CITY OF TUCSON
ENVIRONMENTAL SERVICES

Do More Blue

January 25, 2013

VIA HAND DELIVERY

Ms. Gretchen Wagenseller, Project Manager
Superfund Program Unit – Southern Regional Office, ADEQ
400 W. Congress St., Suite 433
Tucson, AZ 85701

Re: Silverbell Landfill Water Quality Revolving Fund Site, Tucson, AZ
Transmittal: Completion Report for the Installation and Testing of Groundwater Monitoring Well SLM-553M

Dear Ms. Wagenseller:

The City of Tucson, Environmental Services retained Clear Creek and Associates to oversee installation of one monitoring well at the Silverbell Landfill Water Quality Assurance Revolving Fund Site (WQARF). Attached is a copy of the well completion report for your review.

If you have any questions or comments, please contact Molly Collins at (520) 837-3703.

Sincerely,

Nancy Petersen
Deputy Director

NP/MC/nr

Enclosure:
Clear Creek and Associates Reports
Completion Report for the Installation and Testing of Groundwater Monitoring Well SLM-553M, December 19, 2012

cc: Wally Wilson, City of Tucson, Water Department (email link)
Jeff Drumm, City of Tucson, Environmental Services (email link)
Molly Collins, City of Tucson, Environmental Services (email link)
Silverbell Landfill File

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COMPLETION REPORT FOR THE INSTALLATION AND TESTING OF GROUNDWATER MONITORING WELL SLM-553M

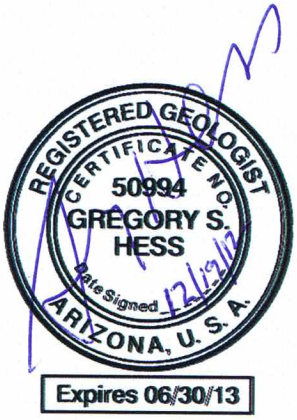
Silverbell Landfill WQARF Site
Tucson, Arizona
December 19, 2012

Prepared for:

City of Tucson Environmental Services
Price Service Center
4004 South Park Ave., Bldg. #1
Tucson, Arizona 85714

Prepared by:

Clear Creek Associates, P.L.C.
221 N. Court Avenue, Suite 101
Tucson, Arizona 85701



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EXECUTIVE SUMMARY

The City of Tucson Department of Environmental Services contracted Clear Creek Associates to design and oversee the installation of a groundwater monitor well (SLM-553M) adjacent to the Silverbell Landfill WQARF site. The well was installed immediately northwest of the intersection of Silverbell Road and Avenida Albor to identify the northwest limit of groundwater impacted by tetrachloroethylene (PCE) and other chlorinated solvents.

The borehole was drilled to a total depth of 410 feet below land surface (bls) and then backfilled to 335 feet bls after collection of depth-specific water quality samples at 50-foot intervals. The well was constructed with 5-inch PVC casing and screen; the screened interval was placed from 280 feet to 330 feet bls. A dedicated electric submersible stainless steel Grundfos pump was installed near the bottom of the screened interval.

Key findings included:

- Chlorinated solvents were not detected in any of the depth-specific samples, which were collected at 210, 260, 310, 360, and 410 feet bls.
- The nitrate concentration in the water quality sample collected from 310 feet bls exceeded the drinking water maximum contaminant level.
- The static water level was 183.6 feet bls on November 13, 2012.
- The specific capacity was 18.3 gpm per foot of drawdown at a pumping rate of 75.5 gpm.

1.0 INTRODUCTION

The City of Tucson Department of Environmental Services (Environmental Services) contracted Clear Creek Associates (Clear Creek) to oversee the installation of one groundwater monitoring well (SLM-553M) adjacent to the Silverbell Landfill Water Quality Assurance Revolving Fund (WQARF) site, in the western part of the Tucson basin, adjacent to the Santa Cruz River (Figure 1). SLM-553M was installed to evaluate concentrations of PCE and other chlorinated solvents at intermediate depths of the aquifer (approximately 100 to 150 feet below the water table) along the northwestern boundary of the WQARF site. The monitor well was installed between October 29, 2012 and November 8, 2012 immediately northwest of the intersection of Silverbell Road and Avenida Albor (Figure 1).

This report describes the following activities: permitting (Section 2.0), borehole drilling and well construction (Section 3.0), well development (Section 4.0), pumping test (Section 5.0), water quality sampling (Section 6.0), installation of a dedicated pump and sounding tube (Section 7.0), and management of investigation derived waste (Section 8.0). The data collected during drilling and testing are discussed in Section 9.0. Recommendations are provided in Section 10.0.

2.0 PERMITTING

The Arizona Department of Water Resources (ADWR) issued a drilling card to Layne Christensen Company prior to mobilization of the drilling rig. The ADWR registration number for SLM-553M[1] is 55-914838; the cadastral location is D-13-13-29aac.

Clear Creek obtained authorization for discharges from well-drilling and testing activities from the Arizona Department of Environmental Quality (ADEQ). Authorization AZDGP-73137[2], issued by ADEQ under the Arizona Pollutant Discharge Elimination System (AZPDES) General Permit for De Minimis Discharges, allowed groundwater produced during well development and testing at SLM-553M to be discharged to a tributary of the Santa Cruz River. However, all water was contained on site and no AZPDES discharges occurred.

Copies of the ADWR and ADEQ authorizations are provided in Appendix A.

[1] Authorization was obtained for two wells, initially designated as SLM-553M (55-914837; D-13-13-28ccb) and SLM-554M (55-914838; D-13-13-29aac). However, the well authorized at D-13-13-28ccb was not drilled, and the well installed at D-13-13-29aac was re-named SLM-553M.

[2] The ADEQ authorization identified the well as SLM-554M, but as described above, the well name was changed to SLM-553M.

3.0 WELL INSTALLATION

Layne Christensen Company (Layne), of Chandler, Arizona, installed the well using an AP-1000 Dual Wall Casing Hammer drilling rig. A hydrogeologist from Clear Creek oversaw the drilling, construction, development and testing of the well. The procedures used for borehole drilling and well construction were in accordance with the technical specifications (Clear Creek Associates, 2012a; Clear Creek Associates, 2012b).

3.1 OBJECTIVES AND SITE SELECTION CONSIDERATIONS

The detection of elevated concentrations of PCE and other chlorinated solvents at monitor well WR-198M (Figure 1) indicated that the extent of impacts in the intermediate groundwater zone had not been delineated along the northwestern boundary of the WQARF site (Clear Creek Associates, 2012c). A new monitor well was needed north and west of WR-198M to identify the maximum extent of impacted groundwater in this area. The location for SLM-553M (Figure 1) was selected because the site is on property owned by the City of Tucson and is accessible from Silverbell Road.

Clear Creek contacted Arizona Blue Stake to identify and clear utilities prior to the start of drilling. No utility conflicts were encountered.

3.2 BOREHOLE DRILLING

Layne drilled the borehole using a conventional casing advance drilling technique with dual-wall, 10¾-inch steel drill casing. To control dust, Layne crews added approximately 5 to 10 gallons of potable water (obtained from a nearby metered fire hydrant) for every 10 vertical feet of drilling above the water table. No other drilling fluids were added.

Auxiliary equipment included a generator, forklift, flat-bed trucks for moving equipment and material to and around the site, a hopper, and a water-tight roll-off bin to collect drill cuttings. Heavy plastic sheets were placed beneath the drilling rig and air compressor to protect the ground surface from leaked oil and hydraulic fluid.

The well was drilled entirely in unconsolidated to lightly cemented basin fill deposits consisting mostly of sand, gravel, and cobbles, with minor amounts of silt. Cuttings samples were collected at 5-foot intervals, from the land surface to the total depth of the boring. Information collected and recorded during drilling included lithology, drill rate, reaction with a 10% solution of hydrochloric acid (HCl), grain-size distribution, clast composition, and observed depth to groundwater. Photographs taken during borehole drilling and well construction are presented in Appendix B. Lithologic logs are presented in Appendix C.

3.3 MONITOR WELL CONSTRUCTION

The well was constructed in accordance with the technical specifications (Clear Creek Associates, 2012a; Clear Creek Associates, 2012b). Figure 2 presents the as-built drawing. Table 1 contains a summary of well construction information. Appendix D includes well construction field records.

3.3.1 Bottom Seal

The borehole was advanced to 410 feet bls to obtain water quality samples from the interval below the depth at which the monitor well would be completed. After collection of the last water quality sample and prior to construction of the monitor well, the borehole was backfilled with pea gravel. In order to prevent cross contamination of the deeper part of the aquifer, 5-foot seals consisting of hydrated bentonite pellets were placed at the bottom of the borehole and at the top of the backfilled interval, with the top of the upper seal located 5 feet below the bottom of the well screen (Figure 2).

3.3.2 Casing and Screen

Prior to installation, Clear Creek inspected all sections of casing and screen to ensure that each section was new, clean and undamaged, and to verify that all materials complied with the project technical specifications. Photographs of the casing and screen are presented in Appendix B.

The uppermost 21 feet of blank casing consisted of 5-inch inside diameter, schedule 40 low carbon steel pipe manufactured in accordance with ASTM Specification A53 Grade B. The steel surface casing extended from 1 foot above grade to 20 feet bls.

Below the steel surface casing, the blank casing consisted of 5-inch, Schedule 80, flush-threaded, polyvinyl chloride (PVC) pipe. The screen was 5-inch, Schedule 80, flush-threaded PVC pipe with 0.040-inch horizontal slots. The PVC blank casing and screen arrived on-site in factory-sealed packaging. A flush-threaded Schedule 40 / Schedule 80 adapter was installed between the steel surface casing and the PVC casing.

The screen and well casing were installed by threading each section together and lowering the string into the borehole incrementally. The male flush-threaded well casing was fitted with an O-ring to provide a better seal. The lowermost section of screen was fitted with a threaded, stainless steel end cap. The well casing was suspended in the borehole during annular material installation. Pipe tallies for the well casing strings are included in Appendix D.

3.3.3 Annular Materials

Annular materials were installed following installation of the well casing. The estimated volume of each material type was calculated in the field before it was installed. The depth to the top of each annular material type was verified with a weighted tape measure.

Annular materials used during monitor well construction are listed below:

- Filter pack (Carmeuse Industrial Silica Sand 8-12 Mesh)
- Fine sand (Carmeuse Industrial Silica Sand 60 Mesh)
- Bentonite Pellets (Pel-Plug)
- High Solids Bentonite Grout (Wyo-Ben Grout-Well)
- Cement-Bentonite Grout Seal (one 94-lb sack of Portland Type II cement, 3 to 5 lbs of bentonite and no more than 6.5 gallons of water)

The annular material was gravity fed from the surface while maintaining a maximum distance of 5 feet between the top of the annular material and the bottom of the drill casing, which was removed concurrently with the installation of the annular materials. The filter pack was installed to entirely fill the annulus from the top of the backfilled interval to approximately 10 feet above

the top of the screen. The well screen was swabbed for approximately 30 minutes to settle the filter pack after it was installed. Approximately 5 feet of fine sand was installed above the filter pack, and approximately 5 feet of hydrated bentonite pellets were installed above the fine sand. A high-solids (>15% solids) bentonite grout seal was then installed from the top of the hydrated bentonite pellets to approximately 30 feet bls. A cement-bentonite slurry consisting of Portland Type II cement and 3 to 5 pounds of bentonite per 94-pound bag of cement was then installed to fill the annulus from the surface completion to 30 feet bls.

3.4 Surface Completion

Verdad Group (Verdad) of Tucson, AZ installed the surface completion, including an above-grade well vault. Photographs of the well vault are included in Appendix B.

4.0 MONITOR WELL DEVELOPMENT

Layne initially developed the well by swabbing and bailing for approximately two hours. The well was further developed using a temporary electric submersible pump suspended on a 2-inch drop pipe. Approximately 27 saturated casing volumes were pumped from the well during development. The pump was installed at the top of the well screen during the initial pumping development and gradually lowered to approximately 3 feet from the bottom of the well.

A hydrogeologist from Clear Creek recorded flow rates, discharge water clarity, pH, temperature, specific conductance, and sand content to monitor development progress. The well was pumped for 215 minutes at a pumping rate of approximately 19 gpm. Development was discontinued when the discharge water was clear and field parameters were stable. Table 2 presents a summary of well development data. Development records are presented in Appendix E.

5.0 PUMPING TEST

SLM-553M was pumped for 3 hours on November 13, 2012 at rates ranging from 20 to 75.5 gpm. A constant pumping rate of 75.5 gpm was maintained for the last 90 minutes of the test. The primary objective was to calculate the specific capacity of the well. The test was conducted using a 10-horsepower (HP) Grundfos pump provided by Layne. Clear Creek monitored the discharge rate with a digital flow meter provided by Layne. Clear Creek monitored water levels with an electric water level sounder.

Figure 3 presents a graph of drawdown versus time. Appendix F presents a copy of the field data sheets. The static water level at the beginning of the test was 183.62 feet bls. Drawdown after 3 hours was 4.13 feet, which at a rate of 75.5 gpm corresponds to a specific capacity of 18.3 gpm/ft.

6.0 DEPTH-SPECIFIC WATER QUALITY SAMPLING

Depth-specific water quality samples were collected from the borehole at approximately 50-foot intervals during drilling. The purpose was to evaluate vertical trends in water quality and evaluate whether VOCs were likely to be present in the intervals above or below the interval over which the completed monitor well would be screened.

6.1 SAMPLE COLLECTION METHOD

To enable collection of depth-specific samples, Layne ceased drilling upon reaching the targeted sampling depth and raised the drill casing one foot above the bottom of the borehole. The borehole was cleaned of sediment by airlifting until the driller determined that the water was sufficiently free of sediment for safe operation of a pump (about 15 minutes). After cessation of airlifting, a temporary 1.5-HP pump, protected by a 0.040-slot well screen, was installed approximately 5 feet above the bottom of the borehole. At the land surface, the discharge assembly consisted of a sample spigot, flow meter, throttle valve, and a garden hose. Clear Creek collected water samples from the spigot after water quality parameters (temperature, specific conductivity, and pH) stabilized. The water quality samples were submitted to Turner Laboratories for analysis of selected anions and turbidity, and to the Tucson Water Quality Laboratory for VOCs analysis by EPA Method 8260B.

After Clear Creek collected the sample, Layne removed and decontaminated the temporary pump and ancillary downhole materials via steam cleaning, and resumed drilling to the next sampling depth.

6.2 ANALYSIS RESULTS

Table 3 presents a summary of the depth-specific sampling results for selected constituents. No chlorinated solvents were detected in any of the samples. Nitrate was detected above the AWQS in the 310-foot sample. Copies of the laboratory analysis reports are provided in Appendix G.

7.0 DEDICATED PUMP AND SOUNDING TUBE INSTALLATION

Verdad equipped the monitor well with an electric submersible stainless steel Grundfos pump with a 1.5-HP, three-phase motor, a 1-inch galvanized steel drop pipe, and an electric cable wired with a four-prong, 30-amp plug. The pump assembly was tested after installation and produced approximately 15 gpm.

A 2-inch, Schedule 40 flush-threaded PVC sounding tube was installed from the wellhead to approximately 6 feet above the pump intake. The bottom 10 feet of the sounding tube consists of Schedule 40 PVC with 0.010-inch horizontal slots and a bottom cap.

Pump setting and sounding tube installation depths are shown on Figure 2 and are summarized on Table 4.

8.0 MANAGEMENT OF INVESTIGATION DERIVED WASTE (IDW)

IDW included drill cuttings and water generated during drilling, development, testing, and equipment decontamination. Other waste included miscellaneous litter and debris, which was cleaned up and removed for proper disposal at the end of every work day.

8.1 DRILL CUTTINGS

Drill cuttings were contained in a watertight roll-off bin during drilling. At the completion of drilling, the cuttings were removed from the roll-off bin and spread evenly across the ground surface at the well site, in a manner that would not interfere with future access.

8.2 LIQUIDS

8.2.1 Water Generated During Drilling, Development, and Testing

Layne constructed a temporary retention area with drill cuttings and native soil to prevent the water generated during drilling, development and testing from leaving the site. Water generated during drilling was discharged to a roll-off bin and subsequently transferred to the ground surface and directed into the retention area. Water generated during depth-specific sampling, well development and testing was discharged directly to the ground surface and directed into the retention area.

8.2.2 Decontamination Water

Down-hole drilling and sampling equipment was decontaminated by steam cleaning. The volume of water generated during decontamination procedures was minimal, and was discharged to the ground surface.

9.0 DISCUSSION

This field investigation provided water quality data, lithology data, and specific capacity data along the northwestern boundary of the Silverbell Landfill WQARF site. The findings are summarized below.

9.1 Water Quality

9.1.1 Volatile Organic Compounds

SLM-553M is located in an area where the northwest limit of groundwater impacted by chlorinated solvents had yet to be defined. No monitor wells screened at intermediate depths of the aquifer previously existed in the area northwest of WR-198M, where elevated concentrations of PCE and other chlorinated solvents have been detected.

Chlorinated solvents were not detected in any depth-specific samples from SLM-553M, which indicates that the northwestern extent of the intermediate plume is located between WR-198M and SLM-553M.

9.1.2 Nitrate and Chloride/Bromide Data

Nitrate concentrations and ratios of chloride concentrations to bromide concentrations (Cl/Br ratios) are typically higher in reclaimed wastewater than in ambient Tucson basin groundwater. The nitrate and Cl/Br ratio data collected during drilling were useful for evaluating the influence of the upgradient Sweetwater recharge facilities on water quality at SLM-553M. The Cl/Br ratios were highest in the uppermost samples from the borehole, which is consistent with the expectation that shallow intervals of the aquifer would be more likely to contain larger fractions of recharged reclaimed water than deeper intervals.

9.2 Specific Capacity

Specific capacity measured during the pumping test averaged approximately 18 gpm/ft. This value is within the range of specific capacity data for monitor wells around the site.

9.3 Lithology

SLM-553M was drilled in unconsolidated to lightly cemented, poorly sorted basin fill deposits consisting mostly of subrounded to subangular sand, gravel, and cobbles, with minor amounts of silt. No significant vertical trends were observed in the distribution of grain sizes. Clast composition was mixed, but predominantly volcanic. In the interval from 300 feet to 410 feet bls a strong hydrochloric acid reaction along with visible calcite growth and lightly cemented sands was observed.

In general, the lithology was consistent with other monitor wells drilled at the site.

9.4 Static Water Level

The static water level was 183.6 feet bls on November 13, 2012, which corresponds to a water level elevation of approximately 2,083 feet above mean sea level.

10.0 RECOMMENDATIONS

Clear Creek offers the following recommendations for Environmental Services' consideration.

- At least one additional monitoring well is recommended to evaluate the extent of impacted groundwater south of SLM-553M and west of WR-198M. If the western extent of the contaminant plume is not defined, the effectiveness of future remediation activities cannot be assessed.

- The contaminant transport model should be updated with water quality data obtained from WR-198M, SLM-553M, and the additional monitoring well recommended above, to evaluate the impact of the previously recommended extraction and reinjection well locations (Clear Creek Associates, 2011) on the northwestern extent of the intermediate plume.

11.0 REFERENCES CITED

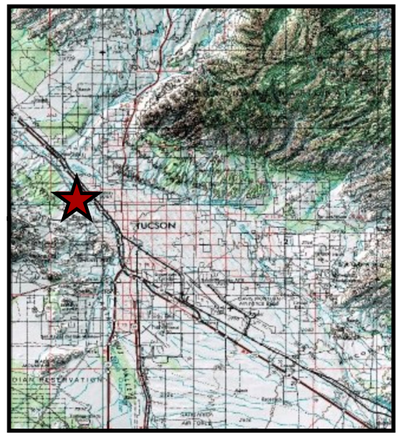
Clear Creek Associates, 2012a. Technical Specifications, Monitor Well Drilling & Construction for Silverbell Landfill, Intermediate Aquifer Characterization. WR-298M, WR-205M, WR-433M, SLM-552, SLM-552M. Prepared for City of Tucson Environmental Services, April 5, 2012.

Clear Creek Associates, 2012b. Addendum No. 2, Drilling and Installation of Monitor Wells at the Silverbell Landfill WQARF Site, Tucson, AZ. Addendum to the Project Technical Specifications Dated April 5, 2012: Two (2) Additional Monitor Wells West of Silverbell Road, October 8, 2012.

Clear Creek Associates, 2012c. Completion Report for the Installation and Testing of Groundwater Monitoring Wells SLM-552, SLM 552M, WR-198M, WR-205M and WR-433M. Prepared for City of Tucson Environmental Services, October 10, 2012.

Clear Creek Associates, 2011. Remedial Action Plan Implementation – Updated Modeling Study for Phase I Implementation Alternatives, Silverbell Landfill WQARF Site, Tucson, Arizona. Prepared for City of Tucson Environmental Services, October 3, 2011.

FIGURES



Legend

- SLM-553M
- Other Monitor Well Drilled 2012
- Approximate Landfill Boundary

N

0 375 750 1,500 Feet

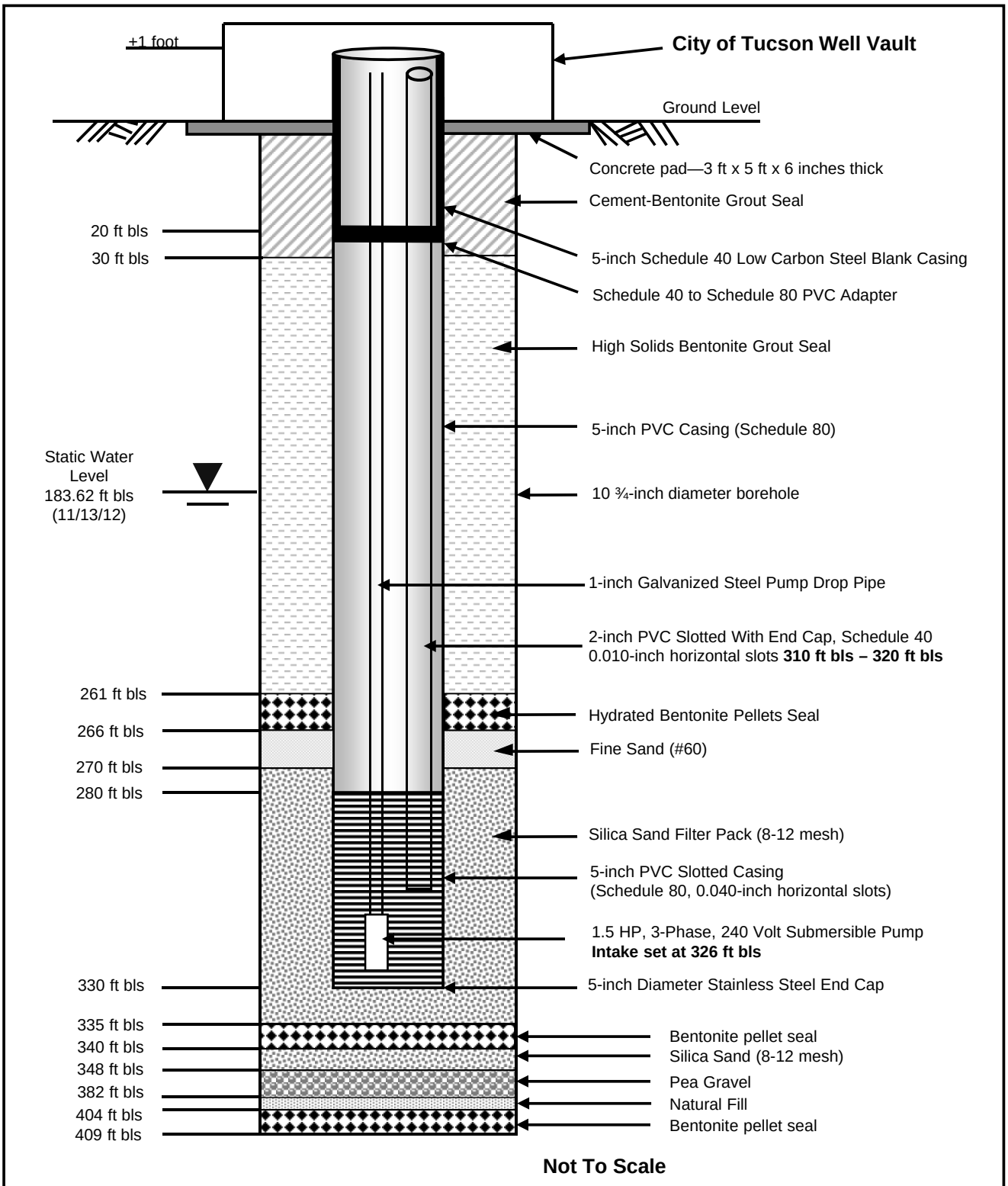
1:7,500

Figure 1
Location of Silverbell
Monitor Well
SLM-553M

Project No. 077045

CLEAR CREEK ASSOCIATES

CITY OF TUCSON



CITY OF TUCSON

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Figure 2
Monitor Well
SLM-553M
As-Built Drawing

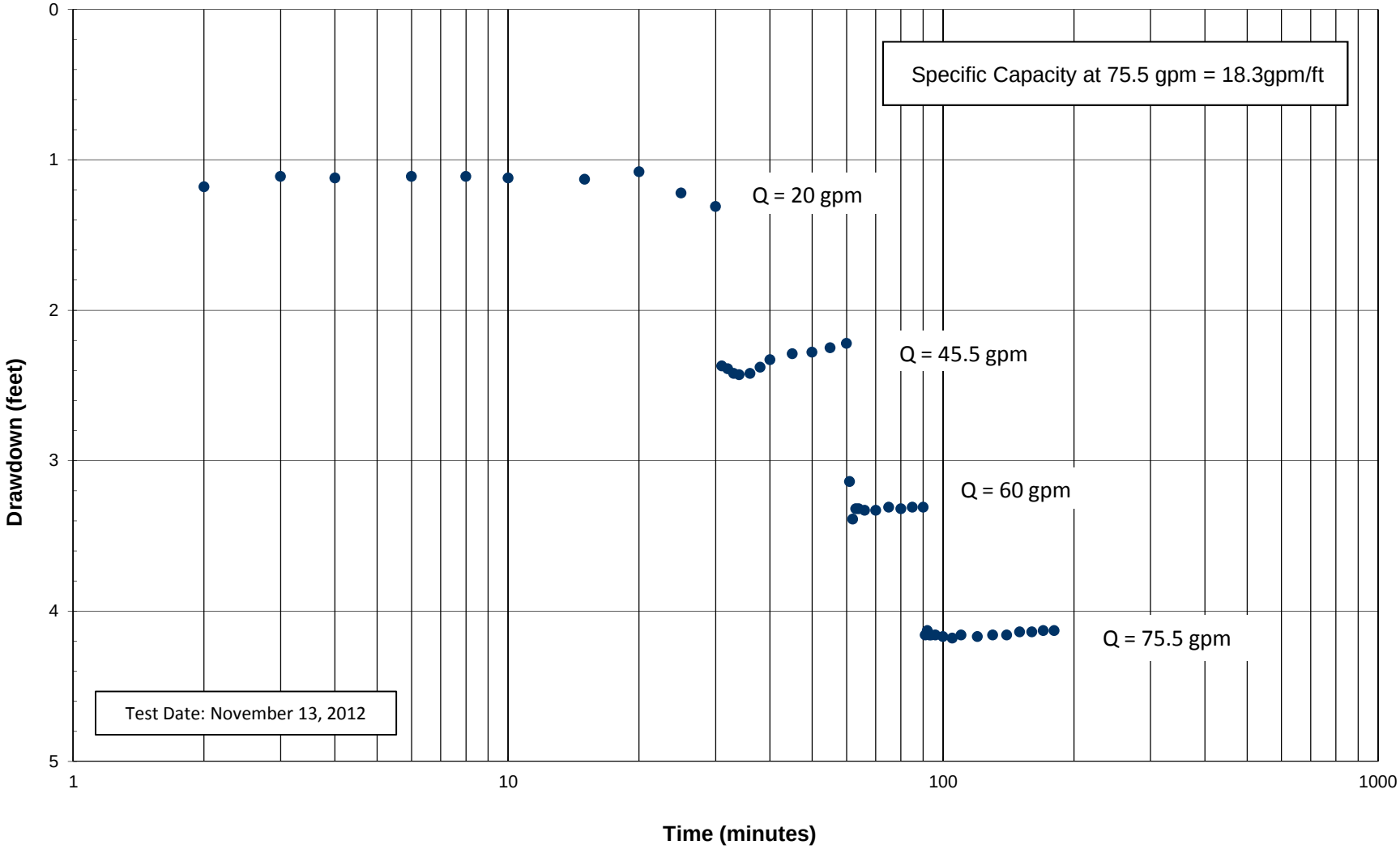

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Figure 3.
SLM-553M
Pumping Test Results
Silverbell Landfill WQARF Site

V:\Projects\City of Tucson\Silverbell\077045 Two Monitor Wells West\Field Documents\SLM-553M Aquifer Test

TABLES

TABLE 1. Summary of Well Construction Data
Monitor Well SLM-553M
Silverbell Landfill Tucson, Arizona

Well #	ADWR#	Borehole Depth (ft. bls)	Screened Interval (ft. bls)	Screen Type	Static Water Level (ft bls)	Date Completed	Latitude	Longitude
SLM-553M	55-914838	410	280-330	0.040-inch horizontal slots	183.62	11/8/2012	32.27695°	111.03247°

Notes: bls = below land surface
Spatial datum is NAD 83, projection is State Plane, AZ Central, international feet
Latitude and Longitude were obtained from a handheld GPS

TABLE 2. Summary of Well Development Data

Monitor Well SLM-553M

Silverbell Landfill Tucson, Arizona

Well #	Date Developed	Time Pumped (min)	Volume Pumped (Gal)	Casing Volumes	Sand Content (ml/l)	pH	Conductivity (µS/cm)	Temperature (degrees F)
SLM-553M	11/12/2012	215	4039	27	Trace	7.36	1261	72.5

Notes: Casing Volumes = gallons pumped ÷ saturated casing volume

Groundwater parameters were measured at the end of well development

CLEAR CREEK ASSOCIATES

TABLE 3. Summary of Depth-Specific Sampling Results
Monitor Well SLM-553M
Silverbell Landfill Tucson, Arizona

Well ID	Screen Interval in Completed Well	Static Water Level (ft bls) [1]	Borehole WQ Sample Depth (ft bls)	Sample Date	PCE	TCE	CDCE	VC	1,1-DCA	DCFA	TCFA	Toluene	Bromide (mg/L)	Chloride (mg/L)	Cl/Br Ratio (mg/L / mg/L)	Sulfate (mg/L)	Nitrate (mg/L)
SLM-553M	280 - 330	183.62	**210**	10/30/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	40.5	0.27	140	519	140	7.2
			260	10/31/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	0.23	120	522	110	6.5
			310	10/31/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.6	0.28	100	357	230	**11.0**
			310*	10/31/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.7	0.29	100	345	210	**11.0**
			360	11/01/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.25	47	188	270	1.9
			410	11/02/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	11.8	0.17	67	394	170	1.9

All results in ug/L unless stated otherwise.
VOC samples analyzed by Tucson Water Quality Laboratory.
Anion samples analyzed by Turner Laboratories.
* Duplicate sample.
[1] Static Water Level measured in completed well prior to specific capacity test.
Bold numbers indicate an exceedance of the maximum contaminant level.

PCE tetrachloroethene
TCE trichloroethene
CDCE cis-1,2-dichloroethene
TCFA trichlorofluoromethane
DCFA dichlorodifluoromethane
1,1-DCA 1,1-dichloroethane
VC Vinyl Chloride

TABLE 4. Pump Installation Summary

Monitor Well SLM-553M

Silverbell Landfill Tucson, Arizona

	Pump				Motor			Sounder Tube	
Well #	**Pump Type**	**Prod. No.**	**Pump Diameter (inches)**	**Intake Depth (ft. bls)**	**Type**	**Model #**	**Horsepower**	**Material**	**Screen Interval (ft. bls)**
SLM-553M	Grundfos MS-402	79302005	4	326.4	Grundfos 16S15-14	B10010014-P11228	1.5	2" Sch 40 PVC 0.010"	310-320

Notes: ft. bls = feet below land surface

Motor is 3-Phase

All drop pipe is 1" galvanized steel

CLEAR CREEK ASSOCIATES

APPENDIX A

ADWR AND ADEQ AUTHORIZATIONS

ARIZONA DEPARTMENT OF WATER RESOURCES
3550 N. Central Avenue Suite 200
Phoenix, Arizona 85012

DRILLING CARD
SPECIAL REQUIRMENTS APPLY (WQARF/SUPERFUND)

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: **55-914838**

AUTHORIZED DRILLER: **LAYNE CHRISTENSEN COMPANY** LICENSE NO: **7**

NOTICE OF INTENT TO **DRILL A MONITOR WELL** HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **City of Tucson Environmental Services**

ADDRESS: **4004 S. Park Ave., PO Box 27210, Tucson, AZ, 85726-7210**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

SW 1/4 of the **NE** 1/4 of the **NE** 1/4 Section **29** Township **13 S** Range **13 E**

NO. OF WELLS IN THIS PROJECT: **1** ASSESSOR'S PARCEL NO: **103-10-001D**

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **10/21/2013**

THE DRILLER MUST FILE A WELL DRILLER REPORT AND WELL LOG WITHIN 30 DAYS OF COMPLETION OF DRILLING

This drilling or abandonment authority was granted based upon the certifications made by the above-named Driller in the notice of intent to drill or abandon. Those certifications, along with any variances granted, are listed below. By drilling or abandoning the well pursuant to this authorization, the above-named driller acknowledges the accuracy of the driller certifications. If the certifications are in error, this authorization is invalid and driller must contact the Department of Water Resource's NOI Section in writing at the address above to correct.

AUTHORIZATION OF THIS WELL IS PURSUANT TO A.R.S. § 45-454(F)(1).

Variance(s) Granted To Driller: **None**

Certification(s) Made By Driller:

- b By checking this box, I certify that I have all necessary Registrar of Contractor (ROC) licenses in all necessary license categories for this drilling or abandonment project and that those licenses are current.
- b If the landowner and the well owner are not the same, by checking this box, I certify that I have obtained written approval from the landowner in order to conduct this drilling or abandonment project. A copy of the written approval shall be submitted to ADWR with the Well Driller Report and Well Log or Well Abandonment Completion Report within 30 days of completion of drilling or abandonment.
- b I understand that this well site is located within the boundaries of a contamination area and that special construction or abandonment requirements shall be complied with, and by checking this box, I certify that I have read the applicable special requirements, and that I shall comply with those standards.
- b By checking this box, I certify that this NOI application is not an application to replace, deepen, or modify an existing well.

b By checking this box, I certify that the landowner has met the conditions applicable to the selected exemption, as outlined in A.R.S. § 45-454(F). I further certify that within 30 days of completion of drilling, I will submit to ADWR with the Well Driller Report and Well log one of the following: (1) documentation demonstrating that the well is for an approved Department of Environmental Quality or United States Environmental Protection Agency remediation program, or (2) a copy of a registered geologist's certification that the well is for the purpose of remediation.

b By checking this box, I certify that I have been authorized by the above-named well owner to submit this Notice of Intent on the well owner's behalf.

b By checking this box, I certify that the information above is complete and correct, and that the well shall be drilled or abandoned in compliance with all pertinent statutes and rules, including any special standards that may be required to protect the aquifer or other water sources.

Form# prdemincert.rdf

ADEQ

Authorization Certificate for De Minimis Discharges
under the AZPDES De Minimis General Permit

Arizona Department of Environmental Quality
1110 West Washington Street, 5415A-1 · Phoenix, Arizona 85007
(Office) (602) 771-4585· (Fax) 602-771-4528

De Minimis General Permit Authorization Certificate

Authorization Number: AZDGP-73137

Effective Date: 10/25/2012 (UPDATED TO INCLUDE WELL TESTING)

Application Information:

ID Number:	73137	**Project:**	SILVERBELL LANDFILL MONITOR WELL SLM-554M	**Received:**	10/10/2012
Inventory #:	106173	**Type:**	SINGLE		
Prior Permit:					

Owner Information:

First:	MOLLY	**Last**	COLLINS	**Phone:**	(520) 837-3703
Business:	CITY OF TUCSON ENVIRONMENTAL SERVICES			**Fax:**	
Address:	4004 S. PARK AVE., BDG. 1				
City:	TUCSON	**State:**	AZ	**Zip:**	85714

Project/Site Information:

Estimated dates:

Project:	SILVERBELL LANDFILL MONITOR WELL SLM-	**Phone:**		**Start:**	10/15/2012
Address:	(SEE ACCESS DIRECTIONS)	**County:**	PIMA	**End:**	02/28/2013
City:	TUCSON AZ - PIMA COUNTY				
Access:	NORTHEAST OF AVENIDA ALBOR AND BOYER LANE, TUCSON, AZ (NORTHWEST OF SILVERBELL GOLF COURSE)				

DWR Well Reg No: 55- PND

Other IDs:

Source(s) of Discharge:

- Well installation / development
- Well testing, purging
- Wells assoc. with remediation

Discharge To:

Ephemeral

Latitude:	321635.7
Longitude:	1110159.0
Watershed:	SANTA CRUZ
Closest Water:	UNNAMED WASH
Perennial/Int. Water:	GILA R. BELOW GILLESPIE DAM

Distance from perennial/int. 100 miles

Discharge into MS4 or conveyance? Yes

MS4/Conveyance:

TUCSON, PIMA COUNTY

Best Management Practices Plan (BMPP):

First:	GREG	**Last:**	HESS	**Phone:**	(520) 622-3222
Business:	CLEAR CREEK ASSOCIATES			**BMPP Confirmation**	Y
Address:	221 N. COURT AVE., SUITE 101				
City:	TUCSON	**State:**	AZ	**Zip:**	85701
				BMPP Submitted:	N

Certification (Owner-Operator or Operator):

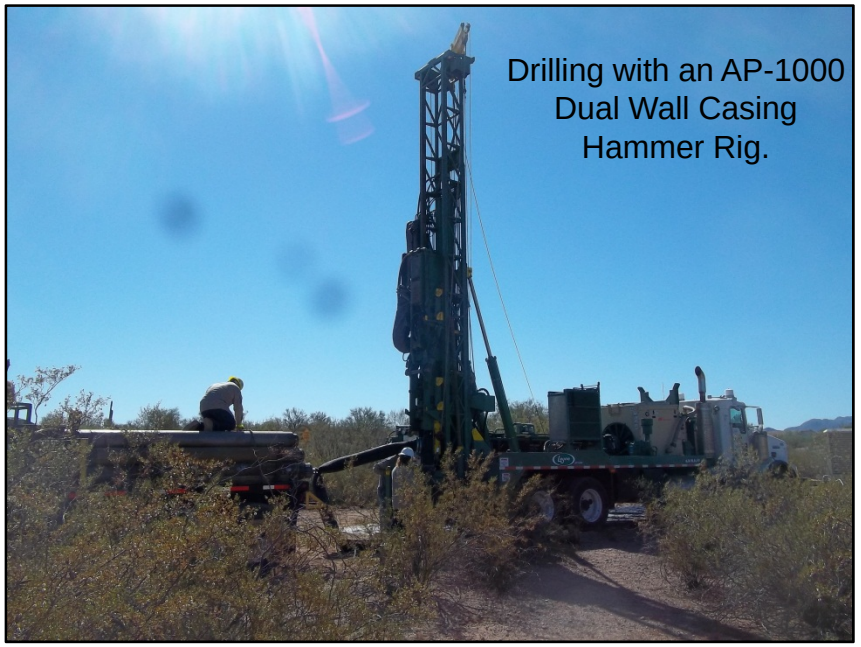
First:	GREG	**Last:**	HESS	**Phone:**	(520) 622-3222
Business:	CLEAR CREEK ASSOCIATES				
Address:	221 N. COURT AVE., SUITE 101			**Certification Signed:**	Y
City:	TUCSON	**State:**	AZ	**Zip:**	85701

APPENDIX B

PHOTOGRAPHS

SLM-553M Drilling

Dual Wall
10 ¾-inch outer diameter drill pipe.



Drilling with an AP-1000 Dual Wall Casing Hammer Rig.

The 1.5-horsepower pump used for depth-specific sampling was decontaminated prior to each use via power washing.

Drill cuttings and water generated from drilling enter an energy dissipating cyclone and are deposited into a water tight roll-off bin. Samples were collected at 5-foot intervals.

SLM-553M Construction

5-inch, Schedule 40, Low Carbon Steel Casing, flush-threaded, used for upper 21ft of well.

Annular materials included hydrated bentonite pellets, 8-12 mesh sand, #60 (fine) sand, bentonite grout and cement grout, which were gravity fed between the drill pipe and the well casing.

Factory sealed, 5-inch, Schedule 80 PVC well casing and well screen with 0.040-inch horizontal slots.

SLM-553M Development

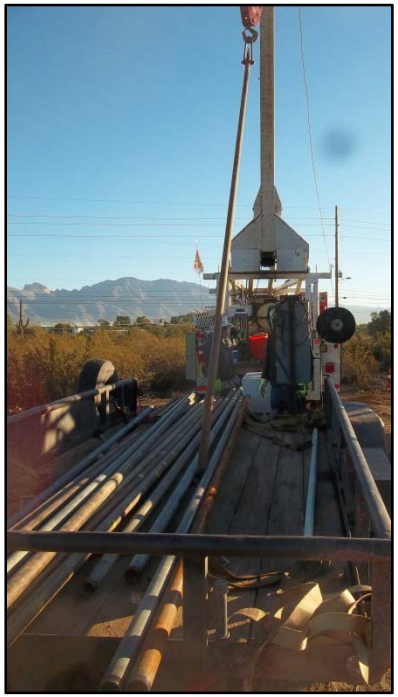
Initial Development by Swab and Bailing (2.5 gal capacity Bailer)

Development pump lowered with 1¼-inch PVC pipe

Discharge of development water directly to surface north of well

SLM-553M Aquifer Testing

Grundfos 10Hp Test Pump, lowered with 2-inch steel drop pipe.



Water discharged to surface north of well; extent of the discharge was contained to a bermed retention area constructed by Layne Personnel

SLM-553M Completion

Grundfos MS402 Pump with 1.5 Hp motor. Intake set at 326.4 feet bls.

1-inch galvanized steel drop pipe; Sounding tube is 2-inch Schedule 40 PVC with 0.010-inch horizontal slots from 310-320 feet bls with a PVC end cap.

Above ground, Tucson Vault Surface Completion

Drill cuttings were evenly smoothed out south and west of the well site.

The retention area was filled in and leveled to the surface.

APPENDIX C

LITHOLOGIC LOG

Project No.: 077045	**Boring Name: SLM-553M**
Project Name: CoT/Two Monitor Wells West Silverbell	**Date/ Time Started: 10/29/12 13:07**
ADWR Number: 55-914838	**Date/Time Completed: 11/1/12 14:34**
Location Cadastral: S29 T13S R13E	**Drilling Equipment: AP 1000**
Location NAD 83: N 32.27695° W 111.03247°	**Drilling Method: Becker Hammer Rig**
Drill Company: Layne Christensen Company	**Bit Size/Type: 10 ¾"**
Driller(s): Bo Peterson	**Conductor Casing (type; diameter; depth):**
Logged By: MML	**Total Borehole Depth: 410 feet**

*** Percentages of fines, sand, & gravels based on visual estimates of volume**

- ■ **Relative % fines (F < 0.06 mm)**
- □ **Relative % sand (S >0.06 < 2 mm)**
- ▨ **Relative % gravel (G > 2 mm)**

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
0	10	80	10		2	Weak	10YR 5/3	Gravelly Sand with Silt - Brown. Some silty fines. Sand is fine to coarse, subround and subangular, felsic dominated grains. Gravel is mostly <1cm, few up to 2cm, subround and subangular, larger grains consist mostly of red breccia and a greyish welded tuff. Poorly sorted. Oxidation staining present of felsic grains.	Begin Drilling 10/29/12 13:07 Munsell colors describes dry color unless noted otherwise. Fine material blowing in wind
5	10	80	10			Weak	7.5YR 5/3	Gravelly Sand with Silt - Brown. Description is the same as described above except more poorly sorted (sand grains in particular are less coarse).	
10	0	80	20		1.7	Weak	7.5YR 5/3	Gravelly Sand - Brown. Fine to coarse sand. Gravel up to 1.5cm, mostly subangular grains, poorly sorted. Felsic grains show yellow-orange oxidation staining. Gravels have same lithology as above.	
15	10	40	50			Strong	7.5YR 6/2	Sandy Gravel - Pinkish Grey. Silty fines. Sand is mainly fine to medium grained. Gravel up to 3cm. Subangular and subround, very poorly sorted, felsic dominated. Less oxidation than above.	
20	10	50	40		1	Moderate	7.5YR 6/2	Gravelly Sand - Pinkish Grey. Silty fines, fine to coarse sand. Gravel mostly <2cm. Poorly sorted, subround to subangluar.	
25	10	40	50			Strong	7.5YR 6/2	Sandy Gravel - Pinkish Grey. Silty fines. Fine to coarse sand. Fine to coarse gravel (4.5cm). Subangular to subround, felsic dominated, very poorly sorted.	

CLEAR CREEK ASSOCIATES

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
30	0	70	30		1.1	None	7.5YR 6/3	Gravelly Sand - Light Brown. Medium to coarse sand. Fine gravel, up to 2cm. Subround, moderate sorting.	Pouring approximately 5gal of water downhole for dust control
35	20	40	40			None	10YR 7/3	Sandy Gravel - Very Pale Brown. Silty fines. Mostly very fine to medium sand. Fine gravel up to 4 cm. Very poorly sorted, subangular/subround.	
40	10	30	60		1	None	7.5YR 7/2	Sandy Gravel - Pinkish Grey. Silty fines. Mostly fine sand. Gravel up to 3 cm, subround to subangular, poorly sorted. Larger grains are predominantly grey-purple welded tuff.	
45	0	70	30			None	7.5YR 6/2	Gravelly Sand - Pinkish Grey. Very fine to coarse sand. Gravel up to 2.5 cm. Subangular to subround, poorly sorted.	
50	0	80	20		1.3	None	7.5YR 6/3	Gravelly Sand - Light Brown, else same as described above.	
55	10	30	60			None	7.5YR 7/2	Sandy Gravel - Pinkish Grey. Silty fines, fine to coarse sand. Gravel is fine to coarse (5cm). Subround to subangular, very poorly sorted. Dominant lithology is still greyish purple welded tuff.	
60	0	70	30		1.1	None	7.5YR 6/3	Gravelly Sand - Light Brown. Fine to coarse sand. Most gravel is fine to 3cm, with a couple up to 5cm. Poorly sorted, subround to subangular.	
65	0	80	20			None	7.5YR 6/3	Gravelly Sand - Light Brown. Fine to coarse sand. Fine gravel up to 2cm. Subround to subangular, moderately well sorted.	

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
70	0	90	10		2	None	7.5YR 6/2	Gravelly Sand - Pinkish Grey. Fine to coarse sand, with fine gravel (<1cm). Subrounded, well sorted.	
75	0	40	60			None	7.5YR 7/2	Sandy Gravel - Pinkish Grey. Fine to coarse sand. Fine gravel up to 5 cm. Very poorly sorted, subround to subangular.	
80	0	30	70		2	None	7.5YR 7/2	Same as described above except with larger gravel (up to 6cm).	
85	0	40	60			None	7.5YR 7/2	Sandy Gravel - Pinkish Grey. Fine to coarse sand. Fine gravel up to 4 cm. Very poorly sorted, subangular to subround.	
90	0	40	60		1.4	None	7.5YR 7/2	Sandy Gravel - Pinkish Grey. Medium to coarse sand. Fine gravel up to 4 cm. Subround to subangular, very poorly sorted. Dominant lithology: greyish purple welded tuff, red breccia, andesite.	
95	0	50	50			None	7.5YR 6/3	Sandy Gravel - Light Brown. Fine to coarse sand. Fine gravel up to 3 cm. Poorly sorted, subround to subangular.	
100	T	70	30		1.4	None	7.5YR 6/3	Gravelly Sand - Light Brown. Fine sand and coarse sand. Fine gravel up to 3cm with few cobbles present. Subangular to subround, poorly sorted. Large gravels are mainly greyish purple welded tuff and plagioclase rich granite.	
105	T	60	40			None	7.5YR 6/3	Gravelly Sand - Light Brown. Fine to coarse sand. Predominantly fine gravel (<2cm) with few up to 3cm. Subround to subangular, moderate sorting.	

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
110	10	80	10		1.4	None	7.5YR 6/3	Gravelly Sand - Light Brown,. Silty fines. Sand is predominantly very fine to medium grained. Fine gravel (<2cm). Subround to subangular, poorly sorted, predominately greyish purple welded tuff and plagioclase rich granite.	
115	T	70	30			None	7.5YR 7/2	Gravelly Sand - Pinkish Grey. Fine to coarse sand. Mostly fine gravel (<2cm), that is generally subround (sand is more angular than gravel), poor to moderate sorting.	
120	T	60	40		1.7	None	7.5YR 6/3	Gravelly Sand - Light Brown. Fine to coarse sand (mostly fine sand). Gravel up to 4cm. Very poorly sorted, subround mainly.	
125	T	70	30			None	7.5YR 6/2	Gravelly Sand - Pinkish Grey. Increase in fine sand from above description and gravel is mostly <2cm, but up to 4cm.	
130	10	60	30		2	None	10YR 7/2	Gravelly Sand - Light Grey. Silty fines. Predominantly fine to medium sand. Gravel is mostly <4cm. Few small cobbles (8cm). Gravels are mostly subround, coarse sand is more angular. Very poorly sorted.	
135	T	60	40			None	10YR 6/3	Gravelly Sand - Pale Brown. Fine to coarse sand (increase in coarse sand from above). Gravel is mostly fine (<2cm) but up to 3 cm. Subangular, poorly sorted.	
140	T	70	30		1.3	None	10YR 6/2	Gravelly Sand - Light Brownish Grey. Predominantly medium to coarse sand. Fine gravel (<2cm). Subangular to angular, moderate sorting.	140: Begin Drilling 10/30/12
145	T	100	T			None	10YR 6/3	Sand - Pale Brown. Fine to coarse sand, well sorted, subround to subangular grains.	

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
150	20	60	20		1.4	None	7.5YR 7/2	Gravelly Sand with Silt - Pinkish Grey. Silty fines. Predominantly very fine to medium grained sand, some coarse. Gravel up to 2.5 cm.. Subround to subangular, very poorly sorted. Dominate lithology: greyish purple welded tuff, reddish breccia, and plagioclase rich granite.	
155	T	80	20			None	10YR 6/3	Gravelly Sand - Pale Brown. Very fine to coarse sand. Fine gravel up to 2.5 cm. Subrounded, poorly sorted, same composition as above.	
160	T	80	20		2	None	7.5YR 6/3	Gravelly Sand - Light Brown. Very fine to coarse sand although generally finer than above interval. Gravel up to 5 cm. Subrounded, very poorly sorted.	
165	T	80	20			None	7.5YR 6/3	Gravelly Sand - Light Brown. Predominantly very fine to medium sand. Gravel up to 3cm. Poorly sorted, subangular to subround.	
170	T	70	30		1.1	None	10YR 6/3	Gravelly Sand - Pale Brown. Fine to coarse sand. Mostly fine gravel (<2cm) but up to 3 cm. Subround to subangular, poorly sorted, same composition as above, granite shows some yellow oxidation staining.	
175	T	70	30			None	10YR 6/3	Same as described above except sand is generally coarser.	
180	T	70	30		1.7	None	10YR 6/3	Same as described above.	
185	T	70	30			None	10YR 6/2	Gravelly Sand - Light Brownish grey. Fine to coarse sand. Gravel mostly fine (<2cm) with a few up to 6cm. Poorly sorted, generally subrounded grains. No compositional changes.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
	F	S	G	F	S	G					
190	T	40	60				1.7	None	7.5YR 6/3	Sandy Gravel - Light Brown. Fine to coarse sand (mainly coarse). Gravel up to 4cm. Subrounded, very poorly sorted. Dominant rock types: greyish purple welded tuff, red breccia, and plagioclase rich granite.	
195	T	40	60					None	7.5YR 6/3	Sandy Gravel - Light Brown. Fine to coarse sand (mostly coarse). Gravel up to 3cm. Subround to subangular, poorly sorted.	Cuttings are damp 200: Unable to get static water level with electronic sounder
200	T	40	60				1.7	None	7.5YR 7/3	Sandy Gravel - Pink. Fine to coarse sand (mainly coarse). Gravel is mainly fine (<2cm) with a few up to 3 cm. Subangular to subround, poorly sorted.	
205	T	50	50					None	10YR 6/3	Sandy Gravel - Pale Brown. Fine to coarse sand (mainly coarse). Gravel is fine (<1cm). Moderately well sorted, subangular to subround.	210: SWL = 186.8 ft bls. WQ Sample SLM-553M 210 collected 10/30/12 14:55
210	0	50	50				1.1	None	7.5YR 6/1	Sandy Gravel - Grey. Medium to coarse sand. Fine gravel (<2cm). Subangular and moderate sorting. Dominant rock type: greyish purple welded tuff, and reddish breccia.	210: Begin Drilling 10/31/12
215	T	60	40					None	7.5YR 6/1	Same as described above.	
220	T60	40					1.7	None	10YR 7/3	Gravelly Sand - Very Pale Brown. Fine to coarse sand. Gravel up to 3 cm. Poorly sorted, subangular.	
225	T	40	60					None	10YR 7/3	Sandy Gravel - Very Pale Brown. Very fine to coarse sand. Gravel up to 3 cm. Subangular to subround, poorly sorted. Same dominant rock types.	

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
230	10	40	50		0.9	None	7.5YR 7/3	Sandy Gravel - Pink. Very fine to medium sand with silty fines. Gravel is mainly <3cm with a few up to 7cm. Very poorly sorted, subround. Rock types: welded tuff, breccia and granite.	
235	20	50	30			None	10YR 7/2	Gravelly Sand with Silt - Light Grey. Silt plus very fine to coarse sand (fine dominates). Fine gravels (<2cm). Very poorly sorted, subangular to subround.	
240	30	40	30		1.3	None	7.5YR 7/2	Silty Sand with Gravel - Pinkish Grey. Silt with very fine to coarse sand (fine dominates). Gravel is mostly <1cm but up to 2cm. Subround to subangular, very poorly sorted.	
245	10	40	50			None	7.5YR 7/2	Sandy Gravel - Pinkish Grey. Some silt with very fine to fine sand. Gravel up to 3cm. Very poorly sorted, subangular. Same rock types present.	
250	10	50	40		1	None	7.5YR 7/2	Gravelly Sand - Pinkish Grey. Silt with very fine to coarse sand. Mostly fine gravel (<2cm) but up to 4 cm. Subround to subangular, very poorly sorted.	
255	10	70	20			None	7.5YR 7/2	Gravelly Sand - Pinkish Grey. Silt with fine to coarse sand. Fine Gravel up to 3cm. Very poorly sorted, subround to subangular.	WQ Sample SLM-553M 260 collected 10/31/12 10:20
260	T	60	40		1.1	None	10YR 7/3	Gravelly Sand - Very Pale Brown. Fine to coarse sand. Gravel up to 6 cm. Very poorly sorted, subround to subangular. Largest gravels are welded tuff and breccia.	
265	T	40	60			None	10YR 7/3	Sandy Gravel - Very Pale Brown. Fine to coarse sand (overall finer than above). Gravel up to 6 cm (but mostly <3cm). Subround to subangular, very poorly sorted. Same rock types.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
	F	S	G	F	S	G					
270	10	40	50				1.1	None	10YR 7/3	Sandy Gravel - Very Pale Brown. Silt with very fine to coarse sand. Gravel mostly <3cm but up to 6cm. Very poorly sorted, subangular. Dominant rock types: greyish purple welded tuff, reddish breccia, loose feldspar.	
275	10	70	20					None	10YR 7/3	Gravelly Sand - Very Pale Brown. Silt with very fine to coarse sand. Gravel is up to 2cm. Very poorly sorted, subround to subangular.	
280	10	80	10				1	None	10YR 6/2	Gravelly Sand - Light Brownish Grey. Silt with fine to coarse sand. Gravel is up to 3 cm. Very poorly sorted, subangular.	
285	10	80	10					None	10YR 6/3	Gravelly Sand - Pale Brown. Increase in very fine sand, else same as described above.	
290	T	80	20				1.3	None	10YR 7/3	Gravelly Sand - Very Pale Brown. Fine to coarse sand. Fine gravel (<2cm). Subangular, moderate sorting.	
295	10	80	10					None	10YR 7/3	Gravelly Sand - Very Pale Brown. Silt with very fine to coarse sand, fine gravel (<2cm). Moderately well sorted, subangular,	
300	10	80	10				1	Strong	7.5YR 7/2	Gravelly Sand - Pinkish Grey. Same as described above except for introduction of cemented sand on larger gravel as well as calcite growth and strong HCl reaction.	
305	T	80	20					Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand, mostly fine gravel (<2cm) but up to 3cm. Subangular to subround, moderate sorting, calcite growth on larger grains.	WQ Sample SLM-553M 360 (plus duplicate) collected 10/31/12 16:15

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
	F	S	G	F	S	G					
310	T	60	40				1	Strong	10YR 7/3	Gravelly Sand - Very Pale Brown. Fine to coarse sand. Fine gravel mostly <2.5cm. Poorly sorted, subround. Dominant rock type: welded tuff, breccia. Larger grains have cemented sand on sides.	310: Start Drilling 11/1/12
315	10	60	30					Strong	10YR 7/3	Gravelly Sand - Very Pale Brown. Fine to coarse sand. Gravel up to 4cm, but mostly <2cm. Poorly sorted, subangular. Same rock types. Some of the gravel sizes pieces are loosely cemented sand that can break apart in hands.	
320	T	60	30				1.4	Strong	10YR 7/3	Gravelly Sand - Very Pale Brown. Fine to coarse sand. Gravel mostly <2cm but up to 4cm. Poorly sorted, subangular to subround. Additional rock types: loose feldspar, and andesite (dark grey aphanitic groundmass with feldspar phenocrysts (<4mm). Welded tuff, breccia and cemented sand still present.	
325	0	90	10					Strong	Multi-colored	Gravelly Sand - Multicolored. Mainly medium to coarse sand. Gravel is mostly <2cm but few up to 3cm. Well sorted, subangular to subround. Dominant rock types: welded tuff and breccia.	Borehole is producing a lot of water, washing away fine material. This is altering the actual grain size percentage
330	0	70	30				1	Moderate	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand. Mostly fine gravel but up to 3 cm. Moderately well sorted, subround to subangular.	
335	0	80	20					Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand, subangular (increase in fine sand from above). Gravel up to 3cm, subround. Poorly sorted. Red breccia, greyish purple welded tuff, loose feldspar present, some felsic grains have yellow/orange oxidation. Calcite adhered to sides of gravels.	
340	0	80	20				1.1	Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand. Fine to coarse gravel. Small cobbles (10cm) also present. Very poorly sorted, subangular. Cemented sand on larger grains.	
345	0	80	20					Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand (predominantly coarse). Fine gravel up to 5 cm. Very poorly sorted, subangular. Grains with calcite growth. Same rock types present, some phenocrysts in welded tuff are altered green.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
	F	S	G	F	S	G					
350	0	80	20				1.1	Strong	Multi-colored	Gravelly Sand - Multicolored (overall mafic). Fine to coarse sand (medium dominates). Gravel up to 4cm. Poorly sorted, subangular. Main rock types: red breccia, greyish purple welded tuff. Calcite growth and cemented sands on larger gravels.	
355	0	80	20					Moderate	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand (coarse dominates). Gravel is mostly <1cm but a few up to 3cm. Well sorted, subangular.	WQ sample SLM-553M 360 collected 11/1/12 12:30
360	0	80	20				1.3	Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand. Gravel is mostly <3cm. Very small cobbles also present (8cm). Poorly sorted, subangular to subround. Rock types: greyish purple welded tuff, red breccia, feldspar. Cemented sands on gravels.	
365	0	70	30					Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand (slightly coarse that above). Fine gravel (<2cm) Well sorted, subround (sand is more subangular).	
370	0	60	40				0.8	Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand. Gravel up to 4 cm. Very poorly sorted, subround to subangular.	
375	0	40	60					Strong	Multi-colored	Sandy Gravel - Multicolored. Fine to coarse sand (coarse dominates). Gravel up to 4cm. Subangular, poorly sorted.	
380	0	80	20				0.8	Strong	Multi-colored	Gravelly Sand - Multicolored. Fine to coarse sand. Fine gravel (<1.5cm). Subround to subangular, moderate sorting. Same rock types.	
385	0	40	60					Strong	Multi-colored	Sandy Gravel - Multicolored. Fine to coarse sand. Gravel up to 5 cm. Very poorly sorted, subround to subangular.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/min)	HCl Rxn	Munsell Color	Sample Description	Remarks
	F	S	G	F	S	G					
390	0	40	60				0.8	Strong	Multi-colored	Sandy Gravel - Multicolored. Fine to coarse sand. Fine gravel up to 4cm. Subround to subangular, poorly sorted. Greyish purple welded tuff and red breccia are main rock types. Calcite growth and cemented sand exhibited on gravels.	
395	0	40	60					Strong	Multi-colored	Same as described above.	
400	0	40	60				0.7	Strong	Multi-colored	Sandy Gravel - Multicolored. Fine to coarse sand. Fine to coarse gravel. Small cobbles (8-10cm). Very poorly sorted, subangular to subround. Same rock types as above plus granite and andesite.	
405	0	70	30					Strong	Multi-colored	Same as described above except cobbles up to 12cm.	WQ sample SLM-553M 410 collected 11/2/12 10:40
410											**Total Depth: 410 feet 11/1/12 14:34**

APPENDIX D

WELL CONSTRUCTION RECORDS

Well SLM-553M
ADWR Reg. No. 55-914838
Page 1 of 1

PIPE TALLY

Project Name: Two Monitor Wells: Silverbell	Project No.: 077045	Site Address: NW Corner Silverbell/Ave Alba	ADWR Registry No.: 55-914838
Drilling Co.: Layne Christensen Co.		Date Started: 11/5/12	Date Finished: 11/5/12
Well Blank Description(s): Sch.80 PVC		Well Screen Description(s): sch.80 PVC w/ 0.040" horizontal slots	
Total Drilled Depth (ft bls): 410		Total Cased Depth (ft bls): 330ft	

Type of Connections: ☐ Welded ☐ T+C ☒ Flush Thread ☐ Other

Pipe No.	✓	Length (ft)	Length Σ (ft)	Pipe Type
1	✓	0.3	0.3	End Cap
2	✓	9.97	10.27	sch.80 PVC w/ 0.040 horizontal slots
3	✓	9.97	20.24	↓
4	✓	9.97	30.21	↓
5	✓	9.97	40.18	↓
6	✓	9.97	50.15	↓
7	✓	9.97	60.12	sch.80 PVC blank
8	✓	9.97	70.09	↓
9	✓	9.97	80.06	↓
10	✓	9.97	90.03	↓
11	✓	9.97	100.0	↓
12	✓	9.97	109.97	↓
13	✓	9.97	119.94	↓
14	✓	9.97	129.91	↓
15	✓	9.97	139.88	↓
16	✓	9.97	149.85	↓
17	✓	9.97	159.82	↓
18	✓	9.97	169.79	↓
19	✓	9.97	179.76	↓
20	✓	9.97	189.73	↓
21	✓	9.97	199.70	sch.80 PVC blank
22	✓	9.97	209.67	↓
23	✓	9.97	219.64	↓
24	✓	9.97	229.61	↓
25	✓	9.97	239.58	↓
26	✓	9.97	249.55	↓
27	✓	9.97	259.52	↓
28	✓	9.97	269.49	↓
29	✓	9.97	279.46	↓
30	✓	9.97	289.43	↓
31	✓	9.97	299.40	↓
32	✓	9.97	309.37	↓
33	✓	0.83	310.2	PVC sch80/sch40 adapter
34	✓	20.0	330.2	Steel
35	✓	3.0	333.2	

Notes: Stick-Up = 3ft → Cut down to 1ft stick up on 11/7/12.

CLEAR CREEK ASSOCIATES

ESTIMATED ANNULAR MATERIAL RECORD

Project No.: 077045	Client: City of Tucson	ADWR Registration No.: 55-914838
Well ID: SLM-553M	Date: 11/2/12 - 11/8/12	
Location: NW corner Silverbell/N Ave Albor	Weather: Sunny, 70's	
Geologist: MML		

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]:	409 feet	Total Cased Depth:	330 feet
Length of Interval to be filled [L]:	330 feet	Rat Hole Volume [R]:	49.77 Ft³
Borehole Diameter [D]:	10.75 inches	Casing Diameter [d]:	5 inches
Annular Volume (A): $(D^2-d^2)\ 0.005454 =$	0.49	Ft³/Lin. Ft → Rat hole = 0.163 Ft³/Lin Ft	
Expected Calculated Volume = (AxL)+R= 161.7 + 49.77	211.47 Ft³		

ANNULAR MATERIALS TALLY

Type of Annular Material: Bentonite Pellets, bentonite grout, ex12 sand, pea gravel

Type/Size of Container: 5gal bucket, 50lb bag, Super Sac

Measurement Method: Wire tag line

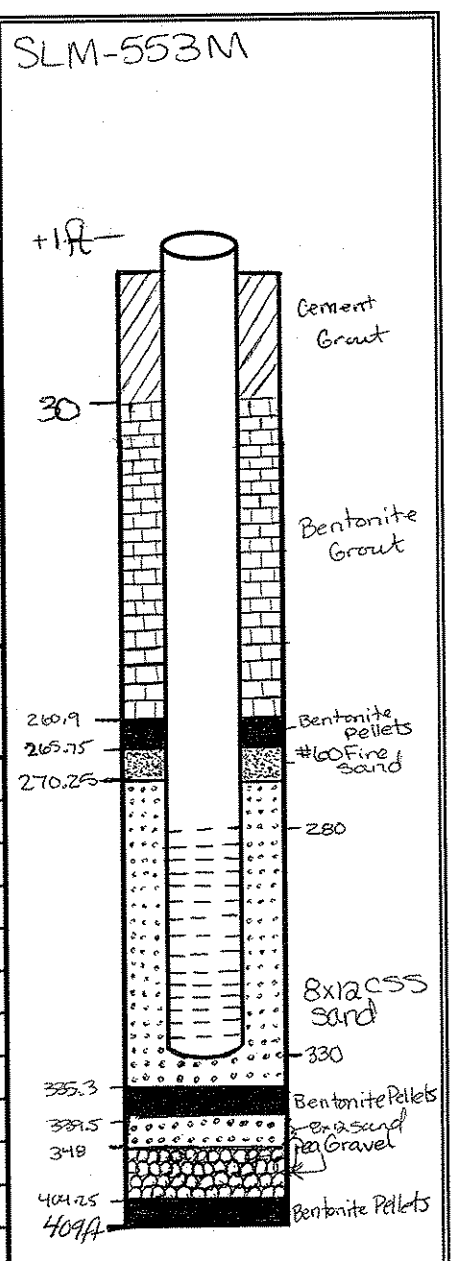
EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

[1] Volume of bag (Ft^3) = bag weight/100

[2] Calculated depth = Previous Calculated depth - (v/A)

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
4	✓	5gal bucket	2.8	2.8	404.6	404.25	Bentonite pellets 1/4, TR30 *Retag 388.3'*
12	✓	5gal bucket	6.0	18.8	372.8	378	Pea Gravel
11	✓	↓	6.0	14.8	368.5	372	
14	✓		6.0	20.8	362.5	364	1 Super Sack = 30ft³
11	✓		6.0	26.8	354.5	358	
12	✓	↓	6.0	32.8	348.5	350	↓
10	✓	50	5.0	37.8	339	348	8x12 Carmeuse Colorado Silica Sand
6	✓	50	3.0	40.8	343	342	↓
2	✓	50	1.0	41.8	340	339.5	
4	✓	5gal bucket	2.8	44.6	335	337.5	1/4 Bentonite Pellets TR30
1	✓	↓	0.7	45.3	336.4	~336	↓
1	✓	↓	0.7	46.0	335.	335.3	



Rat hole = $(10.75)^2 * 0.005454 = 0.163 Ft^3/Lin\ ft$

CLEAR CREEK ASSOCIATES

Well ID: SLM-553M
Project No.: 077045
ADWR Registration No.: 55-914838
Page 2 of 3

ESTIMATED ANNULAR MATERIAL RECORD (CONTINUED)

Annular Volume = 0.49 ft³/Lin ft.
Rat Hole = 0.63

No.	✓	Weight of Bag (lbs.)	Volume of Bag (v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth (ft bls)	Tagged Depth (ft bls)	Comments
49	✓	50	24.5	70.5	292.5	300.4	8x12 Colorado Silica Sand.
45	✓	50	22.5	93.0	254.5	275.0	
4	✓	50	2.0	95.0	266.8	273.25	
2	✓	50	1.0	96.0	271	272	
2	✓	50	1.0	97.0	269.9	271	
1	✓	50	0.5	97.5	269.9	270.25	
16	✓	50	3.0	100.5	261.1	263.2	#60 fine sand.
1	✓	50	0.5	101.0	265.2	265.75	
3	✓	5gal bucket	2.1	103.1	261.5	262	1/4 Bentonite Pellets TR30
1	✓	5gal	0.7	103.8	260.5	260.9	
6	✓	35gal batch	28.1	131.9	203.6	–	Bentonite Grout.
2	✓	35gal	9.4	141.3	184.4	–	
7	✓	35gal	32.7	174.0	117.7	–	
3	✓	35gal	14.0	188.0	89.1	–	
3	✓	35gal	14.0	202.0	60.5	–	
3	✓	35gal	14.0	216.0	31.9	–	
6	✓	35gal	28.1	244.1	0	30	
1	✓	35gal	4.7	248.8	20.4	80	* next morning
5	✓	35	23.4	272.2	32.3	~30	

Notes:
Bentonite Pellets : 98 ft³
Pea Gravel : 30 ft³
8x12 Sand : 60.5 ft³
#60 Sand : 3.5 ft³
Bentonite Grout : 168.4 ft³
Cement Grout : 88.3

CLEAR CREEK ASSOCIATES

Well ID: SLM-553M
Project No.: 077045
ADWR Registration No.: 55-914838
Page 3 of 3

ESTIMATED ANNULAR MATERIAL RECORD (CO[illegible] UED)

No.	✓	Weight of Bag (lbs.)	Volume of Bag (v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth (ft bls)	Tagged Depth (ft bls)	Comments
2.5	✓	35gal	87.5	359.7	Ø	Ø	Cement Grout
1	✓	5gal	0.8	360.5	Ø	Ø	↓

Notes:

CLEAR CREEK ASSOCIATES

APPENDIX E

WELL DEVELOPMENT RECORDS

WELL DEVELOPMENT
FIELD DATA LOG

Project No.: 077045	Client: City of Tucson	ADWR Registration No.: 55-914838
Well ID/Name: SLM-553M	Date: 11/12/12	
Location: NW corner Silverbell Rd / Ave. Albor	Weather: sunny, clear 65/70	
Geologist: MML		
Total Depth of Well (ft bls): 330	Measuring Point (M. P.):	
Screen Interval(s) (ft bls): 280-330	Distance from ground level to M. P.(ft):	

Time	Activity (Bail, Swab, Pump)	Q (gpm)	Totalizer Reading (g)	Q_T (gal)	Sand Content (ml/l)	pH	Conductivity (us/cm)	Temp (F / C)	Pumping Water Level (ft.bls)	Comments
1211	Pump-280ft	18	–	90	0.7	7.35	1317	23.1	–	Light yellow brown opague water, no odor.
1221		19	–	280	0.1	7.36	1359	23.0	–	less brown
1231		19	–	370	Tr	7.35	1310	22.8	–	no color, faint cloudiness
1241		19	–	560	Tr	7.36	1308	22.9	–	same.
1252	Pump-290ft.	19	–	95	Tr	7.37	1310	22.8	–	mostly clear
1257		19	–	190	–	7.39	1298	23.1	–	faintly cloudy
1307		19	–	380	Tr	7.38	1299	22.8	–	clear
1317		19	–	570	Tr	7.36	1290	22.8	–	clear
1328	Pump 300ft	19	–	95	Tr	7.31	1292	22.9	–	clear
1333		19	–	190	Tr	7.36	1282	23.0	–	very faint cloudiness
1343		19	–	380	Tr	7.34	1285	22.8	–	
1353		19	–	570	Tr	7.38	1280	22.6	–	Clear
1406	Pump 310	19	–	95	Tr	7.39	1275	22.9	–	clear
1411		19	–	190	–	7.35	1277	23.0	–	
1416		19	–	380	Tr	7.40	1273	23.1	–	
1426		19	–	570	Tr	7.34	1285	23.0	–	
1436		19	–	760	Tr	7.39	1274	22.8	–	
1446	Pump 320	19	–	95	Tr	7.41	1270	22.7	–	
1456		19	–	285	Tr	7.40	1265	22.7	–	clear
1506		19	–	475	Tr	7.44	1268	22.7	–	
1523	Pump 330ft.	19	–	95	Tr	7.39	1273	22.8	–	clear
1528		19	–	190	Tr	7.33	1263	22.8	–	
1538		19	–	380	Tr	7.38	1268	22.7	–	
1548		19	–	570	Tr	7.35	1279	22.7	–	
1558		19	–	760	Tr	7.36	1261	22.5	–	

Additional Comments:

*SWL = 183.4 bls

Totalizer at start = 0
end = 4039 gal

CLEAR CREEK ASSOCIATES

APPENDIX F

AQUIFER TEST DATA

AQUIFER TEST DATA

Project: City of Tucson / West Silverbell	Project No.: 077045		Static Water Level: 183.62' bls
Well Location: NW corner of Silverbell Rd + Ave. Albor	Well No.: SLM-553 M		Measuring Point: Top of Sounding Tube
Well Diameter: 5	Measured By: MML		Elevation Measuring Point: 1.2 ft
Pump Setting: 325	Pump On: Date 11/13/12	Time: 09:50	Available Drawdown: ~140 ft
Screen Interval(s): 280-330	Pump Off: Date 11/13/12	Time:	Distance From Pumping Well: N/A
How Q Measured: Digital Flowmeter	Duration of Aquifer Test:		Initial Totalizer Reading: ∅

Time of Measure-ment	Time Since Pumping Started (t) (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder Reading (feet)	Correction (feet)	Water Level (feet)	Drawdown (feet)	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer Reading (gallons)	Remarks
0950	0			184.82	1.2	183.62	∅	∅	-	∅	Pump On
0952	2			186.00		184.80	1.18		-		
0953	3			185.93		184.73	1.11	20			
0954	4			185.94		184.74	1.12				
0956	6			185.93		184.73	1.11				
0958	8			185.93		184.73	1.11	19			
1000	10			185.94		184.74	1.12	20			
1005	15			185.95		184.75	1.13	22			
1010	20			185.90		184.70	1.08	20			
1015	25			186.04		184.84	1.22	20			
1020	30			186.13		184.93	1.31	20			
1021	31			187.19		185.99	2.37	-			Set up to 40 gpm
1022	32			187.21		186.01	2.39	39.5			
1023	33			187.24		186.04	2.42	40.5			
1024	34			187.25		186.06	2.44	40.5			
1026	36			187.24		186.04	2.42	40.5			
1028	38			187.20	↓	186.00	2.38	40.5			

CLEAR CREEK ASSOCIATES

AQUIFER TEST DATA

Project No. 077045
Date 11/13/12

Time of Measure-ment	Time Since Pumping Started (t) (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder Reading (feet)	Correction (feet)	Water Level (feet) (183.62)	Drawdown (feet)	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer Reading (gallons)	Remarks
1030	40			187.85	1.2	185.95	2.33	40.5	17.4		
1035	45			187.11		185.91	2.29	40.5	17.7		
1040	50			187.10		185.90	2.28	40.5	17.8		
1045	55			187.07		185.87	2.25	40.5	18.0		
1050	60			187.04		185.84	2.22	40.5	18.2	→	
1051	61			187.96		186.76	3.14	58	18.5		Step Up to 60gpm
1052	62			188.21		187.01	3.39	61	18.0		
1053	63			188.14		186.94	3.32	60	18.1		
1054	64			188.14		186.94	3.32	60	18.1		
1056	66			188.15		186.95	3.33	60	18.0		
1100	70			188.15		186.95	3.33	60	18.0		
1105	75			188.13		186.93	3.31	60	18.1		
1110	80			188.14		186.94	3.32	60	18.1		
1115	85			188.13		186.93	3.31	60	18.1		
1120	90			188.13		186.93	3.31	60	36.5	→	
1121	91			188.98		187.78	4.16	76	18.3		Step Up to 75
1122	92			188.95		187.75	4.13	74	17.9		
1123	93			188.98		187.78	4.16	75	18.0		
1124	94			188.98		187.78	4.16	75	18.0		
1126	96			188.98		187.78	4.16	75	18.0		
1130	100			188.99		187.79	4.17	75.5	18.1		
1135	105			189.00		187.80	4.18	75.5	18.1		
1140	110			188.98	↓	187.78	4.16	75.5	18.1		

CLEAR CREEK ASSOCIATES

AQUIFER TEST DATA

Project No. 077045
Date 11/13/12

Time of Measure-ment	Time Since Pumping Started (t) (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder Reading (feet)	Correction (feet)	Water Level (feet) (183.62)	Drawdown (feet)	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer Reading (gallons)	Remarks
1150	120			188.99	1.2	187.79	4.17	75.5	18.1		
1200	130			188.98		187.78	4.16	75.5	18.1		
1210	140			188.98		187.78	4.16	75.5	18.1	~7470	
1220	150			188.96		187.76	4.14	75.5	18.2		
1230	160			188.96		187.76	4.14	75.5	18.2		
1240	170			188.95		187.75	4.13	75.5	18.3		
1250	180			188.95		187.75	4.13	75.5	18.3		
12:50:15	180.25	0.25	721	185.62		184.42	0.8	Ø	–	10457	End Pumping
12:50:30	180.5	0.5	361	185.25		184.05	0.43				
12:50:45	180.75	0.75	241	185.17		183.97	0.35				
12:51:00	181	1.0	181	185.06		183.86	0.24				
12:51:30	181.5	1.5	121	185.01		183.81	0.19				
12:52	182	2.0	91	185.00		183.80	0.18				
12:53	183	3.0	61	184.90		183.70	0.08				
12:54	184	4.0	46	184.89		183.69	0.07				
12:55	185	5.0	37	184.87		183.67	0.05				
12:57	187	7.0	26.7	184.85		183.65	0.03				
12:10	190	10.0	19	184.81		183.61	~0.01				
12:15	195	15.0	13	184.79		183.59	-0.03				

CLEAR CREEK ASSOCIATES

APPENDIX G

WATER QUALITY ANALYSIS REPORTS

Client:	City of Tucson, Environmental Services	**Client Sample ID:**	SLM-553M 210
Project:	Silverbell	**Collection Date/Time:**	10/30/2012 1455
Work Order:	12J0767	**Matrix:**	Ground Water
Lab Sample ID:	12J0767-01	**Order Name:**	077045

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Turbidity-E180.1								
Turbidity	2700	50		NTU	500	10/31/2012 1550	10/31/2012 1556	AC
Anions by Ion Chromatography-E300								
Bromide	0.27	0.10		mg/L	1	11/05/2012 1130	11/05/2012 1248	EW
Chloride	140	10		mg/L	10	11/01/2012 1400	11/01/2012 1621	EW
Nitrogen, Nitrate (As N)	7.2	1.0		mg/L	1	10/31/2012 1600	10/31/2012 1725	EW
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/31/2012 1600	10/31/2012 1725	EW
Sulfate	140	5.0		mg/L	10	11/01/2012 1400	11/01/2012 1621	EW

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12J0767
Date Received: 10/30/2012

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1211003 - GEN CHEM										
Duplicate (1211003-DUP1)		**Source: 12J0767-01**		Prepared & Analyzed: 10/31/2012						
Turbidity	2700	50	NTU		2700			1	10	

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12J0788
Lab Sample ID: 12J0788-01

Client Sample ID: SLM-553M 260
Collection Date/Time: 10/31/2012 1020
Matrix: Ground Water

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Turbidity-E180.1								
Turbidity	2.7	0.10		NTU	1	11/01/2012 0930	11/02/2012 0935	AC
Anions by Ion Chromatography-E300								
Bromide	0.23	0.10		mg/L	1	11/05/2012 1130	11/05/2012 1307	EW
Chloride	120	10		mg/L	10	11/02/2012 1030	11/02/2012 1317	EW
Nitrogen, Nitrate (As N)	6.5	1.0		mg/L	1	11/01/2012 1400	11/01/2012 1639	EW
Sulfate	110	50		mg/L	10	11/02/2012 1030	11/02/2012 1317	EW

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12J0788
Lab Sample ID: 12J0788-02

Client Sample ID: SLM-553M 310
Collection Date/Time: 10/31/2012 1615
Matrix: Ground Water

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Turbidity-E180.1								
Turbidity	17	0.10		NTU	1	11/01/2012 0930	11/02/2012 0942	AC
Anions by Ion Chromatography-E300								
Bromide	0.28	0.10		mg/L	1	11/05/2012 1130	11/05/2012 1325	EW
Chloride	100	20		mg/L	20	11/02/2012 1030	11/02/2012 1335	EW
Nitrogen, Nitrate (As N)	11	2.0		mg/L	2	11/02/2012 1030	11/02/2012 1126	EW
Sulfate	230	100		mg/L	20	11/02/2012 1030	11/02/2012 1335	EW

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12J0788
Lab Sample ID: 12J0788-03

Client Sample ID: SLM-553M 310
Collection Date/Time: 10/31/2012 1617
Matrix: Ground Water

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Turbidity-E180.1								
Turbidity	17	0.10		NTU	1	11/01/2012 0930	11/02/2012 0945	AC
Anions by Ion Chromatography-E300								
Bromide	0.29	0.10		mg/L	1	11/05/2012 1130	11/05/2012 1344	EW
Chloride	100	20		mg/L	20	11/02/2012 1030	11/02/2012 1354	EW
Nitrogen, Nitrate (As N)	11	2.0		mg/L	2	11/02/2012 1030	11/02/2012 1144	EW
Sulfate	210	100		mg/L	20	11/02/2012 1030	11/02/2012 1354	EW

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12K0087
Lab Sample ID: 12K0087-01

Client Sample ID: SLM-553M 360
Collection Date/Time: 11/01/2012 1230
Matrix: Ground Water

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Turbidity-E180.1								
Turbidity	1.4	0.10		NTU	1	11/01/2012 1640	11/02/2012 1650	AC
Anions by Ion Chromatography-E300								
Bromide	0.25	0.10		mg/L	1	11/05/2012 1130	11/05/2012 1402	EW
Chloride	47	5.0		mg/L	5	11/02/2012 1030	11/02/2012 1430	EW
Nitrogen, Nitrate (As N)	1.9	1.0		mg/L	1	11/01/2012 1400	11/01/2012 2116	EW
Sulfate	270	100		mg/L	20	11/02/2012 1030	11/02/2012 1412	EW

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12K0087
Date Received: 11/01/2012

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1211030 - E180.1										
Duplicate (1211030-DUP1)	**Source: 12J0788-01**			Prepared: 11/01/2012 Analyzed: 11/02/2012						
Turbidity	2.8	0.10	NTU		2.7			4	10	

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12K0093
Lab Sample ID: 12K0093-01

Client Sample ID: SLM-553M 410
Collection Date/Time: 11/02/2012 1040
Matrix: Ground Water

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Turbidity-E180.1								
Turbidity	6.4	0.10		NTU	1	11/02/2012 1455	11/02/2012 1505	AC
Anions by Ion Chromatography-E300								
Bromide	0.17	0.10		mg/L	1	11/05/2012 1130	11/05/2012 1420	EW
Chloride	67	10		mg/L	10	11/02/2012 1500	11/02/2012 1812	EW
Nitrogen, Nitrate (As N)	1.9	1.0		mg/L	1	11/02/2012 1500	11/02/2012 1658	EW
Sulfate	170	50		mg/L	10	11/02/2012 1500	11/02/2012 1812	EW

Client: City of Tucson, Environmental Services
Project: Silverbell
Work Order: 12K0093
Date Received: 11/02/2012

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1211038 - E180.1										
Duplicate (1211038-DUP1)		**Source: 12K0093-01**		Prepared & Analyzed: 11/02/2012						
Turbidity	6.4	0.10	NTU		6.4			0	10	

Silverbell Landfill

Location: SLM-553M 210 **Site**
Sample Date: 10/30/2012 02:55:00 PM

Log-in Number: L27205-03
Collected By: M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256
License # AZ0038

Parameter	Value	Qualifier	Method	RDL	Analysis Date
1,1,1,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,1,1-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,1,2,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,1,2-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,1-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,1-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,1-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2,3-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2,3-Trichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2,4-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2,4-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2-Dibromo-3-chloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2-Dibromoethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,3,5-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,3-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,3-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
1,4-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
2,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
2-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
4-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
4-Isopropyltoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM

Silverbell Landfill

Location: SLM-553M 210 **Site** **Log-in Number:** L27205-03
Sample Date: 10/30/2012 02:55:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Benzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Bromobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Bromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Bromodichloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Bromofluorobenzene (Surr.)	99.4 % recovery		EPA 8260	%	10/31/2012 02:34:00 PM
Bromoform	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Bromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Carbon Tetrachloride	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Chlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Chloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Chloroform	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Chloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Dibromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Dibromofluoromethane (Surr.)	109 % recovery		EPA 8260	%	10/31/2012 02:34:00 PM
Dibromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Dichlorodifluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Ethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Hexachlorobutadiene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Isopropylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Methyl tert-butyl ether	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Methylene Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Naphthalene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Sec-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Styrene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM

Silverbell Landfill

Location: SLM-553M 210 **Site** **Log-in Number:** L27205-03
Sample Date: 10/30/2012 02:55:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Tetrachloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Toluene	.0405 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Toluene-d8 (Surr.)	101.8 % recovery		EPA 8260	%	10/31/2012 02:34:00 PM
Total Trihalomethanes	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Total Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Trichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Trichlorofluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
Vinyl Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
cis-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
cis-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
m/p-Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
n-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
n-Propylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
ortho-Xylene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
tert-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
trans-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM
trans-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 02:34:00 PM

Silverbell Landfill

Location: SLM-553M 260 **Site** **Log-in Number:** L27205-01
Sample Date: 10/31/2012 10:20:00 AM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256
License # AZ0038

Parameter	Value	Qualifier	Method	RDL	Analysis Date
1,1,1,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,1,1-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,1,2,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,1,2-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,1-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,1-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,1-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2,3-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2,3-Trichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2,4-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2,4-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2-Dibromo-3-chloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2-Dibromoethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,3,5-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,3-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,3-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
1,4-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
2,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
2-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
4-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
4-Isopropyltoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM

Silverbell Landfill

Location: SLM-553M 260 **Site** **Log-in Number:** L27205-01
Sample Date: 10/31/2012 10:20:00 AM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Benzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Bromobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Bromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Bromodichloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Bromofluorobenzene (Surr.)	100.2 % recovery		EPA 8260	%	10/31/2012 12:17:00 PM
Bromoform	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Bromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Carbon Tetrachloride	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Chlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Chloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Chloroform	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Chloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Dibromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Dibromofluoromethane (Surr.)	106.2 % recovery		EPA 8260	%	10/31/2012 12:17:00 PM
Dibromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Dichlorodifluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Ethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Hexachlorobutadiene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Isopropylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Methyl tert-butyl ether	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Methylene Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Naphthalene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Sec-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Styrene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM

Silverbell Landfill

Location: SLM-553M 260 **Site** **Log-in Number:** L27205-01
Sample Date: 10/31/2012 10:20:00 AM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Tetrachloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Toluene	.0014 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Toluene-d8 (Surr.)	102.2 % recovery		EPA 8260	%	10/31/2012 12:17:00 PM
Total Trihalomethanes	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Total Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Trichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Trichlorofluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
Vinyl Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
cis-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
cis-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
m/p-Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
n-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
n-Propylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
ortho-Xylene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
tert-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
trans-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM
trans-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	10/31/2012 12:17:00 PM

Silverbell Landfill

Location: SLM-553M 310 **Site** **Log-in Number:** L27210-03
Sample Date: 10/31/2012 04:15:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256
License # AZ0038

Parameter	Value	Qualifier	Method	RDL	Analysis Date
1,1,1,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,1,1-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,1,2,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,1,2-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,1-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,1-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,1-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2,3-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2,3-Trichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2,4-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2,4-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2-Dibromo-3-chloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2-Dibromoethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,3,5-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,3-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,3-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
1,4-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
2,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
2-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
4-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
4-Isopropyltoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM

Silverbell Landfill

Location: SLM-553M 310 **Site** **Log-in Number:** L27210-03
Sample Date: 10/31/2012 04:15:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Benzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Bromobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Bromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Bromodichloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Bromofluorobenzene (Surr.)	90.2 % recovery		EPA 8260	%	11/01/2012 02:38:00 PM
Bromoform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Bromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Carbon Tetrachloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Chlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Chloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Chloroform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Chloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Dibromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Dibromofluoromethane (Surr.)	100.6 % recovery		EPA 8260	%	11/01/2012 02:38:00 PM
Dibromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Dichlorodifluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Ethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Hexachlorobutadiene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Isopropylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Methyl tert-butyl ether	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Methylene Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Naphthalene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Sec-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Styrene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM

Silverbell Landfill

Location: SLM-553M 310 **Site** **Log-in Number:** L27210-03
Sample Date: 10/31/2012 04:15:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Tetrachloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Toluene	.0056 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Toluene-d8 (Surr.)	93 % recovery		EPA 8260	%	11/01/2012 02:38:00 PM
Total Trihalomethanes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Total Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Trichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Trichlorofluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
Vinyl Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
cis-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
cis-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
m/p-Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
n-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
n-Propylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
ortho-Xylene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
tert-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
trans-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM
trans-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 02:38:00 PM

Silverbell Landfill

Location: SLM-553M 310 **Site** **Log-in Number:** L27210-04
Sample Date: 10/31/2012 04:17:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256
License # AZ0038

Parameter	Value	Qualifier	Method	RDL	Analysis Date
1,1,1,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,1,1-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,1,2,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,1,2-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,1-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,1-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,1-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2,3-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2,3-Trichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2,4-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2,4-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2-Dibromo-3-chloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2-Dibromoethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,3,5-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,3-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,3-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
1,4-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
2,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
2-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
4-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
4-Isopropyltoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM

Silverbell Landfill

Location: SLM-553M 310 **Site** **Log-in Number:** L27210-04
Sample Date: 10/31/2012 04:17:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Benzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Bromobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Bromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Bromodichloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Bromofluorobenzene (Surr.)	89 % recovery		EPA 8260	%	11/01/2012 04:42:00 PM
Bromoform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Bromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Carbon Tetrachloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Chlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Chloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Chloroform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Chloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Dibromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Dibromofluoromethane (Surr.)	100 % recovery		EPA 8260	%	11/01/2012 04:42:00 PM
Dibromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Dichlorodifluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Ethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Hexachlorobutadiene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Isopropylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Methyl tert-butyl ether	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Methylene Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Naphthalene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Sec-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Styrene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM

Silverbell Landfill

Location: SLM-553M 310 **Site** **Log-in Number:** L27210-04
Sample Date: 10/31/2012 04:17:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Tetrachloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Toluene	.0067 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Toluene-d8 (Surr.)	96 % recovery		EPA 8260	%	11/01/2012 04:42:00 PM
Total Trihalomethanes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Total Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Trichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Trichlorofluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
Vinyl Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
cis-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
cis-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
m/p-Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
n-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
n-Propylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
ortho-Xylene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
tert-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
trans-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM
trans-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 04:42:00 PM

Silverbell Landfill

Location: SLM-553M 360 **Site** **Log-in Number:** L27210-01
Sample Date: 11/01/2012 12:30:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256
License # AZ0038

Parameter	Value	Qualifier	Method	RDL	Analysis Date
1,1,1,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,1,1-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,1,2,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,1,2-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,1-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,1-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,1-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2,3-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2,3-Trichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2,4-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2,4-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2-Dibromo-3-chloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2-Dibromoethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,3,5-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,3-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,3-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
1,4-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
2,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
2-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
4-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
4-Isopropyltoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM

Silverbell Landfill

Location: SLM-553M 360 **Site** **Log-in Number:** L27210-01
Sample Date: 11/01/2012 12:30:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Benzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Bromobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Bromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Bromodichloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Bromofluorobenzene (Surr.)	90.8 % recovery		EPA 8260	%	11/01/2012 05:14:00 PM
Bromoform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Bromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Carbon Tetrachloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Chlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Chloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Chloroform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Chloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Dibromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Dibromofluoromethane (Surr.)	94.2 % recovery		EPA 8260	%	11/01/2012 05:14:00 PM
Dibromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Dichlorodifluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Ethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Hexachlorobutadiene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Isopropylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Methyl tert-butyl ether	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Methylene Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Naphthalene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Sec-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Styrene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM

Silverbell Landfill

Location: SLM-553M 360 **Site** **Log-in Number:** L27210-01
Sample Date: 11/01/2012 12:30:00 PM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Tetrachloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Toluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Toluene-d8 (Surr.)	91.6 % recovery		EPA 8260	%	11/01/2012 05:14:00 PM
Total Trihalomethanes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Total Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Trichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Trichlorofluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
Vinyl Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
cis-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
cis-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
m/p-Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
n-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
n-Propylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
ortho-Xylene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
tert-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
trans-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM
trans-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/01/2012 05:14:00 PM

Silverbell Landfill

Location: SLM-553M-410 **Site** **Log-in Number:** L27214-01
Sample Date: 11/02/2012 10:40:00 AM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256
License # AZ0038

Parameter	Value	Qualifier	Method	RDL	Analysis Date
1,1,1,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,1,1-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,1,2,2-Tetrachloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,1,2-Trichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,1-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,1-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,1-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2,3-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2,3-Trichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2,4-Trichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2,4-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2-Dibromo-3-chloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2-Dibromoethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2-Dichloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,3,5-Trimethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,3-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,3-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
1,4-Dichlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
2,2-Dichloropropane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
2-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
4-Chlorotoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
4-Isopropyltoluene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM

Silverbell Landfill

Location: SLM-553M-410 **Site** **Log-in Number:** L27214-01
Sample Date: 11/02/2012 10:40:00 AM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Benzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Bromobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Bromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Bromodichloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Bromofluorobenzene (Surr.)	90.4 % recovery		EPA 8260	%	11/02/2012 12:41:00 PM
Bromoform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Bromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Carbon Tetrachloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Chlorobenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Chloroethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Chloroform	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Chloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Dibromochloromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Dibromofluoromethane (Surr.)	97.2 % recovery		EPA 8260	%	11/02/2012 12:41:00 PM
Dibromomethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Dichlorodifluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Ethylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Hexachlorobutadiene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Isopropylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Methyl tert-butyl ether	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Methylene Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Naphthalene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Sec-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Styrene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM

Silverbell Landfill

Location: SLM-553M-410 **Site** **Log-in Number:** L27214-01
Sample Date: 11/02/2012 10:40:00 AM **Collected By:** M. LINDSEY

Results from Tucson Water LIMS, Tucson Water Quality Lab, 4401 S. Tucson Estates Parkway, Tucson, AZ 85735 (520) 791-5256

Parameter	Value	Qualifier	Method	RDL	Analysis Date
Tetrachloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Toluene	.0118 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Toluene-d8 (Surr.)	95.8 % recovery		EPA 8260	%	11/02/2012 12:41:00 PM
Total Trihalomethanes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Total Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Trichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Trichlorofluoromethane	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
Vinyl Chloride	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
cis-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
cis-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
m/p-Xylenes	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
n-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
n-Propylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
ortho-Xylene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
tert-Butylbenzene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
trans-1,2-Dichloroethene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM
trans-1,3-Dichloropropene	<.0005 mg/L		EPA 8260	.0005 mg/L	11/02/2012 12:41:00 PM