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ANNUAL REPORTS

Wasserhund Inc.

P.O. Box 2140 575-396-0522 FAX 575-396-0797 Lovington, New Mexico 88260

ANNUAL CLASS III WELL REPORT FOR 2014

Wasserhund Inc.

Tatum Brine Station

OCD Permit BW-22

Expiration Date: Nov 08, 2018

API No. 30-025-28162 Watson #1

Unit Letter M-Section 20-Ts 12s – R 35e

May 30, 2015

Submitted By: Price LLC on behalf of Wasserhund Inc Principals Mr. Larry and Jon Gandy.

May Sur

Wayne Price-LLC

Larry Gandy

Jan

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Wayne Price-LLC

Larry Gandy

Jon Gandy

Bullet Point 2- Summary of Operations:

(Permit Condition 2.J.2 Annual Report: "Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of C-103.") Permit Expiration Date November 08, 2018.

During the 2014 year, there was no major or remedial work performed on the brine well. Due to brine quality issues experienced during the past two years, Wasserhund Inc. submitted a C-103 to OCD in late December of 2012 to investigate why the well is not producing high quality brine water. (C-103 included in *Appendix "A"*)

Due to the demand for cut-brine, Wasserhund Inc. decided to forego any well work during the 2014 calendar year.

The OCD held a Brine Well Operator's meeting, in Hobbs on September 05, 2012 to discuss permit changes. The most notable change by OCD was the removing of the annual pressure test requirement, and went to a 5-year requirement allowing the "Open-to-Formation" test, and a successful test was performed in September of 2013 (Copy attached in Appendix "D"). The next scheduled 5-year test will be due in 2018.

The brine well was drilled in 1983 and has been in operation for approximately 31 years and is sited on the west side of Tatum, NM, just north of highway 380. The well is producing out of the Salado "Salt Formation" at a depth of approximately 2200-2850 feet below surface.

A copy of the most recent OCD approved Discharge Plan BW-22 and aerial photo is included for reference in *Appendix "A"*.

The brine well has been producing for a number of years and may possibly be considered approaching an "end of life" scenario due to its age. This scenario is not due to a safety aspect. i.e. collapse, since the well has been a relative low producer and the size of the cavity is quite small compared to similar wells of age. **Bullet Point 10** (Brine Cavity/Subsidence Information) below discusses the safety aspects of this well in detail.

As with most brine wells of this age, repeated required annual testing which flexes the cavern support, thus causing flexure stress cracking and the required reverse flow issue, has caused these older wells to have pre-mature down-hole problems, such as "sloughing" of the salt-anhydrite layers damaging the tubing and making re-entry virtually impossible and extremely expensive.

As will be discussed in **Bullet Point 5** (Chemical Analysis) ever since the last open-hole formation-test, the well has not been able to produce 10# brine, either with reverse or conventional flow. In addition, an off color brine water has been noted from time to time.

General housekeeping was routinely performed and on-site training and inspections were conducted for awareness of the permit conditions. The brine tanks currently do not have secondary containment and Wasserhund Inc respectfully requests a waiver of those conditions unless unusual operating conditions warrant such.

A Pro-active well "Area of Review" has being conducted and will continue to ensure the safety of the well system, including cavern subsidence monitoring as required or directed by OCD.

A yearly cavity size calculation and evaluation of the last sonar test has been conducted to determine cavern stability and is discussed further in **Bullet Point 10** below.

Depending upon OCD requirements and local economics, Wasserhund Inc. will have to evaluate whether future operations of this well is warranted as a concentrated brine producing well.

Bullet Point 3- Production Volumes:

(Permit condition 2.J.3 "Monthly fluid injection and brine production volume, including the cumulative total carried over each year"

Sales tickets and flow meters are used to monitor both water injected and brine produced.

Monthly, Yearly and Lifetime Injection and Production Volumes:

The monthly, yearly and lifetime fresh water injection and brine production volumes are attached herein for review. The total 2014 brine production volume was 11,042 bbls and the lifetime production volume is 2,712,147 bbls.

Enclosed in **Appendix "B"** is the injection and production and a comparison chart of injected water to produced water with comments.

Bullet Point 4- "Injection Pressure Data."

(Permit condition 2.J.4 "Injection Pressure Data"

Maximum and Average Injection Pressure: Maximum and Average Injection Pressure:

The maximum operating injection pressure is approximately 380 psig, which is approximately the recommended maximum surface pressure of 380 psig, utilizing a .70 psi/ft brine well gradient, measured from the top to the casing shoe.

The average injection pressure as noted by Wasserhund Inc.'s personnel is approximately 260 psig. This reading is taken from a pressure gauge mounted on the pump outlet.

Bullet Point 5- Chemical Analysis:

(Permit condition 2.J.5 "A copy of the quarterly chemical analysis shall be included with data summary and all QA/QC information.")

Please find attached in *Appendix "C"* the chemical analysis and chain-of-custody of the brine and fresh water injection water samples collected and analyzed by Trace Analysis in Lubbock, Texas, for the 2014 year. The sampling process and laboratory used common approved EPA methods to collect, analyze and reporting.

The injection water was collected from the fresh water tank load line that is connected directly to the fresh water storage tanks. The fresh water is supplied by a fresh-water well located just north of the site.

The brine water was collected from the brine water tank load line that is connected directly to the brine water storage tanks. This sample point is representative of the brine water at the station.

The specific gravity of the brine water was noted to be a good 10# brine in the first half of the year. Production actually picked up in the second half of the year and the specific gravity (Density) fell back to a very low of 1.03 or 8.58 #/gal. As previously reported, from time to time, an off red color of the produced brine has been noted, possibly caused by injected fresh water interacting with the upper Salado/Rustler formation where the salt has been dissolved.

Wasserhund Inc., will continue to monitor the density-quality issue and will report to OCD once the system recovers, or if for some reason it doesn't recover, then some remedial action may be taken, including the possibility of plugging the well, reversing the flow, or deepening the well.

Bullet Point 6- Mechanical Integrity:

(Permit condition 2.J.6 "Copy of any mechanical integrity test chart, including the type of test, i.e., duration, gauge pressure, etc;")

A Mechanical Integrity Test (MIT) was successfully ran and passed on September 09, 2013. The next scheduled MIT will occur in 2018 as approved by OCD.

Please find in *Appendix "D"* a copy of the test chart and meter calibration record.

Bullet Point 7- Deviations from Normal Production Methods:

(Permit condition 2.J.7 "Brief explanation describing deviations from normal operations.")

In 2008 two OCD permitted brine wells collapsed. As a result of those incidents, the OCD issued a temporary moratorium on new brine well permits. During the moratorium OCD facilitated a work group to determine a proper path forward for current and new brine well operations.

As a result of those proceedings, OCD issued instructions to operators to change OCD's previous requirement of injecting fresh water down the annuals and producing brine up the tubing (i.e reverse-flow); to injecting fresh water down the tubing and producing brine up the annuals, (i.e. conventional-flow).

Wasserhund Inc. has been successful in changing the flow pattern to conventional flow, but due to some down-hole geological-physical characteristics, is only able to make a cut-brine ranging in density of 1.20 to 1.03 lb/gal.

Bullet Point 8- Leak and Spill Reports:

(Permit condition 2.J.8 "Results of any leaks and spill reports;")

There were no reportable leaks and spills in 2014.

The loading areas have spill containers under the hose connections, which are designed to catch de-minimis drips from hose connections. Drivers routinely suck out the spill containers, for re-cycling.

The entire facility is bermed to prevent run-on or run-off and all reportable or nonreportable spills are cleaned up pursuant to OCD rules and guidance.

Bullet Point 9- Area of Review Update Summary:

(Permit condition 2.J.9 "An Area of Review (AOR) update summary;")

An extensive AOR review was conducted for the Quality Watson #1 brine well, OCD permit # BW-22, located in UL M of Section 20-Ts12S-R36E. Wasserhund Inc used OCD records and field verification to confirm wells in the AOR.

Using OCD on-line files and actual on-site field verification, a well status list and AOR plot plan was constructed (*see Appendix "E"*) listing all wells within adjacent quarter sections of the BW-22 location. The list shows API#, Operator well name, UL, Section, Township and Range, footages, Wells within 660 ft and ¼ mile, casing program status, casing/ cementing status, and corrective action required status.

In the 2014 review, there were no new wells added to the list. *Appendix "E"* contains the check-off list showing the OCD wells in all adjacent quarter sections surrounding the BW-22 brine well.

This method was formulated to provide a baseline for future AOR studies. Since brine wells are limited in size, a critical AOR of 660 feet was initially established and all wells within that radius was researched in detail.

Using the current estimated diameter of the brine well i.e. 123.0 ft (r= 61.5 ft) up-dated for 2014, a 10:1 safety factor is applied that equates to about 615 ft. As the brine well grows, this newly calculated critical AOR will be expanded and new wells will be added and all existing wells restudied.

The rational behind this approach is the fact that brine wells are non-static in terms of size and configuration, and the fact that the brine well operator has only indirect control on wells drilled in close proximity.

Initially focusing on the current wells in the ¼ mile AOR, and assuming the status of these wells remain the same, may be a mistake. Therefore, a more dynamic approach is being undertaken, and each well in the critical Area of Review (AOR) will be looked at on an annual basis, or whenever any planned activity or new wells are noticed in the AOR.

The critical zone was investigated by checking the OCD on-line well records. There was no well activity in the AOR.

Bullet Point 10- Subsidence/Cavern Volumes/Geometric Measurements

<u>(Permit condition 2.J.10. "A summary with interpretations of MIT's, surface</u> subsidence surveys, cavern volume and geometric measurements with conclusion(s) and recommendation(s);")

Since the use of sonar tests in other wells has not provided adequate information, the continued use of sonar may be in question until the validity of using sonar test is resolved.

The last cavern survey (2008) for this well did provide some useful information pertaining to the size and shape of this particular cavern, but at a very limited depth. An alternate method has been discussed with Jim Griswold-OCD and it was mutually decided that an estimated worst-case diameter is to be determined in order to provide maximum protection and ensure the permit conditions are being met.

The Solution Mining Research Institute (SMRI), other state agencies, OCD work-group, along with various studies conducted during the permitting of the WIPP site, has concluded that failures, such as "catastrophic collapses", have a higher probability when the roof diameter of the cavern exceeds a certain value compared to the actual depth of the cavern.

This number is typically called D/H where "D" is the diameter of the cavity and "H" is the depth from surface to the casing shoe. Various reports seem to conclude that when a ratio of D/H reaches or exceeds .66 then the probably of collapse increases to a point that the well may be considered un-safe, thus closing procedures such as proper plugging and abandonment, and possible long term subsidence monitoring should be instituted.

The alternate method mentioned above involves calculating the maximum diameter of the cavern by using a worst-case scenario of an "*upright cone*". The volume of the cavern is calculated using the lifetime brine production volumes and using a "*rule of thumb*" conversion factor to determine the volumetric size of the cavern. The rule of thumb conversion factor was taken from the 1982 Wilson Report and equates that every barrel of brine produced will create approximately one cubic foot of cavity.

Please find attached in **Appendix "F"**, a wellbore sketch, and the calculations for the brine well, and the lifetime brine production tally of approximately 2.712 million barrels of brine produced as of December 2014. The maximum diameter was calculated to be approximately 123.0 feet with a corresponding D/H ratio of .057 updated for the 2014 year.

While the sonar failed to provide information deeper in the cavern, it did show with some degree of accuracy, that the upper portion of the cavern had a maximum centerline radius of approximately 60 feet with a corresponding diameter of approximately 110 feet over all, which correlates with the worst case calculated value. Attached in **Appendix "F"** is a copy of the MaxPlot of the last sonar test showing the sonar results.

Comparing the current D/H ratio of .057 to the .66 value mentioned above, it can be concluded that the current brine well status meets and exceeds the recommended safety value by over 11.5 times.

Included in *Appendix "F"* is an aerial view showing the 61.5-foot radius superimposed around the brine well and station.

Permit Condition 2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective data of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring

point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well. If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

<u>Special Request: This facility currently does not have subsidence monitors installed</u> <u>and Wasserhund Inc. respectfully request waiver of this requirement until further</u> <u>evaluation can be completed or closure of the site commences.</u>

However, in order to meet the new permit requirements, Wasserhund Inc. hereby submits a subsidence monitoring plan pursuant to Permit Condition 2.B. "Solution Cavern Monitoring Plan Program". A copy of the proposal is included in *Appendix "G"* for OCD review and approval.

<u>Special Request: Wasserhund Inc. request a Minor Modifications that</u> <u>allows the results be supplied in the annual report, unless there is an</u> <u>exceedance as noted in the permit.</u>

2. Solution Cavern Characterization Program: The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.

<u>Solution Cavern Characterization Plan:</u> Wasserhund Inc. hereby proposes to use a combination of calculated results as determined above, and will experiment with various geophysical methods, including actually performing an "Induced Current Method" and report these results in the next annual report.

The 'Induced Current' Method has not been successful, primarily to bad connections and low voltage used. Wasserhund will continue trying this method and others as approved by OCD. The old fashion cavern calculation continues to be the best economic method available.

Bullet Point #11- Ratio of Injected/Produced Fluids

(Permit condition 2.J.11 "A summary of the ratio of the volume of injected fluids to the volume of produced brine;")

See Bullet Point #3 and Appendix "B" for comparison chart numbers.

Special Note: **Key requests a minor modification of the permit requirement 3.K** *"The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours."*

Dear Jim Giswold-NMOCD Environmental Bureau Chief: As you know, this topic has been discussed and kicked around for a long time. The current permit requirement does not take into account many factors that can cause the variance to be under or over the requirement of 110%-120%. Every year we report this number in the annual report and while the average monthly injection for the year is normally within range, the actual monthly numbers can and are sometimes under and over. There are many reasons for this as we have discussed, and thus the requirement to suspend operations is not based on any real parameter or trend that may be an immediate threat to the well, groundwater or the environment. The current requirement put operators in a continuous violation and interruption of operations. Notwithstanding, if you have a well that takes water without producing, or starts to pressure up, then you know you may have lost circulation or communicated to a pressure zone, then immediate action should be taken and notification to the agency. Currently the permit reads as follows:

The Permittee shall immediately suspend injection and notify the agency within 72 hours, if the Fresh Water Injection does not cause a normal immediate return of Brine Water to the surface, or if the well flows excessively for an unusual amount of time without fresh water injection after the cavern pressure has been stabilized to it's normal operating pressure, or if permittee has become aware of any out of zone injection or communication. The Permittee shall include in each annual report a summary showing the monthly variance, the average monthly variance for the year and the total accumulative variance over the life of the well. The operator shall certify and explain that any yearly variance that falls outside of the range of 20%, (Difference between the Fresh Water input and Brine Water output) will not cause harm to Fresh Water, Public Health or the Environment.

Bullet Point #12- Summary of Activities

(Permit condition 2.J.12 "A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;)

See Bullet Point #2 for summary.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

Appendix "H" contains a third party closure estimate for the Wasserhund Inc. BW-22 brine well.

Bullet Point #13- Annual Certification

(Permit condition 2.J.13 "Annual Certification in accordance with Permit Condition 2.B.3. **"2.B.3. Annual Certification:** The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.")

Operator Response: Based on all current information and actual on-site observance, the operator of record herby certifies that the current operations pose no threat to public health and the environment at the submission of this report. If any substantial event that, has or may cause, this current certification to change, then the operator will notify OCD and take the necessary actions to protect the public and environment.

By signing the cover sheet of Bullet Point 1 of permit condition 2.J.1, the operator herby certifies this condition of the permit.

Bullet Point 14- Groundwater Monitoring:

(Permit condition 2.J.14 "A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken;")

The BW-22 facility does not have groundwater monitoring at this site. There are no planned or intentional discharges of water contaminants that may move directly or indirectly into groundwater. Any unintentional discharge, leak, spill, or drip is handled pursuant to the permit conditions.

Bullet Point 15- Annual Reporting

(Permit condition 2.J.15 "The Permittee shall file its Annual Report in an electronic format with a hard copy submitted to OCD's Environmental Bureau.")

The operator herby submits a PDF file on flash drive and one hard copy.

Appendix "A"

- C-103
- Aerial Photo
- Discharge Plan BW-22

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BW-22

Wasserhund/Tatum Watson #1

Permit Renewal 11/8/13

Susana Martinez Governor

David Martin Cabinet Secretary

Brett F. Woods, Ph.D. Deputy Cabinet Secretary

November 8, 2013

Larry Gandy Wasserhund, Inc. PO Box 827 Tatum, New Mexico 88267

RE: Renewal of Discharge Permit BW-22 for the Watson #1 Brine Well in Unit M of Section 20, Township 12 South, Range 36 East NMPM; Lea County, New Mexico

Dear Mr. Gandy,

Pursuant to all applicable parts of the Water Quality Control Commission regulations 20.6.2 NMAC and more specifically 20.6.2.3104 thru.3999 discharge permit, and 20.6.2.5000 thru .5299 Underground Injection Control, the Oil Conservation Division hereby renews the discharge permit and authorizes operation and injection for the Wasserhund, Inc. (owner/operator) brine well BW-22 (API# 30-025-28162) at the location described above and under the conditions specified in the attached Discharge Permit Approval Conditions.

Be advised that approval of this permit does not relieve the owner/operator of responsibility should operations result in pollution of surface water, groundwater, or the environment. Nor does this permit relieve the owner/operator of any responsibility or consequences associated with subsidence or cavern failure. This permit does not relieve the owner/operator of its responsibility to comply with any other applicable governmental rules or regulations.

If you have any questions, please contact Jim Griswold of my staff at (505) 476-3465 or by email at *jim.griswold@state.nm.us*. On behalf of the Oil Conservation Division, I wish to thank you and your staff for your cooperation and patience during this renewal application review.

Respectfully,

Jami Bailey Director

JB/JG/jg Attachment – Discharge Permit Approval Conditions Jami Bailey Division Director Oil Conservation Division



DISCHARGE PERMIT BW-22

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department renews Discharge Permit BW-22 (Discharge Permit) to Wasserhund, Inc. (Permittee) to operate its Underground Injection Control (UIC) Class III well for the in situ extraction of salt (Watson #1 - API No. 30-025-28162) located 593 feet FSL and 639 feet FWL (SW/4 SW/4, Unit Letter M) in Section 20, Township 12 South, Range 36 East, NMPM, Lea County, New Mexico at its Brine Production Facility (Facility). The Facility is located within Tatum, New Mexico to the north of US 380.

The Permittee is permitted to inject water into the subsurface salt layers and produce brine for use in the oil and gas industry. Ground water that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 30 feet below ground surface and has a total dissolved solids concentration of approximately 700 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class III wells associated with the oil and gas industry (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class III well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or onsite disposal of, any materials, product, by-product, or oil-field waste.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.

2. The injection of fluids into a large capacity cesspool is prohibited.

3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.

4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

WASSERHUND, INC. WATSON #1

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health, (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified of 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class III wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT RENEWAL: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required \$100.00 filing fee. The Permittee is now required to submit the \$1,700.00 permit fee for a Class III well. Please remit payment made payable to the Water Quality Management Fund in care of OCD at 1220 South St. Francis Drive in Santa Fe, New Mexico 87505.

EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND 1.F. **PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT:** This Discharge Permit becomes effective 30 days from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on November 8, **2018.** The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD 1.G. Director and OCD's Environmental Bureau of any Facility expansion or process modification (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class III well that was approved pursuant to the requirements of 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

- Noncompliance by Permittee with any condition of this Discharge Permit; a.

or,

The Permittee's failure in the discharge permit application or during the b. discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

A determination that the permitted activity may cause a hazard to public c. health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.51011 NMAC; and, 20.6.2.3109E NMAC).

This Discharge Permit may also be modified or terminated for any of the 2. following causes:

Violation of any provisions of the Water Quality Act or any applicable a. regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS III WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class III well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class III well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and,

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class III well discharge permit upon taking possession of the facility; and

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS III WELLS: The

Permittee may use either or both fresh water or water from otherwise non-potable sources. Pursuant to 20.6.2.5207C, the Permittee shall provide analysis of the injected fluids at least quarterly to yield data representative of their characteristics. The Permittee shall analyze the injected fluids for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids; and,
- chloride concentration.

The Permittee shall also provide analysis of the produced brine on a quarterly basis. The Permittee shall analyze the produced brine for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids;
- chloride concentration; and,
- sodium concentration.

2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective data of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well . If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

2. Solution Cavern Characterization Program: The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.

- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation, other);
- Proposed date of well closure;
- Name of Preparer; and,
- Date.

2.E. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class III well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.F RECORD KEEPING: The Permittee shall maintain records of all inspections, surveys, investigations, *etc.*, required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.G. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. **Oral Notification:** As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;
- The date, time, location, and duration of the discharge;
- The source and cause of discharge;
- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and,

• Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. Written Notification: Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.H. OTHER REQUIREMENTS:

1. Inspection and Entry: Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any injection fluid or produced brine; and,
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. Advance Notice: The Permittee shall provide OCD's Environmental Bureau and Hobbs District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class III well.

3. Environmental Monitoring: The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, and laboratory QA/QC.

2.I. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated with plugging and abandonment of the Class III well, surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a

non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required hereinabove.

2.J. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by **June 1**st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class III Well Report, Name of Permittee, Discharge Permit Number, API number of well(s), date of report, and person submitting report;
- Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103;
- Monthly fluid injection and brine production volume, including the cumulative total carried over each year;
- Injection pressure data;
- A copy of the quarterly chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart, including the type of test, *i.e.*, duration, gauge pressure, etc.;
- Brief explanation describing deviations from the normal operations;
- Results of any leaks and spill reports;
- An Area of Review (AOR) update summary;
- A summary with interpretation of MITs, surface subsidence surveys, cavern volume and geometry measurements with conclusion(s) and recommendation(s);
- A summary of the ratio of the volume of injected fluids to the volume of produced brine;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Annual Certification in accordance with Permit Condition 2.B.3.
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and,
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

Director may require for good cause during the life of the well. The Permittee shall demonstrate mechanical integrity for its Class III well every time it performs a well workover, including when it pulls the tubing. A Class III well has mechanical integrity if there is no detectable leak in the casing or tubing which OCD considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone through the well bore or vertical channels adjacent to the well bore which the OCD Director considers to be significant. The Permittee shall conduct a casing Mechanical Integrity Test (MIT) from the surface to the approved injection depth to assess casing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 300 psig measured at the surface.

The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

- 2. The following criteria will determine if the Class III well has passed the MIT:
 - **a.** Passes MIT if zero bleed-off during the test;

b. Passes MIT if final test pressure is within $\pm 10\%$ of starting pressure, if approved by OCD;

c. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

3.E. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's District Office in Hobbs and the Environmental Bureau in Santa Fe prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Hobbs District Office. Properly completed Forms C-103 and/or C-105 must be filed with OCD upon completion of workover activities and copies included in that year's Annual Report.

3.K. FLUIDS INJECTION AND BRINE PRODUCTION VOLUMES AND

PRESSURES: The Permittee shall continuously monitor the volumes of water injected and brine production . The Permittee shall submit monthly reports of its injection and production volumes on or before the 10th day of the following month. The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours.

3.L. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class III well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc.*) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

5.C. **SURFACE SUBSIDENCE MONITORING PLAN:** The Permittee shall submit the Surface Subsidence Monitoring Plan required in accordance with Permit Condition 2.B.1 within 180 days of permit issuance.

5.D. SOLUTION CAVERN CHARACTERIZATION PLAN: The Permittee shall submit the Solution Cavern Characterization Plan required in accordance with Permit Condition 2.B.2 within 180 days of permit issuance.

Appendix "B"

• Injection and Production Volumes/Comparison Charts



Appendix "C"

- Chemical Analysis Fresh Water
- Chemical Analysis Brine Water

Summary Report

Wayne Price Wasserhund Inc. P.O. Box 2140 Lovington, NM 88260

Report Date: April 23, 2014

Work Order: 14040811

Project Location:Buckeye(BW-4) Tatum (BW-22)Project Name:Annual ReportProject Number:BW-4 & BW-22

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
359859	BW-4 Fresh	water	2014-04-04	11:43	2014-04-08
359860	BW-4 Brine	water	2014-04-04	11:40	2014-04-08
359861	BW-22 Fresh	water	2014-04-04	14:45	2014-04-08
359862	BW-22 Brine	water	2014-04-04	14:49	2014-04-08

Sample: 359859 - BW-4 Fresh

Param	Flag	Result	Units	RL
Chloride		399	m mg/L	2.5
pH		7.77	s.u.	2
Specific Gravity		1.00	g/ml	
Total Dissolved Solids		1000	$\mathrm{mg/L}$	2.5

Sample: 359860 - BW-4 Brine

Param	Flag	Result	Units	RL
Chloride		219000	mg/L	2.5
Dissolved Sodium		101000	m mg/L	1
pН		6.99	s.u.	2
Specific Gravity		1.19	g/ml	
Total Dissolved Solids		132000	mg/L	2.5

Sample: 359861 - BW-22 Fresh

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: April 23, 2014	Wo	Work Order: 14040811		Page Number: 2 of 2	
Param	Flag	Result	Units	RL	
Chloride		406	mg/L	2.5	
pН		7.99	s.u.	2	
Specific Gravity		0.996	g/ml		
Total Dissolved Solids		1240	mg/L	2.5	

Sample: 359862 - BW-22 Brine

Param	Flag	Result	Units	RL
Chloride		19300	m mg/L	2.5
Dissolved Sodium		10400	m mg/L	1
pH		6.41	s.u.	2
Specific Gravity		1.03	g/ml	
Total Dissolved Solids		31900	m mg/L	2.5



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Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Wayne Price Wasserhund Inc. P.O. Box 2140 Lovington, NM, 88260

Report Date: April 23, 2014

Work Order: 14040811

Project Location: Buckeye(BW-4) Tatum (BW-22) **Project** Name: Annual Report Project Number: BW-4 & BW-22

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
359859	BW-4 Fresh	water	2014-04-04	11:43	2014-04-08
359860	BW-4 Brine	water	2014-04-04	11:40	2014-04-08
359861	BW-22 Fresh	water	2014-04-04	14:45	2014-04-08
359862	BW-22 Brine	water	2014-04-04	14:49	2014-04-08

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 18 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Leftur

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

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QC Batch 111053 - Method Blank (1)	9 9 9 10 10 10
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Laboratory Control Spikes I QC Batch 111195 - LCS (1) I QC Batch 111321 - LCS (1) I QC Batch 111322 - LCS (1) I QC Batch 111398 - LCS (1) I QC Batch 111321 - MS (1) I QC Batch 111322 - MS (1) I QC Batch 111328 - MS (1) I QC Batch 111398 - MS (1) I QC Batch 111398 - MS (1) I	-2 12 12 13 13 13
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Case Narrative

Samples for project Annual Report were received by TraceAnalysis, Inc. on 2014-04-08 and assigned to work order 14040811. Samples for work order 14040811 were received intact at a temperature of 2.9 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	94115	2014-04-10 at 16:00	111321	2014-04-10 at 17:33
Chloride (IC)	E 300.0	94116	2014-04-10 at $16:00$	111322	2014-04-10 at $17:33$
Na, Dissolved	S 6010C	94164	2014-04-22 at $18:51$	111398	2014-04-23 at $11:10$
pН	SM 4500-H+	93825	2014-04-08 at $13:44$	110975	2014-04-08 at $13:45$
Specific Gravity	ASTM D1429-95	93887	2014-04-10 at $09:20$	111053	2014-04-10 at $09:45$
TDS	SM 2540C	94005	2014-04-09 at $16:00$	111195	2014-04-09 at $16:00$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14040811 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.
Analytical Report

Sample: 359859 - BW-4 Fresh

Laboratory:	Lubbock						
Analysis:	Chloride (IC)		Analytical	Method:	E 300.0	Prep Method:	N/A
QC Batch:	111321		Date Analy	vzed:	2014-04-10	Analyzed By:	RL
Prep Batch:	94115		Sample Pre	eparation:	2014-04-10	Prepared By:	RL
				RL	1		
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1	399	mg/L	10	2.50

Sample: 359859 - BW-4 Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 110975 93825		Analytical Method: Date Analyzed: Sample Preparation	: SM 4500-1 2014-04-08 n: 2014-04-08	H+ 8 8	Prep Method: Analyzed By: Prepared By:	N/A AT AT
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			1	7.77	s.u.	1	2.00

Sample: 359859 - BW-4 Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Specific Gravity 111053 93887		Analytical Method: Date Analyzed: Sample Preparation:	ASTM I 2014-04- 2014-04-	D1429-95 10 10	Prep Method: Analyzed By: Prepared By:	$_{ m CF}^{ m N/A}$
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Specific Grav	ity			1.00	m g/ml	1	0.00

Sample: 359859 - BW-4 Fresh

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	111195	Date Analyzed:	2014-04-09	Analyzed By:	RL
Prep Batch:	94005	Sample Preparation:	2014-04-09	Prepared By:	RL

Report Date: April 23, 2014 BW-4 & BW-22	W	ork Order: 140 Annual Repo	040811 ort	Page Number: 5 of 1 Buckeye(BW-4) Tatum (BW-2		
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1	1000	$\mathrm{mg/L}$	20	2.50

Sample: 359860 - BW-4 Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 111321 94115		Analytical I Date Analy Sample Pre	Method: E zed: 2 paration: 2	E 300.0 1014-04-10 1014-04-10	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1	219000	mg/L	5000	2.50

Sample: 359860 - BW-4 Brine

Laboratory:	Lubbock						
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
QC Batch:	111398		Date Analyzed:	2014-04-23		Analyzed By:	LM
Prep Batch:	94164		Sample Preparation:	2014-04-22		Prepared By:	PM
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Sod	lium		1	101000	$\mathrm{mg/L}$	100	1.00

Sample: 359860 - BW-4 Brine

pH			1	6.99	s.u.	1	2.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	93825		Sample Prepara	tion: 2014-04-0	18	Prepared By:	AT
QC Batch:	110975		Date Analyzed:	2014-04-0	18	Analyzed By:	AT
Laboratory: Analysis:	Lubbock pH		Analytical Meth	od: SM 4500-	H+	Prep Method:	N/A

Report Date BW-4 & BW	e: April 23, 2014 V-22		Work Order: 140 Annual Repo	040811 ort	Buch	Page Number: 6 of 18 Buckeye(BW-4) Tatum (BW-22)			
Sample: 35	9860 - BW-4 Br	ine							
Laboratory:	Lubbock								
Analysis:	Specific Gravity		Analytical Method	I: ASTM D14	429-95	Prep Method:	N/A		
QC Batch:	111053		Date Analyzed:	2014-04-10		Analyzed By:	CF		
Prep Batch:	93887		Sample Preparatio	n: 2014-04-10		Prepared By:	CF		
Deverator		Flor	Cont	RL Poqult	Unita	Dilution	DI		
Specific Gray	zity	гıag	Cert	1 19	g/ml	1	$\frac{\text{RL}}{0.00}$		
Sample: 35	9860 - BW-4 Br	ine							
Laboratory	Lubbock								
Analysis	TDS		Analytical Method	SM 2540C		Pren Method:	N/A		
OC Batch	111195		Date Analyzed:	2014-04-09		Analyzed By:	RL.		
Prep Batch:	94005		Sample Preparation	n: 2014-04-09		Prepared By:	RL		
				RL.					
Parameter		Fl	ag Cert	Result	Units	Dilution	RL		
Total Dissolv	ved Solids		1	132000	mg/L	1000	2.50		
Sample: 35 Laboratory: Analysis: QC Batch: Prep Batch:	9861 - BW-22 F Lubbock Chloride (IC) 111321 94115	resh	Analytical Metho Date Analyzed: Sample Preparat	od: E 300.0 2014-04-1 ion: 2014-04-1	10 10	Prep Method: Analyzed By: Prepared By:	N/A RL RL		
D				RL	TT 1 .		DI		
Parameter		Flag	Cert	Result	Units	Dilution	RL		
Chloride		В	1	406	mg/L	50	2.50		
Sample: 35	9861 - BW-22 F	resh							
Laboratory:	Lubbock		۲. ۱. ۲. ۲. ۲. ۲. ۲.	CINE AFOO TT			NT / A		
Analysis:	pH		Analytical Method:	SM 4500-H+	-	Prep Method:	N/A		
QU Batch: Drop $\mathbf{D}_{2} \neq -1$	110975		Date Analyzed:	2014-04-08		Analyzed By:	AT AT		
rrep Batch:	93825		Sample Preparation:	2014-04-08		Prepared By:	AL		

 $continued \dots$

Report Date BW-4 & BW	e: April 23, 2014 V-22	Work Order: 14040811 Annual Report				Bu	Page Number: 7 of 18 Buckeye(BW-4) Tatum (BW-22)		
sample 3598	61 continued								
]	RL				
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL	
]	RL				
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL	
рН			1	7.	99	s.u.	1	2.00	
Sample: 35	9861 - BW-22 Fi	resh							
Laboratory:	Lubbock								
Analysis:	Specific Gravity		Analytical Metho	od:	ASTM D142	29-95	Prep Method:	N/A	
QC Batch:	111053		Date Analyzed:		2014-04-10		Analyzed By:	CF	
Prep Batch:	93887		Sample Preparat	tion:	2014-04-10		Prepared By:	CF	
D				П	RL	TT •/		DI	
Parameter	.:	Flag	Cert	K		Units	Dilution	RL	
	·								
Sample: 35	9861 - BW-22 Fi	resh							
Laboratory:	Lubbock								
Analysis:	TDS		Analytical Metho	od:	SM 2540C		Prep Method:	N/A	
QC Batch:	111195		Date Analyzed:		2014-04-09		Analyzed By:	$ {RL}$	
Prep Batch:	94005		Sample Preparati	ion:	2014-04-09		Prepared By:	RL	
					RL				
Parameter		Flag	g Cert		Result	Units	Dilution	RL	
Total Dissolv	7ed Solids		1		1240	mg/L	20	2.50	
Sample: 35	9862 - BW-22 B	rine							
Laboratory:	Lubbock								
Analysis:	Chloride (IC)		Analytical Met	thod:	E 300.0		Prep Method:	N/A	
QC Batch:	111322		Date Analyzed	l:	2014-04-10)	Analyzed By:	RL DI	
Prep Batch:	94110		Sample Prepar	ation:	2014-04-10	J	Prepared By:	КL	
Danamatar		Flor	Cont] D a=-	RL	Unita	Dilution	БΙ	
r arameter		гıag	Cert	res	աս	Omus	Dilution	$\mathbf{n}\mathbf{L}$	

19300

1

 $\mathrm{mg/L}$

1000

2.50

Chloride

Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: Na, Dissolved Analysis: Na, Dissolved QC Batch: 94164 Prep Batch: 94164 Sample Preparation: 2014-04-23 Analyzed: 2014-04-22 Preparation: 2014-04-22 Preparation: 2014-04-22 Preparation: 2014-04-22 Preparation: 2014-04-22 Preparation: 2014-04-02 Preparation: 2014-04-02 Preparation: 1000 Import Source RL Parameter Flag Cert Result Laboratory: Lubbock Analysis: PH Analysis: Prep Method: Sys862 - BW-22 Brine E Laboratory: Lubbock Analysis: Specific Gravity Analysis: Specific Gravity Analysis: Specific Gravity Analysis: Specific Gravity Analysis: Sample Preparation: 2014-04-10	Report Date BW-4 & BW	: April 23, 2014 7-22		Work Ord Annu	ler: 1404 al Report	0811 t	Page Number: 8 Buckeye(BW-4) Tatum (BV		r: 8 of 18 (BW-22)
Laboratory: Lubbock Analysic: Na, Dissolved Analysic: S 2005A QC Batch: 111398 Date Analyzed: 2014-04-23 Analyzed By: LM Prep Batch: 94164 Sample Preparation: 2014-04-22 Prepared By: PM Parameter Flag Cert Result Units Dilution RL Dissolved Sodium i 10400 mg/L 100 1.00 Sample: 359862 - BW-22 Brine Imalysical Method: SM 4500-H+ Prep Method: N/A Laboratory: Lubbock Analysics: pH Analyzed: 2014-04-08 Prepared By: AT Prep Batch: 10975 Date Analyzed: 2014-04-08 Prepared By: AT Parameter Flag Cert Result Units Dilution RL pll i 6.41 s.u. 1 2.00 Sample: 359862 - BW-22 Brine Imalysical Method: ASTM D1429-95 Prep Method: N/A QC Batch: 11053 Date Analyzed: 2014-04-10 Analyzed By: C	Sample: 35	9862 - BW-22 B	rine						
ParameterFlagCertResultUnitsDilutionRLDissolved Sodium110400mg/L1001.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:DHAnalytical Method:SM 4500-H+Prep Method:N/AQC Batch:110975Date Analyzed:2014-04-08Analyzed By:ATPrep Batch:93825Sample Preparation:2014-04-08Prepared By:ATParameterFlagCertResultUnitsDilutionRLpHi6.41s.u.12.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:Specific GravityAnalytical Method:ASTM D1429-95Prep Method:N/AQC Batch:11053Date Analyzed:2014-04-10Analyzed By:CFPrep Batch:93887Sample Preparation:2014-04-10Prepared By:CFParameterFlagCertResultUnitsDilutionRLSample:359862 - BW-22 BrineInte Analyzed:2014-04-10Prepared By:CFSample:359862 - BW-22 BrineInte Analyzed:2014-04-09Prepared By:CFLaboratory:LubbockAnalyzed2014-04-10Prepared By:RLQC Batch:11105Date Analyzed:2014-04-09Prepared By:RLPrep Batch:94005Sample Preparation:2014-04-09Prepared By:RL <th>Laboratory: Analysis: QC Batch: Prep Batch:</th> <th>Lubbock Na, Dissolved 111398 94164</th> <th></th> <th>Analytical 1 Date Analy Sample Pre</th> <th>Method: zed: paration:</th> <th>S 6010C 2014-04-23 : 2014-04-22</th> <th></th> <th>Prep Method: Analyzed By: Prepared By:</th> <th>S 3005A LM PM</th>	Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 111398 94164		Analytical 1 Date Analy Sample Pre	Method: zed: paration:	S 6010C 2014-04-23 : 2014-04-22		Prep Method: Analyzed By: Prepared By:	S 3005A LM PM
ParameterFlagCertResultUnitsDilutionRLDissolved Sodiumi10400mg/L1001.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:pHAnalytical Method:SM 4500-H+Prep Method:N/AQC Batch:110975Date Analyzed:2014-04-08Prepared By:ATPrep Batch:93825Sample Preparation:2014-04-08Prepared By:ATParameterFlagCertResultUnitsDilutionRLpHi6.41s.u.12.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:Specific GravityAnalytical Method:ASTM D1429-95Prep Method:N/AQC Batch:111053Date Analyzed:2014-04-10Analyzed By:CFPrep Batch:93887Sample Preparation:2014-04-10Prepared By:CFParameterFlagCertResultUnitsDilutionRLSpecific Gravity1.03g/ml10.00Sample Preparation:2014-04-10Prepared By:CFParameterFlagCertResultUnitsDilutionRLSpecific Gravity1.03g/ml10.00Sample:359862 - BW-22 BrineLaboratory:LubbockAnalysic:Malysical Method:SM 2540CPrep Method:N/AQC Batch:1111	D			a .		RL	TT 1 .		DI
Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: pH Analysis: pH QC Batch: 110975 Date Analyzed: 2014-04-08 Analysis: pH Prep Batch: 93825 Sample Preparation: 2014-04-08 Prepared By: AT Parameter Flag Cert Result Units pH 1 6.41 s.u. Sample: 359862 - BW-22 Brine Image: Specific Gravity Laboratory: Lubbock Analytical Method: ASTM D1429-95 Prep Method: N/A QC Batch: 110053 Date Analyzed: 2014-04-10 Analyzed By: CF Prep Batch: 93887 Sample Preparation: 2014-04-10 Prepared By: CF Parameter Flag Cert Result Units Dilution RL Specific Gravity 1.03 g/ml 1 0.00 Sample: 359862 - BW-22 Brine Image: Signed - BW-22 Brine Imalyzed By: RL La	Parameter Dissolved Soc	dium	Flag	Cert		Result 10400	Units mg/L	Dilution	$\frac{\text{RL}}{1.00}$
Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analytical Method: SM 4500-H+ Prep Method: N/A QC Batch: 110975 Date Analyzed: 2014-04-08 Analyzed By: AT Prep Batch: 93825 Sample Preparation: 2014-04-08 Prepared By: AT Parameter Flag Cert Result Units Dilution RL Parameter Flag Cert Result Units Dilution RL Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analyzed 2014-04-10 Analyzed By: CF Prep Batch: 93887 Sample Preparation: 2014-04-10 Prepared By: CF Prep Batch: 93887 Sample Preparation: 2014-04-10 Prepared By: CF Parameter Flag Cert Result Units Dilution RL Sample: S39862 - BW-22 Brine Laboratory: Lubbock Analysis: Specific Gravity I.03 g/ml 0.00 Sample: S39862 - BW-22 Brine Laboratory: Lubbock <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>100</th> <th></th>								100	
Laboratory:LubbockAnalytical Method:SM 4500-H+ 2014-04-08Prep Method:N/A Analyzed By:ATQC Batch:110975Date Analyzed:2014-04-08Analyzed By:ATPrep Batch:93825Sample Preparation:2014-04-08Prepared By:ATParameterFlagCertResultUnitsDilutionRLpH16.41s.u.12.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:Specific GravityAnalytical Method:ASTM D1429-95Prep Method:N/AQC Batch:111053Date Analyzed:2014-04-10Analyzed By:CFParameterFlagCertResultUnitsDilutionRLParameterFlagCertResultUnitsDilutionRLSample:359862 - BW-22 BrineI.03g/ml10.00Sample:S59862 - BW-22 BrineLaboratory:LubbockAnalyzical Method:SM 2540CPrep Method:N/ASample:359862 - BW-22 BrineLaboratory:LubbockAnalyzical Method:SM 2540CPrep Method:N/AQC Batch:111195Date Analyzed:2014-04-09Analyzed By:RLPrep Batch:94005Sample Preparation:2014-04-09Prepared By:RL	Sample: 35	9862 - BW-22 B	rine						
RL ParameterFlagCertResultUnitsDilutionRL plpH1 6.41 $s.u.$ 1 2.00 Sample: 359862 - BW-22 BrineLaboratory:Lubbock Analysis:Specific Gravity Specific Gravity Prep Method:Analytical Method:ASTM D1429-95 2014-04-10Prep Method:N/A Analyzed By: CFPrep Batch:93887Date Analyzed: Sample Preparation:2014-04-10 2014-04-10Analyzed By: Prepared By: CFCFParameterFlagCertResult ResultUnitsDilution 1RLSample:359862 - BW-22 BrineI.03g/ml10.00Sample:Sample:SM 2540C 2014-04-09Prep Method: Analyzed By: RLN/A RLQC Batch:111195 Date Analyzed: Sample Preparation:2014-04-09 2014-04-09Prep Method: Analyzed By: RLN/A	Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 110975 93825		Analytical M Date Analyze Sample Prepa	ethod: ed: aration:	SM 4500-H+ 2014-04-08 2014-04-08		Prep Metho Analyzed By Prepared By	d: N/A y: AT 7: AT
Parameter Flag Cert Result Units Dilution RL pH 1 6.41 s.u. 1 2.00 Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A QC Batch: 111053 Date Analyzed: 2014-04-10 Analyzed By: CF Prep Batch: 93887 Sample Preparation: 2014-04-10 Prepared By: CF Parameter Flag Cert Result Units Dilution RL Specific Gravity 1.03 g/ml 1 0.00 Sample: 359862 - BW-22 Brine I.03 g/ml 1 0.00 Sample: 359862 - BW-22 Brine I.03 g/ml 1 0.00 Sample: 359862 - BW-22 Brine I.03 2540C Prep Method: N/A QC Batch: 111195 Date Analyzed: 2014-04-09 Analyzed By: RL Prep Batch: 94005 Sample Preparation: 2014-04-09 Prepared					D	RL	TT •/		DI
Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: Specific Gravity Analysis: Specific Gravity Analysis: Specific Gravity Analyzed: 2014-04-10 Prep Batch: 93887 Sample: 93887 Sample: Sample Preparation: 2014-04-10 Prepared By: CF RL Parameter Flag Cert Result Specific Gravity 1.03 g/ml 1 Specific Gravity 1.03 Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: TDS Analyzed: 2014-04-09 Prep Method: N/A QC Batch: 111195 Date Analyzed: 2014-04-09 Prep Batch: 94005 Sample Preparation: 2014-04-09 Prepared By: RL	Parameter		Flag	Cert	R	esult	Units	Dilution	$\frac{\text{RL}}{2.00}$
Laboratory: Lubbock Analysis: Specific Gravity Analytical Method: ASTM D1429-95 Prep Method: N/A QC Batch: 111053 Date Analyzed: 2014-04-10 Analyzed By: CF Prep Batch: 93887 Sample Preparation: 2014-04-10 Prepared By: CF Parameter Flag Cert Result Units Dilution RL Specific Gravity 1.03 g/ml 1 0.00 Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A QC Batch: 111195 Date Analyzed: 2014-04-09 Analyzed By: RL Prep Batch: 94005 Sample Preparation: 2014-04-09 Prepared By: RL Prep Batch: 94005 Sample Preparation: 2014-04-09 Prepared By: RL	Sample: 35	9862 - BW-22 B	rine						
ParameterFlagCertResultUnitsDilutionRLSpecific Gravity1.03g/ml10.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:TDSAnalytical Method:SM 2540CPrep Method:N/AQC Batch:111195Date Analyzed:2014-04-09Analyzed By:RLPrep Batch:94005Sample Preparation:2014-04-09Prepared By:RL	Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Specific Gravity 111053 93887		Analytical 1 Date Analy Sample Pre	Method: zed: paration:	ASTM D14 2014-04-10 : 2014-04-10	29-95	Prep Metho Analyzed By Prepared By	d: N/A y: CF 7: CF
ParameterFlagCertResultUnitsDilutionRLSpecific Gravity1.03g/ml10.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:TDSAnalytical Method:SM 2540CPrep Method:N/AQC Batch:111195Date Analyzed:2014-04-09Analyzed By:RLPrep Batch:94005Sample Preparation:2014-04-09Prepared By:RL						RL			
Specific Gravity1.03g/ml10.00Sample: 359862 - BW-22 BrineLaboratory:LubbockAnalysis:TDSAnalytical Method:SM 2540CPrep Method:N/AQC Batch:111195Date Analyzed:2014-04-09Analyzed By:RLPrep Batch:94005Sample Preparation:2014-04-09Prepared By:RL	Parameter		Flag	Cert		Result	Units	Dilution	RL
Sample: 359862 - BW-22 Brine Laboratory: Lubbock Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A QC Batch: 111195 Date Analyzed: 2014-04-09 Analyzed By: RL Prep Batch: 94005 Sample Preparation: 2014-04-09 Prepared By: RL	Specific Grav	rity				1.03	g/ml	1	0.00
Laboratory: Lubbock Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A QC Batch: 111195 Date Analyzed: 2014-04-09 Analyzed By: RL Prep Batch: 94005 Sample Preparation: 2014-04-09 Prepared By: RL	Sample: 35	9862 - BW-22 B	rine						
RL	Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock TDS 111195 94005		Analytical M Date Analyz Sample Prep	Iethod: zed: paration:	SM 2540C 2014-04-09 2014-04-09		Prep Metho Analyzed By Prepared By	d: N/A y: RL 7: RL
Parameter Flag Cert Result Units Dilution RL	Parameter		F	lag Ce	ert	RL Result	Units	Dilution	RL
Total Dissolved Solids131900mg/L2002.50	Total Dissolv	red Solids			1	31900	mg/L	200	2.50

Method Blanks

QC Batch:111053 93887Date Analyzed:2014-04-10Analyzed By: Prepared By:CParameterFlagCertResultUnitsFSpecific Gravity0.998g/mlMethod Blank (1)QC Batch:111195Analyzed:2014-04-09QC Batch:111195Date Analyzed:2014-04-09Analyzed By:RParameterFlagCertResultUnitsFParameterFlagCertResultUnitsFTotal Dissolved Solids1<25.0mg/L2Method Blank (1)QC Batch:1113212Analyzed:2014-04-10Prep Batch:94115QC Preparation:2014-04-10Analyzed By: RRParameterFlagCertResultUnitsFTotal Dissolved Solids1<25.0mg/L2Method Blank (1)QC Batch:111321Pate Analyzed:2014-04-10Prep Batch:94115QC Preparation:2014-04-10Prepared By:R	Method Blank (1)	QC Batch: 111053					
MDL MDL Specific Gravity 0.998 g/ml Method Blank (1) QC Batch: 111195 QC Preparation: 2014-04-09 Analyzed By: R Prep Batch: 94005 QC Preparation: 2014-04-09 Prepared By: R Parameter Flag Cert Result Units F Total Dissolved Solids 1 <25.0 mg/L 2 Method Blank (1) QC Batch: 111321 Date Analyzed: 2014-04-10 Analyzed By: R Prep Batch: 94115 Date Analyzed: 2014-04-10 Prepared By: R F	QC Batch: 111053 Prep Batch: 93887		Date Analyzed: QC Preparation:	2014-04-10 2014-04-10		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Specific Gravity 0.998 g/mi Method Blank (1) QC Batch: 111195 Date Analyzed: 2014-04-09 Analyzed By: R Prep Batch: 94005 QC Preparation: 2014-04-09 Prepared By: R Parameter Flag Cert Result Units Total Dissolved Solids 1 <25.0 mg/L 2 Method Blank (1) QC Batch: 111321 Date Analyzed: 2014-04-10 Analyzed By: R Prep Batch: 94115 Date Analyzed: 2014-04-10 Analyzed By: R	Parameter	F	lag Ce	ert	MDL Result	Units	RL
Method Blank (1) QC Batch: 111195 Date Analyzed: 2014-04-09 Analyzed By: R Prep Batch: 94005 QC Preparation: 2014-04-09 MDL Prepared By: R Parameter Flag Cert Result Units F Total Dissolved Solids 1 <25.0	Specific Gravity				0.998	g/ml	
QC Batch:111195 Prep Batch:Date Analyzed:2014-04-09 2014-04-09Analyzed By:RParameterFlagCertResultUnitsFTotal Dissolved Solids1<25.0	Method Blank (1)	QC Batch: 111195					
ParameterFlagCertMDL ResultUnitsHTotal Dissolved Solids1<25.0	QC Batch: 111195 Prep Batch: 94005		Date Analyzed: QC Preparation:	2014-04-09 2014-04-09		Analyzed By: Prepared By:	RL RL
Total Dissolved Solids1<25.0mg/L2Method Blank (1)QC Batch: 111321QC Batch:111321Prep Batch:111321Prep Batch:94115QC Preparation:2014-04-10Prepared By:RPrepared By:R	Parameter		Flag	Cert	MDL Result	Units	RL
Method Blank (1)QC Batch: 111321Date Analyzed: 2014-04-10Analyzed By: RQC Batch: 111321Date Analyzed: 2014-04-10Prepared By: RPrep Batch: 94115QC Preparation: 2014-04-10Prepared By: R	Total Dissolved Solids			1	<25.0	mg/L	2.5
QC Batch:111321Date Analyzed:2014-04-10Analyzed By:RPrep Batch:94115QC Preparation:2014-04-10Prepared By:R	Method Blank (1)	QC Batch: 111321					
	QC Batch: 111321 Prep Batch: 94115		Date Analyzed: QC Preparation:	2014-04-10 2014-04-10		Analyzed By: Prepared By:	RL RL
Parameter Flag Cert Result Units F	Parameter	Flag	Cert		MDL Result	Units	RL
Chloride 1 1.61 mg/L 2	Chloride	^O	1		1.61	mg/L	2.5

Method Bla	ank (1)	QC Batch: 111322				
QC Batch:	111322		Date Analyzed:	2014-04-10	Analyzed By:	RL
Prep Batch:	94116		QC Preparation:	2014-04-10	Prepared By:	RL

Report Date: April 23, 2014 BW-4 & BW-22		Work Order: 14040811 Annual Report	Page Number: 10 of 18 Buckeye(BW-4) Tatum (BW-22)			
Parameter	Flag	Cert	MDL Result	Units	RL	
Chloride		1	1.23	m mg/L	2.5	

Method Blank (1)	QC Batch: 111398					
QC Batch: 111398 Prep Batch: 94164		Date Analyzed: QC Preparation:	2014-04-23 2014-04-22		Analyzed By: Prepared By:	LM PM
Devenue of an	Т			MDL Barrelt	T:.	DI
Parameter	F	lag Co	ert	Result	Units	RL
Dissolved Sodium			1	< 0.172	m mg/L	1

Duplicates (1) Duplicated Sample: 359865

QC Batch: Prep Batch:	$110975 \\ 93825$		Date An QC Pre	Date Analyzed: 2014-04-08 QC Preparation: 2014-04-08					
Param			Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit	
pН		1	8.45	8.46	s.u.	1	0	20	

Duplicates (1) Duplicated Sample: 359862

QC Batch: Prep Batch:	$\frac{111053}{93887}$	Date Analyz QC Prepara	Date Analyzed: 2014-04-10 QC Preparation: 2014-04-10				
		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Specific Grav	ity	1.03	1.03	g/ml	1	0	200

Duplicates (1) Duplicated Sample: 360017

QC Batch:	111195	Date Analyzed:	2014-04-09	Analyzed By:	RL
Prep Batch:	94005	QC Preparation:	2014-04-09	Prepared By:	RL

Report Date: April 23, 2014 BW-4 & BW-22		Work Order: Annual Re	14040811 eport		Page Number: 11 of 18 Buckeye(BW-4) Tatum (BW-22)			
Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit	
Total Dissolved Solids	1	1690	1720	$\mathrm{mg/L}$	20	2	10	

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 111195			Date	e Analyze	d: 20	14-04-09			Ana	alyzed E	By: RL
Prep Batch: 94005		QC Preparation: 2014-04-09 Prepared I							y: RL		
				LCS			Spike	Ma	trix		Rec.
Param]	F	С	Result	Units	Dil.	Amount	Re	sult F	Rec.	Limit
Total Dissolved Solids			1	1020	mg/L	10	1000	<2	25.0 1	102	90 - 110
Percent recovery is based on	the spike i	esul	t. RPD	is based	on the s	pike and sp	pike duplic	ate resu	ılt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1	1010	$\mathrm{mg/L}$	10	1000	$<\!25.0$	101	90 - 110	1	10
Percent recovery is based on	Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.										

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	111321 94115		Da Qe	ate Analyze C Preparat	ed: 2014 ion: 2014	-04-10 -04-10			Analyzed Prepared	By: RL By: RL
				LCS			Spike	Matrix		Rec.
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			1	26.2	$\mathrm{mg/L}$	1	25.0	1.61	98	90 - 110
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.										

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1	26.1	$\mathrm{mg/L}$	1	25.0	1.61	98	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	111322	Date Analyzed:	2014-04-10	Analyzed By:	RL
Prep Batch:	94116	QC Preparation:	2014-04-10	Prepared By:	RL

Report Date: April 23, 2014 BW-4 & BW-22		Work Order: 14040811 Annual Report				Bucke	Page Number: 13 of 18 Buckeye(BW-4) Tatum (BW-22)				
Denem		F	C	LCS	TT:+	D:1	Spike	M	atrix	Dee	Rec.
Chloride		r	1 1	26.0	mg/L	<u> </u>	Amount 25.0	R	esult 1.23	899 89	$\frac{1}{90 - 110}$
Percent recovery is based on the s	spike	resu	lt. RPD	is based	on the s	pike and s	pike duplic	ate res	sult.		
			LCSD	1		Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1	26.0	mg/L	1	25.0	1.23	99	90 - 110) 0	20
Laboratory Control Spike (L	C S-1	.)									
QC Batch: 111398			Date	e Analyze	ed: 20	14-04-23			An	alyzed B	y: LM
Prep Batch: 94164			QC	Preparati	ion: 201	14-04-22			Pre	epared B	y: PM
-		-	~	LCS			Spike	М	atrix	-	Rec.
Param Disseland Collinson		F,	С	Result	Units	Dil.	Amount	R	esult	$\frac{\text{Rec.}}{106}$	Limit
Dissolved Sodium			1	ə ə .0	mg/L	1	50.0	<(J.172	100	60 - 115
Percent recovery is based on the s	spike	resul	lt. RPD	is based	on the s	pike and s	pike duplic	ate res	ult.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		1	53.1	$\mathrm{mg/L}$	1	50.0	< 0.172	106	85 - 115	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 359861

QC Batch:	111321	Date Analyzed:	2014-04-10	Analyzed By:	RL
Prep Batch:	94115	QC Preparation:	2014-04-10	Prepared By:	RL

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride		1	1840	$\mathrm{mg/L}$	50	1250	406	115	80 - 120
Percent recovery is based on the spik	e resu	lt. RP	D is based	on the spi	ke and s	pike duplicat	e result.		

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1	1850	$\mathrm{mg/L}$	50	1250	406	116	80 - 120	0	20

Report Date: April 23, 2014 BW-4 & BW-22			Wo	rk Order: Annual l	140408 Report	11		Buckeye(Page Nu BW-4) 7	ımber: Tatum (14 of 18 (BW-22)
Matrix Spike (MS-1) Spiked	l Sai	mple:	360083								
QC Batch: 111322 Prep Batch: 94116			Date QC	e Analyze Preparati	ed: 20 ion: 20	14-04-10 14-04-10			Anal Prep	yzed By ared By	y: RL 7: RL
Param Chloride		F		MS Result 19000	Units mg/L	Dil. 500	Spike Amount 12500	Matri Resu 4720	ix lt Re) 11	ec.	Rec. Limit 80 - 120
Percent recovery is based on the s	pike	resul	lt. RPD	is based	on the s	pike and s	pike duplic	ate result			
Param Chloride	F		MSD Result 19200	Units mg/L	Dil. 500	Spike Amount 12500	Matrix Result 4720	Rec.	Rec. Limit 0 - 120	RPD 1	RPD Limit 20
Percent recovery is based on the s	pike	resul	lt. RPD	is based	on the s	pike and sj	pike duplic	ate result			
Matrix Spike (MS-1) Spiked	l Sai	mple:	360135								
QC Batch: 111398 Prep Batch: 94164			Date QC	e Analyze Preparati	d: 201 on: 201	14-04-23 14-04-22			Analy Prepa	vzed By ared By	: LM : РМ
Param		F	С	MS Result	Units	Dil.	Spike Amount	Matri Resu	ix lt Re	ec.	Rec. Limit
Dissolved Sodium			1	617	$\mathrm{mg/L}$	1	500	82.10	6 10)7 7	75 - 125
Percent recovery is based on the s	pike	resul	lt. RPD	is based	on the s	pike and sp	pike duplic	ate result			
Param	F	С	MSD Result	Unite	Dil	Spike Amount	Matrix Result	Rec	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	1	1	582	mg/L	1	500	82.16	100 7	5 - 125	6	20

Calibration Standards

Standard (ICV-1)

QC Batch:	110975		Date	e Analyzed:	2014-04-08		Analy	vzed By: AT
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1	s.u.	7.00	7.00	100	98 - 102	2014-04-08

Standard (CCV-1)

pН		1	s.u.	7.00	7.01	100	98 - 102	2014-04-08
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
				True	Found	Percent	Recovery	Date
				CCVs	CCVs	CCVs	Percent	
QC Batch:	110975		Date	e Analyzed:	2014-04-08		Analy	zed By: AT

Standard (CCV-1)

QC Batch:	111321			Date	Analyzed:	2014-04-10		Analy	zed By: RL
					CCVs True	CCVs Found	CCVs Percent	Percent	Date
					nuc	round	1 CICCIII	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1	$\mathrm{mg/L}$	25.0	26.2	105	90 - 110	2014-04-10

Standard (CCV-2)

QC Batch:	111321			Date	Analyzed:	2014-04-10		Analy	zed By: RL
					CCVs	CCVs Found	CCVs Borecont	Percent	Data
					True	rouna	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1	m mg/L	25.0	26.0	104	90 - 110	2014-04-10

Report Dat BW-4 & B	te: April 2 W-22	23, 201	4		Work (An	Order: 14 nual Rep	040811 ort	В	Page Number: 16 of 18 Buckeye(BW-4) Tatum (BW-22)				
Standard	(CCV-1))											
QC Batch:	111322				Date An	nalyzed:	2014-04-10		Analy	zed By: RL			
D		DI	C +	Ţ	т.,	CCVs True	$\begin{array}{c} \mathrm{CCVs} \\ \mathrm{Found} \\ \mathrm{C} \end{array}$	CCVs Percent	Percent Recovery	Date			
Chloride		Flag		n	ng/L	25.0	26.0	104	90 - 110	2014-04-10			
Standard	(CCV-2))											
QC Batch:	111322				Date Ar	nalyzed:	2014-04-10		Analy	zed By: RL			
Daram		Flog	Cort	т	Inita	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date			
Chloride		гıag	Cert	n	$\frac{1}{2} \frac{1}{2} \frac{1}$	25.0	<u>26.0</u>	104	90 - 110	$\frac{\text{Analyzed}}{2014_{-}04_{-}10}$			
Standard QC Batch:	(ICV-1) 111398				Date Ar	nalyzed:	2014-04-23		Analy	zed By: LM			
D				C I	T T •	ICV Tru	vs ICVs e Found	ICVs l Percent	Percent Recovery	Date			
Param Dissolved S	odium		Flag	Cert	Units mg/I	Con	c. Conc.	Recovery	Limits	$\frac{\text{Analyzed}}{2014.04.22}$			
Standard QC Batch:	(CCV-1) 111398)			Date Ar	alyzed:	2014-04-23		Analy	zed By: LM			
Param			Flag	Cort	Unita	CCV Tru Con	e Found	s CCVs l Percent Bocovery	Percent Recovery	Date Analwzod			
$\frac{1}{\text{Dissolved S}}$	odium		riag	1	mg/L	51 ($\frac{1}{10000000000000000000000000000000000$	<u> </u>	90 - 110	2014-04-23			
	Julum			T	ιng/ μ	51.0	00.0	99	00-110	2017-04-20			

Work Order: 14040811 Annual Report Page Number: 17 of 18 Buckeye(BW-4) Tatum (BW-22)

Appendix

Report Definitions

NameDefinitionMDLMethod Detection LimitMQLMinimum Quantitation LimitSDLSample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704219-14-10	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

Attachments

Work Order: 14040811 Annual Report Page Number: 18 of 18 Buckeye(BW-4) Tatum (BW-22)

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

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Summary Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: February 17, 2015

Work Order: 15012304

Project Location: Tatum, NM Project Name: Brine Well-Tatum

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
385127	Fresh	water	2015-01-16	06:17	2015-01-21
385128	Brine	water	2015-01-16	06:25	2015-01-21

Sample: 385127 - Fresh

Param	Flag	Result	Units	RL
Chloride		71.6	mg/L	2.5
Dissolved Sodium	$_{\rm Qs}$	75.9	$\mathrm{mg/L}$	1
pН		8.20	s.u.	2
Specific Gravity		0.9861	m g/ml	
Total Dissolved Solids		$\boldsymbol{642}$	m mg/L	2.5

Sample: 385128 - Brine

Param	Flag	Result	Units	RL
Chloride	Н	16000	mg/L	2.5
Dissolved Sodium	Qs	11400	m mg/L	1
pH		6.16	s.u.	2
Specific Gravity		1.027	g/ml	
Total Dissolved Solids		31000	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 Texas 79922 El Paso, Texas 79703 Midland. Texas 75006 Carroliton.

E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915·585·3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: February 17, 2015

Work Order: 15012304

Project Location: Tatum, NM **Project** Name: Brine Well-Tatum Brine Well-Tatum Project Number:

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
385127	Fresh	water	2015-01-16	06:17	2015-01-21
385128	Brine	water	2015-01-16	06:25	2015-01-21

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 17 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

5.4

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Analytical Report Sample 385127 (Fresh)	4 4 5
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Calibration Standards 1 QC Batch 118893 - ICV (1) 1 QC Batch 118893 - CCV (1) 1 QC Batch 119127 - ICV (1) 1 QC Batch 119127 - CCV (1) 1 QC Batch 119384 - CCV (1) 1 QC Batch 119384 - CCV (2) 1 QC Batch 119410 - CCV (1) 1 QC Batch 119410 - CCV (2) 1	L 4 14 14 14 14 15 15
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Case Narrative

Samples for project Brine Well-Tatum were received by TraceAnalysis, Inc. on 2015-01-21 and assigned to work order 15012304. Samples for work order 15012304 were received intact at a temperature of 2.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	100958	2015-02-13 at 15:00	119384	2015-02-13 at 18:06
Chloride (IC)	E 300.0	100982	2015-02-16 at $12:00$	119410	2015-02-16 at $12:53$
Na, Dissolved	S 6010C	100546	2015-01-27 at $17:40$	119127	2015-02-06 at $09:23$
pН	SM 4500-H+	100544	2015-01-27 at $04:00$	118893	2015-01-27 at $16:44$
Specific Gravity	ASTM D1429-95	100533	2015-01-27 at $13:00$	118885	2015-01-27 at $13:10$
TDS	SM 2540C	100553	2015-01-26 at $09:00$	118905	2015-01-26 at $17:00$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15012304 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: February 17, 2015 Brine Well-Tatum

Analytical Report

Sample: 385127 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 119384 100958		Analytical M Date Analyz Sample Prej	Method: E z zed: 20 paration:	300.0 15-02-13	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		В	1,2,3,4,5	71.6	mg/L	10	2.50

Sample: 385127 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 119127 100546		Analytical Method: Date Analyzed: Sample Preparation:	S 6010C 2015-02-06 2015-01-27		Prep Method: Analyzed By: Prepared By:	S 3005A RR RR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium	$_{\rm Qs}$	2,3,4,5	75.9	$\mathrm{mg/L}$	1	1.00

Sample: 385127 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 118893 100544		Analytical Method Date Analyzed: Sample Preparatio	d: SM 4500 2015-01- on: 2015-01-)-H+ 27 27	Prep Method: Analyzed By: Prepared By:	N/A AT AT
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			1,2,4,5	8.20	s.u.	1	2.00

Sample: 385127 - Fresh

Laboratory:	Lubbock				
Analysis:	Specific Gravity	Analytical Method:	ASTM D1429-95	Prep Method:	N/A
QC Batch:	118885	Date Analyzed:	2015-01-27	Analyzed By:	\mathbf{CF}
Prep Batch:	100533	Sample Preparation:	2015-01-27	Prepared By:	CF

Report Date: February 17, 2015 Brine Well-Tatum		Work Order: 15012304 Brine Well-Tatum			Page Number: 5 of 17 Tatum, NM	
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			0.9861	g/ml	1	0.000
Sample:385127 - FreshLaboratory:LubbockAnalysis:TDSQC Batch:118905Prep Batch:100553	A I S	analytical Method: Date Analyzed: ample Preparation	: SM 2540C 2015-01-26 a:		Prep Method: Analyzed By: Prepared By:	N/A RL RL
			RL	TT •		DI
Parameter Total Dissolved Solids	Flag	1,2,3,4,5	642	Units mg/L	20	$\frac{\text{RL}}{2.50}$

Sample: 385128 - Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 119410 100982		Analytical M Date Analyz Sample Prep	lethod: E 30 ed: 2015 aration:	00.0 5-02-16	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		н	1,2,3,4,5	16000	mg/L	1000	2.50

Sample: 385128 - Brine

Laboratory:	Lubbock						
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
QC Batch:	119127		Date Analyzed:	2015-02-06		Analyzed By:	\mathbf{RR}
Prep Batch:	100546		Sample Preparation:	2015-01-27		Prepared By:	RR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium	Qs	2,3,4,5	11400	$\mathrm{mg/L}$	100	1.00

Report Date: February 17, 2015 Brine Well-Tatum			Work Bri	Order: 1501230 ne Well-Tatum	Page Number: Tatu	6 of 17 m, NM	
Sample: 38	5128 - Brine						
Laboratory:	Lubbock						
Analysis:	pН		Analytical Meth	od: SM 4500-	·H+	Prep Method:	N/A
QC Batch:	118893		Date Analyzed:	2015-01-2	27	Analyzed By:	AT
Prep Batch:	100544		Sample Preparat	sion: $2015-01-2$	27	Prepared By:	AΤ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pH			1,2,4,5	6.16	s.u.	1	2.00
Sample: 38	5128 - Brine						
Laboratory:	Lubbock						
Analysis:	Specific Gravity		Analytical Met	hod: ASTM	D1429-95	Prep Method:	N/A
QC Batch:	118885		Date Analyzed	: 2015-01	-27	Analyzed By:	\mathbf{CF}
Prep Batch:	100533		Sample Prepar	ation: 2015-01	-27	Prepared By:	CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Specific Grav	vity			1.027	g/ml	1	0.000
Sample: 38	5128 - Brine						
Laboratory:	Lubbock						
Analysis:	TDS		Analytical Met	hod: SM 2540	\mathcal{OC}	Prep Method:	N/A
QC Batch:	118905		Date Analyzed:	2015-01-	-26	Analyzed By:	RL
Prep Batch:	100553		Sample Prepara	ation:		Prepared By:	RL
				RL			
Parameter		Fl	ag Cert	Result	Units	Dilution	RL
Total Dissolv	ved Solids		1,2,3,4,5	31000	mg/L	1000	2.50

Method Blank (1)	QC Batch: 118885					
QC Batch: 118885 Prep Batch: 100533		Date Analyzed: QC Preparation	2015-01-27 : 2015-01-27		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Parameter	F	'lag (Cert	MDL Result	Units	RL
Specific Gravity				0.9916	g/ml	
Method Blank (1)	QC Batch: 118905					
QC Batch: 118905 Prep Batch: 100553		Date Analyzed: QC Preparation	2015-01-26 : 2015-01-26		Analyzed By: Prepared By:	RL RL
Parameter		Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	mg/L	2.5
Method Blank (1)	QC Batch: 119127					
QC Batch: 119127 Prep Batch: 100546		Date Analyzed: QC Preparation	2015-02-06 : 2015-01-27		Analyzed By: Prepared By:	RR PM
Parameter	I	Flag C	Cert	MDL Result	Units	RL
Dissolved Sodium		2,	3,4,5	< 0.0184	m mg/L	1
Method Blank (1)	QC Batch: 119384					
QC Batch: 119384		Date Analyzed:	2015-02-13		Analyzed By:	RL

QC Preparation: 2015-02-13

Method Blanks

Prep Batch: 100958

Report Date: February 17, 2015 Brine Well-Tatum Work Order: 15012304 Brine Well-Tatum

Prepared By: RL

Report Date: February Brine Well-Tatum	7 17, 2015	Work Ore Brine V	der: 15012304 Well-Tatum	Page Number: Tatu	8 of 17 1m, NM
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride		1,2,3,4,5	0.826	m mg/L	2.5
Method Blank (1)	QC Batch: 119410				
QC Batch: 119410 Prep Batch: 100982		Date Analyzed: QC Preparation:	2015-02-16 2015-02-16	Analyzed By Prepared By	: RL : RL
Parameter	Flag	Cert	MDL Result	Units	RL
Unioride		1,2,3,4,5	0.767	mg/L	2.5

Duplicates

Duplicates (1) Duplicated Sample	e: 385269					
QC Batch: 118885 Prep Batch: 100533	Date Analyz QC Prepara	zed: 2015-01 tion: 2015-01	-27 -27		Analyzed l Prepared I	By: CF By: CF
Param	Duplicate Besult	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Gravity	1.074	1.072	g/ml	1	0	200

Duplicates (1) Duplicated Sample: 385269

QC Batch:	118893	Date Analyzed:	2015-01-27	Analyzed By:	AT
Prep Batch:	100544	QC Preparation:	2015-01-27	Prepared By:	AT

		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
pH	1,2,4,5	6.79	6.78	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 385130

QC Batch: Prep Batch:	$118905 \\ 100553$	I G	Date Analyzed: QC Preparation:	$\begin{array}{c} 2015\text{-}01\text{-}26\\ 2015\text{-}01\text{-}26\end{array}$			Analyzed By: Prepared By:	$_{ m RL}^{ m RL}$
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolv	ed Solids	1,2,3,4,5	850	806	mg/L	20	5	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 118905		Date	Analyzed:	2013	5-01-26			An	alyzed B	y: RL
Prep Batch: 100553	QC Preparation: 2015-01-26							Pre	epared By	y: RL
			LCS			Spike	Μ	atrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	b Dil.	Amount	Re	esult	Rec.	Limit
Total Dissolved Solids		1,2,3,4,5	988	mg/L	ı 10	1000	<	25.0	99	90 - 110
Percent recovery is based on the sp	ike res	ult. RPD	is based on	the spi	ike and spi	ke duplica	te resu	ılt.		
		LCS	SD		Spike	Matrix		Rec.		RPD
Param	F (C Resu	ult Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids	1,2,	3,4,5 978	8 mg/L	10	1000	<25.0	98	90 - 11	0 1	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{119127}{100546}$		Dat QC	e Analyzeo Preparatio	l: 2015- on: 2015-		A P	nalyzed repared	By: RR By: PM	
				LCS			Spike	Matrix		Rec.
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Dissolved Soc	lium		2,3,4,5	56.0	$\mathrm{mg/L}$	1	52.5	< 0.0184	107	85 - 115
Percent recov	ery is based on	the spike resu	ılt. RPI) is based o	on the spil	ke and s	pike duplicat	e result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		2,3,4,5	57.2	$\mathrm{mg/L}$	1	52.5	< 0.0184	109	85 - 115	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	119384	Date Analyzed:	2015-02-13	Analyzed By:	RL
Prep Batch:	100958	QC Preparation:	2015-02-13	Prepared By:	RL

Report Date: February 17, 2015			Work O	rder: 15		Page Number: 11 of 17					
Brine Well-Tatum			Brine Well-Tatum							Tat	um, NM
				T CC			а ч	м	, .		D
D		Ð	C	LCS	TT •4	D'1	Spike	M	atrix		$\operatorname{Rec.}_{\mathbf{T}}$
Param Chlorida		F	C	Result	Units	1	Amount	R	esult 1	$\frac{1}{02}$	Limit
Chloride		1	,2,3,4,5	24.1	mg/L	1	25.0	0	.820	93 3	90 - 110
Percent recovery is based on the s	pike	result	. RPD is	s based on	the spi	ke and spi	ke duplica	te resu	ılt.		
			LCSI)		Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	24.3	mg/L	1	25.0	0.826	94	90 - 110	1	20
Percent recovery is based on the s	pike	result	. RPD is	s based on	the spi	ke and spi	ke duplica	te resi	ilt.		
Laboratory Control Spike (IC	1 Pr)									
Laboratory Control Spike (LC	10-1	.)									
QC Batch: 119410			Date .	Analyzed:	2015	6-02-16			Ana	alyzed B	y: RL
Prep Batch: 100982			QC P	reparation	: 2015	5-02-16			Pre	pared By	y: RL
				LCS			Spike	М	atrix		Bec
Param		F	С	Result	Units	Dil.	Amount	R	esult]	Rec.	Limit
Chloride		1	,2,3,4,5	24.0	mg/L	1	25.0	0	.767	93	90 - 110
Percent recovery is based on the s	pike	result	. RPD is	s based on	the spi	ke and spi	ke duplica	te resi	ılt.		
	1.				1	· · · · · · I					
_	_	~	LCSI)		Spike	Matrix	_	Rec.		RPD
Param	F	С	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	3 23.5	$\mathrm{mg/L}$	1	25.0	0.767	91	90 - 110	2	20

Matrix Spikes

Matrix Spike (xMS-1)	Spike	d Sa	mple:	385041								
QC Batch: 119127 Prep Batch: 100546				Date A QC Pr	Analyzed: reparation	2015 n: 2015	5-02-06 5-01-27			Ana Pre	alyzed By pared By	y: RR y: PM
					MS			Spike	М	atrix		Rec.
Param		1	Ŧ	С	Result	Units	Dil.	Amount	R	esult	Rec.	Limit
Dissolved Sodium			2	3,4,5	1660	$\mathrm{mg/L}$	1	525	1	.210	86	75 - 125
Percent recovery is based on	the sp	oike	result.	RPD is	based on	the spi	ike and spi	ke duplica	te res	ult.		
				MGD			Spile	Motnir		Dee		DDD
Param		F	С	Resul	t Unite	Dil	Amount	Result	Rec	Limit	RÞD	Limit
Dissolved Sodium	0.	1	2345	1580	mg/L	1	525	1210	70	75 - 12	$\frac{10D}{5}$	20
Persont recovery is based on	the ar		nogult		baged on	the en	ile and ani	le duplice	to room] <i>t</i>		
Matrix Spike (MS-1) S	piked	San	ple: 3	85127								
QC Batch: 119384				Date A	Analyzed:	2015	5-02-13			An	alyzed B	y: RL
Prep Batch: 100958				QC Pi	reparation	n: 2015	5-02-13			Pre	epared B	y: RL
					MS			Spike	М	atrix		Rec.
Param		F	P	С	Result	Units	Dil.	Amount	R	esult	Rec.	Limit
Chloride			1,	2,3,4,5	319	$\mathrm{mg/L}$	10	250		71.6	99	80 - 120
Percent recovery is based on	the sp	oike	result.	RPD is	based on	the spi	ike and spi	ke duplica	te resi	ult.		
				MSD			Spike	Matrix		Rec.		RPD
Param		F	С	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			1,2,3,4,5	312	mg/L	10	250	71.6	96	80 - 120) 2	20

Matrix Spike (MS-1)	Spiked Sample: 386889
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QC Batch:	119410	Date Analyzed:	2015-02-16	Analyzed By:	RL
Prep Batch:	100982	QC Preparation:	2015-02-16	Prepared By:	RL

Report Date: February 17, 2015 Brine Well-Tatum	ry 17, 2015				Work Order: 15012304 Brine Well-Tatum						Page Number: 13 of 17 Tatum, NM			
Param		F	C 1	MS Result	Units	Dil.	Spike Amount	M Re	atrix esult H	Rec.	Rec. Limit			
Chloride		1,	2,3,4,5	3350	mg/L	100	2500	8	812	102 8	80 - 120			
Percent recovery is based on the	e spike	e result.	RPD is	based on	the spi	ke and spi	ke duplica	te resu	ılt.					
			MSD			Spike	Matrix		Rec.		RPD			
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit			
Chloride		1,2,3,4,5	3290	$\mathrm{mg/L}$	100	2500	812	99	80 - 120	2	20			

Calibration Standards

Standard (ICV-1)

QC Batch:	118893		Da	te Analyzed:	2015-01-27	7	Analy	vzed By: AT
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1,2,4,5	s.u.	7.00	7.01	100	98.6 - 101.4	2015-01-27

Standard (CCV-1)

QC Batch:	118893		Da	te Analyzed:	2015-01-27		Analy	zed By: AT
				CCVs	CCVs Found	CCVs Porcent	Percent	Data
_		~		inte	Found		necovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pH		1,2,4,5	s.u.	7.00	7.01	100	98.6 - 101.4	2015-01-27

Standard (ICV-1)

QC Batch: 119127			Date Anal	yzed: 201	Analyz	Analyzed By: RR		
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sodium		2,3,4,5	m mg/L	51.0	51.7	101	90 - 110	2015-02-06

Standard (CCV-1)

QC Batch:	119127			Analyz	Analyzed By: RR				
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sc	odium		2,3,4,5	$\mathrm{mg/L}$	51.0	55.9	110	90 - 110	2015-02-06

Report Date Brine Well-T	: February 17, 2 Catum	015		Work Order: 15012304 Brine Well-Tatum			Page Number: 15 of 1 Tatum, N			
Standard (CCV-1)									
QC Batch:	119384		Date .	Analyzed:	2015-02-13		Analy	zed By: RL		
				CCVs	CCVs	CCVs	Percent			
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride		1,2,3,4,5	mg/L	25.0	23.6	94	90 - 110	2015-02-13		
Standard (CCV-2)									
QC Batch:	119384		Date .	Analyzed:	2015-02-13		Analy	zed By: RL		
				$\rm CCVs$	$\rm CCVs$	CCVs	Percent			
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride		1,2,3,4,5	$\mathrm{mg/L}$	25.0	23.8	95	90 - 110	2015-02-13		
Standard (CCV-1)									
QC Batch:	119410		Date .	Analyzed:	2015-02-16		Analy	zed By: RL		
				CCVs	CCVs	CCVs	Percent			
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride	0	1,2,3,4,5	mg/L	25.0	23.8	95	90 - 110	2015-02-16		
Standard (CCV-2)									
QC Batch:	119410		Date .	Analyzed:	2015-02-16		Analy	zed By: RL		

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		1,2,3,4,5	$\mathrm{mg/L}$	25.0	23.9	96	90 - 110	2015-02-16

Work Order: 15012304 Brine Well-Tatum Page Number: 16 of 17 Tatum, NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5		2014-018	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

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F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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285/28PC	HS	e	周辺	×		-			P		1956	60.08		-			-	-				-	X		
128 BR	NG	4	뙻	×					1		219045	6.25 PM											X		
PRICE OF P	property Date:	115	1000	Burner Party	I paul	100	53.	o +C	3-	Di-10	HS/	OBIS COR	111		AB	USE LY	-	/ Nan	121		1	1			
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Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: July 31, 2014

Work Order: 14072110

Project Location:	Buckeye, NM-Tatum, NM
Project Name:	Quarterly Samples
Project Number:	Buckeye Station-Tatum Station

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
368929	BS FW	water	2014-07-17	13:05	2014-07-17
368930	BS BW	water	2014-07-17	13:08	2014-07-17
368931	TS FW	water	2014-07-17	13:59	2014-07-17
368932	TS BW	water	2014-07-17	14:03	2014-07-17

Sample: 368929 - BS FW

Param	Flag	Result	Units	RL
Chloride		341	mg/L	2.5
Density		0.995	g/ml	
pH		7.62	s.u.	2
Total Dissolved Solids	\mathbf{Qr}	864	m mg/L	2.5

Sample: 368930 - BS BW

Param	Flag Result	Units	RL
Chloride	200000	m mg/L	2.5
Density	1.20	g/ml	
Dissolved Sodium	149000	m mg/L	1
pН	6.90	s.u.	2
Total Dissolved Solids	295000	m mg/L	2.5

Sample: 368931 - TS FW

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.
Report Date: July 31, 2014	Wor	c Order: 14072110 Page N		umber: 2 of 2	
Param	Flag	Result	Units	RL	
Chloride	-	76.8	mg/L	2.5	
Density		0.994	g/ml		
pH		9.30	s.u.	2	
Total Dissolved Solids		639	$\mathrm{mg/L}$	2.5	

Sample: 368932 - TS BW

Param	Flag	Result	Units	RL
Chloride		17900	m mg/L	2.5
Density		1.02	g/ml	
Dissolved Sodium		11300	m mg/L	1
pH		6.21	s.u.	2
Total Dissolved Solids		34600	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

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Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: July 31, 2014

Work Order: 14072110

Project Location: Buckeye, NM-Tatum, NM Quarterly Samples **Project** Name: Project Number: **Buckeye Station-Tatum Station**

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
368929	BS FW	water	2014-07-17	13:05	2014-07-17
368930	BS BW	water	2014-07-17	13:08	2014-07-17
368931	TS FW	water	2014-07-17	13:59	2014-07-17
368932	TS BW	water	2014-07-17	14:03	2014-07-17

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 19 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Leftur

Dr. Blair Leftwich, Director James Taylor, Assistant Director

Report Contents

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Case Narrative

Samples for project Quarterly Samples were received by TraceAnalysis, Inc. on 2014-07-17 and assigned to work order 14072110. Samples for work order 14072110 were received intact at a temperature of 1.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	96480	2014-07-29 at 16:46	114086	2014-07-29 at 16:46
Density	ASTM D854-92	96429	2014-07-28 at $11:00$	114019	2014-07-28 at $11:15$
Na, Dissolved	S 6010C	96355	2014-07-24 at $13:18$	114016	2014-07-25 at $15:56$
pН	SM 4500-H+ $$	96321	2014-07-23 at $10:49$	113880	2014-07-23 at $10:50$
TDS	SM 2540C	96388	2014-07-23 at $11:00$	113960	2014-07-23 at $11:00$
TDS	SM 2540C	96452	2014-07-25 at $11:40$	114047	2014-07-25 at $11:40$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14072110 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 368929 - BS FW

Laboratory:	El Paso							
Analysis:	Chloride (IC)		Analytical	Method:	E 300.0	Pr	ep Method: N/A	
QC Batch:	114086		Date Analy	zed:	2014-07-29	Ar	nalyzed By: JR	
Prep Batch:	96480		Sample Pre	eparation:	2014-07-29	Pr	epared By: JR	
				RI	- _			
Parameter		Flag	Cert	Resul	t Un	its Dilut	ion RL	
Chloride			1,4,6	341	1 mg	/L	10 2.50	

Sample: 368929 - BS FW

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Density 114019 96429		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D854- 2014-07-28 2014-07-28	92	Prep Method: Analyzed By: Prepared By:	N/A CF CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				0.995	g/ml	1	0.00

Sample: 368929 - BS FW

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 113880 96321		Analytical Method Date Analyzed: Sample Preparatio	l: SM 4500 2014-07- m: 2014-07-	D-H+ -23 -23	Prep Method: Analyzed By: Prepared By:	N/A AT AT
D				RL	TT •.		DI
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			2,3,7,8	7.62	s.u.	1	2.00

Sample: 368929 - BS FW

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	114047	Date Analyzed:	2014-07-25	Analyzed By:	\mathbf{CF}
Prep Batch:	96452	Sample Preparation:	2014-07-25	Prepared By:	CF

Report Date: July 31, 2014 Buckeye Station-Tatum Station		Work Order Quarterly	: 14072110 Samples	Page Number: 5 of 19 Buckeye, NM-Tatum, NM		
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids	Qr	2,3,5,7,8	864	$\mathrm{mg/L}$	20	2.50

Sample: 368930 - BS BW

Laboratory: Analysis: QC Batch: Prep Batch:	El Paso Chloride (IC) 114086 96480		Analytical Date Analy Sample Pre	Method: yzed: eparation:	E 300.0 2014-07-29 2014-07-29		Prep Method: Analyzed By: Prepared By:	N/A JR JR
Paramotor		Flag	Cort	Bosu	L lt	Unite	Dilution	BI
Chloride		riag	1,4,6	20000)0	mg/L	5000	$\frac{\mathrm{RL}}{2.50}$

Sample: 368930 - BS BW

Density				1.20	g/ml	1	0.00
Parameter		Flag	Cert	Result	Units	Dilution	RL
				RL			
Prep Batch:	96429		Sample Preparation:	2014-07-28		Prepared By:	CF
QC Batch:	114019		Date Analyzed:	2014-07-28		Analyzed By:	CF
Analysis:	Density		Analytical Method:	ASTM D854-92	2	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 368930 - BS BW

Dissolved Soc	dium		3,5,7,8	149000	m mg/L	10000	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	96355		Sample Preparation	n: 2014-07-24		Prepared By:	LM
QC Batch:	114016		Date Analyzed:	2014-07-25		Analyzed By:	LM
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Report Date Buckeye Sta	ort Date: July 31, 2014Work Order: 14072110Deeye Station-Tatum StationQuarterly Samples				Page Number: 6 of 19 Buckeye, NM-Tatum, NM		
Sample: 36	8930 - BS BW						
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 113880 96321		Analytical Method Date Analyzed: Sample Preparation	: SM 4500-H 2014-07-23 n: 2014-07-23	I+	Prep Method: Analyzed By: Prepared By:	N/A AT AT
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
pН		0	2,3,7,8	6.90	s.u.	1	2.00
Sample: 36	8930 - BS BW						
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock TDS 113960 96388		Analytical Metho Date Analyzed: Sample Preparatio	d: SM 25400 2014-07-2 on: 2014-07-2	2 3 3	Prep Method: Analyzed By: Prepared By:	${ m N/A} { m CF} { m CF} { m CF}$
Parameter			Flag Cert	RL Result	Units	Dilution	RL
Total Dissolv	ved Solids		2,3,5,7,8	295000	m mg/L	2000	2.50
Sample: 36 Laboratory: Analysis: QC Batch: Prep Batch:	8931 - TS FW El Paso Chloride (IC) 114086 96480		Analytical Met Date Analyzed: Sample Prepara	hod: E 300.0 2014-07 ation: 2014-07) 7-29 7-29	Prep Method: Analyzed By: Prepared By:	N/A JR JR
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Chloride		0	1,4,6	76.8	m mg/L	10	2.50
Sample: 36 Laboratory: Analysis:	8931 - TS FW Lubbock Density		Analytical Method	ASTM D854	1-92	Pren Method:	N/A
QC Batch: Prep Batch:	114019 96429		Date Analyzed: Sample Preparation:	2014-07-28 2014-07-28	1.52	Analyzed By: Prepared By:	CF CF

 $continued \dots$

Report Date Buckeye Sta	Report Date: July 31, 2014Work Order: 14072110Page Number: 7Buckeye Station-Tatum StationQuarterly SamplesBuckeye, NM-Tatum				7 of 19 m, NM			
sample 36893	31 continued							
Parameter		Flag	Ce	ert	RL Result	Units	Dilution	RL
					RL			
Parameter		Flag	Ce	ert	Result	Units	Dilution	RL
Density					0.994	g/ml	1	0.00
Sample: 36	8931 - TS FW							
Laboratory:	Lubbock							
Analysis:	pН		Analyt	ical Method:	SM 4500-H+		Prep Method:	N/A
QC Batch:	113880		Date A	nalyzed:	2014-07-23		Analyzed By:	AT
Prep Batch:	96321		Sample	Preparation:	2014-07-23		Prepared By:	AT
			~		RL			D.F.
Parameter		Flag	Ce	ert	Result	Units	Dilution	RL
рН			2,3	7,8	9.30	s.u.	1	2.00
Sample: 36	8931 - TS FW							
Laboratory:	Lubbock							
Analysis:	TDS		Analy	tical Method	SM 2540C		Prep Method:	N/A
QC Batch:	113960		Date	Analyzed:	2014-07-23		Analyzed By:	$ {CF}$
Prep Batch:	96388		Samp	le Preparation	n: 2014-07-23		Prepared By:	CF
D				C i	RL	TT 1		DI
Parameter	1 C -1: 1-		Flag	Cert	Result	Units	Dilution	$\frac{\text{RL}}{2.50}$
Total Dissolv	7ea Sonas			2,3,5,7,8	039	mg/L	10	2.30
Sample: 36	8932 - TS BW							
Laboratory:	El Paso						_	
Analysis:	Chloride (IC)		Ana	alytical Meth	od: E 300.0		Prep Method:	N/A
QC Batch:	114086		Dat	te Analyzed:	2014-07-2	19 19	Analyzed By:	JR JD
Prep Batch:	90480		Sar	uple Preparat	ion: 2014-07-2	:9	Prepared By:	JK
					RL			
Parameter		Flag	Ce	ert	Result	Units	Dilution	RL
Chloride			1,4	.,6	17900	m mg/L	500	2.50

Report Date: 3 Buckeye Statio	July 31, 2014 on-Tatum Station		Work Orde Quarterl	er: 14072110 y Samples		Page Number: 8 of 1 Buckeye, NM-Tatum, NI	
Sample: 3689	932 - TS BW						
Laboratory: I Analysis: I QC Batch: 1 Prep Batch: 9	Lubbock Density 114019 06429]	Analytical Method: Date Analyzed: Sample Preparation:	ASTM D854-9: 2014-07-28 2014-07-28	2	Prep Method: Analyzed By: Prepared By:	N/A CF CF
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Density				1.02	g/mi	1	0.00
Sample: 3689	932 - TS BW						
Laboratory: I Analysis: N QC Batch: 1 Prep Batch: 9	Lubbock Na, Dissolved 14016 06355		Analytical Metho Date Analyzed: Sample Preparatio	d: S 6010C 2014-07-25 on: 2014-07-24		Prep Method: S Analyzed By: Li Prepared By: Li	3005A M M
_			~	RL			
Parameter Dissolved Sodiu	um	Flag	3,5,7,8	Result 11300	Units mg/L	Dilution 100	RL 1.00
Sample: 3689 Laboratory: I Analysis: p QC Batch: 1 Prep Batch: 9	932 - TS BW Lubbock bH 113880 96321		Analytical Method: Date Analyzed: Sample Preparation	SM 4500-H+ 2014-07-23 a: 2014-07-23		Prep Method: Analyzed By: Prepared By:	N/A AT AT
. T			r r	RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
рн			2,3,7,8	6.21	s.u.	I	2.00
Sample: 3689	932 - TS BW						
Laboratory: I Analysis: 7 QC Batch: 1 Prep Batch: 9	Lubbock FDS 113960 96388		Analytical Method Date Analyzed: Sample Preparatio	l: SM 2540C 2014-07-23 on: 2014-07-23		Prep Method: Analyzed By: Prepared By:	N/A CF CF
Parameter		Fl	ag Cert	RL Result	Units	Dilution	RL
Total Dissolved	l Solids		2,3,5,7,8	34600	$\mathrm{mg/L}$	1000	2.50

Method Blanks

QC Batch:113960 QC Preparation:Date Analyzed: $2014-07-23$ Analyzed By: Prepared By:CParameterFlagCertResultUnitsFTotal Dissolved Solids2.3,5,7,8<2.50mg/L2Method Blank (1)QC Batch:114016QC Batch:114016Date Analyzed:2014-07-25Analyzed By:LNPrep Batch:96355QC Preparation:2014-07-24Prepared By:PNParameterFlagCertResultUnitsRParameterFlagCertResultUnitsRDissolved Sodium $3,5,7,8$ <0.0184mg/LT						QC Batch: 113960	ank (1)	Method Bla
ParameterFlagCertResultUnitsFTotal Dissolved Solids2.3,5,7,8<2.50	${ m CF} { m CF}$	Analyzed By: Prepared By:		2014-07-23 2014-07-23	Date Analyzed: QC Preparation:		$\frac{113960}{96388}$	QC Batch: Prep Batch:
Method Blank (1) QC Batch: 114016 QC Batch: 114016 Date Analyzed: 2014-07-25 Analyzed By: LN Prep Batch: 96355 QC Preparation: 2014-07-24 Prepared By: PN MDL Parameter Flag Cert Result Units R Dissolved Sodium 3,5,7,8 <0.0184 mg/L 1	$\frac{\mathrm{RL}}{2.5}$	Units mg/L	MDL Result <2.50	Cert	Flag		ed Solids	Parameter Total Dissolve
Method Blank (1) QC Batch: 114016 Date Analyzed: 2014-07-25 Analyzed By: LM Prep Batch: 96355 QC Preparation: 2014-07-24 Prepared By: PM MDL MDL Parameter Flag Cert Result Units R Dissolved Sodium 3,5,7,8 <0.0184				-,0,0,1,0				
QC Batch:114016Date Analyzed:2014-07-25Analyzed By:LMPrep Batch:96355QC Preparation:2014-07-24Prepared By:PMParameterFlagCertResultUnitsRDissolved Sodium3,5,7,8<0.0184						QC Batch: 114016	ank (1)	Method Bla
ParameterFlagCertResultUnitsFlagDissolved Sodium3,5,7,8<0.0184	LM PM	Analyzed By: Prepared By:		2014-07-25 2014-07-24	Date Analyzed: QC Preparation:		$\frac{114016}{96355}$	QC Batch: Prep Batch:
Dissolved Sodium 3,5,7,8 <0.0184 mg/L	RL	Units	MDL Result	ert	lag Ce	F		Parameter
	1	m mg/L	< 0.0184	7,8	3,5,		lium	Dissolved Sod
Method Blank (1) QC Batch: 114019						QC Batch: 114019	unk (1)	Method Bla
QC Batch:114019Date Analyzed:2014-07-28Analyzed By:ClPrep Batch:96429QC Preparation:2014-07-28Prepared By:Cl	CF CF	Analyzed By: Prepared By:		2014-07-28 2014-07-28	Date Analyzed: QC Preparation:		114019 96429	QC Batch: Prep Batch:
ParameterFlagCertMDLDensity0.005n/ml	RL	Units	MDL Result		Cert	Flag		Parameter
Density 0.995 g/ml		g/mi	0.995					Density

Method Blank (1)	QC Batch: 114047
------------------	--------------------

QC Batch:	114047	Date Analyzed:	2014-07-25	Analyzed By:	CF
Prep Batch:	96452	QC Preparation:	2014-07-25	Prepared By:	CF

Report Date: July 31, 2 Buckeye Station-Tatum	2014 Station	Work Order: 14072110 Quarterly Samples			Page Number: 10 of 19 Buckeye, NM-Tatum, NM	
Parameter		Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids		:	2,3,5,7,8	<2.50	m mg/L	2.5
Method Blank (1)	QC Batch: 114086					
QC Batch: 114086 Prep Batch: 96480		Date Analyzed: QC Preparation:	2014-07-29 2014-07-29		Analyzed By: Prepared By:	JR JR
Parameter	Flag	Cert		MDL Result	Units	RL
Chloride		1,4,6	<	< 0.00680	m mg/L	2.5

Duplicates

Duplicates	(1) Duplicat	ed Sample:	368940					
QC Batch: Prep Batch:	113880 96321		Date Ana QC Prepa	lyzed: 2014- aration: 2014-	07-23 07-23		Analyzed I Prepared I	By: AT By: AT
Daram			Duplicate	Sample	Unita	Dilution	RDD	RPD Limit
pH		2,3,7,8	8.16	8.20	s.u.	1	$\frac{\Gamma D}{0}$	$\frac{111111}{20}$

Duplicates (1) Duplicated Sample: 369075

QC Batch:	113960	Date Analyzed:	2014-07-23	Analyzed By:	\mathbf{CF}
Prep Batch:	96388	QC Preparation:	2014-07-23	Prepared By:	\mathbf{CF}

		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids	2,3,5,7,8	381	380	$\mathrm{mg/L}$	10	0	10

Duplicates (1) Duplicated Sample: 368932

QC Batch: Prep Batch:	114019 96429	Date An OC Prer	alyzed: 2014	4-07-28 4-07-28		Analyzed E Prepared B	By: CF
Trop Daton.	00120		201	101 20		i ioparoa B	
		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Density		1.02	1.02	g/ml	1	0	20

Duplicates (1) Duplicated Sample: 369374

QC Batch:	114047	Date Analyzed:	2014-07-25	Analyzed By:	\mathbf{CF}
Prep Batch:	96452	QC Preparation:	2014-07-25	Prepared By:	CF

Report Date: July 31, 2 Buckeye Station-Tatum		Work Order: Quarterly	14072110 Samples		Page Number: 12 of 19 Buckeye, NM-Tatum, NM				
Param				Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	\mathbf{Qr}	Qr	2,3,5,7,8	2660	2300	$\mathrm{mg/L}$	50	14	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch:	113960			Date A	nalyzed:	2014	4-07-23			Anε	alyzed By	y: CF
Prep Batch: 96388 QC Preparation: 2014-07-23										Pre	pared By	y: CF
					LCS			Spike	Ma	atrix		Rec.
Param			F	C	Result	Units	Dil.	Amount	Re	sult l	Rec.	Limit
Total Dissolv	ed Solids		2,	3,5,7,8	1000	$\mathrm{mg/L}$	1	1000	<	2.50	100 9	90 - 110
Percent recov	very is based on the	spike	e result.	RPD is	based on	the spi	ike and spi	ke duplica	te resu	lt.		
				LCSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolv	ed Solids		2,3,5,7,8	1040	$\mathrm{mg/L}$	1	1000	$<\!2.50$	104	90 - 110) 4	10
-		-	-							-		

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	114016 Date Analyzed: 2014-07-25 96355 QC Preparation: 2014-07-24							A P	nalyzed repared	By: LM By: PM
Daram		F	С	LCS Bogult	Unita	Dil	Spike A mount	Matrix	Pog	Rec.
Dissolved Soc	lium	Г	3,5,7,8	49.5	mg/L	<u> </u>	52.5	<0.0184	94	85 - 115
Percent recov	ery is based on t	he spike resu	ılt. RPI) is based of	on the spil	ke and s	pike duplicat	e result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		3, 5, 7, 8	50.2	$\mathrm{mg/L}$	1	52.5	< 0.0184	96	85 - 115	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	114047	Date Analyzed:	2014-07-25	Analyzed By:	\mathbf{CF}
Prep Batch:	96452	QC Preparation:	2014-07-25	Prepared By:	\mathbf{CF}

Report Date: July 31, 2014 Buckeye Station-Tatum Station			Work O Quart	rder: 14 terly Sa		Page Number: 14 of 19 Buckeye, NM-Tatum, NM					
-		-	~	LCS			Spike	М	atrix		Rec.
Param		F,	С	Result	Uni	ts Dil.	Amount	R	esult F	Rec.	Limit
Total Dissolved Solids			2,3,5,7,8	972	mg/	L I	1000	<	(2.50	97	90 - 110
Percent recovery is based on the	spike	e resul	lt. RPD	is based o	on the s	pike and s	pike duplica	te res	ılt.		
			LCS	D		Snike	Matrix		Rec		RPD
Param	F	\mathbf{C}	Resu	ılt Unit	ts Dil	Amoun	t Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		2,3,5,7	7.8 102	0 mg/	L 1	1000	<2.50	102	90 - 110	5	10
Laboratory Control Spike (L QC Batch: 114086	CS-:	1)	Date	Analyze	d: 20	14-07-29			Ana	lyzed B	y: JR
Prep Batch: 96480			QC I	Preparati LCS	on: 20	14-07-29	Spike	Ma	Prej trix	pared B	y: JR Rec.
Param		F	C I	Result	Units	Dil.	Amount	Re	sult F	Rec.	Limit
Chloride			1,4,6	25.2	$\mathrm{mg/L}$	1	25.0	<0.0	00680 1	101	90 - 110
Percent recovery is based on the	spike	e resul	lt. RPD	is based o	on the s	pike and s	pike duplica	te res	ılt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1, 4, 6	25.1	mg/L	1	25.0	< 0.00680	100	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

0

20

Matrix Spikes

Matrix Spike (MS-1) Spi	ked Sar	nple: 3	368864								
QC Batch: 114016 Prep Batch: 96355			Date A QC Pi	Analyzed: reparation	2014 a: 2014	4-07-25 4-07-24			An Pre	alyzed By epared By	: LM : PM
				MS			Spike	Ma	atrix		Rec.
Param		F	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Dissolved Sodium			3,5,7,8	4530	mg/L	10	525	4	100	82	75 - 125
Percent recovery is based on the	ne spike	result	. RPD is	s based on	the sp	ike and sp	ike duplica	te resu	ılt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		3,5,7,8	4540	mg/L	10	525	4100	84	75 - 12	5 0	20
Matrix Spike (MS-1) Spi	ked Sar	nple: 3	368931								
QC Batch: 114086			Date	Analvzed:	201	4-07-29			A	nalvzed B	v: JR
Prep Batch: 96480			QC P	reparation	n: 201	4-07-29			Pı	repared B	y: JR
				MS			Spike	Ma	atrix		Rec.
Param		F	C I	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride			1,4,6	1480	$\mathrm{mg/L}$	55.6	1390	7	6.8	101 8	80 - 120
Percent recovery is based on th	ne spike	result	. RPD is	s based on	the sp	ike and sp	ike duplica	te resu	ılt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

Chloride	1,4,6	1480	mg/L	55.6	1390	76.8	8 101	80 - 120
Percent recovery is based on the spik	e result.	RPD	is based	on the	spike and	spike du	plicate re	esult.

Calibration Standards

Standard (ICV-1)

QC Batch:	113880		Date	e Analyzed:	2014-07-23		Analy	zed By: AT
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pH		2,3,7,8	s.u.	7.00	7.01	100	98 - 102	2014-07-23

Standard (CCV-1)

QC Batch:	atch: 113880			e Analyzed:	2014-07-23		Analyzed By: AT		
				CCVs True	CCVs Found	CCVs Porcont	Percent	Data	
Danam	Flor	Cont	Unita	Cone	Cone	Pagawaru	Limita	Appluzed	
	Flag	Cert	Units	Conc.	Colic.	necovery	LIIIIUS	Analyzeu	
pH		2,3,7,8	s.u.	7.00	7.01	100	98 - 102	2014-07-23	

Standard (ICV-1)

QC Batch: 114016			Date Anal	yzed: 201	Analyz	Analyzed By: LM		
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sodium		3, 5, 7, 8	$\mathrm{mg/L}$	51.0	48.8	96	90 - 110	2014-07-25

Standard (CCV-1)

QC Batch:	114016			Date Anal	yzed: 2014	4-07-25		Analyz	ed By: LM
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sc	odium		3,5,7,8	mg/L	51.0	49.9	98	90 - 110	2014-07-25

Report Dat Buckeye Sta	e: July 31, 2014 ation-Tatum Sta	tion		Work Orde Quarterl	er: 14072110 y Samples		Page Nu Buckeye, N	mber: 17 of 19 M-Tatum, NM
Standard ((CCV-1)							
QC Batch:	114086		Date	Analyzed:	2014-07-29		Analy	yzed By: JR
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		1,4,6	mg/L	25.0	24.8	99	90 - 110	2014-07-29
Standard ((CCV-2)							
QC Batch:	114086		Date	Analyzed:	2014-07-29		Analy	yzed By: JR

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		1,4,6	$\mathrm{mg/L}$	25.0	25.0	100	90 - 110	2014-07-29

Standard (CCV-3)

QC Batch:	114086			Date	Analyzed:	2014-07-29		Analy	zed By: JR
					CCVs	CCVs Found	CCVs Demonst	Percent	Data
					Inte	round	reicent	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,4,6	$\mathrm{mg/L}$	25.0	25.2	101	90 - 110	2014-07-29

Work Order: 14072110 Quarterly Samples Page Number: 18 of 19 Buckeye, NM-Tatum, NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-103	El Paso
2	PJLA	L14-93	Lubbock
3	Kansas	Kansas E-10317	Lubbock
4	LELAP	LELAP-02002	El Paso
5	LELAP	LELAP-02003	Lubbock
6	NELAP	T104704221-12-3	El Paso
7	NELAP	T104704219-14-10	Lubbock
8		2013-083	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.

Report Date: July 31, 2014 Buckeye Station-Tatum Station Work Order: 14072110 Quarterly Samples Page Number: 19 of 19 Buckeye, NM-Tatum, NM

F Description

Qr RPD outside of laboratory limits

Qs Spike recovery outside of laboratory limits.

Qsr Surrogate recovery outside of laboratory limits.

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

LAB Order IC	IPLAN .	0																		Pa	8	-	8	4	- [
	TraceA	naly	SiS,	I s	nc.		6	112	1000	NULL NO.	-	A loss of the loss	1000	1000	ş.,	8	福祉	N NOT	Serie .	2	юð	The state	In Territory	.88.	
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NOTAMAL CORV

Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: October 29, 2014

Work Order: 14102108

Project Location: Tatum, NM Project Name: Wasserhund

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
377451	Fresh	water	2014-10-16	15:56	2014-10-21
377452	Brine	water	2014-10-16	15:43	2014-10-21

Sample: 377451 - Fresh

Param	Flag	Result	Units	RL
Chloride		75.5	mg/L	2.5
pН		8.02	s.u.	2
Specific Gravity		1.004	g/ml	
Total Dissolved Solids		672	m mg/L	2.5

Sample: 377452 - Brine

Param	Flag	Result	Units	RL
Chloride		16800	mg/L	2.5
Dissolved Sodium	Qs	14100	m mg/L	1
pH		6.34	s.u.	2
Specific Gravity		1.035	g/ml	
Total Dissolved Solids		32400	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 Texas 79922 El Paso, Texas 79703 Midland. Texas 75006 Carroliton.

E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915·585·3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: October 29, 2014

Work Order: 14102108

Project Location: Tatum, NM **Project** Name: Wasserhund Wasserhund-Tatum Project Number:

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
377451	Fresh	water	2014-10-16	15:56	2014-10-21
377452	Brine	water	2014-10-16	15:43	2014-10-21

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 16 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Elan Left

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

Report Contents

Case Narrative	3
Analytical Report Sample 377451 (Fresh)	4 4 5
Method Blanks QC Batch 116586 - Method Blank (1) QC Batch 116734 - Method Blank (1) QC Batch 116735 - Method Blank (1) QC Batch 116755 - Method Blank (1)	7 7 7 7
Duplicates QC Batch 116526 - Duplicate (1) QC Batch 116586 - Duplicate (1) QC Batch 116755 - Duplicate (1)	9 9 9 9
Laboratory Control Spikes 1 QC Batch 116734 - LCS (1) 1 QC Batch 116735 - LCS (1) 1 QC Batch 116755 - LCS (1) 1	0 _0 _0 _0
Matrix Spikes 1 QC Batch 116734 - MS (1) 1 QC Batch 116735 - MS (1) 1	2 12
Calibration Standards 1 QC Batch 116526 - ICV (1) 1 QC Batch 116526 - CCV (1) 1 QC Batch 116734 - ICV (1) 1 QC Batch 116734 - CCV (1) 1 QC Batch 116735 - CCV (1) 1 QC Batch 116735 - CCV (2) 1	3 3 3 3 3 3 4
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Case Narrative

Samples for project Wasserhund were received by TraceAnalysis, Inc. on 2014-10-21 and assigned to work order 14102108. Samples for work order 14102108 were received intact at a temperature of 1.9 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	98705	2014-10-28 at 15:00	116735	2014-10-28 at 16:01
Na, Dissolved	S $6010C$	98605	2014-10-23 at $14:50$	116734	2014-10-29 at $10:25$
pН	SM 4500-H+	98540	2014-10-21 at $16:30$	116526	2014-10-21 at $16:30$
Specific Gravity	ASTM D1429-95	98592	2014-10-23 at $10:30$	116586	2014-10-23 at $10:45$
TDS	SM 2540C	98719	2014-10-23 at $10:00$	116755	2014-10-23 at $16:00$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14102108 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: October 29, 2014 Wasserhund-Tatum

Analytical Report

Sample: 377451 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 116735 98705		Analytical I Date Analy Sample Pre	Method: 1 zed: 2 paration:	E 300.0 2014-10-28	Prep Method Analyzed By: Prepared By:	: N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Unit	ts Dilution	RL
Chloride		в	1.2.3.4.5	75.5	mg/	L 10	2.50

Sample: 377451 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 116526 98540		Analytical Method Date Analyzed: Sample Preparatio	l: SM 4- 2014- on:	500-H+ 10-21	Prep M Analyz Prepar	Method: zed By: red By:	N/A JP JP
				RL				
Parameter		Flag	Cert	Result	Unit	s Dilution		RL
pН			1,2,4,5	8.02	s.u	. 1		2.00

Sample: 377451 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Specific Gravity 116586 98592		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D 2014-10-2 2014-10-2	1429-95 3 3	Prep Method: Analyzed By: Prepared By:	${ m N/A} { m CF} { m CF}$
Parameter		Flag	Cert	Result	Units	Dilution	RL
Specific Grav	ity			1.004	g/ml	1	0.000

Sample: 377451 - Fresh

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	116755	Date Analyzed:	2014-10-23	Analyzed By:	RL
Prep Batch:	98719	Sample Preparation:		Prepared By:	RL

Report Date: October 29, 2014 Wasserhund-Tatum	Work Orde Wass	er: 14102108 erhund		Page Number: 5 of 16 Tatum, NM		
Parameter	Flag	Cert	RL Besult	Units	Dilution	BL
Total Dissolved Solids	riag	12345	672	mg/L	20	2.50
Total Disserved Solids		1,2,3,4,0		111 <u>8</u> /12	20	2.00

Sample: 377452 - Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 116735 98705		Analytical 1 Date Analy Sample Pre	Method: E 300 zed: 2014- paration:).0 10-28	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,5	16800	m mg/L	500	2.50

Sample: 377452 - Brine

Dissolved Soc	dium	$_{\rm Qs}$	2,3,4,5	14100	m mg/L	100	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	98605		Sample Preparation:	2014-10-23		Prepared By:	LM
QC Batch:	116734		Date Analyzed:	2014-10-29		Analyzed By:	LM
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Sample: 377452 - Brine

pH			1,2,4,5	6.34	s.u.	1	2.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	98540		Sample Preparat	sion:		Prepared By:	JP
QC Batch:	116526		Date Analyzed:	2014-10-1	21	Analyzed By:	JP
Laboratory:	Lubbock pH		Analytical Meth	od· SM 4500	-H+	Prep Method:	N/A

Report Date: October 29, 2014 Wasserhund-Tatum	ort Date: October 29, 2014 Wo serhund-Tatum				Page Number: Tatur	6 of 16 m, NM
Sample: 377452 - Brine						
Laboratory: Lubbock Analysis: Specific Gravity QC Batch: 116586 Prep Batch: 98592	A D Sa	nalytical Method: ate Analyzed: ample Preparation	ASTM D14 2014-10-23 a: 2014-10-23	29-95	Prep Method: Analyzed By: Prepared By:	N/A CF CF
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Specific Gravity			1.035	g/ml	1	0.000
Sample: 377452 - Brine						
Laboratory: Lubbock						
Analysis: TDS	Ar	nalytical Method:	SM 2540C		Prep Method:	N/A
QC Batch: 116755	Da	te Analyzed:	2014-10-23		Analyzed By:	$ {RL}$
Prep Batch: 98719	Sa	mple Preparation	:		Prepared By:	RL
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	32400	mg/L	200	2.50

Wasserhund-Tatum		Wasserhund		Tatum, NM		
Method B	Blanks					
Method Blank (1)	QC Batch: 116586					
QC Batch: 116586 Prep Batch: 98592		Date Analyzed: QC Preparation:	2014-10-23 2014-10-23		Analyzed By: Prepared By:	${ m CF} { m CF}$
Parameter	F	lag Ce	ert	MDL Result	Units	RL
Specific Gravity				1.002	g/ml	
Method Blank (1)	QC Batch: 116734					
QC Batch: 116734 Prep Batch: 98605		Date Analyzed: QC Preparation:	2014-10-29 2014-10-23		Analyzed By: Prepared By:	LM PM
Parameter	F	`lag Ce	\mathbf{rt}	MDL Result	Units	RL
Dissolved Sodium		2,3,	4,5	< 0.0184	mg/L	1
Method Blank (1)	QC Batch: 116735					
QC Batch: 116735 Prep Batch: 98705		Date Analyzed: QC Preparation:	2014-10-28 2014-10-28		Analyzed By: Prepared By:	RL RL
Parameter	Flag	Cert		MDL Result	Units	RL
~	0	10045		1.11	mg/L	2.5

Work Order: 14102108

Page Number: 7 of 16

Report Date: October 29, 2014

QC Batch:	116755	Date Analyzed:	2014-10-23	Analyzed By:	RL
Prep Batch:	98719	QC Preparation:	2014-10-23	Prepared By:	RL

Report Date: October 29, 2014 Wasserhund-Tatum	W	ork Order: 1410210 Wasserhund	Page Numb T	er: 8 of 16 atum, NM	
			MDL		
Parameter	Flag	Cert	Result	Units	RL
Total Dissolved Solids		1,2,3,4,5	<25.0	mg/L	2.5

Duplicates

Duplicates	(1) Duplica	ted Sample:	377452					
QC Batch: Prep Batch:	$\frac{116526}{98540}$		Date Ana QC Prepa		Analyzed By: JI Prepared By: JI			
D			Duplicate	Sample	TT •/		DDD	RPD
Param			Result	Result	Units	Dilution	RPD	Limit
pН		1,2,4,5	6.33	6.34	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 377452

QC Batch:	116586	Date Analyzed:	2014-10-23	Analyzed By:	${ m CF} { m CF}$
Prep Batch:	98592	QC Preparation:	2014-10-23	Prepared By:	
		Duplicate Sa	ample		RPD

	Duplicate	Sample				πpd
Param	Result	Result	Units	Dilution	RPD	Limit
Specific Gravity	1.009	1.035	g/ml	1	2	200

Duplicates (1) Duplicated Sample: 377727

QC Batch:	116755		Date Analyzed:	2014-10-23			Analyzed By:	RL
Prep Batch:	98719		QC Preparation:	2014-10-23			Prepared By:	RL
				<i></i>				
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolv	ed Solids	1,2,3,4,5	1830	1830	mg/L	20	0	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 116734		Date 1	Analyzed	: 201	14-10-29			Anal	yzed By	: LM
Prep Batch: 98605		QC P	reparatio	n: 201	14-10-23			Prep	ared By	: PM
			LCS			Spike	Ma	atrix		Rec.
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Re	sult I	Rec.	Limit
Dissolved Sodium		2,3,4,5	54.9	mg/L	, 1	52.5	<0.	0184	104 8	85 - 115
Percent recovery is based on the spil	ke resi	ult. RPD is	s based o	n the s	pike and sp	oike duplica	ate resu	ılt.		
		LCSD			Spike	Matrix		Rec.		RPD
Param F	' C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium	2,3,4	,5 53.4	$\mathrm{mg/L}$	1	52.5	< 0.0184	102	85 - 115	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	116735 98705		Date Analyzed: 2014-10-28 QC Preparation: 2014-10-28						Analyzed Prepared	By: RL By: RL
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride		_	1,2,3,4,5	25.4	mg/L	1	25.0	1.11	97	90 - 110
Percent recov	very is based on the	spike res	ult. RPD	is based or	n the spike	e and sp	ike duplicate	result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	25.3	$\mathrm{mg/L}$	1	25.0	1.11	97	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	116755	Date Analyzed:	2014-10-23	Analyzed By:	RL
Prep Batch:	98719	QC Preparation:	2014-10-23	Prepared By:	RL

Report Date: October 29, 2014 Wasserhund-Tatum		Work Order: 14102108 Wasserhund						Page Number: 11 of 16 Tatum, NM			
Param		F	C F	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec. Limit
Total Dissolved Solids		1,2	,3,4,5	986	mg/L	10	1000	<	25.0	99	90 - 110
Percent recovery is based on the s	spike	result.	RPD is b	oased on	the spi	ike and spi	ke duplica	te resu	ılt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	969	$\mathrm{mg/L}$	10	1000	$<\!25.0$	97	90 - 11	0 2	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

20

Matrix Spikes

Matrix Spike (MS-1)	Spiked	San	nple: 3	376967								
QC Batch: 116734 Prep Batch: 98605				Date QC F	Analyzed: Preparation	2014 : 2014	-10-29 -10-23			An Pre	alyzed By epared By	r: LM : PM
			F	C	MS	TT 1	D.II	Spike	М	atrix	D	Rec.
Param Disselved Codium			F	C	Result 5740	Units	Dil.	Amount	- Re	esult	Rec.	Limit
Dissolved Sodium	Qs	3	Qs	2,3,4,5	5740	mg/L	100	525	9	457	34	(5 - 125
Percent recovery is based of	on the sp	pike	result	. RPD i	is based on	the spi	ke and spi	ike duplica	te resu	ılt.		
				MSI	D		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium	Qs	$_{\rm Qs}$	2, 3, 4,	5 580	0 mg/L	100	525	5457	65	75 - 12	5 1	20
Matrix Spike (MS-1)	Spiked	San	nple: 3	377451								
QC Batch: 116735				Date	Analyzed:	2014	1-10-28			Aı	nalvzed B	v: RL
Prep Batch: 98705				QC I	Preparation	n: 2014	4-10-28			Pr	epared By	7: RL
					MS			Spike	М	atrix		Rec.
Param		Ι	F	С	Result	Units	Dil.	Amount	R	esult	Rec.	Limit
Chloride			1	1,2,3,4,5	340	mg/L	10	250	7	75.5	106	80 - 120
Percent recovery is based of	on the sp	pike	result	. RPD i	is based on	the spi	ke and spi	ike duplica	te resu	ılt.		
				MSI)		Spike	Matrix		Rec.		RPD
Param		F	\mathbf{C}	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

 \mathbf{F} \mathbf{C} Result RPD Param Units Dil. Amount Result Rec. Limit Chloride 1,2,3,4,5339 mg/L10 250 75.510580 - 120 0

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (ICV-1)

QC Batch:	116526		Date	e Analyzed:	2014-10-21		Analy	Analyzed By: JP		
				ICVs	ICVs	ICVs	Percent	_		
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
pН		1,2,4,5	s.u.	7.00	7.01	100	98 - 102	2014-10-21		

Standard (CCV-1)

QC Batch:	116526	Date	e Analyzed:	2014-10-21		Analyzed By: JP		
				CCVs True	CCVs Found	CCVs Percent	Percent Becovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1,2,4,5	s.u.	7.00	7.01	100	98 - 102	2014-10-21

Standard (ICV-1)

QC Batch: 116734			Date Anal	yzed: 201	Analyzed By: LM			
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sodium		2,3,4,5	$\mathrm{mg/L}$	51.0	51.7	101	90 - 110	2014-10-29

Standard (CCV-1)

QC Batch:	116734	Date Analyzed: 2014-10-29							Analyzed By: LM	
					CCVs	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Dissolved Sc	odium		2,3,4,5	mg/L	51.0	52.5	103	90 - 110	2014-10-29	

Report Date: (Wasserhund-Ta	October 29, 20 atum		Work Orde Wass	Page Number: 14 of 16 Tatum, NM				
Standard (CC	CV-1)							
QC Batch: 116735			Date A	Analyzed:	Analyzed By: RL			
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	~	1,2,3,4,5	$\mathrm{mg/L}$	25.0	25.5	102	90 - 110	2014-10-28

Standard (CCV-2)

QC Batch:	116735			Date .	Analyzed:	2014-10-28		Analyzed By: RL		
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	25.4	102	90 - 110	2014-10-28	
Page Number: 15 of 16 Tatum, NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5		2014-018	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

Report Date: October 29, 2014 Wasserhund-Tatum Work Order: 14102108 Wasserhund Page Number: 16 of 16 Tatum, NM

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Oracle Oracle<

Appendix "D"

• 2013 MIT Chart



D & L Meters & Instrument Service, Inc.

Lovington, NM 88260 P.O. Box 1621 Office: (575) 396-3715 Fax: (575) 396-5812



Friday, June 28, 2013

Certification of Pressure Recorder Test:

Company: Celero Energy Unit: N/A Model: 8" Bristols Pressure Rating: 1,000# Serial #: 3914

This Pressure Recorder was tested at midrange for accuracy and verified within

+5% and -5% for a 1,000# pressure element.

Josse Arbnivas , Technician

Appendix "E"

- AOR Well Status List
- AOR Plot Plan

2014 BW-22 AOR Review-- Well Status List up-dated Apr 28, 2015

	API#	Well Name	UL	ectic Ts	Rg	Footage	Within 1/4 mi AOR * within 660 ft or Critical AOR	Casing Progra Checked	Cased/Cemented across salt section	Corrective Action Required
1	<u>30-025-28162</u>	<u>Wasserhund Quality Watson #1</u>	<u>M</u>	<u>20</u> 12s	36e	<u>593 FSL & 639 FWL</u>	NA	NA	Na	NA
								0 0		
 Total # of wells in adjacent quarter-sections Total # of wells in 1/4 mile AOR Total # of wells that within 660 ft or the Critical AOR of the outside radius of the brine well and casing program will be checked and reported annually. 										

Notes:

* Means the well is within 660 ft or the Critical AOR of the outside radius of the brine well and casing program will be checked annually.



	Well AP1#: *- 30-025-28162	Note: Wells are identified by the last 2 digits of th
Westerhund IVC	Permit # BW-22	in the well status list.
2014	Location: UL M-Sec 20-Ts12s-R36e	

1.	D	c	8	٨
4	ε	۴.	6	н
	L	к		1
	м	N	0	

- Typical One Hile Section showing

he well's APL#. APL #'s are listed

Appendix "F"

- Wellbore Sketch, Brine Cavity Calculations with new 2014 Radius and D/H calculations.
- Aerial View showing Cavern Radius





Appendix "G"

• Solution Cavern Monitoring Plan Program

"Solution Cavern Monitoring Plan Program"

Wasserhund Inc. Brine Station Tatum Brine Station OCD Permit BW-22 API No. 30-025-28162 Watson #1 Unit Letter M-Section 20-Ts 12s – R 35e

Wasserhund Inc. hereby proposes to install a minimum of three National Geodetic Survey (NGS) survey control stations, i.e. survey monuments, around the brine well in a manner that will adequately provide vertical geodetic data to determine if any subsidence is occurring at the aforementioned well site.

A Berntsen Monument Installation Detail is included for reference. An approved Surveying/Contracting company will install the complete system.

A certified surveyed plat will be provided showing the location of the monuments and all significant features of the site.

The monuments will be laid out in a triangulation configuration around the wellhead, and located so as to pick-up any movement related to up-lift or subsidence of the anticipated areas of greatest concern.

The wellhead will also be included in the measurements, along with a known geodetic reference point outside of the possible influence of the well. While the system will focus on vertical movements, lateral movements will be visually noted and will actually impact the vertical readings.

The surveys will be performed semi-annually, evaluated and reported to the agency. All survey readings will be adjusted for and conform to the New Mexico Coordinate System.

Price LLC will conduct surveys in-house using approved level measuring instruments with a set number of readings collected by a licensed surveyor for quality control.

The data will be tabulated and a graph be maintained for each point over the life of the system.

Attached: Examples Only:

Topographic Map-Vicinity Map shows Local Benchmarks-Example only USGS Map-Example only Susidence Monument Location Map- Example only. Berntsen Monument Installation Detail-Actual Data Sheets-Example Only Graphs-Example Only











11 11 16 17 19 20 21	14 15 16 17 18 19 20 21 22	-1.5010 -2.6820 -6.0820 -5.5910 -2.5910 -2.6950 -2.8570 -2.1030	427.9000 322.6000 384.5400 464.4600 384.1600 424.7600 398.0200 385.9600 267.9000
21	72	-2.1030	261.9000

ADJUSTED ELEVATIONS

Station 198 22 1 2 3 4 5	Adjusted Elev 3434,3700 3434,3705 3434,9801 3439,3987 3442,4091 3444,7482 3444,5778	Standard Dev, 0.00000 0.01150 0.01150 0.01364 0.01364 0.02205 0.02338	NGS HORDHENT 198
67	3455.7212 3457.9332	0.02422 0.02724	NONCHENT #1
1	3459.1092	0.02888	MONUMENT #2
2.0	3460.4962	0.02863	STATE 41 WELL
11	3460.6115	0.02450	(AVERAGE)
1.2	3461.9215	0.02694	STATE #1 WELL 3461.921
1.3	3460.4925	0.02785	HONUMENT #3 3460, 494
14	3459.1105	0.02910	MONUMENT #2 3459,110
15	3457.9295	0.02643	MOSCHENT #1 3457.931
1.0	3454.5260	0.02425	
13	3450.1768	0.02326	
1.8	3444,5923	0.02101	
1.9	2442,0345	0.01937	
20	3439.3359	0.01595	
21	2436.4754	0.01061	

		ROUTE SUMMARY	Σ.	
Tron	20	Elev. Diff. (adjusted)	Residuals	
1,94	1	2,6101	-0.0029	
1	2	2.4186	-0.0034	
2	3	3.0104	-D.0036	
5	. 6	2,3390	-0.0040	
6		5.0297	-0.0033	
5	6	5.1434	-0.0036	/ \Q
6	7	2,2120	-0.0000	
6		3.3800	-0.0000	
6		4.7750	-0.0000	
6	10	6.2000	-D.0000	
5	3.1	4.0903	-0,0037	VET IN
15	22	1.3100	-0.0000	
13	13	-0.1190	-0.0000	$\sim \sim $
11	2.6	-1,3010	-0.0000	
11	15	-2.6820	0.0000	
				~



Appendix "H"

Wasserhund Inc. Closure Cost Estimate.

2014 Annual Report BW-22 Wasserhund Inc. Closure Cost

Pulling Unit Rig	\$25,000
Halliburton Cement Job	\$8,000.00
Post Subsidance Monitoring 5 years	\$15,000.00
Tank Removal, Pad Clean-Up	\$30,000.00
Consulting fees	\$10,000.00
Total Estimate	\$88,000

Wasserhund Inc.

P.O. Box 2140 575-396-0522 FAX 575-396-0797 Lovington, New Mexico 88260

ANNUAL CLASS III WELL REPORT FOR 2011

Wasserhund Inc.

Tatum Brine Station

OCD Permit BW-22

API No. 30-025-28162 Watson #1

Unit Letter M-Section 20-Ts 12s - R 35e

April 28, 2012

Submitted By: Price LLC on behalf of Wasserhund Inc Principal Mr. Larry Gandy.

Section 1- Summary of Operations:

(Permit Condition 21.L.2. "Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Include copy of C-103 if appropriate.")

The brine well was drilled in 1983 and has been in operation for approximately 29 years and is sited on the west side of Tatum, NM, just north of highway 380. The well is producing out of the Salado "Salt Formation" at a depth of approximately 2200-2850 feet below surface.

A copy of the most recent OCD approved Discharge Plan BW-22 and aerial photo is included for reference in *Appendix A*.

The brine well has been producing for a number of years and may possibly be considered approaching an "end of life" scenario due to its age. This scenario is not due to a safety aspect. i.e. collapse, since the well has been a relative low producer and the size of the cavity is quite small compared to similar wells of age. Section 8 (Brine Cavity/Subsidence Information) below discusses the safety aspects of this well in detail.

As with most brine wells of this age, repeated required annual testing which flexes the cavern support, thus causing flexure stress cracking and the required reverse flow issue, has caused these older wells to have premature down-hole problems, such as "sloughing" of the salt-anhydrite layers damaging the tubing and making re-entry virtually impossible and extremely expensive.

As will be discussed in Section 3 (Chemical Analysis) ever since the last open-hole formation test the well has not been able to produce 10# brine, either with reverse or conventional flow.

In addition, Wasserhund Inc respectfully request a waiver on having to pull the tubing for the next MIT/Braden head test since re-entry will virtually be impossible. We would like to purpose using a Nitrogen "Leak Off" Test instead. These test are considerably more accurate than the OCD standard MIT hydro-test that includes a 10% variance. On October 13, 2011, the brine well operations were transferred from the Gandy Corporation to Wasserhund Inc. In addition, a brine well renewal application was submitted to OCD with filing fee on October 27, 2011. <u>Appendix B</u> contains the change of operator and renewal application.

During the 2011year there was no major remedial work on the brine well, other than the annual open to formation mechanical integrity test (MIT). Since the well-head and tubing was not unseated or pulled, a C-103 is normally not required, however a C-103 form was submitted and is included in the MIT Section 3 found in <u>Appendix E.</u>

General housekeeping was routinely performed and on-site training and inspections were conducted for awareness of the permit conditions. The brine tanks currently do not have secondary containment and Wasserhund Inc respectfully requests a waiver of those conditions until the next permit is negotiated and approved.

A Pro-active well "Area of Review" has being conducted and will continue to ensure the safety of the well system, including cavern subsidence monitoring as required or directed by OCD.

A yearly cavity size calculation and evaluation of the last sonar test has been conducted to determine cavern stability and is discussed further in Section 8 below.

Depending upon OCD requirements and local economics, Wasserhund Inc will have to evaluate whether future operations of this well is warranted.

Section 2- Production Volumes:

(Permit condition 21.L.3. "Production volumes as required from 21.G. including a running total to be carried over to each year. The maximum and average injection pressure.")

(21.G. Requires "The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Santa Fe Office in the annual report.") Sales tickets and flow meters are used to monitor both water injected and brine produced.

Monthly, Yearly and Lifetime Injection and Production Volumes:

The monthly, yearly and lifetime fresh water injection and brine production volumes are attached herein for review. The total 2011 brine production volume was 23,350 bbls and the lifetime production volume is 2,650,595 bbls.

Enclosed in <u>Appendix C</u> is the injection and production and a comparison chart of injected water to produced water with comments.

Maximum and Average Injection Pressure:

The maximum operating injection pressure is approximately 380 psig, which is approximately 70 pounds below the permit maximum pressure of 450 psig.

The average injection pressure as noted by Wasserhund Inc.'s personnel is approximately 260 psig. This reading is taken from a pressure gauge mounted on the pump outlet.

Section 3- Chemical Analysis:

(Permit condition 21.L.4. "A copy of the chemical analysis as required in 21H. "Analysis of injection Fluid and Brine: Provide an analysis of the injection fluid and brine with each annual report. Analysis will be for General Chemistry (method 40 CFR 136.3) using EPA methods.")

Please find attached in <u>Appendix D</u> the latest chemical analysis and chain-of-custody of the brine and fresh water injection water samples collected October 18, 2011 and analyzed by Cardinal Laboratory in Hobbs, NM. The sampling process and laboratory used common approved EPA methods to collect, analyze and report for general chemistry i.e. major cations and anions, WQCC metals and cyanide.

The injection water was collected from the fresh water tank load line that is connected directly to the fresh water storage tanks. The fresh water is supplied by a fresh-water well located just north of the site and is of high quality that meets EPA's Safe Drinking Water Standards. The brine water was collected from the brine water tank load line that is connected directly to the brine water storage tanks. This sample point is representative of the brine water at the station.

The analysis revealed that the brine water is predominately sodium chloride with minor constituents of calcium, magnesium, and potassium combined with sulfate and bi-carbonate. This analysis is very representative of Salado "Salt" formation waters found in the area.

The specific gravity of the brine water was 1.054, which equates to 8.77 lb/gal. This is lower than the usual 10 lb/gal normally produced. This was attributed to the fact that during the test in October, most of the brine water was sold leaving only fresh water for the MIT "Open to Formation Test." This loaded the hole with a large amount of fresh water and the well had not recovered from this event.

Wasserhund Inc will continue to monitor the density issue and will report to OCD once the system recovers, or if for some reason it doesn't recover, then some remedial action may be taken, including the possibility of plugging the well.

Section 4- Mechanical Integrity:

(Permit condition 21.L.5. "A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or casing test.")

The BW-22 discharge permit condition 21.E set forth the criteria for running MIT's for this well. This condition also includes a schedule for which type of test is required to be run during various years of the permit. In 2011, an "open to formation" test was successfully run and witness by Mr. Maxey Brown of the OCD Hobbs office. The MIT test chart is attached in *Appendix E* for review.

Section 5- Deviations from Normal Production Methods:

(Permit condition 21.L.6. "Brief explanation describing deviations from normal production methods.")

In 2008 two OCD permitted brine wells collapsed. As a result of those incidents, the OCD issued a temporary moratorium on new brine well permits. During the moratorium OCD facilitated a work group to determine a proper path forward for current and new brine well operations.

As a result of those proceedings, OCD issued instructions to operators to change OCD's previous requirement of injecting fresh water down the annuals and producing brine up the tubing (i.e reverse-flow); to injecting fresh water down the tubing and producing brine up the annuals, (i.e. conventional-flow).

Wasserhund Inc has attempted to change the flow pattern and as of date, 10# brine cannot be made with conventional-flow. Wasserhund will continue to investigate the reason for this problem.

Section 6- Leak and Spill Reports:

(Permit condition 21.L.7. "A copy of any leaks and spill reports.")

There were no reportable leaks and spills in 2011.

The loading areas have spill containers under the hose connections, which are designed to catch de-minimis drips from hose connections. Drivers routinely suck out the spill containers, for re-cycling.

The entire facility is bermed to prevent run-on or run-off and all reportable or non-reportable spills are cleaned up pursuant to OCD rules and guidance.

Section 7- Groundwater Monitoring:

(Permit condition 21.L.8. "If applicable, results of any groundwater monitoring.")

The BW-22 facility does not have groundwater monitoring at this site. There are no planned or intentional discharges of water contaminants that may move directly or indirectly into groundwater. Any unintentional discharge, leak, spill, or drip is handled pursuant to the permit conditions.

Section 8- Brine Cavity/Subsidence Information:

(Permit condition 21.L.9. Information required from cavity/subsidence 21.F. "The operator shall provide information on the size and extent of the solution cavern and geologic/engineering data demonstrating that continued brine extraction will not cause surface subsidence, collapse or damage to property, or become a threat to public health and the environment.") Since the use of sonar tests in other wells has not provided adequate information, the continued use of sonar may be in question until the validity of using sonar test is resolved.

The last cavern survey (2008) for this well did provide some useful information pertaining to the size and shape of this particular cavern, but at a very limited depth. An alternate method has been discussed with Jim Griswold-OCD and it was mutually decided that an estimated worstcase diameter is to be determined in order to provide maximum protection and ensure the permit conditions are being met.

The Solution Mining Research Institute (SMRI), other state agencies, OCD work-group, along with various studies conducted during the permitting of the WIPP site, has concluded that failures, such as "catastrophic collapses", have a higher probability when the roof diameter of the cavern exceeds a certain value compared to the actual depth of the cavern.

This number is typically called D/H where "D" is the diameter of the cavity and "H" is the depth from surface to the casing shoe. Various reports seem to conclude that when a ratio of D/H reaches or exceeds .66 then the probably of collapse increases to a point that the well may be considered un-safe, thus closing procedures such as proper plugging and abandonment, and possible long term subsidence monitoring should be instituted.

The alternate method mentioned above involves calculating the maximum diameter of the cavern by using a worst-case scenario of an "<u>upright</u> <u>cone"</u>. The volume of the cavern is calculated using the lifetime brine production volumes and using a "*rule of thumb*" conversion factor to determine the volumetric size of the cavern. The rule of thumb conversion factor was taken from the 1982 Wilson Report and equates that every barrel of brine produced will create approximately one cubic foot of cavity.

Please find attached in *Appendix F*, a wellbore sketch, and the calculations for the brine well, and the lifetime brine production tally of approximately 2.68 million barrels of brine produced as of December 2011. The maximum diameter was calculated to be approximately 122 feet with a corresponding D/H ratio of .055 updated for the 2011 year.

While the sonar failed to provide information deeper in the cavern, it did show with some degree of accuracy, that the upper portion of the cavern had a maximum center-line radius of approximately 60 feet with a corresponding diameter of approximately 110 feet over all, which correlates with the worst case calculated value. Attached in Appendix F is a copy of the MaxPlot of the last sonar test showing the sonar results.

Comparing the current D/H ratio of .055 to the .66 value mentioned above, it can be concluded that the current brine well status meets and exceeds the recommended safety value by over twelve times.

Included in *Appendix F* is an aerial view showing the 60-foot radius superimposed around the brine well and station.

Section 9- Area of Review Update Summary:

(Permit condition 21.L.10. "An Area of Review (AOR) Summary.")

An extensive AOR review was conducted for the Quality Watson #1 brine well, OCD permit # BW-22, located in UL M of Section 20-Ts12S-R36E. Wasserhund Inc used OCD records and field verification to confirm wells in the AOR.

Using OCD on-line files, a well status list and AOR plot plan was constructed (*see Appendix G*) listing all wells within adjacent quarter sections of the BW-22 location. The list shows API#, Operator well name, UL, Section, Township and Range, footages, Wells within 660 ft and ¹/₄ mile, casing program status, casing/ cementing status, and corrective action required status.

In the 2011 review, there were no wells included in the list. *Appendix G* contains the check-off list showing the OCD wells in all adjacent quarter sections surrounding the BW-22 brine well.

This method was formulated to provide a baseline for future AOR studies. Since any future brine well will certainly be limited in size, a critical AOR of 660 feet was established and all wells within that radius will be researched in greater detail.

The rational of this approach is the fact that brine wells are non-static in terms of size and configuration and the fact that Wasserhund Inc has no direct control on wells drilled in close proximity. By just initially focusing on the current wells in the ¼ mile AOR and assuming the status of these wells will remain the same, could be a mistake. Therefore, Wasserhund Inc

is taking a more dynamic approach and will study wells as the brine well grows, especially wells in the critical zone.

We used the current estimated diameter of the brine well i.e. 120 ft (r = 60 ft) up-dated for 2011, and added a 10:1 safety factor which equates to about 600 ft. As the brine well grows, the critical AOR will be expanded and new wells will be added.

The critical zone was investigated by checking the OCD on-line well records. There was no well activity in the AOR.

Section 10- Certification (Permit Condition 22.L.11)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Larry Gandy Principal- Wasserhund Inc. Appendix "A"

- Aerial Photo
- Discharge Plan BW-22





NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON Governor Joanna Prukop Cabinet Secretary Mark E. Fesmire, P.E. Director Oil Conservation Division

March 28, 2007

Mr. Larry Gandy Gandy Corporation PO Box 827 Tatum, New Mexico 88267

Re: Discharge Permit BW-022 Renewal

Dear Mr. Gandy:

RECEIVE

Pursuant to all applicable parts of the Water Quality Control Commission (WQCC) Regulations 202.2 NMAC and more specifically 20.6.2.3104 - 20.6.2.3999 discharge permit, and 20.6.2.5000-.5299 Underground Injection Control, the Oil Conservation Division (OCD) hereby approves the dischar permit and authorizes the operation and injection for Gandy Corporation's Tatum Brine Station (*Owner/operator*) brine well BW-022 located in the SW/4, SW/4 of Section 20, Township 12 South, Range 36 East, NMPM, Lea County, New Mexico, under the conditions specified in the enclosed Attachment To The Discharge Permit.

Enclosed are two copies of the conditions of approval. Please sign and return one copy to the New Mexico Oil Conservation Division (OCD) Santa Fe Office within 30 working days of receipt of this Letter including permit fees.

Please be advised that approval of this permit does not relieve the owner/operator of responsibility should operations result in pollution of surface water, ground water or the environment. Nor does approval of the permit relieve the owner/operator of its responsibility to comply with any other applicable governmental authority's rules and regulations.

If you have any questions, please contact Brad A. Jones of my staff at (505) 476-3487 or E-mail brad.a..jones@state.nm.us. On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge permit review.

Wayne Price Environmental Bureau Chief

LWP/baj

Attachments-1 xc: OCD District Office

> Oil Conservation Division * 1220 South St. Francis Drive * Santa Fe, New Mexico 87505 Phone: (505) 476-3440 * Fax (505) 476-3462 * <u>http://www.emnrd.state.nm.us</u>
Mr. Larry Gandy BW-022 March 28, 2007 Page 2 of 9

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ATTACHMENT TO THE DISCHARGE PERMIT GANDY CORPORATION'S TATUM BRINE STATION BRINE WELL (BW-022) DISCHARGE PERMIT APPROVAL CONDITIONS MARCH 28, 2007

Please remit a check for \$1700.00 made payable to Water Quality Management Fund:

Water Quality Management Fund C/o: Oil Conservation Division 1220 S. Saint Francis Drive Santa Fe, New Mexico 87505

1. Payment of Discharge Plan Fees: All discharge permits are subject to WQCC Regulations. Every billable facility that submits a discharge permit application will be assessed a filing fee of \$100.00, plus a renewal flat fee (see WQCC Regulation 20.6.2.3114 NMAC). The Oil Conservation Division ("OCD") has received the required \$100.00 filing fee. However, the owner/operator still owes the required \$1700.00 permit fee for a Class III Brine Well.

2.) **Permit Expiration and Renewal:** Pursuant to WQCC Regulation 20.6.2.3109.H.4 NMAC, this permit is valid for a period of five years. **The permit will expire on March 11**, **2012** and an application for renewal should be submitted no later than 120 days before that expiration date. Pursuant to WQCC Regulation 20.6.2.3106.F NMAC, if a discharger submits a discharge permit renewal application at least 120 days before the discharge permit expires and is in compliance with the approved permit, then the existing discharge permit will not expire until the application for renewal has been approved or disapproved.

3. **Permit Terms and Conditions:** Pursuant to WQCC Regulation 20.6.2.3104 NMAC, when a permit has been issued, the owner/operator must ensure that all discharges shall be consistent with the terms and conditions of the permit. In addition, all facilities shall abide by the applicable rules and regulations administered by the OCD pursuant to the Oil and Gas Act, NMSA 1978, Sections 70-2-1 through 70-2-38.

4. **Owner/Operator Commitments:** The owner/operator shall abide by all commitments submitted in its February 9, 2007 discharge permit renewal application, including attachments and subsequent amendments and these conditions for approval. Permit applications that reference previously approved plans on file with the division shall be incorporated in this permit and the owner/operator shall abide by all previous commitments of such plans and these conditions for approval.

5. Modifications: WQCC Regulation 20.6.2.3107.C, 20.6.2.3109 and 20.6.2.5101.I NMAC addresses possible future modifications of a permit. The owner/operator (discharger) shall notify the OCD of any facility expansion, production increase or process modification that would result in any significant modification in the discharge of water contaminants. The Division Director may require a permit modification if any water quality standard specified at 20.6.2.3103 NMAC

Mr. Larry Gandy BW-022 March 28, 2007 Page 3 of 9

is being or will be exceeded, or if a toxic pollutant as defined in WQCC Regulation 20.6.2.7 NMAC is present in ground water at any place of withdrawal for present or reasonably foreseeable future use, or that the Water Quality Standards for Interstate and Intrastate streams as specified in 20.6.4 NMAC are being or may be violated in surface water in New Mexico.

6. Waste Disposal and Storage: The owner/operator shall dispose of all wastes at an OCDapproved facility. Only oil field RCRA-exempt wastes may be disposed of by injection in a Class II well. RCRA non-hazardous, non-exempt oil field wastes may be disposed of at an OCDapproved facility upon proper waste determination pursuant to 40 CFR Part 261. Any waste stream that is not listed in the discharge permit application must be approved by the OCD on a case-by-case basis.

A. OCD Rule 712 Waste: Pursuant to OCD Rule 712 (19.15.9.712 NMAC) disposal of certain non-domestic waste without notification to the OCD is allowed at NMED permitted solid waste facilities if the waste stream has been identified in the discharge permit and existing process knowledge of the waste stream does not change.

B. Waste Storage: The owner/operator shall store all waste in an impermeable bermed area, except waste generated during emergency response operations for up to 72 hours. All waste storage areas shall be identified in the discharge permit application. Any waste storage area not identified in the permit shall be approved on a case-by-case basis only. The owner/operator shall not store oil field waste on-site for more than 180 days unless approved by the OCD.

7. **Drum Storage:** The owner/operator must store all drums, including empty drums, containing materials other than fresh water on an impermeable pad with curbing. The owner/operator must store empty drums on their sides with the bungs in place and lined up on a horizontal plane. The owner/operator must store chemicals in other containers, such as tote tanks, sacks, or buckets on an impermeable pad with curbing.

8. Process, Maintenance and Yard Areas: The owner/operator shall either pave and curb or have some type of spill collection device incorporated into the design at all process, maintenance, and yard areas which show evidence that water contaminants from releases, leaks and spills have reached the ground surface.

9. Above Ground Tanks: The owner/operator shall ensure that all aboveground tanks have impermeable secondary containment (e.g., liners and berms), which will contain a volume of at least one-third greater than the total volume of the largest tank or all interconnected tanks. The owner/operator shall retrofit all existing tanks before discharge permit renewal. Tanks that contain fresh water or fluids that are gases at atmospheric temperature and pressure are exempt from this condition.

10. Labeling: The owner/operator shall clearly label all tanks, drums, and containers to identify their contents and other emergency notification information. The owner/operator may use a tank code numbering system, which is incorporated into their emergency response plans.

Mr. Larry Gandy BW-022 March 28, 2007 Page 4 of 9

11. Below-Grade Tanks/Sumps and Pits/Ponds.

A. All below-grade tanks and sumps must be approved by the OCD prior to installation and must incorporate secondary containment with leak detection into the design. The owner/operator shall retrofit all existing systems without secondary containment and leak detection before discharge permit renewal. All existing below-grade tanks and sumps without secondary containment and leak detection must be tested annually or as specified herein. Systems that have secondary containment with leak detection shall have a monthly inspection of the leak detection system to determine if the primary containment is leaking. Small sumps or depressions in secondary containment systems used to facilitate fluid removal are exempt from these requirements if fluids are removed within 72 hours. .

B. All pits and ponds, including modifications and retrofits, shall be designed by a certified registered professional engineer and approved by the OCD prior to installation. In general, all pits or ponds shall have approved hydrologic and geologic reports, location, foundation, liners, and secondary containment with leak detection, monitoring and closure plans. All pits or ponds shall be designed, constructed and operated so as to contain liquids and solids in a manner that will protect fresh water, public health, safety and the environment for the foreseeable future. The owner/operator shall retrofit all existing systems without secondary containment and leak detection before discharge permit renewal.

C. The owner/operator shall ensure that all exposed pits, including lined pits and open top tanks (8 feet in diameter or larger) shall be fenced, screened, netted, or otherwise rendered non-hazardous to wildlife, including migratory birds.

D. The owner/operator shall maintain the results of tests and inspections at the facility covered by this discharge permit and available for OCD inspection. The owner/operator shall report the discovery of any system which is found to be leaking or has lost integrity to the OCD within 15 days. The owner/operator may propose various methods for testing such as pressure testing to 3 pounds per square inch greater than normal operating pressure and/or visual inspection of cleaned tanks and/or sumps, or other OCD-approved methods. The owner/operator shall notify the OCD at least 72 hours prior to all testing.

12. Underground Process/Wastewater Lines:

A. The owner/operator shall test all underground process/wastewater pipelines at least once every five (5) years to demonstrate their mechanical integrity, except lines containing fresh water or fluids that are gases at atmospheric temperature and pressure. Pressure rated pipe shall be tested by pressuring up to one and one-half times the normal operating pressure, if possible, or for atmospheric drain systems, to 3 pounds per square inch greater than normal operating pressure, and pressure held for a minimum of 30 minutes with no more than a 1% loss/gain in pressure. The owner/operator may use other methods for testing if approved by the OCD.

Mr. Larry Gandy BW-022 March 28, 2007 Page 5 of 9

B. The owner/operator shall maintain underground process and wastewater pipeline schematic diagrams or plans showing all drains, vents, risers, valves, underground piping, pipe type, rating, size, and

approximate location. All new underground piping must be approved by the OCD prior to installation. The owner/operator shall report any leaks or loss of integrity to the OCD within 15 days of discovery. The owner/operator shall maintain the results of all tests at the facility covered by this discharge permit and they shall be available for OCD inspection. The owner/operator shall notify the OCD at least 72 hours prior to all testing.

13. Class V Wells: The owner/operator shall close all Class V wells (e.g., septic systems, leach fields, dry wells, etc.) that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes unless it can be demonstrated that ground water will not be impacted in the reasonably foreseeable future. Leach fields and other wastewater disposal systems at OCD-regulated facilities that inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. Class V wells that inject domestic waste only, must be permitted by the New Mexico Environment Department (NMED).

14. Housekeeping: The owner/operator shall inspect all systems designed for spill collection/prevention and leak detection at least monthly to ensure proper operation and to prevent over topping or system failure. All spill collection and/or secondary containment devices shall be emptied of fluids within 72 hours of discovery. The owner/operator shall maintain all records at the facility and available for OCD inspection.

15. Spill Reporting: The owner/operator shall report all unauthorized discharges, spills, leaks and releases and conduct corrective action pursuant to WQCC Regulation 20.5.12.1203 NMAC and OCD Rule 116 (19.15.3.116 NMAC). The owner/operator shall notify both the OCD District Office and the Santa Fe Office within 24 hours and file a written report within 15 days.

16. OCD Inspections: The OCD may place additional requirements on the facility and modify the permit conditions based on OCD inspections.

17. Storm Water: The owner/operator shall implement and maintain run-on and runoff plans and controls. The owner/operator shall not discharge any water contaminant that exceeds the WQCC standards specified in 20.6.2.3101 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams) including any oil sheen in any stormwater run-off. The owner/operator shall notify the OCD within 24 hours of discovery of any releases and shall take immediate corrective action(s) to stop the discharge.

18. Unauthorized Discharges: The owner/operator shall not allow or cause water pollution, discharge or release of any water contaminant that exceeds the WQCC standards listed in 20.6.2.3101 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams) unless specifically listed in the permit application and approved herein. <u>An</u> <u>unauthorized discharge is a violation of this permit.</u>

Mr. Larry Gandy BW-022 March 28, 2007 Page 6 of 9

19. Vadose Zone and Water Pollution: The owner/operator shall address any contamination through the discharge permit process or pursuant to WQCC 20.6.2.4000-.4116 NMAC (Prevention and Abatement

of Water Pollution). The OCD may require the owner/operator to modify its permit for investigation, remediation, abatement, and monitoring requirements for any vadose zone or water pollution. Failure to perform any required investigation, remediation, abatement and submit subsequent reports will be a violation of the permit.

20. Additional Site Specific Conditions: N/A

21. Brine Well(s) Identification, Operation, Monitoring, Bonding and Reporting.

- A. Well Identification: API # 30-025-28162 Quality Brine Watson #1
- B. <u>Well Work Over Operations</u>: OCD approval will be obtained prior to performing remedial work, pressure test or any other work. Approval will be requested on OCD Form C-103 "Sundry Notices and Reports on Wells" (OCD Rule 1103.A.) with appropriate copies sent to the OCD Environmental Bureau and District Office.
- C. <u>Production Method:</u> Fresh water will be injected down the casing and brine shall be recovered up the tubing. Reverse flow will be allowed only once a month for up to 24 hours for clean out. Operators may request long term reverse operation if they can demonstrate that additional casing and monitoring systems are installed and approved by OCD. Operating in the reverse mode for more than 24 hours unless approved otherwise is a violation of this permit.
- D. <u>Well Pressure Limits:</u> The maximum operating surface injection and/or test pressure measured at the wellhead shall not exceed 450 psig unless otherwise approved. The operator shall have a working pressure limiting device or controls to prevent overpressure. Any pressure that causes new fractures or propagate existing fractures or causes damage to the system shall be reported to OCD within 24 hours of discovery.
- E. <u>Mechanical Integrity Testing</u>: Conduct an annual open to formation pressure test by pressuring up the formation with approved fluids or gas to a minimum of 300 psig measured on the surface casing for four hours. However, no operator may exceed test pressures that may cause formation fracturing (see item 21.D above) or system failures. Systems requiring test pressures less than 300 psig must be approved by OCD prior to testing. At least once every five years and during well work-overs the salt cavern formation will be isolated from the casing/tubing annuals and the casing pressure tested at 300 psig for 30 minutes. All pressure tests must be performed per the scheduled shown below and witnessed by OCD unless otherwise approved.

Mr. Larry Gandy BW-022 March 28, 2007 Page 7 of 9

Testing Schedule:

2006- 30 minute @ 300 psig casing test only (set packer to isolate formation)
2007- 4 hour @ 300 psig casing open to formation test
2008- 4 hour @ 300 psig casing open to formation test
2009- 4 hour @ 300 psig casing open to formation test
2010- 4 hour @ 300 psig casing open to formation test

F. <u>Capacity/ Cavity Configuration and Subsidence Survey</u>: The operator shall provide information on the size and extent of the solution cavern and geologic/engineering data demonstrating that continued brine extraction will not cause surface subsidence, collapse or damage to property, or become a threat to public health and the environment. This information shall be supplied in each <u>annual report</u>. OCD may require the operator to perform additional well surveys, test, and install subsidence monitoring in order to demonstrate the integrity of the system. If the operator cannot demonstrate the integrity of the system to the satisfaction of the Division then the operator may be required to shut-down, close the site and properly plug and abandoned the well.

Any subsidence must be reported within 24 hours of discovery.

- G. <u>Production/Injection Volumes</u>: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Santa Fe Office in the annual report.
- H. <u>Analysis of Injection Fluid and Brine:</u> Provide an analysis of the injection fluid and brine with each annual report. Analysis will be for General Chemistry (method 40 CFR 136.3) using EPA methods.
- I. <u>Area of Review (AOR)</u>: The operator shall report within 24 hours of discovery of any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within ¹/₄ mile from the brine well.
- J. <u>Loss of Mechanical Integrity</u>: The operator shall report within 24 hours of discovery of any failure of the casing, tubing or packer, or movement of fluids outside of the injection zone.

The operator shall cease operations until proper repairs are made and receive OCD approval to re-start injection operations.

K. <u>Bonding or Financial Assurance</u>: The operator shall maintain at a minimum, a one well plugging bond pursuant to OCD rules and regulations. If warranted, OCD may require additional financial assurance.

Mr. Larry Gandy BW-022 March 28, 2007 Page 8 of 9

- L. <u>Annual Report</u>: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:
 - 1. Cover sheet marked as "Annual Brine Well Report, name of operator, BW permit #, API# of well(s), date of report, and person submitting report.

• .

- 2. Brief summary of brine wells operations including description and reason for any remedial or major work on the well. Copy of C-103.
- 3. Production volumes as required above in 21.G. including a running total should be carried over to each year. The maximum and average injection pressure.
- 4. A copy of the chemical analysis as required above in 21.H.
- 5. A copy of any mechanical integrity test chart, including the type of test, i.e. open to formation or casing test.
- 6. Brief explanation describing deviations from normal production methods.
- 7. A copy of any leaks and spills reports.
- 8. If applicable, results of any groundwater monitoring.
- 9. Information required from cavity/subsidence 21.F. above.
- 10. An Area of Review (AOR) summary.
- 11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.

22. Transfer of Discharge Permit: Pursuant to WQCC 20.6.2.5101.H the owner/operator and new owner/operator shall provide written notice of any transfer of the permit. Both parties shall sign the notice 30 days prior to any transfer of ownership, control or possession of a facility with an approved discharge permit. In addition, the purchaser shall include a written commitment to comply with the terms and conditions of the previously approved discharge permit. OCD will not transfer brine well operations until proper bonding or financial assurance is in place and approved by the division. OCD reserves the right to require a modification of the permit during transfer.

23. Closure: The owner/operator shall notify the OCD when operations of the facility are to be discontinued for a period in excess of six months. Prior to closure of the facility, the operator shall submit for OCD approval, a closure plan including a completed C-103 form for plugging and abandonment of the well(s). Closure and waste disposal shall be in accordance with the statutes, rules and regulations in effect at the time of closure.

24. Certification: Gandy Corporation (Owner/Operator), by the officer whose signature appears below, accepts this permit and agrees to comply with all submitted commitments, including these terms and conditions contained here. Owner/Operator further acknowledges that the OCD may, for good cause shown, as necessary to protect fresh water, public health, safety, and the environment, change the conditions and requirements of this permit administratively.

Mr. Larry Gandy BW-022 March 28, 2007 Page 9 of 9

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Conditions accepted by: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment."

Company Name-print name above

Company Representative-print name Company Representative-signature need. Title 24-0 Date:

Appendix "B"

- Change of OperatorPermit Renewal Application

From Operator GANDY CORP OGRID 8426 To Operator WASSERHUND INC OGRID 130851 Wells Selected for Transfer, Permit 138088 Permit Status: APPROVED

OCD District Hobbs

Property Well	Lea Typ	se ULSTR	OCE Unit	API	Well Type	Pool Pool Name ID
16527 EIDSON STATE #001	S	4-31-16S-35E	M	30-025-26883	M	96173 BSW;SALADO
309588 QUALITY BRINE WATSON #001	F	M-20-12S-36E	М	30-025-28162	Μ	96173 BSW;SALADO

Page 1 of 3

<u>District I</u> 1625 N 1 reach Dr., Hobbs, NM 88240 Phone (275) 303 6464 Lay (575) 303.0720 Distant U	State of New Mexico Energy Minerals and Natural	Form C-145 August 1-2011
NTES 1051 St. Artesta. NM 58240 Phone (575) 748-12834 av (575) 748-9720	Resources	Permit 138088
District III 1000 Rev Harays Rd - Vrice NM 87410 Phone (505) 334-6178 Las (505) 334-6170 <u>District IV</u> 12205 SciFancis Di - Santa Le NM 87305 Phone (505) 176-5470 Las (505) 176-5462	Oil Conservation Division 1220 S. St Francis Dr. Santa Fc, NM 87505	HOBBS OCD
	Change of Operator	OCT 1 2 2011

RECEIVED **Previous Operator Information** New Operator Information Effective Date Effective on the date of approval by the OCD 130851 8426 OGRID OGRID. GANDY CORP Name: WASSLRHUND INC Name: Address PO Box 2140 Address' PO Box 2140 City, State, Zip Lovington NM 88260 City, State, Zip Lovington NM 88260

I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information on this form and the certified list of wells is true to the best of my knowledge and belief

Additionally, by signing below, WASSERHUND INC certifies that it has read and understands the following synopsis of applicable rules

PREVIOUS OPERATOR certifies that all below-grade tanks constructed and installed prior to June 16, 2008 associated with the selected wells being transferred are either (1) in compliance with 19 15 17 NMAC, (2) have been closed pursuant to 19 15.17 13 NMAC or (3) have been retrofitted to comply with Paragraphs 1 through 4 of 19.15.17 11(I) NMAC

WASSERHUND INC understands that the OCD's approval of this operator change:

- 1 constitutes approval of the transfer of the permit for any permitted pit, below-grade tank or closedloop system associated with the selected wells; and
- constitutes approval of the transfer of any below-grade tanks constructed and installed prior to June 16, 2008 associated with the selected wells, regardless of whether the transferor has disclosed the existence of those below-grade tanks to the transferee or to the OCD, and regardless of whether the below-grade tanks are in compliance with 19 15 17 NMAC.

http://www.emmid.state.nm.us/OCD/OCDPermitting/Report/C104A/C104AReport.aspx? 10/12/2011

District I 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy, Minerals and Natural Resources Department

Revised June 10, 2003

Submit Original Plus 1 Copy to Santa Fe 1 Copy to Appropriate District Office

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

DISCHARGE PLAN APPLICATION FOR BRINE EXTRACTION FACILITES

(Refer to the OCD Guidelines for assistance in completing the application)

New XX Renewal

- I. Facility Name: Tatum Brine Station-BW-22
- II. Operator: Wasserhund Inc.Address: P.O. Box 827 Tatum, NM 88267Contact Person: Larry Gandy

Phone: 505-398-4940

Request , Commitments and Attachments:

- Pursuant to WQCC 20.6.2.5003.A NMAC "Existing Facilities" and per WQCC 20.6.2.5003.B; Wasserhund Inc. is
- requesting that the previously submitted information be referenced for this permit renewal application and Wasserhund
- Inc. hereby commits to continue and operate pursuant to the existing permit on-file with OCD until renewed by

OCD. Required \$100.00 filing fee is attached hereto.

III. Location: SW/4 SW/4 Section 20 Township 12S Range 36E

Submit large scale topographic map showing exact location.- ON

File with OCD

- IV. Attach the name and address of the landowner of the facility site.-ON File with OCD
- V. Attach a description of the types and quantities of fluids at the facility.-ON File with OCD
- VI. Attach a description of all fluid transfer and storage and fluid and solid disposal facilities.-ON File with OCD
- VII. Attach a description of underground facilities (i.e. brine extraction well).-ON File with OCD
- VIII. Attach a contingency plan for reporting and clean-up of spills or releases.-ON File with OCD
- IX. Attach geological/hydrological evidence demonstrating that brine extraction operations will not adversely impact fresh water.-ON File with OCD
- X. Attach such other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.-ON File with OCD
- XI. CERTIFICATION:

I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Name: Wayne Price-Price LLC

Title: Agent for Wasserhund Inc.

Signature: Milips file

Date: October 27, 2011

E-mailAddress:wayneprice77@earthlink.net_____

Appendix "C"

- Injection and Production Volumes/Comparison Charts
- Monthly/Quarterly Data Sheets

Image: Second				Plus numbers represent more injected than brine produced. numbers the opposite.	
Jan 5694 5809 2.02% Feb 3075 3190 3.74% Mar 1280 1455 13.67% Apr 2595 2688 3.58% May 2585 2668 3.21% Jun 840 895 6.55% Jul 1930 2015 4.40% Aug 440 495 12.50% Seep 1520 1605 5.59% Oct 1800 1930 7.22% Nov 2090 440 -78.95% Dec 3430 1520 -55.69% Cotal Production Carry Over from Years Past Bt 2,650,595 24710 -9.42% Total Production year ending 2011 2,677,874 - -		Brine-BBLS	Fresh-BBLS	% diff	
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Oct 1800 1930 7.22% Image: Content of the second se	jep	1520	1605	5.59%	
Nov a a 2090 440 -78.95% a a Dec 3430 1520 -55.69% a <	Dct	1800	1930	7.22%	
Dec 3430 1520 -55.69% -9.42% 2011 Total 27279 24710 -9.42% -9.42% Fotal Brine Water Production Carry Over from Years Past BI 2,650,595 -9.42% -9.42% -9.42% Fotal Production year ending 2011 2,677,874 -9.42% -9.42% -9.42% -9.42% -9.42%	lov	2090	440	-78.95%	
2011 Total 27279 24710 -9.42%	Dec	3430	1520	-55.69%	
Total Brine Water Production Carry Over from Years Past Bt 2,650,595 Image: Control of Carry Over from Years Past Bt 2,677,874 Fotal Production year ending 2011 2,677,874 Image: Control of Carry Over from Years Past Bt 2,677,874	011 Total	27279	24710	-9.42%	
Total Production year ending 2011 2,677,874	otal Brine Water Production Carry Over from Y	ears Past BE 2,650,595			
Fotal Production year ending 2011 2,677,874					
	otal Production year ending 2011	2,677,874			

GANDY CORPORATION OILFIELD SERVICES P.O. Box 2140 Lovington, New Mexico 88260 575-396-0522 2011 APR 18 P 1: 35 FAX 575-396-0797

April 15, 2011

NM Oil Conservation Division 1220 S. Saint Francis Drive Santa Fe, NM 87505

Fresh Water injected at the Tatum Brine Station (BW-022)

January 2011	5809
February 2011	3190
March 2011	1455

Brine Water Sold at the Tatum Brine Station (BW-022)

January 2011	5694			
February 2011	3075			
March 2011	1280			

Sincerely Yours; ie-

Donny Collins

WASSERHUND, INC. P.O. Box 2140 Lovington, NM 88260-2140

RECEIVED OCD 2011 JUL 18 A 11: 40

July 15, 2011

NM Oil Conservation Division 1220 S. Saint Francis Drive Santa Fe, NM 87505

Fresh Water injected at the Tatum Brine Station (BW-022)

April 2011			2688
May 2011	·	•	2668
June 2011			895

Brine Water Sold at the Tatum Brine Station (BW-022)

April 2011	2595
May 2011	2585
June 2011	840

Sincerely Yours;

Donny Collins

WASSERHUND, INC. P.O. Box 2140 Lovington, NM 88260-2140

January 16, 2012

NM Oil Conservation Division 1220 S. Saint Francis Drive Santa Fe, NM 87505

Fresh Water injected at the Tatum Brine Station (BW-022)

October 2011	1875
November 2011	2115
December 2011	3495

Brine Water Sold at the Tatum Brine Station (BW-022)

October 2011	1800
November 2011	2090
December 2011	3430

Sincerely Yours;

Donny Collins

Appendix "D"

- Chemical Analysis Fresh Water
- Chemical Analysis Brine Water



April 10, 2012

LESTER WAYNE PRICE, JR PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO, NM 87124

RE: TATUM BRINE WELL

BLU-22 AMENDEDN

Enclosed are the results of analyses for samples received by the laboratory on 10/18/11 16:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list on accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Analytical Results For:

PRICE LLC Project: 312 ENCANTADO RIDGE COURT, NE Project Number: RIO RANCHO NM, 87124 Project Manager: Fax To: Fax To:		TATUM BRINE WELL NONE GIVEN LESTER WAYNE PRICE, JR UNK-NOWN	Reported: 10-Apr-12 11:05		
Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	
FRESHWATER	H102248-01	Water	18-Oct-11 09:50	18-Oct-11 16:30	
BRINE WATER	H102248-02	Water	18-Oct-11 10:00	18-Oct-11 16:30	

Cardinal Laboratories

*=Accredited Analyte

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

				and the second se					
PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124		Project Nun Project Mana Fa:	oject: TAT nber: NOM ager: LES x To: UNM	'um Brine Ne given Ter Wayn K-Nown	WELL E PRICE, J	R		Reported: 10-Apr-12 11:0	05
		FRE	SHWATI	ER					
		H1022	48-01 (Wa	iter)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
		Cardina	al Laborat	ories					
Total Metals by ICPMS									
Arsenic	0.0073	0.0005	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Barium	0.0316	0.000500	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Cadmium	ND	0.00010	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Chromium	ND	0.001	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Cobalt	ND	0.00010	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Copper	0.0004	0.0001	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Lead	ND	0.0005	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Manganese	ND	0.0050	mg/L	10	1111412	JM	11-Nov-11	200.8	GAL
Molybdenum	0.0038	0.0005	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Nickel	0.0017	0.0005	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Selenium	0.008	0.001	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Silver	ND	0.00010	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Uranium	0.00410	0.000100	mg/L	1	1111412	JM	02-Nov-11	200.8	GAL
Zinc	ND	0.010	mg/L	10	1111412	JM	11-Nov-11	200.8	GAL
Mercury (Total) by CVAA									
Mercury	ND	0.0002	mg/L	1	1111411	JM	27-Oct-11	245.1	GAL
Inorganic Compounds									
Alkalinity, Bicarbonate	205	5.00	mg/L	1	1083007	HM	20-Oct-11	310.1M	
Alkalinity, Carbonate	ND	0.00	mg/L	1	1083007	HM	20-Oct-11	310.1M	
Chloride	84.0	16.0	mg/L	4	1101905	HM	21-Oct-11	4500-Cl-B	
Conductivity	1020	1.00	uS/cm	1	1102705	HM	20-Oct-11	120.1	
Cyanide (total)	ND	0.005	mg/L	1	1111413	CK	26-Oct-11	335.4	GAL
Fluoride	1.04	0.200	mg/L	1	1111414	CK	01-Nov-11	4500F C	GAL
pH	8.03	0.100	pH Units	1	1102705	HM	20-Oct-11	150.1	
Specific Gravity @ 60° F	0,9935	0.000	[blank]	1	1110307	HM	28-Oct-11	SM 2710F	
Sulfate	244	10.0	mg/L	1	1103102	HM	28-Oct-11	375.4	
TDS	639	5.00	mg/L	1	1102603	HM	22-Oct-11	160.1	
Alkalinity, Total	168	4.00	mg/L	1	1083007	HM	20-Oct-11	310.1M	

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*=Accredited Analyte

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Celey D. Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

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PRICE LLC Project: TATUM BRINE WELL Reported: 312 ENCANTADO RIDGE COURT, NE Project Number: NONE GIVEN 10-Apr-12 11: RIO RANCHO NM, 87124 Project Manager: LESTER WAYNE PRICE, JR Fax To: UNK-NOWN												
FRESHWATER H102248-01 (Water)												
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes			
		Cardina	l Labora	atories								
Inorganic Compounds												
TSS	6.00	2.00	mg/L	1	1111105	HM	25-Oct-11	160.2				
TOTAL METALS BY ICP												
Aluminum	0.0580	0.0500	mg/L	1	1111410	JM	26-Oct-11	200.7	GAL			
Boron	0.351	0.300	mg/L	1	1111410	JM	26-Oct-11	200.7	GAL			
Calcium	94.6	1.00	mg/L	1	1111410	CK	26-Oct-11	200.7	GAL			
Iron	0.251	0.060	mg/L	1	1111410	JM	26-Oct-11	200.7	GAL			
Magnesium	20.1	1.00	mg/L	1	1111410	CK	26-Oct-11	200.7	GAL			
Potassium	2.49	1.00	mg/L	1	1111410	CK	26-Oct-11	200.7	GAL			
Sodium	76.5	1.00	mg/L	1	1111410	CK	26-Oct-11	200.7	GAL			

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124		Pro Project Num Project Mana Fax	1	Reported: 10-Apr-12 11:05										
	BRINE WATER H102248-02 (Water)													
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes					
		Cardina	al Laborat	ories										
Total Metals by ICPMS														
Arsenic	ND	0.0500	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Barium	0.0518	0.0500	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Cadmium	ND	0.0100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Chromium	ND	0.100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Cobalt	ND	0.0100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Copper	0.354	0.0100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Lead	ND	0.0500	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Manganese	0.317	0.0050	mg/L	10	1111412	JM	11-Nov-11	200.8	GAL					
Molybdenum	ND	0.0500	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Nickel	ND	0.0500	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Selenium	ND	0.100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Silver	ND	0.0100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Uranium	0.0116	0.0100	mg/L	100	1111412	JM	02-Nov-11	200.8	GAL					
Zinc	ND	0.010	mg/L	10	1111412	JM	11-Nov-11	200.8	GAL					
Mercury (Total) by CVAA	ana na ana ang ang ang ang ang ang ang a								No Watchington					
Mercury	ND	0.0002	mg/L	1	1111411	JM	27-Oct-11	245.1	GAL					
Inorganic Compounds														
Alkalinity, Bicarbonate	161	5.00	mg/L	1	1102105	HM	21-Oct-11	310.1M						
Alkalinity, Carbonate	ND	0.00	mg/L	1	1102105	HM	21-Oct-11	310.1M						
Chloride	47500	16.0	mg/L	4	1101905	HM	21-Oct-11	4500-C1-B						
Conductivity	155000	1.00	uS/cm	1	1102705	HM	20-Oct-11	120.1						
Cyanide (total)	ND	0.005	mg/L	1	1111413	CK	26-Oct-11	335.4	GAL					
Fluoride	0.480	0.200	mg/L	1	1111414	CK	01-Nov-11	4500F C	GAL					
pH	7.24	0.100	pH Units	1	1102705	HM	20-Oct-11	150.1						
Specific Gravity @ 60° F	1.054	0.000	[blank]	1	1110307	HM	28-Oct-11	SM 2710F						
Sulfate	6180	10.0	mg/L	1	1103102	HM	28-Oct-11	375.4						
TDS	79400	5.00	mg/L	1	1102603	HM	22-Oct-11	160.1						
Alkalinity, Total	132	4.00	mg/L	1	1102105	HM	21-Oct-11	310.1M						

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*=Accredited Analyte

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Celey Keene

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

		And the second se	and the second second second	Contraction of the second second second			Contraction of the second	and the second se					
PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124	1	Reported: 10-Apr-12 11:05											
	BRINE WATER H102248-02 (Water)												
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes				
Cardinal Laboratories													
Inorganic Compounds													
TSS	42.0	2.00	mg/L	1	1111105	HM	25-Oct-11	160.2					
TOTAL METALS BY ICP													
Aluminum	1.51	0.500	mg/L	10	1111410	JM	26-Oct-11	200.7	GAL				
Boron	7.86	3.00	mg/L	10	1111410	JM	26-Oct-11	200.7	GAL				
Calcium	1450	10.0	mg/L	10	1111410	СК	26-Oct-11	200.7	GAL				
H102248-02 (Water) Analyte Result Reporting Limit Units Dilution Batch Analyst Analyzed Method Cardinal Laboratories Inorganic Compounds SS 42.0 2.00 mg/L 1 111105 HM 25-Oct-11 160.2 OTAL METALS BY ICP Iuminum 1.51 0.500 mg/L 10 1111410 JM 26-Oct-11 200.7 oron 7.86 3.00 mg/L 10 1111410 JM 26-Oct-11 200.7 oron 7.86 3.00 mg/L 10 1111410 JM 26-Oct-11 200.7 oron 7.86 3.00 mg/L 10 1111410 JM 26-Oct-11 200.7 oron 7.86 3.00 mg/L 10 1111410 JM 26-Oct-11 200.7 oron 7.81 10.0 mg/L 10							GAL						
Magnesium	731	10.0	mg/L	10	1111410	СК	26-Oct-11	200.7	GAL				
Potassium	509	10.0	mg/L	10	1111410	CK	26-Oct-11	200.7	GAL				
Sodium	24400	10.0	mg/L	10	1111410	CK	26-Oct-11	200.7	GAL				

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Celey & Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

And and a second se	PRICE LLC	Project:	TATUM BRINE WELL	Reported:
-	312 ENCANTADO RIDGE COURT, NE	Project Number:	NONE GIVEN	10-Apr-12 11:05
	RIO RANCHO NM, 87124	Project Manager:	LESTER WAYNE PRICE, JR	
		Fax To:	UNK-NOWN	

Total Metals by ICPMS - Quality Control Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1111412 - EPA 3005										
Blank (1111412-BLK1)				Prepared: (01-Nov-11	Analyzed: (2-Nov-11			
Barium	ND	0.000500	mg/L							
Selenium	ND	0.001	mg/L							
Lead	ND	0.0005	mg/L							
Uranium	ND	0.000100	mg/L							
Zinc	0.018	0.001	mg/L							E
Chromium	ND	0.001	mg/L							
Manganese	0.0035	0.0005	mg/L							E
Molybdenum	ND	0.0005	mg/L							
Arsenic	ND	0.0005	mg/L							
Copper	ND	0.0001	mg/L							
Nickel	ND	0.0005	mg/L							
Silver	ND	0.00010	mg/L							
Cobalt	ND	0.00010	mg/L							
Cadmium	ND	0.00010	mg/L							
LCS (1111412-BS1)				Prepared: 0)1-Nov-11 A	Analyzed: 0	2-Nov-11			
Barium	0.0503		mg/L	0.0500		101	85-115			
Copper	0.0502		mg/L	0.0500		100	85-115			
Cobalt	0.0515		mg/L	0.0500		103	85-115			
Lead	0.0503		mg/L	0.0500		101	85-115			
Cadmium	0.0507		mg/L	0.0500		101	85-115			
Arsenic	0.0529		mg/L	0.0500		106	85-115			
Manganese	0.0429		mg/L	0.0500		85.8	85-115			
Chromium	0.049		mg/L	0.0500		98.6	85-115			
Nickel	0.0504		mg/L	0.0500		101	85-115			
Molybdenum	0.0542		mg/L	0.0500		108	85-115			
Uranium	0.0490		mg/L	0.0500		98.0	85-115			
Silver	0.0521		mg/L	0.0500		104	85-115			
Zinc	0.059		mg/L	0.0500		118	85-115			BS
Selenium	0.273		mo/I.	0.250		109	85-115			20

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Celey & Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124	Project: TATUM BRINE WELL Project Number: NONE GIVEN Project Manager: LESTER WAYNE PRICE, JR Fax To: UNK-NOWN	Reported: 10-Apr-12 11:05
--	--	------------------------------

Total Metals by ICPMS - Quality Control

Cardinal Laboratories

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1111412 - EPA 3005

LCS Dup (1111412-BSD1)		Prepared: 01-Nov-11 Analyzed: 02-Nov-11									
Barium	0.0492	mg/L	0.0500	98.4	85-115	2.21	20				
Molybdenum	0.0523	mg/L	0.0500	105	85-115	3.57	20				
Uranium	0.0485	mg/L	0.0500	97.0	85-115	1.03	20				
Copper	0.0487	mg/L	0.0500	97.4	85-115	3.03	20				
Selenium	0.256	mg/L	0.250	102	85-115	6.43	20				
Chromium	0.049	mg/L	0.0500	98.2	85-115	0.407	20				
Cadmium	0.0501	mg/L	0.0500	100	85-115	1.19	20				
Nickel	0.0493	mg/L	0.0500	98.6	85-115	2.21	20				
Arsenic	0.0505	mg/L	0.0500	101	85-115	4.64	20				
Silver	0.0483	mg/L	0.0500	96.6	85-115	7.57	20				
Cobalt	0.0503	mg/L	0.0500	101	85-115	2.36	20				
Manganese	0.0443	mg/L	0.0500	88.6	85-115	3.21	20				
Lead	0.0498	mg/L	0.0500	99.6	85-115	0.999	20				
Zinc	0.065	mg/L	0.0500	130	85-115	9.52	20	BS1			

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Celey D. Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124	Project: Project Number: Project Manager: Fax To:	TATUM BRINE WELL NONE GIVEN LESTER WAYNE PRICE, JR UNK-NOWN	Reported: 10-Apr-12 11:05
	Mercury (Total) by CV	AA - Quality Control	

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1111411 - EPA 245.1										an the starting of party of the set of the
Blank (1111411-BLK1)				Prepared &	Analyzed:	27-Oct-11				
Mercury	ND	0.0002	mg/L							
LCS (1111411-BS1)				Prepared &	Analyzed:	27-Oct-11				
Mercury	0.0022		mg/L	0.00200		110	85-115			
LCS Dup (1111411-BSD1)				Prepared &	Analyzed:	27-Oct-11				
Mercury	0.0021		mg/L	0.00200		105	85-115	4.65	20	

Cardinal Laboratories

*=Accredited Analyte

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Celey & Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC Project: TATUM BRINE WELL 312 ENCANTADO RIDGE COURT, NE Project Number: NONE GIVEN RIO RANCHO NM, 87124 Project Manager: LESTER WAYNE PRICE, JR Fax To: UNK-NOWN	Reported: 10-Apr-12 11:05
--	------------------------------

Inorganic Compounds - Quality Control

Cardinal Laboratories

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1083007 - General Prep - Wet Chem

Blank (1083007-BLK1)				Prepared: 25-Au	g-11 Analyzed:	14-Sep-11			
Alkalinity, Carbonate	ND	0.00	mg/L						
Alkalinity, Bicarbonate	ND	5.00	mg/L						
Alkalinity, Total	ND	4.00	mg/L						
LCS (1083007-BS1)				Prepared: 25-Au	g-11 Analyzed:	14-Sep-11			
Alkalinity, Carbonate	ND	0.00	mg/L			80-120			
Alkalinity, Bicarbonate	ND	5.00	mg/L			80-120			
Alkalinity, Total	112	4.00	mg/L	100	112	80-120			
LCS Dup (1083007-BSD1)				Prepared: 25-Au	g-11 Analyzed:	14-Sep-11			
Alkalinity, Carbonate	ND	0.00	mg/L			80-120		20	
Alkalinity, Bicarbonate	ND	5.00	mg/L			80-120		20	
Alkalinity, Total	116	4.00	mg/L	100	116	80-120	3.51	20	
Duplicate (1083007-DUP1)	Sou	rce: H101772-	01	Prepared & Ana	lyzed: 25-Aug-1	1			
Alkalinity, Carbonate	ND	0.00	mg/L	0	.00			20	
Alkalinity, Bicarbonate	259	5.00	mg/L	2	44		5.96	20	
Alkalinity, Total	212	4.00	mg/L	2	00		5.83	20	
Batch 1101905 - SPLP 1312	(Transition of the providence of the				P (1, 4) (1, 4) (1, 1) (
Riank (1101905-RI K1)				Prenared: 17-Oc	t-11 Analyzed 2	0-Oct-11			

BIANK (1101903-BLA1)				Prepared. 17-Oct-1	1 Analyzed. 20	-001-11	
Chloride	ND	4.00	mg/L				
LCS (1101905-BS1)				Prepared: 17-Oct-1	1 Analyzed: 20	-Oct-11	
Chloride	112	4.00	mg/L	100	112	80-120	

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Celey D. Keine

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124		P Project Nu Project Ma F	Project: umber: inager: Fax To:	TATUM BRINE WELL NONE GIVEN LESTER WAYNE PRICE, JR UNK-NOWN				Reported: 10-Apr-12 11:05		
	Inor	ganic Com	pounds	- Quality	Control					
		Cardir	nal Lat	oratories			ergectratic stranding sigts			
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1101905 - SPLP 1312										
LCS Dup (1101905-BSD1)				Prepared: 1	7-Oct-11 A	nalyzed: 2	0-Oct-11			
Chloride	108	4.00	mg/L	100		108	80-120	3.64	20	
Batch 1102105 - General Prep - Wet Chem	1									
Blank (1102105-BLK1)				Prepared &	Analyzed:	21-Oct-11				
Alkalinity, Carbonate	ND	0.00	mg/L							
Alkalinity, Bicarbonate	ND	5.00	mg/L							
Alkalinity, Total	ND	4.00	mg/L							
LCS (1102105-BS1)				Prepared &	Analyzed:	21-Oct-11				
Alkalinity, Carbonate	ND	0.00	mg/L				80-120			
Alkalinity, Bicarbonate	ND	5.00	mg/L				80-120			
Alkalinity, Total	112	4.00	mg/L	100		112	80-120			
LCS Dup (1102105-BSD1)				Prepared &	Analyzed:	21-Oct-11				
Alkalinity, Carbonate	ND	0.00	mg/L				80-120		20	
Alkalinity, Bicarbonate	ND	5.00	mg/L				80-120		20	
Alkalinity, Total	120	4.00	mg/L	100		120	80-120	6.90	20	
Duplicate (1102105-DUP1)	Sour	ce: H102248-	-02	Prepared &	Analyzed:	21-Oct-11				
Alkalinity, Carbonate	ND	0.00	mg/L		0.00				20	
Alkalinity, Bicarbonate	156	5.00	mg/L		161			3.15	20	
Alkalinity, Total	128	4.00	mg/L		132			3.08	20	
Batch 1102603 - *** DEFAULT PREP ***										
Blank (1102603-BLK1)				Prepared: 2	2-Oct-11 A	nalyzed: 20	5-Oct-11			
TDS	ND	5.00	mg/L							

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124		Project: Project Number: Project Manager: Fax To:			NE WELL N YNE PRIC	e, jr		10-	Reported: -Apr-12 11	:05
	Ino	rganic Con	npounds	- Quality	Control					
	The States and the second	Carui		oratories						
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1102603 - *** DEFAULT PREP ***										and the second
LCS (1102603-BS1)				Prepared: 2	2-Oct-11 A	nalyzed: 2	6-Oct-11			
DS	235	~	mg/L	240		97.9	80-120			
Duplicate (1102603-DUP1)	Sou	Source: H102277-01 Prepared: 22-Oct-11 Ana			nalyzed: 2	6-Oct-11				
DS	3260	5.00	mg/L	3260				0.00	20	
Batch 1102705 - General Prep - Wet Chem										
LCS (1102705-BS1)				Prepared &	Analyzed:	20-Oct-11				
Conductivity	509		uS/cm	500		102	80-120			
Н	7.11		pH Units	7.00		102	90-110			
Duplicate (1102705-DUP1)	Sou	rce: H102247	-01	Prepared & Analyzed: 20-Oct-11						
Conductivity	1410	1.00	uS/cm		1410			0.00	20	
H	7.75	0.100	pH Units		7.73			0.258	20	
3atch 1103102 - General Prep - Wet Chem		001								
Blank (1103102-BLK1)				Prepared &	Analyzed:	28-Oct-11				
ulfate	ND	10.0	mg/L							
LCS (1103102-BS1)				Prepared &	Analyzed:	28-Oct-11				
ulfate	20.9	10.0	mg/L	20.0		104	80-120			
CS Dup (1103102-BSD1)				Prepared & Analyzed: 28-Oct-11						
ulfate	18.2	10.0	mg/L	20.0		91.0	80-120	13.8	20	

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Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

										the second s	
PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124		Project N Project Ma	Project: TATUM BRINE WELL roject Number: NONE GIVEN oject Manager: LESTER WAYNE PRICE, JR Fax To: UNK-NOWN					Reported: 10-Apr-12 11:05			
	Ino	rganic Con	pounds	- Quality	Control						
		Cardi	nal Lab	oratories							
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch 1103102 - General Prep - Wet Chem											
Duplicate (1103102-DUP1)	Sou	rce: H102247	-01	Prepared &	Analyzed:	28-Oct-11					
Sulfate	70.1	10.0	mg/L		67.5			3.78	20		
Batch 1110307 - General Prep - Wet Chem											
Duplicate (1110307-DUP1)	Source: H102247-01		Prepared &	Analyzed:	28-Oct-11						
Specific Gravity @ 60° F	0.9950	0.000	[blank]		0.9969			0.194	200		
Batch 1111105 - Filtration											
Blank (1111105-BLK1)				Prepared &	Analyzed:	25-Oct-11					
TSS	ND	2.00	mg/L								
Duplicate (1111105-DUP1)	Sou	rce: H102248	-01	Prepared &	Analyzed:	25-Oct-11					
TSS	6.00	2.00	mg/L		6.00			0.00	20		
Batch 1111413 - General Prep											
Blank (1111413-BLK1)				Prepared: 2	5-Oct-11 A	nalyzed: 26	5-Oct-11				
Cyanide (total)	ND	0.005	mg/L								
LCS (1111413-BS1)				Prepared: 2	5-Oct-11 A	nalyzed: 26	5-Oct-11				
Cyanide (total)	0.042		mg/L	0.0500		85.0	85-115				
LCS Dup (1111413-BSD1)				Prepared: 2	5-Oct-11 A	nalyzed: 26	5-Oct-11				
Cyanide (total)	0.047		mg/L	0.0500		94.8	85-115	10.9	20		

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Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124	C Project ANTADO RIDGE COURT, NE Project Number ICHO NM, 87124 Project Manage Fax Tr				: TATUM BRINE WELL : NONE GIVEN : LESTER WAYNE PRICE, JR : UNK-NOWN					Reported: 10-Apr-12 11:05			
	Ino	rganic Com Cardin	pound nal Lai	s - Quality	Control								
		Reporting		Spike	Source	and and a second second	%REC		RPD				
nalyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes			
atch 1111414 - General Prep													
lank (1111414-BLK1)				Prepared &	Analyzed:	01-Nov-11							
uoride	ND	0.200	mg/L										
CS (1111414-BS1)				Prepared &	Analyzed:	01-Nov-11							
aoride	1.09		mg/L	1.00		109	80-120						
CS Dup (1111414-BSD1)				Prepared &	Analyzed:	01-Nov-11							
aoride	1.09		mg/L	1.00		109	80-120	0.00	20				

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Celeg D. Keene

Celey D. Keene, Lab Director/Quality Manager



Analytical Results For:

PRICE LLC 312 ENCANTADO RIDGE COURT, NE RIO RANCHO NM, 87124	Project: TATU Project Number: NONI Project Manager: LEST Fax To: UNK-	TUM BRINE WELL DNE GIVEN STER WAYNE PRICE, JR IK-NOWN	Reported: 10-Apr-12 11:05
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TOTAL METALS BY ICP - Quality Control

Cardinal Laboratories

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		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 1111410 - EPA 3005										
Blank (1111410-BLK1)				Prepared: 2	25-Oct-11 A	nalyzed: 20	6-Oct-11			
Aluminum	ND	0.0500	mg/L							
Iron	ND	0.060	mg/L							
Sodium	ND	1.00	mg/L							
Calcium	ND	1.00	mg/L							
Potassium	ND	1.00	mg/L							
Magnesium	ND	1.00	mg/L							
Boron	ND	0.300	mg/L							
LCS (1111410-BS1)				Prepared: 2	25-Oct-11 A	Analyzed: 2	6-Oct-11			
Sodium	6.34		mg/L	6.48		97.8	85-115			
Magnesium	19.9		mg/L	20.0		99.5	85-115			
Iron	3.89		mg/L	4.00		97.2	85-115			
Boron	3.86		mg/L	4.00		96.5	85-115			
Calcium	3.90		mg/L	4.00		97.5	85-115			
Aluminum	3.94		mg/L	4.00		98.5	85-115			
Potassium	7.71		mg/L	8.00		96.4	85-115			
LCS Dup (1111410-BSD1)				Prepared:	25-Oct-11 A	Analyzed: 2	6-Oct-11			
Magnesium	20.1		mg/L	20.0		100	85-115	1.00	20	
Sodium	6.40		mg/L	6.48		98.8	85-115	0.942	20	
Calcium	3.91		mg/L	4.00		97.8	85-115	0.256	20	
Iron	3.92		mg/L	4.00		98.0	85-115	0.768	20	
Potassium	8.08		mg/L	8.00		101	85-115	4.69	20	
Aluminum	3.95		mg/L	4.00		98.8	85-115	0.253	20	
Boron	3.89		mg/L	4.00		97.2	85-115	0.774	20	

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Celey D. Keene, Lab Director/Quality Manager

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Notes and Definitions

GAL	Analysis subcontracted to Green Analytical Laboratories, a subsidiary of Cardinal Laboratories.
BS1	Blank spike recovery above laboratory acceptance criteria. Results for analyte potentially biased high.
B1	Target analyte detected in method blank at or above method reporting limit. Sample concentration found to be 10 times above the concentration found in the method blank or less than the reporting limit.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500CI-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

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Page 16 of 17



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

	101 East Marland, Hobbs, (575) 393-2326 FAX (575)	NM 88240 393-2476		10T				
Company Name	" Price LLE	and a stand of the second standards of a standard second standard second standard second standard second second	BILL TO	3		ANALVER F	FOUTOT	The second s
Project Manage	" Leston Ways	Pinic A.	P.O. #: 8:40	T		ANALISIS	EQUEST	
Address: 3/	2 ENCANTUR R	19. Court NE	Company: 12 AND CAPPERS	The P				
City: K-it	Randra State	: NM Zip: 87124	Attn:	C.				1 1
Phone #: SO	5-878-5543Fax#		Address:	18				
Project #:	Projec	ct Owner:	City: COUNTRAN		E .			
Project Name:	Let pp Parks U	110]]	State: NM Zip: 77210		12			
Project Location	1:	~	Phone #: 505-997-4969					
Sampler Name:	Leston 111.	and Price An	Fax #:	C.				
FOR LAB USE ONLY	<u> </u>	MATRIX	PRESERV. SAMPLING	<	A ST			
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PLEASE NOTE: Liability and analyses. All claims including	Damages, Cardinal's liability and client's exclusive those for negligence and any other cause whatsoe	remedy for any claim arising whether based in contra ever shall be deemed waived unless made in writing a	ict or tort, shall be limited to the amount paid by the client for ind received by Cardinal within 30 days after correct to a difference	the				
affiliates or successors arisin	rdinal be liable for incidental or consequental damag g out of or related to the performance of services he	reunder by Cardinal, regardless of whether such clai	5. less et use, et loss et profits incurred by client, its subsidial n is based upon any of the above stated reasons or otherwise	re applicable fics.				
Reinquished By	Date:	18/ Received By:	Phone Res	sult: L	Yes 🗆 No	Add'l Phone #:	anna an	1
Lestin W.	ayulino / Time:	To Clock Do	II A MULLI REMARKS	t: [5:	Yes No	Add'I Fax #:		1. F
Relinquished By	: Date:	Received By:	Mr. All Carte					

CHECKED BY:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

4D

Sample Condition Cool_Intact/ Yes Yes No No

Time:

Delivered By: (Circle One)

Sampler - UPS - Bus - Other:

Page 17 of 17
Appendix "E"

- C-103 for Annual Test
- MIT Test Results-Chart
- Well Bore Sketch

	Submit 1 Copy To Appropriate District State of New Mexico	Form C-103				
	District I – (575) 393-6161 Energy, Minerals and Natural Resources	WELL API NO.				
	District II - (575) 748-1283 HOBBS OUL CONSERVATION DIVISION	30-025-28162				
•	Bill S. First St., Artesia, NM 88210 District III - (505) 334-6178	5. Indicate Type of Lease				
8	1000 Rio Brazos Rd., Aztec, NM 87400 09 201 1220 South St. Trancis Di.	STATE X FEE FO				
	District IV – (505) 476-3460	or polico				
	87505	7 Lesse Name or Unit Agreement Name				
	DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A	7. Lease Name of Omr Agreement Name				
	DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH	Quality Watson				
	1. Type of Well: Oil Well [] Gas Well [] Other Brine Well	8. Well Number 1				
	2. Name of Operator	9. OGRID Number 130851				
	3. Address of Operator	10. Pool name or Wildcat				
	P.O. Box 2140, Lovington, NM 88260	BSW Salada				
	4. Well Location	and the West line				
	Unit Letter M : 593 feet from the South line and	639 feet from the West line				
	Section 20 Township 12s Range 36e	NMPM County Lea				
	11. Elevation (Snow whether DR, RAD, R1, OR, etc.)					
	12. Check Appropriate Box to Indicate Nature of Notice,	Report or Other Data				
	NOTICE OF INTENTION TO: SUB	SEQUENT REPORT OF:				
	PERFORM REMEDIAL WORK PLUG AND ABANDON					
	OTHER: integrity test	d give pertinent dates, including estimated date				
	13. Describe proposed/or completed operations. (Clearly state an pertinent details, and	mpletions: Attach wellbore diagram of				
	proposed completion or recompletion.					
	Please see attached:					
	Chart					
	Well Bore Diagram					
	Last time pulled packer test - 10/21/08					
	* OPTETAL	L. CHART MAILED TO				
		- (ITM GPTSIDD)				
	. DANTH-FC	, (JIM GALSWOOD,				
	Sand Date: Rig Release Date:					
	Spud Date.					
		11.11.0				
	I hereby certify that the information above is true and complete to the best of my knowled	ge and beller.				
	SIGNATURE May Donay TITLE Secretary/Treas	DATEDATE11/04/11				
	Type or print name Larry Gandy E-mail address: lgandy@gandy.	corporation.com PHONE: 575-396-0522				
	For State Use Only A Loud A Lo ON -					
	APPROVED BY: V Ale 1 Drown TITLE Compliance Officer DATE 11/10/2011					
	Conditions of Approval (if any)					
	V					



Wasserhund Inc. Quality Brine Watson #1 M 20-12s-36e 30-025-28162

.



Appendix "F"

- Brine Cavity Calculations with Wellbore Sketch
- D/H Calculations
- Aerial View showing Cavern Radius





Appendix "G"

- AOR Well Status List
- AOR Plot Plan
- OCD Well Records Search

2011 BW-22 AOR Review-- Well Status List up-dated Jan 01, 2012

							Within 1/4 mi AOR * within 660 ft or	Casing Progra	Cased/Cemented	Corrective Action
	API#	Well Name	UL	ectic Ts R	g	Footage	Critical AOR	Checked	across salt section	Required
1	30-025-28162	Wasserhund Quality Watson #1	M	20 125 36	5e 593	FSL & 639 FWL	NA	NA	Na	NA
1 Tota 0 Tota 0 Tota	al # of wells in adjacen al # of wells in 1/4 mik al # of wells that withir	t quarter-sections e AOR 1 660 ft or the Critical AOR of the outs	ide r	adius of the	brine v	vell and casing pr	ogram will be checked a	0 0 and reported annu	ually.	

Notes:

* Means the well is within 660 ft or the Critical AOR of the outside radius of the brine well and casing program will be checked annually.



Brine Well Area of Review (AOR) UL Plot Plan	Well API#: - 30-025-28162	Note: Wells are identified by the last 2 digits of the well's API#. API #'s are listed
Operator Name: Wasserhund INC	Permit # BW-22	in the well status list.
AOR Year: 2011	Location: UL M-Sec 20-Ts12s-R36e	

Well File Search - Select Documents to View

Please click on any thumbnail below in order to view the document. Access to the OCD Internet images does not grant permission to reproduce, disseminate, disclose, or otherwise utilize materials subject to protection of United States copyright or trademark laws. Contact the copyright owner for specific permission to utilize any such materials. Image size and approximate download times are shown below each thumbnail. Download times are based upon a 28.8Kb modem speed.

Clicking the "View All" button below will download a single file containing all documents. "View All" will select only those thumbnails shown in the currently selected API Number. If you wish to select a different API Number, please use the "Go Back" button. "View All" may take several minutes.

API Number	ULSTR	Footages
3002528162	M-20-12S-36E	593 FSL & 639 FWL
Well Name & Number:	QUALITY BRINE WATSON	No. 001

• Ascending Obescending

Operator: WASSERHUND INC

Sort Order:

Note: If you are using Microsoft Internet Explorer and your system does not allow you to open TIFF images from the Internet without saving them first, please contact your administrator. You may be experiencing a problem with the Internet Explorer Cumulative Patch. Please refer to the Microsoft Knowledge Base Article, Q319829, "Cannot Open a Tagged Information File Format (TIFF) File in Internet Explorer", located here.



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Well File Search - Select API Number to View

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

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WASSEPHUND BW-22 next lected. heteby AdR- SEC19-TI2S-R36E AdR- 2012

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 Mell File Search - Select API Number to View

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 AOF SEC 30-Ties-R36E

 O Records Found
 M 2012

ULSTR

Footages

API Number

Wasserhund Inc.

P.O. Box 2140 575-396-0522 FAX 575-396-0797 Lovington, New Mexico 88260

ANNUAL CLASS III WELL REPORT FOR 2015

Wasserhund Inc.

Tatum Brine Station

OCD Permit BW-22

Expiration Date: Nov 08, 2018

API No. 30-025-28162 Watson #1

Unit Letter M-Section 20-Ts 12s - R 35e

April 30, 2016

Submitted By: Price LLC on behalf of Wasserhund Inc Principals Mr. Larry and Jon Gandy.

Mayro Pur

Wayne Price-LLC

Larry Gandy

Jon Gandy

Bullet Point 2- Summary of Operations:

(Permit Condition 2.J.2 Annual Report: "Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of C-103.") Permit Expiration Date November 08, 2018.

During the 2015 year, there was no major or remedial work performed on the brine well. Due to brine quality issues experienced during the past years, Wasserhund Inc. submitted a C-103 to OCD in late December of 2012 to investigate why the well is not producing high quality brine water. (C-103 included in *Appendix "A"*)

Even though the oilfield has slowed down, there still is some demand for cut-brine, Wasserhund Inc. decided to forego any well work during the 2015 calendar year.

The brine well was drilled in 1983 and has been in operation for approximately 32 years and is sited on the west side of Tatum, NM, just north of highway 380. The well is producing out of the Salado "Salt Formation" at a depth of approximately 2200-2850 feet below surface.

A copy of the most recent OCD approved Discharge Plan BW-22, aerial photo and recent site inspection report is included for reference in *Appendix "A"*.

The brine well has been producing for a number of years and may possibly be considered approaching an "end of life" scenario due to its age. This scenario is not due to a safety aspect. i.e. collapse, since the well has been a relative low producer and the size of the cavity is quite small compared to similar wells of age. **Bullet Point 10** (Brine Cavity/Subsidence Information) below discusses the safety aspects of this well in detail.

As with most brine wells of this age, repeated required annual testing which flexes the cavern support, thus causing flexure stress cracking and the required reverse flow issue, has caused these older wells to have pre-mature down-hole problems, such as "sloughing" of the salt-anhydrite layers damaging the tubing and making re-entry virtually impossible and extremely expensive.

As will be discussed in **Bullet Point 5** (Chemical Analysis) ever since the last open-hole formation-test, the well has not been able to produce 10# brine, either with reverse or conventional flow. In addition, an off color brine water has been noted from time to time.

General housekeeping was routinely performed and on-site training and inspections were conducted for awareness of the permit conditions. The brine tanks currently do not have secondary containment and Wasserhund Inc respectfully requests a waiver of those conditions unless unusual operating conditions warrant such.

A Pro-active well "Area of Review" has being conducted and will continue to ensure the safety of the well system, including cavern subsidence monitoring as required or directed by OCD.

A yearly cavity size calculation and evaluation of the last sonar test has been conducted to determine cavern stability and is discussed further in **Bullet Point 10** below.

Depending upon OCD requirements and local economics, Wasserhund Inc. will have to evaluate whether future operations of this well is warranted as a concentrated brine producing well.

Bullet Point 3- Production Volumes:

(Permit condition 2.J.3 "Monthly fluid injection and brine production volume, including the cumulative total carried over each year"

Sales tickets and flow meters are used to monitor both water injected and brine produced.

Monthly, Yearly and Lifetime Injection and Production Volumes:

The monthly, yearly and lifetime fresh water injection and brine production volumes are attached herein for review. The total 2015 brine production volume was 6,225 bbls and the lifetime production volume is 2,718,372 bbls.

Enclosed in *Appendix "B"* is the injection and production and a comparison chart of injected water to produced water with comments.

Bullet Point 4- "Injection Pressure Data."

(Permit condition 2.J.4 "Injection Pressure Data"

Maximum and Average Injection Pressure: Maximum and Average Injection Pressure:

The maximum operating injection pressure is approximately 380 psig, which is approximately the recommended maximum surface pressure of 380 psig, utilizing a .70 psi/ft brine well gradient, measured from the top to the casing shoe.

The average injection pressure as noted by Wasserhund Inc.'s personnel is approximately 260 psig. This reading is taken from a pressure gauge mounted on the pump outlet.

Bullet Point 5- Chemical Analysis:

(Permit condition 2.J.5 "A copy of the quarterly chemical analysis shall be included with data summary and all QA/QC information.")

Please find attached in *Appendix "C"* the chemical analysis and chain-of-custody of the brine and fresh water injection water samples collected and analyzed by Trace Analysis in Lubbock, Texas, for the 2015 year. The sampling process and laboratory used common approved EPA methods to collect, analyze and reporting.

The injection water was collected from the fresh water tank load line that is connected directly to the fresh water storage tanks. The fresh water is supplied by a fresh-water well located just north of the site.

The brine water was collected from the brine water tank load line that is connected directly to the brine water storage tanks. This sample point is representative of the brine water at the station.

As reported in the production volumes, the Tatum Brine Station saw very little action and the specific gravity (Density) was reported to fall between .996 to 1.027. As previously reported, from time to time, an off red color of the produced brine has been noted, possibly caused by injected fresh water interacting with the upper Salado/Rustler formation where the salt has been dissolved.

Wasserhund Inc., will continue to monitor the density-quality issue and will report to OCD once the system recovers, or if for some reason it doesn't recover, then some remedial action may be taken, including the possibility of running a tubing plug with wire-line to determine integrity, reversing the flow, deepening the well or plugging the well.

The sodium-chloride average ratio was .632, and varied from a low of .60 to a high of .71, where the theoretical average for Sodium Chloride salt is .648. These ratios were compared to production volumes, but no correlation was apparent at this time.

Bullet Point 6- Mechanical Integrity:

(Permit condition 2.J.6 "Copy of any mechanical integrity test chart, including the type of test, i.e., duration, gauge pressure, etc;")

A Mechanical Integrity Test (MIT) was successfully ran and passed on September 09, 2013. The next scheduled MIT will occur in 2018 as approved by OCD.

Please find in *Appendix "D"* a copy of the test chart and meter calibration record.

Bullet Point 7- Deviations from Normal Production Methods:

(Permit condition 2.J.7 "Brief explanation describing deviations from normal operations.")

In 2008 two OCD permitted brine wells collapsed. As a result of those incidents, the OCD issued a temporary moratorium on new brine well permits. During the moratorium OCD facilitated a work group to determine a proper path forward for current and new brine well operations.

As a result of those proceedings, OCD issued instructions to operators to change OCD's previous requirement of injecting fresh water down the annuals and producing brine up the tubing (i.e reverse-flow); to injecting fresh water down the tubing and producing brine up the annuals, (i.e. conventional-flow).

Wasserhund Inc. has been successful in changing the flow pattern to conventional flow, but due to some down-hole geological-physical characteristics, is only able to make a cut-brine ranging in specific gravity of .996 to 1.027.

Bullet Point 8- Leak and Spill Reports:

(Permit condition 2.J.8 "Results of any leaks and spill reports;")

There were no reportable leaks and spills in 2015.

The loading areas have spill containers under the hose connections, which are designed to catch de-minimis drips from hose connections. Drivers routinely suck out the spill containers, for re-cycling.

The entire facility is bermed to prevent run-on or run-off and all reportable or nonreportable spills are cleaned up pursuant to OCD rules and guidance.

Bullet Point 9- Area of Review Update Summary:

(Permit condition 2.J.9 "An Area of Review (AOR) update summary;")

An extensive AOR review was conducted for the Quality Watson #1 brine well, OCD permit # BW-22, located in UL M of Section 20-Ts12S-R36E. Wasserhund Inc used OCD records and field verification to confirm wells in the AOR.

Using OCD on-line files and actual on-site field verification, a well status list and AOR plot plan was constructed (*see Appendix "E"*) listing all wells within adjacent quarter sections of the BW-22 location. The list shows API#, Operator well name, UL, Section, Township and Range, footages, Wells within 660 ft and ¼ mile, casing program status, casing/ cementing status, and corrective action required status.

In the 2015 review, there were no new wells added to the list. *Appendix "E"* contains the check-off list showing the OCD wells in all adjacent quarter sections surrounding the BW-22 brine well.

This method was formulated to provide a baseline for future AOR studies. Since brine wells are limited in size, a critical AOR of 660 feet was initially established and all wells within that radius was researched in detail.

Using the current estimated diameter of the brine well i.e. 123.0 ft (r= 61.5 ft) up-dated for 2015, a 10:1 safety factor is applied that equates to about 615 ft. As the brine well grows, this newly calculated critical AOR will be expanded and new wells will be added and all existing wells restudied.

The rational behind this approach is the fact that brine wells are non-static in terms of size and configuration, and the fact that the brine well operator has only indirect control on wells drilled in close proximity.

Initially focusing on the current wells in the ¼ mile AOR, and assuming the status of these wells remain the same, may be a mistake. Therefore, a more dynamic approach is being undertaken, and each well in the critical Area of Review (AOR) will be looked at on an annual basis, or whenever any planned activity or new wells are noticed in the AOR.

The critical zone was investigated by checking the OCD on-line well records. There was no well activity in the AOR.

Bullet Point 10- Subsidence/Cavern Volumes/Geometric Measurements

(Permit condition 2.J.10. "A summary with interpretations of MIT's, surface subsidence surveys, cavern volume and geometric measurements with conclusion(s) and recommendation(s);")

Since the use of sonar tests in other wells has not provided adequate information, the continued use of sonar may be in question until the validity of using sonar test is resolved.

The last cavern survey (2008) for this well did provide some useful information pertaining to the size and shape of this particular cavern, but at a very limited depth. An alternate method has been discussed with Jim Griswold-OCD and it was mutually decided that an estimated worst-case diameter is to be determined in order to provide maximum protection and ensure the permit conditions are being met.

The Solution Mining Research Institute (SMRI), other state agencies, OCD work-group, along with various studies conducted during the permitting of the WIPP site, has concluded that failures, such as "catastrophic collapses", have a higher probability when the roof diameter of the cavern exceeds a certain value compared to the actual depth of the cavern.

This number is typically called D/H where "D" is the diameter of the cavity and "H" is the depth from surface to the casing shoe. Various reports seem to conclude that when a ratio of D/H reaches or exceeds .66 then the probably of collapse increases to a point that the well may be considered un-safe, thus closing procedures such as proper plugging and abandonment, and possible long term subsidence monitoring should be instituted.

The alternate method mentioned above involves calculating the maximum diameter of the cavern by using a worst-case scenario of an "*upright cone*". The volume of the cavern is calculated using the lifetime brine production volumes and using a "*rule of thumb*" conversion factor to determine the volumetric size of the cavern. The rule of thumb conversion factor was taken from the 1982 Wilson Report and equates that every barrel of brine produced will create approximately one cubic foot of cavity.

Please find attached in *Appendix "F"*, a wellbore sketch, and the calculations for the brine well, and the lifetime brine production tally of approximately 2.71 million barrels of brine produced as of December 2015. The maximum diameter was calculated to be approximately 123.0 feet with a corresponding D/H ratio of .057 updated for the 2015 year.

While the sonar failed to provide information deeper in the cavern, it did show with some degree of accuracy, that the upper portion of the cavern had a maximum centerline radius of approximately 60 feet with a corresponding diameter of approximately 110 feet over all, which correlates with the worst case calculated value. Attached in **Appendix "F"** is a copy of the MaxPlot of the last sonar test showing the sonar results.

Comparing the current D/H ratio of .057 to the .66 value mentioned above, it can be concluded that the current brine well status meets and exceeds the recommended safety value by over 11.5 times.

Included in *Appendix "F"* is an aerial view showing the 61.5-foot radius superimposed around the brine well and station.

Permit Condition 2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective data of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring

point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well. If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

Special Request: This facility currently does not have subsidence monitors installed and Wasserhund Inc. respectfully request waiver of this requirement until further evaluation can be completed or closure of the site commences.

However, in order to meet the new permit requirements, Wasserhund Inc. hereby submits a subsidence monitoring plan pursuant to Permit Condition 2.B. "Solution Cavern Monitoring Plan Program". A copy of the proposal is included in *Appendix "G"* for OCD review and approval.

<u>Special Request: Wasserhund Inc. request a Minor Modifications that</u> <u>allows the results be supplied in the annual report, unless there is an</u> <u>exceedance as noted in the permit.</u>

2. Solution Cavern Characterization Program: The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.

<u>Solution Cavern Characterization Plan</u>: Wasserhund Inc. hereby proposes to use a combination of calculated results as determined above, and will experiment with various geophysical methods, including actually performing an "Induced Current Method" and report these results in the next annual report.

The 'Induced Current' Method has not been successful, primarily to bad connections and low voltage used. Wasserhund will continue trying this method and others as approved by OCD. The old fashion cavern calculation continues to be the best economic method available.

Bullet Point #11- Ratio of Injected/Produced Fluids

(Permit condition 2.J.11 "A summary of the ratio of the volume of injected fluids to the volume of produced brine;")

See Bullet Point #3 and Appendix "B" for comparison chart numbers.

Special Note: Key requests a minor modification of the permit requirement **3.K** "The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours."

Dear Jim Giswold-NMOCD Environmental Bureau Chief: As you know, this topic has been discussed and kicked around for a long time. The current permit requirement does not take into account many factors that can cause the variance to be under or over the requirement of 110%-120%. Every year we report this number in the annual report and while the average monthly injection for the year is normally within range, the actual monthly numbers can and are sometimes under and over. There are many reasons for this as we have discussed, and thus the requirement to suspend operations is not based on any real parameter or trend that may be an immediate threat to the well, groundwater or the environment. The current requirement put operators in a continuous violation and interruption of operations. Notwithstanding, if you have a well that takes water without producing, or starts to pressure up, then you know you may have lost circulation or communicated to a pressure zone, then immediate action should be taken and notification to the agency. Currently the permit reads as follows:

The Permittee shall immediately suspend injection and notify the agency within 72 hours, if the Fresh Water Injection does not cause a normal immediate return of Brine Water to the surface, or if the well flows excessively for an unusual amount of time without fresh water injection after the cavern pressure has been stabilized to it's normal operating pressure, or if permittee has become aware of any out of zone injection or communication. The Permittee shall include in each annual report a summary showing the monthly variance, the average monthly variance for the year and the total accumulative variance over the life of the well. The operator shall certify and explain that any yearly variance that falls outside of the range of 20%, (Difference between the Fresh Water input and Brine Water output) will not cause harm to Fresh Water, Public Health or the Environment.

Bullet Point #12- Summary of Activities

(Permit condition 2.J.12 "A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;)

See Bullet Point #2 for summary.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

Appendix "H" contains a third party closure estimate for the Wasserhund Inc. BW-22 brine well.

Bullet Point #13- Annual Certification

(Permit condition 2.J.13 "Annual Certification in accordance with Permit Condition 2.B.3. **"2.B.3. Annual Certification:** The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.")

Operator Response: Based on all current information and actual on-site observance, the operator of record hereby certifies that the current operations pose no threat to public health and the environment at the submission of this report. If any substantial event that, has or may cause, this current certification to change, then the operator will notify OCD and take the necessary actions to protect the public and environment.

By signing the cover sheet of Bullet Point 1 of permit condition 2.J.1, the operator herby certifies this condition of the permit.

Bullet Point 14- Groundwater Monitoring:

(*Permit condition 2.J.14 "A summary of any new discoveries of ground water* contamination with all leaks, spills and releases and corrective actions taken;")

The BW-22 facility does not have groundwater monitoring at this site. There are no planned or intentional discharges of water contaminants that may move directly or indirectly into groundwater. Any unintentional discharge, leak, spill, or drip is handled pursuant to the permit conditions.

Bullet Point 15- Annual Reporting

(Permit condition 2.J.15 "The Permittee shall file its Annual Report in an electronic format with a hard copy submitted to OCD's Environmental Bureau.")

The operator herby submits a PDF file on flash drive and one hard copy.

Appendix "A"

- C-103
- Aerial Photo
- Discharge Plan BW-22
- Inspection Sheet & Photos

Submit 1 Copy To Appropriate District State of New Mexic Office District 1 – (575) 393-6161 HOBBS CACPy, Minerals and Natural	Resources Form C-103		
1625 N. French Dr., Hobbs, NM 88240 District II – (575) 748-1283	WELL API NO. 30-025-26885 2 8162		
811 S. First St., Artesia, NM 88210 DEC 1 4 2042 CONSERVATION D	VISION 5. Indicate Type of Lease		
1220 South St. Francis 1000 Rio Brazos Rd., Aztec, NM 87410	Dr. STATE FEE		
District IV – (505) 476-3460 1220 S. St. Francis Dr., Santa Fe, NM RECEIVED 87505	5 6. State Oil & Gas Lease No.		
SUNDRY NOTICES AND REPORTS ON WELLS	7. Lease Name or Unit Agreement Name		
DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR S	ACKIDA UCH Quality Brine		
PROPOSALS.)	8. Well Number 1		
2. Name of Operator	9. OGRID Number		
Wasserhund, Inc.	130851		
3. Address of Operator	10. Pool name or Wildcat		
P.O. Box 2140 Lovington, NM 88260			
4. Wen Location Unit Letter M · 593 feet from the South	line and 639 feet from the West line		
Section 20 Townshin 12s Range	36e NMPM County Lea		
11. Elevation (Show whether DR, RK	B, RT, GR, etc.)		
12. Check Appropriate Box to Indicate Natu	re of Notice, Report or Other Data		
NOTICE OF INTENTION TO:	SUBSEQUENT REPORT OF:		
PERFORM REMEDIAL WORK D PLUG AND ABANDON			
TEMPORARILY ABANDON CHANGE PLANS	OMMENCE DRILLING OPNS. P AND A		
	ASING/CEMENT JOB		
OTHER: 0			
13. Describe proposed or completed operations. (Clearly state all pert	inent details, and give pertinent dates, including estimated date		
proposed completion or recompletion.	or multiple Completions. Attach wendore diagram of		
1. Pull tubing because of light brine weight			
2. Run packer, test casing.			
3. Drill to approximately 2850'.			
4. Return to making brine.	-		
Begin work as soon as we have OCD approval.			
Spud Date: Rig Release Date:			
a second and a second			
I hereby certify that the information above is true and complete to the best	of my knowledge and belief		
	in my knowledge and benet.		
SIGNATURE IIILE_Presid	DATE 12/05/12		
Type or print name Larry Gandy E-mail address: 1	gandy@gandycorporation.com PHONE: 575-396-0522		
For State Use Only			
APPROVED BY: Mal Whitely TITLE Com.	diance officer 17-21-2012		
Conditions of Approval (if any):	DAIL DAIL		
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BW-22

Wasserhund/Tatum Watson #1

Permit Renewal 11/8/13

Susana Martinez Governor

David Martin Cabinet Secretary

Brett F. Woods, Ph.D. Deputy Cabinet Secretary

November 8, 2013

Larry Gandy Wasserhund, Inc. PO Box 827 Tatum, New Mexico 88267

RE: Renewal of Discharge Permit BW-22 for the Watson #1 Brine Well in Unit M of Section 20, Township 12 South, Range 36 East NMPM; Lea County, New Mexico

Dear Mr. Gandy,

Pursuant to all applicable parts of the Water Quality Control Commission regulations 20.6.2 NMAC and more specifically 20.6.2.3104 thru.3999 discharge permit, and 20.6.2.5000 thru .5299 Underground Injection Control, the Oil Conservation Division hereby renews the discharge permit and authorizes operation and injection for the Wasserhund, Inc. (owner/operator) brine well BW-22 (API# 30-025-28162) at the location described above and under the conditions specified in the attached Discharge Permit Approval Conditions.

Be advised that approval of this permit does not relieve the owner/operator of responsibility should operations result in pollution of surface water, groundwater, or the environment. Nor does this permit relieve the owner/operator of any responsibility or consequences associated with subsidence or cavern failure. This permit does not relieve the owner/operator of its responsibility to comply with any other applicable governmental rules or regulations.

If you have any questions, please contact Jim Griswold of my staff at (505) 476-3465 or by email at *jim.griswold@state.nm.us*. On behalf of the Oil Conservation Division, I wish to thank you and your staff for your cooperation and patience during this renewal application review.

Respectfully,

Jami Bailey Director

JB/JG/jg Attachment – Discharge Permit Approval Conditions Jami Bailey Division Director Oil Conservation Division



DISCHARGE PERMIT BW-22

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department renews Discharge Permit BW-22 (Discharge Permit) to Wasserhund, Inc. (Permittee) to operate its Underground Injection Control (UIC) Class III well for the in situ extraction of salt (Watson #1 - API No. 30-025-28162) located 593 feet FSL and 639 feet FWL (SW/4 SW/4, Unit Letter M) in Section 20, Township 12 South, Range 36 East, NMPM, Lea County, New Mexico at its Brine Production Facility (Facility). The Facility is located within Tatum, New Mexico to the north of US 380.

The Permittee is permitted to inject water into the subsurface salt layers and produce brine for use in the oil and gas industry. Ground water that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 30 feet below ground surface and has a total dissolved solids concentration of approximately 700 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class III wells associated with the oil and gas industry (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class III well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or onsite disposal of, any materials, product, by-product, or oil-field waste.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.

2. The injection of fluids into a large capacity cesspool is prohibited.

3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.

4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

WASSERHUND, INC. WATSON #1

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health, (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified of 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class III wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT RENEWAL: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required \$100.00 filing fee. The Permittee is now required to submit the \$1,700.00 permit fee for a Class III well. Please remit payment made payable to the Water Quality Management Fund in care of OCD at 1220 South St. Francis Drive in Santa Fe, New Mexico 87505.

EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND 1.F. **PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT:** This Discharge Permit becomes effective 30 days from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on November 8, **2018.** The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD 1.G. Director and OCD's Environmental Bureau of any Facility expansion or process modification (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class III well that was approved pursuant to the requirements of 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

- Noncompliance by Permittee with any condition of this Discharge Permit; a.

or,

The Permittee's failure in the discharge permit application or during the b. discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

A determination that the permitted activity may cause a hazard to public c. health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.51011 NMAC; and, 20.6.2.3109E NMAC).

This Discharge Permit may also be modified or terminated for any of the 2. following causes:

Violation of any provisions of the Water Quality Act or any applicable a. regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS III WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class III well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class III well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and,

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class III well discharge permit upon taking possession of the facility; and

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS III WELLS: The

Permittee may use either or both fresh water or water from otherwise non-potable sources. Pursuant to 20.6.2.5207C, the Permittee shall provide analysis of the injected fluids at least quarterly to yield data representative of their characteristics. The Permittee shall analyze the injected fluids for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids; and,
- chloride concentration.

The Permittee shall also provide analysis of the produced brine on a quarterly basis. The Permittee shall analyze the produced brine for the following characteristics:

- pH;
- density;
- concentration of total dissolved solids;
- chloride concentration; and,
- sodium concentration.

2.B. SOLUTION CAVERN MONITORING PROGRAM:

1. Surface Subsidence Monitoring Plan: The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective data of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually.

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well . If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.

2. Solution Cavern Characterization Program: The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.
a. The Permittee shall provide an estimate of the size and shape of the solution cavern at least annually, based on fluid injection and brine production data.

b. The Permit shall compare the ratio of the volume of injected fluids to the volume of produced brine monthly. If the average ratio of injected fluid to produced brine varies is less than 90% or greater than 110%, the Permittee shall report this to OCD and cease injection and production operations of its Class III well within 24 hours. The Permittee shall begin an investigation to determine the cause of this abnormal ratio within 72 hours. The Permittee shall submit to OCD a report of its investigation within 15 days of cessation of injection and production operations of its Class III well.

3. Annual Certification: The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.

If the solution cavern is determined by either OCD or the Permittee to be potentially unstable by either direct or indirect means, then the Permittee shall cease all fluid injection and brine production within 24 hours. If the Permittee ceases operations because it or OCD has determined that the solution cavern is unstable, then it shall submit a plan to stabilize the solution cavern within 30 days. OCD may require the Permittee to implement additional subsidence monitoring and to conduct additional corrective action.

2.C. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Renewal Application to cope with failure of a system(s) in the Discharge Permit.

2.D. CLOSURE: Prior to closure of the facility, the Permittee shall submit for OCD's approval, a closure plan including a completed form C-103 for plugging and abandonment of the Class III well. The Permittee shall plug and abandon its well pursuant to 20.6.2.5209 NMAC and as specified in Permit Condition 2.D.

1. **Pre-Closure Notification:** Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class III well. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before Permittee may implement its proposed closure plan.

2. Required Information: The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);
- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);

WASSERHUND, INC. WATSON #1

- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation, other);
- Proposed date of well closure;
- Name of Preparer; and,
- Date.

2.E. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class III well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.F RECORD KEEPING: The Permittee shall maintain records of all inspections, surveys, investigations, *etc.*, required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.G. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. **Oral Notification:** As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;
- The date, time, location, and duration of the discharge;
- The source and cause of discharge;
- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and,

• Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. Written Notification: Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.H. OTHER REQUIREMENTS:

1. Inspection and Entry: Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any injection fluid or produced brine; and,
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. Advance Notice: The Permittee shall provide OCD's Environmental Bureau and Hobbs District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class III well.

3. Environmental Monitoring: The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, and laboratory QA/QC.

2.I. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated with plugging and abandonment of the Class III well, surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a

non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required hereinabove.

2.J. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by **June 1**st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class III Well Report, Name of Permittee, Discharge Permit Number, API number of well(s), date of report, and person submitting report;
- Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103;
- Monthly fluid injection and brine production volume, including the cumulative total carried over each year;
- Injection pressure data;
- A copy of the quarterly chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart, including the type of test, *i.e.*, duration, gauge pressure, etc.;
- Brief explanation describing deviations from the normal operations;
- Results of any leaks and spill reports;
- An Area of Review (AOR) update summary;
- A summary with interpretation of MITs, surface subsidence surveys, cavern volume and geometry measurements with conclusion(s) and recommendation(s);
- A summary of the ratio of the volume of injected fluids to the volume of produced brine;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Annual Certification in accordance with Permit Condition 2.B.3.
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and,
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS III WELL OPERATIONS:

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206A NMAC to ensure that:

1. Injection will occur through the innermost tubing string and brine production through the annulus between the casing and tubing string to promote cavern development at depth. Injection and production flow can be reversed as required to achieve optimal cavern shaping, mine salt most efficiently, and to periodically clean the tubing and annulus. Injection must only occur in the intended solution mining interval.

2. Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class III well is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall within 24 hours notify OCD's Environmental Bureau and Hobbs District Office of the circumstances and action(s) taken. The Permittee shall cease operations until proper repairs are made and it has received approval from OCD to re-start injection operations.

3.B. INJECTION OPERATIONS:

1. Well Injection Pressure Limit: The Permittee shall ensure that the maximum wellhead or surface injection pressure on its Class III well shall not exceed the fracture pressure of the injection salt formation and will not cause new fractures or propagate any existing fractures of cause damage to the system.

2. Pressure Limiting Device: The Permittee shall equip and operate its Class III well or system with a pressure limiting device which shall, at all times, limit surface injection pressure to the maximum allowable pressure for its Class III well. The Permittee shall monitor the pressure-limiting device daily and shall report all pressure exceedances within 24 hours of detecting an exceedance to OCD's Environmental Bureau.

The Permittee shall take all steps necessary to ensure that the injected fluids enter only the proposed injection interval and is not permitted to escape to other formations or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of injection pressure, flow rate, flow volume, and pressure on the annulus between the tubing and the long string of casing.

3.D. MECHANICAL INTEGRITY FOR CLASS III WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall demonstrate mechanical integrity for its Class III well at least once every five years or more frequently as the OCD

Director may require for good cause during the life of the well. The Permittee shall demonstrate mechanical integrity for its Class III well every time it performs a well workover, including when it pulls the tubing. A Class III well has mechanical integrity if there is no detectable leak in the casing or tubing which OCD considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone through the well bore or vertical channels adjacent to the well bore which the OCD Director considers to be significant. The Permittee shall conduct a casing Mechanical Integrity Test (MIT) from the surface to the approved injection depth to assess casing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 300 psig measured at the surface.

The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

- 2. The following criteria will determine if the Class III well has passed the MIT:
 - **a.** Passes MIT if zero bleed-off during the test;

b. Passes MIT if final test pressure is within $\pm 10\%$ of starting pressure, if approved by OCD;

c. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

3.E. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's District Office in Hobbs and the Environmental Bureau in Santa Fe prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Hobbs District Office. Properly completed Forms C-103 and/or C-105 must be filed with OCD upon completion of workover activities and copies included in that year's Annual Report.

3.K. FLUIDS INJECTION AND BRINE PRODUCTION VOLUMES AND

PRESSURES: The Permittee shall continuously monitor the volumes of water injected and brine production . The Permittee shall submit monthly reports of its injection and production volumes on or before the 10th day of the following month. The Permittee shall suspend injection if the monthly injection volume is less than 110% or greater than 120% of associated brine production. If such an event occurs, the Permittee shall notify OCD within 24 hours.

3.L. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class III well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc.*) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class III well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

5.C. **SURFACE SUBSIDENCE MONITORING PLAN:** The Permittee shall submit the Surface Subsidence Monitoring Plan required in accordance with Permit Condition 2.B.1 within 180 days of permit issuance.

5.D. SOLUTION CAVERN CHARACTERIZATION PLAN: The Permittee shall submit the Solution Cavern Characterization Plan required in accordance with Permit Condition 2.B.2 within 180 days of permit issuance.

Brine Well Inspection Sheet:

Permit #BW-22API#30-025-28162 Watson #1Operator:Wasserhund Inc.Location:Unit Letter M-Section 20-Ts 12s - R 35e1 Any reportable leaks or spills noted at time of inspection?2 Any observed radial cracks or any evidence of subsidence?	Yes X	No X X
 API# 30-025-28162 Watson #1 Operator: Wasserhund Inc. Location: Unit Letter M-Section 20-Ts 12s - R 35e 1 Any reportable leaks or spills noted at time of inspection? 2 Any observed radial cracks or any evidence of subsidence? 	Yes X	No X X X
Operator: Wasserhund Inc. Location: Unit Letter M-Section 20-Ts 12s – R 35e 1 Any reportable leaks or spills noted at time of inspection? 2 Any observed radial cracks or any evidence of subsidence?	Yes X X	No X X
Location: Unit Letter M-Section 20-Ts 12s – R 35e 1 Any reportable leaks or spills noted at time of inspection? 2 Any observed radial cracks or any evidence of subsidence?	Yes X X	No X X X
1 Any reportable leaks or spills noted at time of inspection?2 Any observed radial cracks or any evidence of subsidence?	x	x x x
2 Any observed radial cracks or any evidence of subsidence?	×	x
top to participation of the state of the sta	x x	x
3 Load/unload pots in place?	x	x
4 Any New Wells IN AOR?	x	
5 Observed Injection Pressure on Well?		120 psig
6 Is operator experiencing any downhole issues?	x	
7 Do brine Tanks have secondary containment?		x
8 Samples Collected?	х	Fresh + Brine
9 Brine well Operated Normal or Reverse Flow?	Norm	al
10 Checked Sumps?	NA	
11 Groundwater Monitor Wells on-site?		x
12 Subsidence Monitors on-site?		x
13 Equipment failures?		x
Photos Taken:		2 see attached
Date of Inspection:		
2/17/16		
Inspector: Wayne Price Jr. Price LLC		

Difficult to Produce 10 lb brine

Inspector Signature:

WR



Wasserhund BW-22 Well Head Pressure Gage Feb 17, 2016-Photo by Price LLC Appendix "B"

• Injection and Production Volumes/Comparison Charts



Appendix "C"

- Chemical Analysis Fresh Water
- Chemical Analysis Brine Water



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 Texas 79922 El Paso, Texas 79703 Midland. Carroliton. Texas 75006

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Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: February 17, 2015

Work Order: 15012304

Project Location: Tatum, NM **Project** Name: Brine Well-Tatum Project Number: Brine Well-Tatum

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
385127	Fresh	water	2015-01-16	06:17	2015-01-21
385128	Brine	water	2015-01-16	06:25	2015-01-21

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 17 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

15.4

Dr. Blair Leftwich. Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Method Blanks QC Batch 118885 - Method Blank (1)	7 7 7 7 8
Duplicates QC Batch 118885 - Duplicate (1) QC Batch 118893 - Duplicate (1) QC Batch 118905 - Duplicate (1)	9 9 9 9
Laboratory Control Spikes 1 QC Batch 118905 - LCS (1) 1 QC Batch 119127 - LCS (1) 1 QC Batch 119384 - LCS (1) 1 QC Batch 119410 - LCS (1) 1 Matrix Spikes 1 QC Batch 119127 - xMS (1) 1 QC Batch 119384 - MS (1) 1	.0 10 10 10 11 12 12
QC Batch 119410 - MS (1) 1 Calibration Standards 1 QC Batch 118893 - ICV (1) 1 QC Batch 118893 - CCV (1) 1 QC Batch 119127 - ICV (1) 1 QC Batch 119127 - CCV (1) 1 QC Batch 119384 - CCV (1) 1 QC Batch 119384 - CCV (2) 1 QC Batch 119410 - CCV (2) 1 QC Batch 119410 - CCV (2) 1	12 14 14 14 14 15 15
Appendix 1 Report Definitions 1 Laboratory Certifications 1 Standard Flags 1 Attachments 1	1 6 16 16 17

Case Narrative

Samples for project Brine Well-Tatum were received by TraceAnalysis, Inc. on 2015-01-21 and assigned to work order 15012304. Samples for work order 15012304 were received intact at a temperature of 2.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	100958	2015-02-13 at $15:00$	119384	2015-02-13 at 18:06
Chloride (IC)	E 300.0	100982	2015-02-16 at $12:00$	119410	2015-02-16 at $12:53$
Na, Dissolved	S 6010C	100546	2015-01-27 at $17:40$	119127	2015-02-06 at $09:23$
pН	SM 4500-H+	100544	2015-01-27 at $04:00$	118893	2015-01-27 at $16:44$
Specific Gravity	ASTM D1429-95	100533	2015-01-27 at $13:00$	118885	2015-01-27 at $13:10$
TDS	SM 2540C	100553	2015-01-26 at $09:00$	118905	2015-01-26 at $17:00$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15012304 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: February 17, 2015 Brine Well-Tatum

Analytical Report

Sample: 385127 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 119384 100958		Analytical Me Date Analyzed Sample Prepa	ethod: E d: 24 ration:	300.0 015-02-13	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		в	1,2,3,4,5	71.6	mg/L	10	2.50

Sample: 385127 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 119127 100546		Analytical Method: Date Analyzed: Sample Preparation:	S 6010C 2015-02-06 2015-01-27		Prep Method: Analyzed By: Prepared By:	S 3005A RR RR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium	$_{\rm Qs}$	2,3,4,5	75.9	$\mathrm{mg/L}$	1	1.00

Sample: 385127 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 118893 100544		Analytical Method Date Analyzed: Sample Preparatio	d: SM 450 2015-01 on: 2015-01	0-H+ -27 -27	Prep Method: Analyzed By: Prepared By:	N/A AT AT
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pH			1,2,4,5	8.20	s.u.	1	2.00

Sample: 385127 - Fresh

Laboratory:	Lubbock				
Analysis:	Specific Gravity	Analytical Method:	ASTM D1429-95	Prep Method:	N/A
QC Batch:	118885	Date Analyzed:	2015-01-27	Analyzed By:	CF
Prep Batch:	100533	Sample Preparation:	2015-01-27	Prepared By:	CF

Report Date: February 17, 2015 Brine Well-Tatum		Work Ore Brine V	Page Number: 5 of 17 Tatum, NM			
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Gravity			0.9861	g/ml	1	0.000
Sample: 385127 - Fresh						
Laboratory: Lubbock Analysis: TDS QC Batch: 118905 Prep Batch: 100553	I I S	Analytical Method Date Analyzed: Sample Preparation	: SM 2540C 2015-01-26		Prep Method: Analyzed By: Prepared By:	N/A RL RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	642	$\mathrm{mg/L}$	20	2.50

Sample: 385128 - Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 119410 100982		Analytical M Date Analyz Sample Prep	Method: E 300 zed: 2015-6 paration:	.0 02-16	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		н	1,2,3,4,5	16000	mg/L	1000	2.50

Sample: 385128 - Brine

Laboratory:	Lubbock						
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
QC Batch:	119127		Date Analyzed:	2015-02-06		Analyzed By:	\mathbf{RR}
Prep Batch:	100546		Sample Preparation:	2015-01-27		Prepared By:	RR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium	$_{\rm Qs}$	2,3,4,5	11400	$\mathrm{mg/L}$	100	1.00

Report Date Brine Well-T	: February 17, 201 Catum	5	Work Ord Brine V	Page Number: 6 of 17 Tatum, NM			
Sample: 38	5128 - Brine						
Laboratory:	Lubbock						
Analysis:	pН		Analytical Method:	SM 4500-H-	F	Prep Method:	N/A
QC Batch:	118893		Date Analyzed:	2015-01-27		Analyzed By:	AT
Prep Batch:	100544		Sample Preparation:	2015-01-27		Prepared By:	AT
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pH			1,2,4,5	6.16	s.u.	1	2.00
Sample: 38	5128 - Brine						
Laboratory:	Lubbock						
Analysis:	Specific Gravity		Analytical Method	: ASTM D1	429-95	Prep Method:	N/A
QC Batch:	118885		Date Analyzed:	2015-01-27	7	Analyzed By:	CF
Prep Batch:	100533		Sample Preparation	n: 2015-01-27	7	Prepared By:	CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Specific Grav	vity			1.027	g/ml	1	0.000
Sample: 38	5128 - Brine						
Laboratory:	Lubbock						
Analysis:	TDS		Analytical Method:	$\rm SM~2540C$		Prep Method:	N/A
QC Batch:	118905		Date Analyzed:	2015-01-26		Analyzed By:	RL
Prep Batch:	100553		Sample Preparation	1:		Prepared By:	RL
				RL			
Parameter		\mathbf{Fl}	ag Cert	Result	Units	Dilution	RL
Total Dissolv	red Solids		1,2,3,4,5	31000	mg/L	1000	2.50

Report Date: February 17, 2015 Brine Well-Tatum

Method Blanks

Method Blank (1)	QC Batch: 118885					
QC Batch: 118885 Prep Batch: 100533		Date Analyzed: QC Preparation:	2015-01-27 2015-01-27		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Parameter	Fl	ag Ce	ert	MDL Result	Units	RL
Specific Gravity				0.9916	g/ml	
Method Blank (1)	QC Batch: 118905					
QC Batch: 118905 Prep Batch: 100553		Date Analyzed: QC Preparation:	2015-01-26 2015-01-26		Analyzed By: Prepared By:	RL RL
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	mg/L	2.5
Method Blank (1)	OC Batch: 119127					
			2015 02 02			DD
QC Batch: 119127 Prep Batch: 100546		Date Analyzed: QC Preparation:	2015-02-06 2015-01-27		Analyzed By: Prepared By:	RR PM
				MDL		
Parameter	F	lag Ce	ert	Result	Units	RL
Dissolved Sodium		2,3	4,5	< 0.0184	mg/L	

Method Blank (1)	QC Batch: 119384

QC Batch:	119384	Date Analyzed:	2015-02-13	Analyzed By:	RL
Prep Batch:	100958	QC Preparation:	2015-02-13	Prepared By:	RL

Parameter Flag Cert Result Units	RL
Chloride 1,2,3,4,5 0.826 mg/L	2.5
Method Blank (1) QC Batch: 119410	
QC Batch:119410Date Analyzed:2015-02-16Analyzed EPrep Batch:100982QC Preparation:2015-02-16Prepared B	y: RL y: RL
Parameter Flag Cert Result Units	RL

Duplicates

Duplicates (1) Duplicated Samp	ble: 385269					
QC Batch: 118885	Date Analyz	zed: 2015-01	-27		Analyzed l	By: CF
Prep Batch: 100533	Prepared I	By: CF				
	Duplicate	Sample				RPD
Param	Result	Result	Units	Dilution	RPD	Limit
Specific Gravity	1.074	1.072	g/ml	1	0	200

Duplicates (1) Duplicated Sample: 385269

QC Batch:	118893	Date Analyzed:	2015-01-27	Analyzed By:	AT
Prep Batch:	100544	QC Preparation:	2015-01-27	Prepared By:	AT

		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
pH	1,2,4,5	6.79	6.78	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 385130

QC Batch: Prep Batch:	$118905 \\ 100553$	I Q	Date Analyzed: QC Preparation:	$\begin{array}{c} 2015\text{-}01\text{-}26 \\ 2015\text{-}01\text{-}26 \end{array}$			Analyzed By: Prepared By:	$_{ m RL}^{ m RL}$
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolv	ed Solids	1,2,3,4,5	850	806	mg/L	20	5	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Datch: 118905		Date A	analyzed:	2013	01-26			An	alyzed By	y: RL
Prep Batch: 100553		QC Pr	eparation	: 2015	5-01-26			Pre	pared By	r: RL
			LCS			Spike	Ma	atrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Total Dissolved Solids		1,2,3,4,5	988	$\mathrm{mg/L}$	10	1000	<	25.0	99 9	90 - 110
Percent recovery is based on the spik	e resul	t. RPD is	based on	the spi	ike and spi	ke duplica	te resu	lt.		
		LCSD			Spike	Matrix		Rec.		RPD
Param F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids	1,2,3,4	4,5 978	$\mathrm{mg/L}$	10	1000	$<\!25.0$	98	90 - 110) 1	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{119127}{100546}$		Date Analyzed:2015-02-06AnalyzedQC Preparation:2015-01-27Prepared						By: RR By: PM	
				LCS			Spike	Matrix		Rec.
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Dissolved Soc	lium		2,3,4,5	56.0	$\mathrm{mg/L}$	1	52.5	< 0.0184	107	85 - 115
Percent recov	ery is based on	the spike resu	ult. RPE) is based of	on the spil	ke and s	pike duplicat	e result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		2,3,4,5	57.2	$\mathrm{mg/L}$	1	52.5	< 0.0184	109	85 - 115	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	119384	Date Analyzed:	2015-02-13	Analyzed By:	RL
Prep Batch:	100958	QC Preparation:	2015-02-13	Prepared By:	RL

Report Date: February 17, 2015	ort Date: February 17, 2015 Work Order: 1501230									Number:	11 of 17
Brine Well-Tatum			Brine Well-Tatum							Tat	um, NM
				T OO			G '1	2.6	, .		D
D		D	C	LCS	TT •/	D'1	Spike	Ma	atrix	л	Rec.
Param		F	C	Result	Units	1	Amount	Re	esult	Rec.	$\frac{\text{Limit}}{00 - 110}$
Chloride		1	,2,3,4,5	24.1	mg/L	1	25.0	0.	820	93	90 - 110
Percent recovery is based on the s	spike	result	. RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
			LCS	D		Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,	5 24.3	B mg/L	1	25.0	0.826	94	90 - 11	0 1	20
Percent recovery is based on the s	spike	result	. RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
Laboratory Control Spike (L0	CS-1)									
QC Batch: 119410			Date	Analyzed:	2015	5-02-16			Aı	nalyzed B	y: RL
Prep Batch: 100982			QC F	reparation	: 2015	5-02-16			Pr	epared B	y: RL
				LCS			Spike	Ma	atrix		Rec.
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride		1	,2,3,4,5	24.0	mg/L	1	25.0	0.	767	93	90 - 110
Percent recovery is based on the s	spike	result	. RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
			LCS	D		Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,	5 23.5	5 mg/L	1	25.0	0.767	91	90 - 11	0 2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spike (xMS-1)	Spiked	Sar	nple: 3	385041								
QC Batch: 119127 Prep Batch: 100546				Date 2 QC Pi	Analyzed: reparation	2015 n: 2015	5-02-06 5-01-27			Ana Pre	lyzed B pared By	y: RR v: PM
					MS			Spike	М	atrix		Rec.
Param		F		С	Result	Units	Dil.	Amount	R	esult	Rec.	Limit
Dissolved Sodium			2,	3,4,5	1660	$\mathrm{mg/L}$	1	525	1	.210	86	75 - 125
Percent recovery is based on	the spi	ke r	esult.	RPD is	s based on	the spi	ike and spi	ike duplica	te res	ult.		
				MOD			a .1	N		П		מתת
Daram		Г	С	Rosul	t Unita	Dil	Amount	Regult	Dog	Rec.	חסס	RPD Limit
Dissolved Sodium	0	r o	0	1580	$\frac{1}{m\sigma/L}$	1	525	1210	70	75 - 12		20
	Qs	Qs 1	2,3,4,5	- 1000 - DDD -	1 1	.1		1210	10	10 - 12	, ,	20
Percent recovery is based on	the spi	ke r	esult.	RPD 18	s based on	the spi	ike and spi	ike duplica	te resi	ult.		
Matrix Spike (MS-1)	Spiked S	Sam	ple: 38	85127								
QC Batch: 119384				Date	Analyzed:	2015	5-02-13			An	alyzed B	y: RL
Prep Batch: 100958				QC P	reparation	n: 2015	5-02-13			\Pr	pared B	y: RL
					MS			Spike	М	latrix		Rec.
Param		\mathbf{F}		С	Result	Units	Dil.	Amount	R	esult	Rec.	Limit
Chloride			1,2	2,3,4,5	319	$\mathrm{mg/L}$	10	250	,	71.6	99	80 - 120
Percent recovery is based on	the spi	ke r	esult.	RPD is	s based on	the spi	ike and spi	ike duplica	te res	ult.		
				MSD	1		Spike	Matrix		Rec.		RPD
Param	I	ק	\mathbf{C}	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1	,2,3,4,5	312	mg/L	10	250	71.6	96	80 - 12) 2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1)	Spiked Sample: 386889
---------------------	-----------------------

QC Batch:	119410	Date Analyzed:	2015-02-16	Analyzed By:	RL
Prep Batch:	100982	QC Preparation:	2015-02-16	Prepared By:	RL

Report Date: February 17, 2015 Brine Well-Tatum	115 Work Order: Brine Wel				rder: 15 Well-T	er: 15012304 P /ell-Tatum				umber: Tatı	13 of 17 1m, NM
Param		F	СІ	MS Result	Units	Dil.	Spike Amount	M Re	atrix esult I	Rec.	Rec. Limit
Chloride		1,5	2,3,4,5	3350	mg/L	100	2500	8	812	102 8	80 - 120
Percent recovery is based on the	spike	result.	RPD is	based on	the spi	ike and spi	ke duplica	te resu	ılt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	3290	$\mathrm{mg/L}$	100	2500	812	99	80 - 120	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (ICV-1)

QC Batch:	118893		Da	te Analyzed:	2015-01-27	,	Analy	vzed By: AT
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1,2,4,5	s.u.	7.00	7.01	100	98.6 - 101.4	2015-01-27

Standard (CCV-1)

QC Batch:	118893		Da	te Analyzed:	2015-01-27		Analy	zed By: AT
				CCVs True	CCVs Found	CCVs Percent	Percent Becovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1,2,4,5	s.u.	7.00	7.01	100	98.6 - 101.4	2015-01-27

Standard (ICV-1)

QC Batch: 119127			Date Anal	yzed: 201	Analyz	Analyzed By: RR		
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sodium		2,3,4,5	$\mathrm{mg/L}$	51.0	51.7	101	90 - 110	2015-02-06

Standard (CCV-1)

QC Batch:	119127		Analyzed By: RR						
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved So	odium		2,3,4,5	$\mathrm{mg/L}$	51.0	55.9	110	90 - 110	2015-02-06

Report Date: F Brine Well-Tatu	port Date: February 17, 2015 ine Well-Tatum			Work Or Brine	Page Nu	mber: 15 of 17 Tatum, NM		
Standard (CC	V-1)							
QC Batch: 119	0384		Date .	Analyzed:	2015-02-13		Analy	zed By: RL
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		1,2,3,4,5	m mg/L	25.0	23.6	94	90 - 110	2015-02-13
Standard (CC	V-2)							
QC Batch: 119	9384		Date .	Analyzed:	2015-02-13		Analy	zed By: RL
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	-	1,2,3,4,5	$\mathrm{mg/L}$	25.0	23.8	95	90 - 110	2015-02-13
Standard (CC	V-1)							
QC Batch: 119	9410		Date	Analyzed:	2015-02-16		Analy	zed By: RL
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		1,2,3,4,5	$\mathrm{mg/L}$	25.0	23.8	95	90 - 110	2015-02-16
Standard (CC	V-2)							
QC Batch: 119	9410		Date	Analyzed:	2015-02-16		Analy	zed By: RL
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date

Conc.

23.9

Recovery

96

Limits 90 - 110

Analyzed

2015-02-16

Flag

Param

Chloride

 Cert

1,2,3,4,5

Units

 $\mathrm{mg/L}$

Conc.

25.0

Work Order: 15012304 Brine Well-Tatum Page Number: 16 of 17 Tatum, NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5		2014-018	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je $\;$ Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

Report Date: February 17, 2015 Brine Well-Tatum Work Order: 15012304 Brine Well-Tatum Page Number: 17 of 17 Tatum, NM

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Summary Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: June 5, 2015

Work Order: 15050506

Project Location: Tatum NM Project Name: Tatum Fresh & Brine Well

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
392449	Fresh	water	2015-04-27	14:10	2015-05-01
392450	Brine	water	2015-04-27	14:20	2015-05-01

Sample: 392449 - Fresh

Param	Flag	Result	Units	RL
Chloride		82.8	mg/L	2.5
pН		8.32	s.u.	2
Specific Gravity		0.9923	g/ml	
Total Dissolved Solids		633	m mg/L	2.5

Sample: 392450 - Brine

Param	Flag	Result	Units	RL
Chloride		20500	mg/L	2.5
Dissolved Sodium		12500	m mg/L	1
pН		6.05	s.u.	2
Specific Gravity		1.018	g/ml	
Total Dissolved Solids		34100	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Texas 79424 Lubbock, El Paso, Texas 79922 Midland. Texas 79703 Texas 75006 Carroliton.

E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

806 • 794 • 1296 FAX 806 • 794 • 1298 915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: June 5, 2015

Work Order: 15050506

Project Location: Tatum NM **Project** Name: Tatum Fresh & Brine Well Tatum Fresh & Brine Well Project Number:

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
392449	Fresh	water	2015-04-27	14:10	2015-05-01
392450	Brine	water	2015-04-27	14:20	2015-05-01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 18 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Case Narrative

Samples for project Tatum Fresh & Brine Well were received by TraceAnalysis, Inc. on 2015-05-01 and assigned to work order 15050506. Samples for work order 15050506 were received intact at a temperature of 1.4 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	102846	2015-05-14 at 09:30	121554	2015-05-14 at 10:32
Na, Dissolved	S 6010C	103232	2015-06-04 at $14:09$	122047	2015-06-05 at $13:17$
pН	SM 4500-H+	102649	2015-05-06 at $16:48$	121318	2015-05-06 at $16:51$
Specific Gravity	ASTM D1429-95	102660	2015-05-07 at $10:00$	121329	2015-05-07 at $10:10$
TDS	SM 2540C	102686	2015-05-07 at $17:44$	121355	2015-05-07 at $17:46$
TDS	SM 2540C	102742	2015-05-11 at $19:20$	121420	2015-05-11 at $19:21$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15050506 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.
Analytical Report

Sample: 392449 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	ory: Lubbock s: Chloride (IC) ch: 121554 atch: 102846		Analytical I Date Analy Sample Pre	Method: E 30 zed: 2015 paration:)0.0 5-05-14	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,5	82.8	mg/L	5	2.50

Sample: 392449 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 121318 : 102649		Analytical Metho Date Analyzed: Sample Preparati	od: SM 4 2015-	500-H+ 05-06	Prep Method Analyzed By Prepared By	l: N/A 7: HJ 7: HJ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			1,2,4,5	8.32	s.u.	1	2.00

Sample: 392449 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Specific Gravity 121329 102660		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D 2015-05-0 2015-05-0	1429-95 7 7	Prep Method: Analyzed By: Prepared By:	N/A CF CF
Parameter		Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Specific Grav	ity	1 1008	(0.9923	g/ml	1	0.000

Sample: 392449 - Fresh

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	121420	Date Analyzed:	2015-05-11	Analyzed By:	HJ
Prep Batch:	102742	Sample Preparation:		Prepared By:	HJ

Report Date: June 5, 2015 Tatum Fresh & Brine Well		Page Number: 6 of 18 Tatum NM				
D		C i	RL	T T 1 .		DI
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	633	$\mathrm{mg/L}$	10	2.50

Sample: 392450 - Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 121554 102846		Analytical M Date Analyz Sample Prep	Method: E 300 zed: 2015- paration:	0.0 -05-14	Prep Method: N Analyzed By: F Prepared By: F	
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,5	20500	m mg/L	500	2.50

Sample: 392450 - Brine

Dissolved Soc	dium		2,3,4,5	12500	m mg/L	100	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	103232		Sample Preparation:	2015-06-04		Prepared By:	RR
QC Batch:	122047		Date Analyzed:	2015-06-05		Analyzed By:	\mathbf{RR}
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Sample: 392450 - Brine

pH			1,2,4,5	6.05	s.u.	1	2.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	102649	Sample Preparation:				Prepared By:	HJ
QC Batch:	121318		Date Analyzed:	2015-0	5-06	Analyzed By:	нĴ
Analysis:	pH		Analytical Met	hod: SM 450	00-H+	Prep Method:	N/A
Laboratory:	Lubbock						

Report Date: June 5, 2015 Tatum Fresh & Brine Well	Work Order: 15050506 Tatum Fresh & Brine Well				Page Number: 7 of 18 Tatum NM	
Sample: 392450 - Brine						
Laboratory: Lubbock Analysis: Specific Gravity QC Batch: 121329 Prep Batch: 102660	A1 Da Sa	nalytical Method: ate Analyzed: mple Preparation	ASTM D14 2015-05-07 1: 2015-05-07	29-95	Prep Method: Analyzed By: Prepared By:	${ m N/A} { m CF} { m CF}$
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Specific Gravity			1.018	g/ml	1	0.000
Sample: 392450 - Brine						
Laboratory: Lubbock Analysis: TDS QC Batch: 121355 Prep Batch: 102686	An Da Sar	alytical Method: te Analyzed: nple Preparation:	SM 2540C 2015-05-07		Prep Method: Analyzed By: Prepared By:	N/A HJ HJ
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	34100	mg/L	1000	2.50

Method Blanks

Method Blank (1)	QC Batch: 121329					
QC Batch: 121329 Prep Batch: 102660		Date Analyzed: QC Preparation:	2015-05-07 2015-05-07		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Parameter	F	lag Ce	ert	MDL Result	Units	RL
Specific Gravity				0.9884	g/ml	
Method Blank (1)	QC Batch: 121355					
QC Batch: 121355 Prep Batch: 102686		Date Analyzed: QC Preparation:	$2015-05-07\\2015-05-07$		Analyzed By: Prepared By:	HJ HJ
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Total Dissolved Solids		~	1,2,3,4,5	$<\!25.0$	m mg/L	2.5
Method Blank (1)	QC Batch: 121420					
QC Batch: 121420 Prep Batch: 102742		Date Analyzed: QC Preparation:	2015-05-11 2015-05-11		Analyzed By: Prepared By:	HJ HJ
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	mg/L	2.5

Method Blank (1)		QC Batch: 121554				
QC Batch:	121554		Date Analyzed:	2015-05-14	Analyzed By:	RL
Prep Batch:	102846		QC Preparation:	2015-05-14	Prepared By:	RL

Report Date: June 5, 2 Tatum Fresh & Brine V	015 Vell	Work Order Tatum Fresh	:: 15050506 & Brine Well	Page N	Page Number: 9 of 18 Tatum NM	
Parameter	Flag	Cert	MDL Result	Units	RL	
Chloride		1,2,3,4,5	0.973	mg/L	2.5	
Method Blank (1) QC Batch: 122047 Prep Batch: 103232	QC Batch: 122047	Date Analyzed: QC Preparation:	2015-06-05 2015-06-04	Analyz Prepar	zed By: RR red By: PM	
Parameter	н	lag Ce	MD ort Bosu	L lt Units	RL	
Dissolved Sodium	T	2,3,	4,5 <0.019	$\frac{11}{97}$ mg/L	1	

Duplicates

Duplicates	(1) Duplic	ated Sample:	392489					
QC Batch:	121318		Date Ana	alyzed: 2015-	05-06		Analyzed	By: HJ
Prep Batch:	Prepared	By: HJ						
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
pН		1,2,4,5	9.09	9.19	s.u.	1	1	20

Duplicates (1) Duplicated Sample: 392450

QC Batch:	121329	Date Analyzed:	2015-05-07	Analyzed By:	${ m CF} { m CF}$
Prep Batch:	102660	QC Preparation:	2015-05-07	Prepared By:	

	Duplicate	Sample				RPD
Param	Result	Result	Units	Dilution	RPD	Limit
Specific Gravity	1.008	1.018	g/ml	1	1	200

Duplicates (1) Duplicated Sample: 392450

QC Batch:	121355	Da	ate Analyzed:	2015-05-07			Analyzed By:	HJ
Prep Batch:	102686	Q	C Preparation:	2015-05-07			Prepared By:	HJ
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolv	red Solids	1,2,3,4,5	32400	34100	mg/L	1000	5	10

Duplicates (1) Duplicated Sample: 392783

QC Batch:	121420	Date Analyzed:	2015-05-11	Analyzed By:	НJ
Prep Batch:	102742	QC Preparation:	2015-05-11	Prepared By:	HJ

Report Date: June 5, 2015 Tatum Fresh & Brine Well		Work Order: Tatum Fresh &	2 15050506 2 Brine Well	Page Number: 11 of 18 Tatum NM			
		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids	1,2,3,4,5	38.0	39.0	mg/L	10	3	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 121355			Date A	nalyzed:	2013	5-05-07			An	alyzed B	y: HJ
Prep Batch: 102686			QC Pre	eparation	: 201	5-05-07			Pre	epared B	y: HJ
				LCS			Spike	Ma	atrix		Rec.
Param		F	C 1	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Total Dissolved Solids		1,2	2,3,4,5	963	mg/L	. 10	1000	<	25.0	96	90 - 110
Percent recovery is based on t	the spike	result.	RPD is l	based on	the spi	ike and spi	ke duplica	te resu	lt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	970	$\mathrm{mg/L}$	10	1000	$<\!25.0$	97	90 - 110) 1	10
Percent recovery is based on t	he spike	result.	RPD is l	pased on	the spi	ike and spi	ke duplica	te resu	lt.		

ed on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{121420}{102742}$		Date QC I	e Analyzed: Preparation	: 2015-0 n: 2015-0)5-11)5-11			Analyzed Prepared	By: HJ By: HJ
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolv	red Solids		1,2,3,4,5	993	$\mathrm{mg/L}$	10	1000	<25.0	99	90 - 110
D		41 : 1			41		1			

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	975	$\mathrm{mg/L}$	10	1000	$<\!25.0$	98	90 - 110	2	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	121554	Date Analyzed:	2015-05-14	Analyzed By:	RL
Prep Batch:	102846	QC Preparation:	2015-05-14	Prepared By:	RL

Report Date: June 5, 2015 Work Order: 15050506								Page Number: 13 of 18			
Tatum Fresh & Brine Well			Tatu	m Fresh	& Brin	ne Well				Tat	tum NM
				TOC			C :1	м	- <i>4</i> :		Dee
Demons		Ð	a T		T T : 4	D:1	5ріке Альналі	D INI		D	Rec.
Param		Г		tesuit	Units	D11.	Amount	R	esuit .	Rec.	Limit
Chloride		1,2	2,3,4,5	25.3	mg/L	1	25.0	0	.973	97	90 - 110
Percent recovery is based on th	e spike	result.	RPD is l	based on	the spi	ke and spi	ke duplica	te resu	ılt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	25.3	mg/L	1	25.0	0.973	97	90 - 110) 0	20
Percent recovery is based on th	e spike	result.	RPD is b	pased on	the spi	ke and spi	ke duplica	te resu	ılt.		
	P				· ~r-						

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	122047 103232		Date Analyzed: 2015-06-05 QC Preparation: 2015-06-04					Analyzed By: Prepared By:				
Param		F	С	LCS Besult	Units	Dil	Spike Amount	Matrix Result	Bec	Rec. Limit		
Dissolved Ser	dium	Ľ	U	56 Q	mg/I	1	52.5	<0.0107	109	<u>95 115</u>		
Percent recov	very is based on	the spike resu	$\frac{2,3,4,5}{\text{ilt. RPE}}$) is based α	$\frac{110}{11}$ on the spil	ke and s	pike duplicat	< 0.0197	108	00 - 110		

			LCSD			Spike	Matrix		Rec.		RPD	
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Dissolved Sodium		2,3,4,5	54.4	$\mathrm{mg/L}$	1	52.5	< 0.0197	104	85 - 115	4	20	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Dissolved Sodium

Matrix Spikes

Matrix Spik	e (MS-1)	Spiked Sar	mple: 3	392448								
QC Batch: Prep Batch:			Ana Prej	lyzed By pared By	7: RL 7: RL							
					MS			Spike	Ma	trix		Rec.
Param]	F	С	Result	Units	Dil.	Amount	Res	sult I	Rec.	Limit
Chloride			1	,2,3,4,5	320000	$\mathrm{mg/L}$	5000	125000	185	000	108 8	30 - 120
Percent recove	ery is based o	n the spike	result	. RPD i	is based or	the spi	ke and spi	ke duplica	te resul	t.		
				MSI)		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			1,2,3,4,5	31600	00 mg/L	5000	125000	185000	105	80 - 120	1	20
Matrix Spik	e (MS-1)	Spiked Sar	mple: :	394405								
QC Batch: Prep Batch:	122047 103232			Date QC F	Analyzed: Preparation	2015 a: 2015	-06-05 -06-04			Ana Prep	lyzed By bared By:	: RR : PM
					MS			Spike	Mat	rix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Res	ult F	Rec.	Limit
Dissolved Sod	ium			2,3,4,5	703	$\mathrm{mg/L}$	1	525	14	.3 .	107 7	75 - 125
Percent recove	ery is based o	n the spike	result	. RPD i	is based or	the spi	ke and spi	ke duplica	te resul	t.		
				MSD)		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

688 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

2, 3, 4, 5

mg/L

1

525

143

104

75 - 125

2

20

Calibration Standards

Standard (ICV-1)

QC Batch:	121318		Da	te Analyzed:	2015-05-06	3	Analy	Analyzed By: HJ			
				ICVs	ICVs	ICVs	Percent				
				True	Found	Percent	Recovery	Date			
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed			
pН		1,2,4,5	s.u.	7.00	7.00	100	98.6 - 101.4	2015-05-06			

Standard (CCV-1)

QC Batch:	121318		Da	te Analyzed:	2015-05-06		Analyzed By: HJ				
				CCVs True	CCVs Found	CCVs Percent	Percent	Date			
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed			
pН		1,2,4,5	s.u.	7.00	7.05	101	98.6 - 101.4	2015-05-06			

Standard (CCV-1)

QC Batch: 1	121554			Date	Analyzed:	2015-05-14		Analy	zed By: RL
					CCVs	CCVs Found	CCVs Demonst	Percent	Data
					True	round	Percent	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	mg/L	25.0	24.8	99	90 - 110	2015-05-14

Standard (CCV-2)

QC Batch:	121554			Date	Analyzed:	2015-05-14		Analy	yzed By: RL
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	24.9	100	90 - 110	2015-05-14

Report Date: June 5, 202 Tatum Fresh & Brine We	15 ell		Work Tatum	Corder: 15 Fresh & Bi	Page Number: 16 of 18 Tatum NM			
Standard (ICV-1)								
QC Batch: 122047			Date Anal	Analyzed By: RR				
P			TT 1 .	ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param Dissolved Sodium	Flag	2.3.4.5	Units mg/L	Conc. 51.0	Conc. 52.5	Recovery 103	Limits 90 - 110	Analyzed 2015-06-05
Dissorved Sodium		2,3,4,5	iiig/L	51.0	52.5	109	90 - 110	2010-00-00

Standard (CCV-1)

QC Batch:	122047			Analyz	Analyzed By: RR				
					CCVs True	CCVs Found	CCVs Percent	Percent	Data
					Inte	round	rercent	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved So	odium		2,3,4,5	$\mathrm{mg/L}$	51.0	50.5	99	90 - 110	2015-06-05

Work Order: 15050506 Tatum Fresh & Brine Well Page Number: 17 of 18 Tatum NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2014-018	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je $\;$ Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

Work Order: 15050506 Tatum Fresh & Brine Well Page Number: 18 of 18 Tatum NM

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: August 19, 2015

Work Order: 15081114

Project Location: Tatum NM Project Name: Tatum Fresh & Brine Well

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
401722	Fresh	water	2015-07-08	17:30	2015-08-09
401723	Brine	water	2015-07-08	17:40	2015-08-09

Sample: 401722 - Fresh

Param	Flag	Result	Units	RL
Chloride	B,H	73.5	mg/L	2.5
Dissolved Sodium		120	m mg/L	1
pН		8.04	s.u.	2
Specific Gravity		1.000	g/ml	
Total Dissolved Solids		669	$\mathrm{mg/L}$	2.5

Sample: 401723 - Brine

Param	Flag	Result	Units	RL
Dissolved Sodium		9700	m mg/L	1

Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: August 19, 2015

Work Order: 15081114

Project Location: Tatum NM Project Name: Tatum Fresh & Brine Well

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
401722	Fresh	water	2015-07-08	17:30	2015-08-09
401723	Brine	water	2015-07-08	17:40	2015-08-09

Sample: 401722 - Fresh

Param	Flag	Result	Units	RL
Chloride	B,H	73.5	mg/L	2.5
Dissolved Sodium		120	m mg/L	1
pH		8.04	s.u.	2
Specific Gravity		1.000	g/ml	
Total Dissolved Solids		669	$\mathrm{mg/L}$	2.5

Sample: 401723 - Brine

Param	Flag	Result	Units	RL
Dissolved Sodium		9700	m mg/L	1

Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: November 12, 2015

Work Order: 15102712

Project Location:Buckeye & Tatum NMProject Name:Brine Well 3rd QT. SampleProject Number:BW-4 & BW-22

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
407093	BW-22 Tatum Fresh	water	2015-10-23	13:15	2015-10-26
407094	BW-22 Tatum Brine	water	2015-10-23	13:20	2015 - 10 - 26
407095	BW-4 Buckeye Fresh	water	2015-10-23	17:55	2015-10-26
407096	BW-4 Buckeye Brine	water	2015-10-23	18:00	2015 - 10 - 26

Sample: 407093 - BW-22 Tatum Fresh

Param	Flag	Result	Units	RL
Chloride		76.6	mg/L	2.5
Density		0.978	g/ml	
pН		7.79	s.u.	2
Total Dissolved Solids		659	m mg/L	2.5

Sample: 407094 - BW-22 Tatum Brine

Param	Flag	Result	Units	RL
Chloride		18000	mg/L	2.5
Density		1.02	g/ml	
Dissolved Sodium		12500	m mg/L	1
pН		6.99	s.u.	2
Total Dissolved Solids		37000	m mg/L	2.5

Sample: 407095 - BW-4 Buckeye Fresh

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: November 12, 2015		Work Order: 15102712	Page Number: 2 of 2	
Param	Flag	Result	Units	RL
Chloride		280	mg/L	2.5
Density		0.997	g/ml	
pH		7.61	s.u.	2
Total Dissolved Solids		868	$\mathrm{mg/L}$	2.5

Sample: 407096 - BW-4 Buckeye Brine

Param	Flag	Result	Units	RL
Chloride		176000	m mg/L	2.5
Density		1.18	g/ml	
Dissolved Sodium		108000	$\mathrm{mg/L}$	1
pH		6.76	s.u.	2
Total Dissolved Solids		310000	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 El Paso, Texas 79922 Texas 79703 Midland. Texas 75006 Carroliton. E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: November 12, 2015

Work Order: 15102712

Project Location: Buckeye & Tatum NM Project Name: Brine Well 3rd QT. Sample Project Number: BW-4 & BW-22

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
407093	BW-22 Tatum Fresh	water	2015-10-23	13:15	2015-10-26
407094	BW-22 Tatum Brine	water	2015-10-23	13:20	2015 - 10 - 26
407095	BW-4 Buckeye Fresh	water	2015-10-23	17:55	2015 - 10 - 26
407096	BW-4 Buckeye Brine	water	2015-10-23	18:00	2015-10-26

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

Report Contents

Case Narrative	4
Analytical ReportSample 407093 (BW-22 Tatum Fresh)Sample 407094 (BW-22 Tatum Brine)Sample 407095 (BW-4 Buckeye Fresh)Sample 407095 (BW-4 Buckeye Brine)	5 5 6 7 8
Method Blanks 1 QC Batch 126012 - Method Blank (1) 1 QC Batch 126018 - Method Blank (1) 1 QC Batch 126079 - Method Blank (1) 1 QC Batch 126115 - Method Blank (1) 1 QC Batch 126288 - Method Blank (1) 1	10 10 10 10 10 11
Duplicates 1 QC Batch 125907 - Duplicate (1) 1 QC Batch 126012 - Duplicate (1) 1 QC Batch 126018 - Duplicate (1) 1 QC Batch 126079 - Duplicate (1) 1 QC Batch 126079 - Duplicate (1) 1	12 12 12 12 12 12
Laboratory Control Spikes 1 QC Batch 126012 - LCS (1) 1 QC Batch 126079 - LCS (1) 1 QC Batch 126115 - LCS (1) 1 QC Batch 126288 - LCS (1) 1	14 14 14 14 15
Matrix Spikes 1 QC Batch 126115 - MS (1)	16 16 16
Calibration Standards 1 QC Batch 125907 - CCV (1) 1 QC Batch 126115 - CCV (1) 1 QC Batch 126115 - CCV (2) 1 QC Batch 126288 - ICV (1) 1 QC Batch 126288 - CCV (1) 1	L7 17 17 17 17 17
Appendix 1 Report Definitions 1 Laboratory Certifications 1 Standard Flags 1 Attachments 1	19 19 19 19 20

Case Narrative

Samples for project Brine Well 3rd QT. Sample were received by TraceAnalysis, Inc. on 2015-10-26 and assigned to work order 15102712. Samples for work order 15102712 were received intact at a temperature of 3.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	106703	2015-11-04 at 13:00	126115	2015-11-04 at 13:45
Density	ASTM D854-92	106620	2015-11-02 at $13:10$	126018	2015-11-02 at $13:15$
Na, Dissolved	S 6010C	106726	2015-11-06 at 12:43	126288	2015-11-12 at $10:10$
pН	SM 4500-H+	106519	2015-10-27 at $17:30$	125907	2015-10-27 at $17:31$
TDS	SM 2540C	106564	2015-10-29 at $12:04$	126012	2015-10-29 at $12:00$
TDS	SM 2540C	106671	2015-11-03 at $16:30$	126079	2015-11-03 at $16:31$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15102712 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analytical I Date Analy Sample Pre	Method: E 3 zed: 201 paration:	00.0 5-11-04	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,6	76.6	mg/L	5	2.50

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Density 126018 106620		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D8 2015-11-02	854-92 2	Prep Method: Analyzed By: Prepared By:	${ m N/A} { m CF} { m CF} { m CF}$
_			~	RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				0.978	g/ml	1	0.00

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 125907 106519		Analytical Method Date Analyzed: Sample Preparatio	: SM 45 2015-1 n:	00-H+ 0-27	Prep Method: Analyzed By: Prepared By:	N/A LQ LQ
Danamatan		Ela m	Cont	RL	Unita	Dilution	DI
Parameter		Flag	Cert	Result	Units	Dilution	KL
pH			1,2,4,6	7.79	s.u.	1	2.00

Sample: 407093 - BW-22 Tatum Fresh

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	126012	Date Analyzed:	2015-10-29	Analyzed By:	LQ
Prep Batch:	106564	Sample Preparation:		Prepared By:	LQ

Report Date: November 12, 2015 BW-4 & BW-22		Work Ord Brine Well 3	Page Numbe Buckeye & Ta	er: 6 of 20 atum NM		
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,6	659	mg/L	10	2.50

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analytical M Date Analyz Sample Prej	Method: E zed: 20 paration:	300.0 115-11-04	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,6	18000	$\mathrm{mg/L}$	500	2.50

Sample: 407094 - BW-22 Tatum Brine

Laboratory:	Lubbock						
Analysis:	Density		Analytical Method:	ASTM D8	54-92	Prep Method:	N/A
QC Batch:	126018		Date Analyzed:	2015-11-02	2	Analyzed By:	\mathbf{CF}
Prep Batch:	106620		Sample Preparation:	:		Prepared By:	CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				1.02	g/ml	1	0.00

Sample: 407094 - BW-22 Tatum Brine

Dissolved Soc	lium		2,3,4,6	12500	m mg/L	100	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	106726		Sample Preparation:	2015-11-06		Prepared By:	RR
QC Batch:	126288		Date Analyzed:	2015 - 11 - 12		Analyzed By:	\mathbf{RR}
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Report Date: November 12, 2015	Work Order: 15102712	Page Number: 7 of 20
BW-4 & BW-22	Brine Well 3rd QT. Sample	Buckeye & Tatum NM

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 125907 106519		Analytical Method: Date Analyzed: Sample Preparation	SM 450 2015-10	00-H+)-27	Prep Method: Analyzed By: Prepared By:	N/A LQ LQ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			1,2,4,6	6.99	s.u.	1	2.00

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Laboratory: Lubbock Analysis: TDS QC Batch: 126012 Prep Batch: 106564		nalytical Metho ate Analyzed: ample Preparati	od: SM 2540C 2015-10-29 ion:		Prep Method: Analyzed By: Prepared By:	m N/A LQ LQ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,6	37000	$\mathrm{mg/L}$	1000	2.50

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analytical M Date Analyz Sample Prep	Method: zed: paration:	E 300.0 2015-11-04		Prep Method: Analyzed By: Prepared By:	N/A RL RL
		RL						
Parameter		Flag	Cert	Result	t	Units	Dilution	RL
Chloride			1,2,3,4,6	280)	mg/L	10	2.50

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory:	Lubbock				
Analysis:	Density	Analytical Method:	ASTM D854-92	Prep Method:	N/A
QC Batch:	126018	Date Analyzed:	2015-11-02	Analyzed By:	CF
Prep Batch:	106620	Sample Preparation:		Prepared By:	\mathbf{CF}

continued ...

Report Date: November 12, 2015 Work Order: 15102712 Page Number: 8 of 20 BW-4 & BW-22 Brine Well 3rd QT. Sample Buckeye & Tatum NM sample 407095 continued ... \mathbf{RL} Cert Dilution Parameter Flag Result Units RL RL Parameter Flag Cert Result Units Dilution RL Density 0.997 g/ml 1 0.00 Sample: 407095 - BW-4 Buckeye Fresh Laboratory: Lubbock Analysis: $_{\rm pH}$ Analytical Method: SM 4500-H+ $\,$ Prep Method: N/A QC Batch: 125907Date Analyzed: 2015 - 10 - 27Analyzed By: LQPrep Batch: 106519 Sample Preparation: Prepared By: LQRLParameter Flag Cert Result Units Dilution RL 7.61 1,2,4,62.00 pH s.u. 1

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory:	Lubbock						
Analysis:	TDS	Aı	nalytical Method	: SM 2540C		Prep Method:	N/A
QC Batch:	126012Date Analyzed:2		2015 - 10 - 29		Analyzed By:	LQ	
Prep Batch:	106564	Sa	mple Preparation	n:		Prepared By:	LQ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,6	868	mg/L	20	2.50

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analyti Date A Sample	cal Method: nalyzed: Preparation:	E 300.0 2015-11-04	4	Prep Method: Analyzed By: Prepared By:	N/A RL RL
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
Chloride			1,2,3,4,6	1760	00	$\mathrm{mg/L}$	5000	2.50

Report Date: November 12, 2015	Work Order: 15102712	Page Number: 9 of 20
BW-4 & BW-22	Brine Well 3rd QT. Sample	Buckeye & Tatum NM

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Density 126018 106620		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D 2015-11-0	854-92 2	Prep Method: Analyzed By: Prepared By:	N/A CF CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				1.18	g/ml	1	0.00

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 126288 106726		Analytical Method: Date Analyzed: Sample Preparation:	S 6010C 2015-11-12 2015-11-06		Prep Method: Analyzed By: Prepared By:	S 3005A RR RR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium		2,3,4,6	108000	$\mathrm{mg/L}$	1000	1.00

Sample: 407096 - BW-4 Buckeye Brine

pН			1,2,4,6	6.76	s.u.	1	2.00
Parameter		Flag	Cert	Result	Units	Dilution	RL
				RL			
Prep Batch:	106519		Sample Prepara	tion:	Prepared By:	LQ	
QC Batch:	125907		Date Analyzed:	2015-10-	-27	Analyzed By:	LQ
Analysis:	pН		Analytical Meth	nod: SM 4500)-H+	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock TDS 126079 106671	Analytical Method: Date Analyzed: Sample Preparation:		: SM 2540C 2015-11-03 n:		Prep Method: Analyzed By: Prepared By:	$_{ m LQ}^{ m N/A}$
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,6	310000	m mg/L	2000	2.50

Method Blanks

Method Blank (1)	QC Batch: 126012					
QC Batch: 126012 Prep Batch: 106564		Date Analyzed: QC Preparation:	2015-10-29 2015-10-29		Analyzed By: Prepared By:	LQ LQ
Parameter Total Dissolved Solids		Flag	Cert 1,2,3,4,6	MDL Result <25.0	Units mg/L	RL 2.5
Method Blank (1)	QC Batch: 126018					
QC Batch: 126018 Prep Batch: 106620		Date Analyzed: QC Preparation:	2015-11-02 2015-11-02		Analyzed By: Prepared By:	CF CF
Parameter	Flag	Cert		MDL Result	Units	RL
Density	0			0.988	g/ml	
Method Blank (1)	QC Batch: 126079					
QC Batch: 126079 Prep Batch: 106671		Date Analyzed: QC Preparation:	2015-11-03 2015-11-03		Analyzed By: Prepared By:	LQ LQ
Dependent		Flog	Cont	MDL	Unita	DI
Total Dissolved Solids		r iag	1,2,3,4,6	<25.0	mg/L	2.5

Method Bla	ank (1)	QC Batch: 126115				
QC Batch:	126115		Date Analyzed:	2015-11-04	Analyzed By:	RL
Prep Batch:	106703		QC Preparation:	2015-11-04	Prepared By:	RL

Report Date: November 12, 20 BW-4 & BW-22)15 B	Work Order: 151 rine Well 3rd QT	02712 . Sample	Page Number: 11 of 20 Buckeye & Tatum NM			
Parameter	Flag	Cert	MDL Besult	Units	BL		
Chloride	1 145	1,2,3,4,6	<0.323	mg/L	2.5		
Method Blank (1) QC I	Batch: 126288						
QC Batch: 126288 Prep Batch: 106726	Date An QC Pre	nalyzed: 2015-1 paration: 2015-1	1-12 1-06	Analyzed By Prepared By	r: RR r: PM		
Parameter Dissolved Sodium	Flag	Cert	MDL Result	Units mg/I	RL		

Duplicates

Duplicates	(1) Duplicate	ed Sample: 4	.06966					
QC Batch: 125907 Date Analyzed: 2015-10-27 Analyzed H Prep Batch: 106519 QC Preparation: 2015-10-27 Prepared H Duplicate Sample						By: LQ By: LQ		
Param			Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		1,2,4,6	6.95	6.79	s.u.	1	2	20

Duplicates (1) Duplicated Sample: 407191

QC Batch:	126012	Date Analyzed:	2015-10-29	Analyzed By:	LQ
Prep Batch:	106564	QC Preparation:	2015-10-29	Prepared By:	LQ

		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids	1,2,3,4,6	3320	3180	$\mathrm{mg/L}$	50	4	10

Duplicates (1) Duplicated Sample: 407096

QC Batch:	126018	Date Analyzed:	2015 - 11 - 02		Analyzed By:	CF
Prep Batch:	106620	QC Preparation	: 2015-11-02		Prepared By:	CF
		Duplicate Sam	ple			RPD
Param		Result Res	ult Units	Dilution	RPD	Limit
Density		1.19 1.1	l8 g/ml	1	1	20

Duplicates (1) Duplicated Sample: 407287

QC Batch:	126079	Date Analyzed:	2015-11-03	Analyzed By:	LQ
Prep Batch:	106671	QC Preparation:	2015-11-03	Prepared By:	LQ

Report Date: November 12, 2018 BW-4 & BW-22	5	Work Order: 15102712Page NumberBrine Well 3rd QT. SampleBuckeye & '		ge Number: ickeye & Ta	er: 13 of 20 Tatum NM		
		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids	1,2,3,4,6	1190	1180	mg/L	20	1	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 126012			Date A	nalyzed:	2015	5 - 10 - 29			Ana	alyzed B	y: LQ
Prep Batch: 106564			QC Pre	paration	: 2015	5-10-29			Pre	pared By	y: LQ
				LCS			Spike	Ma	atrix		Rec.
Param]	F	C I	Result	Units	b Dil.	Amount	Re	sult	Rec.	Limit
Total Dissolved Solids		1,2	,3,4,6	1000	mg/L	ı 10	1000	<	25.0	100	90 - 110
Percent recovery is based on	the spike	result.	RPD is l	based on	the spi	ike and spi	ke duplica	te resu	lt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,6	1000	$\mathrm{mg/L}$	10	1000	$<\!25.0$	100	90 - 110) 0	10
		_		_					_		

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{126079}{106671}$		Date QC 1	Analyzed: Preparation	l F	Analyzed By: LQ Prepared By: LQ				
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolv	ed Solids		1,2,3,4,6	992	$\mathrm{mg/L}$	10	1000	<25.0	99	90 - 110
Percent recov	very is based on t	the spike resu	ılt. RPD	is based or	n the spike	e and sp	ike duplicate	e result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,6	992	$\mathrm{mg/L}$	10	1000	$<\!25.0$	99	90 - 110	0	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	126115	Date Analyzed:	2015-11-04	Analyzed By:	RL
Prep Batch:	106703	QC Preparation:	2015-11-04	Prepared By:	RL

Report Date: November 12, 201 BW-4 & BW-22	5		Work Order: 15102712 Brine Well 3rd OT, Sample						Page Number: 15 of 20 Buckeye & Tatum NM			
				Dime W		gr. Sampi	6		Duene	ye a 1a		
				LCS			Spike	М	atrix		Rec.	
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	R	esult 1	Rec.	Limit	
Chloride			1,2,3,4,6	24.7	mg/I	. 1	25.0	<	0.323	99	90 - 110	
Percent recovery is based on the	spike	e resu	lt. RPD	is based o	on the sp	ike and sp	ike duplica	te resi	ılt.			
			LCS	SD		Spike	Matrix		Rec.		RPD	
Param	\mathbf{F}	С	Res	ult Unit	s Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Chloride		1,2,3,	4,6 24.	.9 mg/l	L 1	25.0	< 0.323	100	90 - 110) 1	20	
Laboratory Control Spike (I QC Batch: 126288 Prep Batch: 106726	LCS-	1)	Date OC 1	e Analyzed Preparatio	l: 2013	5-11-12 5-11-06			Ana Prei	lyzed By pared By	v: RR v: PM	
				LCS			Spike	Ma	atrix		Rec.	
Param		F	С	Result	Units	Dil.	Amount	Re	sult	Rec.	Limit	
Dissolved Sodium			2,3,4,6	53.0	mg/L	1	52.5	<0.	.0197	101	85 - 115	
Percent recovery is based on the	spike	e resu	lt. RPD	is based o	on the sp	ike and sp	ike duplica	te resi	ılt.			
			LCSI	D		Spike	Matrix		Rec.		RPD	
Param	F	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Dissolved Sodium		2, 3, 4,	6 53.2	mg/L	1	52.5	< 0.0197	101	85 - 115	6 0	20	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

2

20

Matrix Spikes

Matrix Spike (MS-1)	piked Sam	ple: 40	07240								
QC Batch: 126115 Prep Batch: 106703			Date A QC Pr	Analyzed: reparation	2013 n: 2015	5-11-04 5-11-04			A: Pi	nalyzed E repared E	By: RL by: RL
_		_	~	MS			Spike	Ma	atrix		Rec.
Param	ŀ	1	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride		1,2	,3,4,6	153	mg/L	5	125	2	6.2	101	80 - 120
Percent recovery is based on	the spike 1	esult.	RPD is	based on	the spi	ike and spi	ike duplica	te resu	lt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limi	t RPD	Limit
Chloride		1,2,3,4,6	153	mg/L	5	125	26.2	101	80 - 12	20 0	20
Matrix Spike (MS-1)	piked Sam	ple: 40)7349								
QC Batch: 126288			Date A	nalvzed:	2015	5-11-12			Ar	nalvzed B	v: RR
Prep Batch: 106726			QC Pr	eparation	: 2015	5-11-06			Pr	epared B	y: PM
				MS			Spike	Ma	ntrix		Rec.
Param	F	ק	C 1	Result	Units	Dil.	Amount	$R\epsilon$	sult	Rec.	Limit
Dissolved Sodium		2,	3,4,6	874	$\mathrm{mg/L}$	1	525	3	77	95	75 - 125
Percent recovery is based on	the spike 1	esult.	RPD is	based on	the spi	ike and spi	ike duplica	te resu	lt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

Calibration Standards

Standard (CCV-1)

QC Batch:	125907		Da	te Analyzed:	2015-10-27		Analy	Analyzed By: LQ		
				CCVs	CCVs	CCVs	Percent			
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
pH		1,2,4,6	s.u.	7.00	7.01	100	98.6 - 101.4	2015-10-27		

Standard (CCV-1)

QC Batch:	126115			Date 4	Analyzed:	2015-11-04		Analy	Analyzed By: RL		
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date		
Param	I	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride			1,2,3,4,6	$\mathrm{mg/L}$	25.0	25.1	100	90 - 110	2015-11-04		

Standard (CCV-2)

QC Batch:	126115			Date .	Analyzed:	2015-11-04		Analy	Analyzed By: RL		
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date		
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride			1,2,3,4,6	$\mathrm{mg/L}$	25.0	24.6	98	90 - 110	2015-11-04		

Standard (ICV-1)

QC Batch:	126288		Analyzed By: RR						
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Se	odium		2,3,4,6	$\mathrm{mg/L}$	27.5	26.8	97	90 - 110	2015-11-12
Report Date: November 1 BW-4 & BW-22	W Brin	Vork Order: ne Well 3rd	Page Number: 18 of 20 Buckeye & Tatum NM						
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Standard (CCV-1)									
QC Batch: 126288		Date Anal	yzed: 201	Analyzed By: RR					
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
Dissolved Sodium	-0	2,3,4,6	$\mathrm{mg/L}$	27.5	27.8	101	90 - 110	2015-11-12	

Page Number: 19 of 20 Buckeye & Tatum NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5	NELAP	T104704392-14-8	Midland
6		2015-066	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.

Report Date: November 12, 2015 BW-4 & BW-22

Work Order: 15102712 Brine Well 3rd QT. Sample Page Number: 20 of 20 Buckeye & Tatum NM

F Description

Qsr Surrogate recovery outside of laboratory limits.

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Lubbock, Texas 79424 El Paso, Texas 79922 Midland. Texas 79703 Texas 75006 Carroliton. E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

(Corrected Report)

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: March 24, 2016

Work Order: 16022211

Project Location: Tatum, NM **Project Name:** Brine Well-Tatum Project Number: Brine Well-Tatum

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
414780	Fresh Water	water	2016-02-17	17:55	2016-02-18
414781	Brine Water	water	2016-02-17	18:00	2016-02-18

Report Corrections (Work Order 16022211)

• 3/24/16: Added Chloride, pH, TDS and Density to sample 414781.

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Letturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Johnny Grindstaff, Operations Manager

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Case Narrative

Samples for project Brine Well-Tatum were received by TraceAnalysis, Inc. on 2016-02-18 and assigned to work order 16022211. Samples for work order 16022211 were received intact at a temperature of -0.1 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	108743	2016-02-23 at 10:00	128419	2016-02-23 at 10:08
Chloride (IC)	E 300.0	109290	2016-03-23 at $14:00$	129049	2016-03-23 at $15:09$
Density	ASTM D854-92	108721	2016-02-23 at $13:10$	128394	2016-02-23 at $13:15$
Density	ASTM D854-92	109263	2016-03-23 at $11:10$	129013	2016-03-23 at $11:15$
Na, Dissolved	S 6010C	108686	2016-02-22 at $12:23$	128362	2016-02-22 at $15:23$
pН	SM 4500-H+	108694	2016-02-22 at $15:00$	128366	2016-02-22 at $15:00$
pН	SM 4500-H+	109282	2016-03-23 at $12:30$	129028	2016-03-23 at $12:30$
TDS	SM 2540C	108734	2016-02-23 at $15:30$	128463	2016-02-23 at $15:30$
TDS	SM 2540C	109281	2016-03-23 at 16:30 $$	129044	2016-03-23 at 16:30

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16022211 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 414780 - Fresh Water

Chloride			1,2,3,4,5	76.6	mg/L	10	2.50
Parameter		Flag	Cert	Result	Units	Dilution	RL
				RL			
Prep Batch:	108743Sample Preparation:				Prepared By:	RL	
QC Batch:	128419		Date Analy	zed: 20	16-02-23	Analyzed By:	RL
Analysis:	Chloride (IC)		Analytical I	Method: E	300.0	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 414780 - Fresh Water

Density				0.985	g/ml	1	0.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	108721		Sample Preparation:			Prepared By:	CF
QC Batch:	128394		Date Analyzed:	2016-02-23		Analyzed By:	CF
Analysis:	Density		Analytical Method:	ASTM D85	54-92	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 414780 - Fresh Water

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 128366 108694		Analytical Metho Date Analyzed: Sample Preparati	d: SM 45 2016-0 on:	00-H+ 2-22	Prep Method: Analyzed By: Prepared By:	$_{ m LQ}^{ m N/A}$
D				RL	TT •		DI
Parameter		Flag	Cert	Result	Units	Dilution	RL
pH			1,2,4,5	7.93	s.u.	1	2.00

Sample: 414780 - Fresh Water

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	128463	Date Analyzed:	2016-02-23	Analyzed By:	LQ
Prep Batch:	108734	Sample Preparation:		Prepared By:	LQ

Report Date: March 24, 2016 Brine Well-Tatum		Work Orde Brine We	Page Number: 7 of 20 Tatum, NM			
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	662	$\mathrm{mg/L}$	10	2.50

Sample: 414781 - Brine Water

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 129049 109290		Analytical M Date Analyza Sample Prep	lethod: ed: aration:	E 300.0 2016-03-23 2016-03-23		Prep Method: Analyzed By: Prepared By:	N/A RL RL
				R	L			
Parameter		Flag	Cert	Resu	lt	Units	Dilution	RL
Chloride		Н	1,2,3,4,5	1260	0	$\mathrm{mg/L}$	500	2.50

Sample: 414781 - Brine Water

Laboratory:	Lubbock						
Analysis:	Density		Analytical Method:	ASTM D8	854-92	Prep Method:	N/A
QC Batch:	129013		Date Analyzed:	2016-03-2	3	Analyzed By:	\mathbf{CF}
Prep Batch:	109263		Sample Preparation:			Prepared By:	CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density	1			0.996	g/ml	1	0.00

Sample: 414781 - Brine Water

Dissolved Soc	lium		2,3,4,5	6760	m mg/L	1000	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	108686		Sample Preparation:	2016-02-22		Prepared By:	RR
QC Batch:	128362		Date Analyzed:	2016-02-22		Analyzed By:	\mathbf{RR}
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Report Date Brine Well-T	: March 24, 2016 Tatum		Work Order: 16022211 Brine Well-Tatum			Page Number: 8 of 20 Tatum, NM	
Sample: 41	4781 - Brine W	ater					
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 129028 109282		Analytical Method: Date Analyzed: Sample Preparation:	SM 4500-H+ 2016-03-23 2016-03-23		Prep Method: Analyzed By: Prepared By:	${ m N/A} { m LQ} { m LQ} { m LQ}$
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
рН			1,2,4,5	7.29	s.u.	1	2.00
Sample: 41	4781 - Brine W	ater					
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock TDS 129044 109281		Analytical Method: Date Analyzed: Sample Preparation	SM 2540C 2016-03-23 : 2016-03-23		Prep Method: Analyzed By: Prepared By:	$_{ m LQ}^{ m N/A}$ LQ

QU Datch.	129044	Da	te Analyzeu.	2010-03-23		Analyzed Dy.	ъQ
Prep Batch:	109281	Sar	nple Preparatio	n: 2016-03-23 Prepared By		LQ	
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,5	26700	mg/L	1000	2.50

Method Blanks

Method Blank (1)	QC Batch: 128362					
QC Batch: 128362 Prep Batch: 108686		Date Analyzed: QC Preparation:	2016-02-22 2016-02-22		Analyzed By: Prepared By:	RR PM
Parameter	F	flag Ce	\mathbf{rt}	MDL Result	Units	RL
Dissolved Sodium		2,3,	4,5	< 0.0197	mg/L	1
Method Blank (1)	QC Batch: 128394					
QC Batch: 128394 Prep Batch: 108721		Date Analyzed: QC Preparation:	2016-02-23 2016-02-23		Analyzed By: Prepared By:	CF CF
Parameter	Flag	Cert		MDL Result	Units	RL
Density				0.988	g/ml	
Method Blank (1)	QC Batch: 128419					
QC Batch: 128419 Prep Batch: 108743		Date Analyzed: QC Preparation:	2016-02-23 2016-02-23		Analyzed By: Prepared By:	RL RL
Parameter	Flag	Cert		MDL Result	Units	RL
Chloride	0	1,2,3,4,5		< 0.323	mg/L	2.5

Method Bla	ank (1)	QC Batch: 128463				
QC Batch:	128463		Date Analyzed:	2016-02-23	Analyzed By:	LQ
Prep Batch:	108734		QC Preparation:	2016-02-23	Prepared By:	LQ

Report Date: March 24 Brine Well-Tatum	, 2016	Work Orde Brine W	er: 16022211 Vell-Tatum	Page Number: 10 of 20 Tatum, NM		
Parameter		Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	mg/L	2.5
Method Blank (1)	QC Batch: 129013					
QC Batch: 129013 Prep Batch: 109263		Date Analyzed: QC Preparation:	2016-03-23 2016-03-23		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Parameter	Flag	Cert		MDL Result	Units	RL
Method Blank (1) QC Batch: 129044	QC Batch: 129044	Date Analyzed:	2016-03-23		Analyzed By:	LQ
Prep Batch: 109281		QC Preparation:	2016-03-23	MDL Bosult	Prepared By:	LQ
Total Dissolved Solids		T lag	1,2,3,4,5	<25.0	mg/L	2.5
Method Blank (1)	QC Batch: 129049					
QC Batch: 129049 Prep Batch: 109290		Date Analyzed: QC Preparation:	2016-03-23 2016-03-23		Analyzed By: Prepared By:	RL RL
Parameter Chloride	Flag	Cert 1,2,3,4,5		MDL Result <0.323	Units mg/L	RL 2.5

Duplicates

Duplicates (1)	Duplicated Sample: 414780	
----------------	---------------------------	--

QC Batch:	128366		Date Ana	lyzed: 2016	6-02-22		Analyzed I	By: LQ
Prep Batch:	108694		QC Prepa	aration: 2016	6-02-22		Prepared F	By: LQ
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
pН		1,2,4,5	7.91	7.93	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 414780

QC Batch:	128394	Date Analyzed:	2016-02-23	Analyzed By:	CF
Prep Batch:	108721	QC Preparation:	2016-02-23	Prepared By:	CF

	Duplicate	Sample				RPD
Param	Result	Result	Units	Dilution	RPD	Limit
Density	0.968	0.985	g/ml	1	2	20

Duplicates (1) Duplicated Sample: 414786

QC Batch:	128463	Ι	Date Analyzed:	2016-02-23			Analyzed By:	LQ
Prep Batch:	108734	Q	QC Preparation:	2016-02-23		Prepared By:	LQ	
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolve	ed Solids	1,2,3,4,5	1090	1120	mg/L	20	3	10

Duplicates (1) Duplicated Sample: 414781

QC Batch:	129013	Date Analyzed:	2016-03-23	Analyzed By:	\mathbf{CF}
Prep Batch:	109263	QC Preparation:	2016-03-23	Prepared By:	\mathbf{CF}

Report Date: March 24, 2016 Brine Well-Tatum	W	Work Order: 16022211 Brine Well-Tatum					
	Duplicate	Sample				RPD	
Param	Result	Result	Units	Dilution	RPD	Limit	
Density ²	0.978	0.996	g/ml	1	2	20	

Duplicates	(1) Duplicate	ed Sample: 4	16191							
QC Batch:129028Date Analyzed:2016-03-23Analyzed By:LOPrep Batch:109282QC Preparation:2016-03-23Prepared By:LO										
Daram			Duplicate	Sample	Unita	Dilution	חספ	RPD Limit		
pH		1,2,4,5	7.18	7.18	s.u.	1 Dilution	4	$\frac{111111}{20}$		

Duplicates (1) Duplicated Sample: 416188

QC Batch: 129044 Prep Batch: 109281		D: Q	ate Analyzed: C Preparation:	2016-03-23 2016-03-23			Analyzed By: Prepared By:	LQ LQ
Param			Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolv	red Solids	1,2,3,4,5	4630	4670	mg/L	50	1	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 128362	8362 Date Analyzed: 2016-02-22 Analyzed By: RR										
Prep Batch: 108686	QC Preparation: 2016-02-22 Prepared E								ared By	: PM	
			LCS			Spike	Ma	atrix		Rec.	
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Re	sult I	Rec.	Limit	
Dissolved Sodium		2,3,4,5	55.1	mg/L	1	52.5	<0.	0197	105 8	85 - 115	
Percent recovery is based on the spi	ike res	ult. RPD	is based o	n the s	pike and sp	oike duplica	ate resu	ılt.			
		LCS	D		Spike	Matrix		Rec.		RPD	
Param	F C	C Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Dissolved Sodium	2,3,	4,5 52.	7 mg/L	1	52.5	< 0.0197	100	85 - 115	4	20	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	128419Date Analyzed:2016-02-23108743QC Preparation:2016-02-23								Analyzed By: RL Prepared By: RL		
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	
Chloride			1,2,3,4,5	25.8	$\mathrm{mg/L}$	1	25.0	< 0.323	103	90 - 110	
Percent recov	very is based on the s	spike res	ult. RPD	is based or	n the spike	e and sp	ike duplicate	e result.			

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	25.7	m mg/L	1	25.0	< 0.323	103	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	128463	Date Analyzed:	2016-02-23	Analyzed By:	LQ
Prep Batch:	108734	QC Preparation:	2016-02-23	Prepared By:	LQ

Report Date: March 24, 2016 Brine Well-Tatum	Work Order: 16022211Page NumberBrine Well-TatumTatum							Number: Tat	14 of 20 500, NM		
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec. Limit
Total Dissolved Solids		1	,2,3,4,5	1010	mg/L	10	1000	<	25.0	101	90 - 110
Percent recovery is based on the	spike	e result.	RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
			LCS	D		Spike	Matrix		Rec.		RPD
Param	F	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	101	0 mg/L	10	1000	<25.0	101	90 - 11	0 0	10
Laboratory Control Spike (L QC Batch: 129044 Prep Batch: 109281	CS-	1)	Date QC F	Analyzed: Preparation	2016 .: 2016	5-03-23 5-03-23			An Pre	alyzed B epared B	y: LQ y: LQ
Param Total Dissolved Solids		F	C ,2,3,4,5	LCS Result 995	Units mg/L	Dil. 10	Spike Amount 1000	Ma Re	atrix esult 25.0	Rec.	Rec. Limit 90 - 110
Percent recovery is based on the	spike	e result.	RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
Param Total Dissolved Solids Percent recovery is based on the	F	C 1,2,3,4,5 e result.	LCS Resu 1020 RPD i	D llt Units 0 mg/L as based on	Dil. 10 the spi	Spike Amount 1000 ke and spi	Matrix Result <25.0 ke duplica	Rec. 102 te resu	Rec. Limit 90 - 11 lt.	RPD 0 2	RPD Limit 10
Laboratory Control Spike (L QC Batch: 129049 Prep Batch: 109290	CS-	1)	Date QC I	Analyzed: Preparation	2016 : 2016	5-03-23 5-03-23			An Pre	alyzed B	y: RL v: BL
Param		F	C	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec.
Chloride		1	,2,3,4,5	24.3	mg/L	1	25.0	<0	.323	97	90 - 110
Percent recovery is based on the	spike	e result.	RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	24.2	$\mathrm{mg/L}$	1	25.0	< 0.323	97	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spik	æ (MS-1)	Spiked Sar	mple:	414212								
QC Batch: Prep Batch:	$\frac{128362}{108686}$			Date . QC P	Analyzed: reparation	2016 n: 2016	3-02-22 3-02-22			An Pre	alyzed By epared By	y: RR v: PM
					MS			Spike	Ma	atrix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Dissolved Soc	lium			2,3,4,5	491	$\mathrm{mg/L}$	1	500	2	.44	98	75 - 125
Percent recov	ery is based of	n the spike	result	. RPD is	s based on	the spi	ike and spi	ike duplica	te resu	ılt.		
				MSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Soc	lium		2,3,4,5	500	$\mathrm{mg/L}$	1	500	2.44	100	75 - 12	5 2	20
Matrix Spik	er, 25 5000 0.	Spiked Sa	mple:	414780								
	le (1010-1)	Spiked bai	inpic.	111100								
QC Batch:	128419			Date	Analyzed:	2010	6-02-23			Ar	nalyzed B	y: RL
Prep Batch:	108743			QC P	reparatior	n: 2016	6-02-23			Pr	epared B	y: RL
					MS			Spike	M	atrix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride			:	1,2,3,4,5	340	mg/L	10	250	7	6.6	105	80 - 120
Percent recov	ery is based of	n the spike	result	. RPD is	s based on	the spi	ike and sp	ike duplica	te resu	ılt.		
				MSE)		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	С	Resul	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

333 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

1,2,3,4,5

Matrix Spike (MS-1)	Spiked Sample: 416184
---------------------	-----------------------

Chloride

QC Batch:	129049	Date Analyzed:	2016-03-23	Analyzed By:	RL
Prep Batch:	109290	QC Preparation:	2016-03-23	Prepared By:	RL

mg/L

10

250

76.6

102

80 - 120

2

20

Report Date: March 24, 2016 Brine Well-Tatum		Work Order: 16022211 Brine Well-Tatum						Page Number: 16 of 20 Tatum, NM			
Param		F	С	MS Result	Units	Dil.	Spike Amount	M Re	atrix esult 1	Rec.	Rec. Limit
Chloride		1	2,3,4,5	3570	mg/L	100	2500	1	100	99	80 - 120
Percent recovery is based on the	spike	e result.	RPD is	based on	the spi	ke and spi	ke duplica	te resu	ılt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	3540	mg/L	100	2500	1100	98	80 - 120) 1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (ICV-1)

QC Batch:	128362			Date Anal	yzed: 201	Analyzed By: RR			
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Se	odium		2,3,4,5	mg/L	26.0	24.9	96	90 - 110	2016-02-22

Standard (CCV-1)

QC Batch:	128362			Date Anal	yzed: 201	Analyzed By: RR			
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved So	odium		2,3,4,5	$\mathrm{mg/L}$	26.0	25.3	97	90 - 110	2016-02-22

Standard (CCV-1)

QC Batch:	128366		Da	te Analyzed:	2016-02-22	2	Analy	Analyzed By: LQ		
				CCVs	CCVs	CCVs	Percent			
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
pН		1,2,4,5	s.u.	7.00	7.00	100	98.6 - 101.4	2016-02-22		

Standard (CCV-1)

QC Batch:	128419			Date	Analyzed:	2016-02-23		Analy	zed By: RL
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	mg/L	25.0	25.7	103	90 - 110	2016-02-23

Report Date: March 24, 2016 Brine Well-Tatum				Work Ord Brine V	ler: 16022211 Vell-Tatum	Page Nu	mber: 18 of 20 Tatum, NM	
Standard (C	CV-2)							
QC Batch: 12	28419		Date	e Analyzed:	2016-02-23		Analy	vzed By: RL
Param Chloride	Flag	Cert 1,2,3,4,5	Units mg/L	CCVs True Conc. 25.0	CCVs Found Conc. 25.9	CCVs Percent Recovery 104	Percent Recovery Limits 90 - 110	Date Analyzed 2016-02-23
Standard (C	CV-1)				2016.00.00			
QC Batch: 12	29028		Date	e Analyzed:	2016-03-23		Analy	zed By: LQ
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
рН		1,2,4,5	s.u.	7.00	7.03	100	98.6 - 101.4	2016-03-23
Standard (C	CV-1)							
QC Batch: 12	29049		Date	e Analyzed:	2016-03-23		Analy	zed By: RL
		~		CCVs True	$\begin{array}{c} \mathrm{CCVs} \\ \mathrm{Found} \\ \widetilde{\mathbf{C}} \end{array}$	CCVs Percent	Percent Recovery	Date
Param Chlorido	Flag	Cert	Units mg/I	25.0	Conc.	Recovery	Limits	Analyzed
Unionae		1,2,3,4,5	шg/ L	$_{20.0}$	24.4	90	90 - 110	2010-05-25

Standard (CCV-2)

QC Batch:	129049			Date .	Analyzed:	2016-03-23		Analy	yzed By: RL
					$\rm CCVs$	$\rm CCVs$	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	24.4	98	90 - 110	2016-03-23

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Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2015-066	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je $\;$ Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

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F Description

U The analyte is not detected above the SDL

Result Comments

- 1 Analyzed out of hold time.
- 2 Analyzed out of hold time.

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Summary Report

(Corrected Report)

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: March 24, 2016

Work Order:	16022211

Project Location: Tatum, NM Project Name: Brine Well-Tatum

Report Corrections (Work Order 16022211)

• 3/24/16: Added Chloride, pH, TDS and Density to sample 414781.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
414780	Fresh Water	water	2016-02-17	17:55	2016-02-18
414781	Brine Water	water	2016-02-17	18:00	2016-02-18

Sample: 414780 - Fresh Water

Param	Flag	Result	Units	RL
Chloride		76.6	mg/L	2.5
Density		0.985	g/ml	
pH		7.93	s.u.	2
Total Dissolved Solids		$\boldsymbol{662}$	m mg/L	2.5

Sample: 414781 - Brine Water

Param	Flag	Result	Units	RL
Chloride	Н	12600	mg/L	2.5
Density	1	0.996	g/ml	
Dissolved Sodium		6760	$\mathrm{mg/L}$	1
pH		7.29	s.u.	2
				continued

¹Analyzed out of hold time.

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: March 24, 2016		Work Order: 16022211	Page Nu	Page Number: 2 of 2		
sample 414781 continued						
Param	Flag	Result	Units	RL		
Total Dissolved Solids		26700	m mg/L	2.5		

Summary Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: June 5, 2015

Work Order: 15050506

Project Location: Tatum NM Project Name: Tatum Fresh & Brine Well

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
392449	Fresh	water	2015-04-27	14:10	2015-05-01
392450	Brine	water	2015-04-27	14:20	2015-05-01

Sample: 392449 - Fresh

Param	Flag	Result	Units	RL
Chloride		82.8	mg/L	2.5
рН		8.32	s.u.	2
Specific Gravity		0.9923	g/ml	
Total Dissolved Solids		633	m mg/L	2.5

Sample: 392450 - Brine

Param	Flag	Result	Units	RL
Chloride		20500	mg/L	2.5
Dissolved Sodium		12500	m mg/L	1
pН		6.05	s.u.	2
Specific Gravity		1.018	g/ml	
Total Dissolved Solids		34100	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Texas 79424 Lubbock, El Paso, Texas 79922 Midland. Texas 79703 Texas 75006 Carroliton.

E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

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Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: June 5, 2015

Work Order: 15050506

Project Location: Tatum NM **Project** Name: Tatum Fresh & Brine Well Tatum Fresh & Brine Well Project Number:

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
392449	Fresh	water	2015-04-27	14:10	2015-05-01
392450	Brine	water	2015-04-27	14:20	2015-05-01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 18 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Case Narrative

Samples for project Tatum Fresh & Brine Well were received by TraceAnalysis, Inc. on 2015-05-01 and assigned to work order 15050506. Samples for work order 15050506 were received intact at a temperature of 1.4 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	102846	2015-05-14 at 09:30	121554	2015-05-14 at 10:32
Na, Dissolved	S 6010C	103232	2015-06-04 at $14:09$	122047	2015-06-05 at $13:17$
pН	SM 4500-H+	102649	2015-05-06 at $16:48$	121318	2015-05-06 at $16:51$
Specific Gravity	ASTM D1429-95	102660	2015-05-07 at $10:00$	121329	2015-05-07 at $10:10$
TDS	SM 2540C	102686	2015-05-07 at $17:44$	121355	2015-05-07 at $17:46$
TDS	SM 2540C	102742	2015-05-11 at $19:20$	121420	2015-05-11 at $19:21$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15050506 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 392449 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 121554 102846		Analytical I Date Analy Sample Pre	Method: E 30 zed: 2015 paration:)0.0 5-05-14	Prep Method: Analyzed By: Prepared By:	$_{ m RL}^{ m N/A}$
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,5	82.8	mg/L	5	2.50

Sample: 392449 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 121318 102649		Analytical Metho Date Analyzed: Sample Preparati	od: SM 4 2015-	500-H+ 05-06	Prep Method Analyzed By Prepared By	l: N/A 7: HJ 7: HJ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			1,2,4,5	8.32	s.u.	1	2.00

Sample: 392449 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Specific Gravity 121329 102660		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D 2015-05-0 2015-05-0	1429-95 7 7	Prep Method: Analyzed By: Prepared By:	N/A CF CF
Parameter		Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Specific Grav	ity	1 1008	(0.9923	g/ml	1	0.000

Sample: 392449 - Fresh

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	121420	Date Analyzed:	2015-05-11	Analyzed By:	HJ
Prep Batch:	102742	Sample Preparation:		Prepared By:	HJ

Report Date: June 5, 2015 Tatum Fresh & Brine Well	Work Order: 15050506 Tatum Fresh & Brine Well				Page Number: 6 of 18 Tatum NM		
D		C i	RL	T T 1 .		DI	
Parameter	Flag	Cert	Result	Units	Dilution	RL	
Total Dissolved Solids		1,2,3,4,5	633	$\mathrm{mg/L}$	10	2.50	

Sample: 392450 - Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 121554 102846		Analytical M Date Analyz Sample Prej	Method: E 300 zed: 2015- paration:	0.0 -05-14	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,5	20500	$\mathrm{mg/L}$	500	2.50

Sample: 392450 - Brine

Dissolved Soc	dium		2,3,4,5	12500	m mg/L	100	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	103232		Sample Preparation:	2015-06-04		Prepared By:	RR
QC Batch:	122047		Date Analyzed:	2015-06-05		Analyzed By:	\mathbf{RR}
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Sample: 392450 - Brine

pH			1,2,4,5	6.05	s.u.	1	2.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	102649		Sample Prepara	ation:		Prepared By:	HJ
QC Batch:	121318		Date Analyzed:	2015-05-	-06	Analyzed By:	нJ
Analysis:	pН		Analytical Met	hod: SM 450	0-H+	Prep Method:	N/A
Laboratory:	Lubbock						

Report Date: June 5, 2015 Tatum Fresh & Brine Well	Work Order: 15050506 Tatum Fresh & Brine Well				Page Number: 7 of 18 Tatum NM		
Sample: 392450 - Brine							
Laboratory: Lubbock Analysis: Specific Gravity QC Batch: 121329 Prep Batch: 102660	A1 Da Sa	nalytical Method: ate Analyzed: mple Preparation	ASTM D14 2015-05-07 1: 2015-05-07	29-95	Prep Method: Analyzed By: Prepared By:	${ m N/A} { m CF} { m CF}$	
			RL				
Parameter	Flag	Cert	Result	Units	Dilution	RL	
Specific Gravity			1.018	g/ml	1	0.000	
Sample: 392450 - Brine							
Laboratory: Lubbock Analysis: TDS QC Batch: 121355 Prep Batch: 102686	An Da Sar	alytical Method: te Analyzed: nple Preparation	SM 2540C 2015-05-07		Prep Method: Analyzed By: Prepared By:	N/A HJ HJ	
Parameter	Flag	Cert	RL Result	Units	Dilution	RL	
Total Dissolved Solids		1,2,3,4,5	34100	mg/L	1000	2.50	

Method Blanks

Method Blank (1)	QC Batch: 121329					
QC Batch: 121329 Prep Batch: 102660		Date Analyzed: QC Preparation:	2015-05-07 2015-05-07		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Parameter	F	lag Ce	ert	MDL Result	Units	RL
Specific Gravity				0.9884	g/ml	
Method Blank (1)	QC Batch: 121355					
QC Batch: 121355 Prep Batch: 102686		Date Analyzed: QC Preparation:	2015-05-07 2015-05-07		Analyzed By: Prepared By:	HJ HJ
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	m mg/L	2.5
Method Blank (1)	QC Batch: 121420					
QC Batch: 121420 Prep Batch: 102742		Date Analyzed: QC Preparation:	2015-05-11 2015-05-11		Analyzed By: Prepared By:	HJ HJ
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	mg/L	2.5

Method Bla	ank (1)	QC Batch: 121554				
QC Batch:	121554		Date Analyzed:	2015-05-14	Analyzed By:	RL
Prep Batch:	102846		QC Preparation:	2015-05-14	Prepared By:	RL
Report Date: June 5, 2 Tatum Fresh & Brine V	015 Vell	Work Order: 15050506PagTatum Fresh & Brine Well				
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Parameter	Flag	Cert	MDL Result	Units	RL	
Chloride		1,2,3,4,5	0.973	mg/L	2.5	
Method Blank (1) QC Batch: 122047 Prep Batch: 103232	QC Batch: 122047	Date Analyzed: QC Preparation:	2015-06-05 2015-06-04	Analyz Prepar	zed By: RR red By: PM	
Parameter	н	lag Ce	MD ort Bosu	L lt Units	RL	
Dissolved Sodium	T	2,3,	$\frac{10}{4.5}$ <0.019	$\frac{11}{97}$ mg/L	1	

Duplicates

Duplicates	(1) Duplic	ated Sample:	392489					
QC Batch:	121318		Date Ana	alyzed: 2015-	05-06		Analyzed	By: HJ
Prep Batch:	Prepared	By: HJ						
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
pН		1,2,4,5	9.09	9.19	s.u.	1	1	20

Duplicates (1) Duplicated Sample: 392450

QC Batch:	121329	Date Analyzed:	2015-05-07	Analyzed By:	${ m CF} { m CF}$
Prep Batch:	102660	QC Preparation:	2015-05-07	Prepared By:	

	Duplicate	Sample				RPD
Param	Result	Result	Units	Dilution	RPD	Limit
Specific Gravity	1.008	1.018	g/ml	1	1	200

Duplicates (1) Duplicated Sample: 392450

QC Batch:	121355	Da	ate Analyzed:	2015-05-07			Analyzed By:	HJ
Prep Batch:	102686	Q	C Preparation:	2015-05-07			Prepared By:	HJ
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolv	red Solids	1,2,3,4,5	32400	34100	mg/L	1000	5	10

Duplicates (1) Duplicated Sample: 392783

QC Batch:	121420	Date Analyzed:	2015-05-11	Analyzed By:	НJ
Prep Batch:	102742	QC Preparation:	2015-05-11	Prepared By:	HJ

Report Date: June 5, 2015 Tatum Fresh & Brine Well		Work Order: Tatum Fresh &	2 15050506 2 Brine Well		Pag	ge Number: Ta	11 of 18 atum NM
		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids	1,2,3,4,5	38.0	39.0	mg/L	10	3	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 121355	Date Analyzed: 2015-05-07 Analyzed By: HJ										
Prep Batch: 102686			QC Pre	eparation	: 201	5-05-07			Pre	epared B	y: HJ
				LCS			Spike	Ma	atrix		Rec.
Param		F	C 1	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Total Dissolved Solids		1,2	2,3,4,5	963	mg/L	. 10	1000	<	25.0	96	90 - 110
Percent recovery is based on t	the spike	result.	RPD is l	based on	the spi	ike and spi	ke duplica	te resu	lt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	970	$\mathrm{mg/L}$	10	1000	$<\!25.0$	97	90 - 110) 1	10
Percent recovery is based on t	he spike	result.	RPD is l	pased on	the spi	ike and spi	ke duplica	te resu	lt.		

ed on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 121420 Date Analyzed: 2015-05-11 Prep Batch: 102742 QC Preparation: 2015-05-11							Analyzed By: H Prepared By: H			
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolv	red Solids		1,2,3,4,5	993	$\mathrm{mg/L}$	10	1000	<25.0	99	90 - 110
D		41 : 1			41		1			

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	975	$\mathrm{mg/L}$	10	1000	$<\!25.0$	98	90 - 110	2	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	121554	Date Analyzed:	2015-05-14	Analyzed By:	RL
Prep Batch:	102846	QC Preparation:	2015-05-14	Prepared By:	RL

Report Date: June 5, 2015			We	ork Orde		Page Number: 13 of 18					
Tatum Fresh & Brine Well			Tatu	m Fresh	& Brin	ne Well				Tat	tum NM
				TOC			C :1	м	- <i>4</i> :		Dee
Demons		Ð	a T		T T : 4	D:1	5ріке Альналі	D INI		D	Rec.
Param		Г		tesuit	Units	D11.	Amount	R	esuit .	Rec.	Limit
Chloride		1,2	2,3,4,5	25.3	mg/L	1	25.0	0	.973	97	90 - 110
Percent recovery is based on th	e spike	result.	RPD is l	based on	the spi	ke and spi	ke duplica	te resu	ılt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	25.3	mg/L	1	25.0	0.973	97	90 - 110) 0	20
Percent recovery is based on th	e spike	result.	RPD is b	pased on	the spi	ke and spi	ke duplica	te resu	ılt.		
	P				· ~r-						

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	122047 103232		Dat QC	e Analyzeo Preparatio	l: 2015- on: 2015-	-06-05 -06-04		Analyzed By: RR Prepared By: PM			
Param		F	С	LCS Besult	Units	Dil	Spike Amount	Matrix Result	Bec	Rec. Limit	
Dissolved Ser	dium	Ľ	U	56 Q	mg/I	1	52.5	<0.0107	109	<u>95 115</u>	
Percent recov	very is based on	the spike resu	$\frac{2,3,4,5}{\text{ilt. RPE}}$) is based α	$\frac{110}{11}$ on the spil	ke and s	pike duplicat	< 0.0197	108	00 - 110	

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		2,3,4,5	54.4	$\mathrm{mg/L}$	1	52.5	< 0.0197	104	85 - 115	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Dissolved Sodium

Matrix Spikes

Matrix Spik	e (MS-1)	Spiked Sar	mple: 3	392448								
QC Batch: Prep Batch:	$\frac{121554}{102846}$			Date QC I	Analyzed: Preparation	2015 n: 2015	5-05-14 5-05-14			Ana Prej	lyzed By pared By	7: RL 7: RL
					MS			Spike	Ma	trix		Rec.
Param]	F	С	Result	Units	Dil.	Amount	Res	sult I	Rec.	Limit
Chloride			1	,2,3,4,5	320000	$\mathrm{mg/L}$	5000	125000	185	000	108 8	30 - 120
Percent recove	ery is based o	n the spike	result	. RPD i	is based or	the spi	ke and spi	ke duplica	te resul	t.		
				MSI)		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			1,2,3,4,5	31600	00 mg/L	5000	125000	185000	105	80 - 120	1	20
Matrix Spik	e (MS-1)	Spiked Sar	mple: :	394405								
QC Batch: Prep Batch:	122047 103232			Date QC F	Analyzed: Preparation	2015 a: 2015	-06-05 -06-04			Ana Prep	lyzed By bared By	: RR : PM
					MS			Spike	Mat	rix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Res	ult F	Rec.	Limit
Dissolved Sod	ium			2,3,4,5	703	$\mathrm{mg/L}$	1	525	14	.3 .	107 7	75 - 125
Percent recove	ery is based o	n the spike	result	. RPD i	is based or	the spi	ke and spi	ke duplica	te resul	t.		
				MSD)		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

688 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

2, 3, 4, 5

mg/L

1

525

143

104

75 - 125

2

20

Calibration Standards

Standard (ICV-1)

QC Batch:	121318		Da	te Analyzed:	2015-05-06	3	Analy	yzed By: HJ
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1,2,4,5	s.u.	7.00	7.00	100	98.6 - 101.4	2015-05-06

Standard (CCV-1)

QC Batch:	121318		Da	te Analyzed:	2015-05-06		Analy	vzed By: HJ
				CCVs True	CCVs Found	CCVs Percent	Percent	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pН		1,2,4,5	s.u.	7.00	7.05	101	98.6 - 101.4	2015-05-06

Standard (CCV-1)

QC Batch:	121554			Date	Analyzed:	2015-05-14		Analy	zed By: RL
					CCVs	CCVs Found	CCVs Demonst	Percent	Data
					True	round	Percent	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	mg/L	25.0	24.8	99	90 - 110	2015-05-14

Standard (CCV-2)

QC Batch:	121554			Date	Analyzed:	2015-05-14		Analy	yzed By: RL
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	24.9	100	90 - 110	2015-05-14

Report Date: June 5, 202 Tatum Fresh & Brine We	15 ell		Work Tatum	Corder: 15 Fresh & Bi	Page Number: 16 of 18 Tatum NM			
Standard (ICV-1)								
QC Batch: 122047			Date Anal	yzed: 201	5-06-05		Analyz	zed By: RR
P			TT 1 .	ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param Dissolved Sodium	Flag	2.3.4.5	Units mg/L	Conc. 51.0	Conc. 52.5	Recovery 103	Limits 90 - 110	Analyzed 2015-06-05
Dissorved Sodium		2,3,4,5	iiig/L	51.0	52.5	109	90 - 110	2010-00-00

Standard (CCV-1)

QC Batch:	122047			Date Anal	yzed: 201	Analyzed By: RR			
					CCVs	CCVs Found	CCVs Percent	Percent	Data
					Inte	round	rercent	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved So	odium		2,3,4,5	$\mathrm{mg/L}$	51.0	50.5	99	90 - 110	2015-06-05

Work Order: 15050506 Tatum Fresh & Brine Well Page Number: 17 of 18 Tatum NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2014-018	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je $\;$ Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

Work Order: 15050506 Tatum Fresh & Brine Well Page Number: 18 of 18 Tatum NM

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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LAB Order ID #_		Company Name: Address: (Str	Contact Person:	Invoice to: (If different from ab	Project #:	Project Location (in		LAB #	39449 E	450 B				Relinquished by: Lester Wa	Relinquished by:	Relinquished by:	Submittal of sample



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Texas 79424 Lubbock, Texas 79922 El Paso, Midland. Texas 79703 Texas 75006 Carroliton. E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: August 19, 2015

Work Order: 15081114

Project Location: Tatum NM **Project** Name: Tatum Fresh & Brine Well Tatum Fresh & Brine Well Project Number:

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
401722	Fresh	water	2015-07-08	17:30	2015-08-09
401723	Brine	water	2015-07-08	17:40	2015-08-09

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 16 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Duplicates QC Batch 123931 - Duplicate (1) QC Batch 123992 - Duplicate (1) QC Batch 124118 - Duplicate (1)	9 9 9 9
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Matrix Spikes 1 QC Batch 124020 - MS (1) 1 QC Batch 124129 - MS (1) 1	. 2 12 12
Calibration Standards 1 QC Batch 123931 - CCV (1) 1 QC Batch 124020 - ICV (1) 1 QC Batch 124020 - CCV (1) 1 QC Batch 124129 - CCV (1) 1 QC Batch 124129 - CCV (2) 1	. 3 13 13 13 13
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Case Narrative

Samples for project Tatum Fresh & Brine Well were received by TraceAnalysis, Inc. on 2015-08-09 and assigned to work order 15081114. Samples for work order 15081114 were received intact at a temperature of 30.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	104957	2015-08-17 at 11:00	124129	2015-08-17 at 12:10
Na, Dissolved	S $6010C$	104805	2015-08-12 at $14:05$	124020	2015-08-13 at $16:07$
pН	SM 4500-H+	104784	2015-08-11 at 17:18	123931	2015-08-11 at $17:19$
Specific Gravity	ASTM D1429-95	104834	2015-08-13 at $10:45$	123992	2015-08-13 at $10:50$
TDS	SM 2540C	104944	2015-08-17 at $16:36$	124118	2015-08-17 at $16:37$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15081114 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 401722 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 124129 104957		Analytical I Date Analy Sample Pre	Method: E zed: 2 paration:	2 300.0 015-08-17	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		B,H	1,2,3,4,5	73.5	mg/L	5	2.50

Sample: 401722 - Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 124020 104805		Analytical Method: Date Analyzed: Sample Preparation:	S 6010C 2015-08-13 2015-08-12 RL		Prep Method: Analyzed By: Prepared By:	S 3005A RR RR
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium		2,3,4,5	120	$\mathrm{mg/L}$	1	1.00

Sample: 401722 - Fresh

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
pH		1,2,4,5	8.04	s.u.	1	2.00

Sample: 401722 - Fresh

Laboratory: Lubbock Analysis: Specific Gravity QC Batch: 123992 Prep Batch: 104834			Analytical Method: Date Analyzed: Sample Preparation	ASTM 1 2015-08-	D1429-95 -13	Prep Method: Analyzed By: Prepared By:	N/A CF CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Specific Grav	ity			1.000	g/ml	1	0.000

Report Date: August 19, 2015	Work Order: 15081114	Page Number: 6 of 16
Tatum Fresh & Brine Well	Tatum Fresh & Brine Well	Tatum NM

Sample: 401722 - Fresh

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	669	$\mathrm{mg/L}$	10	2.50

Sample: 401723 - Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 124020 104805		Analytical Method: Date Analyzed: Sample Preparation:	S 6010C 2015-08-13 2015-08-12		Prep Method: Analyzed By: Prepared By:	S 3005A RR RR
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium		2,3,4,5	9700	m mg/L	1	1.00

Method Blanks

Method Blank (1)	QC Batch: 123992	2				
QC Batch: 123992		Date Analyze	d: 2015-08-13		Analyzed By:	CF
Prep Batch: 104834		QC Preparati	on: 2015-08-13		Prepared By:	\mathbf{CF}
				MDL		
Parameter	-	Flag	Cert	Result	Units	RL
Specific Gravity				0.9856	g/ml	
Method Blank (1)	QC Batch: 124020)				
	Q 0 200000 121020	´				
QC Batch: 124020		Date Analyze	d: 2015-08-13		Analyzed By:	RR
Prep Batch: 104805		QC Preparation	on: 2015-08-12		Prepared By:	ΡM
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Dissolved Sodium			2,3,4,5	< 0.0197	mg/L	1
Method Blank (1)	QC Batch: 124118	3				
QC Batch: 124118		Date A	analyzed:		Analyzed E	By:
Prep Batch:		QC Pr	eparation:		Prepared B	By:
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	$\mathrm{mg/L}$	2.5
Method Blank (1)	QC Batch: 124129)				

QC Batch:	124129	Date Analyzed:	2015-08-17	Analyzed By:	RL
Prep Batch:	104957	QC Preparation:	2015-08-17	Prepared By:	RL

Report Date: August 19, 2015 Tatum Fresh & Brine Well			Work Order: 150 Tatum Fresh & Br	Page Number: 8 of 1 Tatum NM		
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Chloride	В	В	1,2,3,4,5	0.971	mg/L	2.5

Duplicates

Duplicates (1) Duplicated Sample: 401722										
QC Batch: 1239 Prep Batch:	931	Da Qu		Analyzed By: Prepared By:						
Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit			
рН	1,2,4,5	8.05	8.04	s.u.	1	0	20			
Duplicates (1)	Duplicated Sample:	401722								

QC Batch:	123992	Date Analyzed:	2015-08-13		Analyzed By:	\mathbf{CF}
Prep Batch:	104834	QC Preparation:	2015-08-13		Prepared By:	\mathbf{CF}
		Duplicate Sa	ample			RPD
Danama		D 14 D	TT:+-	D:1	DDD	т : : 4

	Duplicate	Sample				RPD
Param	Result	Result	Units	Dilution	RPD	Limit
Specific Gravity	0.9743	1.000	m g/ml	1	3	200

Duplicates (1) Duplicated Sample: 401720

QC Batch: Prep Batch:	124118		Date Analy QC Prepar	Date Analyzed: QC Preparation:					
Devee			Duplicate	Sample	II	Dilution	חחם	RPD Limit	
Param			Result	Result	Units	Dilution	RPD	Limit	
Total Dissolved Solids 1,2,3,4,5		804	804	$\mathrm{mg/L}$	20	0	10		

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 124020 Date Analyzed: 2015-08-13 Analyzed By: R											
QC Preparation: 2015-08-12								Prepared By: PM			
			LCS			Spike	Ma	ıtrix		Rec.	
F	יז	С 1	Result	Units	Dil.	Amount	Re	sult	Rec.	Limit	
	2	,3,4,5	51.4	$\mathrm{mg/L}$	1	50.0	< 0.	0197	103	85 - 115	
pike 1	result	. RPD is	based or	n the s	pike and sp	oike duplica	ate resu	ılt.			
LCSD Spike Matrix Rec.										RPD	
aram F C Result Units				Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Dissolved Sodium 2				1	50.0	< 0.0197	102	85 - 115	5 1	20	
	F pike 1 F	F pike result F C 2,3,4,5	F C I $2,3,4,5$ pike result. RPD is $LCSD$ $F C Result$ $2,3,4,5 51.0$	Date Analyzed: QC Preparation F C Result $_{2,3,4,5}$ 51.4 pike result. RPD is based on LCSD F C Result Units $_{2,3,4,5}$ 51.0 mg/L	Date Analyzed: 201 QC Preparation: 201 LCS F C Result Units $_{2,3,4,5}$ 51.4 mg/L pike result. RPD is based on the sp LCSD F C Result Units Dil. $_{2,3,4,5}$ 51.0 mg/L 1	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Date Analyzed:2015-08-13 QC Preparation:2015-08-12 LCS SpikeMaFCResultUnitsDil.AmountRe2,3,4,551.4mg/L150.0<0.	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 124118 Prep Batch:			Date An QC Prep	Date Analyzed: QC Preparation:					Analyzed By: Prepared By:	
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolve	ed Solids		1,2,3,4,5	999	mg/L	10	1000	<25.0	100	90 - 110
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.										

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	987	$\mathrm{mg/L}$	10	1000	$<\!25.0$	99	90 - 110	1	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	124129	Date Analyzed:	2015-08-17	Analyzed By:	RL
Prep Batch:	104957	QC Preparation:	2015-08-17	Prepared By:	RL

	Work Order: 15081114 Tatum Fresh & Brine Well						Page Number: 11 of 16 Tatum NM			
F	C	LCS Bogult	Unite		Spike	M	atrix	Pog	Rec.	
Ľ	F C Result Units				Amount	. 10	esuit	nec.		
	$1,\!2,\!3,\!4,\!5$	24.9	mg/I	л 1	25.0	0.	.971	96	90 - 110	
ke resu	lt. RPD	is based on	the sp	ike and spi	ke duplica	ate resu	ılt.			
	LCS	SD		Spike	Matrix		Rec.		RPD	
С	C Result Units			Amount	Result	Rec.	Limit	RPD	Limit	
Chloride 1,2,3,4,8			1	25.0	0.971	96	90 - 11	0 1	20	
	F xe resu <u> Y</u> C 1,2,3,	F C	Work Ord Tatum Fres F C Result $1,2,3,4,5 24.9$ ke result. RPD is based on LCSD C Result Units 1,2,3,4,5 25.1 mg/L	Work Order: 15 Tatum Fresh & BLCSFCResultUnits $1,2,3,4,5$ 24.9mg/I $1,2,3,4,5$ 24.9mg/ILCSDCResultUnitsDil. $1,2,3,4,5$ 25.1mg/L1	Work Order: 15081114 Tatum Fresh & Brine WellLCSFCResultUnitsDil. $1,2,3,4,5$ 24.9mg/L1ke result. RPD is based on the spike and spiLCSDSpikeCResultUnitsDil. $1,2,3,4,5$ 25.1mg/L1 25.0	Work Order: 15081114 Tatum Fresh & Brine WellLCSSpikeFCResultUnitsDil.Amount $1,2,3,4,5$ 24.9mg/L125.0ke result. RPD is based on the spike and spike duplicaLCSDSpikeMatrixCResultUnitsDil.Amount $1,2,3,4,5$ 25.1mg/L125.00.971	Work Order: 15081114 Tatum Fresh & Brine WellLCSSpikeMFCResultUnitsDil.AmountR $1,2,3,4,5$ 24.9mg/L125.00ke result. RPD is based on the spike and spike duplicate resuLCSDSpikeMatrixCResultUnitsDil.AmountResultRec. $1,2,3,4,5$ 25.1mg/L125.00.97196	Work Order: 15081114Page 1Tatum Fresh & Brine WellLCSSpikeMatrixFCResultUnitsDil.AmountResult $1,2,3,4,5$ 24.9mg/L125.00.971LCSDSpikeMatrixRec.LCSDSpikeMatrixRec.CResultUnitsDil.AmountResultRec. $1,2,3,4,5$ 25.1mg/L125.00.9719690 - 114	Work Order: 15081114 Tatum Fresh & Brine WellPage Number: TaLCSSpikeMatrixFCResultUnitsDil.AmountResultRec. $1,2,3,4,5$ 24.9mg/L125.00.97196ke result. RPD is based on the spike and spike duplicate result.LCSDSpikeMatrixRec.CResultUnitsDil.AmountResultRPD $1,2,3,4,5$ 25.1mg/L125.00.9719690 - 1101	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Chloride

Matrix Spike (MS-1) S	piked Sar	mple: 4	401686								
QC Batch: 124020 Prep Batch: 104805			Date A QC Pr	Analyzed: reparation	2015 : 2015	5-08-13 5-08-12			An Pre	alyzed By pared By	: RR : PM
Param		г	C	MS Bosult	Unite	Dil	Spike A mount	Ma Be		Roc	Rec.
Dissolved Sodium		<u>г</u>	2.3.4.5	631	mg/L	1	500	1	35	$\frac{1000}{99}$	$\frac{111110}{75 - 125}$
Percent recovery is based on	the spike	result	RPD is	based on	the sp	ike and sn	ike duplica	te resu	lt		
refective recovery is babed on	one spine	resure		babea on	one sp	ike and sp	ike dupilee	100 1050			
-	-	~	MSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		2,3,4,5	620	mg/L	1	500	135	97	75 - 12	5 2	20
Matrix Spike (MS-1) S	piked Sar	mple: 4	402139								
QC Batch: 124129			Date	Analyzed:	201	5-08-17			Ar	alvzed B	v: RL
Prep Batch: 104957			QC Pi	reparation	n: 201	5-08-17			Pr	epared By	r: RL
				MS			Spike	Ma	atrix		Rec.
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride		1	,2,3,4,5	3270	mg/L	, 100	2500	6	557	104 8	30 - 120
Percent recovery is based on	the spike	result	. RPD is	based on	the sp	ike and sp	ike duplica	te resu	lt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

1,2,3,4,5

3260

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

mg/L

100

2500

657

104

80 - 120

0

20

Calibration Standards

Standard (CCV-1)

QC Batch:	123931			Date An	alyzed:		Aı	Analyzed By:		
				CCVs	CCVs	CCVs	Percent			
				True	Found	Percent	Recovery	Date		
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
pН		1,2,4,5	s.u.	7.00	7.06	101	98.6 - 101.4	2015-08-11		

Standard (ICV-1)

QC Batch:	124020			Analyz	Analyzed By: RR				
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved So	odium		2,3,4,5	$\mathrm{mg/L}$	25.5	26.1	102	90 - 110	2015-08-13

Standard (CCV-1)

QC Batch: 124020			Date Anal	yzed: 201	Analyz	Analyzed By: RR		
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Sodium		2,3,4,5	$\mathrm{mg/L}$	25.0	23.5	94	90 - 110	2015-08-13

Standard (CCV-1)

QC Batch: 124129			Date Analyzed:				Analy	Analyzed By: RL		
					CCVs	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	24.5	98	90 - 110	2015-08-17	

Report Dat Tatum Fres	te: August 19, 201 sh & Brine Well	Т	Work Orde atum Fresh	Page Number: 14 of 16 Tatum NM				
Standard ((CCV-2)							
QC Batch: 124129			Date A	Analyzed:	Analyzed By: RL			
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		1,2,3,4,5	$\mathrm{mg/L}$	25.0	25.1	100	90 - 110	2015-08-17

Work Order: 15081114 Tatum Fresh & Brine Well Page Number: 15 of 16 Tatum NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2014-018	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je $\;$ Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

Report Date: August 19, 2015 Tatum Fresh & Brine Well Work Order: 15081114 Tatum Fresh & Brine Well Page Number: 16 of 16 Tatum NM

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: August 19, 2015

Work Order: 15081114

Project Location: Tatum NM Project Name: Tatum Fresh & Brine Well

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
401722	Fresh	water	2015-07-08	17:30	2015-08-09
401723	Brine	water	2015-07-08	17:40	2015-08-09

Sample: 401722 - Fresh

Param	Flag	Result	Units	RL
Chloride	B,H	73.5	mg/L	2.5
Dissolved Sodium		120	m mg/L	1
pH		8.04	s.u.	2
Specific Gravity		1.000	g/ml	
Total Dissolved Solids		669	$\mathrm{mg/L}$	2.5

Sample: 401723 - Brine

Param	Flag	Result	Units	RL
Dissolved Sodium		9700	m mg/L	1



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 El Paso, Texas 79922 Texas 79703 Midland. Texas 75006 Carroliton. E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: November 12, 2015

Work Order: 15102712

Project Location: Buckeye & Tatum NM Project Name: Brine Well 3rd QT. Sample Project Number: BW-4 & BW-22

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
407093	BW-22 Tatum Fresh	water	2015-10-23	13:15	2015-10-26
407094	BW-22 Tatum Brine	water	2015-10-23	13:20	2015 - 10 - 26
407095	BW-4 Buckeye Fresh	water	2015-10-23	17:55	2015 - 10 - 26
407096	BW-4 Buckeye Brine	water	2015-10-23	18:00	2015-10-26

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

Report Contents

Case Narrative	4
Analytical ReportSample 407093 (BW-22 Tatum Fresh)Sample 407094 (BW-22 Tatum Brine)Sample 407095 (BW-4 Buckeye Fresh)Sample 407095 (BW-4 Buckeye Brine)	5 5 6 7 8
Method Blanks 1 QC Batch 126012 - Method Blank (1) 1 QC Batch 126018 - Method Blank (1) 1 QC Batch 126079 - Method Blank (1) 1 QC Batch 126115 - Method Blank (1) 1 QC Batch 126288 - Method Blank (1) 1	10 10 10 10 10 11
Duplicates 1 QC Batch 125907 - Duplicate (1) 1 QC Batch 126012 - Duplicate (1) 1 QC Batch 126018 - Duplicate (1) 1 QC Batch 126079 - Duplicate (1) 1 QC Batch 126079 - Duplicate (1) 1	12 12 12 12 12 12
Laboratory Control Spikes 1 QC Batch 126012 - LCS (1) 1 QC Batch 126079 - LCS (1) 1 QC Batch 126115 - LCS (1) 1 QC Batch 126288 - LCS (1) 1	14 14 14 14 15
Matrix Spikes 1 QC Batch 126115 - MS (1)	16 16 16
Calibration Standards 1 QC Batch 125907 - CCV (1) 1 QC Batch 126115 - CCV (1) 1 QC Batch 126115 - CCV (2) 1 QC Batch 126288 - ICV (1) 1 QC Batch 126288 - CCV (1) 1	L7 17 17 17 17 17
Appendix 1 Report Definitions 1 Laboratory Certifications 1 Standard Flags 1 Attachments 1	19 19 19 19 20

Case Narrative

Samples for project Brine Well 3rd QT. Sample were received by TraceAnalysis, Inc. on 2015-10-26 and assigned to work order 15102712. Samples for work order 15102712 were received intact at a temperature of 3.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	106703	2015-11-04 at 13:00	126115	2015-11-04 at 13:45
Density	ASTM D854-92	106620	2015-11-02 at $13:10$	126018	2015-11-02 at $13:15$
Na, Dissolved	S 6010C	106726	2015-11-06 at 12:43	126288	2015-11-12 at $10:10$
pН	SM 4500-H+	106519	2015-10-27 at $17:30$	125907	2015-10-27 at $17:31$
TDS	SM 2540C	106564	2015-10-29 at $12:04$	126012	2015-10-29 at $12:00$
TDS	SM 2540C	106671	2015-11-03 at $16:30$	126079	2015-11-03 at $16:31$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15102712 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analytical I Date Analy Sample Pre	Method: E 3 zed: 201 paration:	00.0 5-11-04	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,6	76.6	mg/L	5	2.50

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Density 126018 106620		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D8 2015-11-02	854-92 2	Prep Method: Analyzed By: Prepared By:	${ m N/A} { m CF} { m CF} { m CF}$
_			~	RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				0.978	g/ml	1	0.00

Sample: 407093 - BW-22 Tatum Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 125907 106519		Analytical Method Date Analyzed: Sample Preparatio	: SM 45 2015-1 n:	00-H+ 0-27	Prep Method: Analyzed By: Prepared By:	N/A LQ LQ
Danamatan		Ela m	Cont	RL	Unita	Dilution	DI
Parameter		Flag	Cert	Result	Units	Dilution	KL
pH			1,2,4,6	7.79	s.u.	1	2.00

Sample: 407093 - BW-22 Tatum Fresh

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	126012	Date Analyzed:	2015-10-29	Analyzed By:	LQ
Prep Batch:	106564	Sample Preparation:		Prepared By:	LQ

Report Date: November 12, 2015 BW-4 & BW-22	Work Order: 15102712 Brine Well 3rd QT. Sample			Page Numbe Buckeye & Ta	Page Number: 6 of 20 Buckeye & Tatum NM	
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,6	659	mg/L	10	2.50

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analytical M Date Analyz Sample Prej	Method: E zed: 20 paration:	300.0 115-11-04	Prep Method: Analyzed By: Prepared By:	N/A RL RL
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride			1,2,3,4,6	18000	$\mathrm{mg/L}$	500	2.50

Sample: 407094 - BW-22 Tatum Brine

Laboratory:	Lubbock						
Analysis:	Density		Analytical Method:	ASTM D8	54-92	Prep Method:	N/A
QC Batch:	126018		Date Analyzed:	2015-11-02	2	Analyzed By:	\mathbf{CF}
Prep Batch:	106620		Sample Preparation:	:		Prepared By:	CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				1.02	g/ml	1	0.00

Sample: 407094 - BW-22 Tatum Brine

Dissolved Soc	lium		2,3,4,6	12500	m mg/L	100	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	106726		Sample Preparation:	2015-11-06		Prepared By:	RR
QC Batch:	126288		Date Analyzed:	2015 - 11 - 12		Analyzed By:	\mathbf{RR}
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Report Date: November 12, 2015	Work Order: 15102712	Page Number: 7 of 20
BW-4 & BW-22	Brine Well 3rd QT. Sample	Buckeye & Tatum NM

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 125907 106519		Analytical Method: Date Analyzed: Sample Preparation	SM 450 2015-10	00-H+)-27	Prep Method: Analyzed By: Prepared By:	N/A LQ LQ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
pН			1,2,4,6	6.99	s.u.	1	2.00

Sample: 407094 - BW-22 Tatum Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock TDS 126012 106564	An Da Sa	nalytical Method ate Analyzed: mple Preparation	: SM 2540C 2015-10-29 n:		Prep Method: Analyzed By: Prepared By:	${ m N/A} { m LQ} { m LQ} { m LQ}$
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolve	ed Solids		1,2,3,4,6	37000	$\mathrm{mg/L}$	1000	2.50

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analytical M Date Analyz Sample Prep	Method: zed: paration:	E 300.0 2015-11-04		Prep Method: Analyzed By: Prepared By:	N/A RL RL
	RL							
Parameter		Flag	Cert	Result	t	Units	Dilution	RL
Chloride			1,2,3,4,6	280)	mg/L	10	2.50

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory:	Lubbock				
Analysis:	Density	Analytical Method:	ASTM D854-92	Prep Method:	N/A
QC Batch:	126018	Date Analyzed:	2015-11-02	Analyzed By:	CF
Prep Batch:	106620	Sample Preparation:		Prepared By:	\mathbf{CF}

continued ...
Report Date: November 12, 2015 Work Order: 15102712 Page Number: 8 of 20 BW-4 & BW-22 Brine Well 3rd QT. Sample Buckeye & Tatum NM sample 407095 continued ... \mathbf{RL} Cert Dilution Parameter Flag Result Units RL RL Parameter Flag Cert Result Units Dilution RL Density 0.997 g/ml 1 0.00 Sample: 407095 - BW-4 Buckeye Fresh Laboratory: Lubbock Analysis: $_{\rm pH}$ Analytical Method: SM 4500-H+ $\,$ Prep Method: N/A QC Batch: 125907Date Analyzed: 2015 - 10 - 27Analyzed By: LQPrep Batch: 106519 Sample Preparation: Prepared By: LQRLParameter Flag Cert Result Units Dilution RL 7.61 1,2,4,62.00 pH s.u. 1

Sample: 407095 - BW-4 Buckeye Fresh

Laboratory:	Lubbock						
Analysis:	TDS	Aı	nalytical Method	: SM 2540C		Prep Method:	N/A
QC Batch:	126012	Da	ate Analyzed:	2015 - 10 - 29		Analyzed By:	LQ
Prep Batch:	106564	Sa	mple Preparation	n:		Prepared By:	LQ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,6	868	mg/L	20	2.50

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 126115 106703		Analyti Date A Sample	cal Method: nalyzed: Preparation:	E 300.0 2015-11-04	4	Prep Method: Analyzed By: Prepared By:	N/A RL RL
]	RL			
Parameter		Flag	Cert	Res	ult	Units	Dilution	RL
Chloride			1,2,3,4,6	1760	00	$\mathrm{mg/L}$	5000	2.50

Report Date: November 12, 2015	Work Order: 15102712	Page Number: 9 of 20
BW-4 & BW-22	Brine Well 3rd QT. Sample	Buckeye & Tatum NM

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Density 126018 106620		Analytical Method: Date Analyzed: Sample Preparation:	ASTM D 2015-11-0	854-92 2	Prep Method: Analyzed By: Prepared By:	N/A CF CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density				1.18	g/ml	1	0.00

Sample: 407096 - BW-4 Buckeye Brine

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Na, Dissolved 126288 106726		Analytical Method: Date Analyzed: Sample Preparation:	S 6010C 2015-11-12 2015-11-06		Prep Method: Analyzed By: Prepared By:	S 3005A RR RR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Dissolved Soc	lium		2,3,4,6	108000	$\mathrm{mg/L}$	1000	1.00

Sample: 407096 - BW-4 Buckeye Brine

pН			1,2,4,6	6.76	s.u.	1	2.00
Parameter		Flag	Cert	Result	Units	Dilution	RL
				RL			
Prep Batch:	106519		Sample Prepara	tion:		Prepared By:	LQ
QC Batch:	125907		Date Analyzed:	2015-10-	-27	Analyzed By:	LQ
Analysis:	pН		Analytical Meth	nod: SM 4500)-H+	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 407096 - BW-4 Buckeye Brine

Laboratory:LubbockAnalysis:TDSQC Batch:126079Prep Batch:106671		Ana Date Sam	lytical Method e Analyzed: ple Preparatio:	: SM 2540C 2015-11-03 n:	SM 2540C 2015-11-03		N/A LQ LQ
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,6	310000	m mg/L	2000	2.50

Method Blanks

Method Blank (1)	QC Batch: 126012					
QC Batch: 126012 Prep Batch: 106564		Date Analyzed: QC Preparation:	2015-10-29 2015-10-29		Analyzed By: Prepared By:	LQ LQ
Parameter Total Dissolved Solids		Flag	Cert 1,2,3,4,6	MDL Result <25.0	Units mg/L	RL 2.5
Method Blank (1)	QC Batch: 126018					
QC Batch: 126018 Prep Batch: 106620		Date Analyzed: QC Preparation:	2015-11-02 2015-11-02		Analyzed By: Prepared By:	CF CF
Parameter	Flag	Cert		MDL Result	Units	RL
Density	0			0.988	g/ml	
Method Blank (1)	QC Batch: 126079					
QC Batch: 126079 Prep Batch: 106671		Date Analyzed: QC Preparation:	2015-11-03 2015-11-03		Analyzed By: Prepared By:	LQ LQ
Dependent		Flog	Cont	MDL	Unita	DI
Total Dissolved Solids		r iag	1,2,3,4,6	<25.0	mg/L	2.5

Method Bla	ank (1)	QC Batch: 126115				
QC Batch:	126115		Date Analyzed:	2015-11-04	Analyzed By:	RL
Prep Batch:	106703		QC Preparation:	2015-11-04	Prepared By:	RL

Report Date: November 12, 20 BW-4 & BW-22)15 B	Work Order: 151 rine Well 3rd QT	Page Number: 11 of 20 Buckeye & Tatum NM		
Parameter	Flag	Cert	MDL Besult	Units	BL
Chloride	1 145	1,2,3,4,6	<0.323	mg/L	2.5
Method Blank (1) QC I	Batch: 126288				
QC Batch: 126288 Prep Batch: 106726	Date An QC Pre	nalyzed: 2015-1 paration: 2015-1	1-12 1-06	Analyzed By Prepared By	r: RR r: PM
Parameter Dissolved Sodium	Flag	Cert	MDL Result	Units mg/I	RL

Duplicates

Duplicates	(1) Duplicate	ed Sample: 4	.06966					
QC Batch: 125907 Date Analyzed: 2015-10-27 Prep Batch: 106519 QC Preparation: 2015-10-27 2015-10-27					Analyzed Prepared 1	By: LQ By: LQ		
Param			Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		1,2,4,6	6.95	6.79	s.u.	1	2	20

Duplicates (1) Duplicated Sample: 407191

QC Batch:	126012	Date Analyzed:	2015-10-29	Analyzed By:	LQ
Prep Batch:	106564	QC Preparation:	2015-10-29	Prepared By:	LQ

		Duplicate	Sample				RPD
Param		Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids	1,2,3,4,6	3320	3180	$\mathrm{mg/L}$	50	4	10

Duplicates (1) Duplicated Sample: 407096

QC Batch:	126018	Date Analyzed:	2015 - 11 - 02		Analyzed By:	CF
Prep Batch:	106620	QC Preparation	: 2015-11-02		Prepared By:	CF
		Duplicate Sam	ple			RPD
Param		Result Res	ult Units	Dilution	RPD	Limit
Density		1.19 1.1	l8 g/ml	1	1	20

Duplicates (1) Duplicated Sample: 407287

QC Batch:	126079	Date Analyzed:	2015-11-03	Analyzed By:	LQ
Prep Batch:	106671	QC Preparation:	2015-11-03	Prepared By:	LQ

Report Date: November 12, 2018 BW-4 & BW-22	5	Work Ord Brine Well	der: 15102712 3rd QT. Sam	Pag Bu	Page Number: 13 of 20 Buckeye & Tatum NM			
		Duplicate	Sample				RPD	
Param		Result	Result	Units	Dilution	RPD	Limit	
Total Dissolved Solids	1,2,3,4,6	1190	1180	mg/L	20	1	10	

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 126012			Date A	nalyzed:	2015	5 - 10 - 29			Ana	alyzed B	y: LQ
Prep Batch: 106564			QC Pre	paration	: 2015	5-10-29			Pre	pared By	y: LQ
				LCS			Spike	Ma	atrix		Rec.
Param]	F	C I	Result	Units	b Dil.	Amount	Re	sult	Rec.	Limit
Total Dissolved Solids		1,2	,3,4,6	1000	mg/L	ı 10	1000	<	25.0	100	90 - 110
Percent recovery is based on	the spike	result.	RPD is l	based on	the spi	ike and spi	ke duplica	te resu	lt.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,6	1000	$\mathrm{mg/L}$	10	1000	$<\!25.0$	100	90 - 110) 0	10
		_		_	_				_		

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	$\frac{126079}{106671}$		Date QC 1	Analyzed: Preparation	2015-1 n: 2015-1	1-03 1-03		l F	Analyzed Prepared	By: LQ By: LQ
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolv	ed Solids		1,2,3,4,6	992	$\mathrm{mg/L}$	10	1000	<25.0	99	90 - 110
Percent recov	very is based on t	the spike resu	ılt. RPD	is based or	n the spike	e and sp	ike duplicate	e result.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,6	992	$\mathrm{mg/L}$	10	1000	$<\!25.0$	99	90 - 110	0	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	126115	Date Analyzed:	2015-11-04	Analyzed By:	RL
Prep Batch:	106703	QC Preparation:	2015-11-04	Prepared By:	RL

Report Date: November 12, 201 BW-4 & BW-22			Work Brine W	Order: 1 ell 3rd C		Page Number: 15 of 20 Buckeye & Tatum NM					
				Dime W		gr. Sampi	6		Duene	ye a 1a	
				LCS			Spike	М	atrix		Rec.
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	R	esult 1	Rec.	Limit
Chloride			1,2,3,4,6	24.7	mg/I	. 1	25.0	<	0.323	99	90 - 110
Percent recovery is based on the	spike	e resu	lt. RPD	is based o	on the sp	ike and sp	ike duplica	te resi	ılt.		
			LCS	SD		Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Res	ult Unit	s Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,	4,6 24.	.9 mg/l	L 1	25.0	< 0.323	100	90 - 110) 1	20
Laboratory Control Spike (I QC Batch: 126288 Prep Batch: 106726	LCS-	1)	Date OC 1	e Analyzed Preparatio	l: 2013	5-11-12 5-11-06			Ana Prei	lyzed By pared By	v: RR v: PM
				LCS			Spike	Ma	atrix		Rec.
Param		F	С	Result	Units	Dil.	Amount	Re	sult	Rec.	Limit
Dissolved Sodium			2,3,4,6	53.0	mg/L	1	52.5	<0.	.0197	101	85 - 115
Percent recovery is based on the	spike	e resu	lt. RPD	is based o	on the sp	ike and sp	ike duplica	te resi	ılt.		
			LCSI	D		Spike	Matrix		Rec.		RPD
Param	F	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Sodium		2, 3, 4,	6 53.2	mg/L	1	52.5	< 0.0197	101	85 - 115	6 0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

 $\mathbf{2}$

20

Matrix Spikes

Matrix Spike (MS-1)	piked Sam	ple: 40	07240								
QC Batch: 126115 Prep Batch: 106703			Date A QC Pr	Analyzed: reparation	2013 n: 2015	5-11-04 5-11-04			A: Pi	nalyzed E repared E	By: RL by: RL
_		_	~	MS			Spike	Ma	atrix		Rec.
Param	ŀ	1	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride		1,2	,3,4,6	153	mg/L	5	125	2	6.2	101	80 - 120
Percent recovery is based on	the spike 1	esult.	RPD is	based on	the spi	ike and spi	ike duplica	te resu	lt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limi	t RPD	Limit
Chloride		1,2,3,4,6	153	mg/L	5	125	26.2	101	80 - 12	20 0	20
Matrix Spike (MS-1)	piked Sam	ple: 40)7349								
QC Batch: 126288			Date A	nalvzed:	2015	5-11-12			Ar	nalvzed B	v: RR
Prep Batch: 106726			QC Pr	eparation	: 2015	5-11-06			Pr	epared B	y: PM
				MS			Spike	Ma	ntrix		Rec.
Param	F	ק	C 1	Result	Units	Dil.	Amount	$R\epsilon$	sult	Rec.	Limit
Dissolved Sodium		2,	3,4,6	874	$\mathrm{mg/L}$	1	525	3	77	95	75 - 125
Percent recovery is based on	the spike 1	esult.	RPD is	based on	the spi	ike and spi	ike duplica	te resu	lt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

Calibration Standards

Standard (CCV-1)

QC Batch:	125907		Da	te Analyzed:	2015-10-27		Analy	rzed By: LQ
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
pH		1,2,4,6	s.u.	7.00	7.01	100	98.6 - 101.4	2015-10-27

Standard (CCV-1)

QC Batch:	126115			Date 4	Analyzed:	2015-11-04		Analy	yzed By: RL
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	I	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,6	$\mathrm{mg/L}$	25.0	25.1	100	90 - 110	2015-11-04

Standard (CCV-2)

QC Batch:	126115			Date .	Analyzed:	2015-11-04		Analy	zed By: RL
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,6	$\mathrm{mg/L}$	25.0	24.6	98	90 - 110	2015-11-04

Standard (ICV-1)

QC Batch:	126288		Analyz	Analyzed By: RR					
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Se	odium		2,3,4,6	$\mathrm{mg/L}$	27.5	26.8	97	90 - 110	2015-11-12

Report Date: November 1 BW-4 & BW-22		W Brin	Vork Order: ne Well 3rd	Page Number: 18 of 20 Buckeye & Tatum NM				
Standard (CCV-1)								
QC Batch: 126288			Date Anal	yzed: 201	Analyzed By: RR			
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium	-0	2,3,4,6	$\mathrm{mg/L}$	27.5	27.8	101	90 - 110	2015-11-12

Page Number: 19 of 20 Buckeye & Tatum NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5	NELAP	T104704392-14-8	Midland
6		2015-066	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.

Report Date: November 12, 2015 BW-4 & BW-22

Work Order: 15102712 Brine Well 3rd QT. Sample Page Number: 20 of 20 Buckeye & Tatum NM

F Description

Qsr Surrogate recovery outside of laboratory limits.

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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Summary Report

Wayne Price Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: November 12, 2015

Work Order: 15102712

Project Location:Buckeye & Tatum NMProject Name:Brine Well 3rd QT. SampleProject Number:BW-4 & BW-22

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
407093	BW-22 Tatum Fresh	water	2015-10-23	13:15	2015-10-26
407094	BW-22 Tatum Brine	water	2015-10-23	13:20	2015 - 10 - 26
407095	BW-4 Buckeye Fresh	water	2015-10-23	17:55	2015-10-26
407096	BW-4 Buckeye Brine	water	2015-10-23	18:00	2015 - 10 - 26

Sample: 407093 - BW-22 Tatum Fresh

Param	Flag	Result	Units	RL
Chloride		76.6	mg/L	2.5
Density		0.978	g/ml	
pН		7.79	s.u.	2
Total Dissolved Solids		659	m mg/L	2.5

Sample: 407094 - BW-22 Tatum Brine

Param	Flag	Result	Units	RL
Chloride		18000	mg/L	2.5
Density		1.02	g/ml	
Dissolved Sodium		12500	m mg/L	1
pН		6.99	s.u.	2
Total Dissolved Solids		37000	m mg/L	2.5

Sample: 407095 - BW-4 Buckeye Fresh

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: November 12, 2015		Work Order: 15102712	Page Number: 2 of 2		
Param	Flag	Result	Units	RL	
Chloride		280	mg/L	2.5	
Density		0.997	g/ml		
pH		7.61	s.u.	2	
Total Dissolved Solids		868	$\mathrm{mg/L}$	2.5	

Sample: 407096 - BW-4 Buckeye Brine

Param	Flag	Result	Units	RL
Chloride		176000	mg/L	2.5
Density		1.18	g/ml	
Dissolved Sodium		108000	mg/L	1
pH		6.76	s.u.	2
Total Dissolved Solids		310000	m mg/L	2.5



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 El Paso, Texas 79922 Midland. Texas 79703 Texas 75006 Carroliton. E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443 FAX 915 • 585 • 4944 432-689-6301 FAX 432 • 689 • 6313 972-242 -7750

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

(Corrected Report)

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM, 87124

Report Date: March 24, 2016

Work Order: 16022211

Project Location: Tatum, NM **Project Name:** Brine Well-Tatum Project Number: Brine Well-Tatum

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
414780	Fresh Water	water	2016-02-17	17:55	2016-02-18
414781	Brine Water	water	2016-02-17	18:00	2016-02-18

Report Corrections (Work Order 16022211)

• 3/24/16: Added Chloride, pH, TDS and Density to sample 414781.

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 20 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blain Letturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Johnny Grindstaff, Operations Manager

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Case Narrative

Samples for project Brine Well-Tatum were received by TraceAnalysis, Inc. on 2016-02-18 and assigned to work order 16022211. Samples for work order 16022211 were received intact at a temperature of -0.1 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	108743	2016-02-23 at 10:00	128419	2016-02-23 at 10:08
Chloride (IC)	E 300.0	109290	2016-03-23 at $14:00$	129049	2016-03-23 at $15:09$
Density	ASTM D854-92	108721	2016-02-23 at $13:10$	128394	2016-02-23 at $13:15$
Density	ASTM D854-92	109263	2016-03-23 at $11:10$	129013	2016-03-23 at $11:15$
Na, Dissolved	S 6010C	108686	2016-02-22 at $12:23$	128362	2016-02-22 at $15:23$
pН	SM 4500-H+	108694	2016-02-22 at $15:00$	128366	2016-02-22 at $15:00$
pН	SM 4500-H+	109282	2016-03-23 at $12:30$	129028	2016-03-23 at $12:30$
TDS	SM 2540C	108734	2016-02-23 at $15:30$	128463	2016-02-23 at $15:30$
TDS	$\rm SM~2540C$	109281	2016-03-23 at 16:30 $$	129044	2016-03-23 at 16:30

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16022211 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 414780 - Fresh Water

Chloride			1,2,3,4,5	76.6	mg/L	10	2.50
Parameter		Flag	Cert	Result	Units	Dilution	RL
				RL			
Prep Batch:	108743	Sample Preparation:				Prepared By:	RL
QC Batch:	128419		Date Analy	zed: 20	16-02-23	Analyzed By:	RL
Analysis:	Chloride (IC)		Analytical I	Method: E	300.0	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 414780 - Fresh Water

Density				0.985	g/ml	1	0.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	108721		Sample Preparation:			Prepared By:	CF
QC Batch:	128394		Date Analyzed:	2016-02-23		Analyzed By:	CF
Analysis:	Density		Analytical Method:	ASTM D85	54-92	Prep Method:	N/A
Laboratory:	Lubbock						

Sample: 414780 - Fresh Water

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 128366 108694		Analytical Metho Date Analyzed: Sample Preparati	d: SM 45 2016-0 on:	00-H+ 2-22	Prep Method: Analyzed By: Prepared By:	$_{ m LQ}^{ m N/A}$
D				RL	TT •		DI
Parameter		Flag	Cert	Result	Units	Dilution	RL
pH			1,2,4,5	7.93	s.u.	1	2.00

Sample: 414780 - Fresh Water

Laboratory:	Lubbock				
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	128463	Date Analyzed:	2016-02-23	Analyzed By:	LQ
Prep Batch:	108734	Sample Preparation:		Prepared By:	LQ

Report Date: March 24, 2016 Brine Well-Tatum		Work Orde Brine We	Page Numbe Ta	r: 7 of 20 tum, NM		
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Total Dissolved Solids		1,2,3,4,5	662	$\mathrm{mg/L}$	10	2.50

Sample: 414781 - Brine Water

Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock Chloride (IC) 129049 109290		Analytical M Date Analyza Sample Prep	lethod: ed: aration:	E 300.0 2016-03-23 2016-03-23		Prep Method: Analyzed By: Prepared By:	N/A RL RL
				R	L			
Parameter		Flag	Cert	Resu	lt	Units	Dilution	RL
Chloride		Н	1,2,3,4,5	1260	0	$\mathrm{mg/L}$	500	2.50

Sample: 414781 - Brine Water

Laboratory:	Lubbock						
Analysis:	Density		Analytical Method:	ASTM D8	854-92	Prep Method:	N/A
QC Batch:	129013		Date Analyzed:	2016-03-2	3	Analyzed By:	\mathbf{CF}
Prep Batch:	109263		Sample Preparation:			Prepared By:	CF
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Density	1			0.996	g/ml	1	0.00

Sample: 414781 - Brine Water

Dissolved Soc	lium		2,3,4,5	6760	m mg/L	1000	1.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	108686		Sample Preparation:	2016-02-22		Prepared By:	RR
QC Batch:	128362		Date Analyzed:	2016-02-22		Analyzed By:	\mathbf{RR}
Analysis:	Na, Dissolved		Analytical Method:	S $6010C$		Prep Method:	S $3005A$
Laboratory:	Lubbock						

Report Date: March 24, 2016 Brine Well-Tatum		Work Order: 16022211 Brine Well-Tatum			Page Number: 8 of 20 Tatum, NM		
Sample: 41	4781 - Brine W	ater					
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock pH 129028 109282		Analytical Method: Date Analyzed: Sample Preparation:	SM 4500-H+ 2016-03-23 2016-03-23		Prep Method: Analyzed By: Prepared By:	${ m N/A} { m LQ} { m LQ} { m LQ}$
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
рН			1,2,4,5	7.29	s.u.	1	2.00
Sample: 41	4781 - Brine W	ater					
Laboratory: Analysis: QC Batch: Prep Batch:	Lubbock TDS 129044 109281		Analytical Method: Date Analyzed: Sample Preparation	SM 2540C 2016-03-23 : 2016-03-23		Prep Method: Analyzed By: Prepared By:	$_{ m LQ}^{ m N/A}$ LQ

QU Datch.	129044	Da	te Analyzeu.	2010-03-23		Analyzed Dy.	ъQ
Prep Batch:	Batch: 109281 Sample Preparation: 2016-03-23		Prepared By:	LQ			
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Total Dissolv	ed Solids		1,2,3,4,5	26700	mg/L	1000	2.50

Method Blanks

Method Blank (1)	QC Batch: 128362					
QC Batch: 128362 Prep Batch: 108686		Date Analyzed: QC Preparation:	2016-02-22 2016-02-22		Analyzed By: Prepared By:	RR PM
Parameter	F	flag Ce	\mathbf{rt}	MDL Result	Units	RL
Dissolved Sodium		2,3,	4,5	< 0.0197	mg/L	1
Method Blank (1)	QC Batch: 128394					
QC Batch: 128394 Prep Batch: 108721		Date Analyzed: QC Preparation:	2016-02-23 2016-02-23		Analyzed By: Prepared By:	CF CF
Parameter	Flag	Cert		MDL Result	Units	RL
Density				0.988	g/ml	
Method Blank (1)	QC Batch: 128419					
QC Batch: 128419 Prep Batch: 108743		Date Analyzed: QC Preparation:	2016-02-23 2016-02-23		Analyzed By: Prepared By:	RL RL
Parameter	Flag	Cert		MDL Result	Units	RL
Chloride	0	1,2,3,4,5		< 0.323	mg/L	2.5

Method Blank (1)		QC Batch: 128463				
QC Batch:	128463		Date Analyzed:	2016-02-23	Analyzed By:	LQ
Prep Batch:	108734		QC Preparation:	2016-02-23	Prepared By:	LQ

Report Date: March 24, 2016 Brine Well-Tatum		Work Orde Brine W	er: 16022211 Vell-Tatum	Page Number: 10 of 20 Tatum, NM		
Parameter		Flag	Cert	MDL Result	Units	RL
Total Dissolved Solids			1,2,3,4,5	<25.0	mg/L	2.5
Method Blank (1)	QC Batch: 129013					
QC Batch: 129013 Prep Batch: 109263		Date Analyzed: QC Preparation:	2016-03-23 2016-03-23		Analyzed By: Prepared By:	$_{\rm CF}^{\rm CF}$
Parameter	Flag	Cert		MDL Result	Units	RL
Method Blank (1) QC Batch: 129044	QC Batch: 129044	Date Analyzed:	2016-03-23		Analyzed By:	LQ
Prep Batch: 109281		QC Preparation:	2016-03-23	MDL Bosult	Prepared By:	LQ
Total Dissolved Solids		T lag	1,2,3,4,5	<25.0	mg/L	2.5
Method Blank (1)	QC Batch: 129049					
QC Batch: 129049 Prep Batch: 109290		Date Analyzed: QC Preparation:	2016-03-23 2016-03-23		Analyzed By: Prepared By:	RL RL
Parameter Chloride	Flag	Cert 1,2,3,4,5		MDL Result <0.323	Units mg/L	RL 2.5

Duplicates

Duplicates (1)	Duplicated Sample: 414780	
----------------	---------------------------	--

QC Batch:	128366		Date Ana	lyzed: 2016	6-02-22		Analyzed I	By: LQ
Prep Batch:	108694		QC Prepa	aration: 2016	6-02-22		Prepared F	By: LQ
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
pН		1,2,4,5	7.91	7.93	s.u.	1	0	20

Duplicates (1) Duplicated Sample: 414780

QC Batch:	128394	Date Analyzed:	2016-02-23	Analyzed By:	CF
Prep Batch:	108721	QC Preparation:	2016-02-23	Prepared By:	CF

	Duplicate	Sample				RPD
Param	Result	Result	Units	Dilution	RPD	Limit
Density	0.968	0.985	g/ml	1	2	20

Duplicates (1) Duplicated Sample: 414786

QC Batch:	128463	Ι	Date Analyzed:	2016-02-23			Analyzed By:	LQ
Prep Batch:	108734	Q	QC Preparation:	2016-02-23		Prepared By:	LQ	
			Duplicate	Sample				RPD
Param			Result	Result	Units	Dilution	RPD	Limit
Total Dissolve	ed Solids	1,2,3,4,5	1090	1120	mg/L	20	3	10

Duplicates (1) Duplicated Sample: 414781

QC Batch:	129013	Date Analyzed:	2016-03-23	Analyzed By:	\mathbf{CF}
Prep Batch:	109263	QC Preparation:	2016-03-23	Prepared By:	\mathbf{CF}

Report Date: March 24, 2016 Brine Well-Tatum	W	Work Order: 16022211 Brine Well-Tatum				Page Number: 12 of 20 Tatum, NM		
	Duplicate	Sample				RPD		
Param	Result	Result	Units	Dilution	RPD	Limit		
Density ²	0.978	0.996	g/ml	1	2	20		

Duplicates	(1) Duplicate	ed Sample: 4	16191					
QC Batch:129028Date Analyzed:2016-03-23APrep Batch:109282QC Preparation:2016-03-23P						Analyzed By: Prepared By:	LQ LQ	
Daram			Duplicate	Sample	Unita	Dilution	חספ	RPD Limit
pH		1,2,4,5	7.18	7.18	s.u.	1 Dilution	4	$\frac{111111}{20}$

Duplicates (1) Duplicated Sample: 416188

QC Batch: Prep Batch:	129044 109281	D: Q	ate Analyzed: C Preparation:	2016-03-23 2016-03-23			Analyzed By: Prepared By:	LQ LQ
Param			Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolv	red Solids	1,2,3,4,5	4630	4670	mg/L	50	1	10

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 128362		Dat	e Analyzed	: 201	6-02-22			Analyzed By					
Prep Batch: 108686		QC	Preparatio	n: 201	6-02-22			Prep	ared By	: PM			
			LCS			Spike	Ma	atrix		Rec.			
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Re	sult I	Rec.	Limit			
Dissolved Sodium		2,3,4,5	55.1	mg/L	1	52.5	<0.	0197	105 8	85 - 115			
Percent recovery is based on the spi	ike res	ult. RPD	is based o	n the s	pike and sp	oike duplica	ate resu	ılt.					
		LCS	D		Spike	Matrix		Rec.		RPD			
Param	F C	C Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit			
Dissolved Sodium	2,3,	4,5 52.	7 mg/L	1	52.5	< 0.0197	100	85 - 115	4	20			

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	128419 108743		Date QC 1	Analyzed Preparation	: 2016-0 n: 2016-0)2-23)2-23		I	By: RL By: RL		
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	
Chloride			1,2,3,4,5	25.8	$\mathrm{mg/L}$	1	25.0	< 0.323	103	90 - 110	
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.											

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	25.7	m mg/L	1	25.0	< 0.323	103	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	128463	Date Analyzed:	2016-02-23	Analyzed By:	LQ
Prep Batch:	108734	QC Preparation:	2016-02-23	Prepared By:	LQ

Report Date: March 24, 2016 Brine Well-Tatum				Work Orc Brine V	ler: 160 Vell-Tat	22211 tum			Page 1	Number: Tat	14 of 20 500, NM
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec. Limit
Total Dissolved Solids		1	,2,3,4,5	1010	mg/L	10	1000	<	25.0	101	90 - 110
Percent recovery is based on the	spike	e result.	RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
			LCS	D		Spike	Matrix		Rec.		RPD
Param	F	С	Resu	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Total Dissolved Solids		1,2,3,4,5	101	0 mg/L	10	1000	<25.0	101	90 - 11	0 0	10
Laboratory Control Spike (L QC Batch: 129044 Prep Batch: 109281	CS-	1)	Date QC F	Analyzed: Preparation	2016 .: 2016	5-03-23 5-03-23			An Pre	alyzed B epared B	y: LQ y: LQ
Param Total Dissolved Solids		F	C ,2,3,4,5	LCS Result 995	Units mg/L	Dil. 10	Spike Amount 1000	Ma Re	atrix esult 25.0	Rec.	Rec. Limit 90 - 110
Percent recovery is based on the	spike	e result.	RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		
Param Total Dissolved Solids Percent recovery is based on the	F	C 1,2,3,4,5 e result.	LCS Resu 1020 RPD i	D llt Units 0 mg/L as based on	Dil. 10 the spi	Spike Amount 1000 ke and spi	Matrix Result <25.0 ke duplica	Rec. 102 te resu	Rec. Limit 90 - 11 lt.	RPD 0 2	RPD Limit 10
Laboratory Control Spike (L QC Batch: 129049 Prep Batch: 109290	CS-	1)	Date QC I	Analyzed: Preparation	2016 : 2016	5-03-23 5-03-23			An Pre	alyzed B	y: RL v: BL
Param		F	C	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec.
Chloride		1	,2,3,4,5	24.3	mg/L	1	25.0	<0	.323	97	90 - 110
Percent recovery is based on the	spike	e result.	RPD i	s based on	the spi	ke and spi	ke duplica	te resu	lt.		

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	24.2	$\mathrm{mg/L}$	1	25.0	< 0.323	97	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spik	æ (MS-1)	Spiked Sar	mple:	414212								
QC Batch: Prep Batch:	$\frac{128362}{108686}$			Date . QC P	Analyzed: reparation	2016 n: 2016	3-02-22 3-02-22			An Pre	alyzed By epared By	y: RR y: PM
					MS			Spike	Ma	atrix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Dissolved Soc	lium			2,3,4,5	491	$\mathrm{mg/L}$	1	500	2	.44	98	75 - 125
Percent recov	ery is based of	n the spike	result	. RPD is	s based on	the spi	ike and spi	ike duplica	te resu	ılt.		
				MSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Dissolved Soc	lium		2,3,4,5	500	$\mathrm{mg/L}$	1	500	2.44	100	75 - 12	5 2	20
Matrix Spik	er, 25 5000 0.	Spiked Sa	mple:	414780								
	le (1010-1)	Spiked bai	inpic.	111100								
QC Batch:	128419			Date	Analyzed:	2010	6-02-23			Ar	nalyzed B	y: RL
Prep Batch:	108743			QC P	reparatior	n: 2016	6-02-23			Pr	epared B	y: RL
					MS			Spike	M	atrix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride			:	1,2,3,4,5	340	mg/L	10	250	7	6.6	105	80 - 120
Percent recov	ery is based of	n the spike	result	. RPD is	s based on	the spi	ike and sp	ike duplica	te resu	ılt.		
				MSE)		Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	С	Resul	lt Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

333 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

1,2,3,4,5

Matrix Spike (MS-1)	Spiked Sample: 416184
---------------------	-----------------------

Chloride

QC Batch:	129049	Date Analyzed:	2016-03-23	Analyzed By:	RL
Prep Batch:	109290	QC Preparation:	2016-03-23	Prepared By:	RL

mg/L

10

250

76.6

102

80 - 120

2

20

Report Date: March 24, 2016 Brine Well-Tatum			Work Ore Brine V	der: 160 Well-Ta		Page Number: 16 of 20 Tatum, NM					
Param		F	С	MS Result	Units	Dil.	Spike Amount	M Re	atrix esult 1	Rec.	Rec. Limit
Chloride		1	2,3,4,5	3570	mg/L	100	2500	1	100	99	80 - 120
Percent recovery is based on the	spike	e result.	RPD is	based on	the spi	ke and spi	ke duplica	te resu	ılt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		1,2,3,4,5	3540	mg/L	100	2500	1100	98	80 - 120) 1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (ICV-1)

QC Batch:	128362		Analyz	zed By: RR					
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Se	odium		2,3,4,5	mg/L	26.0	24.9	96	90 - 110	2016-02-22

Standard (CCV-1)

QC Batch:	128362			Date Anal	yzed: 201	Analyzed By: RR			
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved So	odium		2,3,4,5	$\mathrm{mg/L}$	26.0	25.3	97	90 - 110	2016-02-22

Standard (CCV-1)

QC Batch:	128366		Da	te Analyzed:	2016-02-22	2	Analyzed By: LQ		
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
pН		1,2,4,5	s.u.	7.00	7.00	100	98.6 - 101.4	2016-02-22	

Standard (CCV-1)

QC Batch:	128419			Date Analyzed:				Analy	Analyzed By: RL	
					CCVs	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	25.7	103	90 - 110	2016-02-23	

Report Date: Brine Well-Ta	March 24, 201 tum	6		Work Ord Brine V	ler: 16022211 Vell-Tatum	Page Nu	mber: 18 of 20 Tatum, NM	
Standard (C	CV-2)							
QC Batch: 12	28419		Date	e Analyzed:	2016-02-23		Analy	vzed By: RL
Param Chloride	Flag	Cert 1,2,3,4,5	Units mg/L	CCVs True Conc. 25.0	CCVs Found Conc. 25.9	CCVs Percent Recovery 104	Percent Recovery Limits 90 - 110	Date Analyzed 2016-02-23
Standard (C	CV-1)		-					
QC Batch: 12	29028		Date	e Analyzed:	2016-03-23		Analy	zed By: LQ
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
рН		1,2,4,5	s.u.	7.00	7.03	100	98.6 - 101.4	2016-03-23
Standard (C	CV-1)							
QC Batch: 12	29049		Date	e Analyzed:	2016-03-23		Analy	zed By: RL
		~		CCVs True	$\begin{array}{c} \mathrm{CCVs} \\ \mathrm{Found} \\ \widetilde{\mathbf{C}} \end{array}$	CCVs Percent	Percent Recovery	Date
Param Chlorido	Flag	Cert	Units mg/I	25.0	Conc.	Recovery	Limits 00 110	Analyzed
Unionae		1,2,3,4,5	шg/ L	$_{20.0}$	24.4	90	90 - 110	2010-05-25

Standard (CCV-2)

QC Batch:	129049			Date .	Analyzed:	2016-03-23		Analy	yzed By: RL
					$\rm CCVs$	$\rm CCVs$	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			1,2,3,4,5	$\mathrm{mg/L}$	25.0	24.4	98	90 - 110	2016-03-23

Work Order: 16022211 Brine Well-Tatum Page Number: 19 of 20 Tatum, NM

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5		2015-066	Lubbock

Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je $\;$ Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

Work Order: 16022211 Brine Well-Tatum Page Number: 20 of 20 Tatum, NM

F Description

U The analyte is not detected above the SDL

Result Comments

- 1 Analyzed out of hold time.
- 2 Analyzed out of hold time.

Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.
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Summary Report

(Corrected Report)

Lester Waynce Price Jr. Price LLC 312 Encantado Ridge Ct. NE Rio Rancho, NM 87124

Report Date: March 24, 2016

Work Order:	16022211

Project Location: Tatum, NM Project Name: Brine Well-Tatum

Report Corrections (Work Order 16022211)

• 3/24/16: Added Chloride, pH, TDS and Density to sample 414781.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
414780	Fresh Water	water	2016-02-17	17:55	2016-02-18
414781	Brine Water	water	2016-02-17	18:00	2016-02-18

Sample: 414780 - Fresh Water

Param	Flag	Result	Units	RL
Chloride		76.6	mg/L	2.5
Density		0.985	g/ml	
pH		7.93	s.u.	2
Total Dissolved Solids		$\boldsymbol{662}$	m mg/L	2.5

Sample: 414781 - Brine Water

Param	Flag	Result	Units	RL
Chloride	Н	12600	mg/L	2.5
Density	1	0.996	g/ml	
Dissolved Sodium		6760	$\mathrm{mg/L}$	1
pH		7.29	s.u.	2
				continued

¹Analyzed out of hold time.

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: March 24, 2016	V	Work Order: 16022211	Page Nu	Page Number: 2 of 2		
sample 414781 continued						
Param	Flag	Result	Units	RL		
Total Dissolved Solids		26700	m mg/L	2.5		

Appendix "D"

• 2013 MIT Chart



.#

D & L Meters & Instrument Service, Inc.

Lovington, NM 88260 P.O. Box 1621 Office: (575) 396-3715 Fax: (575) 396-5812



Friday, June 28, 2013

Certification of Pressure Recorder Test:

Company: Celero Energy Unit: N/A Model: 8"Bristols Pressure Rating: 1,000# Serial #: 3914

This Pressure Recorder was tested at midrange for accuracy and verified within +5% and -5% for a 1,000# pressure element.

· · · · ·

Jesse Arenivas, Technician

Appendix "E"

- AOR Well Status List
- AOR Plot Plan

2015 BW-22 AOR Review-- Well Status List up-dated Apr 5, 2016

						Within 1/4 mi AOR * within 660 ft or	Casing Progra	Cased/Cemented	Corrective Action
	API#	Well Name	UL	ectio Ts Rg	Footage	Critical AOR	Checked	across salt section	Required
1	30-025-28162	Wasserhund Quality Watson #1	Μ	<u>20 12s 36e</u>	e 593 FSL & 639 FW	<u>.</u> NA	NA	Na	NA
							0 0		
1	Total # of wells in adjacent quar	ter-sections							
0 -	Fotal # of wells in 1/4 mile AOR								
0 -	District in Second states within CC0 the state AOD of the extended and the of the bring well and extended and we stated around the								

0 Total # of wells that within 660 ft or the Critical AOR of the outside radius of the brine well and casing program will be checked and reported annually.

Notes:

* Means the well is within 660 ft or the Critical AOR of the outside radius of the brine well and casing program will be checked annually.



Brine Well Area of R	eview (AOR) UL Plot Plan	Well API#:	30-025-28162	Note: Wells are identified by
Operator Name:	Wasserhund INC	Permit #	BW-22	in the well status list.
AOR Year:	2015	Location:	UL M-Sec 20-Ts12s-R36e	

the last 2 digits of the well's API#. API #'s are listed

Appendix "F"

- Wellbore Sketch, Brine Cavity Calculations with new 2015 Radius and D/H calculations.
- Aerial View showing Cavern Radius





Appendix "G"

• Solution Cavern Monitoring Plan Program

"Solution Cavern Monitoring Plan Program"

Wasserhund Inc. Brine Station Tatum Brine Station OCD Permit BW-22 API No. 30-025-28162 Watson #1 Unit Letter M-Section 20-Ts 12s – R 35e

Wasserhund Inc. hereby proposes to install a minimum of three National Geodetic Survey (NGS) survey control stations, i.e. survey monuments, around the brine well in a manner that will adequately provide vertical geodetic data to determine if any subsidence is occurring at the aforementioned well site.

A Berntsen Monument Installation Detail is included for reference. An approved Surveying/Contracting company will install the complete system.

A certified surveyed plat will be provided showing the location of the monuments and all significant features of the site.

The monuments will be laid out in a triangulation configuration around the wellhead, and located so as to pick-up any movement related to up-lift or subsidence of the anticipated areas of greatest concern.

The wellhead will also be included in the measurements, along with a known geodetic reference point outside of the possible influence of the well. While the system will focus on vertical movements, lateral movements will be visually noted and will actually impact the vertical readings.

The surveys will be performed semi-annually, evaluated and reported to the agency. All survey readings will be adjusted for and conform to the New Mexico Coordinate System.

Price LLC will conduct surveys in-house using approved level measuring instruments with a set number of readings collected by a licensed surveyor for quality control.

The data will be tabulated and a graph be maintained for each point over the life of the system.

Attached: Examples Only:

Topographic Map-Vicinity Map shows Local Benchmarks-Example only USGS Map-Example only Susidence Monument Location Map- Example only. Berntsen Monument Installation Detail-Actual Data Sheets-Example Only Graphs-Example Only











11	14	-1.5010	427.9000
11	15	-2.6820	222.6000
11	16	-6.0820	384.5400
16	17	-4.3450	464.4600
17	18	-5.5910	384.1600
18	19	-2.5440	424.7600
19	20	-2.6950	398.0200
20	21	-2.8570	385.9600
21	22	-2.1030	267.9000

ADJUSTED ELEVATIONS

Station	Adjusted Elev	Standard Dev.	
L98	3434.3700	0.00000	NGS MONUMENT L98
22	3434.3700	0.00000	
1	3436.9801	0.01150	
2	3439.3987	0.01639	
3	3442.4091	0.01964	
4	3444.7482	0.02205	
5	3450.5778	0.02338	
6	3455.7212	0.02422	
7	3457.9332	0.02724	MONUMENT #1
8	3459.1092	0.02888	MONUMENT #2
9	3460.4962	0.02863	MONUMENT #3
10	3461.9212	0.02775	STATE #1 WELL
11	3460.6115	0.02450	(AVERAGE)
12	3461.9215	0.02694	STATE #1 WELL 3461.921
13	3460.4925	0.02785	MONUMENT #3 3460, 494
14	3459.1105	0.02810	MONUMENT #2 3459.110
15	3457.9295	0.02643	MONUMENT #1 3457.931
16	3454.5260	0.02425	
17	3450.1768	0.02326	
18	3444.5823	0.02181	
19	3442.0345	0.01937	
20	3439.3359	0.01595	
21	3436.4754	0.01061	

From To Elev. Diff. Residuals	~
	~
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L98 1 2.6101 -0.0029	· /
1 2 2.4186 -0.0034	
2 3 3.0104 -0.0036	
3 4 2.3390 -0.0040	
4 5 5.8297 -0.0033	
5 6 5.1434 -0.0036	
6 7 2.2120 -0.0000	
6 8 3.3880 -0.0000	
6 9 4.7750 -0.0000	
6 10 6.2000 -0.0000	
6 11 4.8903 -0.0037 CT 1	
11 12 1.3100 -0.0000	
11 13 -0.1190 -0.0000	
11 14 -1.5010 -0.0000	
11 15 -2.6820 0.0000	



Appendix "H"

Wasserhund Inc. Closure Cost Estimate.

 2015 Anni	ual Report					
BW-22 W	/asserhun	d Inc. Closure (Cost			
				CDI		
 Pulling Un	it Rig		\$25,000	1.03	\$25,750	
Halliburto	n Cement J	ор	\$8,000.00	1.03	\$8,240	
 Post Subs	danco Mor	itoring 5 years	¢15 000 00	1 02	¢15 /50	
 FUSE SUBS		ittoring 5 years	\$15,000.00	1.05	φ1 3, 430	
Tank Rem	oval, Pad C	lean-Up	\$30,000.00	1.03	\$30,900	
	_					
Consulting	j fees		\$10,000.00	1.03	\$10,300	
Total Estin	nate		\$88,000	1.03	\$90,640	
			, , ,			

Chavez, Carl J, EMNRD

From: Sent: To: Subject: Chavez, Carl J, EMNRD Friday, February 12, 2010 4:32 PM 'gandy2@leaco.net' BW-004 and 022 Annual Reports

Larry:

The OCD is in receipt of your annual reports and will get back with you soon.

Please contact me if you have questions.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

200 FEB 12 P H 01 CENED OCD

Annual Brine Well Report Gandy Corporation Tatum Brine Station BW Permit #BW-022 API #30-025-26883 January 31, 2010 Larry Gandy 2. Summary:

Fresh water injected down tubing producing brine water through casing into storage tanks.

Remedial:

No remedial or major work done in 2009.

3. Production Volumes:

Beginning balance	2,619,285
2009 total	7,960
Ending balance	2,627,245

Maximum Pressure380#Average Pressure260#

- 4. Chemical Analysis: See attached.
- 5. MIT, Casing Test: Chart attached.
- 6. Deviation: None
- 7. Leaks or Spills: None
- 8. Groundwater Monitoring: None required.
- 9. Cavity Information: See attached.
- 10. AOR Summary: No wells within a quarter of a mile.
- 11. Sign-Off Requirements: See attached.



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS. NM 88240

ANALYTICAL RESULTS FOR EDDIE SEAY CONSULTING ATTN: EDDIE SEAY 601 W. ILLINOIS HOBBS, NM 88242 FAX TO: (505) 392-6949

Receiving Date: 02/05/07 Reporting Date: 02/07/07 Project Owner: GANDY CORP. Project Name: TATUM BRINE FACILITY Project Location: TATUM, NM Sampling Date: 02/02/07 Sample Type: WATER Sample Condition: COOL & INTACT Sample Received By: HM Analyzed By: HM

		Na	Ca	Mg	К	Conductivity	T-Alkalinity
LAB NUMBER	SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(<i>u</i> S/cm)	(mgCaCO ₃ /L)

ANALYSIS DATE:	02/06/07	02/06/07	02/06/07	02/06/07	02/05/07	02/06/07
H12143-1 BRINE WATER #1	#VALUE!	1164	3923	6900	277600	68
H12143-2 FRESH WATER #2	147	92	15	1.87	1154	144
Quality Control	NR	. 53.2	51.6	1.94	1380	NR
True Value QC	NR	50.0	50.0	2.00	1413	NR
% Recovery	NR	106	103	97	98	NR
Relative Percent Difference	NR	7.8	1.6	4.2	0.3	NR
			·			
METHODS:	SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1
			·	•		
		SO4	CO3	HCO3	pН	TDS
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
				<u></u>		· ```````````````````````````````
ANALYSIS DATE:	02/05/07	02/06/07	02/06/07	02/06/07	02/05/07	02/06/07
H12143-1 BRINE WATER #1	138957	13665	0		6.91	239980
H12143-2 FRESH WATER #2	208	169	0	176	7.57	693
Quality Control	510	20.0	NID	015	C 99	ND
	510	20.0		915	0.00	
	500	20.0	NR	1000	7.00	NR
% Recovery	102	104	NR	92	98	NR
Relative Percent Difference	1	4.4	NR	2.7	0.7	NR

Chemist

-07

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable server a filiates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

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ECHO - LOG

Gandy Corporation

Tatum Brine BW-2

Tatum, New Mexico

1st. Survey

08/21/2008

083053



SOCON Sonar Well Services, Inc.11133 I-45 South, Ste. EConroe, Texas 77302Phone (936) 441-5801Fax (936) 539-6847e-mail: soconusa@socon.com



Tatum Brine BW-2

083053

08/21/2008

Results of the Cavern Survey

By means of Echo-Sounding

In the cavern

Tatum Brine BW-2

Date: 08/21/2008

083053

Customer: Gandy Corporation

Tatum, New Mexico

Responsible for the survey:

Surveyor: Richard Lawrence Leadership: Larry Gandy Interpreter: Richard Lawrence Control: Jason McCartney

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08/21/2008

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Vertical sections



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Tatum Brine BW-2	083053	80	8/21/2008
Summary of results			
Well details			
All depths are given as:			MD
Datum level for all depths:			BHF
Shoe of the cemented 7"-casing:		22	200 ft
Shoe of the 4 1/2"- casing during the surveying:		21	165 ft
Reference depth for ECHO-LOG	:	22	200 ft
Depth correction:			-29 ft
Pressure at the well head:			0 psi
Details of survey equipment			
Measuring vehicle used:		Por	rtable
Tools used:		Echo tool BSF 39, BS	SF 39
<u>General details</u>			
Number of runs:			1

Measured horizontal sections:	13
Measured tilted sections:	41
Lowest survey depth:	2220 ft



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Maximum and minimum dimensions with ref. to the measuring axis

Reference direction:

magnetic north

Determination out of 12 vertical sections derived from horizontally and tilted measured data at 5/15 degree intervals:

Minimum radius: Depth: Direction:	0.0 ft 2220.3 ft 0°
Maximum radius:	58.9 ft
Depth: Direction:	2205.0 ft 330°
Highest point of cavern:	2190.7 ft
Horizontal distance: Direction:	24.4 ft 195°
Lowest point of cavern:	2242.1 ft
Horizontal distance:	23.5 ft
Direction:	225°
Lowest point in the measuring axis:	2220.3 ft

Determination out of 29 horizontal sections in the depths between 2201 ft and 2241 ft at 5/15 degree intervals:

	Maximum radius:	59.4 ft
	Depth:	2205.0 ft
	Direction:	331°
	Maximum diameter:	83.8 ft
	Depth:	2206.0 ft
	Direction:	45 - 225°
Volume		
	Volume:	11,289 bbls
	Depth range:	2191 ft <> 2241 ft

2191 ft <--> 2241 ft



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Interpretation

Supposing a rectilinear propagation of ultrasonic waves all recorded echo travel times were converted into distances by using the subsequent speeds of sound:

1810.0 m/s (5938.3 ft/s) in brine (measured)

In the case of recording several echoes along one trace of echo signals, the representative echo signal was selected according to the level of amplitude, transmission time, and density of measured points and the shape of the cavern.

Horizontal sections

13 horizontal sections at following measured depths are included as graphical plots in this report:

2201.0 ft	2202.0 ft	2204.0 ft	2205.0 ft	2206.0 ft	2208.0 ft	2210.0 ft
2212.0 ft	2214.0 ft	2215.0 ft	2216.0 ft	2218.0 ft	2220.0 ft	

The following 16 sections are constructed:

2191.0 ft	2193.0 ft	2195.0 ft	2197.0 ft	2199.0 ft	2221.0 ft	2223.0 ft
2225.0 ft	2227.0 ft	2229.0 ft	2231.0 ft	2233.0 ft	2235.0 ft	2237.0 ft
2239.0 ft	2241.0 ft					

Tilted sections

41 sections recorded with tilted echo-transducer at following measured depths are presented in the vertical sections:

20 sections of these with upwards-tilted echo-transducer:

Depth / Tilting Angle

2215.0/ 6	2215.0/ 9	2215.0 / 12	2215.0 / 15	2215.0 / 18	2215.0 / 21
2215.0 / 24	2215.0 / 27	2215.0 / 30	2215.0 / 33	2215.0/39	2215.0 / 45
2215.0 / 51	2215.0 / 57	2215.0 / 63	2215.0 / 69	2215.0 / 74	2215.0 / 81
2215.0 / 84	2215.0 / 87				



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21 sections of these with downwards-tilted echo-transducer:

Depth / Tilting Angle

2210.0 / 24 2210.0/30 2210.0/36 2210.0/6 2210.0 / 12 2210.0 / 18 2210.0/48 2210.0/51 2210.0 / 42 2210.0 / 54 2210.0 / 57 2210.0 / 60 2210.0/63 2210.0 / 66 2210.0 / 69 2210.0 / 72 2210.0 / 75 2210.0 / 78 2210.0/81 2210.0 / 84 2210.0 / 88

Vertical sections

The shape of the cavern was determined by interpretation of all horizontally and tilted measured data and is presented by 36 vertical sections in this report.

Maximum plots (top view)

The maximum plot presents the largest extension of the cavern in a top view. The first picture shows the areas of all horizontal sections and the area resulting out of the vertical sections (hatched). The resulting total area is shown in the second picture (cross hatching) together with the largest single area.

In both pictures the total centre of gravity of the cavern is shown with its distance and its direction referring to the measuring axis.

The total centre of gravity is derived out of the envelope, which is the connection line of the largest cavern extension in every direction

Perspective views

Several perspective drawings are included in this report to give a quick review of detailed relations.

Pockets in the cavern wall

Pockets in the cavern wall, which have been identified by the tilted echo-transducer, were transferred from the vertical sections to the respective horizontal sections. The resulting additional areas have been added to the calculated areas.


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LEGEND

- Measured point recorded with horizontal adjusted ultrasonic transducer
- O Measured point recorded with tilted or vertical orientated ultrasonic transducer
- Δ Interpolated point derived from the vertical sections
- Connection line between two measured points in order to calculate the volume
- ___ Assumed connection line (in areas which are not sufficiently covered by measured points)
- N Magnetic north determined with compass inside the tool (Magnetic compass in areas without tubing) (Fibre gyro compass in areas with tubing)
- (N) Assumed north direction (for sections in magnetic disturbed surroundings without fibre gyro compass)
- a Longest extension in section (Without considering of hidden leached pockets)
- **b** Longest extension in section perpendicular to a (Without considering of hidden leached pockets)
- a/b Ratio of longest extensions in section which are perpendicular to each other
- (xx m²) Area in actual section resulting from hidden leached pockets
- **r~** Average radius
- © 021835 29.04 2002 Job number and survey date















Volume list

Cavern: Tatum Brine	BW-2
---------------------	------

Depth [ft] Radius [ft] Area [ft²] Depth range [ft] Volume	e [bbls] total
from to partial	total
	0
2191.0 0.9 2 2191.0 2192.0 0	0
2193.0 2.3 17 2192.0 2194.0 6	0
2195.0 5.0 26 2194.0 2196.0 10 2107.0 6.0 147 2106.0 2108.0 52	10
2197.0 6.8 147 2196.0 2198.0 52 2100.0 10.0 200 0100.0 2198.0 52	69
2199.0 13.8 600 2198.0 2200.0 214	283
2201.0 22.1 1537 2200.0 2201.5 411	693
2202.0 21.0 1389 2201.5 2203.0 371	1064
2204.0 25.2 2002 2203.0 2204.5 535	1599
2205.0 32.7 3363 2204.5 2205.5 599	2198
2206.0 33.4 3510 2205.5 2207.0 938	3136
2208.0 35.9 4041 2207.0 2209.0 1440	4575
2210.0 36.2 4124 2209.0 2211.0 1469	6044
2212.0 35.2 3898 2211.0 2213.0 1388	7432
2214.0 32.8 3374 2213.0 2214.5 901	8334
2215.0 31.0 3010 2214.5 2215.5 536	8870
2216.0 28.6 2573 2215.5 2217.0 687	9557
2218.0 24.7 1918 2217.0 2219.0 683	10240
2220.0 16.8 891 2219.0 2220.5 238	10479
2221.0 14.3 642 2220.5 2222.0 172	10650
2223.0 11.2 391 2222.0 2224.0 139	10789
2225.0 7.9 195 2224.0 2226.0 69	10859
2227.0 5.9 111 2226.0 2228.0 39	10898
2229.0 5.0 78 2228.0 2230.0 28	10926
2231.0 3.0 29 2230.0 2232.0 10	10937
2233.0 17.1 919 2232.0 2234.0 327	11264
2235.0 2.7 23 2234.0 2236.0 8	11272
2237.0 2.7 24 2236.0 2238.0 8	11281
2239.0 2.5 20 2238.0 2240.0 7	11288
2241.0 1.6 8 2240.0 2241.0 1	11289





Table of volumes (foot by foot)

Job-No.: 083053, Name: Tatum Brine BW-2, Date: 08/21/2008									
depth	volume	depth	volume	depth	volume	depth	volume	depth	volume
[ft]	[bbls]	[ft]	[bbls]	[ft]	[bbls]	[ft]	[bbls]	[it]	[bbls]
		2191	01	2192	01	2193	31	2194	6
2195	11	2196	16	2197	431	2198	69	2199	176
2200	283	2201	556	2202	817	2203	1064	2204	1421
2205	1899	2206	2511	2207	3136	2208	3856	2209	4575
2210	5310	2211	6044	2212	6738	2213	7432	2214	8033
2215	8602	2216	9099!	2217	9557	2218	9899	2219	10240
2220	10399	2221	10536	2222	10650	2223	10720	2224	10789
2225	10824	2226	10859	2227	10879	2228	10898	2229	10912
2230	10926	2231	10931	2232	10937	2233	11100	2234	11264
2235	11268	2236	11272	2237	11276	2238	11281	2239	11284
2240	112881	2241	11289						

Cavity: Tatum Brine BW-2 Report number: 083053 Date: 08/21/2008



Tatum Brine BW-2

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RADII / DIAMETERS





Table of radii and diameters

Cavern: Tatum Brine BW-2					08/21/2008			
Depth	Radiu	s [MIN]	Radius	s [MAX]	Diame	eter [MIN]	1]	MAXI
[ft]	[ft]	[°]	[ft]	[°]	<u>[ft]</u>	[°]	[ft]	[°]
0404.0		-						
2191.0	0.0	0	24.2	195	0.0	0 <-> 180	24.2	15 <-> 195
2193.0	0.0	0	23.2	195	0.0	0 <-> 180	23.2	15 <-> 195
2195.0	0.0	0	22.1	195	0.0	0 <-> 180	22.1	15 <-> 195
2197.0	0.0	1	23.3	45	0.0	1 <-> 181	36.3	15 <-> 195
2199.0	0.0	1	27.3	45	0.0	1 <-> 181	41.2	15 <-> 195
2201.0	8.4	144	38.6	259	30.6	144 <-> 324	62.3	79 <-> 259
2202.0	0.8	61	39.0	225	24.0	79 <-> 259	68.4	45 <-> 225
2204.0	1.3	62	45.9	0	27.4	151 <-> 331	69.8	45 <-> 225
2205.0	2.7	121	59.4	331	32.0	81 <-> 261	76.7	150 <-> 330
2206.0	2.1	149	57.6	330	33.6	0 <-> 180	83.8	45 <-> 225
2208.0	3.5	120	56.0	315	32.6	0 <-> 180	82.1	45 <-> 225
2210.0	2.1	130	53.9	325	48.0	25 <-> 205	80.9	105 <-> 285
2212.0	6.6	120	49.7	345	53.4	130 <-> 310	74.1	45 <-> 225
2214.0	3.0	329	49.5	345	11.3	155 <-> 335	74.7	60 <-> 240
2215.0	2.3	154	45.1	81	30.0	151 <-> 331	78.0	71 <-> 251
2216.0	2.9	59	46.8	345	10.2	156 <-> 336	70.5	60 <-> 240
2218.0	2.0	59	40.9	315	6.7	164 <-> 344	62.8	60 <-> 240
2220.0	0.2	301	37.1	315	2.3	72 <-> 252	58.0	60 <-> 240
2221.0	0.0	0	33.3	60	0.0	1 <-> 181	48.5	135 <-> 315
2223.0	0.0	0	28.8	60	0.0	1 <-> 181	39.3	60 <-> 240
2225.0	0.0	0	25.4	60	0.0	0 <-> 180	37.0	60 <-> 240
2227.0	0.0	0	20.0	195	0.0	0 <-> 180	20.0	15 <-> 195
2229.0	0.0	0	17.8	195	0.0	0 <-> 180	17.8	15 <_> 195
2231.0	0.0	0	17.2	225	0.0	0 <-> 180	17.0	45 <-> 225
2233.0	0.0	0	18.3	225	0.0	0 <-> 180	18.3	45 <-> 225
2235.0	0.0	Ő	19.5	225	0.0	0 <-> 180	10.5	45 < 225
2237.0	0.0	0	20.6	225	0.0	0 <-> 100	20.6	45 < 220
2239.0	0.0	õ	21.0	225	0.0	0 <-> 100	20.0	45 < 220
2241.0	0.0	Õ	22.9	225	0.0	0 <-> 180	22.7	45 <-> 225
	÷	-				Q . 100		



Table of radii in N-E-S-W-NE-SE-SW-NW presentation

Cavern: Tatum Brine BW-2			083053			08/21/2008			
Depth	<r></r>	N	E	S	W	NE	SE	SW	NW
[tt]	ותן	[ft]	[π]	[tt]	[II]	<u>[n]</u>	[R]		[[[]
2191.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2193.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2195.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2197.0	6.8	10.1	0.0	0.0	0.0	23.3	0.0	0.0	0.0
2199.0	13.8	22.2	0.0	0.0	14.5	27.3	0.0	2.7	20.6
2201.0	22.1	25.0	14.9	17.8	25.0	25.7	9.4	36.5	22.5
2202.0	21.0	31.9	11.1	17.2	21.5	29.4	4.9	39.0	31.2
2204.0	25.2	45.9	9.5	15.9	27.2	30.1	6.5	39.7	35.9
2205.0	32.7	52.8	3.3	15.2	30.0	31.4	4.7	9.6	54.8
2206.0	33.4	19.2	18.6	14.5	34.1	43.6	7.8	40.2	54.6
2208.0	35.9	19.5	20.8	13.1	46.3	45.3	7.6	36.8	56.0
2210.0	36.2	50.8	27.5	2.4	49.8	46.7	7.4	21.8	53.3
2212.0	35.2	47.6	31.8	11.4	40.3	42.6	7.1	31.6	46.5
2214.0	32.8	41.7	35.1	11.8	37.9	36.1	7.9	27.8	45.6
2215.0	31.0	28.3	42.5	3.8	31.8	33.1	8.2	35.6	31.6
2216.0	28.6	40.7	34.9	12.8	32.9	32.2	8.6	11.8	43.8
2218.0	24.7	38.9	33.3	13.7	27.7	29.2	10.6	10.9	40.9
2220.0	16.8	0.3	29.4	14.7	6.6	23.8	13.9	10.9	37.1
2221.0	14.3	0.0	24.9	14.9	0.0	0.0	15.5	11.5	33.0
2223.0	11.2	0.0	21.5	7.0	0.0	0.0	16.4	12.6	0.0
2225.0	7.9	0.0	16.6	0.0	0.0	0.0	16.3	13.8	0.0
2227.0	5.9	0.0	0.0	0.0	0.0	0.0	14.3	14.9	0.0
2229.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	0.0
2231.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2	0.0
2233.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	18.3	0.0
2235.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	19.5	0.0
2237.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.0
2239.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	21.7	0.0
2241.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	22.9	0:0





























Tatum Brine BW-2

083053

08/21/2008

HORIZONTAL SECTIONS

Cavern: Tatum Brine BW-2

Report No.: 083053

Utilized speed of sound: 1810.0 m/s (5938.3 ft/s)

Measuring date: 08/21/2008

Scale: 1:20

Horizontal sections measured at following depths:

2201.0 ft	2202.0 ft	2204.0 ft	2205.0 ft	2206.0 ft	2208.0 ft	2210.0 ft
2212.0 ft	2214.0 ft	2215.0 ft	2216.0 ft	2218.0 ft	2220.0 ft	

The following 16 sections are constructed:

2191.0 ft2193.0 ft2195.0 ft2197.0 ft2199.0 ft2221.0 ft2223.0 ft2225.0 ft2227.0 ft2229.0 ft2231.0 ft2233.0 ft2235.0 ft2237.0 ft2239.0 ft2241.0 ft



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Cavern: Ta	tum Brine	B\ W-2				83	3053	8/	21/2008	
	4.0.0									
Depth: 220	1.0 ft				D a alti in	r.c.13				
l°I	05.0		047	00.0	Radii in		05.4	05.0	05.0	05.7
0	25.0	24.6	24.7	26.2	26.0	25.5	25.1	25.2	25.3	25.7
50	25.9	26.5	27.1	27.6	28.2	26.7	21.9	16.4	14.9	14.4
. 100	13.5	12.8	12.4	11.2	11.6	11.4	10.4	9.4	8.7	8.5
150	8.8	8.5	8.6	9.0	9.4	9.1	9.5	10.0	10.4	11.1
200	11.7	13.3	14.3	15.6	18.6	21.0	22.1	23.7	26.7	30.1
250	32.1	32.8	36.4	28.8	25.0	22.8	21.6	20.6	20.9	21.6
300	21.5	21.5	21.7	22.5	22.8	22.4	23.0	23.4	23.4	23.5
350	25.0	25.7								
Depth: 220	2.0 ft									
[°]					Radii in	[ft]				
0	31.9	29.9	28.2	27.0	28.2	29.8	31.8	30.7	29.9	29.4
50	27.0	25.2	23.8	3.3	1.8	1.2	1.7	3.0	11.1	11.1
100	11.3	11.5	6.6	4.6	3.6	3.9	4.3	4.9	6.4	9.6
150	19.0	6.7	4.1	2.9	4.0	6.5	17.2	17.3	17.5	17.8
200	5.5	3.3	2.3	3,4	6.2	39.0	32.6	28.1	24.9	24.1
250	23.4	23.0	22.3	21.8	21.5	21.7	22.1	22.7	23.2	23.9
300	24.8	26.4	28.5	31.2	28.8	26.8	25.3	23.6	22.2	21.1
350	23.6	27.1								
Depth: 220	4.0 ft									
[°]					Radii ir	[ft]				
	45.9	36 7	30.8	26 7	30.4	35.6	43 4	37 5	33 3	30.1
50	27.6	25.6	24.1	22.5	21.3	20.3	14.6	11.4	9.5	7.8
100	67	5.9	5.3	<u>ل</u> م	44	49	5.5	6.5	8.3	11.5
150	19.2	11.5	8.2	6.5	8.0	10.6	15.9	15.9	16.1	16.4
200	62	3.8	2.8	4.0	73	39.7	35.8	32.8	30.5	30.0
250	29.7	29.7	28.6	27.8	27.2	25.9	24 9	24.2	25.1	26.2
300	27.7	29.8	32.4	35.9	30.7	27.0	24.3	26.3	29.1	32.7
350	35.9	40.1	. 02.4	00.0	00.1	27.0	21.0	20.0	20.1	02.7
Depth ⁻ 220)5 0 ft									2
[°]	10.0 M		N		Radii ir	n [ft]				
0	52.8	52 1	51.0	50 7	51.2	48.7	46 0	44 7	44 9	31.4
50	27.4	5.9	3.9	3.6	3.5	3.5	3.5	32	3.3	3.3
100	3.4	34	3.3	3.1	2.8	2.9	3.0	47	3.3	3.0
150	3.1	3.1	3.3	32	32	31	3.0	3.0	2.9	2.9
200	3.0	3.0	3.0	3.8	43	9.6	24 G	31 9	33.0	33.0
200	31.6	30.3	28.8	29.9	30.0	291	36.1	40.2	42.5	<u>45</u> 0
200	28 A	50.5	20.0 52 8	54 R	56.8	57 3	58 0	58 N	56 1	
350	0 49 5	52.8	02.0	0.4.0	00.0	01.0	00.0	00.0		01.0
000	10.0	02.0								



Sonar Well Services SOCON Sonar Well Services, Inc.

Cavern: Tat	um Brine	BW-2				83	3053	8/	21/2008	
Depth: 2206	5.0 ft									
[°]					Radii in	[ft]				
0	19.2	24.0	32.3	50.1	48.0	46.5	45.4	44.4	43.9	43.6
50	34.5	28.7	24.8	23.0	21.7	20.6	19.7	19.1	18.6	17.5
100	16.7	16.1	6.5	4.1	3.0	3.8	5.1	7.8	9.4	11.9
150	16.3	13.1	11.0	9.6	10.7	12.3	14.5	14.5	14.7	14.9
200	15.6	16.6	17.8	21.7	28.1	40.2	38.3	36.9	35.8	35.1
250	34.7	34.6	34.1	34.0	34.1	35.6	37.5	40.0	42.2	44.9
300	48.3	49.9	51.9	54.6	55.1	56.1	57.6	54.9	52.8	51.3
350	32.6	24.0								
Depth: 2208	3.0 ft									
[°]					Radii in	[ft]				
0	19.5	24.3	32.3	48.9	46.9	45.3	44.2	44.2	44.6	45.3
50	35.3	29.0	24.8	23.5	22.4	21.6	21.2	20.9	20.8	20.2
100	19.6	19.3	7.7	4.8	3.5	4.3	5.5	7.6	8.8	10.6
150	13.4	13.2	13.0	13.0	12.9	12.9	13.1	13.1	13.2	13.4
200	16.8	22.8	35.8	35.9	36.2	36.8	38.0	39.6	41.7	42.1
250	42.8	43.8	44.3	45.1	46.3	46.8	47.7	48.9	48.4	48.2
300	48.4	50.3	52.8	56.0	55.2	54.9	54.9	53.3	52.1	51.3
350	33.0	24.5								
Depth: 2210).0 ft									
[°]					Radii in	[ft]				
0	50.8	51.1	48.8	47.7	43.9	42.5	43.1	46.0	45.2	46.7
50	40.5	33.9	33.5	32.5	31.2	29.7	27.5	27.8	27.5	24.2
100	30.3	31.5	5.2	5.6	2.8	2.4	2.1	7.4	7.6	7.7
150	2.1	2.3	2.3	2.1	2.3	23	24	3.6	4.6	13.9
200	16.9	5.5	5.9	6.6	7.4	21.8	37.2	38.1	38.5	42.0
250	39.8	39.0	41.6	46.8	49.8	48.2	48 7	49.5	49.2	48.3
300	48.8	50.7	50.7	53.3	53.3	53.9	52.3	53.3	52.9	51.4
350	51.5	52.1				••••			02.0	• • • •
Depth: 2212	2.0 ft									÷
[°]					Radii ir	n [ft]				
0	47.6	46.1	45.0	44.3	42.5	41.1	40.1	40.6	41.4	42.6
50	39.9	37.7	36.1	33.9	32.1	30.7	30.8	31.2	31.8	30.9
100	30.4	30.1	13.6	8.8	6.6	6.7	6.9	7.1	8.3	10.1
150	13.0	11.8	10.9	10.2	10.5	10.9	11.4	12.1	12.8	13.9
200	16.8	21.6	30.6	30.7	31.0	31.6	33.1	35.2	37.8	37.2
250	37.0	37.0	37.8	38.8	40.3	40.9	41.9	43.3	44.3	45.7
300	47.6	46.9	46.5	46.5	46.7	47.3	48.2	48.3	48.8	49.7
350	48.6	47.9								



Cavern: Tat	um Brine	B\W-2				83	3053	8/2	21/2008	
Depth: 2214	1.0 ft									
[°]					Radii in	[ft]				
., 0	41.7	41.5	41.6	42.1	40.3	38.9	37.9	37.0	36.4	36.1
- 50	37.4	39.1	41.2	40.0	39.1	38.5	37.0	35.9	35.1	28.3
100	23.9	20.8	12.0	8.5	6.6	7.0	7.4	7.9	8.4	9.1
150	10.0	72	5.7	4.7	5.9	7.8	11.8	12.5	13.3	14.4
200	15.3	16.4	17.8	20.1	23.2	27.8	29.2	31.0	33.4	32.9
250	32.6	32.5	33.9	35.7	37.9	38.5	39.3	40.5	41.9	43.7
300	46.0	45.5	45.4	45.6	44.6	44.1	43.9	45.2	47.1	49.5
350	46.2	43.7								
Depth: 2215	5.0 ft									
[°]					Radii in	[ft]				
0	28.3	28.5	29.6	33.3	31.2	31.5	31.0	31.5	32.0	33.1
50	37.2	40.4	42.2	42.7	44.6	44.9	45.1	44.7	42.5	41.6
100	30.1	16.9	5.7	5.3	5.5	5.7	5.5	8.2	8.8	2.7
150	2.3	2.3	2.4	2.7	2.9	3.1	3.8	6.0	9.5	15.0
200	30.6	39.7	38.6	36.8	36.4	35.6	34.1	31.7	31.1	31.7
250	32.7	32.2	31.3	31.3	31.8	32.3	33.9	35.1	32.4	31.0
300	32.3	32.6	31.1	31.6	30.3	29.6	28.0	28.9	28.0	29.1
350	28.9	28.0								
Depth: 221	6.0 ft									
[°]					Radii ir	[ft]				
0	40.7	37.5	35.0	33.0	30.2	28.0	26.3	27.8	29.7	32.2
50	34.4	37.2	40.8	39.7	38.9	38.4	36.9	35.7	34.9	27.6
100	22.9	19.8	9.2	6.0	4.5	5.3	6.5	8.6	8.9	9.5
150	10.1	5.7	4.0	3.1	4.1	6.2	12.8	13.5	14.4	15.6
200	13.5	12.0	10.9	11.1	11.4	11.8	14.6	19.5	29.7	29.2
250	28.9	28.8	29.8	31.2	32.9	33.2	33.7	34.5	32.8	31.5
300	30.5	33.7	38.0	43.8	42.8	42.1	41.7	43.0	44.6	46.8
350	44.2	42.2								
Depth: 221	8.0 ft									
[°]					Radii ir	n [ft]				
0	38.9	35.4	32.7	30.5	19.1	13.9	11.0	13.8	18.7	29.2
50	31.3	34.1	37.8	37.3	37.1	37.1	35.5	34.2	33.3	30.1
100	27.6	25.6	10.3	6.5	4.8	5.8	7.5	10.6	9.6	8.9
150	8.3	6.0	4.7	3.9	5.1	7.4	13.7	14.5	15.5	16.7
200	13.2	10.9	9.4	9.8	10.3	10.9	13.3	17.3	25.1	25.1
250	25.2	25.6	26.1	26.7	27.7	28.6	29.7	31.3	22.2	17.3
300	14.3	18.1	25.0	40.9	40.2	39.8	39.7	39.6	39.8	40.3
350	39.6	39.1								



SWS Sonor Well Services SOCON Sonar Well Services, Inc.

Cavern: Ta	tum Brine	BW-2				8	3053	8/	/21/2008	
Dopthy 222	0.0.4									
Depth. ZZZ	0.0 11									
[°]					Radii ir) [ft]				
0	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	1.1	23.8
50	26.4	30.0	34.9	32.7	31.1	29.8	29.4	29.3	29.4	29.3
100	29.4	29.7	7.2	4.1	2.9	3.9	6.1	13.9	9.8	7.6
150	6.2	5.6	5.1	4.7	6.1	8.6	14.7	15.8	17.2	19.1
200	13.8	10.8	9.0	9.5	10.1	10.9	13.1	16.7	23.1	13.4
250	9.5	7.4	7.0	6.8	6.6	6.6	6.6	6.7	6.2	5.9
300	5.7	7.8	12.9	37.1	36.2	35.6	35.3	28.0	23.4	20.2
350	0.8	04			,					



SOCON Sonar Well Services, Inc. <u>Horizontal slices 1 - 12</u>





SOCON Sonar Well Services, Inc. <u>Horizontal slices 13 - 24</u>





SOCON Sonar Well Services, Inc. <u>Horizontal slices 25 - 29</u>



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SOCON Sonar Well Services, Inc. Vertical slices 1 - 12



315° 135° Range from 2190 ft to 2242 ft, step 10 ft

330° 150°

345° 165°

1-7

<u>Conditions accepted by:</u> "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment."

Gandy Corporation

Company Name

Larry Gandy

Company Representative-Printed

Gamdi

Company Representative-Signed

Secretary/Treasurer

Title

02/11/10 Date

Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	wednesday, November 18, 2009 7:02 AM
То:	'Prather, Steve'; 'gandy2@leaco.net'; 'James Millett'; 'Clay Wilson'; 'Bob Patterson'; 'David Pveatt': 'ganmschubert@aol.com': 'Gany Schubert'
Cor	Griswold Lim EMNED: VanConton Clann EMNED: Sanchaz Daniel L EMNED
	answord, Jini, Elwinn, Vondonten, Glenn, Elwinn, Sanchez, Danier J., Elwinn, D
Subject:	UIC Class III Well Annual Report Schedule for Submittal & Content REMINDER- 2010
Attachments:	Annual Reports 2010.xls

Gentlemen:

Good morning. You may recall an e-mail message from me this past Summer alerting you to the reporting provision of your current discharge permit (permit) and how the New Mexico Oil Conservation Division (OCD) is stepping up its efforts to track reporting under issued permits.

Please find attached a spreadsheet listing the dates that OCD expects to receive your Annual Reports and/or any reporting requirements from your permit. If you are an operator with limited reporting requirements based on your permit, you are welcome to follow the format and content required from more recent permit renewals issued by the OCD, which are more comprehensive and constitute a report, Any renewed permits will likely require similar content anyway.

Please plan on meeting the Annual Report submittal dates in January of 2010 as failure to submit the report will constitute a violation under the Federal Underground Injection Control (UIC) Program and reporting to the United States Environmental Protection Agency, which could result in the shut-in and/or plug and abandonment of your brine production well.

Please contact me if you have questions. Thank you in advance for your cooperation in this matter.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

CC: Brine Well File "Annual Reporting"

Gandy Corp.	01/31/10	L. Annual Report: All operators shall submit an annual report due on January 31 of each
		year. The report shall include the following information:
		 Cover sheet marked as "Annual Brine Well Report, name of operator, BW
		permit #, API# of well(s), date of report, and person submitting report. 2. Brief summary of brine wells operations including description and
		reason for
		any remedial or major work on the well. Lopy of C- 103. 3. Production volumes as required above in 21.G. including a running total
		should
		be carried over to each year. The maximum and average injection
		pressure.
		4. A copy of the chemical analysis as required above in 21.1-1.
		5. A copy of any mechanical integrity test chart, including the type of test,
		i.e.
		open to formation or easing test.
		6. Brief explanation describing deviations from normal production
		methods.
		A copy of any leaks and spills reports.
		8. If applicable, results of any groundwater monitoring.
		9. Information required from cavity/subsidence 21.F. above.
		10. An Area of Review (AOR) summary.
		11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.
PAB- Salty Dog	Mo. w/ Qtly Rpts.	

BW-8

BW-4

L. Annual Report: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:	 Cover sheet marked as "Annual Brine Well Report, name of operator, BW permit #, API# of well(s), date of report, and person submitting report. Brief summary of brine wells operations including description and 	reason for any remedial or major work on the well. Copy of C-103. 3. Production volumes as required above in 21.G. including a running total	should be carried over to each year. The maximum and average injection pressure. 4. A copy of the chemical analysis as required above in 21.H. 5. Δ conv of any mechanical integrity test chart including the type of test	 i.e. open to formation or casing test. 6. Brief explanation describing deviations from normal production methods. 7. A copy of any leaks and spills reports. 8. If applicable, results of any groundwater monitoring. 9. Information required from cavity/subsidence 21. F. above. 10. An Area of Review (AOR) summary. 	 Production/Injection Volumes/Annual Report: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Santa Fe Office in an annual report due on the thirty-first (31) day of January of each year.
01/31/10					01/31/10
Gandy Corp.					Basic Energy
BW-22					BW-25

BW-27	Mesquite	01/01/10	 Production/Injection Volumes: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Sanla Fe Office in an annual report due on the first day of January of each year.
BW-28	ey Ernergy Services LL	01/31/10	L. Annual Report: All operators shall submit an annual report due on January 31 of each year. The report shall include the following information:
			 Cover sheet marked as "Annual Brine Well Report, name of operator, BW
			permit #, API# of well(s), date of report, and person submitting report. 2. Brief summary of brine wells operations including description and reason for
			any remedial or major work on the well. Copy of C-103. 3. Production volumes as required above in 21 .G. including a running total should
			be carried over to each year. The maximum and average injection pressure.
			 4. A copy of the chemical analysis as required above in 21 .H. 5. A copy of any mechanical integrity test chart, including the type of test, i.e.
			open to formation or casing test. 6. Brief explanation describing deviations from normal production
			 methods. 7. A copy of any leaks and spills reports. 8. If applicable, results of any groundwater monitoring. 9. Information required from cavity/subsidence 21. F. above.
			11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5101.

BW-27

			year. The report shall include the tollowing information:
			1. Cover sheet marked as "Annual Brine Well Report, name of operator, BW
			permit ~, API~ of well(s), date of report, and person submitting report. 2. Brief summary of brine wells operations including description and
			reason for any remedial or major work on the well. Copy of C-103. 3. Production volumes as required above in 21 .G. including a running total should
			be carried over to each year. The maximum and average injection
			 4. A copy of the chemical analysis as required above in 21 .H. 5. A copy of any mechanical integrity test chart, including the type of test, i.e.
			open to formation or casing test. 6. Brief explanation describing deviations from normal production methods.
			 7. A copy of any leaks and spills reports. 8. If applicable, results of any groundwater monitoring. 9. Information required from cavity/subsidence 21. F. above. 10. An Area of Review (AOR) summary. 11. Sign-off requirements pursuant to WQCC Subsection G 20.6.2.5 101.
BW-31	HRC- Schubert	01/31/10	 Production/Injection Volumes/Annual Report: The volumes of fluids injected (fresh water) and produced (brine) will be recorded monthly and submitted to the OCD Santa Fe Office in an annual report due on the thirty-first (31) day of January of each year.

Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, September 25, 2009 1:48 PM
То:	'Prather, Steve'; 'gandy2@leaco.net'; 'James Millett'; 'Clay Wilson'; 'Bob Patterson'; 'Blevins, Sam'; 'David Pyeatt'; 'garymschubert@aol.com'
Cc:	Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Griswold, Jim, EMNRD; Jones, William V., EMNRD
Subject:	New Mexico Oil Conservation Division Class III Solution Mining Well Operator Notice ANNUAL REPORTS

Gentlemen:

Re: Annual Reporting

You are receiving this message because you are currently operating a Underground Injection Control (UIC) Class III Solution Mining Well in New Mexico under an Oil Conservation Division (OCD) Discharge Permit. You may be aware of the most recent events related to OCD Class III Wells in New Mexico and can find out more by visiting the OCD's Webste at http://www.emnrd.state.nm.us/OCD/brinewells.htm and OCD Brine Well Work Group Website at http://crdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?appNo=pCJC0906359521.

The OCD is writing to inform you that it will be monitoring the receipt of your "Annual Reports" under the applicable section of your OCD discharge permit. The OCD has been deficient in tracking reporting obligations in the past; however, the OCD has recently upgraded our online system to track operators who are not meeting the reporting requirements specified in OCD Discharge Permits. Please plan on submitting the report with the required information by the date required in your discharge permit.

To access your OCD Discharge Permit Online for the date of submittal and contents of the report, please go to OCD Online at http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx (enter "Order Type" as BW and your "Order Number"). If you have not submitted an Annual Report (report) for your well, a historical review of your injection and production records will be required in order to provide cumulative injection and production information in this year's report.

Please contact me if you have questions or need assistance.

Thank you in advance for your cooperation in this matter.

Copy: Brine Well Files BWs 2, 4, 8, 22, 25, 27, 28, 30 & 31

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")