

TECHNICAL MEMORANDUM

To: Nevada Environmental Response Trust

Cc: Nevada Division of Environmental Protection
United States Environmental Protection Agency

From: Dana Grady

Date: March 29, 2021

Subject: Las Vegas Wash Bioremediation Pilot Study Monthly Progress Report

At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum which summarizes Tetra Tech's progress during February 2021 toward successfully implementing the Las Vegas Wash Bioremediation Pilot Study.

Task Progress Update: February 2021

Task M19 – Las Vegas Wash Pilot Study

- Current Status
 - Injections – The first injection event was completed in December 2020 and the pilot study is currently in the effectiveness monitoring phase. A summary of the injections was provided in the previous January 2021 monthly progress report. On-going effectiveness monitoring program and results are provided below. A layout map and construction details of all injection, monitoring, and extraction wells are provided as Figures 1 through 4 and Table 1.
 - Effectiveness Monitoring – Baseline groundwater sampling was completed in the fall of 2020 prior to the first injection event. Following the first injection event, the monitoring program described in the Work Plan Addendum was implemented to evaluate the effectiveness of in-situ bioremediation. As part of this monitoring program, groundwater sampling was conducted on a biweekly basis for the Zone 2 alluvium for the first two months post-injection and was followed by a monthly sampling program thereafter, which is ongoing. Groundwater sampling is being conducted monthly in the Upper Muddy Creek formation (UMCf), and/or UMCf-coarse grained (cg) for Zones 1, 2, and 3. The most recent monthly groundwater sampling event was conducted from February 8, 2021 through February 15, 2021.
 - Available groundwater analytical results from the baseline sampling event and effectiveness monitoring events performed in December 2020 and January 2021 (two biweekly sampling events and the first monthly sampling event following injections) are provided in Table 2. Groundwater analytical results from the second monthly groundwater

sampling event recently completed in February 2021 will be provided in future monthly progress reports as data become available. Results are summarized below.

- Zone 2 Alluvium:
 - Cross-gradient monitoring wells LVWPS-A2-MW04A/B and LVWPS-A2-MW05A/B, which are located approximately 17 feet from each end of the Zone 2 injection well transect, continue to observe perchlorate concentration decreases in groundwater samples, ranging from 32 to 99 percent reduction when compared to baseline concentrations.
 - Groundwater samples collected from the 14 monitoring wells located approximately 50 to 100 feet downgradient of the injection well transect exhibited an overall average percentage decrease in groundwater perchlorate concentrations (compared to baseline concentrations) of up to 60 percent during the first monthly post-injection sampling event. Of these 14 monitoring wells, groundwater samples collected from five monitoring wells have observed a greater than 90 percent reduction in perchlorate concentrations during the sampling events conducted approximately four and six weeks following injection activities compared to baseline.
 - Groundwater samples collected six weeks after injection activities from monitoring wells LVWPS-MW208B and LVWPS-MW223B, which are located approximately 200-250 feet downgradient of the injection well transect, exhibited perchlorate concentration decreases of greater than 90 percent when compared to baseline concentrations.
 - Chlorate results followed a similar pattern to perchlorate results for samples collected during sampling events at four and six weeks post-injection. Groundwater samples collected from three of the four cross-gradient monitoring wells showed decreases in chlorate concentrations of greater than 80 percent compared to baseline. Groundwater samples collected from 11 of the 18 monitoring wells located between 50 and 250 feet downgradient of the injection well transect exhibited reductions in chlorate concentration of greater than 70 percent. Of these 11 monitoring wells, groundwater samples collected from eight of these monitoring wells exhibited concentration decreases greater than 90 percent when compared to baseline.
 - Nitrate concentrations in groundwater were also evaluated because it is often a competing and preferred electron acceptor and carbon substrate consumer. Nitrate concentrations in groundwater samples collected from Zone 2 alluvium monitoring wells averaged 17 milligrams per liter (mg/L) during the baseline sampling event. Since injections, nitrate concentrations have reduced an average of 65 percent in groundwater samples collected from cross-gradient and downgradient monitoring wells. During the first monthly and second biweekly sampling events, groundwater samples collected from 18 cross-gradient or downgradient monitoring wells exhibited decreases in nitrate concentrations to less than 10 mg/L. Of these 18 monitoring wells, groundwater samples collected from seven monitoring wells exhibited nitrate concentrations less than 1 mg/L.
- Zone 1, 2, and 3 UMCf/UMCf-cg:
 - Zone 1 UMCf – Approximately one month following injections into Zone 1 UMCf, groundwater samples collected from three of the six monitoring wells located

approximately 25 feet downgradient of the injection well transect exhibited a greater than 90% reduction in perchlorate concentrations compared to baseline. Other notable groundwater perchlorate concentration decreases when compared to baseline include groundwater samples collected from one monitoring well located 100 feet downgradient of the injection well transect (LVWPS-U1-MW09B) observed a 41 percent reduction in perchlorate concentrations. Lastly, reductions were also observed in two upgradient monitoring wells, namely LVWPS-U1-MW06B and LVWPS-U1-MW07. This was expected based on the low effective porosities observed and calculated during injection activities. Low effective porosity causes injectate solution to move farther from the injection points (both upgradient and downgradient) during injections, particularly when injecting under pressure. Nitrate and chlorate concentrations followed a similar pattern to perchlorate.

- Zone 2 UMCf – Approximately one month following injections into Zone 2 UMCf, groundwater samples collected from cross-gradient monitoring wells LVWPS-U2-MW04 and LVWPS-U2-MW05, which are screened in the UMCf and located approximately 12 feet from the injection well at either end of the Zone 2 injection well transect, indicate perchlorate concentration reductions of greater than 99 percent when compared to baseline. Additionally, groundwater samples collected from monitoring well LVWPS-U2-MW17, which is located approximately 100 feet downgradient of the Zone 2 injection well transect, indicate a perchlorate reduction of approximately 60 percent when compared to baseline. Nitrate and chlorate concentrations followed a similar pattern to perchlorate.
- Zone 3 UMCf-cg – Approximately one month following injections into Zone 3 UMCf-cg, five of the ten monitoring wells located approximately 25 to 50 feet downgradient exhibited a greater than 97% reduction in perchlorate compared to baseline conditions. In addition, monitoring wells LVWPS-U3-MW10A/B, which are approximately 100 feet downgradient of the Zone 3 injection well transect, both exhibited a greater than 99% reduction in perchlorate, chlorate, and nitrate concentrations compared to baseline conditions. These observations farther downgradient relative to observations in the UMCf in Zones 1 and 2 are likely related to the coarser-grained aquifer matrix in Zone 3 UMCf-cg and associated with faulting in the area.
- Surface water sampling was performed prior to injection activities on October 16, 2020 and October 29, 2020. Three surface water sampling events have since been performed in December 2020 (during injections) and January and February 2021 (after injections). It should be noted that although limited surface water sampling will be periodically conducted downgradient of the study area, reducing perchlorate concentrations in surface water is not an objective of this pilot study. Noteworthy results related to the pilot study will be summarized in future monthly progress reports as warranted.
- Dye Study – As part of injection activities, rhodamine WT and fluorescein tracer dyes were injection into the alluvium and UMCf/UMCf-cg, respectively. A summary of the sampling program and results from the December 2020 and January 2021 sampling events was presented to NDEP on March 4, 2020. An abbreviated summary is provided below. Available analytical results for dye samples collected during baseline activities, injection activities, and the December 2020 and January 2021 effectiveness monitoring events are provided Table 3. It should be noted that there were several cases where charcoal samplers showed low detections of dye, but the water samples did not show dye, indicating that either the dye peak already passed before the water

sample was collected, or the levels of dye in the water are so low that they are not detectable. Results from future sampling events will be evaluated to provide additional clarification of the likely scenario. Noteworthy results during this monitoring period are described below:

- Zone 2 Alluvium:
 - During injection activities, rhodamine tracer dye was measured in all four of the Zone 2 alluvium dose response wells. One month following injection activities, rhodamine tracer dye was still being detected in all four dose response wells.
 - As previously discussed, cross-gradient monitoring wells LVWPS-A2-MW04A/B and LVWPS-A2-MW05A/B (located approximately 17 feet from either end of the Zone 2 injection well transect) had detections of rhodamine dye with the field probe in all four of these wells during injections. Approximately six weeks following injections, rhodamine dye was detected in groundwater samples collected from monitoring well LVWPS-A2-MW05B. However, TOC concentrations (a surrogate for the carbon substrate injected) remain elevated above baseline concentrations in all four ROI wells. This is expected based on the ability of the emulsified vegetable oil to adsorb to the subsurface in the vicinity of the injection well transect, whereas the tracer dye continues to move downgradient.
 - As expected, the high groundwater flow velocity in the alluvium resulted in many downgradient wells observing the presence of dye during active injections or within a few days after injections were completed. Approximately one month after injection activities were completed, rhodamine dye was detected in Zone 2 alluvium groundwater samples collected from seven monitoring wells located 50 to 250 feet downgradient of the injection well transect. In addition, rhodamine dye was detected in charcoal samples collected from monitoring wells LVWPS-MW209 and LVWPS-MW210A/B, which are located approximately 625 and 850 feet downgradient, respectively.
- Zone 1, 2, and 3 UMCf/UMCf-cg:
 - Zone 1 UMCf – One month after injections were completed in Zone 1 UMCf, fluorescein tracer dye was no longer detected in groundwater samples collected 50 feet upgradient of the injection well transect at LVWPS-U1-MW06B and LVWPS-U1-MW07, indicating downgradient migration over time. Dye continued to be detected in both charcoal and groundwater samples collected from monitoring wells LVWPS-U1-MW08A/B (located 25 feet downgradient). Fluorescein was also detected in charcoal samples from alluvial wells located 100 to 150 feet downgradient of the Zone 1 UMCf injection well transect, likely indicating upflux from the UMCf into the alluvium in this vicinity.
 - Zone 2 UMCf – Approximately one month after injections, fluorescein was detected in charcoal and/or groundwater samples collected from both dose response wells (LVWPS-U2-DR01 and LVWPS-U2-DR02) and both cross-gradient monitoring wells located approximately 12 feet from the injection well transect. Rhodamine and low levels of fluorescein were detected in groundwater at LVWPS-U2-MW17, which is located 100 feet downgradient. The rhodamine detection is from the injections into the Zone 2 alluvium, which likely migrated into the downgradient UMCf well due to localized downward gradients present within Zone 2. Fluorescein was also detected in charcoal samples from alluvial wells located 100 to 200 feet downgradient of the Zone 2 UMCf injection well transect, likely indicating upflux from the UMCf into the alluvium in this vicinity.

- Zone 3 UMCf-cg – Approximately one month after injections were completed in the Zone 3 UMCf-cg, fluorescein was detected in either charcoal or groundwater samples collected from all dose response wells and four of the six monitoring wells located approximately 25 feet downgradient of the Zone 3 injection well transect. In addition, fluorescein tracer dye was detected in charcoal samples collected from monitoring wells LVWPS-U3-MW10A/B and LVWPS-MW12A/B, which are located approximately 100 and 150 feet downgradient, respectively.
- Access and Permitting
 - All access agreements and permits are now in place for all projected pilot study activities.
- Schedule and Progress Updates
 - The third monthly effectiveness monitoring event is scheduled for the week of March 8, 2021.
- Health and Safety
 - There were no safety incidents related to Task M19 during February 2021.
 - Safety measures continue to be implemented to minimize potential exposure to COVID-19, including the use of face coverings, gloves, and hand sanitizer, as well as protocols for monitoring temperatures, minimizing the number of people on site at one time, and evaluating tasks to increase physical distance between personnel.

CERTIFICATION

Las Vegas Wash Bioremediation Pilot Study Monthly Progress Report

Nevada Environmental Response Trust Site (Former Tronox LLC Site) Henderson, Nevada


Nevada Environmental Response Trust (NERT) Representative Certification

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Not Individually, but Solely
as President of the Trustee

Signature:  _____, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Name: Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Title: Solely as President and not individually

Company: Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Date: 3/22/21

CERTIFICATION

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Description of Services Provided: Las Vegas Wash Bioremediation Pilot Study Monthly Progress Report, Nevada Environmental Response Trust Site, Henderson, Nevada.



Kyle Hansen, CEM
Field Operations Manager/Geologist
Tetra Tech, Inc.

March 29, 2021

Date

Nevada CEM Certificate Number: 2167
Nevada CEM Expiration Date: September 18, 2022

Figures

- Legend**
- ⊕ Extraction Well
 - ⊙ Dual-Nested UMCf Injection Well
 - ⊗ Alluvial Monitoring Well
 - ⊙ UMCf Monitoring Well
 - ⊗ UMCf (Semi-consolidated) Monitoring Well
 - ⊙ Dose Response Well



Note:
Monitoring and injection well names are shown without prefix LVWPS.



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NEVADA ENVIRONMENTAL RESPONSE TRUST

LAS VEGAS WASH BIOREMEDIATION PILOT STUDY
HENDERSON, NEVADA

WELL LAYOUT FOR ZONE 1 STUDY AREA

PROJECT NO.: 117-7502019
DATE: NOVEMBER 10, 2020
DESIGNED BY: ES

Figure No.
2

Tables

Table 1
Phase 2 Well Construction Details
 Las Vegas Wash Bioremediation Pilot Study

Well ID	Screened Lithology	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water ¹	Construction Type	Construction Material	Slot Size	Filter Pack Gradation	Borehole Diameter	Borehole Total Depth	Well Diameter	Nominal Screen Length	Well Total Depth	Bottom of Screen	Top of Screen
				feet amsl	feet amsl	feet bTOC			inches		inches	feet bgs	inches	feet	feet bgs	feet bgs	feet bgs
Zone 1 Study Area																	
LWVPS-A1-DR01	Alluvium	26735024.80	838207.19	1524.18	1523.98	29.38	Single	Schedule 40 PVC	0.020	#3	6	83.5	2	20	83	82.5	62.8
LWVPS-A1-DR02	Alluvium	26734983.35	838236.38	1524.57	1524.20	29.54	Single	Schedule 40 PVC	0.020	#3	6	79.0	2	20	78.5	78	58.3
LWVPS-A1-MW04	Alluvium	26735022.91	838259.32	1529.32	1529.30	34.87	Single	Schedule 40 PVC	0.020	#3	6	92.5	2	20	89.5	89	69.3
LWVPS-A1-MW05	Alluvium	26734946.32	838312.17	1530.88	1530.55	36.10	Single	Schedule 40 PVC	0.020	#3	6	95.0	2	20	89.5	89	69.3
LWVPS-A1-MW06	Alluvium	26734994.26	838149.70	1523.90	1523.76	28.80	Single	Schedule 40 PVC	0.020	#3	6	85.0	2	20	79.5	79	59.3
LWVPS-A1-MW07	Alluvium	26734911.17	838213.86	1525.06	1524.99	30.15	Single	Schedule 40 PVC	0.020	#3	6	80.0	2	20	78.5	78	58.3
LWVPS-A1-MW09	Alluvium	26735029.71	838317.19	1529.61	1529.43	35.62	Single	Schedule 40 PVC	0.020	#3	6	107.0	2	20	106	105.5	85.8
LWVPS-A1-MW10	Alluvium	26735080.18	838337.96	1527.26	1527.07	33.55	Single	Schedule 40 PVC	0.020	#3	6	91.5	2	20	91	90.5	70.8
LWVPS-U1-DR01A	UMCf	26735027.64	838205.37	1524.09	1524.00	29.15	Single	Schedule 40 PVC	0.010	#2/16	6	116.5	2	25	115.5	115	90.3
LWVPS-U1-DR01B	UMCf	26735030.53	838203.16	1524.07	1523.94	28.89	Single	Schedule 80 PVC	0.010	#2/16	6	152.5	2	30	151.5	151	121.3
LWVPS-U1-DR02A	UMCf	26734986.83	838234.68	1524.02	1523.92	29.15	Single	Schedule 40 PVC	0.010	#2/16	6	117.5	2	30	117	116.5	86.8
LWVPS-U1-DR02B	UMCf	26734991.38	838232.08	1523.92	1523.71	28.63	Single	Schedule 80 PVC	0.010	#2/16	6	153.5	2	30	153	152.5	122.8
LWVPS-U1-IW01A	UMCf	26735044.59	838183.29	1523.67	1523.72	28.91	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	155.0	2	25	114	113.5	88.8
LWVPS-U1-IW01B	UMCf	26735044.44	838182.98	1523.67	1523.65	28.76		Schedule 40 PVC	0.010	#2/16			2	25	145.5	145	120.3
LWVPS-U1-IW02A	UMCf	26735024.11	838198.37	1524.46	1524.39	29.41	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	155.0	2	25	115.5	115	90.3
LWVPS-U1-IW02B	UMCf	26735023.96	838198.03	1524.46	1524.43	29.42		Schedule 40 PVC	0.010	#2/16			2	30	151.5	151	121.3
LWVPS-U1-IW03A	UMCf	26735004.66	838213.18	1523.88	1523.55	28.59	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	155.0	2	25	119	118.5	93.8
LWVPS-U1-IW03B	UMCf	26735004.34	838213.12	1523.88	1523.53	28.40		Schedule 40 PVC	0.010	#2/16			2	25	150.5	150	125.3
LWVPS-U1-IW04A	UMCf	26734984.96	838228.48	1523.90	1523.65	28.89	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	155.0	2	30	117	116.5	86.8
LWVPS-U1-IW04B	UMCf	26734984.86	838228.18	1523.90	1523.59	28.49		Schedule 40 PVC	0.010	#2/16			2	30	153	152.5	122.8
LWVPS-U1-IW05A	UMCf	26734965.08	838243.71	1524.36	1524.25	29.45	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	155.0	2	25	114	113.5	88.8
LWVPS-U1-IW05B	UMCf	26734965.09	838243.38	1524.36	1524.23	29.21		Schedule 40 PVC	0.010	#2/16			2	25	145.5	145	120.3
LWVPS-U1-IW06A	UMCf	26734945.21	838258.76	1524.91	1525.12	30.40	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	157.5	2	25	113	112.5	87.8
LWVPS-U1-IW06B	UMCf	26734945.02	838258.36	1524.91	1525.07	30.06		Schedule 40 PVC	0.010	#2/16			2	30	149.5	149	119.3
LWVPS-U1-IW07A	UMCf	26734925.20	838273.28	1529.08	1528.30	33.50	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	160.0	2	25	121	120.5	95.8
LWVPS-U1-IW07B	UMCf	26734925.28	838272.95	1529.08	1528.66	33.46		Schedule 40 PVC	0.010	#2/16			2	25	152.5	152	127.3
LWVPS-U1-IW08A	UMCf	26734905.81	838289.00	1529.69	1530.71	35.85	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	170.0	2	30	125.5	125	95.3
LWVPS-U1-IW08B	UMCf	26734905.38	838288.84	1529.69	1530.83	35.70		Schedule 40 PVC	0.010	#2/16			2	25	157	156.5	131.8
LWVPS-U1-MW01A	UMCf	26735054.25	838206.27	1526.30	1526.15	31.60	Single	Schedule 40 PVC	0.010	#2/16	6	116.0	2	25	115.5	115	90.3
LWVPS-U1-MW01B	UMCf	26735052.48	838200.84	1525.78	1525.85	30.95	Single	Schedule 80 PVC	0.010	#2/16	8	157.5	4	20	153.5	153	133.5
LWVPS-U1-MW02A	UMCf	26734972.90	838277.36	1529.90	1529.61	35.00	Single	Schedule 40 PVC	0.010	#2/16	6	120.0	2	25	119.5	119	94.3
LWVPS-U1-MW02B	UMCf	26734976.53	838276.51	1529.75	1529.63	34.81	Single	Schedule 80 PVC	0.010	#2/16	8	165.0	4	25	162	161.5	136.9
LWVPS-U1-MW03B	UMCf	26735108.31	838199.29	1527.13	1527.06	32.32	Single	Schedule 80 PVC	0.010	#2/16	8	165.0	4	20	154.5	154	134.5
LWVPS-U1-MW04A	UMCf	26735021.39	838264.46	1529.55	1529.35	34.82	Single	Schedule 40 PVC	0.010	#2/16	6	126.5	2	25	124.5	124	99.3
LWVPS-U1-MW04B	UMCf	26735026.82	838262.94	1529.47	1529.33	34.59	Single	Schedule 80 PVC	0.010	#2/16	8	175.0	4	25	165	164.5	139.9
LWVPS-U1-MW05A	UMCf	26734947.22	838319.22	1530.32	1529.93	35.52	Single	Schedule 40 PVC	0.010	#2/16	6	122.0	2	25	121	120.5	95.8
LWVPS-U1-MW05B	UMCf	26734951.22	838315.42	1530.45	1530.30	35.40	Single	Schedule 80 PVC	0.010	#2/16	8	172.5	4	25	162	161.5	136.9
LWVPS-U1-MW06A	UMCf	26734986.21	838153.16	1523.81	1523.70	28.56	Single	Schedule 40 PVC	0.010	#2/16	6	106.5	2	20	105.5	105	85.3
LWVPS-U1-MW06B	UMCf	26734991.82	838156.18	1524.09	1523.73	28.51	Single	Schedule 40 PVC	0.010	#2/16	6	143.0	2	25	134.5	134	109.3
LWVPS-U1-MW07	UMCf	26734907.19	838218.01	1525.17	1524.96	30.16	Single	Schedule 40 PVC	0.010	#2/16	6	140.0	2	25	111.5	111	86.3
LWVPS-U1-MW08A	UMCf	26735014.52	838236.36	1524.11	1523.97	29.20	Single	Schedule 40 PVC	0.010	#2/16	6	120.0	2	25	119	118.5	93.8
LWVPS-U1-MW08B	UMCf	26735017.13	838233.33	1523.84	1523.74	28.75	Single	Schedule 80 PVC	0.010	#2/16	6	151.0	2	25	150.5	150	125.3
LWVPS-U1-MW09A	UMCf	26735032.96	838320.87	1529.36	1529.11	35.12	Single	Schedule 40 PVC	0.010	#2/16	6	126.0	2	10	125.5	125	115.3
LWVPS-U1-MW09B	UMCf	26735025.78	838320.98	1529.37	1529.08	34.62	Single	Schedule 80 PVC	0.010	#2/16	6	156.0	2	25	155.5	155	130.3
LWVPS-U1-MW10A	UMCf	26735085.42	838340.44	1527.11	1527.02	33.20	Single	Schedule 40 PVC	0.010	#2/16	6	125.0	2	25	124.5	124	99.3
LWVPS-U1-MW10B	UMCf	26735081.08	838344.98	1527.40	1527.21	32.98	Single	Schedule 80 PVC	0.010	#2/16	6	160.0	2	25	155.5	155	130.3
Zone 2 Study Area																	
LWVPS-A2-DR01A	Alluvium	26734896.39	838889.65	1524.78	1524.77	31.90	Single	Schedule 40 PVC	0.020	#3	6	72.0	2	35	71.5	71	36.3
LWVPS-A2-DR01B	Alluvium	26734896.42	838884.23	1524.80	1524.57	31.75	Single	Schedule 40 PVC	0.020	#3	6	113.0	2	35	112.5	112	77.3
LWVPS-A2-DR02A	Alluvium	26734894.17	838964.08	1524.91	1524.65	32.00	Single	Schedule 40 PVC	0.020	#3	6	52.5	2	15	52	51.5	36.8
LWVPS-A2-DR02B	Alluvium	26734896.56	838956.61	1524.91	1524.90	32.09	Single	Schedule 40 PVC	0.020	#3	6	78.5	2	20	78	77.5	57.8

Table 1
Phase 2 Well Construction Details
 Las Vegas Wash Bioremediation Pilot Study

Well ID	Screened Lithology	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water ¹	Construction Type	Construction Material	Slot Size	Filter Pack Gradation	Borehole Diameter	Borehole Total Depth	Well Diameter	Nominal Screen Length	Well Total Depth	Bottom of Screen	Top of Screen
				feet amsl	feet amsl	feet bTOC			inches		inches	feet bgs	inches	feet	feet bgs	feet bgs	feet bgs
LVWPS-A2-IW01A	Alluvium	26734887.97	838782.98	1530.17	1529.79	36.44	Dual-Nested	Schedule 40 PVC	0.020	#3	10	105.0	2	25	66.5	66	41.3
LVWPS-A2-IW01B	Alluvium	26734888.00	838782.65	1530.17	1529.78	36.64		Schedule 40 PVC	0.020	#3			2	25	98	97.5	72.8
LVWPS-A2-IW02A	Alluvium	26734888.97	838815.84	1529.49	1529.01	35.88	Dual-Nested	Schedule 40 PVC	0.020	#3	10	110.0	2	30	69	68.5	38.8
LVWPS-A2-IW02B	Alluvium	26734889.05	838815.49	1529.49	1529.03	36.22		Schedule 40 PVC	0.020	#3			2	25	100.5	100	75.3
LVWPS-A2-IW03A	Alluvium	26734888.88	838851.00	1527.28	1526.93	33.94	Dual-Nested	Schedule 40 PVC	0.020	#3	10	115.0	2	30	67.5	67	37.3
LVWPS-A2-IW03B	Alluvium	26734889.18	838850.83	1527.28	1526.93	33.94		Schedule 40 PVC	0.020	#3			2	30	104	103.5	73.8
LVWPS-A2-IW04A	Alluvium	26734889.81	838887.08	1524.70	1524.57	31.70	Dual-Nested	Schedule 40 PVC	0.020	#3	10	115.0	2	35	71.5	71	36.3
LVWPS-A2-IW04B	Alluvium	26734890.02	838886.74	1524.70	1524.61	31.80		Schedule 40 PVC	0.020	#3			2	35	112.5	112	77.3
LVWPS-A2-IW05A	Alluvium	26734889.15	838921.04	1524.89	1524.86	32.05	Dual-Nested	Schedule 40 PVC	0.020	#3	10	105.0	2	25	63	62.5	37.8
LVWPS-A2-IW05B	Alluvium	26734889.30	838920.74	1524.89	1524.83	31.94		Schedule 40 PVC	0.020	#3			2	25	94	93.5	68.8
LVWPS-A2-IW06A	Alluvium	26734888.81	838957.92	1524.94	1524.91	32.20	Dual-Nested	Schedule 40 PVC	0.020	#3	10	80.0	2	15	52	51.5	36.8
LVWPS-A2-IW06B	Alluvium	26734888.84	838957.55	1524.94	1524.89	32.10		Schedule 40 PVC	0.020	#3			2	20	78	77.5	57.8
LVWPS-A2-IW07A	Alluvium	26734889.27	838991.11	1524.39	1524.31	31.57	Dual-Nested	Schedule 40 PVC	0.020	#3	10	85.0	2	15	50.5	50	35.3
LVWPS-A2-IW07B	Alluvium	26734889.32	838990.81	1524.39	1524.34	31.57		Schedule 40 PVC	0.020	#3			2	20	76.5	76	56.3
LVWPS-A2-IW08A	Alluvium	26734889.80	839026.35	1524.85	1524.74	32.10	Dual-Nested	Schedule 40 PVC	0.020	#3	10	90.0	2	20	56	55.5	35.8
LVWPS-A2-IW08B	Alluvium	26734889.91	839026.04	1524.85	1524.80	32.15		Schedule 40 PVC	0.020	#3			2	20	82	81.5	61.8
LVWPS-A2-IW09A	Alluvium	26734889.16	839061.18	1525.33	1525.37	32.68	Dual-Nested	Schedule 40 PVC	0.020	#3	10	85.0	2	15	52	51.5	36.8
LVWPS-A2-IW09B	Alluvium	26734889.14	839060.89	1525.33	1525.37	32.69		Schedule 40 PVC	0.020	#3			2	15	74	73.5	58.8
LVWPS-A2-MW01A	Alluvium	26734838.04	838817.08	1526.61	1526.29	33.07	Single	Schedule 40 PVC	0.020	#3	6	61	2	20	60.5	60	40.3
LVWPS-A2-MW01B	Alluvium	26734837.91	838821.64	1526.61	1526.16	33.09	Single	Schedule 40 PVC	0.020	#3	6	91	2	20	90.5	90	70.3
LVWPS-A2-MW02A	Alluvium	26734839.33	838936.61	1527.83	1527.49	34.66	Single	Schedule 40 PVC	0.020	#3	6	61	2	20	60.5	60	40.3
LVWPS-A2-MW02B	Alluvium	26734839.33	838940.48	1527.88	1527.62	34.55	Single	Schedule 40 PVC	0.020	#3	6	91	2	20	90.5	90	70.3
LVWPS-A2-MW03A	Alluvium	26734839.87	839041.77	1528.00	1527.72	34.95	Single	Schedule 40 PVC	0.020	#3	6	60	2	20	58.5	58	38.3
LVWPS-A2-MW03B	Alluvium	26734839.96	839046.05	1528.02	1527.68	34.90	Single	Schedule 40 PVC	0.020	#3	6	85	2	20	84.5	84	64.3
LVWPS-A2-MW04A	Alluvium	26734900.17	838770.49	1527.54	1527.55	34.24	Single	Schedule 40 PVC	0.020	#3	6	64.5	2	20	64	63.5	43.8
LVWPS-A2-MW04B	Alluvium	26734901.60	838772.88	1528.17	1527.86	34.91	Single	Schedule 40 PVC	0.020	#3	6	96.0	2	20	95.5	95	75.3
LVWPS-A2-MW05A	Alluvium	26734901.04	839073.31	1524.49	1524.18	31.50	Single	Schedule 40 PVC	0.020	#3	6	53.0	2	15	52	51.5	36.8
LVWPS-A2-MW05B	Alluvium	26734903.12	839070.97	1524.49	1524.29	31.68	Single	Schedule 40 PVC	0.020	#3	6	75.0	2	15	74	73.5	58.8
LVWPS-A2-MW08A	Alluvium	26734933.48	838815.75	1529.44	1529.35	36.36	Single	Schedule 40 PVC	0.020	#3	6	56.0	2	15	55.5	55	40.3
LVWPS-A2-MW08B	Alluvium	26734937.17	838818.51	1529.20	1528.84	35.90	Single	Schedule 40 PVC	0.020	#3	6	81.3	2	20	80	79.5	59.8
LVWPS-A2-MW08C	Alluvium	26734938.06	838813.32	1529.24	1528.93	36.25	Single	Schedule 40 PVC	0.020	#3	6	110.0	2	20	106.5	106	86.3
LVWPS-A2-MW09A	Alluvium	26734942.12	839052.25	1523.77	1523.56	30.91	Single	Schedule 40 PVC	0.020	#3	6	56.0	2	20	55	54.5	34.8
LVWPS-A2-MW09B	Alluvium	26734943.95	839045.22	1523.85	1523.67	31.31	Single	Schedule 40 PVC	0.020	#3	6	85.0	2	20	79	78.5	58.8
LVWPS-A2-MW11A	Alluvium	26734984.76	838791.31	1528.05	1528.00	35.10	Single	Schedule 40 PVC	0.020	#3	6	61.5	2	20	60.5	60	40.3
LVWPS-A2-MW11B	Alluvium	26734986.77	838787.83	1528.01	1527.79	35.06	Single	Schedule 40 PVC	0.020	#3	6	86.0	2	20	85.5	85	65.3
LVWPS-A2-MW11C	Alluvium	26734987.49	838793.00	1528.09	1527.81	35.36	Single	Schedule 40 PVC	0.020	#3	6	114.0	2	20	110.5	110	90.3
LVWPS-A2-MW12A	Alluvium	26734988.20	838951.66	1523.08	1522.85	30.24	Single	Schedule 40 PVC	0.020	#3	6	46.0	2	10	45	44.5	34.9
LVWPS-A2-MW12B	Alluvium	26734989.46	838955.96	1523.15	1522.94	30.48	Single	Schedule 40 PVC	0.020	#3	6	75.0	2	20	69.5	69	49.3
LVWPS-A2-MW13A	Alluvium	26734986.06	839098.37	1523.62	1523.23	31.00	Single	Schedule 40 PVC	0.020	#3	6	62.0	2	20	61.5	61	41.3
LVWPS-A2-MW13B	Alluvium	26734989.09	839099.95	1523.60	1523.40	31.44	Single	Schedule 40 PVC	0.020	#3	6	90.0	2	20	86.6	86.1	66.4
LVWPS-A2-MW14A	Alluvium	26734938.41	838942.48	1524.15	1523.84	31.16	Single	Schedule 40 PVC	0.020	#3	6	51.5	2	15	51	50.5	35.8

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Well ID	Screened Lithology	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water ¹	Construction Type	Construction Material	Slot Size	Filter Pack Gradation	Borehole Diameter	Borehole Total Depth	Well Diameter	Nominal Screen Length	Well Total Depth	Bottom of Screen	Top of Screen	
				feet amsl	feet amsl	feet bTOC			inches		inches	feet bgs	inches	feet	feet bgs	feet bgs	feet bgs	
LVWPS-A2-MW14B	Alluvium	26734938.74	838946.20	1524.51	1524.32	31.70	Single	Schedule 40 PVC	0.020	#3	6	80.0	2	20	75	74.5	54.8	
LVWPS-A2-MW15A	Alluvium	26735094.04	838828.85	1521.20	1520.95	28.70	Single	Schedule 40 PVC	0.020	#3	6	61.0	2	20	60	59.5	39.8	
LVWPS-A2-MW15B	Alluvium	26735101.30	838829.49	1521.68	1521.37	29.34	Single	Schedule 40 PVC	0.020	#3	6	110.0	2	20	90.5	90	70.3	
LVWPS-A2-MW16A	Alluvium	26735252.27	838928.69	1520.47	1520.73	29.34	Single	Schedule 40 PVC	0.020	#3	6	56.0	2	20	56	55.5	35.8	
LVWPS-A2-MW16B	Alluvium	26735258.00	838931.03	1520.25	1520.51	29.21	Single	Schedule 40 PVC	0.020	#3	6	90.0	2	20	80.5	80	60.3	
LVWPS-A2-MW17A	Alluvium	26734983.57	838866.47	1526.43	1526.35	33.65	Single	Schedule 40 PVC	0.020	#3	6	61.5	2	20	60.5	60	40.3	
LVWPS-A2-MW17B	Alluvium	26734985.17	838863.03	1526.25	1526.26	33.65	Single	Schedule 40 PVC	0.020	#3	6	86.0	2	20	85.5	85	65.3	
LVWPS-A2-MW17C	Alluvium	26734989.37	838862.92	1526.03	1525.81	33.86	Single	Schedule 40 PVC	0.020	#3	6	115.5	2	20	110.5	110	90.3	
LVWPS-U2-DR01	UMCf	26734896.14	838880.43	1524.84	1524.74	32.06	Single	Schedule 40 PVC	0.010	#2/16	6	142.0	2	20	141.5	141	121.3	
LVWPS-U2-DR02	UMCf	26734896.48	838953.23	1524.85	1524.76	32.25	Single	Schedule 40 PVC	0.010	#2/16	6	109.5	2	25	109	108.5	83.8	
LVWPS-U2-IW01	UMCf	26734889.36	838880.42	1524.71	1524.63	32.09	Single	Schedule 40 PVC	0.010	#2/16	6	155.0	2	20	141.5	141	121.2	
LVWPS-U2-IW02	UMCf	26734889.50	838905.01	1525.09	1525.07	32.55	Single	Schedule 40 PVC	0.010	#2/16	6	145.0	2	25	141.5	141	116.2	
LVWPS-U2-IW03	UMCf	26734889.40	838930.38	1524.99	1524.91	32.25	Single	Schedule 40 PVC	0.010	#2/16	6	125.0	2	25	124.5	124	99.2	
LVWPS-U2-IW04	UMCf	26734888.87	838954.79	1524.89	1524.84	32.10	Single	Schedule 40 PVC	0.010	#2/16	6	145.0	2	25	109	108.5	83.7	
LVWPS-U2-IW05	UMCf	26734889.80	838980.34	1524.54	1524.54	32.80	Single	Schedule 40 PVC	0.010	#2/16	6	120.0	2	30	118	117.5	87.7	
LVWPS-U2-IW06	UMCf	26734889.08	839005.30	1524.82	1524.70	32.52	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	15	104.5	104	89.2	
LVWPS-U2-IW07	UMCf	26734889.76	839029.85	1524.95	1524.98	32.40	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	15	106.5	106	91.2	
LVWPS-U2-IW08	UMCf	26734889.41	839055.50	1525.34	1525.29	32.72	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	25	109	108.5	83.7	
LVWPS-U2-IW09	UMCf	26734886.72	838779.73	1529.53	1529.26	36.22	Single	Schedule 40 PVC	0.010	#2/16	6	130.0	2	25	128.5	128	103.2	
LVWPS-U2-IW10	UMCf	26734887.07	838805.16	1529.51	1529.59	36.72	Single	Schedule 40 PVC	0.010	#2/16	6	135.0	2	20	129.5	129	109.3	
LVWPS-U2-IW11	UMCf	26734886.91	838830.51	1528.30	1528.02	35.26	Single	Schedule 40 PVC	0.010	#2/16	6	135.0	2	25	134.2	133.7	108.9	
LVWPS-U2-IW12	UMCf	26734889.28	838856.13	1526.66	1526.14	33.53	Single	Schedule 40 PVC	0.010	#2/16	6	139.0	2	25	138	137.5	112.8	
LVWPS-U2-MW01	UMCf	26734837.77	838825.83	1526.69	1526.40	33.42	Single	Schedule 40 PVC	0.010	#2/16	6	125	2	20	117.5	117	97.3	
LVWPS-U2-MW02	UMCf	26734839.36	838945.11	1527.94	1527.68	35.20	Single	Schedule 40 PVC	0.010	#2/16	6	126	2	25	125.5	125	100.3	
LVWPS-U2-MW03	UMCf	26734839.69	839050.30	1527.99	1527.66	34.91	Single	Schedule 40 PVC	0.010	#2/16	6	115	2	20	110.5	110	90.3	
LVWPS-U2-MW04	UMCf	26734895.79	838771.90	1528.66	1528.35	35.35	Single	Schedule 40 PVC	0.010	#2/16	6	130.0	2	25	128.5	128	103.2	
LVWPS-U2-MW05	UMCf	26734897.24	839064.72	1524.94	1524.76	32.20	Single	Schedule 40 PVC	0.010	#2/16	6	110.0	2	25	108.5	108	83.2	
LVWPS-U2-MW06	UMCf	26734914.99	838875.13	1525.48	1524.89	32.40	Single	Schedule 40 PVC	0.010	#2/16	6	142.5	2	20	142	141.5	121.8	
LVWPS-U2-MW07	UMCf	26734914.74	839095.07	1524.53	1524.37	31.82	Single	Schedule 40 PVC	0.010	#2/16	6	120.0	2	20	108.5	108	88.2	
LVWPS-U2-MW08	UMCf	26734941.29	838816.82	1529.11	1528.75	36.21	Single	Schedule 40 PVC	0.010	#2/16	6	135.0	2	20	133.5	133	113.2	
LVWPS-U2-MW09	UMCf	26734941.56	839048.32	1523.83	1523.62	31.61	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	20	105.2	104.7	84.9	
LVWPS-U2-MW10	UMCf	26734942.01	839149.60	1525.67	1525.57	34.12	Single	Schedule 40 PVC	0.010	#2/16	6	120.0	2	20	110.5	110	90.2	
LVWPS-U2-MW12	UMCf	26734992.74	838953.32	1523.09	1522.89	31.20	Single	Schedule 40 PVC	0.010	#2/16	6	110.0	2	25	108.5	108	83.2	
LVWPS-U2-MW13	UMCf	26734988.97	839095.12	1523.52	1523.42	31.89	Single	Schedule 40 PVC	0.010	#2/16	6	120.0	2	15	110	109.5	94.7	
LVWPS-U2-MW14	UMCf	26734939.25	838950.26	1524.77	1524.30	32.70	Single	Schedule 40 PVC	0.010	#2/16	6	110.0	2	25	108.5	108	83.2	
LVWPS-U2-MW17	UMCf	26734987.32	838868.87	1526.17	1525.88	34.19	Single	Schedule 40 PVC	0.010	#2/16	6	137.7	2	20	137	136.5	117	
LVWPS-U2-MW18	UMCf	26734914.05	838993.79	1524.16	1524.09	32.53	Single	Schedule 40 PVC	0.010	#2/16	6	114.0	2	25	113.5	113	88.3	
LVWPS-U2-MW19	UMCf	26734889.37	839106.34	1525.18	1525.07	32.71	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	20	111.5	111	91.2	
LVWPS-U2-MW20	UMCf	26734889.93	839153.61	1525.44	1525.24	32.98	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	20	108.5	108	88.2	
LVWPS-BH01	---	26734872.28	838780.13	1530.46	---	---	Soil Boring	---	---	---	6	105.0	---	---	---	---	---	
Zone 3 Study Area																		
LVWPS-A3-DR01	Alluvium	26734911.52	839503.33	1522.87	1522.71	30.41	Single	Schedule 40 PVC	0.020	#3	6	76.5	2	20	76	75.5	55.8	
LVWPS-A3-MW02	Alluvium	26734944.12	839475.20	1522.61	1522.39	30.30	Single	Schedule 40 PVC	0.020	#3	6	85.0	2	20	73	72.5	52.8	
LVWPS-A3-MW06	Alluvium	26734960.45	839530.77	1522.32	1521.99	30.03	Single	Schedule 40 PVC	0.020	#3	6	76.0	2	20	75.5	75	55.3	
LVWPS-A3-MW07	Alluvium	26734843.39	839449.63	1525.17	1525.06	32.48	Single	Schedule 40 PVC	0.020	#3	6	75	2	20	75	74.5	54.8	
LVWPS-A3-MW08	Alluvium	26734864.46	839588.62	1525.58	1525.30	32.90	Single	Schedule 40 PVC	0.020	#3	6	110	2	20	105	104.5	84.8	
LVWPS-A3-MW10	Alluvium	26734994.40	839445.10	1521.78	1521.72	30.06	Single	Schedule 40 PVC	0.020	#3	6	77.0	2	20	76.5	76	56.3	
LVWPS-A3-MW11	Alluvium	26735007.80	839556.93	1521.33	1521.36	29.41	Single	Schedule 40 PVC	0.020	#3	6	80.0	2	20	74	73.5	53.8	
LVWPS-A3-MW12	Alluvium	26735042.88	839483.87	1520.86	1520.75	29.13	Single	Schedule 40 PVC	0.020	#3	6	80.0	2	20	79.5	79	59.3	
LVWPS-U3-DR01A	UMCf-cg	26734912.10	839506.61	1522.95	1522.72	30.55	Single	Schedule 40 PVC	0.010	#2/16	6	124.5	2	30	123.5	123	93.3	
LVWPS-U3-DR01B	UMCf-cg	26734912.55	839510.18	1522.84	1522.69	30.71	Single	Schedule 80 PVC	0.010	#2/16	6	160.0	2	30	159.5	159	129.3	
LVWPS-U3-DR02A	UMCf-cg	26734924.88	839575.78	1523.27	1523.13	30.96	Single	Schedule 40 PVC	0.010	#2/16	6	112.5	2	25	111.5	111	86.3	

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				feet amsl	feet amsl	feet bTOC			inches		inches	feet bgs	inches	feet	feet bgs	feet bgs	feet bgs	
LVWPS-U3-DR02B	UMCf-cg	26734925.39	839579.10	1523.15	1522.98	31.05	Single	Schedule 40 PVC	0.010	#2/16	6	144.0	2	25	143	142.5	117.8	
LVWPS-U3-DR02C	UMCf-cg	26734925.79	839582.56	1523.10	1522.90	31.03	Single	Schedule 80 PVC	0.010	#2/16	6	175.0	2	25	174.5	174	149.3	
LVWPS-U3-IW01	UMCf-cg	26734893.19	839433.14	1522.95	1525.61	34.12	Single	Schedule 40 PVC	0.010	#2/16	10	118.0	2	35	115.5	115	80.2	
LVWPS-U3-IW02A	UMCf-cg	26734896.96	839458.60	1522.81	1524.20	33.32	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	128.0	2	20	99.5	99	79.3	
LVWPS-U3-IW02B	UMCf-cg	26734896.77	839458.31	1522.81	1524.22	32.78		Schedule 40 PVC	0.010	#2/16			2	20	125	124.5	104.8	
LVWPS-U3-IW03A	UMCf-cg	26734901.01	839482.33	1522.92	1524.25	32.31	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	144.0	2	25	103	102.5	77.8	
LVWPS-U3-IW03B	UMCf-cg	26734901.38	839482.28	1522.92	1524.33	32.61		Schedule 40 PVC	0.010	#2/16			2	30	139.5	139	109.3	
LVWPS-U3-IW04A	UMCf-cg	26734905.65	839507.50	1523.09	1522.80	30.46	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	160.0	2	30	123.5	123	93.3	
LVWPS-U3-IW04B	UMCf-cg	26734905.89	839507.21	1523.09	1522.81	30.87		Schedule 40 PVC	0.010	#2/16			2	30	159.5	159	129.3	
LVWPS-U3-IW05A	UMCf-cg	26734909.80	839531.81	1522.62	1522.80	31.46	Dual-Nested	Schedule 40 PVC	0.010	#2/16	10	175.0	2	35	126.5	126	91.3	
LVWPS-U3-IW05B	UMCf-cg	26734909.78	839531.47	1522.62	1522.80	30.58		Schedule 40 PVC	0.010	#2/16			2	35	168	167.5	132.8	
LVWPS-U3-IW06A	UMCf-cg	26734914.65	839556.40	1522.79	1522.83	30.52	Triple-Nested	Schedule 40 PVC	0.010	#2/16	10	175.0	2	25	111.5	111	86.3	
LVWPS-U3-IW06B	UMCf-cg	26734914.56	839556.00	1522.79	1522.89	30.68		Schedule 40 PVC	0.010	#2/16			2	25	143	142.5	117.8	
LVWPS-U3-IW06C	UMCf-cg	26734914.32	839556.27	1522.79	1522.85	31.02	Triple-Nested	Schedule 40 PVC	0.010	#2/16	10	175.0	2	25	174.5	174	149.3	
LVWPS-U3-IW07A	UMCf-cg	26734918.75	839580.97	1523.32	1523.03	30.80		Schedule 40 PVC	0.010	#2/16			2	25	111.5	111	86.3	
LVWPS-U3-IW07B	UMCf-cg	26734918.38	839580.95	1523.32	1523.03	31.02	Triple-Nested	Schedule 40 PVC	0.010	#2/16	10	175.0	2	25	143	142.5	117.8	
LVWPS-U3-IW07C	UMCf-cg	26734918.60	839580.61	1523.32	1523.03	31.02		Schedule 40 PVC	0.010	#2/16			2	25	174.5	174	149.3	
LVWPS-U3-IW08A	UMCf-cg	26734923.35	839605.13	1523.23	1523.11	30.87	Triple-Nested	Schedule 40 PVC	0.010	#2/16	10	175.0	2	25	111.5	111	86.3	
LVWPS-U3-IW08B	UMCf-cg	26734923.06	839605.34	1523.23	1523.09	31.08		Schedule 40 PVC	0.010	#2/16			2	25	143	142.5	117.8	
LVWPS-U3-IW08C	UMCf-cg	26734923.00	839604.97	1523.23	1523.10	31.05	Triple-Nested	Schedule 40 PVC	0.010	#2/16	10	175.0	2	25	174.5	174	149.3	
LVWPS-U3-MW01B	UMCf-cg	26734942.69	839376.18	1522.54	1522.41	30.90		Single	Schedule 80 PVC	0.010			#2/16	8	107.5	4	20	103.8
LVWPS-U3-MW02A	UMCf-cg	26734948.75	839479.60	1522.40	1522.13	30.42	Single	Schedule 40 PVC	0.010	#2/16	6	98.5	2	15	97.5	97	82.3	
LVWPS-U3-MW02B	UMCf-cg	26734943.22	839481.31	1522.50	1522.21	30.76	Single	Schedule 80 PVC	0.010	#2/16	8	130.0	4	20	123	122.5	103	
LVWPS-U3-MW03A	UMCf-cg	26734944.17	839583.42	1522.80	1522.68	30.60	Single	Schedule 40 PVC	0.010	#2/16	6	112.5	2	25	111.5	111	86.3	
LVWPS-U3-MW03B	UMCf-cg	26734944.11	839576.72	1522.86	1522.49	30.68	Single	Schedule 80 PVC	0.010	#2/16	8	179.0	4	25	176.2	175.7	151.1	
LVWPS-U3-MW03C	UMCf-cg	26734949.67	839579.79	1522.47	1522.21	30.32	Single	Schedule 40 PVC	0.010	#2/16	6	143.5	2	25	143	142.5	117.8	
LVWPS-U3-MW04B	UMCf-cg	26734968.11	839326.96	1522.25	1521.92	30.36	Single	Schedule 80 PVC	0.010	#2/16	8	102.5	4	20	98.2	97.7	78.2	
LVWPS-U3-MW05B	UMCf-cg	26734968.70	839425.48	1522.17	1521.98	30.50	Single	Schedule 80 PVC	0.010	#2/16	8	112.5	4	20	105.2	104.7	85.2	
LVWPS-U3-MW06A	UMCf-cg	26734962.99	839525.84	1522.04	1521.91	30.10	Single	Schedule 40 PVC	0.010	#2/16	6	116.5	2	25	115.5	115	90.3	
LVWPS-U3-MW06B	UMCf-cg	26734965.59	839528.63	1522.18	1521.92	30.20	Single	Schedule 80 PVC	0.010	#2/16	8	152.5	4	25	150.4	149.9	125.3	
LVWPS-U3-MW07A	UMCf-cg	26734843.54	839454.21	1525.21	1524.95	32.40	Single	Schedule 40 PVC	0.010	#2/16	6	100	2	15	98	97.5	82.8	
LVWPS-U3-MW07B	UMCf-cg	26734843.26	839458.27	1525.26	1524.93	32.87	Single	Schedule 40 PVC	0.010	#2/16	6	126	2	20	125	124.5	104.8	
LVWPS-U3-MW08A	UMCf-cg	26734863.82	839592.64	1525.64	1525.45	33.40	Single	Schedule 40 PVC	0.010	#2/16	6	145	2	25	143	142.5	117.8	
LVWPS-U3-MW08B	UMCf-cg	26734863.16	839597.03	1525.70	1525.28	33.21	Single	Schedule 80 PVC	0.010	#2/16	6	175	2	25	174.5	174	149.3	
LVWPS-U3-MW09	UMCf-cg	26734922.06	839452.86	1522.74	1525.38	34.00	Single	Schedule 40 PVC	0.010	#2/16	6	115.0	2	25	108	107.5	82.8	
LVWPS-U3-MW10A	UMCf-cg	26734997.78	839440.95	1521.78	1521.47	30.09	Single	Schedule 40 PVC	0.010	#2/16	6	97.0	2	10	95.5	95	85.3	
LVWPS-U3-MW10B	UMCf-cg	26734999.52	839447.11	1521.68	1521.55	30.14	Single	Schedule 40 PVC	0.010	#2/16	6	130.0	2	20	121.5	121	101.3	
LVWPS-U3-MW11A	UMCf-cg	26735013.48	839552.91	1521.42	1521.39	29.79	Single	Schedule 40 PVC	0.010	#2/16	6	107.5	2	20	106.5	106	86.3	
LVWPS-U3-MW11B	UMCf-cg	26735014.90	839559.83	1521.28	1521.35	29.91	Single	Schedule 40 PVC	0.010	#2/16	6	138.0	2	25	137.5	137	112.3	
LVWPS-U3-MW11C	UMCf-cg	26735017.93	839555.86	1521.33	1521.20	29.83	Single	Schedule 80 PVC	0.010	#2/16	6	170.0	2	20	163.4	163	143.3	
LVWPS-U3-MW12A	UMCf-cg	26735045.73	839479.41	1521.01	1520.83	29.40	Single	Schedule 40 PVC	0.010	#2/16	6	109.5	2	20	108.5	108	88.3	
LVWPS-U3-MW12B	UMCf-cg	26735047.74	839484.29	1520.91	1520.74	29.36	Single	Schedule 40 PVC	0.010	#2/16	6	140.0	2	25	138.5	138	113.3	
LVWPS-U3-MW13A	UMCf-cg	26734933.25	839516.75	1522.40	1522.24	30.21	Single	Schedule 40 PVC	0.010	#2/16	6	122.5	2	25	121.5	121	96.3	
LVWPS-U3-MW13B	UMCf-cg	26734934.09	839522.37	1522.01	1521.91	30.00	Single	Schedule 40 PVC	0.010	#2/16	6	155.0	2	15	148	147.5	132.8	
Extraction Wells																		
LVWPS-EW01	Alluvium	26734957.94	838426.21	1530.03	1529.74	35.74	Single	Schedule 40 PVC with Stainless Steel Wire Wrap Screen	0.020	12-20	10	95.0	6	40	85	84.5	44.8	
LVWPS-EW02	Alluvium	26734885.98	838507.29	1523.66	1523.25	29.20	Single	Schedule 40 PVC with Stainless Steel Wire Wrap Screen	0.020	12-20	10	61.0	6	30	58.5	58	28.3	

Table 1
Phase 2 Well Construction Details
 Las Vegas Wash Bioremediation Pilot Study

Well ID	Screened Lithology	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water ¹	Construction Type	Construction Material	Slot Size	Filter Pack Gradation	Borehole Diameter	Borehole Total Depth	Well Diameter	Nominal Screen Length	Well Total Depth	Bottom of Screen	Top of Screen
				feet amsl	feet amsl	feet bTOC			inches		inches	feet bgs	inches	feet	feet bgs	feet bgs	feet bgs
LVWPS-EW03	Alluvium	26734886.94	838621.90	1523.14	1522.70	28.95	Single	Schedule 40 PVC with Stainless Steel Wire Wrap Screen	0.020	12-20	10	81.0	6	30	70.5	70	40.3
LVWPS-EW04	Alluvium	26734947.54	838573.33	1522.40	1521.92	28.20	Single	Schedule 40 PVC with Stainless Steel Wire Wrap Screen	0.020	12-20	10	47.0	6	20	46.5	46	26.3
LVWPS-EW05	Alluvium	26734978.54	838497.51	1529.76	1529.42	35.60	Single	Schedule 40 PVC with Stainless Steel Wire Wrap Screen	0.020	12-20	10	81.0	6	30	80.5	80	50.3

Notes

amsl - above mean sea level

bgs - below ground surface

bTOC - below top of casing

PVC - polyvinyl chloride

UMCf - Upper Muddy Creek formation

UMCf-cg - Upper Muddy Creek formation - coarse grained facies

UMCf/Horse Springs- Alternating layers of UMCf, semi-consolidated UMCf, and reworked Horse Springs formation.

UMCf (Semi-Cons) - Semi-consolidated Upper Muddy Creek formation

--- Not Applicable

1. Depth to water measurements collected in October 2020.

2. Well names including IW indicate an injection well. Well names including DR indicate a dose response well. Well names including MW indicate a monitoring well. Well names including EW indicate an extraction well.

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LWVPS-A1-MW04	9/30/2020	N	BL04	Zone 1	Alluvium	69.3 - 89.0	2,000	12,000	15	1,600	1.5	2.26
LWVPS-A1-MW04	1/13/2021	N	EM02	Zone 1	Alluvium	69.3 - 89.0	2,400	15,000	17	1,700	1.5	1.38
LWVPS-A1-MW04	1/13/2021	FD	EM02	Zone 1	Alluvium	69.3 - 89.0	2,800	15,000	17	1,700	1.4	----
LWVPS-A1-MW05	9/30/2020	N	BL04	Zone 1	Alluvium	69.3 - 89.0	2,900	16,000	19	2,000	1.6	2.90
LWVPS-A1-MW05	1/15/2021	N	EM02	Zone 1	Alluvium	69.3 - 89.0	3,300	17,000	21	2,200	1.6	1.54
LWVPS-A1-MW06	9/29/2020	N	BL04	Zone 1	Alluvium	59.3 - 79.0	1,900	9,000	13	1,300	1.4	1.16
LWVPS-A1-MW06	1/14/2021	N	EM02	Zone 1	Alluvium	59.3 - 79.0	3,200 J	11,000	15	1,500	1.5	1.38
LWVPS-A1-MW06	1/14/2021	FD	EM02	Zone 1	Alluvium	59.3 - 79.0	2,300 J	11,000	15	1,600	1.4	----
LWVPS-A1-MW07	9/30/2020	N	BL04	Zone 1	Alluvium	58.3 - 78.0	2,900	16,000	19	1,900	1.6	1.43
LWVPS-A1-MW07	1/14/2021	N	EM02	Zone 1	Alluvium	58.3 - 78.0	3,200	17,000	20	2,200	1.6	1.22
LWVPS-A1-MW09	9/30/2020	N	BL04	Zone 1	Alluvium	85.8 - 105.5	2,700	15,000	16	1,600	1.6	1.17
LWVPS-A1-MW09	1/13/2021	N	EM02	Zone 1	Alluvium	85.8 - 105.5	2,500	14,000	13	1,800	4.2	1.06
LWVPS-A1-MW10	10/1/2020	N	BL04	Zone 1	Alluvium	70.8 - 90.5	4,400 J-	14,000	16	1,600	1.4	1.13
LWVPS-A1-MW10	10/1/2020	FD	BL04	Zone 1	Alluvium	70.8 - 90.5	3,700	14,000	16	1,700	1.5	----
LWVPS-A1-MW10	1/13/2021	N	EM02	Zone 1	Alluvium	70.8 - 90.5	3,100	16,000	17	1,800	1.5	1.11
LWVPS-A2-IW01A	10/1/2020	N	BL04	Zone 2	Alluvium	41.3 - 66.0	3,300	5,100	19	----	----	4.10
LWVPS-A2-IW01A	10/1/2020	FD	BL04	Zone 2	Alluvium	41.3 - 66.0	3,300	5,000	19	----	----	----
LWVPS-A2-IW01B	10/1/2020	N	BL04	Zone 2	Alluvium	72.8 - 97.5	2,300	5,400	20	----	----	4.23
LWVPS-A2-IW02A	10/1/2020	N	BL04	Zone 2	Alluvium	38.8 - 68.5	2,900	5,200	18	----	----	4.29
LWVPS-A2-IW02B	10/2/2020	N	BL04	Zone 2	Alluvium	75.3 - 100.0	3,800	6,100	20	----	----	4.44
LWVPS-A2-IW03A	10/2/2020	N	BL04	Zone 2	Alluvium	37.3 - 67.0	3,300	5,400	20	----	----	4.44
LWVPS-A2-IW03B	10/2/2020	N	BL04	Zone 2	Alluvium	73.8 - 103.5	3,400	5,500	18	----	----	4.30
LWVPS-A2-IW03B	10/2/2020	FD	BL04	Zone 2	Alluvium	73.8 - 103.5	2,700	5,400	18	----	----	----
LWVPS-A2-IW04A	10/2/2020	N	BL04	Zone 2	Alluvium	36.3 - 71.0	2,700	5,600	20	----	----	4.43
LWVPS-A2-IW04B	10/2/2020	N	BL04	Zone 2	Alluvium	77.3 - 112.0	3,200	5,000	18	----	----	5.05
LWVPS-A2-IW05A	10/2/2020	N	BL04	Zone 2	Alluvium	37.8 - 62.5	4,800	6,200	19	----	----	4.44
LWVPS-A2-IW05B	10/2/2020	N	BL04	Zone 2	Alluvium	68.8 - 93.5	4,400	5,300	19	----	----	4.47
LWVPS-A2-IW06A	10/5/2020	N	BL04	Zone 2	Alluvium	36.8 - 51.5	3,700	5,900	18	----	----	5.36
LWVPS-A2-IW06B	10/5/2020	N	BL04	Zone 2	Alluvium	57.8 - 77.5	4,600	4,900	18	----	----	4.75
LWVPS-A2-IW07A	10/5/2020	N	BL04	Zone 2	Alluvium	35.3 - 50.0	3,100	5,500	21	----	----	4.76
LWVPS-A2-IW07A	10/5/2020	FD	BL04	Zone 2	Alluvium	35.3 - 50.0	2,800	5,600	20	----	----	----
LWVPS-A2-IW07B	10/5/2020	N	BL04	Zone 2	Alluvium	56.3 - 76.0	2,700	4,500	16	----	----	5.14
LWVPS-A2-IW08A	10/5/2020	N	BL04	Zone 2	Alluvium	35.8 - 55.5	3,500	4,800	20	----	----	4.79
LWVPS-A2-IW08B	10/5/2020	N	BL04	Zone 2	Alluvium	61.8 - 81.5	2,100	3,600	13	----	----	5.54
LWVPS-A2-IW09A	10/5/2020	N	BL04	Zone 2	Alluvium	36.8 - 51.5	2,000	3,000	13	----	----	5.36
LWVPS-A2-IW09B	10/6/2020	N	BL04	Zone 2	Alluvium	58.8 - 73.5	1,500	2,300	9.1	----	----	6.22
LWVPS-A2-MW01A	10/8/2020	N	BL04	Zone 2	Alluvium	40.3 - 60.0	2,900	5,500	20	2,200	1.8	4.48
LWVPS-A2-MW01A	10/8/2020	FD	BL04	Zone 2	Alluvium	40.3 - 60.0	2,900	5,600	19	2,200	1.8	----
LWVPS-A2-MW01A	12/23/2020	N	EM01	Zone 2	Alluvium	40.3 - 60.0	3,600	5,100	19	2,200	2.1	3.69
LWVPS-A2-MW01A	1/13/2021	N	EM02	Zone 2	Alluvium	40.3 - 60.0	2,700	6,300	19	2,100	1.9	3.75
LWVPS-A2-MW01A	1/25/2021	N	EM03	Zone 2	Alluvium	40.3 - 60.0	2,900	5,100	18	2,100	1.9 J+	3.46
LWVPS-A2-MW01B	10/8/2020	N	BL04	Zone 2	Alluvium	70.3 - 90.0	3,100	5,200	18	2,100	1.7	4.49
LWVPS-A2-MW01B	12/23/2020	N	EM01	Zone 2	Alluvium	70.3 - 90.0	3,000	5,000	18	2,200	1.7	4.16
LWVPS-A2-MW01B	1/13/2021	N	EM02	Zone 2	Alluvium	70.3 - 90.0	2,800	6,700	18	2,200	2.1	3.97
LWVPS-A2-MW01B	1/25/2021	N	EM03	Zone 2	Alluvium	70.3 - 90.0	3,200	5,200	18	2,100	2.4 J+	3.44
LWVPS-A2-MW02A	10/8/2020	N	BL04	Zone 2	Alluvium	40.3 - 60.0	3,700	6,500	18	2,600	1.3	4.19
LWVPS-A2-MW02A	10/8/2020	FD	BL04	Zone 2	Alluvium	40.3 - 60.0	3,800	6,600	18	2,600	1.3	----
LWVPS-A2-MW02A	12/23/2020	N	EM01	Zone 2	Alluvium	40.3 - 60.0	3,800	8,100	18	2,700	1.2	5.28
LWVPS-A2-MW02A	1/12/2021	N	EM02	Zone 2	Alluvium	40.3 - 60.0	3,900	6,300	18	2,600	1.2	4.46
LWVPS-A2-MW02A	1/25/2021	N	EM03	Zone 2	Alluvium	40.3 - 60.0	4,200	7,100	20	2,500	1.3 J+	3.93
LWVPS-A2-MW02B	10/8/2020	N	BL04	Zone 2	Alluvium	70.3 - 90.0	2,300	3,900	14	2,100	1.2	5.81
LWVPS-A2-MW02B	12/23/2020	N	EM01	Zone 2	Alluvium	70.3 - 90.0	2,200	4,900	15	2,300	1.3	5.57
LWVPS-A2-MW02B	1/13/2021	N	EM02	Zone 2	Alluvium	70.3 - 90.0	2,100	3,600	14	2,100	1.2	5.79
LWVPS-A2-MW02B	1/25/2021	N	EM03	Zone 2	Alluvium	70.3 - 90.0	3,700	4,000	13	2,000	1.3 J+	5.11
LWVPS-A2-MW03A	10/9/2020	N	BL04	Zone 2	Alluvium	38.3 - 58.0	1,300	2,000	9.2	1,800	0.63	6.82
LWVPS-A2-MW03A	10/9/2020	FD	BL04	Zone 2	Alluvium	38.3 - 58.0	1,300	2,000	9.1	1,800	0.70	----
LWVPS-A2-MW03A	12/23/2020	N	EM01	Zone 2	Alluvium	38.3 - 58.0	1,100	7,500	7.3	1,700	0.47 J	6.86
LWVPS-A2-MW03A	1/14/2021	N	EM02	Zone 2	Alluvium	38.3 - 58.0	1,100	1,600	7.8	1,900	0.54	7.34
LWVPS-A2-MW03A	1/25/2021	N	EM03	Zone 2	Alluvium	38.3 - 58.0	2,500	3,300	9.2	1,800	0.77 J+	5.88
LWVPS-A2-MW03B	10/9/2020	N	BL04	Zone 2	Alluvium	64.3 - 84.0	2,000	3,700	12	2,000	0.92	6.21
LWVPS-A2-MW03B	12/23/2020	N	EM01	Zone 2	Alluvium	64.3 - 84.0	3,600	3,500	12	2,100	0.87 J-	5.56
LWVPS-A2-MW03B	1/14/2021	N	EM02	Zone 2	Alluvium	64.3 - 84.0	2,100	3,600	12	2,100	0.96	6.03
LWVPS-A2-MW03B	1/26/2021	N	EM03	Zone 2	Alluvium	64.3 - 84.0	2,300	3,400	9.8	1,900	1.0 J+	5.24
LWVPS-A2-MW04A	10/2/2020	N	BL04	Zone 2	Alluvium	43.8 - 63.5	4,100 J	5,300	19	2,100	1.7	5.60
LWVPS-A2-MW04A	10/2/2020	FD	BL04	Zone 2	Alluvium	43.8 - 63.5	2,900 J	5,200	19	2,100	1.7	----
LWVPS-A2-MW04A	12/22/2020	N	EM01	Zone 2	Alluvium	43.8 - 63.5	2,600	5,100	19	2,100	2.2 J	3.79
LWVPS-A2-MW04A	12/22/2020	FD	EM01	Zone 2	Alluvium	43.8 - 63.5	2,600	5,100	19	2,100	1.8	----
LWVPS-A2-MW04A	1/12/2021	N	EM02	Zone 2	Alluvium	43.8 - 63.5	2,700	4,900	20	2,200	1.9	3.84
LWVPS-A2-MW04A	1/12/2021	FD	EM02	Zone 2	Alluvium	43.8 - 63.5	2,700	4,900	19	2,200	2.1	----
LWVPS-A2-MW04A	1/26/2021	N	EM03	Zone 2	Alluvium	43.8 - 63.5	2,800	4,900	19	1,900	2.0 J+	3.67

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LWVPS-A2-MW04A	1/26/2021	FD	EM03	Zone 2	Alluvium	43.8 - 63.5	2,700	4,900	19	1,900	1.8 J+	----
LWVPS-A2-MW04B	10/2/2020	N	BL04	Zone 2	Alluvium	75.3 - 95.0	3,400	7,300	22	2,200	1.7	3.65
LWVPS-A2-MW04B	12/22/2020	N	EM01	Zone 2	Alluvium	75.3 - 95.0	2,800	7,300	13	2,100	23	0.49
LWVPS-A2-MW04B	1/12/2021	N	EM02	Zone 2	Alluvium	75.3 - 95.0	700	1,300	3.0	2,300	52	0.66
LWVPS-A2-MW04B	1/26/2021	N	EM03	Zone 2	Alluvium	75.3 - 95.0	1,100	2,400	3.7	1,900	34	0.46
LWVPS-A2-MW05A	10/5/2020	N	BL04	Zone 2	Alluvium	36.8 - 51.5	2,400	3,900	14	2,200	1.1	6.22
LWVPS-A2-MW05A	12/22/2020	N	EM01	Zone 2	Alluvium	36.8 - 51.5	310	73	0.91	2,200	170	0.91
LWVPS-A2-MW05A	1/13/2021	N	EM02	Zone 2	Alluvium	36.8 - 51.5	330	190	1.5	2,000	50	0.28
LWVPS-A2-MW05A	1/26/2021	N	EM03	Zone 2	Alluvium	36.8 - 51.5	720	460	1.8	1,600	120	0.44
LWVPS-A2-MW05B	10/5/2020	N	BL04	Zone 2	Alluvium	58.8 - 73.5	1,900	2,300	8.7	2,000	0.66	7.24
LWVPS-A2-MW05B	12/22/2020	N	EM01	Zone 2	Alluvium	58.8 - 73.5	2.9	<4.0	<0.014	1,800	170 J-	0.35
LWVPS-A2-MW05B	12/22/2020	FD	EM01	Zone 2	Alluvium	58.8 - 73.5	2.9	<4.0	0.026 J	2,000	170	----
LWVPS-A2-MW05B	1/13/2021	N	EM02	Zone 2	Alluvium	58.8 - 73.5	<0.31	<10	<0.014	1,400	150	0.29
LWVPS-A2-MW05B	1/13/2021	FD	EM02	Zone 2	Alluvium	58.8 - 73.5	<0.31	<10	<0.014	1,400	150	----
LWVPS-A2-MW05B	1/26/2021	N	EM03	Zone 2	Alluvium	58.8 - 73.5	<0.31	<10	<0.014	860	220	0.45
LWVPS-A2-MW08A	9/30/2020	N	BL04	Zone 2	Alluvium	40.3 - 55.0	2,700	2,100	20	2,100	1.9 J+	5.27
LWVPS-A2-MW08A	12/23/2020	N	EM01	Zone 2	Alluvium	40.3 - 55.0	1,400	2,000	4.7	2,100	7.4	0.91
LWVPS-A2-MW08A	1/15/2021	N	EM02	Zone 2	Alluvium	40.3 - 55.0	750	1,300	3.2	2,200	25	1.84
LWVPS-A2-MW08A	1/26/2021	N	EM03	Zone 2	Alluvium	40.3 - 55.0	1,100	1,800	6.1	1,800	6.5	0.86
LWVPS-A2-MW08B	10/1/2020	N	BL04	Zone 2	Alluvium	59.8 - 79.5	3,800	6,000	21	2,000	1.8	5.25
LWVPS-A2-MW08B	12/23/2020	N	EM01	Zone 2	Alluvium	59.8 - 79.5	2,400	4,900	18	2,000	2.4	1.45
LWVPS-A2-MW08B	1/15/2021	N	EM02	Zone 2	Alluvium	59.8 - 79.5	2,100	4,400	15	2,100	2.2	1.76
LWVPS-A2-MW08B	1/26/2021	N	EM03	Zone 2	Alluvium	59.8 - 79.5	2,500	4,600	16	1,900	2.4 J+	1.54
LWVPS-A2-MW08C	10/1/2020	N	BL04	Zone 2	Alluvium	86.3 - 106.0	4,100	7,200	21	2,200	1.7	4.92
LWVPS-A2-MW08C	12/23/2020	N	EM01	Zone 2	Alluvium	86.3 - 106.0	110	<10	<0.014	2,400	210	0.81
LWVPS-A2-MW08C	1/15/2021	N	EM02	Zone 2	Alluvium	86.3 - 106.0	<0.31	<10	<0.014	2,100	130	0.35
LWVPS-A2-MW08C	1/28/2021	N	EM03	Zone 2	Alluvium	86.3 - 106.0	<3.1	<10	<0.014	1,400	91	0.42
LWVPS-A2-MW09A	10/9/2020	N	BL04	Zone 2	Alluvium	34.8 - 54.5	3,400	5,500	17	2,500	1.4	5.63
LWVPS-A2-MW09A	12/22/2020	N	EM01	Zone 2	Alluvium	34.8 - 54.5	1,900	2,300	8.3 J-	2,000	1.7 J	4.92
LWVPS-A2-MW09A	1/11/2021	N	EM02	Zone 2	Alluvium	34.8 - 54.5	3,000	3,200	12	2,400	1.5	2.82
LWVPS-A2-MW09A	1/11/2021	FD	EM02	Zone 2	Alluvium	34.8 - 54.5	3,200	3,400	12	2,500	1.6	----
LWVPS-A2-MW09A	1/26/2021	N	EM03	Zone 2	Alluvium	34.8 - 54.5	2,200	2,700	8.7	2,400	2.1 J+	1.94
LWVPS-A2-MW09B	10/9/2020	N	BL04	Zone 2	Alluvium	58.8 - 78.5	1,600	2,100	8.8	2,000	0.60	7.44
LWVPS-A2-MW09B	12/22/2020	N	EM01	Zone 2	Alluvium	58.8 - 78.5	1,500	1,600	5.5	1,800	0.69	3.74
LWVPS-A2-MW09B	1/14/2021	N	EM02	Zone 2	Alluvium	58.8 - 78.5	1,300	1,700	6.1	1,900	0.59	3.90
LWVPS-A2-MW09B	1/27/2021	N	EM03	Zone 2	Alluvium	58.8 - 78.5	1,500	1,600	6.5	1,700	0.64	3.54
LWVPS-A2-MW11A	10/2/2020	N	BL04	Zone 2	Alluvium	40.3 - 60.0	3,100	5,300	19	2,100	1.7	4.72
LWVPS-A2-MW11A	10/2/2020	FD	BL04	Zone 2	Alluvium	40.3 - 60.0	3,100	5,100	19	2,100	1.7	----
LWVPS-A2-MW11A	12/23/2020	N	EM01	Zone 2	Alluvium	40.3 - 60.0	2,900	5,000	19	2,100	2.0	3.75
LWVPS-A2-MW11A	1/13/2021	N	EM02	Zone 2	Alluvium	40.3 - 60.0	2,500	5,600	19	2,100	1.9	3.37
LWVPS-A2-MW11A	1/27/2021	N	EM03	Zone 2	Alluvium	40.3 - 60.0	2,200	4,700	5.2	1,900	1.9	3.34
LWVPS-A2-MW11B	10/2/2020	N	BL04	Zone 2	Alluvium	65.3 - 85.0	2,900	7,200	21	2,100	1.7	4.18
LWVPS-A2-MW11B	12/23/2020	N	EM01	Zone 2	Alluvium	65.3 - 85.0	2,600	6,100	22	2,100	2.3 J	7.73
LWVPS-A2-MW11B	1/13/2021	N	EM02	Zone 2	Alluvium	65.3 - 85.0	2,600	6,500	22	2,100	2.2	7.13
LWVPS-A2-MW11B	1/27/2021	N	EM03	Zone 2	Alluvium	65.3 - 85.0	3,300	6,900	23	1,900	1.9	3.35
LWVPS-A2-MW11C	10/2/2020	N	BL04	Zone 2	Alluvium	90.3 - 110.0	3,500	11,000	23	2,100	1.6	3.91
LWVPS-A2-MW11C	12/23/2020	N	EM01	Zone 2	Alluvium	90.3 - 110.0	3,000	9,800	23	2,100	<0.26	3.43
LWVPS-A2-MW11C	1/14/2021	N	EM02	Zone 2	Alluvium	90.3 - 110.0	2,900	9,900	23	2,300	1.7	3.14
LWVPS-A2-MW11C	1/27/2021	N	EM03	Zone 2	Alluvium	90.3 - 110.0	3,500	11,000	24	2,000	2.2	2.67
LWVPS-A2-MW12A	10/6/2020	N	BL04	Zone 2	Alluvium	34.9 - 44.5	4,400	5,300	18	2,100	1.7	4.83
LWVPS-A2-MW12A	12/22/2020	N	EM01	Zone 2	Alluvium	34.9 - 44.5	32	50 J	<0.014	2,500	120	0.56
LWVPS-A2-MW12A	12/22/2020	FD	EM01	Zone 2	Alluvium	34.9 - 44.5	40	48 J	<0.014	2,400	120	----
LWVPS-A2-MW12A	1/11/2021	N	EM02	Zone 2	Alluvium	34.9 - 44.5	<0.31	<4.0	<0.014	2,100	92	0.74
LWVPS-A2-MW12A	1/27/2021	N	EM03	Zone 2	Alluvium	34.9 - 44.5	<0.31	<10	<0.014	Pending	8.0	0.45
LWVPS-A2-MW12B	10/7/2020	N	BL04	Zone 2	Alluvium	49.3 - 69.0	4,000	5,600	19	2,300	1.6	4.82
LWVPS-A2-MW12B	12/22/2020	N	EM01	Zone 2	Alluvium	49.3 - 69.0	12	<10	<0.014	2,100	45	0.53
LWVPS-A2-MW12B	1/12/2021	N	EM02	Zone 2	Alluvium	49.3 - 69.0	170	130	0.036 J	2,300	11	0.68
LWVPS-A2-MW12B	1/27/2021	N	EM03	Zone 2	Alluvium	49.3 - 69.0	220	140	<0.014	1,900	2.8	0.57
LWVPS-A2-MW12B	1/27/2021	FD	EM03	Zone 2	Alluvium	49.3 - 69.0	220	150	<0.014	2,000	2.9	----
LWVPS-A2-MW13A	10/1/2020	N	BL04	Zone 2	Alluvium	41.3 - 61.0	1,200	2,100	10	1,800	0.76	6.60
LWVPS-A2-MW13A	12/22/2020	N	EM01	Zone 2	Alluvium	41.3 - 61.0	1,100	1,300	7.3	1,900	1.4	6.32
LWVPS-A2-MW13A	1/11/2021	N	EM02	Zone 2	Alluvium	41.3 - 61.0	1,100	1,100	5.9	2,300	1.7	0.85
LWVPS-A2-MW13A	1/27/2021	N	EM03	Zone 2	Alluvium	41.3 - 61.0	1,700	1,900	8.9	2,000	1.6	1.12
LWVPS-A2-MW13B	10/1/2020	N	BL04	Zone 2	Alluvium	66.4 - 86.1	2,200	4,300	15	2,200	1.2	5.76
LWVPS-A2-MW13B	12/22/2020	N	EM01	Zone 2	Alluvium	66.4 - 86.1	610	830	3.5	2,200	32	2.43
LWVPS-A2-MW13B	1/12/2021	N	EM02	Zone 2	Alluvium	66.4 - 86.1	38	58 J	0.11 J	2,100	21	0.49
LWVPS-A2-MW13B	1/27/2021	N	EM03	Zone 2	Alluvium	66.4 - 86.1	52	26 J	0.71	1,700	9.6	0.44
LWVPS-A2-MW14A	10/6/2020	N	BL04	Zone 2	Alluvium	35.8 - 50.5	2,600	5,400	19	2,200	1.7	5.77
LWVPS-A2-MW14A	10/6/2020	FD	BL04	Zone 2	Alluvium	35.8 - 50.5	2,700	5,100	19	2,200	1.7	----
LWVPS-A2-MW14A	12/22/2020	N	EM01	Zone 2	Alluvium	35.8 - 50.5	130	240	0.58 J-	2,300	28	0.33

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LWVPS-A2-MW14A	12/22/2020	FD	EM01	Zone 2	Alluvium	35.8 - 50.5	140	210	0.58 J-	2,200	29	----
LWVPS-A2-MW14A	1/13/2021	N	EM02	Zone 2	Alluvium	35.8 - 50.5	200	250	0.57	1,900	31	0.69
LWVPS-A2-MW14A	1/13/2021	FD	EM02	Zone 2	Alluvium	35.8 - 50.5	210	220	0.59	1,900	32	----
LWVPS-A2-MW14A	1/28/2021	N	EM03	Zone 2	Alluvium	35.8 - 50.5	50	65 J	0.24	950	59	1.02
LWVPS-A2-MW14A	1/28/2021	FD	EM03	Zone 2	Alluvium	35.8 - 50.5	59	52 J	0.25	960	61	----
LWVPS-A2-MW14B	10/6/2020	N	BL04	Zone 2	Alluvium	54.8 - 74.5	2,800	5,400	18	2,300	1.6	5.42
LWVPS-A2-MW14B	12/22/2020	N	EM01	Zone 2	Alluvium	54.8 - 74.5	1,700	2,800	7.9	2,400	7.4	0.28
LWVPS-A2-MW14B	1/13/2021	N	EM02	Zone 2	Alluvium	54.8 - 74.5	1,800	3,800	10	2,300	3.1	0.70
LWVPS-A2-MW14B	1/25/2021	N	EM03	Zone 2	Alluvium	54.8 - 74.5	2,400	3,000	8.6	2,100	2.2 J+	0.98
LWVPS-A2-MW15A	10/7/2020	N	BL04	Zone 2	Alluvium	39.8 - 59.5	3,400	5,100	20	2,100	1.7	4.55
LWVPS-A2-MW15A	12/21/2020	N	EM01	Zone 2	Alluvium	39.8 - 59.5	3,000	5,100	19	2,000	1.9	4.42
LWVPS-A2-MW15A	1/11/2021	N	EM02	Zone 2	Alluvium	39.8 - 59.5	2,800	5,400	19	2,200	1.9	3.70
LWVPS-A2-MW15A	1/25/2021	N	EM03	Zone 2	Alluvium	39.8 - 59.5	2,900	5,000	18	2,000	2.0 J+	3.59
LWVPS-A2-MW15B	10/8/2020	N	BL04	Zone 2	Alluvium	70.3 - 90.0	3,200	9,000	22	2,300	1.7	3.90
LWVPS-A2-MW15B	12/22/2020	N	EM01	Zone 2	Alluvium	70.3 - 90.0	3,300	7,600	24	2,200	2.0	4.30
LWVPS-A2-MW15B	1/12/2021	N	EM02	Zone 2	Alluvium	70.3 - 90.0	3,300	8,400	24	2,300	1.8	3.05
LWVPS-A2-MW15B	1/26/2021	N	EM03	Zone 2	Alluvium	70.3 - 90.0	3,400	9,000	25	2,000	1.8 J+	9.30 E
LWVPS-A2-MW16A	10/9/2020	N	BL04	Zone 2	Alluvium	35.8 - 55.5	3,500	5,800	22	2,100	1.6	5.17
LWVPS-A2-MW16A	12/22/2020	N	EM01	Zone 2	Alluvium	35.8 - 55.5	3,600	5,600	21	2,000	1.8	3.55
LWVPS-A2-MW16A	1/12/2021	N	EM02	Zone 2	Alluvium	35.8 - 55.5	2,900	5,300	21	2,300	1.7	3.87
LWVPS-A2-MW16A	1/25/2021	N	EM03	Zone 2	Alluvium	35.8 - 55.5	3,900	5,300	20	2,000	1.8 J+	3.87
LWVPS-A2-MW16B	10/9/2020	N	BL04	Zone 2	Alluvium	60.3 - 80.0	3,600	9,000	22	2,200	1.5	4.45
LWVPS-A2-MW16B	10/9/2020	FD	BL04	Zone 2	Alluvium	60.3 - 80.0	3,400	9,100	22	2,200	1.6	----
LWVPS-A2-MW16B	12/22/2020	N	EM01	Zone 2	Alluvium	60.3 - 80.0	4,100	7,800	22 J-	2,100	2.0	3.44
LWVPS-A2-MW16B	1/12/2021	N	EM02	Zone 2	Alluvium	60.3 - 80.0	3,000	9,200	22	2,300	1.7	3.57
LWVPS-A2-MW16B	1/25/2021	N	EM03	Zone 2	Alluvium	60.3 - 80.0	3,500	8,400	20	2,000	1.8 J+	3.63
LWVPS-A2-MW17A	10/1/2020	N	BL04	Zone 2	Alluvium	40.3 - 60.0	2,500	5,300	19	2,100	1.7	4.90
LWVPS-A2-MW17A	12/22/2020	N	EM01	Zone 2	Alluvium	40.3 - 60.0	2,100	2,100	6.4	2,200	2.8	0.37
LWVPS-A2-MW17A	1/11/2021	N	EM02	Zone 2	Alluvium	40.3 - 60.0	2,100	3,000	8.7	2,200	2.0	0.67
LWVPS-A2-MW17A	1/26/2021	N	EM03	Zone 2	Alluvium	40.3 - 60.0	2,700	3,700	14	1,900	2.4 J+	1.77 E
LWVPS-A2-MW17B	10/1/2020	N	BL04	Zone 2	Alluvium	65.3 - 85.0	2,700	5,700	21	2,100	1.7	4.83
LWVPS-A2-MW17B	12/22/2020	N	EM01	Zone 2	Alluvium	65.3 - 85.0	560	350	1.2	2,200	7.6	0.37
LWVPS-A2-MW17B	1/11/2021	N	EM02	Zone 2	Alluvium	65.3 - 85.0	790	1,200	3.2	2,200	6.8	0.26
LWVPS-A2-MW17B	1/26/2021	N	EM03	Zone 2	Alluvium	65.3 - 85.0	870	1,300	3.3	1,700	4.5	7.06 E
LWVPS-A2-MW17C	10/1/2020	N	BL04	Zone 2	Alluvium	90.3 - 110.0	2,200	3,700	14	2,100	1.1	5.67
LWVPS-A2-MW17C	12/22/2020	N	EM01	Zone 2	Alluvium	90.3 - 110.0	2,000	1,700	4.3	1,900	4.8	2.30
LWVPS-A2-MW17C	1/11/2021	N	EM02	Zone 2	Alluvium	90.3 - 110.0	660	920	2.6	2,100	3.6	0.91
LWVPS-A2-MW17C	1/26/2021	N	EM03	Zone 2	Alluvium	90.3 - 110.0	720	1,000	2.5	1,800	2.9	3.80 E
LWVPS-A3-MW02	10/5/2020	N	BL04	Zone 3	Alluvium	52.8 - 72.5	100	150	7.0	900	0.29 J	6.42
LWVPS-A3-MW02	1/14/2021	N	EM02	Zone 3	Alluvium	52.8 - 72.5	100	140	7.2	1,000	0.35 J	6.18
LWVPS-A3-MW06	10/5/2020	N	BL04	Zone 3	Alluvium	55.3 - 75.0	110	150	9.0	1,300	0.45 J	7.24
LWVPS-A3-MW06	1/15/2021	N	EM02	Zone 3	Alluvium	55.3 - 75.0	100	160	8.6	1,400	0.61 J-	6.47
LWVPS-A3-MW07	10/8/2020	N	BL04	Zone 3	Alluvium	54.8 - 74.5	100	210	6.4	1,100	0.45 J	6.98
LWVPS-A3-MW07	1/15/2021	N	EM02	Zone 3	Alluvium	54.8 - 74.5	130	230	7.1	1,200	<1.0	6.70
LWVPS-A3-MW08	10/8/2020	N	BL04	Zone 3	Alluvium	84.8 - 104.5	120	180	8.5	1,600	0.81	4.73
LWVPS-A3-MW08	1/14/2021	N	EM02	Zone 3	Alluvium	84.8 - 104.5	71	160	8.4	1,700	1.1 J	6.42
LWVPS-A3-MW10	10/5/2020	N	BL04	Zone 3	Alluvium	56.3 - 76.0	200	200	7.5	870	0.26 J	7.31
LWVPS-A3-MW10	1/14/2021	N	EM02	Zone 3	Alluvium	56.3 - 76.0	190	220	7.7	930	0.44 J	6.97
LWVPS-A3-MW11	10/7/2020	N	BL04	Zone 3	Alluvium	53.8 - 73.5	78	160	9.2	1,600	0.96	8.50
LWVPS-A3-MW11	1/15/2021	N	EM02	Zone 3	Alluvium	53.8 - 73.5	55 J	140	8.4	1,700	0.72	6.84
LWVPS-A3-MW12	10/5/2020	N	BL04	Zone 3	Alluvium	59.3 - 79.0	200	270	7.2	1,200	0.40 J	6.48
LWVPS-A3-MW12	1/13/2021	N	EM02	Zone 3	Alluvium	59.3 - 79.0	230	260	7.1	1,200	0.35 J	5.84
LWVPS-EW01	9/29/2020	N	BL04	Extraction	Alluvium	44.8 - 84.5	2,900	13,000	23	2,200	1.6	2.76
LWVPS-EW02	9/29/2020	N	BL04	Extraction	Alluvium	28.3 - 58.0	2,900	5,500	20	2,100	1.9	4.29
LWVPS-EW03	9/30/2020	N	BL04	Extraction	Alluvium	40.3 - 70.0	3,100	5,000	18	2,100	1.7	4.09
LWVPS-EW04	9/30/2020	N	BL04	Extraction	Alluvium	26.3 - 46.0	2,800	5,200	20	2,100	2.0	4.35
LWVPS-EW05	9/29/2020	N	BL04	Extraction	Alluvium	50.3 - 80.0	2,800	11,000	23	2,100	1.8	2.32
LWVPS-EW05	9/29/2020	FD	BL04	Extraction	Alluvium	50.3 - 80.0	2,800	11,000	23	2,100	1.7	----
LWVPS-MW201A	9/28/2020	N	BL04	General Vicinity	Alluvium	28.2 - 47.8	1,800	11,000	13	----	----	0.59
LWVPS-MW201B	9/28/2020	N	BL04	General Vicinity	UMCf	60.1 - 79.8	610	560	0.55	----	----	1.13
LWVPS-MW202	9/29/2020	N	BL04	General Vicinity	Alluvium	41.8 - 61.5	1,100	6,000	12	----	----	0.80
LWVPS-MW203A	9/30/2020	N	BL04	General Vicinity	Alluvium	34.8 - 54.5	120	<40	9.3	----	----	0.74
LWVPS-MW203A	9/30/2020	FD	BL04	General Vicinity	Alluvium	34.8 - 54.5	120	<40	9.3	----	----	----
LWVPS-MW203B	9/30/2020	N	BL04	General Vicinity	UMCf	75.1 - 94.7	2.6 J-	<40	<0.014	----	----	0.88
LWVPS-MW203C	9/30/2020	N	BL04	General Vicinity	UMCf (Semi-Cons)	100.3 - 120.0	<0.31	<20	<0.014	----	----	0.65
LWVPS-MW204	9/28/2020	N	BL04	General Vicinity	Alluvium	50.3 - 70.0	1,600	10,000	14	1,300	1.4	1.84
LWVPS-MW204	9/28/2020	FD	BL04	General Vicinity	Alluvium	50.3 - 70.0	1,600	10,000	14	1,300	1.3	----
LWVPS-MW204B	9/28/2020	N	BL04	General Vicinity	UMCf	101.5 - 121.2	12,000	22,000	15	1,800	0.75	2.92
LWVPS-MW204C	10/7/2020	N	BL04	General Vicinity	UMCf (Semi-Cons)	150.5 - 170.0	46	<100	<0.028	----	----	2.40
LWVPS-MW205B	9/28/2020	N	BL04	General Vicinity	Alluvium	64.9 - 84.6	1,300	6,300	12	----	----	0.50

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LWVPS-MW205C	9/29/2020	N	BL04	General Vicinity	Alluvium	100.3 - 120.0	790	2,700	11	----	----	0.87
LWVPS-MW206A	9/30/2020	N	BL04	Extraction	Alluvium	39.8 - 59.5	3,400 J-	8,500	23	----	----	3.77
LWVPS-MW206B	9/30/2020	N	BL04	Extraction	Alluvium	69.9 - 89.5	2,800	16,000	10	----	----	1.84
LWVPS-MW206C	9/30/2020	N	BL04	Extraction	UMCf	100.3 - 120.0	4,900 J-	6,000	3.4	----	----	2.70
LWVPS-MW206D	10/6/2020	N	BL04	Extraction	UMCf	125.3 - 145.0	9.5	<10	<0.014	----	----	2.08
LWVPS-MW206E	10/5/2020	N	BL04	Extraction	UMCf (Semi-Cons)	195.5 - 205.0	39	<100	<0.014	----	----	2.11
LWVPS-MW207	9/28/2020	N	BL04	General Vicinity	Alluvium	68.1 - 87.8	2,200	14,000	18	1,800	1.5	1.55
LWVPS-MW207	12/22/2020	N	EM01	General Vicinity	Alluvium	68.1 - 87.8	4,900	13,000	17	1,900	1.6	1.27
LWVPS-MW207	1/29/2021	N	EM03	General Vicinity	Alluvium	68.1 - 87.8	2,500	14,000	14	1,800	1.7	1.09
LWVPS-MW208A	10/9/2020	N	BL04	Zone 2	Alluvium	39.9 - 59.5	1,900	2,900	12	2,100	0.93	5.77
LWVPS-MW208A	12/23/2020	N	EM01	Zone 2	Alluvium	39.9 - 59.5	2,200	2,300	9.4	1,900	0.81	4.14
LWVPS-MW208A	1/13/2021	N	EM02	Zone 2	Alluvium	39.9 - 59.5	13,000 J	2,600	11	2,000	0.88	5
LWVPS-MW208A	1/27/2021	N	EM03	Zone 2	Alluvium	39.9 - 59.5	2,200	2,600	11	2,000	0.92	5.82 E
LWVPS-MW208B	10/9/2020	N	BL04	Zone 2	Alluvium	65.3 - 85.0	2,100	3,200	12	2,000	1.0	5.90
LWVPS-MW208B	12/23/2020	N	EM01	Zone 2	Alluvium	65.3 - 85.0	870	42 J	0.23	1,900	11	0.31
LWVPS-MW208B	12/23/2020	FD	EM01	Zone 2	Alluvium	65.3 - 85.0	810	39 J	0.23	1,900	11	----
LWVPS-MW208B	1/13/2021	N	EM02	Zone 2	Alluvium	65.3 - 85.0	63	46	0.33	1,800	8.4	0.83
LWVPS-MW208B	1/27/2021	N	EM03	Zone 2	Alluvium	65.3 - 85.0	74	56 J	0.25	1,600	9.9	3.35 E
LWVPS-MW208B	1/27/2021	FD	EM03	Zone 2	Alluvium	65.3 - 85.0	63	55 J	0.28	1,600	10	----
LWVPS-MW209	10/6/2020	N	BL04	General Vicinity	Alluvium	71.3 - 91.0	2,700	8,500	22	2,200	1.6	4.40
LWVPS-MW209	10/6/2020	FD	BL04	General Vicinity	Alluvium	71.3 - 91.0	2,800	9,000	22	2,200	1.6	----
LWVPS-MW209	12/21/2020	N	EM01	General Vicinity	Alluvium	71.3 - 91.0	3,000	7,600	18	2,200	1.8	2.38
LWVPS-MW209	1/27/2021	N	EM03	General Vicinity	Alluvium	71.3 - 91.0	2,600	7,800	19	2,000	1.8	2.94 E
LWVPS-MW209A	10/6/2020	N	BL04	General Vicinity	Alluvium	35.3 - 55.0	2,800	6,800	21	2,200	1.7	4.72
LWVPS-MW209A	12/21/2020	N	EM01	General Vicinity	Alluvium	35.3 - 55.0	3,000	5,300	20	2,300	1.6	3.96
LWVPS-MW209A	1/27/2021	N	EM03	General Vicinity	Alluvium	35.3 - 55.0	2,300	3,700	14	2,100	2.4	2.59 E
LWVPS-MW209B	10/6/2020	N	BL04	General Vicinity	UMCf-cg	110.3 - 130.0	2,700	8,300	21	----	----	4.30
LWVPS-MW209C	10/7/2020	N	BL04	General Vicinity	UMCf-cg	151.0 - 170.5	8,500	12,000	14	----	----	2.44
LWVPS-MW210A	10/6/2020	N	BL04	General Vicinity	Alluvium	35.3 - 55.0	2,600	12,000	20	1,800	1.5	2.44
LWVPS-MW210A	12/21/2020	N	EM01	General Vicinity	Alluvium	35.3 - 55.0	3,100	13,000	21	2,000	1.6	2.04
LWVPS-MW210A	1/29/2021	N	EM03	General Vicinity	Alluvium	35.3 - 55.0	2,900	11,000	17	1,800	1.6	2.66
LWVPS-MW210B	10/6/2020	N	BL04	General Vicinity	Alluvium	70.1 - 89.8	2,800	9,700	22	2,100	1.6	3.60
LWVPS-MW210B	12/21/2020	N	EM01	General Vicinity	Alluvium	70.1 - 89.8	2,800	8,300	15	2,100	1.9	1.48
LWVPS-MW210B	1/29/2021	N	EM03	General Vicinity	Alluvium	70.1 - 89.8	2,400	7,800	14	2,000	1.8	1.62
LWVPS-MW210C	10/1/2020	N	BL04	General Vicinity	UMCf-cg	100.3 - 120.0	10,000 J-	17,000	15	----	----	2.59
LWVPS-MW210D	10/7/2020	N	BL04	General Vicinity	UMCf-cg	130.4 - 140.0	8,500	10,000	3.8	----	----	3.24
LWVPS-MW210E	10/7/2020	N	BL04	General Vicinity	UMCf-cg	145.5 - 165.0	4,400	7,100	2.2	----	----	2.19
LWVPS-MW211	9/30/2020	N	BL04	General Vicinity	Alluvium	50.0 - 69.7	2,000	3,200	14	2,100	1.1	6.33
LWVPS-MW211	12/21/2020	N	EM01	General Vicinity	Alluvium	50.0 - 69.7	2,100	3,000	13	1,900	0.99	5.52
LWVPS-MW211	1/29/2021	N	EM03	General Vicinity	Alluvium	50.0 - 69.7	850	1,300	4.4	1,800	1.3 J	1.20
LWVPS-MW212A	10/5/2020	N	BL04	Zone 3	Alluvium	34.3 - 54.0	390	460	8.5	1,200	0.47 J	6.73
LWVPS-MW212A	12/21/2020	N	EM01	Zone 3	Alluvium	34.3 - 54.0	400	510	8.9	1,200	0.43 J	6.56
LWVPS-MW212A	1/27/2021	N	EM03	Zone 3	Alluvium	34.3 - 54.0	400	470	8.7	1,200	0.45 J	8.10 E
LWVPS-MW212B	10/5/2020	N	BL04	Zone 3	Alluvium	59.8 - 79.5	170	200	7.7	980	0.32 J	6.48
LWVPS-MW212B	12/22/2020	N	EM01	Zone 3	Alluvium	59.8 - 79.5	150	190	7.8	1,100	0.29 J	6.57
LWVPS-MW212B	1/27/2021	N	EM03	Zone 3	Alluvium	59.8 - 79.5	210	200	8.1	1,100	<1.0	9.04 E
LWVPS-MW212C	10/5/2020	N	BL04	Zone 3	UMCf-cg	100.3 - 120.0	7,800	11,000	8.4	----	----	4.32
LWVPS-MW212D	10/8/2020	N	BL04	Zone 3	UMCf-cg	125.5 - 145.0	6,800	11,000	10	----	----	5.60
LWVPS-MW213	10/1/2020	N	BL04	General Vicinity	Alluvium	40.1 - 59.8	170	260	3.2	----	----	4.96
LWVPS-MW213	10/1/2020	FD	BL04	General Vicinity	Alluvium	40.1 - 59.8	140	270	3.2	----	----	----
LWVPS-MW214	10/7/2020	N	BL04	General Vicinity	Alluvium	34.4 - 44.0	2,500	3,700	14	----	----	5.16
LWVPS-MW215A	10/8/2020	N	BL04	General Vicinity	Alluvium	13.5 - 33.2	2,600 J-	9,700	17	----	----	1.26
LWVPS-MW215B	10/9/2020	N	BL04	General Vicinity	Bedrock	40.7 - 45.3	2,600	6,700	11	----	----	1.46
LWVPS-MW216	10/7/2020	N	BL04	General Vicinity	Alluvium	10.4 - 20.0	1,100	930	4.0	----	----	0.66
LWVPS-MW216	10/7/2020	FD	BL04	General Vicinity	Alluvium	10.4 - 20.0	1,100	940	4.1	----	----	----
LWVPS-MW217A	9/30/2020	N	BL04	Zone 1	Alluvium	51.3 - 71.0	2,200	11,000	15	1,500	1.4	2.60
LWVPS-MW217A	1/12/2021	N	EM02	Zone 1	Alluvium	51.3 - 71.0	2,600	14,000	17	1,800	1.5	1.75
LWVPS-MW217B	9/30/2020	N	BL04	Zone 1	UMCf	100.3 - 120.0	7,300	14,000	15	1,600	1.0	2.53
LWVPS-MW217B	1/13/2021	N	EM02	Zone 1	UMCf	100.3 - 120.0	9,500	14,000	15	1,700	1.3 J	1.03
LWVPS-MW217C	10/5/2020	N	BL04	Zone 1	UMCf	155.5 - 175.0	6,200	10,000	12	1,600	1.5	2.53
LWVPS-MW217C	1/13/2021	N	EM02	Zone 1	UMCf	155.5 - 175.0	7,100	11,000	12	1,700	1.8 J	1.02
LWVPS-MW217C	1/13/2021	FD	EM02	Zone 1	UMCf	155.5 - 175.0	7,500	10,000	12	1,700	1.8 J	----
LWVPS-MW218A	10/5/2020	N	BL04	General Vicinity	Alluvium	35.3 - 55.0	5,100	14,000	20	1,900	1.4	4.72
LWVPS-MW218A	12/21/2020	N	EM01	General Vicinity	Alluvium	35.3 - 55.0	3,200	14,000	21	2,000	1.5	3.89
LWVPS-MW218A	1/26/2021	N	EM03	General Vicinity	Alluvium	35.3 - 55.0	3,400	12,000	19	1,800	1.5 J+	4.61 E
LWVPS-MW218B	10/2/2020	N	BL04	General Vicinity	UMCf/UMCf-cg	100.3 - 120.0	8,400	13,000	16	----	----	5.83
LWVPS-MW218C	10/2/2020	N	BL04	General Vicinity	UMCf/UMCf-cg	136.0 - 155.5	5,300	7,200	4.3	----	----	1.78
LWVPS-MW219A	10/9/2020	N	BL04	General Vicinity	Alluvium	35.1 - 49.8	3,500	8,500	19	----	----	5.78
LWVPS-MW219B	10/9/2020	N	BL04	General Vicinity	UMCf/Bedrock	75.3 - 95.0	2.2	<100	<0.014	----	----	3.23
LWVPS-MW219C	10/9/2020	N	BL04	General Vicinity	UMCf/Bedrock	115.5 - 135.0	53	<10	0.045 J	----	----	2.43

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LWVPS-MW220A	10/5/2020	N	BL04	General Vicinity	Alluvium	60.3 - 80.0	3,100	9,400	21	2,100	1.6	3.77
LWVPS-MW220A	12/21/2020	N	EM01	General Vicinity	Alluvium	60.3 - 80.0	3,100	7,000	20	2,200	1.8	3.31
LWVPS-MW220A	1/28/2021	N	EM03	General Vicinity	Alluvium	60.3 - 80.0	3,500	9,000	22	2,200	1.6	3.77 E
LWVPS-MW220B	10/7/2020	N	BL04	General Vicinity	UMCf-cg	134.5 - 154.0	4,200	10,000	12	----	----	2.66
LWVPS-MW221A	10/6/2020	N	BL04	Zone 2	Alluvium	50.3 - 70.0	990 J-	710	8.4	1,500 J+	0.51 J-	7.60
LWVPS-MW221A	12/22/2020	N	EM01	Zone 2	Alluvium	50.3 - 70.0	610	710	8.2	1,500	1.7 J	6.85
LWVPS-MW221A	1/12/2021	N	EM02	Zone 2	Alluvium	50.3 - 70.0	710	740	8.3	1,600	0.46 J	6.62
LWVPS-MW221A	1/28/2021	N	EM03	Zone 2	Alluvium	50.3 - 70.0	720	750	8.2	1,500	0.48 J	7.82 E
LWVPS-MW221B	10/6/2020	N	BL04	Zone 2	UMCf/UMCf-cg	83.7 - 103.2	6,600	11,000	5.8	1,500 J+	0.54	3.09
LWVPS-MW222A	10/2/2020	N	BL04	Zone 3	UMCf/UMCf-cg	80.3 - 100.0	2,900	3,800	4.1	----	----	2.97
LWVPS-MW222B	10/7/2020	N	BL04	Zone 3	UMCf-cg	150.3 - 170.0	1,500	1,200	1.6	----	----	3.10
LWVPS-MW222C	10/2/2020	N	BL04	Zone 3	UMCf-cg	214.0 - 233.5	1,500	1,300	2.4	----	----	2.25
LWVPS-MW223A	10/6/2020	N	BL04	Zone 2	Alluvium	45.3 - 65.0	3,300	5,900	17	2,400	1.4	4.57
LWVPS-MW223A	10/6/2020	FD	BL04	Zone 2	Alluvium	45.3 - 65.0	3,900	5,800	17	2,400	1.4	----
LWVPS-MW223A	12/22/2020	N	EM01	Zone 2	Alluvium	45.3 - 65.0	4,100	370	0.54	2,700	11	0.33
LWVPS-MW223A	1/11/2021	N	EM02	Zone 2	Alluvium	45.3 - 65.0	730	820	1.4	2,600	<21	1.14
LWVPS-MW223A	1/26/2021	N	EM03	Zone 2	Alluvium	45.3 - 65.0	2,700	3,700	9.1	2,600	1.4 J+	1.03 E
LWVPS-MW223B	10/6/2020	N	BL04	Zone 2	Alluvium	70.3 - 90.0	3,300	6,100	20	2,100	1.8	4.26
LWVPS-MW223B	12/22/2020	N	EM01	Zone 2	Alluvium	70.3 - 90.0	2,100	2,800	6.7 J-	2,100	3.5	0.44
LWVPS-MW223B	1/11/2021	N	EM02	Zone 2	Alluvium	70.3 - 90.0	1,700	2,100	6.6	2,300	30 J	0.75
LWVPS-MW223B	1/28/2021	N	EM03	Zone 2	Alluvium	70.3 - 90.0	330	470 J-	1.8	1,700	10	7.53 E
LWVPS-MW223C	10/7/2020	N	BL04	Zone 2	UMCf	95.5 - 110.0	5,700	7,700	14	2,100	1.1	2.77
LWVPS-MW223C	1/11/2021	N	EM02	Zone 2	UMCf	95.5 - 110.0	Pending	Pending	Pending	Pending	Pending	0.92
LWVPS-MW224A	10/7/2020	N	BL04	Zone 2	Alluvium	55.3 - 75.0	2,300	2,900	11	2,000	0.90	6.09
LWVPS-MW224A	12/23/2020	N	EM01	Zone 2	Alluvium	55.3 - 75.0	2,700	2,800	11	2,200	1.4 J	6.34
LWVPS-MW224A	1/29/2021	N	EM03	Zone 2	Alluvium	55.3 - 75.0	1,900	3,000	9.9	1,900	1.5 J	5.75
LWVPS-MW224B	10/7/2020	N	BL04	Zone 2	UMCf	106.8 - 126.5	200	220	0.63	----	----	1.48
LWVPS-MW224C	10/8/2020	N	BL04	Zone 2	UMCf (Semi-Cons)	174.5 - 194.0	30	<100	0.068	----	----	2.10
LWVPS-MW225A	10/7/2020	N	BL04	General Vicinity	Alluvium	49.3 - 69.0	2,300	5,200	22	----	----	4.35
LWVPS-MW225A	10/7/2020	FD	BL04	General Vicinity	Alluvium	49.3 - 69.0	2,300	5,200	22	----	----	----
LWVPS-MW225B	10/7/2020	N	BL04	General Vicinity	UMCf	90.5 - 110.0	4,000	5,100	3.3	----	----	1.92
LWVPS-MW226A	10/1/2020	N	BL04	General Vicinity	Alluvium	40.3 - 55.0	2,800	5,100	19	----	----	3.71
LWVPS-MW226A	10/1/2020	FD	BL04	General Vicinity	Alluvium	40.3 - 55.0	2,300	4,900	19	----	----	----
LWVPS-MW226B	10/1/2020	N	BL04	General Vicinity	UMCf (Semi-Cons)	77.5 - 97.0	37	<100	<0.014	----	----	0.79
LWVPS-U1-IW01A	9/29/2020	N	BL04	Zone 1	UMCf	88.8 - 113.5	9,700	18,000	14	----	----	0.86
LWVPS-U1-IW01B	9/29/2020	N	BL04	Zone 1	UMCf	120.3 - 145.0	7,800	13,000	13	----	----	0.80
LWVPS-U1-IW02A	9/30/2020	N	BL04	Zone 1	UMCf	90.3 - 115.0	2,200	5,000	11	----	----	0.68
LWVPS-U1-IW02B	9/30/2020	N	BL04	Zone 1	UMCf	121.3 - 151.0	3,400	6,900	9.8	----	----	1.82
LWVPS-U1-IW03A	9/30/2020	N	BL04	Zone 1	UMCf	93.8 - 118.5	2,500	5,200	13	----	----	0.68
LWVPS-U1-IW03B	9/30/2020	N	BL04	Zone 1	UMCf	125.3 - 150.0	1,400	3,900	10	----	----	2.18
LWVPS-U1-IW04A	9/28/2020	N	BL04	Zone 1	UMCf	86.8 - 116.5	3,500	6,600	12	----	----	0.53
LWVPS-U1-IW04A	9/28/2020	FD	BL04	Zone 1	UMCf	86.8 - 116.5	3,500	6,600	12	----	----	----
LWVPS-U1-IW04B	9/28/2020	N	BL04	Zone 1	UMCf	122.8 - 152.5	3,400	4,800	11	----	----	2.37
LWVPS-U1-IW05A	9/29/2020	N	BL04	Zone 1	UMCf	88.8 - 113.5	2,100	4,300	10	----	----	0.51
LWVPS-U1-IW05B	9/29/2020	N	BL04	Zone 1	UMCf	120.3 - 145.0	2,500	5,100	11	----	----	1.34
LWVPS-U1-IW06A	9/30/2020	N	BL04	Zone 1	UMCf	87.8 - 112.5	2,400	3,600	8.5	----	----	1.60
LWVPS-U1-IW06B	9/30/2020	N	BL04	Zone 1	UMCf	119.3 - 149.0	2,500	3,900	10	----	----	2.07
LWVPS-U1-IW07A	10/1/2020	N	BL04	Zone 1	UMCf	95.8 - 120.5	3,100	4,500	9.5	----	----	3.39
LWVPS-U1-IW07B	10/1/2020	N	BL04	Zone 1	UMCf	127.3 - 152.0	4,300	4,900	9.5	----	----	2.21
LWVPS-U1-IW08A	10/1/2020	N	BL04	Zone 1	UMCf	95.3 - 125.0	4,000	7,500	9.7	----	----	1.60
LWVPS-U1-IW08B	10/1/2020	N	BL04	Zone 1	UMCf	131.8 - 156.5	4,900	6,700	11	----	----	1.92
LWVPS-U1-MW01A	9/28/2020	N	BL04	Zone 1	UMCf	90.3 - 115.0	6,100	11,000	14	1,600	1.0	1.98
LWVPS-U1-MW01A	1/14/2021	N	EM02	Zone 1	UMCf	90.3 - 115.0	6,900	11,000	12	1,600	1.2 J	2.08
LWVPS-U1-MW01B	9/28/2020	N	BL04	Zone 1	UMCf	133.5 - 153.0	7,100	12,000	13	1,800	1.2 J-	1.72
LWVPS-U1-MW01B	1/14/2021	N	EM02	Zone 1	UMCf	133.5 - 153.0	510	1,100	1.5	Pending	2.1	1.58
LWVPS-U1-MW02A	9/29/2020	N	BL04	Zone 1	UMCf	94.3 - 119.0	4,200	7,600	12	1,600	1.2	4.60
LWVPS-U1-MW02A	1/14/2021	N	EM02	Zone 1	UMCf	94.3 - 119.0	5,400	8,400	12	1,700	1.3 J	0.9
LWVPS-U1-MW02B	10/7/2020	N	BL04	Zone 1	UMCf	136.9 - 161.5	2,400	4,100	11	8,300	1.1	2.35
LWVPS-U1-MW02B	1/14/2021	N	EM02	Zone 1	UMCf	136.9 - 161.5	2,300	3,500	6.5	1,700	1.6	0.88
LWVPS-U1-MW03B	9/29/2020	N	BL04	Zone 1	UMCf	134.5 - 154.0	4,300	7,800	14	1,400	1.5	6.71
LWVPS-U1-MW03B	1/14/2021	N	EM02	Zone 1	UMCf	134.5 - 154.0	5,500	8,900	13	1,400	1.2	0.69
LWVPS-U1-MW04A	9/30/2020	N	BL04	Zone 1	UMCf	99.3 - 124.0	4,500	9,100	13	1,600	1.0	0.84
LWVPS-U1-MW04A	1/13/2021	N	EM02	Zone 1	UMCf	99.3 - 124.0	6,400	10,000	13	1,600	1.3 J	1.15
LWVPS-U1-MW04B	10/1/2020	N	BL04	Zone 1	UMCf	139.9 - 164.5	4,200	9,200	13	1,700	2.1	1.75
LWVPS-U1-MW04B	1/13/2021	N	EM02	Zone 1	UMCf	139.9 - 164.5	Pending	10,000	13	1,700	1.8	0.46
LWVPS-U1-MW05A	9/29/2020	N	BL04	Zone 1	UMCf	95.8 - 120.5	10,000	15,000	14	1,900	1.0	2.23
LWVPS-U1-MW05A	1/18/2021	N	EM02	Zone 1	UMCf	95.8 - 120.5	8,900	15,000	14	2,100	<2.1	1.11
LWVPS-U1-MW05B	9/29/2020	N	BL04	Zone 1	UMCf	136.9 - 161.5	5,100	8,800	13	1,800	1.2	1.71
LWVPS-U1-MW05B	1/13/2021	N	EM02	Zone 1	UMCf	136.9 - 161.5	9,800	14,000	13	1,800	1.1	0.5
LWVPS-U1-MW06A	9/29/2020	N	BL04	Zone 1	UMCf	85.3 - 105.0	1,100	3,300	11	970	1.5	0.98

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LWVPS-U1-MW06A	1/14/2021	N	EM02	Zone 1	UMCf	85.3 - 105.0	1,300	3,300	9.0	1,100	2.0	0.84
LWVPS-U1-MW06B	9/29/2020	N	BL04	Zone 1	UMCf	109.3 - 134.0	1,700	3,800	11	1,000	1.7	1.03
LWVPS-U1-MW06B	1/12/2021	N	EM02	Zone 1	UMCf	109.3 - 134.0	21	8.7 J	0.17 J	1,100	12	0.27
LWVPS-U1-MW07	9/30/2020	N	BL04	Zone 1	UMCf	86.3 - 111.0	4,100	7,700	5.6	2,000	0.84	3.78
LWVPS-U1-MW07	1/14/2021	N	EM02	Zone 1	UMCf	86.3 - 111.0	430	110	<0.014	1,700	210	0.73
LWVPS-U1-MW08A	9/30/2020	N	BL04	Zone 1	UMCf	93.8 - 118.5	4,700	7,300	13	1,500	1.7	2.21
LWVPS-U1-MW08A	1/12/2021	N	EM02	Zone 1	UMCf	93.8 - 118.5	<0.31	<10	<0.14	990	300	0.33
LWVPS-U1-MW08B	9/30/2020	N	BL04	Zone 1	UMCf	125.3 - 150.0	2,800	5,500	10	1,400	1.3	3.10
LWVPS-U1-MW08B	1/11/2021	N	EM02	Zone 1	UMCf	125.3 - 150.0	3.9	<10	<0.014	1,100	230	0.23
LWVPS-U1-MW08B	1/11/2021	FD	EM02	Zone 1	UMCf	125.3 - 150.0	3.8	<10	0.014 R	1,400	220	----
LWVPS-U1-MW09A	9/30/2020	N	BL04	Zone 1	UMCf	115.3 - 125.0	7,500	12,000	13	1,900	1.8	1.62
LWVPS-U1-MW09A	1/13/2021	N	EM02	Zone 1	UMCf	115.3 - 125.0	8,600	13,000	12	1,900	0.88	0.75
LWVPS-U1-MW09B	9/30/2020	N	BL04	Zone 1	UMCf	130.3 - 155.0	6,400	11,000	9.6	1,900	0.89	1.80
LWVPS-U1-MW09B	1/13/2021	N	EM02	Zone 1	UMCf	130.3 - 155.0	3,800	5,900	12	1,700	<2.1	0.74
LWVPS-U1-MW10A	10/2/2020	N	BL04	Zone 1	UMCf	99.3 - 124.0	9,200	16,000	9.9	2,000	0.55	3.77
LWVPS-U1-MW10A	1/13/2021	N	EM02	Zone 1	UMCf	99.3 - 124.0	13,000 J	17,000	10	2,000	1.2 J	3.28
LWVPS-U1-MW10B	10/2/2020	N	BL04	Zone 1	UMCf	130.3 - 155.0	4,600	5,100	3.8	1,800	0.53	1.68
LWVPS-U1-MW10B	1/12/2021	N	EM02	Zone 1	UMCf	130.3 - 155.0	4,600	5,500	4.6	1,900	<1.3	1.37
LWVPS-U2-IW01	10/8/2020	N	BL04	Zone 2	UMCf	121.2 - 141.0	8,100	12,000	9.0	----	----	3.48
LWVPS-U2-IW01	10/8/2020	FD	BL04	Zone 2	UMCf	121.2 - 141.0	6,900	11,000	8.6	----	----	----
LWVPS-U2-IW02	10/8/2020	N	BL04	Zone 2	UMCf	116.2 - 141.0	8,100	12,000	8.7	----	----	3.80
LWVPS-U2-IW03	10/8/2020	N	BL04	Zone 2	UMCf	99.2 - 124.0	7,100	11,000	12	----	----	2.66
LWVPS-U2-IW04	10/8/2020	N	BL04	Zone 2	UMCf	83.7 - 108.5	3,900	6,500	19	----	----	4.10
LWVPS-U2-IW05	10/8/2020	N	BL04	Zone 2	UMCf	87.7 - 117.5	8,500	14,000	12	----	----	4.95
LWVPS-U2-IW06	10/8/2020	N	BL04	Zone 2	UMCf	89.2 - 104.0	10,000	17,000	14	----	----	3.46
LWVPS-U2-IW07	10/6/2020	N	BL04	Zone 2	UMCf	91.2 - 106.0	6,000	8,700	5.7	----	----	1.85
LWVPS-U2-IW08	10/6/2020	N	BL04	Zone 2	UMCf	83.7 - 108.5	12,000	20,000	17	----	----	5.08
LWVPS-U2-IW09	10/6/2020	N	BL04	Zone 2	UMCf	103.2 - 128.0	35	63 J	0.11	----	----	2.85
LWVPS-U2-IW10	10/6/2020	N	BL04	Zone 2	UMCf	109.3 - 129.0	400	150	<0.014	----	----	3.48
LWVPS-U2-IW11	10/6/2020	N	BL04	Zone 2	UMCf	108.9 - 133.7	1,400	2,400	2.6	----	----	3.31
LWVPS-U2-IW12	10/8/2020	N	BL04	Zone 2	UMCf	112.8 - 137.5	5,900	8,300	11	----	----	4.65
LWVPS-U2-MW01	10/8/2020	N	BL04	Zone 2	UMCf	97.3 - 117.0	360	450	0.89	2,500	0.36 J	1.63
LWVPS-U2-MW01	1/14/2021	N	EM02	Zone 2	UMCf	97.3 - 117.0	85	93 J	0.11	2,600	<1.0	2.76
LWVPS-U2-MW02	10/8/2020	N	BL04	Zone 2	UMCf	100.3 - 125.0	5,200	8,300	6.2	1,800	0.64	8.10
LWVPS-U2-MW02	1/12/2021	N	EM02	Zone 2	UMCf	100.3 - 125.0	7,100	9,600	9.1	1,900	<1.3	2.13
LWVPS-U2-MW03	10/9/2020	N	BL04	Zone 2	UMCf	90.3 - 110.0	2,100	3,400	11	2,000	0.98	3.53
LWVPS-U2-MW03	1/14/2021	N	EM02	Zone 2	UMCf	90.3 - 110.0	1,800	3,300	12	2,100	1.4 J	3.53
LWVPS-U2-MW04	10/6/2020	N	BL04	Zone 2	UMCf	103.2 - 128.0	160	260	0.27	3,000	0.27 J	0.93
LWVPS-U2-MW04	1/11/2021	N	EM02	Zone 2	UMCf	103.2 - 128.0	2.0	<10	<0.014	2,900	9.5	0.49
LWVPS-U2-MW05	10/5/2020	N	BL04	Zone 2	UMCf	83.2 - 108.0	9,300	15,000	8.4	1,300	0.41 J	4.35
LWVPS-U2-MW05	1/13/2021	N	EM02	Zone 2	UMCf	83.2 - 108.0	2.7	<10	<0.014	1,100	1,100	0.24
LWVPS-U2-MW06	10/1/2020	N	BL04	Zone 2	UMCf	121.8 - 141.5	4,100	7,300	9.5	1,900	0.94	2.79
LWVPS-U2-MW06	1/11/2021	N	EM02	Zone 2	UMCf	121.8 - 141.5	4,200	5,700	7.0	2,000	<1.3	1.01
LWVPS-U2-MW07	10/2/2020	N	BL04	Zone 2	UMCf	88.2 - 108.0	1,600	2,600	10	1,900	0.74	5.79
LWVPS-U2-MW08	10/1/2020	N	BL04	Zone 2	UMCf	113.2 - 133.0	4,600	8,100	17	2,100	1.5	2.63
LWVPS-U2-MW08	1/11/2021	N	EM02	Zone 2	UMCf	113.2 - 133.0	3,100	9,400	9.1	1,900	<0.26	0.54
LWVPS-U2-MW09	10/9/2020	N	BL04	Zone 2	UMCf	84.9 - 104.7	12,000	18,000	17	2,200	1.1	2.06
LWVPS-U2-MW09	1/18/2021	N	EM02	Zone 2	UMCf	84.9 - 104.7	9,800	15,000	17	2,300	1.4 J	2.21
LWVPS-U2-MW10	10/2/2020	N	BL04	Zone 2	UMCf	90.2 - 110.0	6,000	8,900	15	2,200	1.1	4.16
LWVPS-U2-MW12	10/7/2020	N	BL04	Zone 2	UMCf	83.2 - 108.0	8,800	12,000	18	2,000	1.1	4.13
LWVPS-U2-MW12	1/12/2021	N	EM02	Zone 2	UMCf	83.2 - 108.0	7,000	11,000	16	1,900	1.4 J	3.9
LWVPS-U2-MW13	10/2/2020	N	BL04	Zone 2	UMCf	94.7 - 109.5	5,400	11,000	17	2,100	1.2	3.58
LWVPS-U2-MW13	10/2/2020	FD	BL04	Zone 2	UMCf	94.7 - 109.5	5,800	11,000	17	2,300	1.4	----
LWVPS-U2-MW14	10/6/2020	N	BL04	Zone 2	UMCf	83.2 - 108.0	11,000	360	17	2,000	0.78	5.18
LWVPS-U2-MW14	1/13/2021	N	EM02	Zone 2	UMCf	83.2 - 108.0	9,600	20,000	8.9	1,900	1.4 J	0.82
LWVPS-U2-MW17	10/1/2020	N	BL04	Zone 2	UMCf	117.0 - 136.5	4,500	10,000	11	1,700	0.66	2.28
LWVPS-U2-MW17	1/12/2021	N	EM02	Zone 2	UMCf	117.0 - 136.5	1,800	800	<0.14	2,200	6.1	0.64
LWVPS-U2-MW17	1/12/2021	FD	EM02	Zone 2	UMCf	117.0 - 136.5	2,100	810	0.036 J	2,200	6.6	----
LWVPS-U2-MW18	10/5/2020	N	BL04	Zone 2	UMCf	88.3 - 113.0	8,400	10,000	18	2,200	1.3	4.49
LWVPS-U2-MW18	1/11/2021	N	EM02	Zone 2	UMCf	88.3 - 113.0	5,800	8,800	18	2,400	1.8 J	2.83
LWVPS-U2-MW19	10/2/2020	N	BL04	Zone 2	UMCf	91.2 - 111.0	12,000	14,000	14	2,100	1.0	3.29
LWVPS-U2-MW20	10/2/2020	N	BL04	Zone 2	UMCf	88.2 - 108.0	6,000	13,000	12	2,200	1.5	1.38
LWVPS-U3-IW01	10/9/2020	N	BL04	Zone 3	UMCf-cg	80.2 - 115.0	3,100	4,900	8.3	----	----	5.57
LWVPS-U3-IW02A	10/6/2020	N	BL04	Zone 3	UMCf-cg	79.3 - 99.0	10,000	15,000	14	----	----	4.02
LWVPS-U3-IW02B	10/6/2020	N	BL04	Zone 3	UMCf-cg	104.8 - 124.5	5,200	9,700	9.4	----	----	3.61
LWVPS-U3-IW03A	10/6/2020	N	BL04	Zone 3	UMCf-cg	77.8 - 102.5	1,800	3,500	8.3	----	----	3.56
LWVPS-U3-IW03B	10/6/2020	N	BL04	Zone 3	UMCf-cg	109.3 - 139.0	1,600	3,200	7.9	----	----	4.91
LWVPS-U3-IW04A	10/7/2020	N	BL04	Zone 3	UMCf-cg	93.3 - 123.0	210	390	7.7	----	----	5.74
LWVPS-U3-IW04B	10/7/2020	N	BL04	Zone 3	UMCf-cg	129.3 - 159.0	680	1,100	5.8	----	----	3.71
LWVPS-U3-IW05A	10/7/2020	N	BL04	Zone 3	UMCf-cg	91.3 - 126.0	230	380	7.8	----	----	5.74

Table 2
Groundwater Analytical Results
 Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	QCType	Event	Area_Name	Screened Lithology	Screened Interval	Perchlorate by USEPA Method 314.0 µg/L	Chlorate by USEPA Method 300.1B µg/L	Nitrate (as N) by USEPA Method 300.0 mg/L	Sulfate by USEPA Method 300.0 mg/L	Total Organic Carbon by SM 5310B mg/L	Dissolved Oxygen Field Measurement mg/L
LVWPS-U3-IW05B	10/7/2020	N	BL04	Zone 3	UMCf-cg	132.8 - 167.5	530	870	7.4	----	----	5.83
LVWPS-U3-IW06A	10/7/2020	N	BL04	Zone 3	UMCf-cg	86.3 - 111.0	340	540	7.6	----	----	5.89
LVWPS-U3-IW06B	10/8/2020	N	BL04	Zone 3	UMCf-cg	117.8 - 142.5	5,700	1,800	7.6	----	----	4.72
LVWPS-U3-IW06C	10/8/2020	N	BL04	Zone 3	UMCf-cg	149.3 - 174.0	3,800	4,100	8.1	----	----	5.71
LVWPS-U3-IW07A	10/8/2020	N	BL04	Zone 3	UMCf-cg	86.3 - 111.0	1,400	2,000	7.1	----	----	3.57
LVWPS-U3-IW07B	10/8/2020	N	BL04	Zone 3	UMCf-cg	117.8 - 142.5	9,400	15,000	9.0	----	----	0.80
LVWPS-U3-IW07C	10/9/2020	N	BL04	Zone 3	UMCf-cg	149.3 - 174.0	7,300	14,000	8.0	----	----	0.73
LVWPS-U3-IW08A	10/8/2020	N	BL04	Zone 3	UMCf-cg	86.3 - 111.0	1,900	2,600	5.8	----	----	0.79
LVWPS-U3-IW08A	10/8/2020	FD	BL04	Zone 3	UMCf-cg	86.3 - 111.0	1,900	2,600	5.5	----	----	----
LVWPS-U3-IW08B	10/8/2020	N	BL04	Zone 3	UMCf-cg	117.8 - 142.5	15,000	21,000	12	----	----	0.94
LVWPS-U3-IW08C	10/9/2020	N	BL04	Zone 3	UMCf-cg	149.3 - 174.0	2,400	3,500	2.3	----	----	0.66
LVWPS-U3-MW01B	10/5/2020	N	BL04	Zone 3	UMCf-cg	83.8 - 103.3	2,000	1,800	0.24	1,700	6.3	2.06
LVWPS-U3-MW01B	1/15/2021	N	EM02	Zone 3	UMCf-cg	83.8 - 103.3	1,900	2,700	0.79	1,800	3.9	1.26
LVWPS-U3-MW02A	10/5/2020	N	BL04	Zone 3	UMCf-cg	82.3 - 97.0	3,000	770	5.7	1,400	0.54	2.01
LVWPS-U3-MW02A	1/14/2021	N	EM02	Zone 3	UMCf-cg	82.3 - 97.0	1,900	3,200	6.0	1,500	0.37 J	3.75
LVWPS-U3-MW02A	1/14/2021	FD	EM02	Zone 3	UMCf-cg	82.3 - 97.0	2,300	3,300	6.1	1,500	0.41 J	----
LVWPS-U3-MW02B	10/5/2020	N	BL04	Zone 3	UMCf-cg	103.0 - 122.5	8,400	12,000	10	2,000	2.1	1.70
LVWPS-U3-MW02B	1/14/2021	N	EM02	Zone 3	UMCf-cg	103.0 - 122.5	190	370	0.29	1,800	14	0.49
LVWPS-U3-MW03A	10/2/2020	N	BL04	Zone 3	UMCf-cg	86.3 - 111.0	3,300	4,500	7.5	2,800	0.57 J-	6.40
LVWPS-U3-MW03A	10/2/2020	FD	BL04	Zone 3	UMCf-cg	86.3 - 111.0	3,500	4,500	7.5	2,800	0.62 J-	----
LVWPS-U3-MW03A	1/14/2021	N	EM02	Zone 3	UMCf-cg	86.3 - 111.0	3,400	5,500	7.4	2,900	<2.1	4.38
LVWPS-U3-MW03B	10/2/2020	N	BL04	Zone 3	UMCf-cg	151.1 - 175.7	3,800	13,000	9.1	1,900	0.41 J	3.23
LVWPS-U3-MW03B	1/14/2021	N	EM02	Zone 3	UMCf-cg	151.1 - 175.7	100	<10	<0.014	1,900 J-	61	0.23
LVWPS-U3-MW03C	10/1/2020	N	BL04	Zone 3	UMCf-cg	117.8 - 142.5	4,900	12,000	7.7	1,900	0.32 J	2.96
LVWPS-U3-MW03C	1/14/2021	N	EM02	Zone 3	UMCf-cg	117.8 - 142.5	4,800	4,300	1.6	2,000	2.6	0.43
LVWPS-U3-MW04B	10/2/2020	N	BL04	Zone 3	UMCf-cg	78.2 - 97.7	120	67 J	<0.014	1,600	6.8	2.03
LVWPS-U3-MW05B	10/2/2020	N	BL04	Zone 3	UMCf-cg	85.2 - 104.7	9.4	<10	<0.014	1,900	8.4	2.07
LVWPS-U3-MW05B	1/15/2021	N	EM02	Zone 3	UMCf-cg	85.2 - 104.7	96 J	39 J	<0.014	1,900	7.3	1.11
LVWPS-U3-MW06A	10/5/2020	N	BL04	Zone 3	UMCf-cg	90.3 - 115.0	9,900	15,000	13	1,700	0.48 J	5.05
LVWPS-U3-MW06A	1/15/2021	N	EM02	Zone 3	UMCf-cg	90.3 - 115.0	<6,300	13,000	12	1,800 J-	<1.0	4.12
LVWPS-U3-MW06B	10/7/2020	N	BL04	Zone 3	UMCf-cg	125.3 - 149.9	630	1,200	6.6	1,500	0.43 J	4.23
LVWPS-U3-MW06B	1/14/2021	N	EM02	Zone 3	UMCf-cg	125.3 - 149.9	820	1,500	6.1	1,600	0.58	2.37
LVWPS-U3-MW07A	10/9/2020	N	BL04	Zone 3	UMCf-cg	82.8 - 97.5	250	540	5.9	1,200	0.39 J	5.45
LVWPS-U3-MW07A	1/15/2021	N	EM02	Zone 3	UMCf-cg	82.8 - 97.5	260	530	6.1	1,200	0.37 J	6.37
LVWPS-U3-MW07B	10/9/2020	N	BL04	Zone 3	UMCf-cg	104.8 - 124.5	4,800	8,500	9.2	2,100	0.41 J	6.07
LVWPS-U3-MW07B	1/14/2021	N	EM02	Zone 3	UMCf-cg	104.8 - 124.5	4,600	7,900	9.5	2,100	<2.1	6.26
LVWPS-U3-MW08A	10/8/2020	N	BL04	Zone 3	UMCf-cg	117.8 - 142.5	15,000	22,000	14	2,300	0.47 J	5.05
LVWPS-U3-MW08A	1/15/2021	N	EM02	Zone 3	UMCf-cg	117.8 - 142.5	14,000	20,000	14	2,400	<1.0	4.22
LVWPS-U3-MW08B	10/8/2020	N	BL04	Zone 3	UMCf-cg	149.3 - 174.0	6,100	8,100	4.9	2,200	2.6	2.46
LVWPS-U3-MW08B	1/15/2021	N	EM02	Zone 3	UMCf-cg	149.3 - 174.0	7,400	8,100	5.3	2,200	1.0 J	0.86
LVWPS-U3-MW09	10/7/2020	N	BL04	Zone 3	UMCf-cg	82.8 - 107.5	3,500	6,100	4.8	1,300	<0.26	4.35
LVWPS-U3-MW09	1/15/2021	N	EM02	Zone 3	UMCf-cg	82.8 - 107.5	14	<10	<0.014	1,100	300	0.52
LVWPS-U3-MW10A	10/5/2020	N	BL04	Zone 3	UMCf-cg	85.3 - 95.0	2,600	3,200	3.0	1,800	0.77	0.99
LVWPS-U3-MW10A	1/14/2021	N	EM02	Zone 3	UMCf-cg	85.3 - 95.0	0.96 J	<10	<0.014	1,200	310	0.76
LVWPS-U3-MW10B	10/5/2020	N	BL04	Zone 3	UMCf-cg	101.3 - 121.0	3,200	4,200	6.5	1,600	0.32 J	6.76
LVWPS-U3-MW10B	1/14/2021	N	EM02	Zone 3	UMCf-cg	101.3 - 121.0	0.69 J	<10	<0.014	1,500	280	0.54
LVWPS-U3-MW11A	10/7/2020	N	BL04	Zone 3	UMCf-cg	86.3 - 106.0	10,000	16,000	9.8	2,000	0.42 J	2.55
LVWPS-U3-MW11A	1/15/2021	N	EM02	Zone 3	UMCf-cg	86.3 - 106.0	11,000	18,000	11	2,000	<1.0	3.02
LVWPS-U3-MW11B	10/7/2020	N	BL04	Zone 3	UMCf-cg	112.3 - 137.0	4,100	9,600	5.2	1,900	0.33 J	1.23
LVWPS-U3-MW11B	1/18/2021	N	EM02	Zone 3	UMCf-cg	112.3 - 137.0	5,400	7,600	4.9	2,100	<1.0	2.13
LVWPS-U3-MW11C	10/8/2020	N	BL04	Zone 3	UMCf-cg	143.3 - 163.0	5,300	7,100	8.5	2,000	0.46 J	4.73
LVWPS-U3-MW11C	1/18/2021	N	EM02	Zone 3	UMCf-cg	143.3 - 163.0	6,500	6,800	8.1	2,000	<1.0	4.03
LVWPS-U3-MW12A	10/6/2020	N	BL04	Zone 3	UMCf-cg	88.3 - 108.0	2,700	4,200	5.1	1,800	0.38 J	2.67
LVWPS-U3-MW12A	1/15/2021	N	EM02	Zone 3	UMCf-cg	88.3 - 108.0	2,300	3,200	3.3	1,800	0.60	1.07
LVWPS-U3-MW12B	10/6/2020	N	BL04	Zone 3	UMCf-cg	113.3 - 138.0	6,000	4,900	6.6	1,700	0.27 J	5.94
LVWPS-U3-MW12B	1/15/2021	N	EM02	Zone 3	UMCf-cg	113.3 - 138.0	1,900	2,600	2.7	2,000	0.45 J	1.79
LVWPS-U3-MW13A	10/7/2020	N	BL04	Zone 3	UMCf-cg	96.3 - 121.0	3,900	7,200	11	2,000	0.45 J	5.44
LVWPS-U3-MW13A	1/15/2021	N	EM02	Zone 3	UMCf-cg	96.3 - 121.0	3,900	7,400	10	2,100	<1.0	4.84
LVWPS-U3-MW13B	10/7/2020	N	BL04	Zone 3	UMCf-cg	132.8 - 147.5	350	550	6.8	1,500	0.45 J	5.92
LVWPS-U3-MW13B	1/15/2021	N	EM02	Zone 3	UMCf-cg	132.8 - 147.5	<0.31	<10	<0.014	910	65	0.2

Notes:

- Not tested.
- J- The result is an estimated quantity, but the result may be biased low.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- < The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-A1-DR01	9/28/2020	72.5	LVWPS-A1-DR01-BL04	BL04	Zone 1	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---	
LVWPS-A1-DR01	12/13/2020	72.5	LVWPS-A1-DR01-20201213-1	INJ	Zone 1	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-A1-DR01	12/14/2020	72.5	LVWPS-A1-DR01-20201214	INJ	Zone 1	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-A1-DR01	12/29/2020	72.5	LVWPS-A1-DR01-INJ	INJ	Zone 1	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-A1-DR01	1/12/2021	72.5	LVWPS-A1-DR01-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	561.2 **	8.58	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-DR02	9/28/2020	67.8	LVWPS-A1-DR02-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-DR02	12/13/2020	67.8	LVWPS-A1-DR02-20201213-1	INJ	Zone 1	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	ND	ND
LVWPS-A1-DR02	12/14/2020	67.8	LVWPS-A1-DR02-20201214	INJ	Zone 1	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	ND	ND
LVWPS-A1-DR02	12/29/2020	67.8	LVWPS-A1-DR02-INJ	INJ	Zone 1	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	ND	ND
LVWPS-A1-DR02	1/12/2021	67.8	LVWPS-A1-DR02-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	562.8 **	16.7	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW04	9/30/2020	79.2	LVWPS-A1-MW04-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW04	12/29/2020	79.2	LVWPS-A1-MW04-INJ	INJ	Zone 1	ND	ND	ND	ND	ND	ND	ND	562.2 **	25.6	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW04	1/13/2021	79.2	LVWPS-A1-MW04-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	561.0 **	2.34	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW05	9/30/2020	78.9	LVWPS-A1-MW05-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW05	12/29/2020	78.9	LVWPS-A1-MW05-INJ	INJ	Zone 1	ND	ND	ND	ND	ND	ND	ND	562.3 **	39.7	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW05	1/15/2021	78.9	LVWPS-A1-MW05-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	562.3 **	14.0	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW06	9/29/2020	69.1	LVWPS-A1-MW06-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW06	12/28/2020	69.1	LVWPS-A1-MW06-INJ	INJ	Zone 1	ND	ND	ND	ND	ND	ND	ND	563.2 **	44.5	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW06	1/14/2021	69.1	LVWPS-A1-MW06-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	562.6 **	34.2	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW07	9/30/2020	68.1	LVWPS-A1-MW07-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW07	12/29/2020	68.1	LVWPS-A1-MW07-INJ	INJ	Zone 1	ND	ND	ND	ND	ND	ND	ND	562.1 **	32.3	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW07	1/14/2021	68.1	LVWPS-A1-MW07-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	561.9 **	21.0	ND	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW09	9/30/2020	95.5	LVWPS-A1-MW09-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW09	1/13/2021	95.5	LVWPS-A1-MW09-EM02	EM02	Zone 1	ND	ND	ND	ND	515.4	10.5	ND	ND	561.7 **	4.93	ND	ND	ND	ND	ND	ND
LVWPS-A1-MW10	10/1/2020	80.5	LVWPS-A1-MW10-BL04	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW10	10/1/2020	80.5	LVWPS-A1-MW10-BL04-FD	BL04	Zone 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A1-MW10	1/13/2021	80.5	LVWPS-A1-MW10-EM02	EM02	Zone 1	ND	ND	ND	ND	515.3	7.16	ND	ND	562.1 **	34.4	ND	ND	ND	ND	ND	ND
LVWPS-A2-DR01A	9/28/2020	53.7	LVWPS-A2-DR01A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A2-DR01A	12/7/2020	53.7	LVWPS-A2-DR01A-20201207	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.8	28.4	---	---	ND	ND
LVWPS-A2-DR01A	12/8/2020	53.7	LVWPS-A2-DR01A-20201208	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	565.8	286	---	---	ND	ND
LVWPS-A2-DR01A	12/9/2020	53.7	LVWPS-A2-DR01A-20201209	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	569.0	5,920	---	---	ND	ND
LVWPS-A2-DR01A	12/12/2020	53.7	LVWPS-A2-DR01A-INJ	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.5	104	---	---	ND	ND
LVWPS-A2-DR01A	12/20/2020	53.7	LVWPS-A2-DR01A-20201220	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	574.1	11.6	---	---	ND	ND
LVWPS-A2-DR01A	12/21/2020	53.7	LVWPS-A2-DR01A-20201221	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	574.1	9.77	---	---	ND	ND
LVWPS-A2-DR01A	1/12/2021	53.7	LVWPS-A2-DR01A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	567.7	574	567.0 **	44.1	ND	ND	ND	ND	
LVWPS-A2-DR01B	9/28/2020	94.5	LVWPS-A2-DR01B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A2-DR01B	12/7/2020	94.5	LVWPS-A2-DR01B-20201207	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.8	32.5	---	---	ND	ND
LVWPS-A2-DR01B	12/8/2020	94.5	LVWPS-A2-DR01B-20201208	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.2	22.2	---	---	ND	ND
LVWPS-A2-DR01B	12/9/2020	94.5	LVWPS-A2-DR01B-20201209	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.2	503	---	---	ND	ND
LVWPS-A2-DR01B	12/11/2020	94.5	LVWPS-A2-DR01B-INJ	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.2 **	379	---	---	ND	ND
LVWPS-A2-DR01B	12/20/2020	94.5	LVWPS-A2-DR01B-20201220-1	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	568.0 **	115	---	---	ND	ND
LVWPS-A2-DR01B	12/20/2020	94.5	LVWPS-A2-DR01B-20201220-2	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.1 **	168	---	---	ND	ND
LVWPS-A2-DR01B	12/20/2020	94.5	LVWPS-A2-DR01B-20201220-3	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.0 **	223	---	---	ND	ND
LVWPS-A2-DR01B	12/20/2020	94.5	LVWPS-A2-DR01B-20201220-4	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.0 **	272	---	---	ND	ND
LVWPS-A2-DR01B	12/21/2020	94.5	LVWPS-A2-DR01B-20201221-1	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.2 **	146	---	---	ND	ND
LVWPS-A2-DR01B	12/21/2020	94.5	LVWPS-A2-DR01B-20201221-2	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.0 **	381	---	---	ND	ND
LVWPS-A2-DR01B	12/21/2020	94.5	LVWPS-A2-DR01B-20201221-3	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.2 **	107	---	---	ND	ND
LVWPS-A2-DR01B	12/21/2020	94.5	LVWPS-A2-DR01B-20201221-4	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.6 **	126	---	---	ND	ND
LVWPS-A2-DR01B	1/12/2021	94.5	LVWPS-A2-DR01B-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	568.7	2,170	567.7 **	95.5	ND	ND	ND	ND	
LVWPS-A2-DR02A	9/28/2020	43.9	LVWPS-A2-DR02A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A2-DR02A	12/7/2020	43.9	LVWPS-A2-DR02A-20201207	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.1	326	---	---	ND	ND
LVWPS-A2-DR02A	12/8/2020	43.9	LVWPS-A2-DR02A-20201208	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.2	13.5	---	---	ND	ND
LVWPS-A2-DR02A	12/9/2020	43.9	LVWPS-A2-DR02A-20201209	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.0	189	---	---	ND	ND
LVWPS-A2-DR02A	12/9/2020	43.9	LVWPS-A2-DR02A-20201209	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.0	216	---	---	ND	ND
LVWPS-A2-DR02A	12/12/2020	43.9	LVWPS-A2-DR02A-INJ	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	567.1	72.7	---	---	ND	ND
LVWPS-A2-DR02A	12/20/2020	43.9	LVWPS-A2-DR02A-20201220	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	573.1	0.323	---	---	ND	ND
LVWPS-A2-DR02A	12/21/2020	43.9	LVWPS-A2-DR02A-20201221	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	ND	ND
LVWPS-A2-DR02A	1/12/2021	43.9	LVWPS-A2-DR02A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	567.6	29.9	ND	ND	ND	ND	ND	ND	
LVWPS-A2-DR02B	9/28/2020	67.7	LVWPS-A2-DR02B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-A2-DR02B	12/7/2020	67.7	LVWPS-A2-DR02B-20201207	INJ	Zone 2	---	---	ND	ND	---	---	506.0	0.022	---	---	573.4	0.244	---	---	ND	ND
LVWPS-A2-DR02B	12/8/2020	67.7	LVWPS-A2-DR02B-20201208	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.2	115	---	---	ND	ND
LVWPS-A2-DR02B	12/9/2020	67.7	LVWPS-A2-DR02B-20201209	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.9	98.0	---	---	ND	ND
LVWPS-A2-DR02B	12/12/2020	67.7	LVWPS-A2-DR02B-INJ	INJ	Zone 2	---	---	ND	ND	---	---	---	---	---	---	566.6	250	---	---	ND	ND
LVWPS-A2-DR02B	12/20/2020	67.7	LVWPS-A2-DR02B-20201220-1	INJ	Zone 2	---	---	ND	ND	---	---	515.1 **	28.1	---	---	566.7 **	275	---	---	ND	ND
LVWPS-A2-DR02B	12/20/2020	67.7	LVWPS-A2-DR02B-20201220-2	INJ	Zone 2	---	---	ND	ND	---	---	515.5 **	15.1	---	---	567.0 **	246	---	---	ND	ND
LVWPS-A2-DR02B	12/20/2020	67.7	LVWPS-A2-DR02B-20201220-3	INJ	Zone 2	---	---	ND	ND	---	---	515.6 **	35.6	---	---	566.1 **	71.9	---	---	ND	ND
LVWPS-A2-DR02B	12/20/2020	67.7	LVWPS-A2-DR02B-20201220-4	INJ	Zone 2	---	---	ND	ND	---	---	515.3 **	28.8	---	---	566.9 **	258	---	---	ND	ND
LVWPS-A2-DR02B	12/21/2020	67.7	LVWPS-A2-DR02B-20201221-1	INJ	Zone 2	---	---	ND	ND	---	---	516.1 **	37.2	---	---	566.2 **	134	---	---	ND	ND
LVWPS-A2-DR02B	12/21/2020	67.7	LVWPS-A2-DR02B-20201221-2	INJ	Zone 2	---	---	ND													

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-A2-MW01A	12/23/2020	49.8	LVWPS-A2-MW01A-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW01A	1/13/2021	49.8	LVWPS-A2-MW01A-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW01A	1/25/2021	49.8	LVWPS-A2-MW01A-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW01B	10/8/2020	79.7	LVWPS-A2-MW01B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW01B	12/15/2020	79.7	LVWPS-A2-MW01B-INJ	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	573.6	0.135	---	---	ND	ND
LVWPS-A2-MW01B	12/23/2020	79.7	LVWPS-A2-MW01B-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW01B	1/13/2021	79.7	LVWPS-A2-MW01B-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW01B	1/25/2021	79.7	LVWPS-A2-MW01B-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02A	10/8/2020	49.8	LVWPS-A2-MW02A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW02A	10/8/2020	49.8	LVWPS-A2-MW02A-BL04-FD	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW02A	12/12/2020	49.8	LVWPS-A2-MW02A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02A	12/23/2020	49.8	LVWPS-A2-MW02A-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02A	1/12/2021	49.8	LVWPS-A2-MW02A-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02A	1/25/2021	49.8	LVWPS-A2-MW02A-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02B	10/8/2020	79.9	LVWPS-A2-MW02B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW02B	12/12/2020	79.9	LVWPS-A2-MW02B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02B	12/23/2020	79.9	LVWPS-A2-MW02B-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02B	1/13/2021	79.9	LVWPS-A2-MW02B-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW02B	1/25/2021	79.9	LVWPS-A2-MW02B-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW03A	10/9/2020	47.9	LVWPS-A2-MW03A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW03A	10/9/2020	47.9	LVWPS-A2-MW03A-BL04-FD	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW03A	12/12/2020	47.9	LVWPS-A2-MW03A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	562.0 **	2.46	---	---	ND	ND	---	---
LVWPS-A2-MW03A	12/23/2020	47.9	LVWPS-A2-MW03A-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW03A	1/14/2021	47.9	LVWPS-A2-MW03A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	562.6 **	1.59	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW03A	1/25/2021	47.9	LVWPS-A2-MW03A-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	---	---	561.1 **	1.10	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW03B	10/9/2020	73.8	LVWPS-A2-MW03B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW03B	12/12/2020	73.8	LVWPS-A2-MW03B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW03B	12/23/2020	73.8	LVWPS-A2-MW03B-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW03B	1/14/2021	73.8	LVWPS-A2-MW03B-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW03B	1/26/2021	73.8	LVWPS-A2-MW03B-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	10/2/2020	53.7	LVWPS-A2-MW04A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW04A	12/14/2020	53.7	LVWPS-A2-MW04A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	12/14/2020	53.7	LVWPS-A2-MW04A-INJ-FD	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	12/22/2020	53.7	LVWPS-A2-MW04A-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	12/22/2020	53.7	LVWPS-A2-MW04A-EM01-FD	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	1/12/2021	53.7	LVWPS-A2-MW04A-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	1/12/2021	53.7	LVWPS-A2-MW04A-EM02-FD	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	1/26/2021	53.7	LVWPS-A2-MW04A-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04A	1/26/2021	53.7	LVWPS-A2-MW04A-EM03-FD	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04B	10/2/2020	84.9	LVWPS-A2-MW04B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW04B	12/14/2020	84.9	LVWPS-A2-MW04B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW04B	12/22/2020	84.9	LVWPS-A2-MW04B-EM01	EM01	Zone 2	539.6	4.39	ND	ND	515.6	1.00	ND	ND	---	---	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW04B	1/12/2021	84.9	LVWPS-A2-MW04B-EM02	EM02	Zone 2	ND	ND	ND	ND	515.2	100	507.1	0.442	567.4	1.94	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW04B	1/26/2021	84.9	LVWPS-A2-MW04B-EM03	EM03	Zone 2	ND	ND	ND	ND	514.7	5.70	ND	ND	566.0	1.10	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW05A	10/5/2020	43.9	LVWPS-A2-MW05A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW05A	12/12/2020	43.9	LVWPS-A2-MW05A-INJ	INJ	Zone 2	ND	ND	ND	ND	ND	ND	---	---	566.8	16,000	567.3	157	ND	ND	ND	ND
LVWPS-A2-MW05A	12/22/2020	43.9	LVWPS-A2-MW05A-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	---	---	568.4	5,110	574.9	43.2	ND	ND	ND	ND
LVWPS-A2-MW05A	1/13/2021	43.9	LVWPS-A2-MW05A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	569.7	1,510	566.3 **	19.2	ND	ND	ND	ND
LVWPS-A2-MW05A	1/26/2021	43.9	LVWPS-A2-MW05A-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	---	---	570.1	79.6	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW05B	10/5/2020	66	LVWPS-A2-MW05B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW05B	12/12/2020	66	LVWPS-A2-MW05B-INJ	INJ	Zone 2	ND	ND	ND	ND	ND	ND	---	---	566.6	3,900	566.7	271	ND	ND	ND	ND
LVWPS-A2-MW05B	12/12/2020	66	LVWPS-A2-MW05B-INJ-FD	INJ	Zone 2	ND	ND	ND	ND	ND	ND	---	---	566.4	3,430	566.7	271	ND	ND	ND	ND
LVWPS-A2-MW05B	12/22/2020	66	LVWPS-A2-MW05B-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	---	---	567.0	13,800	566.6 **	98.3	ND	ND	ND	ND
LVWPS-A2-MW05B	12/22/2020	66	LVWPS-A2-MW05B-EM01-FD	EM01	Zone 2	ND	ND	ND	ND	ND	ND	---	---	566.9	17,200	566.8 **	59.9	ND	ND	ND	ND
LVWPS-A2-MW05B	1/13/2021	66	LVWPS-A2-MW05B-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	568.6	2,250	567.1 **	51.0	ND	ND	ND	ND
LVWPS-A2-MW05B	1/13/2021	66	LVWPS-A2-MW05B-EM02-FD	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	568.6	1,750	567.3 **	46.8	ND	ND	ND	ND
LVWPS-A2-MW05B	1/26/2021	66	LVWPS-A2-MW05B-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	---	---	569.1	1,750	567.1 **	26.5	ND	ND	ND	ND
LVWPS-A2-MW05B	1/26/2021	66	LVWPS-A2-MW05B-EM03-FD	EM03	Zone 2	ND	ND	ND	ND	ND	ND	---	---	569.3	2,430	566.7 **	19.2	ND	ND	ND	ND
LVWPS-A2-MW08A	9/30/2020	47.6	LVWPS-A2-MW08A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW08A	12/14/2020	47.6	LVWPS-A2-MW08A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW08A	12/23/2020	47.6	LVWPS-A2-MW08A-EM01	EM01	Zone 2	539.4	3.49	ND	ND	ND	ND	---	---	565.0	5.00	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW08A	1/15/2021	47.6	LVWPS-A2-MW08A-EM02	EM02	Zone 2	539.4	3.17	ND	ND	ND	ND	---	---	567.2	126	573.5	4.44	ND	ND	ND	ND
LVWPS-A2-MW08A	1/26/2021	47.6	LVWPS-A2-MW08A-EM03	EM03	Zone 2	539.9	1.07	ND	ND	ND	ND	---	---	567.2	6.06	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW08B	10/1/2020	69.3	LVWPS-A2-MW08B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW08B	12/14/2020	69.3	LVWPS-A2-MW08B-INJ	INJ	Zone 2	ND	ND	ND	ND	ND	ND	---	---	566.9	31.6	574.2	0.305	ND	ND	ND	ND
LVWPS-A2-MW08B	12/23/2020	69.3	LVWPS-A2-MW08B-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	---	---	568.0	56.7	576.7	0.089	ND	ND	ND	ND
LVWPS-A2-MW08B	1/15/2021	69.3	LVWPS-A2-MW08B-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	566.9	27.5	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW08B	1/26/2021	69.3	LVWPS-A2-MW08B-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-A2-MW08C	10/1/2020	95.9	LVWPS-A2-MW08C-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND					

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-A2-MW09A	12/12/2020	44.5	LVWPS-A2-MW09A-INJ	INJ	Zone 2	539.4	15.2	ND	ND	ND	ND	ND	ND	566.6	109	573.8	0.643	ND	ND	ND	ND
LVWPS-A2-MW09A	12/22/2020	44.5	LVWPS-A2-MW09A-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.9	695	573.8	13.2	ND	ND	ND	ND
LVWPS-A2-MW09A	1/11/2021	44.5	LVWPS-A2-MW09A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.5	262	572.7	8.11	ND	ND	ND	ND
LVWPS-A2-MW09A	1/26/2021	44.5	LVWPS-A2-MW09A-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	568.3	63.4	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW09B	10/9/2020	68.5	LVWPS-A2-MW09B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW09B	12/12/2020	68.5	LVWPS-A2-MW09B-INJ	INJ	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	563.6 **	10.6	575.9	0.243	ND	ND	ND	ND
LVWPS-A2-MW09B	12/22/2020	68.5	LVWPS-A2-MW09B-EM01	EM01	Zone 2	538.9 **	6.99	ND	ND	ND	ND	ND	ND	564.8	6.62	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW09B	1/14/2021	68.5	LVWPS-A2-MW09B-EM02	EM02	Zone 2	538.4 **	2.60	ND	ND	ND	ND	ND	ND	567.6	72.2	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW09B	1/27/2021	68.5	LVWPS-A2-MW09B-EM03	EM03	Zone 2	538.0 **	1.14	ND	ND	ND	ND	ND	ND	568.1	99.3	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW11A	10/2/2020	50.2	LVWPS-A2-MW11A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW11A	12/14/2020	50.2	LVWPS-A2-MW11A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11A	12/23/2020	50.2	LVWPS-A2-MW11A-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11A	1/13/2021	50.2	LVWPS-A2-MW11A-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11A	1/27/2021	50.2	LVWPS-A2-MW11A-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11B	10/2/2020	75	LVWPS-A2-MW11B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW11B	12/14/2020	75	LVWPS-A2-MW11B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11B	12/23/2020	75	LVWPS-A2-MW11B-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11B	1/13/2021	75	LVWPS-A2-MW11B-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11B	1/27/2021	75	LVWPS-A2-MW11B-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11C	10/2/2020	99.9	LVWPS-A2-MW11C-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW11C	12/14/2020	99.9	LVWPS-A2-MW11C-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11C	12/23/2020	99.9	LVWPS-A2-MW11C-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11C	1/14/2021	99.9	LVWPS-A2-MW11C-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW11C	1/27/2021	99.9	LVWPS-A2-MW11C-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW12A	10/6/2020	39.5	LVWPS-A2-MW12A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW12A	12/12/2020	39.5	LVWPS-A2-MW12A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW12A	12/22/2020	39.5	LVWPS-A2-MW12A-EM01	EM01	Zone 2	539.4	2.84	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW12A	1/11/2021	39.5	LVWPS-A2-MW12A-EM02	EM02	Zone 2	538.5 **	7.36	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW12A	1/27/2021	39.5	LVWPS-A2-MW12A-EM03	EM03	Zone 2	ND	ND	ND	ND	515.0	1.31	ND	ND	567.3	13.0	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW12B	10/7/2020	59	LVWPS-A2-MW12B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW12B	12/12/2020	59	LVWPS-A2-MW12B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW12B	12/22/2020	59	LVWPS-A2-MW12B-EM01	EM01	Zone 2	539.8	5.04	ND	ND	ND	ND	ND	ND	567.6	205	566.9 **	8.14	ND	ND	ND	ND
LVWPS-A2-MW12B	1/12/2021	59	LVWPS-A2-MW12B-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.5	789	572.8	6.01	ND	ND	ND	ND
LVWPS-A2-MW12B	1/27/2021	59	LVWPS-A2-MW12B-EM03	EM03	Zone 2	ND	ND	ND	ND	514.5	1.04	ND	ND	567.5	23.1	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW13A	10/1/2020	50.8	LVWPS-A2-MW13A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW13A	12/12/2020	50.8	LVWPS-A2-MW13A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW13A	12/22/2020	50.8	LVWPS-A2-MW13A-EM01	EM01	Zone 2	538.9 **	16.9	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW13A	1/11/2021	50.8	LVWPS-A2-MW13A-EM02	EM02	Zone 2	539.5	2.98	ND	ND	ND	ND	ND	ND	567.2	20.8	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW13A	1/27/2021	50.8	LVWPS-A2-MW13A-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	568.1	438	572.2	5.47	ND	ND	ND	ND
LVWPS-A2-MW13B	10/1/2020	76.1	LVWPS-A2-MW13B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW13B	12/12/2020	76.1	LVWPS-A2-MW13B-INJ	INJ	Zone 2	538.9 **	12.1	ND	ND	ND	ND	ND	ND	565.7	31.9	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW13B	12/22/2020	76.1	LVWPS-A2-MW13B-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	568.0	906	572.8	14.9	ND	ND	ND	ND
LVWPS-A2-MW13B	1/12/2021	76.1	LVWPS-A2-MW13B-EM02	EM02	Zone 2	ND	ND	ND	ND	515.0	11.2	ND	ND	568.0	549	573.5	8.29	ND	ND	ND	ND
LVWPS-A2-MW13B	1/27/2021	76.1	LVWPS-A2-MW13B-EM03	EM03	Zone 2	ND	ND	ND	ND	515.1	8.78	ND	ND	567.6	456	562.2 **	24.9	ND	ND	ND	ND
LVWPS-A2-MW14A	10/6/2020	42.9	LVWPS-A2-MW14A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW14A	10/6/2020	42.9	LVWPS-A2-MW14A-BL04-FD	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW14A	12/12/2020	42.9	LVWPS-A2-MW14A-INJ	INJ	Zone 2	538.7 **	14.4	ND	ND	ND	ND	ND	ND	564.0 **	13.9	574.4	1.26	ND	ND	ND	ND
LVWPS-A2-MW14A	12/12/2020	42.9	LVWPS-A2-MW14A-INJ-FD	INJ	Zone 2	538.7 **	16.0	ND	ND	ND	ND	ND	ND	566.6	11.8	574.2	1.85	ND	ND	ND	ND
LVWPS-A2-MW14A	12/22/2020	42.9	LVWPS-A2-MW14A-EM01	EM01	Zone 2	539.4	15.2	ND	ND	ND	ND	ND	ND	566.6	38.6	573.6	1.44	ND	ND	ND	ND
LVWPS-A2-MW14A	12/22/2020	42.9	LVWPS-A2-MW14A-EM01-FD	EM01	Zone 2	539.4	16.6	ND	ND	ND	ND	ND	ND	566.4	50.8	572.6	3.35	ND	ND	ND	ND
LVWPS-A2-MW14A	1/13/2021	42.9	LVWPS-A2-MW14A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.2	450	573.6	5.00	ND	ND	ND	ND
LVWPS-A2-MW14A	1/13/2021	42.9	LVWPS-A2-MW14A-EM02-FD	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.2	396	573.6	6.19	ND	ND	ND	ND
LVWPS-A2-MW14A	1/28/2021	42.9	LVWPS-A2-MW14A-EM03	EM03	Zone 2	ND	ND	ND	ND	514.4	1.62	ND	ND	568.3	294	566.2 **	19.2	ND	ND	ND	ND
LVWPS-A2-MW14A	1/28/2021	42.9	LVWPS-A2-MW14A-EM03-FD	EM03	Zone 2	ND	ND	ND	ND	514.8	1.43	ND	ND	567.8	293	563.5 **	23.1	ND	ND	ND	ND
LVWPS-A2-MW14B	10/6/2020	64.5	LVWPS-A2-MW14B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW14B	12/12/2020	64.5	LVWPS-A2-MW14B-INJ	INJ	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	564.0 **	5.37	573.4	0.222	ND	ND	ND	ND
LVWPS-A2-MW14B	12/22/2020	64.5	LVWPS-A2-MW14B-EM01	EM01	Zone 2	540.1	1.61	ND	ND	ND	ND	ND	ND	567.8	29.6	574.6	1.34	ND	ND	ND	ND
LVWPS-A2-MW14B	1/13/2021	64.5	LVWPS-A2-MW14B-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.6	104	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW14B	1/25/2021	64.5	LVWPS-A2-MW14B-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	567.9	38.0	ND	ND	ND	ND	ND	ND
LVWPS-A2-MW15A	10/7/2020	49.5	LVWPS-A2-MW15A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW15A	12/14/2020	49.5	LVWPS-A2-MW15A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW15A	12/21/2020	49.5	LVWPS-A2-MW15A-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW15A	1/11/2021	49.5	LVWPS-A2-MW15A-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW15A	1/25/2021	49.5	LVWPS-A2-MW15A-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW15B	10/8/2020	79.9	LVWPS-A2-MW15B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	ND	ND	---	---	---	---
LVWPS-A2-MW15B	12/14/2020	79.9	LVWPS-A2-MW15B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW15B	12/22/2020	79.9	LVWPS-A2-MW15B-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	---	---	---	---
LVWPS-A2-MW15B	1/12/2021	79.9	LVWPS-A2-MW15B-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---</					

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-A2-MW16B	10/9/2020	70.5	LVWPS-A2-MW16B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A2-MW16B	12/14/2020	70.5	LVWPS-A2-MW16B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-A2-MW16B	12/22/2020	70.5	LVWPS-A2-MW16B-EM01	EM01	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-A2-MW16B	1/12/2021	70.5	LVWPS-A2-MW16B-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-A2-MW16B	1/25/2021	70.5	LVWPS-A2-MW16B-EM03	EM03	Zone 2	540.0	0.973	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-A2-MW17A	10/1/2020	50.1	LVWPS-A2-MW17A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A2-MW17A	12/14/2020	50.1	LVWPS-A2-MW17A-INJ	INJ	Zone 2	539.0 **	10.4	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-A2-MW17A	12/22/2020	50.1	LVWPS-A2-MW17A-EM01	EM01	Zone 2	539.4	2.77	ND	ND	ND	ND	---	---	564.0 **	2.94	ND	ND	ND	ND		
LVWPS-A2-MW17A	1/11/2021	50.1	LVWPS-A2-MW17A-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	567.7	119	572.2	2.96	ND	ND		
LVWPS-A2-MW17A	1/26/2021	50.1	LVWPS-A2-MW17A-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	---	---	568.0	135	ND	ND	ND	ND		
LVWPS-A2-MW17B	10/1/2020	75.2	LVWPS-A2-MW17B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A2-MW17B	12/14/2020	75.2	LVWPS-A2-MW17B-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	---	---	---	---	ND	ND		
LVWPS-A2-MW17B	12/22/2020	75.2	LVWPS-A2-MW17B-EM01	EM01	Zone 2	540.0	1.40	ND	ND	ND	ND	---	---	567.2	15.1	ND	ND	ND	ND		
LVWPS-A2-MW17B	1/11/2021	75.2	LVWPS-A2-MW17B-EM02	EM02	Zone 2	ND	ND	ND	ND	ND	ND	---	---	568.0	110	ND	ND	ND	ND		
LVWPS-A2-MW17B	1/26/2021	75.2	LVWPS-A2-MW17B-EM03	EM03	Zone 2	ND	ND	ND	ND	ND	ND	---	---	567.9	33.9	ND	ND	ND	ND		
LVWPS-A2-MW17C	10/1/2020	100	LVWPS-A2-MW17C-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A2-MW17C	12/14/2020	100	LVWPS-A2-MW17C-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A2-MW17C	12/22/2020	100	LVWPS-A2-MW17C-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	---	---	567.9	300	573.6	23.2	ND	ND		
LVWPS-A2-MW17C	1/11/2021	100	LVWPS-A2-MW17C-EM02	EM02	Zone 2	538.8 **	5.42	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A2-MW17C	1/26/2021	100	LVWPS-A2-MW17C-EM03	EM03	Zone 2	537.0 **	0.676	ND	ND	515.2	0.799	ND	ND	---	---	---	---	---	---		
LVWPS-A3-DR01	9/28/2020	65.5	LVWPS-A3-DR01-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-DR01	12/16/2020	65.5	LVWPS-A3-DR01-20201216	INJ	Zone 3	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-DR01	12/17/2020	65.5	LVWPS-A3-DR01-20201217	INJ	Zone 3	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-DR01	12/29/2020	65.5	LVWPS-A3-DR01-INJ	INJ	Zone 3	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-DR01	1/18/2021	65.5	LVWPS-A3-DR01-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW02	10/5/2020	62.5	LVWPS-A3-MW02-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW02	12/30/2020	62.5	LVWPS-A3-MW02-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW02	1/14/2021	62.5	LVWPS-A3-MW02-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW06	10/5/2020	64.9	LVWPS-A3-MW06-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW06	12/30/2020	64.9	LVWPS-A3-MW06-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW06	1/15/2021	64.9	LVWPS-A3-MW06-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW07	10/8/2020	64.5	LVWPS-A3-MW07-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW07	12/30/2020	64.5	LVWPS-A3-MW07-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW07	1/15/2021	64.5	LVWPS-A3-MW07-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW08	10/8/2020	94.4	LVWPS-A3-MW08-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW08	12/30/2020	94.4	LVWPS-A3-MW08-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW08	1/14/2021	94.4	LVWPS-A3-MW08-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW10	10/5/2020	66.1	LVWPS-A3-MW10-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW10	1/14/2021	66.1	LVWPS-A3-MW10-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-A3-MW11	10/7/2020	63.7	LVWPS-A3-MW11-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW11	1/15/2021	63.7	LVWPS-A3-MW11-EM02	EM02	Zone 3	ND	ND	ND	ND	ND	ND	---	---	565.9	11.2	ND	ND	ND	ND		
LVWPS-A3-MW12	10/5/2020	69.1	LVWPS-A3-MW12-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-A3-MW12	1/13/2021	69.1	LVWPS-A3-MW12-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-EW01	9/29/2020	64.4	LVWPS-EW01-BL04	BL04	Extraction	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-EW02	9/29/2020	42.8	LVWPS-EW02-BL04	BL04	Extraction	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-EW03	9/30/2020	54.8	LVWPS-EW03-BL04	BL04	Extraction	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-EW04	9/30/2020	35.7	LVWPS-EW04-BL04	BL04	Extraction	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-EW05	9/29/2020	64.9	LVWPS-EW05-BL04	BL04	Extraction	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-EW05	9/29/2020	64.9	LVWPS-EW05-BL04-FD	BL04	Extraction	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW204	9/28/2020	60	LVWPS-MW204-BL04	BL04	General Vicinity	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW204	9/28/2020	60	LVWPS-MW204-BL04-FD	BL04	General Vicinity	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW204B	9/28/2020	111.2	LVWPS-MW204B-BL04	BL04	General Vicinity	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW207	9/28/2020	77.8	LVWPS-MW207-BL04	BL04	General Vicinity	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW207	12/22/2020	77.8	LVWPS-MW207-EM01	EM01	General Vicinity	ND	ND	ND	ND	514.3	1.72	ND	ND	562.3 **	33.3	ND	ND	ND	ND		
LVWPS-MW207	1/18/2021	77.8	LVWPS-MW207-EM02	EM02	General Vicinity	ND	ND	ND	ND	515.8	12.0	ND	ND	562.6 **	18.9	ND	ND	ND	ND		
LVWPS-MW207	1/29/2021	77.8	LVWPS-MW207-EM03	EM03	General Vicinity	ND	ND	ND	ND	515.5	8.77	ND	ND	560.5 **	11.6	ND	ND	ND	ND		
LVWPS-MW208A	10/9/2020	49.6	LVWPS-MW208A-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW208A	12/12/2020	49.6	LVWPS-MW208A-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-MW208A	12/23/2020	49.6	LVWPS-MW208A-EM01	EM01	Zone 2	539.5	0.792	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-MW208A	1/13/2021	49.6	LVWPS-MW208A-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-MW208A	1/27/2021	49.6	LVWPS-MW208A-EM03	EM03	Zone 2	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-MW208B	10/9/2020	75	LVWPS-MW208B-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW208B	12/12/2020	75	LVWPS-MW208B-INJ	INJ	Zone 2	538.5 **	0.641	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-MW208B	12/23/2020	75	LVWPS-MW208B-EM01	EM01	Zone 2	539.7	10.7	ND	ND	ND	ND	---	---	567.6	139	ND	ND	ND	ND		
LVWPS-MW208B	1/13/2021	75	LVWPS-MW208B-EM02	EM02	Zone 2	ND	ND	ND	ND	515.8	1.65	ND	ND	568.0	31.3	572.2	3.26	ND	ND		
LVWPS-MW208B	1/27/2021	75	LVWPS-MW208B-EM03	EM03	Zone 2	ND	ND	ND	ND	514.4	1.26	ND	ND	568.6	16.8	ND	ND	ND	ND		
LVWPS-MW209	10/6/2020	80.7	LVWPS-MW209-BL04	BL04	General Vicinity	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW209	12/21/2020	80.7	LVWPS-MW209-EM01	EM01	General Vicinity	ND	ND	---	---	ND	ND	---	---	---	---	---	---	---	---		
LVWPS-MW209	1/18/2021	80.7	LVWPS-MW209-EM02	EM02	General Vicinity	541.0	2.14	ND	ND	ND	ND	---	---	565.6	17.4	ND	ND	ND	ND		
LVWPS-MW209	1/27/2021	80.7	LVWPS-MW209-EM03	EM03	General Vicinity	543.0 **	1.01	ND	ND	ND	ND	---	---	564.8	13.6	ND	ND	ND	ND		
LVWPS-MW209A	10/6/2020	45	LVWPS-MW209A-BL04	BL04	General Vicinity	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW209A	12/21/2020	45	LVWPS-MW209A-EM01	EM01	General Vicinity	ND	ND	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW209A	1/18/2021	45	LVWPS-MW209A-EM02	EM02	General Vicinity	ND	ND	---	---	---	---	---	---	---	---	---	---	---	---		
LVWPS-MW209A	1/27/2021	45	LVWPS-MW209A-EM03	EM03	General Vicinity	539.6	0.743	---	---	---	---	---	---	---	---	---	---	---	---		

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-MW209B	10/6/2020	120	LVWPS-MW209B-BL04	BL04	General Vicinity	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW210A	10/6/2020	44.8	LVWPS-MW210A-BL04	BL04	General Vicinity	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW210A	12/21/2020	44.8	LVWPS-MW210A-EM01	EM01	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	561.7 **	27.6	ND	ND	ND	ND	ND	ND
LVWPS-MW210A	1/18/2021	44.8	LVWPS-MW210A-EM02	EM02	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	561.6 **	14.3	ND	ND	ND	ND	ND	ND
LVWPS-MW210A	1/29/2021	44.8	LVWPS-MW210A-EM03	EM03	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	560.7 **	5.45	ND	ND	ND	ND	ND	ND
LVWPS-MW210B	10/6/2020	79.6	LVWPS-MW210B-BL04	BL04	General Vicinity	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW210B	12/21/2020	79.6	LVWPS-MW210B-EM01	EM01	General Vicinity	541.0	2.19	ND	ND	ND	ND	ND	ND	563.4 **	19.0	ND	ND	ND	ND	ND	ND
LVWPS-MW210B	1/18/2021	79.6	LVWPS-MW210B-EM02	EM02	General Vicinity	540.6 **	3.52	ND	ND	516.1	2.89	ND	ND	567.2	101	ND	ND	ND	ND	ND	ND
LVWPS-MW210B	1/29/2021	79.6	LVWPS-MW210B-EM03	EM03	General Vicinity	ND	ND	ND	ND	515.7	4.72	ND	ND	567.5	90.8	ND	ND	ND	ND	ND	ND
LVWPS-MW211	9/30/2020	59.6	LVWPS-MW211-BL04	BL04	General Vicinity	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW211	12/21/2020	59.6	LVWPS-MW211-EM01	EM01	General Vicinity	ND	ND	ND	ND	513.9 **	2.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-MW211	1/18/2021	59.6	LVWPS-MW211-EM02	EM02	General Vicinity	538.8 **	3.31	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-MW211	1/29/2021	59.6	LVWPS-MW211-EM03	EM03	General Vicinity	538.0 **	0.958	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-MW212A	10/5/2020	43.9	LVWPS-MW212A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212A	12/21/2020	43.9	LVWPS-MW212A-EM01	EM01	Zone 3	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212A	1/18/2021	43.9	LVWPS-MW212A-EM02	EM02	Zone 3	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212A	1/27/2021	43.9	LVWPS-MW212A-EM03	EM03	Zone 3	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212B	10/5/2020	69.7	LVWPS-MW212B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212B	12/22/2020	69.7	LVWPS-MW212B-EM01	EM01	Zone 3	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212B	1/18/2021	69.7	LVWPS-MW212B-EM02	EM02	Zone 3	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW212B	1/27/2021	69.7	LVWPS-MW212B-EM03	EM03	Zone 3	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW217A	9/30/2020	61	LVWPS-MW217A-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW217A	1/12/2021	61	LVWPS-MW217A-EM02	EM02	Zone 1	ND	ND	ND	ND	515.2	6.87	ND	ND	562.9 **	42.0	ND	ND	ND	ND	ND	ND
LVWPS-MW217B	9/30/2020	110.1	LVWPS-MW217B-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW217B	1/13/2021	110.1	LVWPS-MW217B-EM02	EM02	Zone 1	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW217C	10/5/2020	165.1	LVWPS-MW217C-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW217C	1/13/2021	165.1	LVWPS-MW217C-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	ND	560.3 **	1.90	ND	ND	ND	ND	ND	ND
LVWPS-MW217C	1/13/2021	165.1	LVWPS-MW217C-EM02-FD	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	ND	558.2 **	2.70	ND	ND	ND	ND	ND	ND
LVWPS-MW218A	10/5/2020	44.9	LVWPS-MW218A-BL04	BL04	General Vicinity	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW218A	12/21/2020	44.9	LVWPS-MW218A-EM01	EM01	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	561.7 **	13.1	ND	ND	ND	ND	ND	ND
LVWPS-MW218A	1/18/2021	44.9	LVWPS-MW218A-EM02	EM02	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	561.9 **	9.72	ND	ND	ND	ND	ND	ND
LVWPS-MW218A	1/26/2021	44.9	LVWPS-MW218A-EM03	EM03	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	562.3 **	2.38	ND	ND	ND	ND	ND	ND
LVWPS-MW220A	10/5/2020	69.8	LVWPS-MW220A-BL04	BL04	General Vicinity	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW220A	12/21/2020	69.8	LVWPS-MW220A-EM01	EM01	General Vicinity	ND	ND	ND	ND	ND	ND	ND	ND	567.2	1.32	ND	ND	ND	ND	ND	ND
LVWPS-MW220A	1/18/2021	69.8	LVWPS-MW220A-EM02	EM02	General Vicinity	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW220A	1/28/2021	69.8	LVWPS-MW220A-EM03	EM03	General Vicinity	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW221A	10/6/2020	60	LVWPS-MW221A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW221A	12/12/2020	60	LVWPS-MW221A-INJ	INJ	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	562.4 **	4.93	ND	ND	ND	ND	ND	ND
LVWPS-MW221A	12/22/2020	60	LVWPS-MW221A-EM01	EM01	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW221A	1/12/2021	60	LVWPS-MW221A-EM02	EM02	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW221A	1/28/2021	60	LVWPS-MW221A-EM03	EM03	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW221B	10/6/2020	93.4	LVWPS-MW221B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223A	10/6/2020	55.1	LVWPS-MW223A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223A	10/6/2020	55.1	LVWPS-MW223A-BL04-FD	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223A	12/14/2020	55.1	LVWPS-MW223A-INJ	INJ	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223A	12/22/2020	55.1	LVWPS-MW223A-EM01	EM01	Zone 2	539.4	6.82	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223A	1/11/2021	55.1	LVWPS-MW223A-EM02	EM02	Zone 2	538.5 **	22.1	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223A	1/26/2021	55.1	LVWPS-MW223A-EM03	EM03	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223B	10/6/2020	80.1	LVWPS-MW223B-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223B	12/14/2020	80.1	LVWPS-MW223B-INJ	INJ	Zone 2	539.7	3.39	ND	ND	ND	ND	ND	ND	566.1	17.6	ND	ND	ND	ND	ND	ND
LVWPS-MW223B	12/22/2020	80.1	LVWPS-MW223B-EM01	EM01	Zone 2	540.2	2.29	ND	ND	ND	ND	ND	ND	567.6	28.4	ND	ND	ND	ND	ND	ND
LVWPS-MW223B	1/11/2021	80.1	LVWPS-MW223B-EM02	EM02	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223B	1/28/2021	80.1	LVWPS-MW223B-EM03	EM03	Zone 2	539.4	0.538	ND	ND	515.2	0.604	ND	ND	568.6	4.11	ND	ND	ND	ND	ND	ND
LVWPS-MW223C	10/7/2020	102.6	LVWPS-MW223C-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW223C	1/11/2021	102.6	LVWPS-MW223C-EM02	EM02	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW224A	10/7/2020	65	LVWPS-MW224A-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW224A	12/23/2020	65	LVWPS-MW224A-EM01	EM01	Zone 2	ND	ND	ND	ND	ND	ND	ND	ND	562.0 **	3.35	ND	ND	ND	ND	ND	ND
LVWPS-MW224A	1/18/2021	65	LVWPS-MW224A-EM02	EM02	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-MW224A	1/29/2021	65	LVWPS-MW224A-EM03	EM03	Zone 2	ND	ND	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	9/28/2020	102.6	LVWPS-U1-DR01A-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/13/2020	102.6	LVWPS-U1-DR01A-20201213-1	INJ	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/13/2020	102.6	LVWPS-U1-DR01A-20201213-2	INJ	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/13/2020	102.6	LVWPS-U1-DR01A-20201213-3	INJ	Zone 1	---	---	---	---	---	---	507.1	0.959	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/13/2020	102.6	LVWPS-U1-DR01A-20201213-4	INJ	Zone 1	---	---	---	---	---	---	513.8	0.901	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/14/2020	102.6	LVWPS-U1-DR01A-20201214-5	INJ	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/14/2020	102.6	LVWPS-U1-DR01A-20201214-6	INJ	Zone 1	---	---	---	---	---	---	515.2	3.35	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/14/2020	102.6	LVWPS-U1-DR01A-20201214-1	INJ	Zone 1	---	---	---	---	---	---	514.9	1.79	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/14/2020	102.6	LVWPS-U1-DR01A-20201214-2	INJ	Zone 1	---	---	---	---	---	---	515.2	18.2	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/14/2020	102.6	LVWPS-U1-DR01A-20201214-3	INJ	Zone 1	---	---	---	---	---	---	506.8	1.18	---	---	ND	ND	---	---	---	---
LVWPS-U1-DR01A	12/14/2020	102.6	LVWPS-U1-DR01A-20201214-4	INJ	Zone 1	---	---	---	---	---	---	515.0	3.03	---	---	ND	ND	---	---	---	

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-U1-MW07	12/29/2020	98.5	LVWPS-U1-MW07-INJ	INJ	Zone 1	ND	ND	ND	ND	515.3	37.2	507.1	0.684	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW07	1/14/2021	98.5	LVWPS-U1-MW07-EM02	EM02	Zone 1	ND	ND	ND	ND	514.9	0.690	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW08A	9/30/2020	106.1	LVWPS-U1-MW08A-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-MW08A	12/29/2020	106.1	LVWPS-U1-MW08A-INJ	INJ	Zone 1	ND	ND	ND	ND	516.2	470	514.7 **	12.2	567.0	5.61	561.3 **	1.28	ND	ND	ND	ND
LVWPS-U1-MW08A	1/12/2021	106.1	LVWPS-U1-MW08A-EM02	EM02	Zone 1	ND	ND	ND	ND	515.3	101	515.6 **	12.6	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW08B	9/30/2020	137.6	LVWPS-U1-MW08B-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-MW08B	12/13/2020	137.6	LVWPS-U1-MW08B-20201213-1	INJ	Zone 1	---	---	ND	ND	---	---	514.9	11.0	---	---	ND	ND	---	---	ND	ND
LVWPS-U1-MW08B	12/13/2020	137.6	LVWPS-U1-MW08B-20201213	INJ	Zone 1	---	---	ND	ND	---	---	515.8	2.54	---	---	ND	ND	---	---	ND	ND
LVWPS-U1-MW08B	12/13/2020	137.6	LVWPS-U1-MW08B-20201213-2	INJ	Zone 1	---	---	ND	ND	---	---	515.2	16.5	---	---	ND	ND	---	---	ND	ND
LVWPS-U1-MW08B	12/14/2020	137.6	LVWPS-U1-MW08B-20201214	INJ	Zone 1	---	---	ND	ND	---	---	515.2	6.92	---	---	ND	ND	---	---	ND	ND
LVWPS-U1-MW08B	12/29/2020	137.6	LVWPS-U1-MW08B-INJ	INJ	Zone 1	ND	ND	ND	ND	515.4	185	515.0 **	8.54	567.2	3.09	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW08B	12/29/2020	137.6	LVWPS-U1-MW08B-INJ-FD	INJ	Zone 1	ND	ND	ND	ND	515.4	199	514.7 **	11.3	567.6	3.54	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW08B	1/11/2021	137.6	LVWPS-U1-MW08B-EM02	EM02	Zone 1	ND	ND	ND	ND	515.5	11.2	515.7 **	4.91	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW08B	1/11/2021	137.6	LVWPS-U1-MW08B-EM02-FD	EM02	Zone 1	ND	ND	ND	ND	515.7	9.63	517.5 **	11.3	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW09A	9/30/2020	120	LVWPS-U1-MW09A-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-MW09A	1/13/2021	120	LVWPS-U1-MW09A-EM02	EM02	Zone 1	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U1-MW09B	9/30/2020	142.4	LVWPS-U1-MW09B-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-MW09B	1/13/2021	142.4	LVWPS-U1-MW09B-EM02	EM02	Zone 1	ND	ND	ND	ND	ND	ND	ND	ND	566.9	11.3	ND	ND	ND	ND	ND	ND
LVWPS-U1-MW10A	10/2/2020	111.6	LVWPS-U1-MW10A-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-MW10A	1/13/2021	111.6	LVWPS-U1-MW10A-EM02	EM02	Zone 1	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U1-MW10B	10/2/2020	142.5	LVWPS-U1-MW10B-BL04	BL04	Zone 1	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U1-MW10B	1/12/2021	142.5	LVWPS-U1-MW10B-EM02	EM02	Zone 1	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-DR01	9/28/2020	131.1	LVWPS-U2-DR01-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-DR01	12/7/2020	131.1	LVWPS-U2-DR01-20201207	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/8/2020	131.1	LVWPS-U2-DR01-20201208	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/9/2020	131.1	LVWPS-U2-DR01-20201209	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/20/2020	131.1	LVWPS-U2-DR01-20201220-1	INJ	Zone 2	---	---	ND	ND	---	---	506.2	0.016	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/20/2020	131.1	LVWPS-U2-DR01-20201220-2	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/20/2020	131.1	LVWPS-U2-DR01-20201220-3	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/20/2020	131.1	LVWPS-U2-DR01-20201220-4	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/21/2020	131.1	LVWPS-U2-DR01-20201221-1	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/21/2020	131.1	LVWPS-U2-DR01-20201221-2	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/21/2020	131.1	LVWPS-U2-DR01-20201221-3	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/21/2020	131.1	LVWPS-U2-DR01-20201221-4	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	12/31/2020	131.1	LVWPS-U2-DR01-INJ	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR01	1/12/2021	131.1	LVWPS-U2-DR01-EM02	EM02	Zone 2	ND	ND	ND	ND	514.8	0.938	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U2-DR02	9/28/2020	96.1	LVWPS-U2-DR02-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-DR02	12/7/2020	96.1	LVWPS-U2-DR02-20201207	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/8/2020	96.1	LVWPS-U2-DR02-20201208	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/9/2020	96.1	LVWPS-U2-DR02-20201209	INJ	Zone 2	---	---	ND	ND	---	---	ND	ND	---	---	575.7	0.206	---	---	ND	ND
LVWPS-U2-DR02	12/20/2020	96.1	LVWPS-U2-DR02-20201220-1	INJ	Zone 2	---	---	ND	ND	---	---	515.4 **	160	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/20/2020	96.1	LVWPS-U2-DR02-20201220-2	INJ	Zone 2	---	---	ND	ND	---	---	515.7 **	151	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/20/2020	96.1	LVWPS-U2-DR02-20201220-3	INJ	Zone 2	---	---	ND	ND	---	---	515.7 **	87.8	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/20/2020	96.1	LVWPS-U2-DR02-20201220-4	INJ	Zone 2	---	---	ND	ND	---	---	515.7 **	97.3	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/21/2020	96.1	LVWPS-U2-DR02-20201221-1	INJ	Zone 2	---	---	ND	ND	---	---	515.7 **	185	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/21/2020	96.1	LVWPS-U2-DR02-20201221-2	INJ	Zone 2	---	---	ND	ND	---	---	515.4 **	67.3	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/21/2020	96.1	LVWPS-U2-DR02-20201221-3	INJ	Zone 2	---	---	ND	ND	---	---	515.8 **	202	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/21/2020	96.1	LVWPS-U2-DR02-20201221-4	INJ	Zone 2	---	---	ND	ND	---	---	515.4 **	652	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/21/2020	96.1	LVWPS-U2-DR02-20201221-4-FD	INJ	Zone 2	---	---	ND	ND	---	---	515.8 **	464	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	12/31/2020	96.1	LVWPS-U2-DR02-INJ	INJ	Zone 2	---	---	ND	ND	---	---	516.2 **	38.3	---	---	ND	ND	---	---	ND	ND
LVWPS-U2-DR02	1/12/2021	96.1	LVWPS-U2-DR02-EM02	EM02	Zone 2	ND	ND	ND	ND	516.1	1,610	515.6 **	97.1	567.2	8.72	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW01	10/8/2020	106.9	LVWPS-U2-MW01-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-MW01	1/4/2021	106.9	LVWPS-U2-MW01-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW01	1/14/2021	106.9	LVWPS-U2-MW01-EM02	EM02	Zone 2	ND	ND	ND	ND	514.9	1.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW02	10/8/2020	112.4	LVWPS-U2-MW02-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-MW02	1/4/2021	112.4	LVWPS-U2-MW02-INJ	INJ	Zone 2	ND	ND	ND	ND	513.7 **	0.685	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW02	1/12/2021	112.4	LVWPS-U2-MW02-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW03	10/9/2020	99.8	LVWPS-U2-MW03-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-MW03	1/4/2021	99.8	LVWPS-U2-MW03-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW03	1/14/2021	99.8	LVWPS-U2-MW03-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW04	10/6/2020	115.3	LVWPS-U2-MW04-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-MW04	12/31/2020	115.3	LVWPS-U2-MW04-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW04	1/11/2021	115.3	LVWPS-U2-MW04-EM02	EM02	Zone 2	ND	ND	ND	ND	513.8 **	0.471	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW05	10/5/2020	95.4	LVWPS-U2-MW05-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-MW05	12/31/2020	95.4	LVWPS-U2-MW05-INJ	INJ	Zone 2	ND	ND	ND	ND	516.2	843	516.4 **	13.1	567.0 **	4.38	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW05	1/13/2021	95.4	LVWPS-U2-MW05-EM02	EM02	Zone 2	ND	ND	ND	ND	515.9	67.7	516.1 **	113	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW06	10/1/2020	131.1	LVWPS-U2-MW06-BL04	BL04	Zone 2	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---	---	---
LVWPS-U2-MW06	12/31/2020	131.1	LVWPS-U2-MW06-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW06	1/11/2021	131.1	LVW																		

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-U2-MW09	1/18/2021	94.6	LVWPS-U2-MW09-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW12	10/7/2020	95.4	LVWPS-U2-MW12-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U2-MW12	1/12/2021	95.4	LVWPS-U2-MW12-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW14	10/6/2020	95.1	LVWPS-U2-MW14-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U2-MW14	12/31/2020	95.1	LVWPS-U2-MW14-INJ	INJ	Zone 2	ND	ND	ND	ND	514.9	1.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U2-MW14	1/13/2021	95.1	LVWPS-U2-MW14-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW17	10/1/2020	126.5	LVWPS-U2-MW17-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U2-MW17	1/12/2021	126.5	LVWPS-U2-MW17-EM02	EM02	Zone 2	ND	ND	ND	ND	515.2	2.50	506.5	0.106	567.2	50.0	575.7	1.16	ND	ND	ND	ND
LVWPS-U2-MW17	1/12/2021	126.5	LVWPS-U2-MW17-EM02-FD	EM02	Zone 2	ND	ND	ND	ND	514.8	3.90	508.7	0.136	567.6	67.2	572.0	1.44	ND	ND	ND	ND
LVWPS-U2-MW18	10/5/2020	100.6	LVWPS-U2-MW18-BL04	BL04	Zone 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U2-MW18	12/31/2020	100.6	LVWPS-U2-MW18-INJ	INJ	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U2-MW18	1/11/2021	100.6	LVWPS-U2-MW18-EM02	EM02	Zone 2	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---
LVWPS-U3-DR01A	9/28/2020	108	LVWPS-U3-DR01A-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U3-DR01A	12/16/2020	108	LVWPS-U3-DR01A	INJ	Zone 3	---	---	ND	ND	---	---	506.9	0.024	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/16/2020	108	LVWPS-U3-DR01A	INJ	Zone 3	---	---	ND	ND	---	---	515.9 **	1.16	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/16/2020	108	LVWPS-U3-DR01A	INJ	Zone 3	---	---	ND	ND	---	---	515.1 **	0.796	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/16/2020	108	LVWPS-U3-DR01A	INJ	Zone 3	---	---	ND	ND	---	---	515.4 **	99.9	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/17/2020	108	LVWPS-U3-DR01A-20201217-1	INJ	Zone 3	---	---	ND	ND	---	---	514.9 **	1.29	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/17/2020	108	LVWPS-U3-DR01A-20201217-2	INJ	Zone 3	---	---	ND	ND	---	---	515.5 **	3.51	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/17/2020	108	LVWPS-U3-DR01A-20201217-3	INJ	Zone 3	---	---	ND	ND	---	---	514.9 **	3.53	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/17/2020	108	LVWPS-U3-DR01A-20201217-4	INJ	Zone 3	---	---	ND	ND	---	---	514.7 **	0.559	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	12/29/2020	108	LVWPS-U3-DR01A-INJ	INJ	Zone 3	---	---	ND	ND	---	---	507.1	1.57	---	---	ND	ND	---	---	ND	ND
LVWPS-U3-DR01A	1/18/2021	108	LVWPS-U3-DR01A-EM02	EM02	Zone 3	ND	ND	ND	ND	515.5	22.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U3-DR01B	9/28/2020	144.1	LVWPS-U3-DR01B-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/16/2020	144.1	LVWPS-U3-DR01B-20201216-1	INJ	Zone 3	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/16/2020	144.1	LVWPS-U3-DR01B-20201216-2	INJ	Zone 3	---	---	ND	ND	---	---	514.1 **	155	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/16/2020	144.1	LVWPS-U3-DR01B-20201216-3	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	135	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/16/2020	144.1	LVWPS-U3-DR01B-20201216-4	INJ	Zone 3	---	---	ND	ND	---	---	515.1 **	7.32	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/17/2020	144.1	LVWPS-U3-DR01B-20201217-1	INJ	Zone 3	---	---	ND	ND	---	---	515.4 **	407	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/17/2020	144.1	LVWPS-U3-DR01B-20201217-2	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	209	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/17/2020	144.1	LVWPS-U3-DR01B-20201217-3	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	210	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/17/2020	144.1	LVWPS-U3-DR01B-20201217-4	INJ	Zone 3	---	---	ND	ND	---	---	515.1 **	39.1	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	12/29/2020	144.1	LVWPS-U3-DR01B-INJ	INJ	Zone 3	---	---	ND	ND	---	---	515.8 **	30.9	---	---	---	---	---	---	---	---
LVWPS-U3-DR01B	1/18/2021	144.1	LVWPS-U3-DR01B-EM02	EM02	Zone 3	ND	ND	ND	ND	516.2	74.8	516.8 **	136	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U3-DR02A	9/28/2020	98.6	LVWPS-U3-DR02A-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/16/2020	98.6	LVWPS-U3-DR02A-20201216-1	INJ	Zone 3	---	---	ND	ND	---	---	515.3 **	36.0	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/16/2020	98.6	LVWPS-U3-DR02A-20201216-2	INJ	Zone 3	---	---	ND	ND	---	---	513.8 **	114	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/16/2020	98.6	LVWPS-U3-DR02A-20201216-3	INJ	Zone 3	---	---	ND	ND	---	---	515.6 **	2.37	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/16/2020	98.6	LVWPS-U3-DR02A-20201216-4	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	125	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/17/2020	98.6	LVWPS-U3-DR02A	INJ	Zone 3	---	---	ND	ND	---	---	515.6 **	101	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/17/2020	98.6	LVWPS-U3-DR02A	INJ	Zone 3	---	---	ND	ND	---	---	515.5 **	61.9	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/17/2020	98.6	LVWPS-U3-DR02A	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	103	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/17/2020	98.6	LVWPS-U3-DR02A	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	78.5	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/17/2020	98.6	LVWPS-U3-DR02A-20201217-4-FD	INJ	Zone 3	---	---	ND	ND	---	---	515.6 **	83.2	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/30/2020	98.6	LVWPS-U3-DR02A-INJ	INJ	Zone 3	---	---	ND	ND	---	---	515.1 **	73.5	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	12/30/2020	98.6	LVWPS-U3-DR02A-INJ	INJ	Zone 3	---	---	ND	ND	---	---	516.0 **	67.5	---	---	---	---	---	---	---	---
LVWPS-U3-DR02A	1/18/2021	98.6	LVWPS-U3-DR02A-EM02	EM02	Zone 3	ND	ND	ND	ND	516.1	295	515.3 **	76.0	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U3-DR02B	9/28/2020	130	LVWPS-U3-DR02B-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/16/2020	130	LVWPS-U3-DR02B-20201216-1	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	144	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/16/2020	130	LVWPS-U3-DR02B-20201216-2	INJ	Zone 3	---	---	ND	ND	---	---	515.3 **	14.1	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/16/2020	130	LVWPS-U3-DR02B-20201216-3	INJ	Zone 3	---	---	ND	ND	---	---	515.7 **	154	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/16/2020	130	LVWPS-U3-DR02B-20201216-4	INJ	Zone 3	---	---	ND	ND	---	---	515.3 **	26.1	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/17/2020	130	LVWPS-U3-DR02B-20201217-1	INJ	Zone 3	---	---	ND	ND	---	---	515.8 **	224	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/17/2020	130	LVWPS-U3-DR02B-20201217-2	INJ	Zone 3	---	---	ND	ND	---	---	515.4 **	12.3	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/17/2020	130	LVWPS-U3-DR02B-20201217-3	INJ	Zone 3	---	---	ND	ND	---	---	515.2 **	27.3	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	12/17/2020	130	LVWPS-U3-DR02B-20201217-4	INJ	Zone 3	---	---	ND	ND	---	---	515.5 **	55.7	---	---	---	---	---	---	---	---
LVWPS-U3-DR02B	1/18/2021	130	LVWPS-U3-DR02B-EM02	EM02	Zone 3	ND	ND	ND	ND	516.2	74.3	515.3 **	60.2	ND	ND	ND	ND	ND	ND	ND	ND
LVWPS-U3-DR02C	9/28/2020	161.5	LVWPS-U3-DR02C-BL04	BL04	Zone 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/16/2020	161.5	LVWPS-U3-DR02C-20201216-1	INJ	Zone 3	---	---	ND	ND	---	---	507.1	0.337	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/16/2020	161.5	LVWPS-U3-DR02C-20201216-2	INJ	Zone 3	---	---	ND	ND	---	---	507.0	0.400	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/16/2020	161.5	LVWPS-U3-DR02C-20201216-3	INJ	Zone 3	---	---	ND	ND	---	---	507.1	1.10	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/16/2020	161.5	LVWPS-U3-DR02C-20201216-3-FD	INJ	Zone 3	---	---	ND	ND	---	---	507.0	0.346	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/16/2020	161.5	LVWPS-U3-DR02C-20201216-4	INJ	Zone 3	---	---	ND	ND	---	---	507.1	0.943	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/17/2020	161.5	LVWPS-U3-DR02C-20201217-1	INJ	Zone 3	---	---	ND	ND	---	---	507.9	0.490	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/17/2020	161.5	LVWPS-U3-DR02C-20201217-2	INJ	Zone 3	---	---	ND	ND	---	---	507.2	0.879	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/17/2020	161.5	LVWPS-U3-DR02C-20201217-3	INJ	Zone 3	---	---	ND	ND	---	---	507.3	0.909	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/17/2020	161.5	LVWPS-U3-DR02C-20201217-4	INJ	Zone 3	---	---	ND	ND	---	---	515.3 **	6.41	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	12/30/2020	161.5	LVWPS-U3-DR02C-INJ	INJ	Zone 3	---	---	ND	ND	---	---	516.4 **	51.2	---	---	---	---	---	---	---	---
LVWPS-U3-DR02C	1/18/2021	161.5	LVWPS-U3-DR02C-EM02	EM02	Zone 3																

Table 3
Charcoal and Groundwater Dye Analytical Results
Las Vegas Wash Bioremediation Pilot Study

Location	Sample Date	Depth (ft bgs)	Sample ID	Event	Zone	Eosine				Fluorescein				Rhodamine WT (RWT)				Sulforhodamine B (SRB)			
						Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater		Charcoal		Groundwater	
						Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
LVWPS-U3-MW02B	10/5/2020	112.5	LVWPS-U3-MW02B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW02B	12/30/2020	112.5	LVWPS-U3-MW02B-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW02B	1/14/2021	112.5	LVWPS-U3-MW02B-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW03A	10/2/2020	98.6	LVWPS-U3-MW03A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW03A	10/2/2020	98.6	LVWPS-U3-MW03A-BL04-FD	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW03A	12/30/2020	98.6	LVWPS-U3-MW03A-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW03A	1/14/2021	98.6	LVWPS-U3-MW03A-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW03B	10/2/2020	163	LVWPS-U3-MW03B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW03B	12/30/2020	163	LVWPS-U3-MW03B-INJ	INJ	Zone 3	ND	ND	ND	ND	515.7	116	508.2	0.226	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW03B	1/14/2021	163	LVWPS-U3-MW03B-EM02	EM02	Zone 3	ND	ND	ND	ND	515.9	9.03	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW03C	10/1/2020	129.9	LVWPS-U3-MW03C-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW03C	12/30/2020	129.9	LVWPS-U3-MW03C-INJ	INJ	Zone 3	ND	ND	ND	ND	515.5	8.21	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW03C	1/14/2021	129.9	LVWPS-U3-MW03C-EM02	EM02	Zone 3	ND	ND	ND	ND	515.3	0.815	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW04B	10/2/2020	87.7	LVWPS-U3-MW04B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW05B	10/2/2020	94.8	LVWPS-U3-MW05B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW05B	1/15/2021	94.8	LVWPS-U3-MW05B-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW06A	10/5/2020	102.6	LVWPS-U3-MW06A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW06A	12/30/2020	102.6	LVWPS-U3-MW06A-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW06A	1/15/2021	102.6	LVWPS-U3-MW06A-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW06B	10/7/2020	137.3	LVWPS-U3-MW06B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW06B	12/30/2020	137.3	LVWPS-U3-MW06B-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW06B	1/14/2021	137.3	LVWPS-U3-MW06B-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW07A	10/9/2020	89.9	LVWPS-U3-MW07A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW07A	12/30/2020	89.9	LVWPS-U3-MW07A-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW07A	1/15/2021	89.9	LVWPS-U3-MW07A-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW07B	10/9/2020	114.3	LVWPS-U3-MW07B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW07B	12/30/2020	114.3	LVWPS-U3-MW07B-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW07B	1/14/2021	114.3	LVWPS-U3-MW07B-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW08A	10/8/2020	130	LVWPS-U3-MW08A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW08A	12/30/2020	130	LVWPS-U3-MW08A-INJ	INJ	Zone 3	ND	ND	ND	ND	514.1	0.439	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW08A	1/15/2021	130	LVWPS-U3-MW08A-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW08B	10/8/2020	161.2	LVWPS-U3-MW08B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW08B	12/30/2020	161.2	LVWPS-U3-MW08B-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW08B	1/15/2021	161.2	LVWPS-U3-MW08B-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW09	10/7/2020	97.8	LVWPS-U3-MW09-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW09	12/30/2020	97.8	LVWPS-U3-MW09-INJ	INJ	Zone 3	ND	ND	ND	ND	515.4	22.8	515.4 **	2.51	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW09	1/15/2021	97.8	LVWPS-U3-MW09-EM02	EM02	Zone 3	ND	ND	ND	ND	515.7	1.98	518.8 **	4.52	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW10A	10/5/2020	89.9	LVWPS-U3-MW10A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW10A	1/14/2021	89.9	LVWPS-U3-MW10A-EM02	EM02	Zone 3	ND	ND	ND	ND	515.9	6.08	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW10B	10/5/2020	111.1	LVWPS-U3-MW10B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW10B	1/14/2021	111.1	LVWPS-U3-MW10B-EM02	EM02	Zone 3	ND	ND	ND	ND	515.9	9.62	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW11A	10/7/2020	96.2	LVWPS-U3-MW11A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW11A	1/15/2021	96.2	LVWPS-U3-MW11A-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW11B	10/7/2020	124.8	LVWPS-U3-MW11B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW11B	1/18/2021	124.8	LVWPS-U3-MW11B-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW11C	10/8/2020	153.1	LVWPS-U3-MW11C-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW11C	1/18/2021	153.1	LVWPS-U3-MW11C-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW12A	10/6/2020	98	LVWPS-U3-MW12A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW12A	1/15/2021	98	LVWPS-U3-MW12A-EM02	EM02	Zone 3	ND	ND	ND	ND	515.5	0.536	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW12B	10/6/2020	125.5	LVWPS-U3-MW12B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW12B	1/15/2021	125.5	LVWPS-U3-MW12B-EM02	EM02	Zone 3	ND	ND	ND	ND	516.0	3.88	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW13A	10/7/2020	108.5	LVWPS-U3-MW13A-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW13A	12/30/2020	108.5	LVWPS-U3-MW13A-INJ	INJ	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW13A	1/15/2021	108.5	LVWPS-U3-MW13A-EM02	EM02	Zone 3	ND	ND	---	---	ND	ND	---	---	ND	ND	---	---	ND	ND		
LVWPS-U3-MW13B	10/7/2020	140.1	LVWPS-U3-MW13B-BL04	BL04	Zone 3	---	---	---	---	---	---	ND	ND	---	---	ND	ND	---	---		
LVWPS-U3-MW13B	12/30/2020	140.1	LVWPS-U3-MW13B-INJ	INJ	Zone 3	ND	ND	ND	ND	515.3	77.9	507.0	0.133	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW13B	12/30/2020	140.1	LVWPS-U3-MW13B-INJ-FD	INJ	Zone 3	ND	ND	ND	ND	515.3	87.3	507.3	0.299	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW13B	1/15/2021	140.1	LVWPS-U3-MW13B-EM02	EM02	Zone 3	ND	ND	ND	ND	515.3	5.08	ND	ND	ND	ND	ND	ND	ND	ND		
LVWPS-U3-MW13B	1/15/2021	140.1	LVWPS-U3-MW13B-EM02-FD	EM02	Zone 3	ND	ND	ND	ND	515.3	9.60	ND	ND	ND	ND	ND	ND	ND	ND		

Notes:

- nm nanometers
- conc concentration
- ppb parts per billion
- ND No dye detected
- FD field duplicate
- ** A fluorescence peak is present that does not meet all the criteria for this dye. However, it has been calculated as a positive dye result. See note 2 below.

1. Dye concentrations are based upon standards used at the Ozark Underground Laboratory (OUL). The standard concentrations are based upon the as sold weight of the dye that the OUL uses - 20% by weight for rhodamine WT and 2. Emission fluorescence peaks are a function of the dye and the liquid matrix of the sample. Narrow acceptable wavelength ranges usually used as a criterion for positive dye detections do not always apply to samples from this study