# AP-062

# **Annual Monitoring Report**

**DATE: JAN 2009** 

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# Samson Livestock "30" Reserve Pit NMOCD Case # AP-62

**2008 Annual Monitoring Report** 

R.T. Hicks Consultants, Ltd.

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#### Samson Livestock "30" Reserve Pit 2008 Annual Monitoring Report NMOCD Case #AP-62

Location: T-21-S, R-35-E, Sec 30, Unit P

Latitude: North 32° 26' 41.2" Longitude: West 103° 24' 6.9"

NMOCD#: AP-62

#### 1 Executive Summary

The Samson Livestock "30" site, which is operated by Samson Resources Company (Samson), is located approximately 16 miles west of Eunice, New Mexico. The data presented in this 2008 Annual Monitoring Report permits us to conclude:

- The extent and magnitude of ground water impairment in the shallow zone is decreasing
- The extent and magnitude of ground water impairment in the deep zone is unchanged.
- The ground water pumping (source removal) program plus natural processes has reduced the magnitude of the documented ground water impairment
- The engineered ET infiltration barrier functions as designed and
- Continuation of the pump-and-use ground water remedy is appropriate

This report is consistent with the commitments made in the June 2006 Corrective Action Plan, September 2006 Stage 1/Stage 2 Abatement Report, Progress reports submitted in December 2006, May 2007, August 2007, and the November 2007 Final Abatement Report.

#### 2 Work Elements Performed

Appendix A presents the chronology of events at the site followed by a brief description of all characterization and corrective action activities performed at the site. Appendix B provides copies of the field run tickets from the May to July 2008 pump-and-use source removal operation. The ground water monitoring laboratory reports are included in Appendix C and Appendix D provides graphs that depict the historic ground water impairment for each monitoring well.

Since November 2007, site activities included:

- 1. Termination of source removal operations from MW-1
- 2. Implementation of a pump-and-use source removal program from MW-3d
- 3. Quarterly sampling of all monitoring wells

#### 3 Conclusions

#### 3.1 ET Barrier Performing as Predicted

Soil moisture monitoring demonstrates that the moisture content within the ET Barrier is very low and has continued to decline over the past year. Table 1 indicates that the lower portion of the ET barrier has dried more slowly than the upper portion because the upper portion of the barrier is affected by evaporation to a larger extent. This result confirms the performance expectations of the ET Barrier presented in the November 2007 Final Abatement Report.

Table 1

	ET C	over Monitoring	Port
Vadose Zone	No. 1	No.2	No. 3
Measurement	West	Center	East
Date	2.8-foot	5-foot	9-foot
4/17/07	80	81	80
5/1/07	7	15	17
5/21/07	3	10	9
7/18/07	1	1	7
8/9/07	1	՝1	7
12/6/07	0	0	4
4/3/08	0	0	3
8/19/08	0	0	4
11/20/08	0	0	3

As discussed below, ground water monitoring results also demonstrate that the chloride concentration of upper portion of the aquifer beneath the ET cover is declining over time. This observation supports a conclusion that the flux of chloride from the vadose zone to ground water beneath the cover is very low or nil.

#### 3.2 Ground Water Flow Direction is Constant

Hicks Consultants gauged each of the monitoring wells and sampled each on a quarterly basis during 2008. Table 2 provides a summary of the historic gauging, purging, and sampling results. Ground water gradient maps (Plates 1A - 1D) indicate essentially no change in the gradient. Observations continue to support a flow rate of about 10 ft per 100 yrs as calculated and provided in the 2007 Final Abatement Report.

#### 3.3 Pump-and-Use Source Removal Operations Removed Chloride

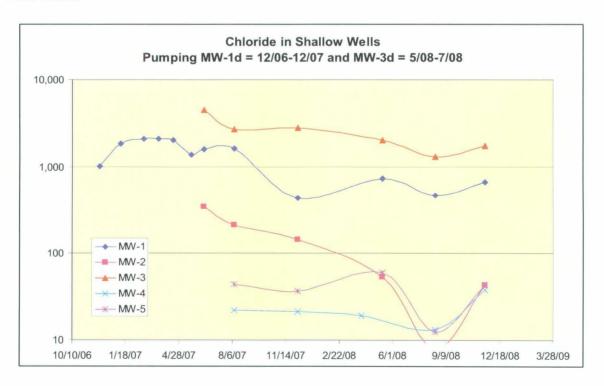
Ground water pumping operations removed approximately 16.4 tons of dissolved solids (59% chloride) from MW-1 (deep screens) in approximately 8,700 hours of pumping from November 30, 2006 to December 6, 2007. In addition, pumping removed approximately 7.8 tons of dissolved solids (60% chloride) from MW-3d in approximately 2,000 hours of pumping from May 7 to July 31, 2008. A total of 494,000 gallons of impaired ground water (14.4 tons chloride / 24.2 tons TDS) have been removed from the site to date.

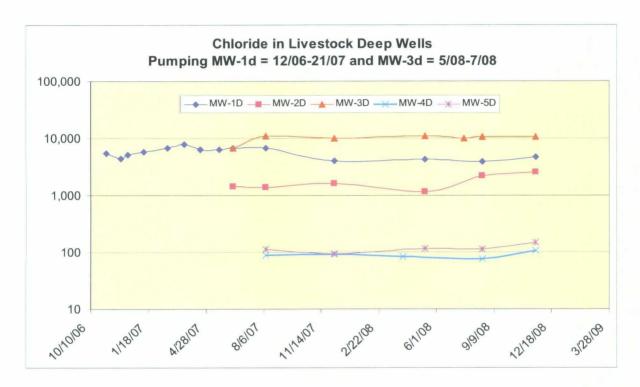
For many reasons, Samson disposed of all of the water pumped from 2006-07 and most of the water pumped in 2008.

## 3.4 Magnitude and Extent of Ground Water Impairment is Decreasing in the Shallow Zone and is Constant in the Deep Zone

Plate 2 depicts the laboratory results for both the shallow and deep zones for each 2008 sampling event.

The following graphs that depict chloride concentrations for both the shallow and deep ground water zones:





The data demonstrate that chloride concentrations in shallow ground water are decreasing over time - the magnitude of impairment in the shallow zone is decreasing. Data also show that chloride and TDS concentrations in MW-2s are consistently below ground water standards, thereby reducing the extent of impairment.

In the deep zone, chloride concentrations have decreased in MW-1d, remained constant at MW-3d (discounting the initial sampling data, which appears anomalous compared to TDS values) and increased in MW-2d. Insufficient data exist to determine if the most recent chloride analyses in MW-4d and 5d suggest an increasing trend or represent natural variation.

From a mass balance perspective, removing high concentrations of chloride via pumping the lower portion of the aquifer is reducing the magnitude of impairment in the deep zone. The effect of source removal pumping is not obvious in the ground water monitoring data.

	Avg Conc. S	Shallow Wells
	CI	TDS
2 sampling events before:	633	1,531
2 sampling events after:	439	1,127
Change	69%	74%
	Avg Conc.	Deep Wells
	CI	TDS
2 sampling events before:	3,239	5,972
2 sampling events after:	3,457	5,634
Change	107%	94%

An analysis of the difference in concentrations during

the most recent sampling events supports a conclusion that the magnitude of impairment in the shallow zone is decreasing while changes in the deep zone are less obvious.

#### 3.5 The Geometry of Deep Zone Ground Water Impairment Is Changing

The chloride v. time graphs for the lower portion of the aquifer show:

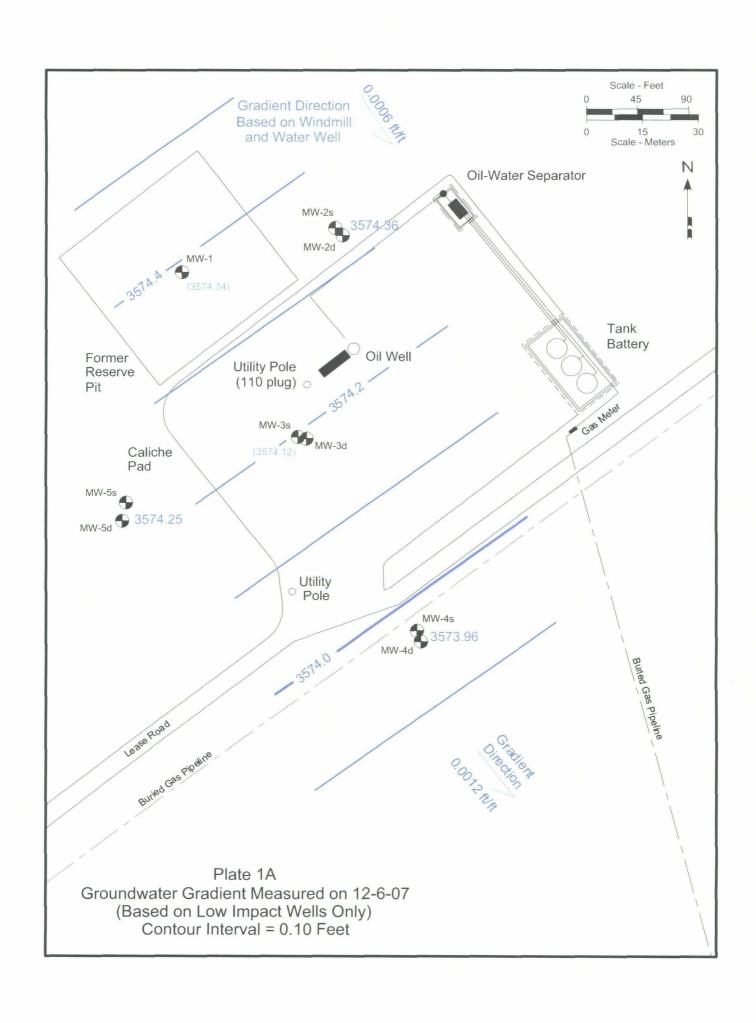
- 1. Data from 2008 from MW-1 (deep screens) at the center of the former reserve pit shows lower chloride and TDS concentrations than 2007
- 2. Chloride and TDS concentrations at MW-2d have doubled in the past 6 months
- 3. Chloride and TDS concentrations at MW-3d are relatively constant
- 4. Discounting the anomalous TDS concentration in December 2007, chloride and TDS concentrations in MW-4d are constant
- 5. At MW-5d, recent data suggest an increasing trend for TDS and chloride.

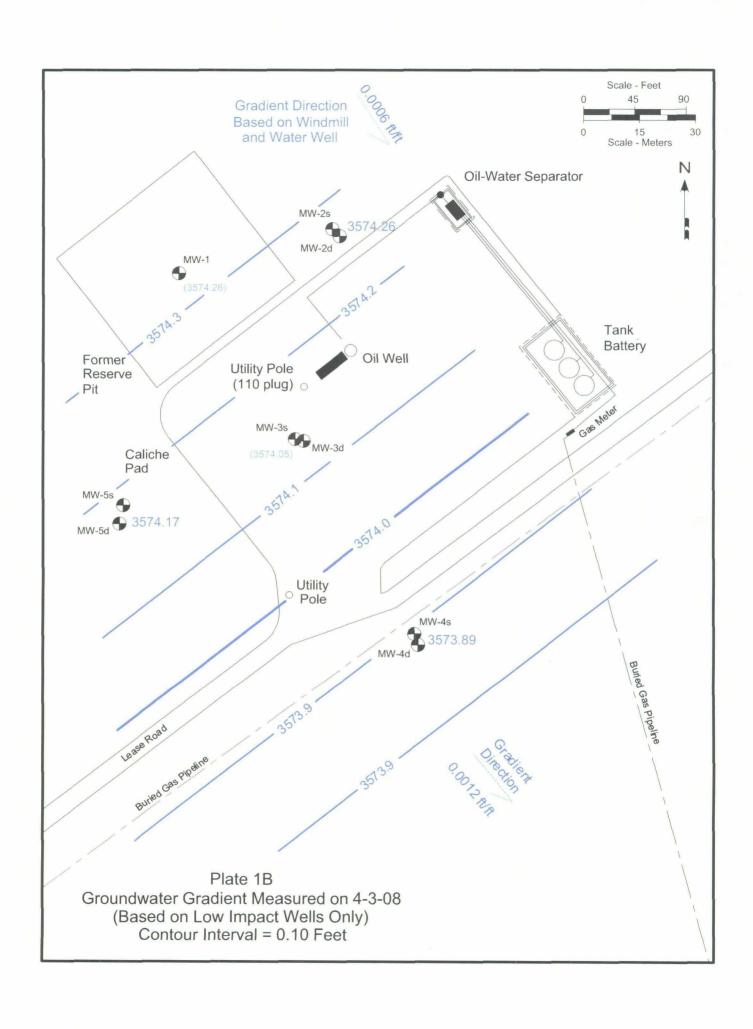
Finally, MW-2d is the only deep monitoring well that cannot achieve a stable or decreasing conductivity reading during the pre-sample purge operation, regardless how many additional well volumes are recovered. Since MW-2d is a 4-inch diameter well, at least 90 gallons of water is recovered prior to sampling. Perhaps the purging procedure and natural migration is causing down gradient movement of saline ground water up gradient from the well.

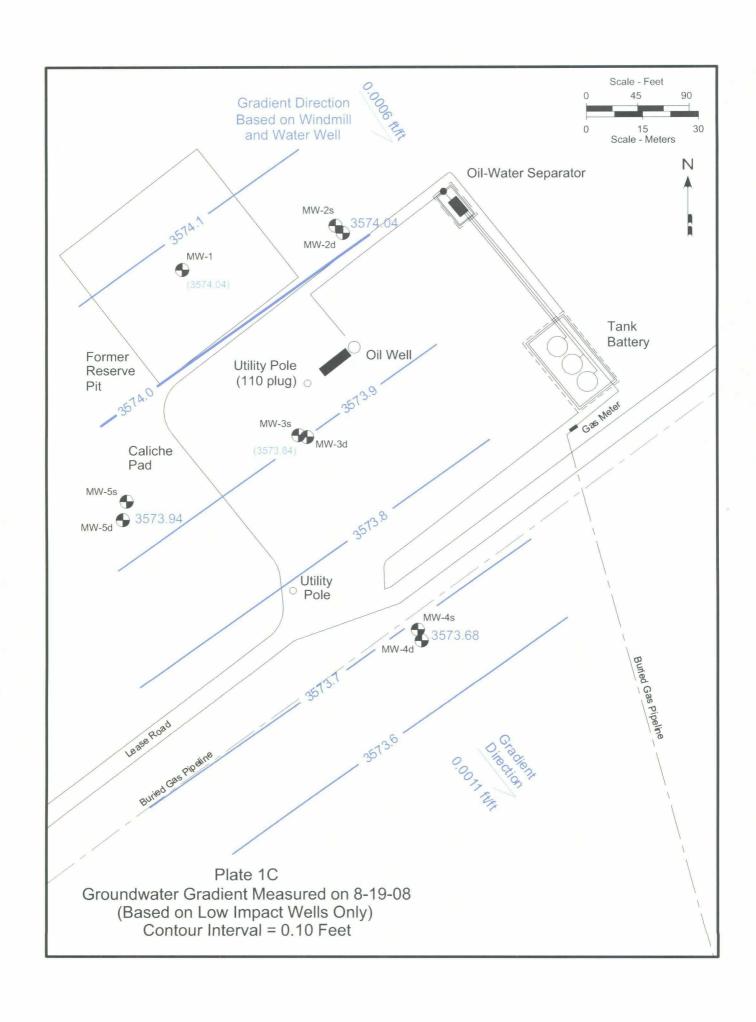
#### 4 Recommendation

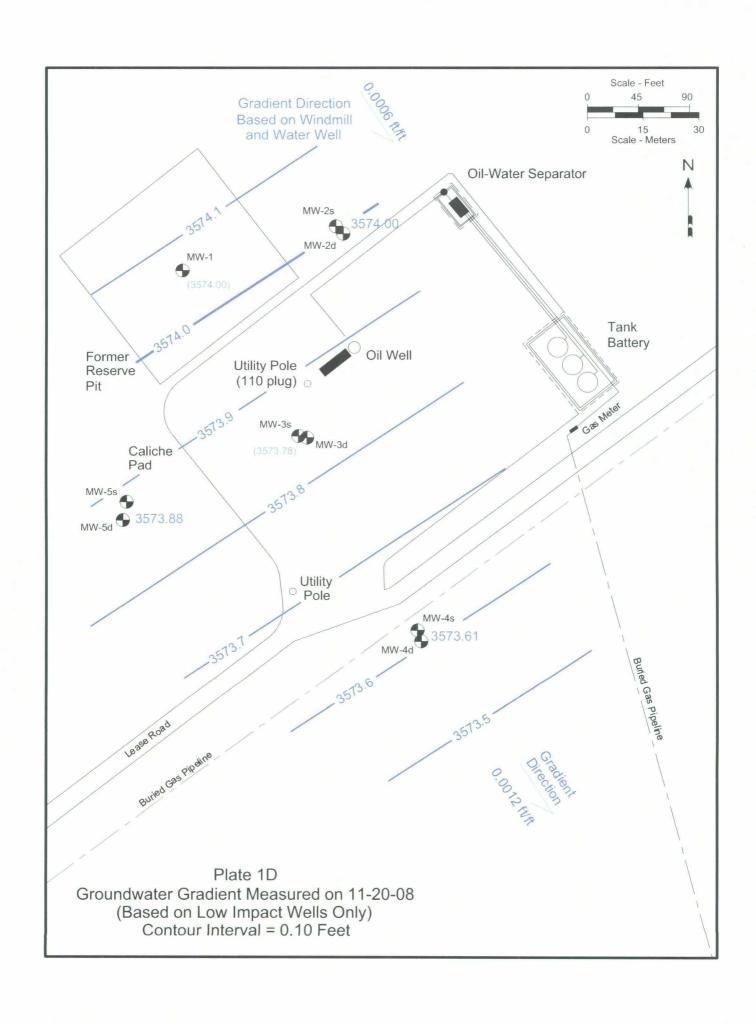
- 1. On a regular basis, use the chloride-impacted water in lieu of fresh water for drilling fluids make-up water, road dust suppression, construction water for access roads and drilling pads. Record the volume of water used each year.
- 2. Collect and analyze ground water samples on annual basis for chloride, TDS and field specific conductance from MW-1 and MW-4.
- 3. During 2009, collect and analyze ground water samples from MW-2, MW-3 and MW-5 on quarterly basis for chloride, TDS and field specific conductance.
- 4. Cease the pump and use program when
  - a. monitoring data demonstrate that the water quality is suitable for mature stock (less than 3000 mg/L TDS) or
  - b. when there is no further use for the water and provide notice to NMOCD.
- 5. Monitor the gypsum blocks in the soil moisture ports whenever on site for ground water sampling to verify that the ET cover and infiltration depression is continuing to function as designed.

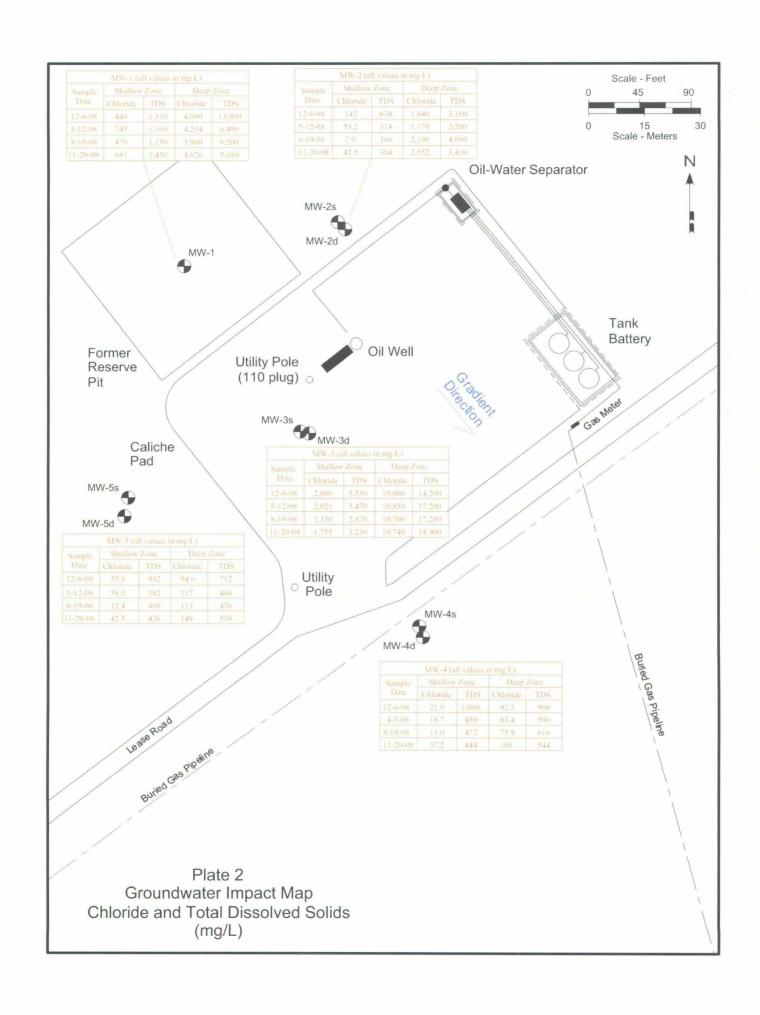
Plates











Appendix A
Chronology of Events

### Appendix A Chronology of Events

09-30-02:	Following the installation of the reserve pit, drilling of the Livestock "30" State No. 1 gas well commenced. The well lies within the Grama Ridge Morrow East Field.
04/05/04:	After the completion of the gas well, while the reserve pit was drying out in preparation for closure, a significant precipitation event flooded the reserve pit and damaged the liner. Rainwater probably flushed the chloride from the cuttings, flowed through the liner tears and caused the impact to the underlying soil and ground water.
05-11-05:	Samson contracted for the removal of the cuttings and some underlying material to a centralized facility. Soil samples collected in the excavation indicated that the material underlying the pit contained chloride concentrations and diesel-range organics but there is no evidence that regulated hydrocarbons were present in soil.
09-16-05:	Ocotillo Environmental installed nine hollow-stem auger holes within and surrounding the reserve pit. The data showed elevated chloride concentrations (>1,000 mg/kg) in at several locations from the base of the excavation to the water table (approximately 40 feet below ground surface.
09-19-05:	A sample from a temporary monitoring well (TMW-1) in the center of the pit showed elevated chloride concentrations.
Undated:	A report by Ocotillo included recommendations to over-excavate the reserve pit to a depth of 30-feet, install a 20-mil plastic liner, backfill the pit with clean soil, and install monitoring wells surrounding the area to delineate the chloride impact to ground water.
03-15-06:	Samson contracted with RT Hicks Consultants, Ltd to re-evaluate the reserve pit site and determine the feasibility of an alternate remedy for closure.
03-30-06:	TMW-1 was purged of 30 gallons of water using a disposable bailer prior to sampling to determine the concentrations of chloride and total dissolved solids. The results indicated that the chloride concentration at TMW-1 had decreased significantly from the sample recovered on 9-19-05 but remained above WQCC Standards. A water sample recovered from the windmill-equipped water well located 1,800 feet to the northwest of the site established background water quality for the area.

05-10-06:	The first of three additional ground water samples was recovered from TMW-1 over a 2-month period. In each case the well was purged of approximately 400 gallons prior to sampling. Chloride concentrations from each sample were generally consistent with the sample recovered on March 30, 2006.
06-12-06:	Hicks Consultants submitted a Corrective Action Plan (CAP) for the proposed pit closure at the Livestock "30" site to Mr. Glenn Von Gonten, with the NMOCD in Santa Fe. The CAP presented a design for an evapotranspiration (ET) cover and recommended installation of the barrier over the reserve pit area to control the migration of additional chloride into the ground water. The CAP proposed a "point-of-use" ground water remedy.
07-12-06:	A solar-powered pump installed in the 2-inch monitoring well (TMW-1) withdrew water at a rate of 1-2 gpm in order to determine if more aggressive water recovery would significantly decrease the chloride concentration in the ground water below the pit. Water discharged to the produced water tank.
08-30-06:	In a meeting with Mr. Glenn Von Gotten and David Sanchez at the NMOCD offices in Santa Fe, Hicks Consultants and Samson presented the June 12, 2006 CAP and results of the ground water purging/sampling feasibility test. The result of the meeting was a commitment to submit a Stage 1/Stage 2 Abatement Plan and to proceed with construction of the ET Infiltration Barrier in advance of NMOCD approval of the Abatement Plan.
09-22-06:	Hicks Consultants submitted a Stage 1/Stage 2 Abatement Plan to the NMOCD. The plan made minor changes to the CAP and to the planned closure of the reserve pit. The plan included a proposal to abate the chloride-impacted ground water through a point-of-use water withdrawal program.
09-28-06:	Hicks Consultants supervised closure of the former reserve pit according to the plan provided to the NMOCD on September 22, 2006.
10-23-06:	Closure of the former reserve pit was complete and the final surface topography was shaped and mapped.
10-30-06:	Hicks Consultants supervised the installation of a 4-inch monitoring/recovery well (MW-1) at the location of the former 2-inch temporary monitoring well (TMW-1). MW-1 included screened intervals at the vadose zone/ground water interface and at the base of the aquifer, above the lower confining Triassic red shale formation. In addition, three vadose zone moisture monitoring ports were installed into the backfilled pit material.

11-30-06:	Following the development of MW-1, a solar-powered pump (Abyss No. 1), was installed at the base of the aquifer. A rubber packer was placed five feet above the pump to restrict flow from the upper portion of the aquifer. Each month, a ground water sampling program sampled chloride-impacted ground water from the lower screen (pump) and upper screen (bailer).
12-18-06:	A progress report submitted to the NMOCD described the closure of the former reserve pit, provided information regarding the final ET cover and described the installation of MW-1 and vadose zone moisture monitoring ports. The proposed Abatement Plan public notice and a request to begin using the withdrawn water for use in drilling was part of this submittal.
04-17-07:	Gypsum blocks were installed in the soil moisture ports and checked to verify that they were working properly. Ground water samples were recovered from the deep screen (pump) and shallow screen (bailer) of MW-1.
05-01-07:	Replaced Abyss No. 1 with Abyss No. 2 in MW-1. Abyss No. 1 ran for approximately 3,600 hours.
05-21-07:	Direct wired the MW-1 pump to the solar power control box to by pass faulty plug. Ground water samples were recovered from the deep screen (pump) and shallow screen (bailer) of MW-1.
05-23-07:	A progress report submitted to the NMOCD described the on-going ground water recovery and monitoring efforts. A recommendation for additional monitoring well installation was part of this submittal.
05-30-07:	Hicks Consultants supervised the installation of monitoring wells MW-2(s), MW-2(d), MW-3(s), and MW-3(d) to delineate the dissolved chloride plume in the ground water. Field activities continued through June 1, 2007. MW-2(s) was fully developed and MW-2(d), MW-3(s), and MW-3(d) were partially developed. All of the new monitoring wells were surveyed to determine the casing elevations relative to MW-1.
06-13-07:	All of the monitoring wells, nearest water well, and the North windmill well were gauged. The North windmill was shut in and the pump in MW-1 was turned off on June 12, 2007 to allow the static water levels to recover. MW-2(d) and MW-3(s) were fully developed and MW-3(d) was partially developed (poor producer). All of the monitoring wells, including MW-1 (deep and shallow) were sampled.

07-18-07:	Replaced Abyss No. 2 pump after 1,800 hours of operation with Abyss No. 1R (rebuilt) pump. The monitoring well casing elevations were re-surveyed to verify the June 1, 2007 data.
08-02-07:	A progress report submitted to the NMOCD described the on-going ground water recovery /monitoring efforts, and the results of the monitoring well installation and sampling conducted in May and June 2007. A recommendation for two additional monitoring well clusters was part of this submittal.
08-07-07:	Monitoring wells MW-4(s), MW-4(d), MW-5(s), and MW-5(d) were installed to the southwest and southeast of the former reserve pit in order to complete the delineation of the dissolved chloride in the ground water. Each of the new wells were developed and surveyed to determine the casing elevations relative to the existing wells. Sediment in MW-3(d) was clean out using compressed air and the well was fully developed. All of the monitoring wells were sampled to determine the concentrations of chloride and total dissolved solids.
11-20-07:	The Final Abatement Plan was submitted to Mr. Glenn Von Goten of the NMOCD by RT Hicks Consultants on behalf of Samson.
12-06-07:	Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids. Removed Abyss No. 1R pump after approximately 3,300 hours of operation. Abyss No. 2R (rebuilt) pump was installed but failed immediately.
04-03-08:	Each of the monitoring wells were gauged. MW-4(s) and MW-4(d) (down gradient) was sampled to determine the concentrations of chloride and total dissolved solids.
05-06-08:	Installed 110-volt electric pump in MW-3(d), however the transformer for the on-site electric supply was too small to operate the 11.9-amp pump. Electrician installed new transformer and started pump at 1.5 gpm on 5/7/08.
05-12-08:	Arrived on site and found pump in MW-3(d) operating at 1.2 gpm but the water level was at the pump depth. Approximately 5,500 gallons of water had been recovered in two frac tanks since the pumping operation began. A ground water sample was recovered from the pumping well and the flow rate was choked down to 1.15 gpm. Each of the other monitoring wells were gauged and MW-1, MW-2(s), MW-2(d), MW-3(s), MW-5(s), and MW-5(d) was sampled to determine the concentrations of chloride and total dissolved solids.
06-02-08:	650 bbls of water from MW-3(d) was transported by Lobo Trucking to the Samson Osudo 33 State Com. No. 1 well for use in the drilling reserve pit.

06-04-08:	110 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.
06-19-08:	120 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.
07-03-08:	240 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.
07-15-/08:	220 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.
07-18-08:	Arrived on site and found pump in MW-3(d) operating at 1.25 gpm. A ground water sample was recovered from the pumping well but the flow rate was not adjusted.
07-23-08:	220 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.
07-30-08:	330 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.
07-31-08:	The pump in MW-3(d) was turned off, but left in the well. 660 bbls of water was transported by Key Energy to the Atha SWD for disposal. Both frac tanks were removed from the site.
08-19-08:	Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.
11-20-08:	Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

#### **Summary of Activities Completed to Date**

#### Initial Assessment

Following the discovery of elevated chloride concentrations in the soil below the former reserve pit by Samson, Ocotillio Environmental installed nine soil borings to define the extent of the impact to the soil. One of the soil borings was converted into a temporary monitoring well (TMW-1) in order to verify the impact to ground water. Details concerning these activities were provided with the September 22, 2006 Stage 1/Stage 2 Abatement Plan.

#### Closure of the Former Reserve Pit

From September 28 to October 23, 2006 the reserve pit was backfilled. An evapotranspiration (ET) cover and surface run-off infiltration area were constructed during the backfill operations. Following completion of the ET cover MW-1 was installed as a replacement to TMW-1 and three soil moisture monitoring ports were installed to verify the effectiveness of the ET cover. Detailed information concerning these activities were provided in the December 18, 2006 Progress Report. Re-seeding of the ET cover and the installation of gypsum blocks into the moisture ports occurred in April 2006. Based on monitoring of the gypsum blocks performed through August 9, 2007, as shown below, there is no indication that rain water is infiltrating the ET barrier.

#### Ground Water Pumping (Source Removal)

A solar-powered pump was installed in MW-1 on November 30, 2006, and the recovery of brine water, released for the reserve pit, along with ground water began at an average rate of 0.8 gallons per minute (gpm). All of the removed water is discharged into the on-site 500-barrel fiberglass tank, mixed with produced water from the gas well, and periodically transferred to a disposal facility. Information concerning these activities were provided in the May 23, 2007 Progress Report.

#### Dissolved Chloride Plume Delineation

Two clusters of monitoring wells, which included a shallow well screened at the surface of the aquifer and a deep well screened at the base of the aquifer, were installed to provide delineation of the chloride-impacted ground water to the northeast (MW-2) and the southeast (MW-3) of the former reserve pit. Information concerning the remediation/monitoring activities and the installation of MW-2 and MW-3 were provided in the August 2, 2007 Progress Report.

From August 7, to August 9, 2007 two additional clusters of monitoring wells were installed at the site. MW-4(s) and MW-4(d) were placed approximately 300 feet southeast from the former reserve pit to verify the down gradient extent of the chloride-impacted ground water. MW-5(s) and MW-5(d) were placed approximately 120 feet south of the former reserve pit in order to delineate the plume to the southwest of MW-3.

Each of the wells, including MW-1, MW-2, and MW-3, were drilled using a hollow-stem auger operated by Atkins Engineering of Roswell, NM. The shallow wells were screened with 20 feet of 2-inch (0.010-inch slot) PVC casing extending approximately 10 to 12 feet below the static water level and the deep wells were screened with 10 feet of similar casing placed at the base of the aquifer. Additional soil samples were not recovered during the drilling activity because the monitoring wells are located beyond the known extent of soil impact.

Following completion, each for the new wells were gauged, developed, and surveyed relative to the casing elevations of the existing monitoring wells. A site ground water gradient map was constructed using data from only MW-2, MW-4, and MW-5. Elevated dissolved solids in the

ground water at the MW-1 and MW-3 locations increase the specific gravity of the water such that measured fluid levels do not accurately reflect the potentiometric energy of the aquifer.

Ground water samples were recovered from each of the project monitoring wells using disposable bailers (shallow wells) or a small submersible pump (deep wells) to determine the concentrations of chloride and total dissolved solids (TDS) with major anion and cation analyses performed on selective samples. Information and lithologic logs concerning these activities were provided in the November 20, 2007 Final Abatement Report.

#### **Activities Completed Since Previous Update**

#### Ground Water Pumping (Source Removal)

The last of the solar-powered pumps initially installed in MW-1 on November 30, 2006 was removed on December 6, 2007. Approximately 386,769 gallons of brine water were recovered from the deep screened interval in MW-1 over 8,700 hours of operation from the three pumps. All of the removed water was discharged into the on-site 500-barrel fiberglass tank, mixed with produced water from the gas well, and periodically transferred to a disposal facility.

An additional 107,100 gallons of water was recovered from MW-3(d) using a 110-volt submersible pump. The recovered water was temporarily stored in two on-site frac tanks before being transferred to an oil well drilling operation for use in the reserve pit or transported to a disposal facility.

#### **Ground Water Monitoring**

From December 6, 2007 to November 20, 2008, four ground water monitoring event were conducted to verify the plume stability and determine the effect of the source removal operations to date.

Appendix B
Field Run Tickets

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Key Energy Serv	ices, Inc.	Key Energy Services, Inc.
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Corners Ext.	MO 22753	NO. 224101

#### **Summary of Water Removal**

Date	Company	Ticket No.	Destination	Vol. (bbls)
6/2/08	Lobo Trucking	62107	Osudo 33 St. Com. #1	390
6/2/08	Lobo Trucking	55079	Osudo 33 St. Com. #1	260
6/4/08	Key Energy	224249	Atha SWD	110
6/19/08	Key Energy	224250	Atha SWD	120
7/3/08	Key Energy	224201	Atha SWD	240
7/15/08	Key Energy	224210	Atha SWD	220
7/23/08	Key Energy	224216	Atha SWD	220
7/30/08	Key Energy	224220	Atha SWD	330
7/31/08	Key Energy	224752	Atha SWD	110
7/31/08	Key Energy	224751	Atha SWD	110
7/31/08	Key Energy	224101	Atha SWD	330
7/31/08	Key Energy	224753	Atha SWD	110
		•	Total bbls Removed	2550

Appendix C
Laboratory Reports

#### **Analytical Report 294158**

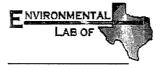
for

#### RT Hicks Consultants Ltd. (Midland)

Project Manager: Dale Littlejohn

Samson Livestock 30 L-124-1207

11-DEC-07



12600 West I-20 East Odessa, Texas 79765

A Xenco Laboratories Company

Texas certification numbers: Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America Midland - Corpus Christi - Atlanta



11-DEC-07

Project Manager: Dale Littlejohn RT Hicks Consultants Ltd. (Midland)

P.O. Box 7624

Midland, TX 79708

Reference: XENCO Report No: 294158

Samson Livestock 30
Project Address: Lea Co., NM

#### Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 294158. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 294158 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II

Odessa Laboratory Manager

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Certified and approved by numerous States and Agencies.

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#### **Sample Cross Reference 294158**

#### RT Hicks Consultants Ltd. (Midland), Midland, TX

Samson Livestock 30

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1 (Top Screen)	W	Dec-06-07 12:45		294158-001
MW-1 (Btm Screen)	W	Dec-06-07 12:50		294158-002
MW-2(s)	W	Dec-06-07 08:15		294158-003
MW-2(d)	W	Dec-06-07 14:55		294158-004
MW-3(s)	W	Dec-06-07 14:00		294158-005
MW-3(d)	W	Dec-06-07 13:35		294158-006
MW-4(s)	W	Dec-06-07 09:25		294158-007
MW-4(d)	W	Dec-06-07 10:15		294158-008
MW-5(s)	W	Dec-06-07 08:45		294158-009
MW-5(d)	W	Dec-06-07 15:22		294158-010



...

Project Id: L-124-1207

Contact: Dale Littlejohn

Project Location: Lea Co., NM

RT Hicks Consultants Ltd. (Midland), Midland, TX
Project Name: Samson Livestock 30

Certificate of Analysis Summary 294158

7

100

Date Received in Lab: Fri Dec-07-07 09:40 am

Report Date: 11-DEC-07
Project Manager: Brent Barron, II

RL $\mathbb{Z}$ Dec-06-07 13:35 Dec-07-07 18:09 Dec-10-07 15:00 294158-006 MW-3(d) WATER 10000 14200 J/gm 5.00 Z 8  $\mathbb{R}$ Dec-10-07 15:00 Dec-07-07 18:09 Dec-06-07 14:00 294158-005 MW-3(s) WATER mg/L 2800 5550 mg/L 25.0  $\mathbb{R}$ 5.00 RL Dec-10-07 15:00 Dec-07-07 18:09 Dec-06-07 14:55 294158-004 MW-2(d) WATER 1640 3160 mg/L mg/L 5.00 ΣĽ Z 5.00 Dec-06-07 08:15 Dec-07-07 18:09 Dec-10-07 15:00 294158-003 MW-2(s) mg/L 142 WATER 634 mg/L 5.00 RL50.0  $\mathbb{Z}$ MW-I (Btm Screen) Dec-07-07 18:09 Dec-10-07 15:00 Dec-06-07 12:50 294158-002 WATER mg/L 4090 13800 mg/L RL 5.00 5.00 RL Dec-10-07 15:00 MW-1 (Top Screen) Dec-07-07 18:09 Dec-06-07 12:45 294158-001 WATER 1310 440 mg/L mg/L Field Id: Depth: Matrix: Analyzed: Analyzed: Sampled: Extracted: Units/RL: Extracted: Units/RL: Residue, Filterable (TDS) by EPA Inorganic Anions by EPA 300 Analysis Requested Total dissolved solids Chloride

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations are usuals expressed the beginning the CRINCO Laboratorius. SENCO Laboratorius, SENCO Laboratorius, SENCO Laboratorius sasumes no respensibility and makes no warranty to the end use of the data hereby presented. Our flability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America

Since 1990

Odessa Laboratory Director



Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-1207

# Certificate of Analysis Summary 294158 RT Hicks Consultants Ltd. (Midland), Midland, TX

Project Name: Samson Livestock 30

Date Received in Lab: Fri Dec-07-07 09:40 am Report Date: 11-DEC-07

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Project Manager: Brent Barron. II

					I Deel Manager. Dient Dation, II	
	Lab Id:	294158-007	294158-008	294158-009	294158-010	
Analysis Donnastod	Field Id:	MW-4(s)	MW-4(d)	MW-5(s)	MW-5(d)	
Analysis nequesieu	Depth:				-	
	Matrix:	WATER	WATER	WATER	WATER	
	Sampled:	Dec-06-07 09:25	Dec-06-07 10:15	Dec-06-07 08:45	Dec-06-07 15:22	
Inorganic Anions by EPA 300	Extracted:					
	Analyzed:	Dec-07-07 18:09	Dcc-07-07 18:09	Dec-07-07 18:09	Dec-07-07 18:09	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	-
Chloride		21.0 2.50	92.3 5.00	35.8 5.00	94.6 5.00	
Residue, Filterable (TDS) by EPA	Extracted:					!
160.1	Analyzed:	Dec-10-07 15:00	Dec-10-07 15:00	Dec-10-07 15:00	Dec-10-07 15:00	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	
Total dissolved solids		1060 5.00	906 5.00	982 5.00	712 5.00	

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed introughen this enablical expert present the beauty infurent of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented Our hability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Odessa Laboratory Director

Page 5 of 9

#### XENCO Laboratories

#### Flagging Criteria

- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F RPD exceeded lab control limits.
- J The target analyte was positively identified below the MQL and above the SQL.
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- **H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K Sample analyzed outside of recommended hold time.
- \* Outside XENCO'S scope of NELAC Accreditation

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	Phone	Fax
11381 Meadowglen Lane Suite L Houston, Tx 77082-2647	(281) 589-0692	(281) 589-0695
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, Suite 104, San Antonio, TX 78238	(210) 509-3334	(201) 509-3335
2505 N. Falkenburg Rd., Tampa, FL 33619	(813) 620-2000	(813) 620-2033
5757 NW 158th St, Miami Lakes, FL 33014	(305) 823-8500	(305) 823-8555



#### **Blank Spike Recovery**

Project Name: Samson Livestock 30

Work Order #: 294158

Project ID:

L-124-1207

Lab Batch #: 710097

Sample: 710097-1-BKS

Matrix: Water

**Date Analyzed:** 12/07/2007

**Date Prepared:** 12/07/2007

Analyst: LATCOR

Reporting Units: mg/L	Batch #: 1	BLANK /BLANK SPIKE RECOV		COVERYS	STUDY	
Inorganic Anions by EPA 300	Blank Result	Spike Added	Blank Spike	Blank Spike	Control Limits	Flags
Analytes	[A]	[B]	Result [C]	%R [D]	%R	
Chloride	ND	10.0	10.2	102	90-110	

Blank Spike Recovery [D] = 100\*[C]/[B]All results are based on MDL and validated for QC purposes.



#### Form 3 - MS Recoveries

Project Name: Samson Livestock 30

Work Order #: 294158

Lab Batch #: 710097

**Project ID:** L-124-1207

**Date Analyzed:** 12/07/2007

**Date Prepared:** 12/07/2007

Analyst: LATCOR

QC- Sample ID: 294158-001 S

Batch #:

Matrix: Water

Reporting Units: mg/L	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Inorganic Anions by EPA 300  Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	440	100	544	104	90-110	

Matrix Spike Percent Recovery [D] = 100\*(C-A)/B Relative Percent Difference [E] = 200\*(C-A)/(C+B) All Results are based on MDL and Validated for QC Purposes



Chloride

#### **Sample Duplicate Recovery**

Project Name: Samson Livestock 30

Work Order #: 294158

Lab Batch #: 710097

Project ID: L-124-1207

**Date Prepared:** 12/07/2007

Analyst: LATCOR

Date Analyzed: 12/07/2007 QC- Sample ID: 294158-001 D

1 Batch #:

Matrix: Water

Reporting Units: mg/L

ng Units: mg/L	SAMPLE /	SAMPLE/SAMPLE DUPLICATE RECOVERY							
Inorganic Anions by EPA 300	Parent Sample Result [A]	Sample Duplicate Result	RPD	Control Limits %RPD	Flag				
Analyte		[B]							
	140	422	1	20					

Lab Batch #: 710180

Date Analyzed: 12/10/2007

**Date Prepared:** 12/10/2007

Analyst: RBA

**QC- Sample ID:** 294158-001 D

Batch #:

Matrix: Water -

Reporting Units: mg/L	SAMPLE / SAMPLE DUPLICATE RECOVERY							
Residue, Filterable (TDS) by EPA 160.1	Parent Sample Result [A]	Duplicate Result	RPD	Control Limits %RPD	Flag			
Analyte		[B]						
Total dissolved solids	1310	1290	2	30				

# Environmental Lab of Texas

12600 West I-20 East Odessa, Texas 79765

Phone: 432-563-1800 Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Dale Littlejohn		Project Name: Samson Livestock 30
Company Name RT Hicks Consultants Ltd	, and	Project #: L-124-1207
Company Address: P.O. Box 7624		Project Loc: Lea Co., NM
City/State/Zip: Midland, Texas 79708		PO#:
Telephone No: (432) 528-3878	Fax No: (432) 689-4578 (Fax)	
Sampler Signature: ( ) all the		

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Date

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Relinquished by:

Date

#### **Environmental Lab of Texas**

Variance/ Corrective Action Report- Sample Log-In

Client: RT Hicks			
Date/ Time: 12-07-07			
Date/ Time: 12-07-07  Lab ID#: 294158			
Initials: JMF			
THE			
Sample Receipt	Checklist		
			Client Initials
#1 Temperature of container/ cooler?	(Yes)	No :	-2-0°C not fail C
#2 Shipping container in good condition?	Yes	No	
#3 Custody Seals intact on shipping container/ cooler?	Yes	<u>No</u>	Not Present
#4 Custody Seals intact on sample bottles/ container?	Yes	No	Not Present
#5 Chain of Custody present?	(Yes)	<u>No</u>	
#6 Sample instructions complete of Chain of Custody?	\\ \text{₹Es}	<u>No</u>	
#7 Chain of Custody signed when relinquished/ received?	(Yes)	No	
#8 Chain of Custody agrees with sample label(s)?	(Yes)	No_	1D written on Cont./ Lid
#9 Container label(s) legible and intact?	(Yes>_	No	Not Applicable
#10 Sample matrix/ properties agree with Chain of Custody?	Yes	No_	
#11 Containers supplied by ELOT?	(Yes)	No	
#12 Samples in proper container/ bottle?	(Yes)	No	See Below
#13 Samples properly preserved?	Yes	No	See Below
#14 Sample bottles intact?	Yes	No	
#15 Preservations documented on Chain of Custody?	(Yes)	No	
#16 Containers documented on Chain of Custody?	<7es  √Yes	No	
#17 Sufficient sample amount for indicated test(s)?	(Yes)	No	See Below
#18 All samples received within sufficient hold time?	(Yes)	No	See Below
#19 Subcontract of sample(s)?	Yes	No	Not Applicable
#20 VOC samples have zero headspace?	Yes	No	Not Applicable
Variance Docu	mentation		
Contact: Contacted by:		,	Date/ Time:
Regarding:	•		
Regalding.			
Corrective Action Taken:			
		·····	
	<u></u>	······································	
Check all that Apply:  See attached e-mail/ fax  Client understands and wou  Cooling process had begun			

# **Analytical Report 301047**

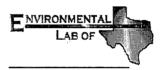
for

# R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Samson Livestock 30 L-124-0408

09-APR-08



12600 West I-20 East Odessa, Texas 79765

Texas certification numbers: Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers: Norcross(Atlanta), GA 98015

North Carolina certification numbers: Norcross(Atlanta), GA 483

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America Midland - Corpus Christi - Atlanta





09-APR-08

Project Manager: Dale Littlejohn
R.T. Hicks Consultants, LTD
On Pic Grando Plyd NW, Suita F.

901 Rio Grande Blvd. NW, Suite F-142

Albuquerque, NM 87104

Reference: XENCO Report No: 301047

Samson Livestock 30 Project Address: Lea Co., NM

#### Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 301047. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 301047 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II

Odessa Laboratory Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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# **Sample Cross Reference 301047**



# R.T. Hicks Consultants, LTD, Albuquerque, NM

Samson Livestock 30

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-4 (s)	W	Apr-03-08 13:57		301047-001
MW-4 (d)	W	Apr-03-08 13:40		301047-002



4

Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-0408

# Certificate of Analysis Summary 301047

9.44

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. Sr. Joseph !

A 1300

R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

Date Received in Lab: Thu Apr-03-08 05:00 pm Report Date: 09-APR-08

Project Manager: Brent Barron, Il

	Lab Id:	301047-001	301047-002		
Analucic Donnactod	Field Id:	MW-4 (s)	MW-4 (d)		
Armiyots Medueofea	Depth:				
	Matrix:	WATER	WATER		
	Sampled:	Sampled: Apr-03-08 13:57	Apr-03-08 13:40		
Anions by EPA 300/300.1	Extracted:				
	Analyzed:	Analyzed: Apr-04-08 12:57	Apr-04-08 12:57		
	Units/RL:	mg/L RL	mg/L RL		
Chloride		18.7 2.50	83,4 5.00	-	
TDS by SM2540C	Extracted:				
	Analyzed:	Analyzed: Apr-04-08 16:30	Apr-04-08 16:30		
	Units/RL:	mg/L RL	mg/L RL		
Total dissolved solids		450 5.00	590 5.00		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XBNCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data breety presented. Our hisbility is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Odessa Laboratory Director

# XENCO Laboratories

#### Flagging Criteria

- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit, therefore, the concentration is reported as estimated.
- F RPD exceeded lab control limits.
- J The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte.

  The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K Sample analyzed outside of recommended hold time.
- \* Outside XENCO'S scope of NELAC Accreditation

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9701 Harry Hines Blvd, Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, Suite 104, San Antonio, TX 78238	(210) 509-3334	(210) 509-3335
2505 N. Falkenburg Rd., Tampa, FL 33619	(813) 620-2000	(813) 620-2033
5757 NW 158th St, Miami Lakes, FL 33014	(305) 823-8500	(305) 823-8555
6017 Financial Dr., Norcross, GA 30071	(770) 449-8800	(770) 449-5477



# **Blank Spike Recovery**



Project Name: Samson Livestock 30

Work Order #: 301047

Project ID:

L-124-0408

Lab Batch #: 719133

Sample: 719133-1-BKS

Matrix: Water

**Date Analyzed:** 04/04/2008

**Date Prepared:** 04/04/2008

Analyst: LATCOR

Reporting Units: mg/I

1 RLANK /RLANK SPIKE RECOVERY STUDY

Reporting Units: mg/L	Batch #:	BLANK /	BLANK SPI	KE REC	OVERY	STUDY
Anions by EPA 300/300.1	Blank Result	Spike Added	Blank Spike	Blank Spike	Control Limits	Flags
Analytes	[A]	[B]	Result [C]	%R [D]	%R	
Chloride	ND	10.0	10.0	100	85-115	



# Form 3 - MS Recoveries

Project Name: Samson Livestock 30



Work Order #: 301047

Lab Batch #: 719133

**Project ID:** L-124-0408

**Date Analyzed:** 04/04/2008

**Date Prepared:** 04/04/2008

Analyst: LATCOR

QC- Sample ID: 301020-001 S

Batch #:

Matrix: Water

Reporting Units: mg/L	MATI	RIX / MA	TRIX SPIKE	RECO	VERY STU	DY
Inorganic Anions by EPA 300	Parent Sample Result	Spike Added	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes	[A]	[B]		. ,		
Chloride	679	200	903	112	85-115	

 $\label{eq:matrix_pike_Percent_Recovery} $$[D] = 100*(C-A)/B$$ Relative Percent Difference $[E] = 200*(C-A)/(C+B)$$ All Results are based on MDL and Validated for QC Purposes$ 



# **Sample Duplicate Recovery**



Project Name: Samson Livestock 30

Work Order #: 301047

**Lab Batch #:** 719133 **Date Analyzed:** 04/04/2008

Project ID: L-124-0408

4/04/2008 Analyst: LATCOR

**Date Prepared:** 04/04/2008

Matrix: Water

QC-Sample ID: 301020-001 D

Batch #: 1

Reporting Units: mg/L	SAMPLE /	SAMPLE	DUPLIC	ATE REC	OVERY
Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result	RPD	Control Limits %RPD	Flag
Analyte		[B]			
Chloride	679	685	1	20	

Lab Batch #: 719392

Date Analyzed: 04/04/2008

**Date Prepared:** 04/04/2008

Analyst: RBA

QC- Sample ID: 301047-001 D

Batch #: 1

Matrix: Water

Reporting Units: mg/L	SAMPLE /	SAMPLE	DUPLIC	ATE REC	OVERY
TDS by SM2540C	Parent Sample Result [A]	Sample Duplicate Result	RPD	Control Limits %RPD	Flag
Analyte		[B]			
Total dissolved solids	450	440	2	30	

Spike Relative Difference RPD 200 \* | (B-A)/(B+A) | All Results are based on MDL and validated for QC purposes.

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17 East 9765	ž	any	y Ad	City/State/Zip: Midland, Texas 79708	Telephone No: (432) 528-3878	Sigr					1	1	$t^-$	T	T	Γ	$\vdash$	1	$\Box$	7	_	F	3	
OF -201	Project Manager: Dale Littlejohn	Company Name RT Hicks Consultants Ltd	Company Address: P.O. Box 7624	Çİ	Tele	Sampler Signature:					1	١,								ctio		X	_   <sub>×</sub>	
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#### Environmental Lab of Texas

	Variance/ Corrective Action Rep	ort- Sampi	e Log-ir	1	
ient:	R.T. Hicks				
ate/ Time:	1.3.08 moo				
ь Ю#:	201047				
tials:	at-				
	Sample Receipt	Chaaklist			
	Sample Necept	CHECKISE		Client h	nitials
Tempera	ature of container/ cooler?	Yes	No	10.0	
	container in good condition?	Yes	No		
	Seals intact on shipping container/ cooler?	Yes	No	Not Present?	
Custody	Seals intact on sample bottles/ container?	Yes	No	Not Present	
Chain of	Custody present?	Yes"	No		
Sample	instructions complete of Chain of Custody?	Yes	No		
Chain of	Custody signed when relinquished/ received?	Yes	No		
Chain of	Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ Lid	
Containe	er label(s) legible and intact?	Yes	Nο	Not Applicable	
0 Sample	matrix/ properties agree with Chain of Custody?	Yes	No		
1 Contain	ers supplied by ELOT?	Yes	No		
2 Sample	s in proper container/ bottle?	Yés)	No	See Below	
3 Sample	s properly preserved?	Yes)	No	See Below	
	bottles intact?	Yes	No		
15 Presen	rations documented on Chain of Custody?	Yes	No		
16 Contair	ers documented on Chain of Custody?	Yes	Nο		
7 Sufficie	nt sample amount for indicated test(s)?	Yes	No	See Below	
18 All sam	ples received within sufficient hold time?	Yes	No	See Below	
19 Subcor	tract of sample(s)?	Yes,	No	Not Applicable	
20 VOC sa	amples have zero headspace?	Yes	No	Not Applicable	
		Caly	408		
	Variance Docur	nentation			
ontact:	Contacted by:			Date/ Time:	·
egarding:					
orrective A	ction Taken:				

See attached e-mail/ fax
Client understands and would like to proceed with analysis
Cooling process had begun shortly after sampling event

Check all that Apply:

# **Analytical Report 303680**

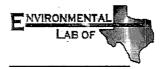
for

# R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Samson Livestock 30 L-124-0508

16-MAY-08



#### 12600 West I-20 East Odessa, Texas 79765

Texas certification numbers: Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers: Norcross(Atlanta), GA 98015

North Carolina certification numbers: Norcross(Atlanta), GA 483

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America Midland - Corpus Christi - Atlanta





16-MAY-08

Project Manager: **Dale Littlejohn R.T. Hicks Consultants, LTD**901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Reference: XENCO Report No: 303680

Samson Livestock 30

Project Address: Lea Co., NM

#### Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 303680. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 303680 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II

Odessa Laboratory Manager

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# **Sample Cross Reference 303680**



#### R.T. Hicks Consultants, LTD, Albuquerque, NM

Samson Livestock 30

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1(s)	W	May-12-08 12:05		303680-001
MW-I(d)	W	May-12-08 11:55		303680-002
MW-2(s)	W	May-12-08 13:25		303680-003
MW-2(d)	W .	May-12-08 14:00		303680-004
MW-3(s)	W	May-12-08 10:35		303680-005
MW-3(d)	W	May-12-08 09:25	•	303680-006
MW-5(s)	W	May-12-08 14:45		303680-007
MW-5(d)	W	May-12-08 15:12		303680-008



Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-0508

Certificate of Analysis Summary 303680 R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

Date Received in Lab: Mon May-12-08 05:15 pm

Report Date: 16-MAY-08

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Project Manager: Brent Barron. II

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	Lab Id:	303680-001	303680-002	303680-003	303680-004	303680-005	303680-006
Analusis Domostod	Field Id:	MW-1(s)	MW-1(d)	MW-2(s)	MW-2(d)	MW-3(s)	MW-3(d)
Antarysis mequesieu	Depth:						
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	Sampled:	May-12-08 12:05	May-12-08 11:55	May-12-08 13:25	May-12-08 14:00	May-12-08 10:35	May-12-08 09:25
Chloride by SM4500-CI- B	Extracted:						
	Analyzed:	May-13-08 11:06	May-16-08 10:03	May-13-08 11:06	May-13-08 11:06	May-13-08 11:06	May-16-08 10:03
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RI
Chloride		744.5 5.000	4254 5.000	53.18 5.000	1170 5.000	2021 5.000	10850 5.000
TDS by SM2540C	Extracted:						
	Analyzed:	May-13-08 16:30	May-13-08 16:30	May-13-08 16:30	May-13-08 16:30	May-13-08 16:30	May-13-08 16:30
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L R1
Total dissolved solids		1160 5.00	6490 5.00	314 5.00	2200 5.00	3470 5.00	17200 5.00

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interprations and reusits expressed throughout his amplitati report, persecut the best jungment of XIRXCO Laboratories. XIRXCO Laboratories assumes no responsibility and makes no warranty to the end use of the data breeful y bresented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Odessa Laboratory Director



Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-0508

# Certificate of Analysis Summary 303680

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R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

Date Received in Lab: Mon May-12-08 05:15 pm Report Date: 16-MAY-08

				D C
	Lab Id:	303680-007	303680-008	
Analysis Donnostod	Field Id:	MW-5(s)	MW-5(d)	
Analysis Requesion	Depth:			
	Matrix:	WATER	WATER	
	Sumpled:	Sampled: May-12-08 14:45	May-12-08 15:12	
Chloride by SM4500-CI- B	Extracted:			
	Analyzed:	Analyzed: May-13-08 11:06 May-13-08 11:06	May-13-08 11:06	
	Units/RL:	mg/L RL	mg/L RL	
Chloride		58.49 5.000	117.0 5.000	
TDS by SM2540C	Extracted:			
	Analyzed:	Analyzed: May-13-08 16:30	May-13-08 16:30	
	Units/RL:	mg/L RL	mg/L RL	
Total dissolved solids		382 5.00	460 5.00	

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations are results expressed throughout this amplited report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our fiability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Brent Barron Odessa Laboratory Director

# XENCO Laboratories

### Flagging Criteria

- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F RPD exceeded lab control limits.
- J The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte.

  The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- **K** Sample analyzed outside of recommended hold time.
- \* Outside XENCO'S scope of NELAC Accreditation

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Phone Fax (281) 589-0692 (281) 589-0695 11381 Meadowglen Lane Suite L Houston, Tx 77082-2647 (214) 902 0300 9701 Harry Hines Blvd , Dallas, TX 75220 (214) 351-9139 5332 Blackberry Drive, Suite 104, San Antonio, TX 78238 (210) 509-3334 (210) 509-3335 (813) 620-2000 2505 N. Falkenburg Rd., Tampa, FL 33619 (813) 620-2033 (305) 823-8500 (305) 823-8555 5757 NW 158th St, Miami Lakes, FL 33014 (770) 449-8800 (770) 449-5477 6017 Financial Dr., Norcross, GA 30071



# **Blank Spike Recovery**



**Project Name: Samson Livestock 30** 

**Work Order #:** 303680

Project ID:

L-124-0508

**Lab Batch #:** 722435

Sample: 722435-1-BKS

Result [A]

ND

Matrix: Water

Date Analyzed: 05/13/2008

Chloride by SM4500-CI-B

**Analytes** 

Date Prepared: 05/13/2008

Analyst: IRO

Reporting Units: mg/L

Batch #:
Blank

1	BLANK /E	BLANK SPI	KE REC	OVERY S	STUDY
	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags

91.46

Lab Batch #: 722838

Sample: 722838-1-BKS

Matrix: Water

91

70-125

**Date Analyzed:** 05/16/2008

**Date Prepared:** 05/16/2008

Analyst: IRO

Reporting Units: mg/L

Chloride

Ratch #:

h#: 1 BLANK/BLANK SPIKE RECOVERY STUDY

100.0

Reporting Units: mg/L	Batch #:	BLANK /	BLANK SPI	KE KEU	OVERY	STUDY
Chloride by SM4500-CI- B	Blank Result [A]	Spike Added [B]	Blank Spike Result	Blank Spike %R	Control Limits %R	Flags
Analytes	[A]	[15]	[C]	[D]	70 K	
Chloride	ND	100.0	89.33	89	70-125	



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# Form 3 - MS / MSD Recoveries

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Project Name: Samson Livestock 30

Work Order #: 303680

Date Analyzed: 05/13/2008 Lab Batch ID: 722435

Reporting Units:

Project ID: L-124-0508

Matrix: Water Batch #: QC-Sample ID: 303680-007 S

IRO Analyst: Date Prepared: 05/13/2008

Reporting Units: mg/L		M	ATRIX SPIKI	E/MAT	RIX SPII	AATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY	TE REC	VERY S	TUDY		
Chloride by SM4500-CI-B	Parent Sample	Spike	Spiked Sample Result	Spiked Sample		Duplicate Spiked Sample	Spiked Dun.	RPD	Control	Control	Flag
Analytes	Result [A]	Added [B]	[]	%R [D]	Added	Result [F]		%	%R	%RPD	D
Chloride	58.49	500.0	553.0	66	500.0	558.3	100	-	70-125	25	

QC-Sample ID: 303680-002 S Date Analyzed: 05/16/2008 Lab Batch ID: 722838

IRO Analyst: Batch #: Date Prepared: 05/16/2008

Matrix: Water

Reporting Units: mg/L		X	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY	[/MATI	RIX SPIF	KE DUPLICA'	TE REC	OVERY S	STUDY		
Chloride by SM4500-CI-B	Parent Sample		Spiked Sample Result	Spiked Sample	pike	Duplicate Spiked Sample	Spiked Dup.	RPD	Control Limits	Control Limits	Flag
Analytes	Result [A]	Added [B]	C  %R A	%R [D]	dded [E]	Result [F]		%	%R	%RPD	
Chloride	4254	10000	14040	86	10000	14250	100	2	70-125	25	

Matrix Spike Percent Recovery [D] = 100\*(C-A)/BRelative Percent Difference RPD = 200\*(D-G)/(D+G)

Matrix Spike Duplicate Percent Recovery [G] = 100\*(F-A)/E

 $ND = Not \, Detected, J = Present \, Below \, Reporting \, Limit, B = Present in \, Blank, \, NR = Not \, Requested, \, I = Interference, \, NA = Not \, ApplicableN = See \, Narrative, \, EQL = Estimated Quantitation Limit$ 



# **Sample Duplicate Recovery**



**Project Name: Samson Livestock 30** 

Work Order #: 303680

Lab Batch #: 722587

**Project ID:** L-124-0508

Date Analyzed: 05/13/2008 Date Prepared:

Analyst: WRU

QC- Sample ID: 303680-001 D

te Prepared: 05/13/2008 Batch #: 1

Matrix: Water

Reporting Units: mg/L	SAMPLE /	SAMPLE	DUPLIC	ATE REC	OVERY
TDS by SM2540C	Parent Sample Result [A]	Sample Duplicate Result	RPD	Control Limits %RPD	Flag
Analyte		[B]			
Total dissolved solids	1160	1130	3	30	

Spike Relative Difference RPD 200 \* | (B-A)/(B+A) | All Results are based on MDL and validated for QC purposes.

Sample Containers Intact? (\*) N Temperature Upon Receipt: -- (こうじが デジッド) Laboratory Comments: CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST abimo18 5/12/68/17:15 W/1dzels 10 seals Project Name: Samson Livestock 30 108 B1EX 8031E/\$030 on B1EX 8500 Project Loc: Lea Co., NM Project #: L-124-0508 ... 6 Send results to Time VVarer (as Date podal Instructions. Send Invoice to RT Hicks Consult, 901 Rio Grande Bivd, NW, Suite F-142, Albuquerque, NM 87104; Daie Littlejohn at the adress above. Fax No. (432) 689-4578 (Fax) \*05<sup>2</sup>H HOPN HCI HNO H977100 No. of Containers 1325 ノング 1400 1035 1445 5290 1155 undrea 5/12/08 5/12/08 5/12/08 5/12/08 5/12/08 5/12/08 5/12/08 5/12/08 7148 1715 **Environmental Lab of Texas** Tine 106 7 Auto 1 Phone: 432-563-1800 Fax: 432-563-1713 Company Name RT Hicks Consultants Ltd City/State/Zip: Mid/and, Texas 79708 Date FIELD CODE Telephone No: (432) 528-3878 Company Address: P.O. Box 7624 Project Manager: Dale Littlejohn Lick 7 Kittyelm MW-2(d) MW-3(s) MW-3(d) Sampler Signature: MW-1(s) MW-1(d) MW-2(s) MW-5(s) MW-5(d) 12600 West I-20 East Odessa, Texas 79765 303680 છ श्च 2 950 singuished by: lab use only) ठ

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#### Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

	RT. Hicks	port Garripi	o Log II		
Client:					
Date/ Time:	5.12.08 17.15				
Lab ID # :	303 <i>68</i> 0				
Initials:	<u> </u>				
	Sample Receipt	Checklist			
				NOT FYCZEN Client Initial	s
#1 Tempera	iture of container/ cooler?	(es)	No	5 °c	1
#2 Shipping	container in good condition?	(Yes)	No		1
#3 Custody	Seals intact on shipping container/ cooler?	Yes	No	Not Present>	1
#4 Custody	Seals intact on sample bottles/ container?	Yes	No	⟨Not Present⟩	1
#5 Chain of	Custody present?	(es)	No		1
#6 Sample i	instructions complete of Chain of Custody?	(es)	No		1
#7 Chain of	Custody signed when relinguished/ received?	(es)	No		1 '
#8 Chain of	Custody agrees with sample label(s)?	(es)	No	ID written on Cont./ Lid	1
	er label(s) legible and intact?	Ves)	No	Not Applicable	1
	matrix/ properties agree with Chain of Custody?	Yes	No	1.000	7
	ers supplied by ELOT?	Yes	No		1
	s in proper container/ bottle?	Yes	No	See Below	-
$\overline{}$	s properly preserved?	(Yes)	No	See Below	-
	bottles intact?	Yes	No	See Below	-
	ations documented on Chain of Custody?	Yes	No	<del> </del>	┨
	ers documented on Chain of Custody?	Ves	No	<del> </del>	-
	nt sample amount for indicated test(s)?	Yes	No	<del> </del>	-}
			No	See Below	-∤
	ples received within sufficient hold time?	(Yes)		See Below	4
	tract of sample(s)?	Yes	No	Not Applicable	4
#20 VOC sa	imples have zero headspace?	Yes	No	(Not Applicable	١
	Variance Docu	mentation			
Contact:	Contacted by:			Date/ Time:	
Regarding:					
Corrective Ad	ction Taken:				
Check all tha	At Apply:  See attached e-mail/ fax  Client understands and wou  Cooling process had begun				

# **Analytical Report 310635**

for

R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Samson Livestock 30 L-124-0808

25-AUG-08





12600 West I-20 East Odessa, Texas 79765

Texas certification numbers: Houston, TX T104704215 - Odessa/Midland, TX T104704215-08-TX

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers: Norcross(Atlanta), GA 98015

North Carolina certification numbers: Norcross(Atlanta), GA 483

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25-AUG-08

Project Manager: **Dale Little john R.T. Hicks Consultants, LTD**901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Reference: XENCO Report No: 310635

Samson Livestock 30 Project Address: Lea Co., NM

#### Dale Little john:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 310635. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 310635 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Brent Barron, II

Odessa Laboratory Manager

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# **Sample Cross Reference 310635**



# R.T. Hicks Consultants, LTD, Albuquerque, NM

Samson Livestock 30

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1 (s)	W	Aug-19-08 09:10		310635-001
MW-1 (d)	W	Aug-19-08 09:02		310635-002
MW-2 (s)	W	Aug-19-08 11:17		310635-003
MW-2 (d)	W	Aug-19-08 11:36		310635-004
MW-3 (s)	W	Aug-19-08 10:27		310635-005
MW-3 (d)	W	Aug-19-08 10:02		310635-006
MW-4 (s)	W	Aug-19-08 12:14		310635-007
MW-4 (d)	W	Aug-19-08 12:23		310635-008
MW-5 (s)	. W	Aug-19-08 13:20		310635-009
MW-5 (d)	W	Aug-19-08 13:15		310635-010



Project Id: L-124-0808

Certificate of Analysis Summary 310635 RT. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

Date Received in Lah: Wed Aug-20-08 03-50 n

4 . 48.6

Contact: Dale Littleiohn				Da	Date Received in Lab: Wcd Aug-20-08 03:50 pm	Wcd Aug-20-08 03:50	md
Project Location: Lea Co., NM					Report Date: 25-AUG-08	25-AUG-08	
					Project Manager:	Brent Barron, II	
	Lab Id:	310635-001	310635-002	310635-003	310635-004	310635-005	310635-006
Analysis Roanostad	Field Id:	M W-1 (s)	M W-1 (d)	M W-2 (s)	M W-2 (d)	MW-3 (s)	MW-3 (d)
maisan hay sis innit	Depth:						
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	Sampled:	Aug-19-08 09:10	Aug-19-08 09:02	Aug-19-08 11:17	Aug-19-08 11:36	Aug-19-08 10:27	Aug-19-08 10:02
Anions by EPA 300/300.1	Extracted:						
•	Analyzed:	Aug-21-08 10:10	Aug-21-08 10:10	Aug-21-08 10:10	Aug-21-08 10:10	Aug-21-08 10:10	Aug-21-08 10:10
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL
Chloride		470 10.0	3960 50.0	7.90 5.00	2190 25.0	1330 25.0	10700 100
TDS by SM2540C	Extracted:						
•	Analyzed:	Aug-21-08 16:25	Aug-21-08 16:25	Aug-21-08 16:25	Aug-21-08 16:25	Aug-21-08 16:25	Aug-21-08 16:25
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL
Total dissolved solids		1150 5.00	6200 5.00	360 5.00	4080 5.00	2870 5.00	17200 5.00

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and restulks expressed throughout this analytical represent the heaty judgment of XBNCO Laboratories. XENCO Laboratories assumes no responsibility and the sensitive of the data hereby presented. Our liability is finited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Brent Barron Odessa Laboratory Director



Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-0808

# Certificate of Analysis Summary 310635 RT. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

J. 20.00

Date Received in Lab: Wed Aug-20-08 03:50 pm

Report Date: 25-AUG-08

					Project Manager: Brent Barron II	
	Lab Id:	310635-007	310635-008	310635-009	310635-010	
Annivers Dogwood	Field Id:	MW-4 (s)	M W-4 (d)	M W-5 (s)	M W-5 (d)	
naisanhau sistinuv	Depth:					
	Matrix:	WATER	WATER	WATER	WATER	
	Sampled:	Aug-19-08 12:14	Aug-19-08 12:23	Aug-19-08 13:20	Aug-19-08 13:15	
Anions by EPA 300/300.1	Extracted:					
	Anulyzed:	Aug-21-08 10:10	Aug-21-08 10:10	Aug-21-08 10:10	Aug-21-08 10:10	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	
Chloride		13.0 5.00	75.9 5.00	12.4 5.00	113 5.00	
TDS by SM2540C	Extracted:					
•	Analyzed:	Aug-21-08 16:25	Aue-21-08 16:25	Aug-21-08 16:25	Aug-21-08 16:25	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	
Total dissolved solids		472 5.00	616 5.00	488 5.00	476 5.00	

This analytical report, and the entire data puskage it represents, has been made for your exclusive and confidential use. The interpetations and results expressed throughout this analytical reposts in the sets judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Brent Barron Odessa Laboratory Director

# XENCO Laboratories

### Flagging Criteria

- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F RPD exceeded lab control limits.
- J The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte.

  The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K Sample analyzed outside of recommended hold time.
- \* Outside XENCO'S scope of NELAC Accreditation

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9701 Harry Hines Blvd, Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, Suite 104, San Antonio, TX 78238	(210) 509-3334	(210) 509-3335
2505 N. Falkenburg Rd., Tampa, FL 33619	(813) 620-2000	(813) 620-2033
5757 NW 158th St, Miami Lakes, FL 33014	(305) 823-8500	(305) 823-8555
6017 Financial Dr., Norcross, GA 30071	(770) 449-8800	(770) 449-5477



# **Blank Spike Recovery**



Project Name: Samson Livestock 30

**Work Order #:** 310635

Project ID:

L-124-0808

Lab Batch #: 731968

Sample: 731968-1-BKS

Matrix: Water

**Date Analyzed:** 08/21/2008

**Date Prepared:** 08/21/2008

Analyst: LATCOR BLANK /BLANK SPIKE RECOVERY STUDY

Reporting Units: mg/L Bs	atch #: 1	BLANK	/BLANK SI	PIKE RE	COVERY	STUDY
Anions by EPA 300/300.1	Blank Result [A]	Spike Added [B]	Blank Spike Result	Blank Spike %R	Control Limits %R	Flags
Analytes	[A]	[5]	[C]	[D]	7010	
Chloride	ND	10.0	9.66	97	80-120	

Blank Spike Recovery [D] = 100\*[C]/[B] All results are based on MDL and validated for QC purposes.



# Form 3 - MS Recoveries

Project Name: Samson Livestock 30



**Work Order #:** 310635

Lab Batch#: 731968

Project ID: L-124-0808

**Date Analyzed:** 08/21/2008

**Date Prepared:** 08/21/2008

Analyst: LATCOR

QC-Sample ID: 310635-001 S

Batch #:

Matrix: Water

Reporting Units: mg/L	MA	TRIX / M.	ATRIX SPIF	KE REC	OVERY ST	UDY
Inorganic Anions by EPA 300  Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	470	200	717	124	80-120	Х

Matrix Spike Percent Recovery [D] = 100\*(C-A)/BRelative Percent Difference [E] = 200\*(C-A)/(C+B)All Results are based on MDL and Validated for QC Purposes



# **Sample Duplicate Recovery**



Project Name: Samson Livestock 30

Work Order #: 310635

Lab Batch #: 731968

QC-Sample ID: 310635-001 D

Project ID: L-124-0808

Analyst: LATCOR

08/21/2008 Date Prepared: **Date Analyzed:** 08/21/2008 Batch #: 1

Matrix: Water

SAMPLE/SAMPLE DUPLICATE RECOVERY Reporting Units: mg/L

Anions by EPA 300/300.1  Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	470	· 473	1	20	

Lab Batch #: 731985

**Date Analyzed:** 08/21/2008

Date Prepared: 08/21/2008 Analyst: WRU

QC- Sample ID: 310635-001 D

1 Batch #:

Matrix: Water

Reporting Units: mg/L	SAMPI	LE / SAMPL	E DUPL	ICATE RE	COVERY
TDS by SM2540C  Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Total dissolved solids	1150	1180	3	30	

Spike Relative Difference RPD 200 \* | (B-A)/(B+A) | All Results are based on MDL and validated for QC purposes.

TAT brebnet8 CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST 8/20/08/3:50 1 LPOOT WILLIAMS Project Name: Samson Livestock 30 M.O.R.M. aboratory Comments: Project Loc: Lea Co., NM Project #: L-124-0808 SAR / ESP / CEC .. 6 Send results to Time Sludge Soil Other (specify). Date Fax No: (432) 689-4578 (Fax) HO\*\*N 'ONH Chrones Lam No. of Containers ととらし 1223 0410 2963 (00 B 1320 1214 7 1136 Time Sampled 8/14/08 ٤ ٤ = 2 ź Dal Trixa, sho Environmental Lab of Texas 1260 West 120 East Phone: 432-583-1800 Odessa, Texas 79765 East 432-583-1713 Company Name RT Hicks Consultants Ltd city/State/Zip: Midland, Texas 79708 FIELD CODE Telephone No: (432) 528-3878 Company Address: P.O. Box 7624 Project Manager: Dale Littlejohn MW-1(d) MW-1(s) MW-2(s) MW-2(d) MW-3(d) MW-4(s) MW-4(d) MW-5(s) Coll Atting MW-3(s) Sampler Signature: 3/0039 8 B ΩJ 9:0 10 80 inquished by

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#### Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

Client:	P.T. Hicks
Date/ Time:	8 10 08 3.50
ab ID # :	310635
nitials:	al

#### Sample Receipt Checklist

#1	Temperature of container/ cooler?	Ves)	Nο	1.5 °C
¥2	Shipping container in good condition?	(es	No	
#3	Custody Seals intact on shipping container/ cooler?	Yes	No	MOT Present
#4	Custody Seals intact on sample bottles/ container?	Yes	No	(Not Present)
45	Chain of Custody present?	Ag S	No	
<del>7</del> 6	Sample instructions complete of Chain of Custody?	Yes	No	
<b>#</b> 7	Chain of Custody signed when relinquished/ received?	Yes)	No	
#8	Chain of Custody agrees with sample label(s)?	(e)	No	ID written on Cont./ Lid
#9	Container label(s) legible and intact?	(es)	No	Not Applicable
#10	Sample matrix/ properties agree with Chain of Custody?	Yes)	No	
#11	Containers supplied by ELOT?	(es	No	
#12	Samples in proper container/ bottle?	Yes	No	See Below
#13	Samples properly preserved?	Kes	No	See Below
#14	Sample bottles intact?	<b>©</b>	No	
#15	Preservations documented on Chain of Custody?	Ves	No	
#16	Containers documented on Chain of Custody?	(es	No	
#17	Sufficient sample amount for indicated test(s)?	Yes	No	See Below
#18		(Yes	No	See Below
#19	Subcontract of sample(s)?	Yes	No	Mot Applicable
#20	VOC samples have zero headspace?	Yes	No	Not Applicable

#### Variance Documentation

Contact:		Contacted by:	Date/ Time:	
Regarding:	_ <del>-</del>		<del></del>	
Corrective Action Taken	:			
Check all that Apply:		See attached e-mail/ fax Client understands and would like to procee Cooling process had begun shortly after sai	•	

# **Analytical Report 318487**

for

# R.T. Hicks Consultants, LTD

Project Manager: Dale Littlejohn

Samson Livestock 30 L-124-1108

26-NOV-08





#### 12600 West I-20 East Odessa, Texas 79765

Texas certification numbers:
Houston, TX T104704215-08B - Odessa/Midland, TX T104704400-08

Florida certification numbers:

Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675

Norcross(Atlanta), GA E87429

South Carolina certification numbers: Norcross(Atlanta), GA 98015

North Carolina certification numbers: Norcross(Atlanta), GA 483

Houston - Dallas - San Antonio - Tampa - Miami - Latin America Midland - Corpus Christi - Atlanta





26-NOV-08

Project Manager: Dale Littlejohn R.T. Hicks Consultants, LTD

901 Rio Grande Blvd. NW, Suite F-142

Albuquerque, NM 87104

Reference: XENCO Report No: 318487

Samson Livestock 30

Project Address: Lea Co., NM

#### Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 318487. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 318487 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II

Odessa Laboratory Manager

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# **Sample Cross Reference 318487**



# R.T. Hicks Consultants, LTD, Albuquerque, NM

Samson Livestock 30

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1 (s)	W	Nov-20-08 10:23		318487-001
MW-1 (d)	W	Nov-20-08 10:18		318487-002
MW-2 (s)	W	Nov-20-08 11:02		318487-003
MW-2 (d)	W	Nov-20-08 11:19		318487-004
MW-3 (s)	W	Nov-20-08 09:13		318487-005
MW-3 (d)	W	Nov-20-08 08:52		318487-006
MW-4 (s)	W	Nov-20-08 12:03		318487-007
MW-4 (d)	W	Nov-20-08 12:15		318487-008
MW-5 (s)	W	Nov-20-08 13:12		318487-009
MW-5 (d)	W	Nov-20-08 12:51		318487-010



Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-1108

Certificate of Analysis Summary 318487 R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

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Date Received in Lab: Fri Nov-21-08 02:37 pm

Report Date: 26-NOV-08

Project Manager: Brent Barron, II

	Lab Id:	318487-001	318487-002	318487-003	318487-004	318487-005	318487-006
Analysis Dogwood	Field Id:	MW-1 (s)	MW-1 (d)	MW-2 (s)	MW-2 (d)	MW-3 (s)	MW-3 (d)
nakan'hay siskinik	Depth:						
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	Sampled:	Nov-20-08 10:23	Nov-20-08 10:18	Nov-20-08 11:02	Nov-20-08 11:19	Nov-20-08 09:13	Nov-20-08 08:52
Chloride by SM4500-CI-B	Extracted:						
	Analyzed:	Nov-24-08 09:35					
	Units/RL:	mg/L RL					
Chloride		680.6 5.000	4626 5.000	42.54 5.000	2552 5.000	1755 5.000	10740 5.000
TDS by SM2540C	Extracted:						
	Analyzed:	Nov-24-08 16:25					
	Units/RL:	mg/L RL					
Total dissolved solids		1450 5.00	5680 5.00	384 5.00	3410 5.00	3230 5.00	14900 5.00

This analytical report, and the entire data package it represents, has been wade for your exclusive and confidential use. The interpretations are results expressed the beginning of XENCO Laboratories. XENCO Laboratories systems expenses the beginning the result use of the data hereby presented. Our finefulity is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America - Atlanta - Corpus Christi

Brent Barron Odessa Laboratory Director



Contact: Dale Littlejohn Project Location: Lea Co., NM

Project Id: L-124-1108

Certificate of Analysis Summary 318487 R.T. Hicks Consultants, LTD, Albuquerque, NM

Project Name: Samson Livestock 30

Date Received in Lab: Fri Nov-21-08 02:37 pm

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Report Date: 26-NOV-08



	Lab Id:	318487-007	318487-008	318487-009	318487-010	
Assolution Danial Contractor	Field Id:	MW-4 (s)	MW-4 (d)	MW-5 (s)	MW-5 (d)	
Allulysis Nequesieu	Depth:					
	Matrix:	WATER	WATER	WATER	WATER	
	Sumpled:	Nov-20-08 12:03	Nov-20-08 12:15	Nov-20-08 13:12	Nov-20-08 12:51	
Chloride by SM4500-CI-B	Extracted:					
	Analyzed:	Analyzed: Nov-24-08 09:35	Nov-24-08 09:35	Nov-24-08 09:35	Nov-24-08 09:35	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	
Chloride		37.22 5.000	106.4 5.000	42.54 5.000	148.9 5.000	
TDS by SM2540C	Extracted:					
	Analyzed:	Nov-24-08 16:25	Nov-24-08 16:25	Nov-24-08 16:25	Nov-24-08 16:25	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	
Total dissolved solids		444 5.00	544 5.00	426 5.00	530 5.00	

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed the tomoghout his mapfied report represent the best judgment of XBNCO Laboratories. XBNCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount myoiced for this work order unless otherwise agreed to in writing.

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Brent Barron Odessa Laboratory Director



## Flagging Criteria



- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F RPD exceeded lab control limits.
- J The target analyte was positively identified below the MQL and above the SQL.
- U Analyte was not detected.
- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte.

  The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K Sample analyzed outside of recommended hold time.

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5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
2505 North Falkenburg Rd, Tampa, FL 33619	(813) 620-2000	(813) 620-2033
5757 NW 158th St, Miami Lakes, FL 33014	(305) 823-8500	(305) 823-8555
12600 West I-20 East, Odessa, TX 79765	(432) 563-1800	(432) 563-1713
842 Cantwell Lane, Corpus Christi, TX 78408	(361) 884-0371	(361) 884-9116



# **Blank Spike Recovery**



Project Name: Samson Livestock 30

Work Order #: 318487

Project ID:

L-124-1108

Lab Batch #: 741319

Sample: 741319-1-BKS

Matrix: Water

**Date Analyzed:** 11/24/2008

Date Prepared: 11/24/2008

Analyst: LATCOR

Reporting Units: mg/L

Batch #: 1 BLANK/BLANK SPIKE RECOVERY STUDY

Reporting Units. Ing/L	Baten #:	DLANK /	BLANK SFI	KE KEU	OVERY	ן נשטני
Chloride by SM4500-CI- B	Blank Result	Spike Added	Blank Spike	Blank Spike	Control Limits	Flags
Analytes	[A]	[B]	Result [C]	%R [D]	%R	
Chloride	ND	100.0	91.46	91	70-125	

Blank Spike Recovery [D] = 100\*[C]/[B]All results are based on MDL and validated for QC purposes.



# Form 3 - MS / MSD Recoveries

Project Name: Samson Livestock 30



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S. E. L. O. S.

Work Order #: 318487

Lab Batch ID: 741319

Date Analyzed: 11/24/2008

QC-Sample ID: 318492-004 S **Date Prepared:** 11/24/2008

**Project ID:** L-124-1108

1 Matrix: Water Analyst: LATCOR Batch #:

eporting Units: mg/L		Σ	ATRIX SPIKI	E/MAT	RIX SPI	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY	re reco	OVERY !	STUDY		
Chloride by SM4500-CI- B	Parent Sample	Spike	Spiked Sample Spiked Result Sample S	Spiked Sample	Spike	1 75	Spiked Dup.	RPD	Control Limits	Control Limits	Flag
Analytes	Result [A]	Added [B]	<u>D</u>	%R [D]	Added [E]	Result [F]	%R ⊡	%	%R	%RPD	
Chloride	212.7	1000	1234	102	1000	1234	102	0	70-125	25	

Matrix Spike Duplicate Percent Recovery [G] = 100\*(F-A)/EMatrix Spike Percent Recovery [D] = 100\*(C-A)/BRelative Percent Difference RPD = 200\*(C-F)/(C+F)

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not ApplicableN = See Narrative, EQL = Estinated Quantitation Limit



# **Sample Duplicate Recovery**



Project Name: Samson Livestock 30

Work Order #: 318487

Lab Batch #: 741373

**Project ID:** L-124-1108

**Date Prepared:** 11/24/2008

Analyst: WRU

**Date Analyzed:** 11/24/2008 **QC- Sample ID:** 318487-001 D

Batch #:

Matrix: Water

Reporting Units: mg/L	SAMPLE /	SAMPLE	DUPLIC	ATE REC	OVERY
TDS by SM2540C  Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Total dissolved solids	1450	1410	3	30	

Spike Relative Difference RPD 200 \* | (B-A)/(B+A) | All Results are based on MDL and validated for QC purposes.

### RUSH TAT (Pre-Schedule Sample Containers Intact? Temperature Upon Recept: -1, to .v.c.1 fvz.v.r. Laboratory Comments: CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST Project Name: Samson Livestock 30 ME () N 31FX 8021B/5030 or BTEX 8260 Project Loc: Lea Co., NM Project #: L-124-1108 34R / ESP / CEC PO # 11 21.08 14:37 Send results to Time Ting 2001 M2108 1815 Hd1 PUBAN Sludge Date Date Fax No: (432) 689-4578 (Fax) HCI <sup>1</sup>ONH J ( 1031 No. of Containers andres Low C833 1033 51150 1215 1312 1102 1203 3101 Time Sampled Received by ELOT: 30/02/11 3 ; s ; ء ئ Ξ Call Total **Environmental Lab of Texas** Phone: 432-563-1800 Fax: 432-563-1713 Time Company Name RT Hicks Consultants Ltd City/State/Zip: Midland, Texas 79708 CO.U. Date FIELD CODE Telephone No; (432) 528-3878 Company Address: P.O. Box 7624 Project Manager: Dale Littlejohn MW-3(d) MW-4(d) MW-5(s) Sampler Signature: MW-1(s) MW-2(s) MW-1(d) MW-2(d) MW-4(s) MW-3(s) Relinquished by: Attached. 12600 West I-20 East Odessa, Texas 79765 318487 LAB# (lab use onty) 3 5 60 0 P O Ç 20 ō Inquished by.

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## Environmental Lab of Texas

	Variance/ Corrective Active	on Report- Sampl	e Log-Ir	
Client:	R.I. Hicks			
Date/ Time;	11-21-08 14:37			
Lab ID # :	<u>318487</u>			
Initials:	<u> </u>			
	Sample Re	ceipt Checklist		
	•	•		not hoten Client Initials
#1 Tempera	sture of container/ cooler?	Yes	No	-1.0 °C
#2 Shipping	container in good condition?	Yeş	No	
#3 Custody	Seals intact on shipping container/ cooler?	Yes	No	Not Present
#4 Custody	Seals intact on sample bottles/ container?	Yes	No	Not Present
#5 Chain of	Custody present?	Yes	No	
#6 Sample	instructions complete of Chain of Custody?	Yes	No	
#7 Chain of	Custody signed when relinquished/ received	? Yes	No	
#8 Chain of	Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ Lid
#9 Containe	er label(s) legible and intact?	Yes	No	Not Applicable
	matrix/ properties agree with Chain of Custo	dy? Yes	No	
	ers supplied by ELOT?	Yes	No	
	s in proper container/ bottle?	Yes	No	See Below
	s properly preserved?	Yes	No	See Below
	bottles intact?	Yes	No	300 201011
	vations documented on Chain of Custody?	Yes	No	
	ers documented on Chain of Custody?	Yes	No	
	nt sample amount for indicated test(s)?	Yes	No	See Below
	ples received within sufficient hold time?	Yes	No	See Below
	stract of sample(s)?	Yes	No	Not Applicable
	amples have zero headspace?	Yes	No	Not Applicable
#20 VOL 52	amples have zero headspace?	1 163	140	Not Applicable
	Variance	Documentation		
Contact:	Contacted by:			Date/ Time:
Regarding:				
Corrective A	ction Taken:			
Check all tha				
	Client understands at			
	Cooling process had	begun shortly after	sampling	j event

Appendix D

Historic Ground Water Data

