

**TUMAMOC LANDFILL
TUCSON, ARIZONA**

**2017 ANNUAL MONITORING REPORT
GROUNDWATER AND METHANE GAS MONITORING RESULTS**

FEBRUARY 28, 2018

**Prepared by:
City of Tucson
Environmental & General Services Department
P.O. Box 27210
Tucson, Arizona 85726-7210**



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Acronyms

Aquifer Water Quality Standards	AWQS
Arizona Department of Environmental Quality	ADEQ
Carbon Dioxide	CO ₂
City of Tucson-Environmental & General Services Department	COT-EGSD
Dissolved Oxygen	DO
Feet Below Ground Surface	ft bgs
Feet Above Mean Sea Level	ft amsl
Landfill Gas	LFG
Nephelometric Turbidity Units	NTU
Non-detect	ND
Methane	CH ₄
Micrograms per liter	µg/l
Milligrams per liter	mg/l
Oxidation Reduction Potential	ORP
Oxygen	O ₂
Preliminary Investigation	PI
Quality Assurance/Quality Control	QA/QC
Relative Percent Difference	RPD
Specific Conductivity	SpC
Tetrachloroethene	PCE
Trichloroethene	TCE
Volatile Organic Compounds	VOCs
Water Level	WL
Water Quality Assurance Revolving Fund	WQARF
Water Table Elevation	WTE

1.0 INTRODUCTION

The City of Tucson-Environmental & General Services Department (COT-EGSD) has prepared this report to document the methane gas monitoring results and site inspections conducted in 2017 at the Tumamoc Landfill located at 2100 West Starr Pass Boulevard in Tucson, Arizona. The location of the Tumamoc Landfill is presented on **Figure 1**. The City of Tucson operated the Tumamoc Landfill from 1962 to 1966 for city-wide municipal waste disposal under a lease agreement with the University of Arizona¹. The COT-EGSD has correspondence in the Tumamoc Landfill project file which references the University of Arizona disposed of industrial wastes, possibly including hazardous substances, during the operational period of the landfill from 1962 through 1966². The landfill property was deeded from Pima County to the City of Tucson in 2009, when Pima County acquired the Tumamoc Hill property from the Arizona State Land Department. COT-EGSD has been monitoring methane gas at the waste footprint boundary, adjacent to nearby structures, since 2000 and has been monitoring groundwater at the site since 2002.

The Tumamoc Landfill site was temporarily placed on the Arizona Department of Environmental Quality's (ADEQ) Water Quality Assurance Revolving Fund (WQARF) Preliminary Investigation (PI) list in July 2004. The Tumamoc Landfill was removed from the PI list in May 2005 when ADEQ determined there were no known impacts to residents living in the area. ADEQ may periodically review the site status to determine if it should be placed on the WQARF PI List in the future³.

Tetrachloroethene (PCE) analytical data obtained from shallow aquifer monitoring wells at the landfill since 2002 were statistically evaluated for contaminant trends using the Mann-Kendall test. Similarly, a statistical trend analysis was performed at monitoring wells that have shown nitrate concentrations above the Aquifer Water Quality Standards (AWQS). Results of the evaluation indicated the observed PCE and nitrate concentrations were stable, decreasing, and likely will not pose a threat to human health and the environment. The results and recommendations were documented in the 2016 Annual Monitoring Report⁴.

Therefore, considering the results of the evaluation, COT-EGSD modified the groundwater monitoring and sampling activities at the Tumamoc Landfill from annually to once every three years. Groundwater monitoring and sampling activities were not performed in 2017. The next groundwater monitoring and sampling event will be performed in 2019.

¹ EEC Inc., *Environmental Assessment of Tumamoc Hill Solid Waste Landfill*, June 7, 1989

² Keene, James, City of Tucson City Manager, *Tumamoc Landfill Update Mayor & Council Memorandum*, September 18, 2000

³ Miller, Shelley, Site Assessment Unit Environmental Program Specialist at the Arizona Department of Environmental Quality, *Tumamoc Landfill WQARF Preliminary Investigation Site Status*, May 23, 2005

⁴ COT-EGSD, *2016 Annual Monitoring Report Groundwater and Methane Gas Monitoring Results Tumamoc Landfill*, December 21, 2016

1.1 Scope of Work

The following activities were conducted by COT-EGSD at the Tumamoc Landfill in 2017:

- Monitoring of perimeter methane gas probes TU-1, TU-2, TU-3, TU-4, TU-5, TU-6, TU-7, TU-8, and TU-9 was performed quarterly during the months of January, April, July, and October 2017. Percentages of methane (CH₄), carbon dioxide (CO₂), and oxygen (O₂) were measured in the field during each sampling event using a Landtec Gas Analyzer.
- Allwyn Consultants Inc. from Tucson, Arizona conducted an inspection of the Tumamoc Landfill on November 9, 2017 as part of the COT-EGSD required annual inspection program for non-regulated closed landfills.

2.0 METHANE GAS MONITORING

Landfill gas probes TU-1, TU-2, TU-3, TU-4, TU-5, TU-6, TU-7, TU-8, and TU-9 were monitored for CH₄, CO₂, and O₂ on a quarterly basis during the months of January, April, July, and October 2017. These landfill gas probes are located around the perimeter of the Tumamoc Landfill. Methane was not detected in any of the probes during the four monitoring events in 2017. **Figure 2** provides the location of the gas probes and **Appendix A** provides the results for each monitoring event.

3.0 ANNUAL LANDFILL INSPECTION

On November 9, 2017, Allwyn Consultants, Inc. (Allwyn) performed the annual field inspection required by COT-EGSD for non-regulated closed landfills. The non-regulated closed landfills are inspected under a COT-EGSD policy in accordance with regulations that are applicable to the regulated landfill sites⁵. In addition to the regular annual inspection, an inspection triggered by a rain event was conducted at the landfill.

Erosional issues identified by the City's previous consultant, Engineering & Environmental Consultants, Inc. (EEC), during the 2016 annual inspection were repaired in April and May 2017. These repairs included:

- Repaired erosion damages on the south perimeter road
- Portions of the south, west, and north slopes of the landfill cap were repaired

⁵ COT-ES, *Closed Landfills Inspection and Maintenance Reporting and Procedures*, March 2011

- A large area of erosion in the central portion of the landfill cap was repaired
- Approximately 10,500 square feet of repaired areas were seeded with a seed and tackifier mix

During the 2017 landfill inspection, Allwyn identified the following relevant issues:

- Significant erosion was observed long the southern inspection road
- Most of the stormwater waddles were undercut
- Significant erosion was observed on the west, north, and south slopes of the landfill cap

All of the above mentioned deficiencies will be evaluated in 2018 for potential repairs.

4.0 CONCLUSIONS

- Groundwater monitoring and sampling activities were not performed in 2017. The next groundwater sampling event will be conducted in 2019.
- Allwyn performed an annual field inspection required for the non-regulated closed landfills in November 2017. Significant erosion was observed along the southern inspection road. Most of the stormwater waddles were undercut and significant erosion was observed on the west, north, and south slopes of the landfill cap.
- Erosional damages identified during the 2016 annual inspection were addressed in April and May 2017.
- Methane was not detected in any of the probes during the four monitoring events in 2017. Landfill gas monitoring will be conducted on a quarterly basis in 2018.

FIGURES

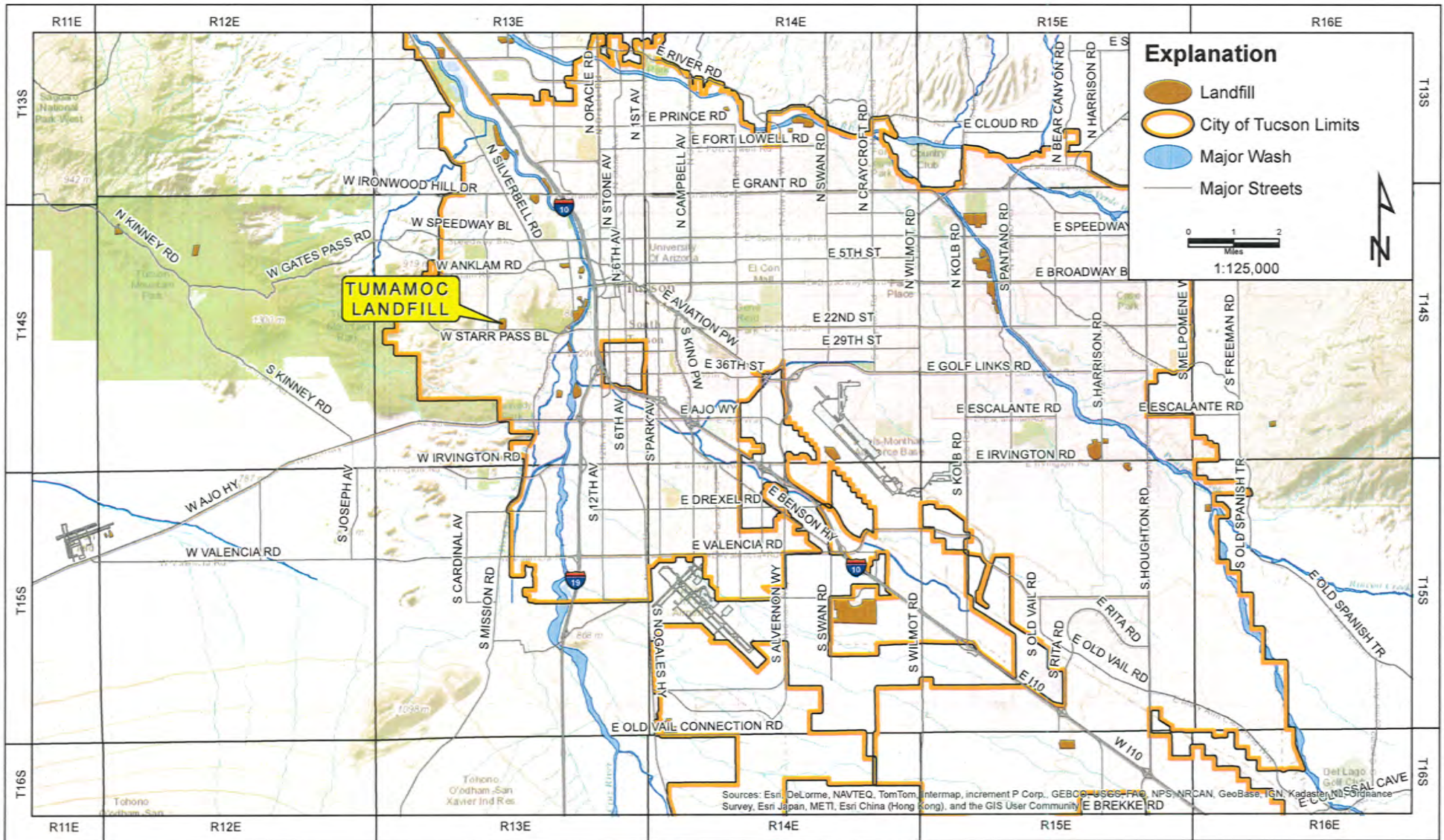


Figure 1
Location Map
Tumamoc Landfill

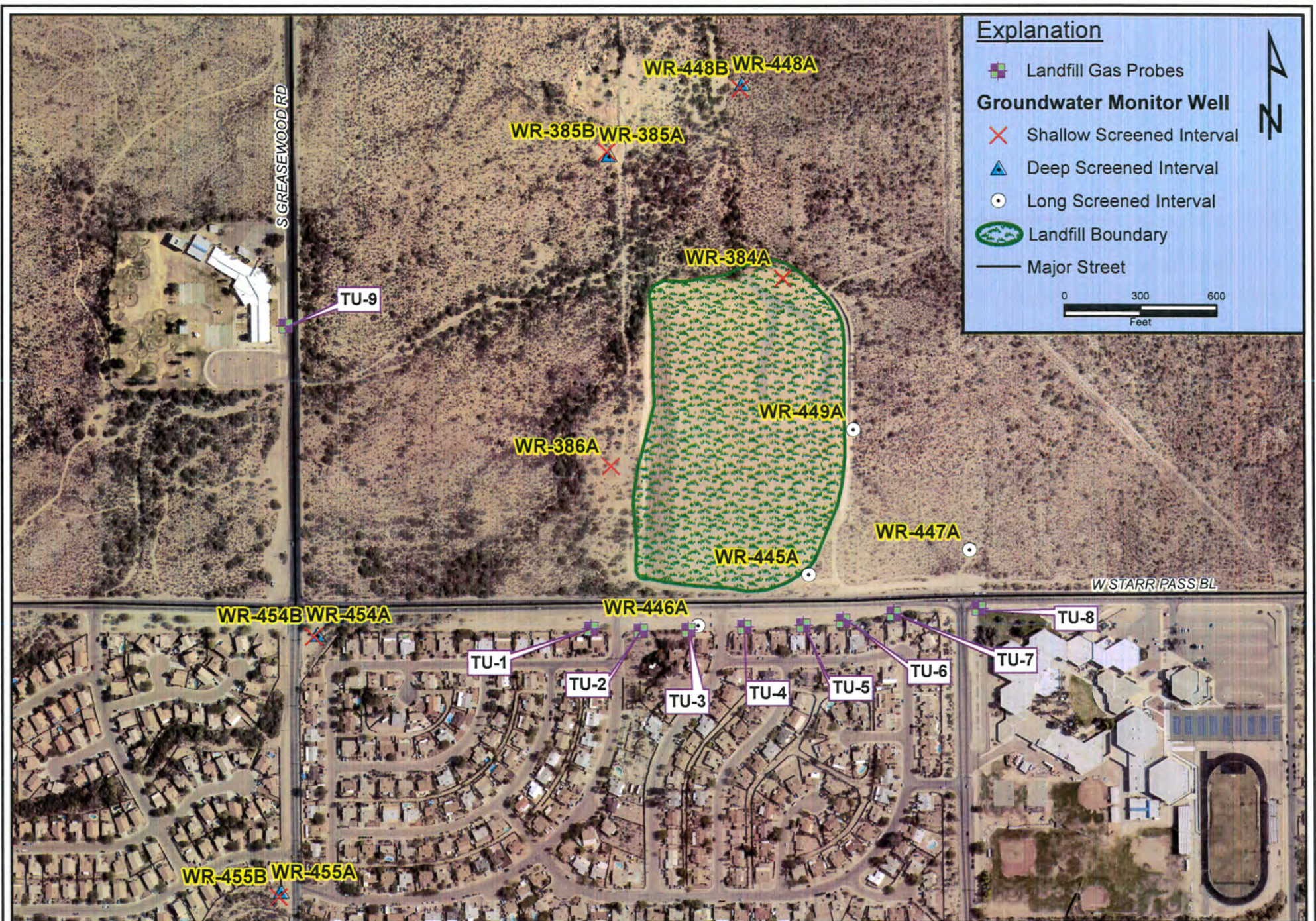


FIGURE 2
Site Map
Tumamoc Landfill

APPENDIX A

Landfill Gas Monitoring Field Results for 2017

Tumamoc Landfill
Methane Monitoring
Wells (all,qtly)

Device ID	Date/Time	CH4 %	CO2 %	O2 %	Balance %	Baro. Press. inches Hg	Rel. Pressure inches H2O
TU000110	1/4/2017 12:30	0.0	1.0	20.1	78.9	27.5	0.02
TU000125	1/4/2017 12:32	0.0	0.0	21.0	79.0	27.5	0.00
TU000125	1/4/2017 12:35	0.0	2.2	19.4	78.4	27.5	0.00
TU000210	1/4/2017 12:40	0.0	2.7	18.4	78.9	27.5	0.01
TU000225	1/4/2017 12:42	0.0	1.5	19.7	78.8	27.5	0.01
TU000310	1/4/2017 12:47	0.0	2.4	19.2	78.4	27.5	0.03
TU000330	1/4/2017 12:50	0.0	2.0	19.9	78.1	27.5	0.02
TU000410	1/4/2017 12:56	0.0	0.5	20.9	78.6	27.5	0.02
TU000430	1/4/2017 12:59	0.0	0.5	20.9	78.6	27.5	0.00
TU000510	1/4/2017 13:06	0.0	0.4	21.0	78.6	27.5	0.01
TU000535	1/4/2017 13:08	0.0	0.4	21.0	78.6	27.5	0.00
TU000610	1/4/2017 13:12	0.0	0.6	20.6	78.8	27.5	0.00
TU000635	1/4/2017 13:15	0.0	0.7	20.3	79.0	27.5	0.01
TU000710	1/4/2017 13:21	0.0	0.5	20.2	79.3	27.5	0.02
TU000735	1/4/2017 13:24	0.0	0.2	20.5	79.3	27.5	0.01
TU000810	1/4/2017 13:30	0.0	1.6	19.7	78.7	27.5	0.01
TU000825	1/4/2017 13:34	0.0	3.7	17.6	78.7	27.6	0.00
TU000910	1/4/2017 12:21	0.0	3.1	17.9	79.0	27.5	0.01
TU000925	1/4/2017 12:23	0.0	6.2	15.9	77.9	27.5	0.02
Note:GEM2000 ID:11159		Monitored by:L.Clark					
GEM2000 was caibrated using 15% methane (see L.Ccalibration sheet for this date)							
Pressure readings were taken with the D.S Mark 111"K" digital manometer.							
Accuracy of the machine is +/-0.3% at methane concentrations of less than<5.0%							

Tumamoc Landfill
Methane Monitoring
Wells(all,Quarterly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Pressure	
		%	%	%	%	inches Hg	inches H2O	
TU000110	4/3/2017 10:09	0.0	1.2	18.9	79.9	27.4	0.00	
TU000125	4/3/2017 10:11	0.0	0.8	19.2	80.0	27.3	0.01	
TU000210	4/3/2017 10:16	0.0	2.4	16.9	80.7	27.4	0.02	
TU000225	4/3/2017 10:18	0.0	3.5	15.8	80.7	27.3	0.00	
TU000310	4/3/2017 10:22	0.0	2.5	17.3	80.2	27.4	0.03	
TU000330	4/3/2017 10:25	0.0	5.6	14.7	79.7	27.3	0.01	
TU000410	4/3/2017 10:29	0.0	0.4	18.7	80.9	27.3	0.03	
TU000430	4/3/2017 10:31	0.0	0.2	18.8	81.0	27.3	0.01	
TU000510	4/3/2017 10:36	0.0	0.2	18.8	81.0	27.3	0.00	
TU000535	4/3/2017 10:39	0.0	0.3	18.7	81.0	27.3	0.01	
TU000610	4/3/2017 10:43	0.0	0.4	18.5	81.1	27.3	0.00	
TU000635	4/3/2017 10:45	0.0	0.6	18.1	81.3	27.3	0.02	
TU000710	4/3/2017 10:49	0.0	0.3	18.8	80.9	27.3	0.01	
TU000735	4/3/2017 10:51	0.0	0.3	18.8	80.9	27.3	0.02	
TU000810	4/3/2017 10:54	0.0	0.3	18.9	80.8	27.3	0.00	
TU000825	4/3/2017 10:57	0.0	0.3	18.8	80.9	27.3	0.03	
TU000910	4/3/2017 9:58	0.0	3.2	17.9	78.9	27.3	0.01	
TU000925	4/3/2017 10:02	0.0	4.0	17.1	78.9	27.3	0.02	
Note:GEM2000 ID:11159		Monitored by:L.Clark						
GEM2000 was caibrated using 15% methane (see L.Ccalibration sheet for this date)								
Pressure readings were taken with the D.S Mark 111"K" digital manometer.								
* Accuracy of the machine is +/-0.3% at methane concentrations of less than<5.0%								

Tumamoc Landfill
Methane Monitoring
Wells (all, Quarterly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Pressure
		%	%	%	%	inches Hg	inches H2O
TU000110	10/3/2017 10:50	0.0	0.3	19.5	80.2	27.28	0.00
TU000125	10/3/2017 10:54	0.0	1.6	18.7	79.7	27.27	0.00
TU000210	10/3/2017 10:42	0.0	1.6	18.4	80.0	27.30	0.00
TU000225	10/3/2017 10:47	0.0	0.3	19.6	80.1	27.28	0.00
TU000310	10/3/2017 10:30	0.0	3.6	16.7	79.7	27.30	0.00
TU000330	10/3/2017 10:35	0.0	8.7	11.3	80.0	27.30	0.00
TU000410	10/3/2017 10:19	0.0	1.6	18.3	80.1	27.31	0.00
TU000430	10/3/2017 10:24	0.0	2.4	16.3	81.3	27.30	0.00
TU000510	10/3/2017 10:08	0.0	0.5	19.1	80.4	27.32	0.00
TU000535	10/3/2017 10:14	0.0	0.5	18.9	80.6	27.31	0.00
TU000610	10/3/2017 9:59	0.0	0.8	19.0	80.2	27.33	0.00
TU000635	10/3/2017 10:04	0.0	0.7	18.6	80.7	27.32	0.11
TU000710	10/3/2017 9:48	0.0	1.4	18.9	79.7	27.33	0.00
TU000735	10/3/2017 9:53	0.0	0.5	19.3	80.2	27.33	0.00
TU000810	10/3/2017 9:22	0.0	2.2	18.9	78.9	27.36	0.00
TU000825	10/3/2017 9:26	0.0	4.0	17.0	79.0	27.36	0.00
TU000910	10/3/2017 9:34	0.0	4.1	15.4	80.5	27.36	0.00
TU000925	10/3/2017 9:37	0.0	0.2	19.9	79.9	27.35	0.00

Note:GEM2000 ID:11158

Monitored by: K.Mendoza

GEM2000 was caibrated using 15% methane (see KM calibration sheet for this date)

Pressure readings were taken with the D.S Mark 111"A" digital manometer.

* Accuracy of the machine is +/-0.3% at methane concentrations of less than<5.0%

APPENDIX B

Landfill Inspection Report 2017

TUMAMOC LANDFILL INSPECTION REPORT
ANNUAL 2017
TUCSON, ARIZONA

FEBRUARY 9, 2018

PREPARED FOR:



CITY OF TUCSON
P.O. BOX 27210
TUCSON, AZ 85726-7210

 Allwyn
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610 S. PARK AVENUE; TUCSON, ARIZONA 85719
PHONE: (520) 730-5422

ALLWYN CONSULTANTS PROJECT NO. 0002-0168



BY: _____
DAVID BARRAZA
PROJECT MANAGER

REVIEWED BY: _____
TOD WHITWER, P.E.
PRINCIPAL

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1.0 INTRODUCTION

This report documents the results of an annual landfill inspection conducted on November 9, 2017 at the closed Tumamoc Landfill (See Appendix A for a site map of the landfill). Tumamoc Landfill was operated by the City of Tucson as a Municipal Solid Waste landfill facility during the 1960s. A closure project was conducted in 2013, which included installation of an evapotranspiration soil cap, erosion protection using straw wattles, and a drainage channel protected with a gabion mattress.

Field inspections are conducted annually each year and follow the procedures outlined in "City of Tucson Closed Landfills Inspection and Maintenance Reporting and Procedures March 2011." This guidance document was internally prepared by the City of Tucson Environmental Services Department (COT-ES).

This report documents the results of a rain event site inspection conducted on August 4, 2017. A rain event triggered site inspection is 0.5 inches or more of rainfall in a 24-hour period. Precipitation totals were obtained using rain sensor data from the Pima County Regional Flood Control District (PCRFCD), which maintains a network of tipping bucket sensors throughout the county. The sensor closest to Tumamoc Landfill is located at Mission Road near Silverlake, approximately 1.2 miles from the landfill and is assigned Rain Sensor No. 6100. In addition to precipitation, COT-ES requires an inspection be conducted during prolonged periods of high winds. A qualifying wind event is described as average wind speeds of 25 miles per hour (mph) or greater for 60 minutes. Wind speed is monitored from data supplied by the 25th Operational Weather Squadron, Davis-Monthan Air Force Base. This data can be monitored in real time or viewed as recorded wind speeds in hourly increments. Details regarding the trigger event that initiated this inspection are included as Section 4.0 of this report. Trigger event precipitation recorded during this monitoring period of July 2017 to December 2017 is presented in Appendix C.

2.0 LANDFILL INSPECTION REPORT FORM

A copy of the 4th Quarter 2017, Landfill Inspection Report Form for the reporting period from October to December 2017, is presented in Appendix B.

3.0 CORRECTIVE ACTIONS COMPLETED

A review of the 2016 Annual Inspection Report dated October 25, 2016, indicated the corrective actions recommended were accomplished.

4.0 LANDFILL INSPECTION SUMMARY

A copy of the Tumamoc Landfill Inspection Report Form completed on November 9, 2017 is presented in Appendix B. The Inspection Report form provides a list of specific landfill items observed during the landfill inspection. Comments on the conditions encountered during the inspection are included in the comment section of the Landfill Report Form. The items inspected, observations made, and recommended corrective actions are summarized below.

4.1 PERIMETER SECURITY FENCE AND GATE

South perimeter fence and gate is in good condition.

4.2 INSPECTION ROADS

Significant erosion was observed along the southern inspection road.

Recommended Corrective Actions: Repair road, adjacent shoulder and reinstall erosion controls.

4.3 STORM WATER CONTROLS

Most of the storm water waddles are undercut and no longer effective.

Recommended Corrective Actions: Repair rills that have developed beneath waddles and reinstall.

4.4 STORMWATER RETENTION BASIN

There is no retention basin located on the site.

4.5 LANDFILL EARTHEN CAP

Significant erosion was observed on the west, north, and south slopes of the landfill cap. Erosion rills are developing along the top of the landfill cap adjacent to the spillway channels.

RECOMMENDED CORRECTIVE ACTIONS: Repair erosion throughout landfill cap and reinstall erosion controls.

4.6 LANDFILL GAS EXTRACTION SYSTEM WELLFIELD

There is no landfill gas extraction system located on the site.

4.7 LANDFILL GAS COLLECTION AND CONTROL SYSTEM COMPUND

There is no landfill gas collection system on the site.

4.8 LANDFILL GAS MONITORING WELLS

There are no landfill gas monitoring wells on the site.

4.9 GROUNDWATER MONITORING WELLS

No deficiencies were observed during the reporting period.

4.10 REMEDIATION EQUIPMENT

There is no remediation equipment on the site.

4.11 ILLEGAL DUMPING

No illegal dumping was observed during the reporting period.

4.12 NEIGHBORING LAND USES

No issues regarding neighboring land uses were observed during the reporting period.

5.0 WEATHER EVENT INSPECTIONS

On August 4, 2017 at 8:00 AM, PCRFC D Gauge No. 6100 registered 0.51 inches of rain recorded over the previous 24 hours. Based on this data, a rain event site inspection was conducted. This trigger event data is included in Appendix B (Rain Data). Observations made during this storm event inspection have been incorporated into this report and the City of Tucson's Landfill Inspection Form, dated November 9, 2017 and are included in Appendix B.

APPENDIX A

LANDFILL SITE MAP



Number in call out box correlates to photograph number in photographic log



610 South Park Avenue
Tucson, Arizona 85719
www.allwynllc.com

**APPENDIX A
Landfill Aerial Map**

**Annual Landfill Inspection
Tumamoc Landfill
Tucson, Arizona**

Project Number: 0002-0168

February 9, 2017



City of Tucson,
Environmental Services
Department

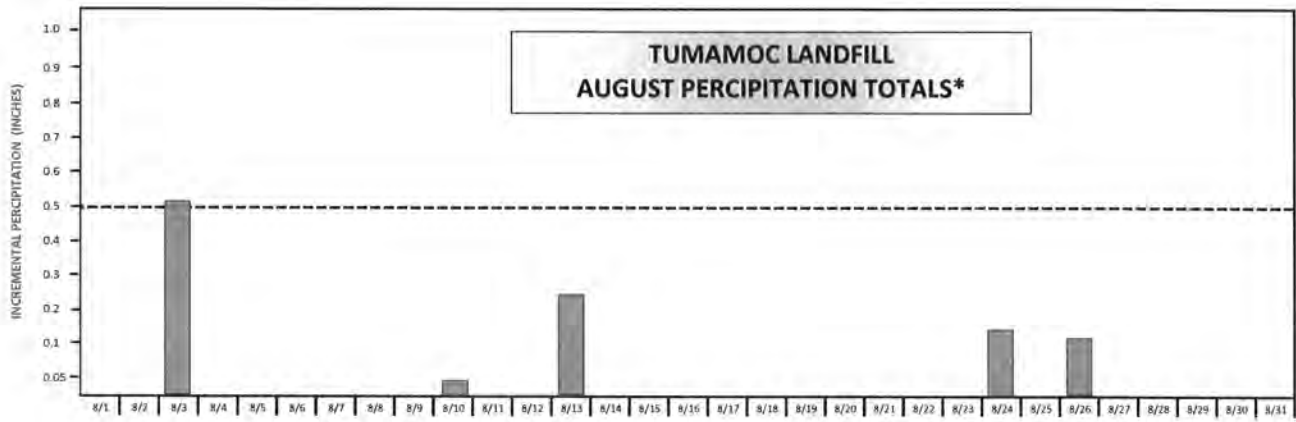


Not to Scale

APPENDIX B

RAINFALL AND WIND DATA

City of Tucson - Environmental Services Department
Annual - 2017 Closed Landfill Inspection
Tumamoc Landfill



* Incremental percipitation totals recorded by PCFC sensor ID #6100, located at Mission Road and Silverlake.

APPENDIX C

LANDFILL INSPECTION REPORT FORM

**CITY OF TUCSON ENVIRONMENTAL SERVICES
ANNUAL CLOSED LANDFILL INSPECTION REPORT
TUMAMOC LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
Perimeter Security Fence and Gate (holes, structure issues)	In good condition	
Inspection Roads (washouts, obstructions, potholes)	Southern road has areas of heavy erosion	Repair damage to south inspection road install runoff controls along southern slope
Storm Water Controls (berms, let downs, spillways)	Fabric exposed in both rock lined spillways all waddles have been undermined on North, South and West slopes.	Replace washed away rip rap in spillways Repair riles on all effected slopes.
Storm Water Retention Basins (washouts, excessive silt in, holding water)	None	
Landfill Earthen Cap (washouts, trash showing, debris and trash)	Significant erosion occurring at North, South and west slopes	Fill and compact erosion riles and reinstall runoff controls
Landfill Gas Extraction System Wellfield (piping, wells, vaults, washouts)	No Gas extraction system on site	
Landfill Gas Extraction System Compound (fencing, blower equipment, flare, carbon canisters)	No Gas extraction system on site	
Landfill Gas Monitoring Wells (including bollards, vaults, locks)	No Monitoring Wells on Site	
Groundwater Monitoring Wells (including bollards, vaults, locks)	None	
Remediation Equipment (compound fence, erosions, leaks)	No remediation Equipment on site	
Illegal Dumping (including overgrown vegetation, homeless camps, vectors)	None observed	
Neighboring Land Uses (changing adjacent land uses that will or currently are impacting the landfill site)	No new uses observed	
INSPECTOR SIGNATURE		DATE
<i>Shona J. [Signature]</i>		9 NOV 2017

APPENDIX D

PHOTOGRAPHIC LOG



PHOTOGRAPH NO. 1

Erosion rills developing on eastside of east perimeter inspection road west of WR-449A. Viewed from the north.



PHOTOGRAPH NO. 2

Erosion rills developing on eastside of east perimeter inspection road west of WR-449A. Viewed from the north.



PHOTOGRAPH NO. 3

Exposed fabric with displaced rip-rap. Viewed from the west.



PHOTOGRAPH NO. 4

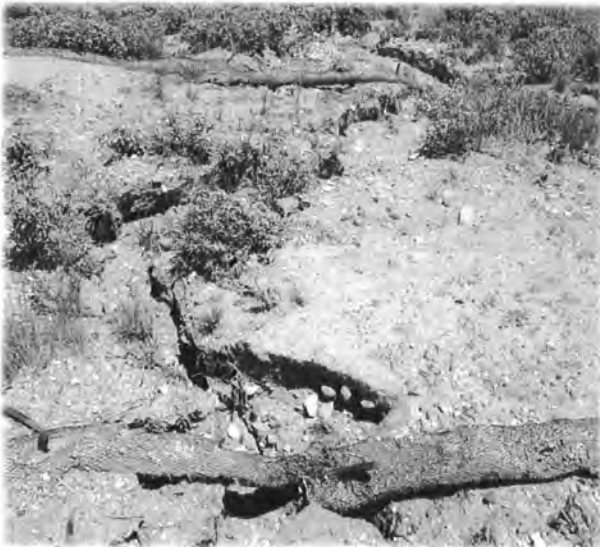
Erosion rills developing at the south (top) end of spillway. Viewed from the south.



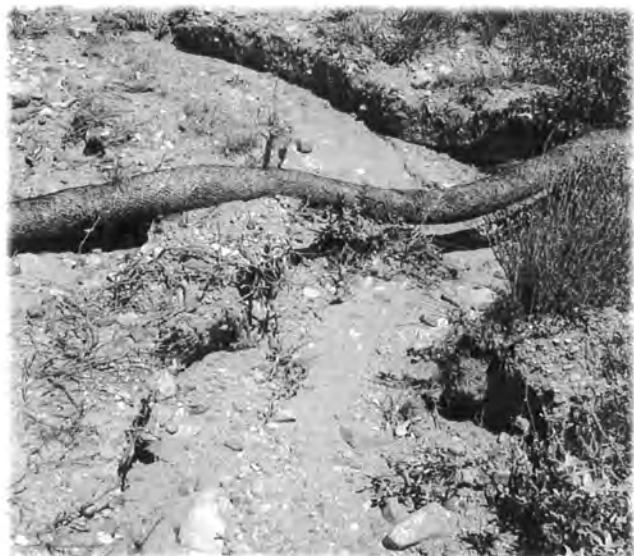
PHOTOGRAPH NO. 5
Erosion rills located on north end of west slope.
Viewed from the east.



PHOTOGRAPH NO. 6
Erosion rills located on west slope. Viewed from the
north.



PHOTOGRAPH NO. 7
Erosion rills and undermined straw waddles
on north slope. Viewed from the south.



PHOTOGRAPH NO. 8
Erosion rills and undermined straw waddles
on north slope. Viewed from the north.



PHOTOGRAPH NO. 9
Erosion rills located on north slope. Viewed from the west.



PHOTOGRAPH NO. 10
Exposed silt covered fabric located on north spillway. Viewed from the North.



PHOTOGRAPH NO. 11
Erosion rills parallel to the west spillway. Viewed from the North.



PHOTOGRAPH NO. 12
Erosion rills parallel to the west spillway. Viewed from the North.



PHOTOGRAPH NO. 13
Deep erosion rills located along the south inspection road. Viewed from the east.



PHOTOGRAPH NO. 14
Deep erosion rills located along the south inspection road. Viewed from the west.



PHOTOGRAPH NO. 15
Deep erosion rills located along the south inspection road. Viewed from the north.



PHOTOGRAPH NO. 16
Deep erosion rills located along the south inspection road. Viewed from the east.



PHOTOGRAPH NO. 17

Deep erosion rills located along the south inspection road. Viewed from the south.



PHOTOGRAPH NO. 18

Deep erosion rills located along the south inspection road. Viewed from the south.



PHOTOGRAPH NO. 19

Deep erosion rills located on the west. Viewed from the south.



PHOTOGRAPH NO. 20

Deep erosion rills located on the west slope. Viewed from the west.



PHOTOGRAPH NO. 21
Deep erosion rills located along the on the south slope. Viewed from the south.



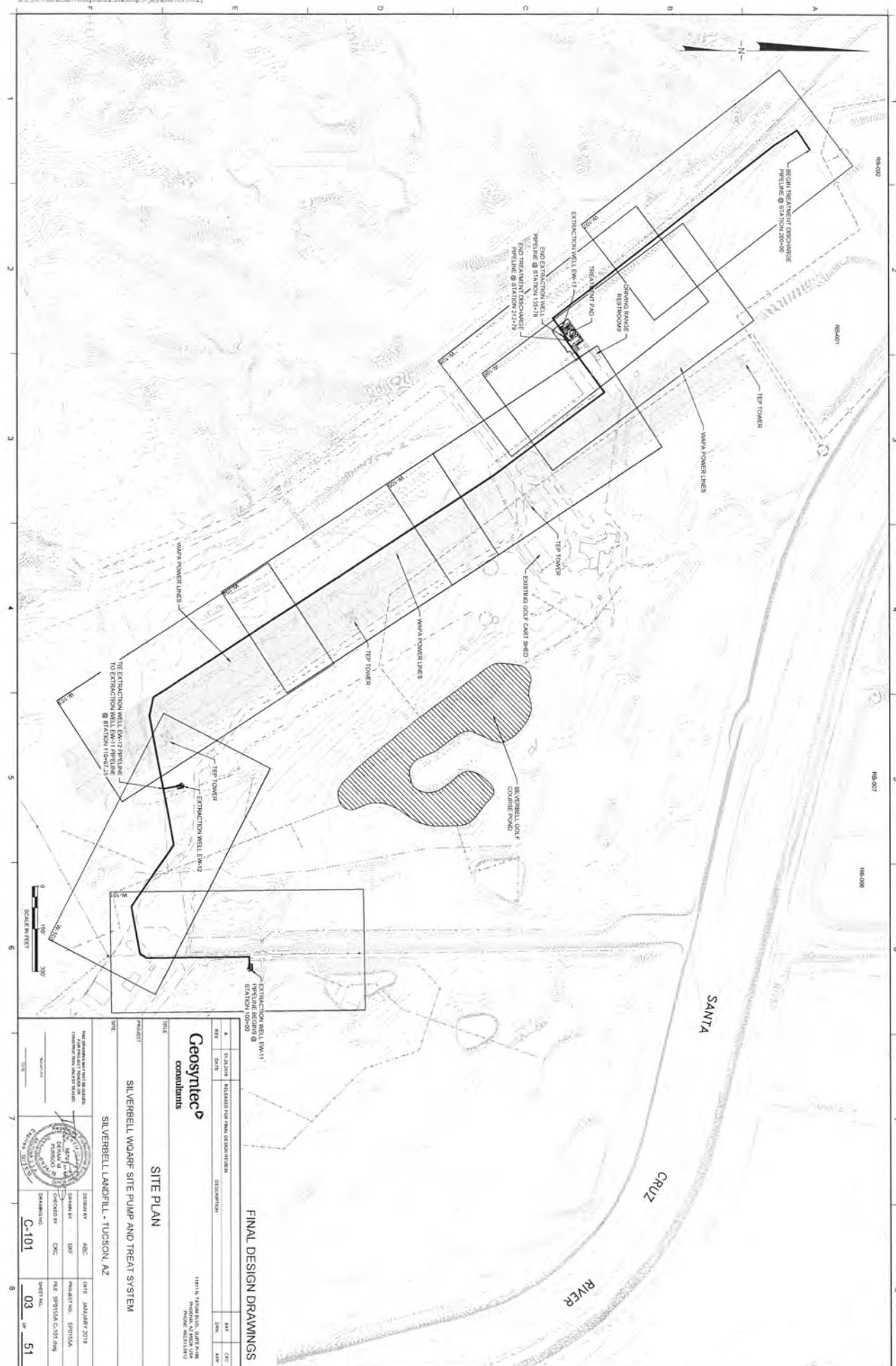
PHOTOGRAPH NO. 22
Deep erosion rills located along the on the south slope. Viewed from the south.



PHOTOGRAPH NO. 23
Deep erosion rills located along the on the west. Viewed from the south.



PHOTOGRAPH NO. 24
Deep erosion rills located along the on the west slope. Viewed from the west.



FINAL DESIGN DRAWINGS

SITE PLAN

SILVERBELL WARRP SITE PUMP AND TREEN SYSTEM

SILVERBELL LANDFILL - TUCSON, AZ

Geosyntec[®]
consultants

DATE: JANUARY 2018
PROJECT NO.: SP1705A
SHEET NO.: 03 OF 51

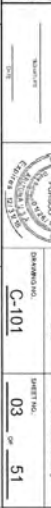
REV	DATE	DESCRIPTION	BY	CHK
1	12/20/17	RELEASED FOR FINAL DESIGN REVIEW		

THE ENGINEER HAS REVIEWED THE DESIGN AND FOUND IT TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERMITS AND REGULATIONS. THE ENGINEER'S REVIEW IS LIMITED TO THE INFORMATION PROVIDED AND DOES NOT CONSTITUTE A GUARANTEE OF THE ACCURACY OF THE INFORMATION PROVIDED.

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SCALE IN FEET

1" = 100'



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