16/16 07:21	06/21/16 18:31	10
Beryllium	ND		10	0.36	-		06/16/16 07:21	06/21/16 18:31	10
Cadmium	ND		10	0.74	-		06/16/16 07:21	06/21/16 18:31	10
Chromium	ND		20		ug/L		06/16/16 07:21	06/21/16 18:31	10
Copper	3.2	J	20		ug/L		06/16/16 07:21	07/13/16 20:40	10
Iron	ND		500		ug/L		06/16/16 07:21	06/21/16 18:31	10
Manganese	16	J	50	0.46	•			06/21/16 18:31	10
Nickel	2.2	J	10		ug/L		06/16/16 07:21		10
Lead	ND		10	0.57	ug/L		06/16/16 07:21		11
Antimony	ND		20		ug/L		06/16/16 07:21		1
Selenium	ND		50		ug/L		06/16/16 07:21		1
Thallium	ND		10	0.13	ug/L		06/16/16 07:21		1
Zinc	ND		50		ug/L			06/21/16 18:31	1
Hardness as calcium carbonate	7300	В	33	0.26	mg/L		06/16/16 07:21	06/21/16 18:31	1
Method: 245.1 - Mercury (CVA)	A)	0 -115	ъ.	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Analyte		Qualifier	RL _				06/17/16 12:53		Dilita
Mercury	ND		0.20	0.039	ug/L		00/1//10 12:00	00/20/10 10:10	
General Chemistry	Posult	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Analyte	31000		500	500	mg/L			06/14/16 13:11	-
Total Dissolved Solids			0.50	0.50				06/13/16 16:16	
Total Suspended Solids	<b>1.3</b> ND		0.010	0.0038			06/14/16 11:45		
Cyanide, Total	ND		0.010	0.0000	g/L				

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

#### 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

MB MB

Result Qualifier RL **MDL** Unit Prepared **Analyzed** Dil Fac Orthophosphate as P ND 0.50 0.15 mg/L 06/13/16 07:50

Lab Sample ID: LCS 180-178969/5

Matrix: Water

Orthophosphate as P

Analysis Batch: 178969

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

Spike LCS LCS %Rec. Added Result Qualifier Unit D %Rec Limits 2.50 2.64 mg/L 105 90 - 110

Lab Sample ID: LCSD 180-178969/8

**Matrix: Water** 

Analyte

Analysis Batch: 178969

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

Spike LCSD LCSD %Rec. **RPD** Added Result Qualifier Unit %Rec Limits **RPD** Limit Orthophosphate as P 2.50 2.66 mg/L 106 90 - 110

Lab Sample ID: MB 180-178994/6

**Matrix: Water** 

Analysis Batch: 178994

Client Sample ID: Method Blank

Prep Type: Total/NA

	MB MB							
Analyte	Result Qualit	fier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND	0.10	0.022	mg/L			06/11/16 11:22	
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

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %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 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

	MB MB							
Analyte	Result 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

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Page 10 of 18

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** 

	MB	MB							
Analyte	Result	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	•		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

Analysis Batsin 1755	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Silver	50.0	50.4		ug/L		101	85 - 115	
Arsenic	40.0	41.3		ug/L		103	85 <sub>-</sub> 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** 

Analyte

Mercury

Analyte

Mercury

Analysis Batch: 179692

MB MB Result Qualifier

ND

RL

MDL Unit 0.039 ug/L

Analyzed Prepared

Client Sample ID: Method Blank

Prep Batch: 179534 Dil Fac

Prep Type: Total/NA

06/17/16 12:53 06/20/16 16:05 0.20 Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 180-179534/2-A

**Matrix: Water** 

Analysis Batch: 179692

Spike Added 2.50

LCS LCS Result Qualifier Unit 2.34

D %Rec 93 ug/L

Prep Batch: 179534 %Rec.

Prep Type: Total/NA

Limits 85 - 115

TestAmerica Pittsburgh

7/14/2016

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample Dup

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 180-179534/3-A **Matrix: Water** 

Analysis Batch: 179692

Analyte Mercury

**Spike** Added

2.50

LCSD LCSD

Result Qualifier 2.15

Unit ua/L

D %Rec 86

%Rec. RPD Limits **RPD** Limit 85 - 115 9

Prep Type: Total/NA

Prep Batch: 179534

20

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

Lab Sample ID: MB 180-179168/2

**Matrix: Water** 

**Analysis Batch: 179168** 

MB MB

Analyte Result Qualifier Total Dissolved Solids ND

RL MDL Unit 10 10 mg/L Prepared

Analyzed 06/14/16 13:11

**Prep Type: Total/NA** 

Dil Fac

Lab Sample ID: LCS 180-179168/1

**Matrix: Water** 

Analysis Batch: 179168

Analyte Total Dissolved Solids

Spike Added

596

LCS LCS Result Qualifier 628

Unit mg/L D %Rec Limits 105 80 - 120

Prep Type: Total/NA %Rec.

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

Lab Sample ID: MB 180-179061/2

**Matrix: Water** 

Analysis Batch: 179061

**Total Suspended Solids** 

ND

MB MB

Result Qualifier

RL 0.50 MDL Unit 0.50 mg/L Prepared

Analyzed

Prep Type: Total/NA

Dil Fac

Lab Sample ID: LCS 180-179061/1

**Matrix: Water** 

Analysis Batch: 179061

Analyte Total Suspended Solids

Spike

Added

49.0

LCS LCS

44.0

Result Qualifier

mg/L

06/13/16 16:16

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

Client Sample ID: Method Blank

%Rec. Unit D

%Rec Limits 90 80 - 120

Method: SM 4500 CN E - Cyanide, Total

Lab Sample ID: MB 180-179152/4-A

**Matrix: Water** 

Analyte

Cyanide, Total

Analysis Batch: 179193

MB MB

Result Qualifier ND

RL 0.010

MDL Unit 0.0038 mg/L Prepared

Analyzed 06/14/16 11:45 06/14/16 14:23

Prep Type: Total/NA

Client Sample ID: Method Blank

**Prep Batch: 179152** Dil Fac

TestAmerica Pittsburgh

### **QC Sample Results**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

Cyanide, Total

TestAmerica Job ID: 180-55633-1

99

90 - 110

Method: SM 4500	CNE-C	yanide, Total	(Continued)
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Lab Sample ID: HLCS 180-179152/2-A Matrix: Water Analysis Batch: 179193	Spike	HLCS	HLCS	Clie	nt Sar	nple ID	: Lab Control Sample Prep Type: Total/NA Prep Batch: 179152 %Rec.
Analyte	Added	Result	Qualifier	Unit	D	%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	Spike	LCS	LCS	Clie	nt Saı	nple ID	: Lab Control Sample Prep Type: Total/NA Prep Batch: 179152 %Rec.
Analyte	Added	Result	Qualifier	Unit	D	%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				Clie	nt Sai	mple ID	: Lab Control Sample Prep Type: Total/NA Prep Batch: 179152
•	Spike		LLCS		_		%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits

0.0500

0.0495

mg/L

## **QC Association Summary**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Ana	lysis	Batch:	178969
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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**

L	_ab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
1	180-55633-1	AT6-277 (MOCK)	Total Recoverable	Water	200.8	
L	_CS 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	- 1106 201011
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
d	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

TestAmerica Pittsburgh

### **QC Association Summary**

Client: EA Engineering, Science, and Technology

Project/Site: Jordan Valley

TestAmerica Job ID: 180-55633-1

Genera	Chemi	stry
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Ana	lysis	Batch:	179061
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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	I otal/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**



Carrier Tracking No(s): Client Information Gamber, Carrie L 180-30634-6905.1 Client Contact: Phone: Page: Mike Chanov carrie.gamber@testamericainc.com Page 1 of 1 Job #. EA Engineering, Science, and Technology **Analysis Requested** Address: Due Date Requested: Preservation Codes: 225 Schilling Circle A-HCL TAT Requested (days): B - NaOH N - None Hunt Valley C - Zn Acetate O - AsNaO2 State, Zip: D - Nitric Acid P - Na2O4S MD, 21031 E - NaHSO4 Q - Na2SO3 R - Na2S2O3 F - MeOH Phone: G - Amchior S-H2SO4 410-329-5120(Tel) Purchase Order Requested T - TSP Dodecahydrate H - Ascorbic Acid U - Acetone mchanov@eaest.com Project Name: Project #. Jordan Valley cify) 18015970 SSOW#: Matrix Sample Type (C=comp, Sample Sample Identification Sample Date Time G=grab) Special Instructions/Note: Preservation Code 6/16/16 4T6-277 Possible Hazard Identification Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client

Disposal By Lab

Archive For \_\_\_\_\_\_\_Month Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological Archive For Deliverable Requested: I, II, III, IV, Other (specify) Special Instructions/QC Requirements: Empty Kit Relinquished by: Time: Company EA 1100 Company Custody Seals Intact: Custody Seal No.: Cooler Temperature(s) \*C and Other Remarks: A Yes A No



MICHAEL CHANOV 4105847000 5120 EA ENG SCIENCE TECH

225 SCHILLING CIRCLE HUNT VALLEY MD 21031

SHIP TO:

SAMPLE CUSTODY **TESTAMERICA** RIDC PARK 301 ALPHA DRIVE

**PITTSBURGH PA 15238-2907** 

33 LBS



PA 152 9-22



**UPS NEXT DAY AIR** 

TRACKING #: 1Z 288 682 44 9133 2051

1 OF 1

Uncorrected temp Thermometer ID

PT-WI-SR-001 effective 7/26/13

BILLING UPS CA.

Department Code: 2122
Project Phase AND Task: TOXLAB
CS 18.1.17. WNINVSO 75.04 04/2016





**UPS CampusShip: Shipment Label** 

### **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.</td <td>True</td> <td></td>	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

Clie	ent:	Project Number:	70005:15
Aut	hor. Michael Chana	EA Report Number	7347
-	REPORT	CHECKLIST	
	QA/QC ITEM	REVIEWER	DATE
1.	Samples collected, transported, and received according to study plan requirements.	MICE	6/22/14
2.	Samples prepared and processed according to study plan requirements.	MKCE	6/22/11
3.	Data collected using calibrated instruments and equipment.	MKOZ	6/22/14
4.	Calculations checked: - Hand calculations checked	MKC	6/22/11
	<ul> <li>Documented and verified statistical procedure used.</li> </ul>	m/K C	6/22/14
5.	Data input/statistical analyses complete and correct.		7/7/16
6.	Reported results and facts checked against original sources.	Milling	7/16
7.	Data presented in figures and tables correct and in agreement with text.	MAM SA	7/7/16
8.	Results reviewed for compliance with study plan requirements.	MKCZ	6/22/16
	Alexander and the second secon	AUTHOR	DATE
9.	Commentary reviewed and resolved.	Mes	7/12/14
10.	All study plan and quality assurance/control require approved:	ements have been met and th	ne report is
	approvoe.	MULL	7/12/16
		PROJECT MANAGER	DATE
		[[]][[]][][]	7/1/16
	,	QUALITY CONTROL OFFICER	DATE
		SENIOR TECHNICAL REVIEW	ZER DATE