

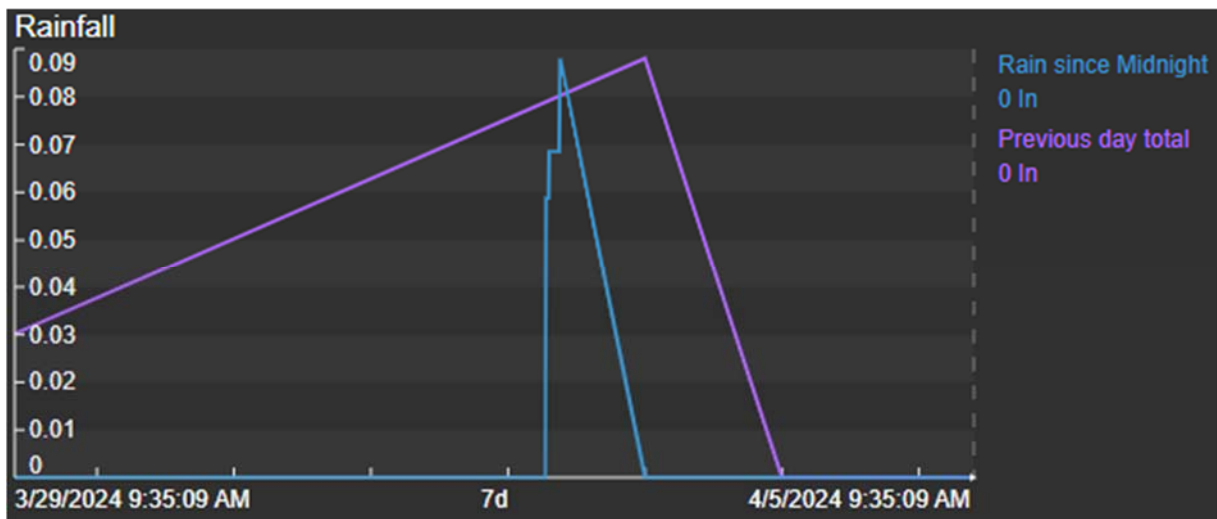
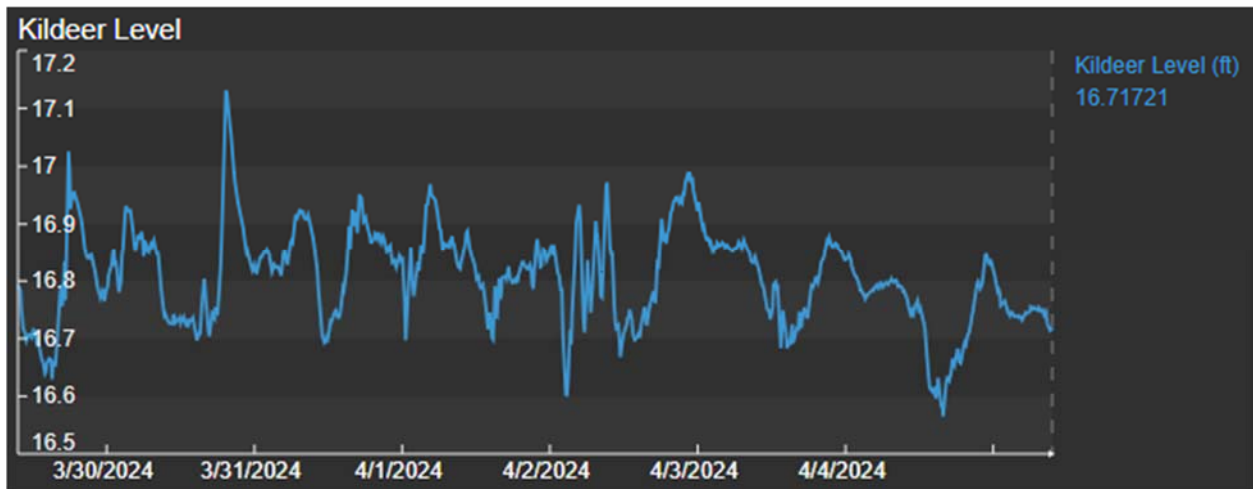
Weekly Report Required by Interim Measures Letter dated 8/4/2023

LSB Chemical Company, NPDES Permit Number: AR0000752, AFIN: 70-00040

Weekly Report Date: 28 March 2023, Updated portions are underlined.

Discharges and Implementation of Emergency Action Plan

Over the last week, the facility received 0.09 inches of rain. Lake Kildeer is currently at 16.71 feet. We have increased our discharge up to 2.0 MGD in anticipation of incoming rainfall. Current weather forecast indicated 5.6 inches of rain over the next 10 days. This will potentially require us to open outfall 001. LSB is attempting to keep the levels of Kildeer below 17.00 feet. In the event of additional rain, LSB will manage the discharge from Kildeer as necessary to ensure water does not overtop the emergency spillway in accordance with the August 4, 2023 Interim Measures letter.



Conduct Daily Sampling of Lake Lee, Lake Killdeer, and Pond 004

LSB commenced this required sampling on August 5, 2023.

Provide Copies of Sampling of Lake Lee, Lake Killdeer, and Pond 004 Since January 1, 2023

Please see the LSB Interim Measures response dated August 9, 2023.

Corrective Action Plan Activities [updates from the previous week are underlined]

During our August 17th conference call we discussed that these proposed activities may trigger a communication to the ADEQ and possible permit changes. We will continue to communicate plans and improvements to obtain ADEQ's guidance on proper permitting.

Minimize Wastewater Contaminant Loading

Water Reuse:

LSB has evaluated its processes to assess locations where water can be reutilized in processes. Currently we are reusing as much wastewater as possible, that would otherwise flow into Pond 004, and are reusing some water from Pond 004 when the opportunity arises.

Minimize Wastewater Inflow

The stormwater diversion project has been completed. LSB met with ADEQ on the 19th to discuss permit applicability. Based on the discussions this action will not require a construction permit. Physical work on the project has been completed and we can now divert a total of 30% of the stormwater flow from 004. This is currently a manual process, to automate additional work will be required.

Additionally, we have started an engineering study to divert additional water away from the Ammonia Nitrate facility. This project will focus on paving in and around the Ammonia Nitrate area and is upstream of any waste/process water connections and will not require a construction permit. LSB has utilized seven frac tanks to increase the storage capacity of Ammonia Nitrate water to reduce the overflow into Pond 004 from rain events.

Maximize Treatment Efficiency and Capacity

Lake Lee Ammonia Stripper

LSB continues to operate the ammonia stripper with an approximate 20% efficiency. However, the stripper has to be shut down during freezing weather due to the lack of heat load on the stripper. Cold weather operation can/will cause freezing of the cooling tower.

Treatment of Pond 004

LSB met with Black & Veatch, a wastewater consulting firm, to determine the best treatment possibilities for Pond 004. Based on these initial conversations a biological system seems to be the best path forward. The B&V report was attached in the 13 Oct 2023 report.

Based on review of the Black and Veatch data, LSB is proceeding with biological treatment of 004, but we are still assessing how to address treatment barriers such as predilution, carbon addition, and sludge generation. The design basis is complete. The design basis is under revision based upon internal technical review and review from Alliance Technical Group who will be submitting the permit application. We are currently working on the P&ID's, finalizing all calculations and developing the plot plan.

The units are currently on site and are in a staging area. A construction permit will be submitted as soon as engineering is completed.

Black and Veatch is developing the processes to operate the plants and develop a written plan to use these package plants in the setup they are proposing. Once the plans are developed, we can propose permit modification to facilitate this. We are currently developing a list of longer lead time items (i.e. Transformers) to try to find alternative sources of procurement to prevent unforeseen delays. It was expected the transformer would be a potential long lead time element, with the design bases completed, we have sized transformers and this appears to no longer be the critical path. Ancillary equipment for these units is undergoing inspection and repaired as needed.

LSB internal engineering is evaluating siting and location for these package plants, this has been narrowed down to two locations. LSB contracted HSG to do site investigations for the foundation and to develop the foundation plans. We have selected a site for the foundations. We are currently drafting plot plans and potential layouts for the units.

Additionally, we are evaluating possibilities of reuse of the process wastewater as an input into a product.

Increased Efficiency in Lake Killdeer Biological Activity

Based upon discussion with supplier of nitrification/denitrification bacteria, LSB will begin dosing Lake Killdeer with calcium carbonate or magnesium carbonate to increase the available of carbon and alkalinity in Lake Killdeer. Increasing available carbon should promote additional biological activity to reduce the amount of ammonia in Lake Killdeer and the effluent discharge. LSB has also ordered one ton of lime and will begin dosing Lake Lee with the lime in efforts to increase alkalinity in Lake Lee which flows into Lake Killdeer. Before any dosing begins a construction, permit will be submitted.

Baffles in Lake Killdeer

LSB selected a vendor to install baffles in Lake Killdeer. As discussed in our August 17th conference call, this should promote longer residence time and further increase biological activity to reduce the amount of ammonia in Lake Killdeer and the effluent discharge. Baffles have arrived onsite. Construction drawings and design basis have been submitted to apply for the construction permit. The permit application was submitted on the 24th of January. The installation is expected to be completed in the first quarter of 2024 or as soon as approval is received from the ADEQ. ADEQ submitted the public notice on the 28th of February. The 10 day comment period is closed and LSB has submitted proof of publication and payment.

Water Quality Sampling Results

Water quality sampling required by the Interim Measures letter is included in the attached 2023 spreadsheet.

Water Column Profile Measurements

LSB has contracted with Alliance Technology Group (formerly GBMc) to complete the profile and sampling of Pond 004, Lake Lee, and Lake Killdeer. The field work was completed on September 28th.

KT French Drain

KT French Drain is located southwest of the KT plant on the west edge of the facility. Water is collected in a wet well then pumped back into the facility, much like a municipality utilized lift stations. During the previous inspection the pump was not operating and the wet well was overflowing. LSB has implemented daily inspections to ensure that the pump remains operational.

As requested, LSB collected samples from KT Wier. Samples collected on December 8th were collected based on the December 7, 2023 conversation with ADEQ and before we received the official request thus all requested in-situ parameters were not collected. Data is presented below:

Date	Temp	pH	D.O.	Cond.	Ammonia mg/l	Nitrate mg/l	Nitrite mg/l	Total – N mg/l	Nitrate + Nitrite
12-8-2023	NA	4.35	NA	79,150	6,600	10,351	0.43	16,951.4	10,351.4
12-12-2023	16	4.40	5.63	79,250	6,500	10,633	0.41	16,833.4	10,633.4
12-14-2023	18	4.37	5.16	77,440	6,350	10,669	0.46	17,019.46	10,669.46
12-19-2023	16	4.35	6.16	78630	12080	11,477	ND	23,557	11,477
12-21-2023	18	4.35	5.43	77,750	9200	11,108	ND	20,308	11,108

Other Actions

In this call LSB was informed we need to obtain a wastewater operator’s license as quickly as possible. Charles McDowell passed the advanced industrial wastewater certification on March 26th thru the 28th. LSB currently has three certified operators. Second, ADEQ advised that LSB should coordinate with other Joint Pipeline members regarding discharges and volumes. We have initiated this communication.

LSB has contracted Alliance Technology to conduct a bathometric survey of 004. The results of the study indicate that Pond 004 contains approximately 1.5 Million Gallons of water.

Date	Lake Killdeer (KD)									Lake Lee							Pond 004										
	KD Grab Sample	KD Grab Sample	KD Composite EDCC LAB	KD Grab Sample	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	LEE Grab Sample	LEE Grab Sample	Lee Composite EDCC LAB	LEE Grab Sample	Lee Composite EDCC LAB	Lee Composite EDCC LAB	Lee Composite EDCC LAB	Lee Composite EDCC LAB	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab		
	Time of Grab	Temp °C	pH	DO, ppm	Conductivity	NH _{3-N} , ppm	NO _{3-N} , ppm	P, ppm	SO ₄ ppm	Time of Grab	Temp °C	pH	DO, ppm	NH _{3-N} , ppm	NO _{3-N} , ppm	Phosphorous, ppm	SO ₄ ppm	DATE/ TIME	Temp °C	DO, ppm	pH	Conductivity	NH _{3-N} , ppm	NO _{3-N} , ppm	SO ₄ ppm		
3/28/2023																											
3/29/2023			7.12		1620	130	134		83					7.13	132	143		178									
3/30/2023														7.16	140	141		140									
3/31/2023			6.98		1622	119	136		85					7.18	126	129		123									
4/1/2023														7.01	87	103		107									
4/2/2023														7.30	68	76		93									
4/3/2023			7.16		1588	122	134	0.04	83					7.92	53	70		127									
4/4/2023														7.10	67	77	1.01	115									
4/5/2023			7.04		1867	164	167		83					7.56	141	134		103			04/04/23		8.33	70340	10060	9506	28
4/6/2023														7.54	139	148		99									
4/7/2023			6.87		1806	159	166		72					6.95	168	170		122									
4/8/2023														6.78	272	294		97									
4/9/2023														6.94	330	343		112									
4/10/2023			7.04		2042	169	188	0.00	72					9.95	164	248		97									
4/11/2023														7.36	175	190	0.24	99									
4/12/2023			7.00		1814	140	162		74					7.02	136	141		154									
4/13/2023														6.58	87	122		149			04/12/23		8.61	39320	4400	5032	20
4/14/2023			6.90		1675	132	146		75					6.47	78	109		138									
4/15/2023														6.86	63	81		231									
4/16/2023														6.24	47	56		182									
4/17/2023			7.18		1598	131	140	1.42	81					6.56	30	44		171									
4/18/2023														5.56	72	82	1.28	205									
4/19/2023			6.75		1615	131	141		83					7.03	64	61		272			04/18/23		7.68	57620	8240	3691	16
4/20/2023														6.94	35	36		233									
4/21/2023			6.82		1580	124	137		84					6.89	19	21		198									
4/22/2023														6.37	18	20		178									
4/23/2023														5.21	75	87		202									
4/24/2023			7.03		1565	130	133	1.41	86					5.42	181	199		187									
4/25/2023														6.26	210	212	2.70	179									
4/26/2023			7.02		1582	121	137		88					6.89	175	177		191									
4/27/2023														6.95	109	117		219									
4/28/2023			6.93		1570	112	135		89					6.65	93	95		184									
4/29/2023														5.71	140	154		162									
4/30/2023														7.63	142	180		174									
5/1/2023			6.87		1611	112	139	1.46	92					6.82	169	204		176									
5/2/2023														5.50	122	169	2.02	189									
5/3/2023			6.82		1633	122	140		93					7.18	133	150		246									
5/4/2023														7.03	95	108		191									
5/5/2023			6.85		1628	120	138		94					6.73	57	68		168									
5/6/2023														4.68	44	51		209									
5/7/2023														6.94	73	89		210									
5/8/2023			6.88		1613	123	139	1.24	95					8.07	95	108		152									
5/9/2023														8.19	81	97	1.50	122									
5/10/2023			6.65		1588	120	132		92					7.58	163	157		75									
5/11/2023														7.55	335	361		82			05/10/23		8.71	34840	5080	4463	26
5/12/2023			6.81		1841	138	161		89					7.60	323	332		139									
5/13/2023														7.02	208	243		90									
5/14/2023														7.19	213	235		171									
5/15/2023			6.80		1805	142	156	1.61	86					7.15	164	187		169									
5/16/2023														7.71	138	156	2.96	192									
5/17/2023			6.86		1812	138	158		86					7.63	103	119		176									
5/18/2023														7.36	81	105		171									
5/19/2023			7.03		1825	145	160		85					7.35	81	95		175									
5/20/2023														7.21	64	75		176									
5/21/2023														6.68	52	65		170									
5/22/2023			6.97		1786	143	155	1.79	86					6.27	111	133		171									
5/23/2023														6.51	182	199	2.72	194									
5/24/2023			7.10		1758	117	153		87					6.78	142	158		221									
5/25/2023														6.72	75	103		206									
5/26/2023			6.73		1760	135	149		111					6.55	68	83		405									
5/27/2023														3.80	63	65		672									
5/28/2023														3.32	46	49		511									
5/29/2023			6.18		1740	122	146	0.32	114					3.17	30	48		432									
5/30/2023														3.14	20	53	1.12	332									
5/31/2023			6.59		1734	119	146		121					3.67	16	32		298									
6/1/2023														4.88	14	20		283									
6/2/2023			6.73		1721	120	147		126					6.67	11	13		275									
6/3/2023														7.24	7	10		234									
6/4/2023														7.25	4	9		199									
6/5/2023			6.68		1680	122	137	1.64	135					7.36	6	9		227									
6/6/2023														7.38	7	10	0.65	205									
6/7/2023			6.06		1674	116	135		139					7.25	7	10		192									
6/8/2023														7.27	8	10		205			06/07/23		7.42	79560	10600	10832	42
6/9/2023			6.22		1655	114	132		141					7.49	6	18		259									
6/10/2023														7.60	5	23		202									
6/11/2023														7.46	3	15		146									
6/12/2023			6.44		1624	116	126	1.31	142					6.35	12	26		190									
6/13/2023														6.70	30	42	0.22	197									

Date	Lake Killdeer (KD)									Lake Lee							Pond 004								
	KD Grab Sample	KD Grab Sample	KD Composite EDCC LAB	KD Grab Sample	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	LEE Grab Sample	LEE Grab Sample	Lee Composite EDCC LAB	LEE Grab Sample	Lee Composite EDCC LAB	Lee Composite EDCC LAB	Lee Composite EDCC LAB	Lee Composite EDCC LAB	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab
Time of Grab	Temp °C	pH	DO, ppm	Conductivity	NH _{3-N} , ppm	NO _{3-N} , ppm	P, ppm	SO ₄ ppm	Time of Grab	Temp °C	pH	DO, ppm	NH _{3-N} , ppm	NO _{3-N} , ppm	Phosphorous, ppm	SO ₄ ppm	DATE/ TIME	Temp °C	DO, ppm	pH	Conductivity	NH _{3-N} , ppm	NO _{3-N} , ppm	SO ₄ ppm	
6/21/2023				6.60	1688	115	131	138					7.31	141	153	201									
6/22/2023													6.86	123	130	322									
6/23/2023				6.68	1705	115	133	141					7.17	101	116	287									
6/24/2023													6.84	78	94	200									
6/25/2023													7.14	55	69	199									
6/26/2023				6.69	1690	119	130	1.32	143				6.72	49	54	184									
6/27/2023													7.02	125	136	180									
6/28/2023				6.75	1672	122	127	142					7.61	195	201	143									
6/29/2023													7.82	192	194	146									
6/30/2023				6.64	1720	119	133	141					7.97	132	164	167									
7/1/2023													7.59	108	126	167									
7/2/2023													7.23	75	100	167									
7/3/2023				6.69	1730	120	137	1.38	144				7.09	72	86	149									
7/4/2023													7.06	51	67	158									
7/5/2023				6.77	1724	125	133	142					6.82	102	116	152									
7/6/2023													6.96	188	209	172									
7/7/2023				6.74	1720	116	132	140					7.62	186	223	161									
7/8/2023													7.66	134	130	186									
7/9/2023													8.21	132	126	195									
7/10/2023				6.75	1780	130	136	5.24	140				8.16	209	231	155									
7/11/2023													7.88	157	196	125									
7/12/2023				6.64	1782	102	113	139					5.74	52	66	73									
7/13/2023													8.49	136	215	75									
7/14/2023				7.50	2240	179	69	34					8.22	281	119	36	07/14/23			9.02	24910	4320	2989	2	
7/15/2023													8.29	278	323	109									
7/16/2023													8.50	231	270	110									
7/17/2023				6.98	1890	151	153	6.08	112				8.35	222	229	124									
7/18/2023													8.03	167	189	122									
7/19/2023				6.95	1820	143	143	104					7.92	133	143	110									
7/20/2023													8.17	128	137	170									
7/21/2023				6.91	1804	140	141	108					8.05	120	129	123									
7/22/2023													7.49	95	93	113									
7/23/2023													6.86	86	82	121									
7/24/2023				6.90	1763	125	136	2.03	110				7.69	86	90	133									
7/25/2023													7.38	72	79	146									
7/26/2023				6.85	1764	126	134	110					7.22	58	72	125									
7/27/2023													7.43	53	57	101									
7/28/2023				6.84	1753	120	132	110					8.14	36	42	121									
7/29/2023													8.27	16	30	107									
7/30/2023													6.99	10	24	121									
7/31/2023				6.83	1745	128	129	1.96	110				7.19	13	20	119									
8/1/2023													6.92	64	75	126									
8/2/2023				6.77	1726	114	128	111					7.09	38	51	122									
8/3/2023													8.10	16	32	113									
8/4/2023				6.79	1710	119	126	111					7.44	9	22	143									
8/5/2023	8:53AM	28	6.79	7.65	1703	114	125			6:00AM	26	6.60	6.03	6	17	1.22	147	11:20am	34	10.63	7.14	48920	5280	6293	25
8/6/2023	9:57AM	29	6.77	8.27	1676	105	123			6:00AM	25	6.45	6.12	6	15	125	10:09AM	27	6.02	6.95	49870	6200	6657	20	
8/7/2023	8:25AM	26	6.80	6.45	1683	115	124	1.75	113	7:00AM	27	6.48	7.69	7	14	115	8:40AM	30	6.5	6.84	49750	6240	6216	33	
8/8/2023	8:45AM	26	6.84	6.13	1678	114	124			7:00AM	26	6.81	6.08	10	18	111	8:53AM	25	5.62	6.81	34560	4260	4281	22	
8/9/2023	8:13AM	27	7.11	7.34	1584	114	120			7:00AM	24	7.26	7.86	102	102	80	8:39AM	25	6.63	6.63	29930	3660	3553	18	