



DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY, MCAPP
25800 RALPH FAIR ROAD, BOERNE, TX 78015-4800

June 10, 2019

U-033-19

SUBJECT: Annual Status Report (June 2018 to May 2019) of the AOC-65 Class V Remediation Infiltration Galleries and Injection Wells at Camp Stanley Storage Activity, Boerne, Texas, TCEQ Authorization No. 5X2600645; IHWCA#69026; CN602728206/RN100662840

Mr. Bryan Smith
Texas Commission on Environmental Quality
Underground Injection Control Permits Section
Radioactive Materials Division
PO Box 13087 (MC233)
Austin, Texas 78711-3087
(512) 239-3150

Dear Mr. Smith:

The Camp Stanley Storage Activity (CSSA), McAlester Army Ammunition Plant, U.S. Army Field Support Command, Army Materiel Command, U.S. Army, is submitting this semiannual report summarizing the injection activities performed at the on-post Area of Concern (AOC) 65 site. The injection activities performed are part of the AOC-65 In-Situ Chemical Oxidation (ISCO) remedial application for treatment of chlorinated compounds in groundwater.

This annual letter provides a summary of activities for the months of June 2018 through May 2019 and includes a report of injection and associated ISCO activities conducted at AOC-65 during the past year as specified by the Texas Commission on Environmental Quality (TCEQ) Underground Injection Control (UIC) permit. Injection activities were performed during the reporting period including: the removal and replacement of 18 "spent" oxidant-infused cylinders in six wells (**Table 1**), the installation of 12 oxidant-infused cylinders within four permitted wells (three cylinders per well) (**Table 2**), the application of liquid permanganate within three permitted wells and two permitted infiltration cells (**Table 3**), and groundwater monitoring.

Injection activities associated with the Class V Injection Well Authorization No. 5X2600645 (amended November 13, 2017) during this reporting period have included oxidant application activities and groundwater monitoring. Groundwater samples were collected from existing monitoring wells, injection wells, and infiltration galleries for analysis of VOCs, metals, and anions (chloride and sulfate) to track the progress of current ISCO applications. Additionally, water quality parameters (pH, DO, ORP, and conductivity) were also collected at monitoring wells. Sampling events were conducted

in June, September, and December 2018, and March 2019. Monitoring events will continue quarterly, with the next monitoring event scheduled to take place in June 2019.

ISCO chemicals were applied during this reporting period following the groundwater monitoring efforts performed in September 2018. Analytical results from quarterly monitoring indicated installed cylinders were nearing the end of their effective lifespan; therefore, all previously installed oxidant-infused paraffin wax cylinders (18 in total) were removed from six injection wells at AOC-65 and were replaced with new cylinders in October 2018. These wells included: VEW-19, VEW-27, VEW-32, SIW-01, TSW-01, and TSW-05. Four additional wells were identified to receive cylinders following analysis of quarterly monitoring results. In November 2018, cylinders were installed within injection wells VEW-15, VEW-18, VEW-29, and VEW-31. Three 1.35-inch-diameter cylinders were installed within SIW-01 due to well construction limitations, and the remaining nine wells each received two 2.5-inch-diameter and one 1.35-inch-diameter cylinders vertically distributed over the well screen interval.

The cylinders consist of potassium permanganate, sodium persulfate, and paraffin wax in a ratio of 38:38:24. The cylinders are 18 inches long and either 2.5 inches or 1.35 inches in diameter. The 2.5-inch cylinders each weigh 5.75 pounds each and 1.35-inch cylinders weigh 2.875 pounds each. This passive oxidant application approach allows the sustained release of ISCO chemicals into groundwater under varying hydrologic conditions encountered throughout the year.

Liquid oxidant injections were also performed during the reporting period within three permitted wells (IIW-01, IIW-02, and IIW-04) and two permitted infiltration cells (NIC and MIC). The injected solution consisted of 100 gallons of 40% permanganate solution (RemOX L) combined with 500 gallons of raw water from CSSA's water supply well CS-10 for a total of 600 gallons of 6.6% liquid sodium permanganate solution. The solution was applied to wells and infiltration cells via gravity feed. During the injections, well IIW-01 received 50 gallons of ISCO solution, IIWs -02 and -04 each received 25 gallons, and each infiltration cell (MIC and NIC) received 250 gallons. Following completion of liquid oxidant injections, 800 gallons of raw water from water supply well CS-10 were injected into the NIC for flushing.

It is anticipated that cylinders will need to be replaced at least annually if not sooner; therefore, cylinders will be inspected quarterly and replaced as needed. A minimum of eighteen 2.5-inch cylinders and twelve 1.35-inch cylinders will be deployed within ten wells at AOC-65 during the next reporting period. Additional injections in the next twelve months may include 600 gallons of 6.6% liquid sodium permanganate applied within IIWs and infiltration cells. No new injection wells or infiltration cells are planned at this time.

If you have any questions regarding the specific ISCO application activities at CSSA, please feel free to contact me at 210-295-7416 or Adrien Lindley, Parsons at 512-719-6052, adrien.lindley@parsons.com.

Sincerely,



Jason D. Shirley
Installation Manager

cc: Margarita Loya, CSSA Environmental Manager
Greg Lyssy, USEPA Region 6
Julie Burdey, Parsons – Austin
Ken Rice, Parsons – Austin
File: 640149.110093.04000

Tables 1 - 3
Oxidant Application Summary

AOC-65 Permanganate/Persulfate Cylinder Application 2018

Table 1. Cylinder Replacements

AOC-65	Well ID	Installation date	1.35" Cylinder (Qty)	2.5" Cylinder (Qty)
Original Cylinder Wells - Replace "Spent" Cylinders (Installed Dec 2016)	SIW-01	October 2018	3	---
	TSW-01	October 2018	1	2
	TSW-05	October 2018	1	2
	VEW-19	October 2018	1	2
	VEW-27	October 2018	1	2
	VEW-32	October 2018	1	2
Total			8	10

Table 2. Cylinder Installation at New Wells

AOC-65	Well ID	Installation date	1.35" Cylinder (Qty)	2.5" Cylinder (Qty)
New Cylinder Wells - Initial Installation Nov 2018	VEW-15	November 2018	1	2
	VEW-18	November 2018	1	2
	VEW-29	November 2018	1	2
	VEW-31	November 2018	1	2
Total			4	8

Notes:

2.5" cylinders contain 4.37 lbs of oxidant (2.185 lbs of persulfate and permanganate)

1.35" cylinders contain 2.185 lbs of oxidant (1.0925 lbs of persulfate and permanganate)

AOC-65 Liquid Permanganate Injected January 16, 2019

Table 3. Liquid Permanganate Injections

AOC-65	Injection Location	Injection Volume	Oxidant Concentration
Wells	IIW-01	50 gallons	6.6%
	IIW-02	25 gallons	6.6%
	IIW-04	25 gallons	6.6%
Infiltration Cells	MIC	250 gallons	6.6%
	NIC	250 gallons	6.6%
	NIC	800 gallons	Raw CS-10 Water Flush

Field Forms

ISCO Sampling AOC-65

Personnel: Elliott + Detert

Permit required samples shaded gray.
 Bold = Performance Monitoring Samples
 candles installed

Well ID	TD / pump depth	Water Level ('BTOC)	Sample Date	Sample Time	Temp. (°C)	Cond. (ms/cm ²)	DO	pH	ORP
LS-5	NA	/	3/6/18	0855	22.44	0.630	/	6.97	/
LS-6	NA	/	/	0425	22.40	0.639	/	6.93	/
LS-7	NA	/	/	0830	22.54	0.648	/	6.85	/
OFR-3	NA	/	/	1053	24.30	0.582	/	7.05	/
RFR-10	NA	/	/	1023	22.57	0.630	/	6.98	/
RFR-11	NA	/	/	0458	23.47	0.597	/	7.03	/
CS-MW36-LGR	361.5	/	3/5/18	0905	22.04	0.650	/	6.97	364.3
CS-MW8-LGR	302	/	/	0435	21.75	0.659	/	6.88	344.9
CS-MW7-LGR	293	/	/	1053	21.45	0.684	/	6.94	341.1
CS-MW6-LGR	314	/	/	0828	22.06	0.583	/	7.04	344.4
AOC65-VEW13-LGR	41	35.51	3/12/18	/	22.97	0.5109	0.51	6.89	-810.4
AOC65-VEW14-LGR	61	60.5	↓	/	22.10	0.629	3.84	7.22	268.8
AOC65-VEW15-UGR	13	7.28	3/12/18	1245	20.35	0.410	16.00	7.41	281.9
AOC65-VEW16-LGR	41	29.96	↓	/	23.00	0.510	5.56	6.84	295.5
AOC65-VEW17-LGR	52.5	51.65	↓	/	22.69	0.633	3.00	6.87	257.7
AOC65-VEW18-LGR	56	44.88	↓	1335	23.02	5.113	5.64	7.19	257.6
AOC65-VEW19-UGR	26	11.95	3/13/18	1305	/	/	/	/	/
AOC65-VEW20	25.7	13.79	3/12/18	/	22.57	0.555	2.14	7.36	219.9
AOC65-VEW21	27	13.74	↓	/	22.71	0.510	3.74	7.33	464.3
AOC65-VEW22	50.5	Dry	↓	/	/	/	/	/	/
AOC65-VEW23	21	Dry	↓	/	/	/	/	/	/
AOC65-VEW24	50	Dry	↓	/	/	/	/	/	/
AOC65-VEW25	21.5	18.90	3/12/18	0830	22.77	6.535	9.74	6.87	409.6
AOC65-VEW26	50	48.07	↓	/	22.91	18.27	0.81	6.47	-13.5
AOC65-VEW27	21	11.65	3/13/18	1255	/	/	/	/	/
AOC65-VEW28A	120	/	/	/	/	/	/	/	/
AOC65-VEW28B	179	/	/	/	/	/	/	/	/
AOC65-VEW29	40	31.48	3/12/18	1300	23.03	0.561	4.76	6.84	-68.2
AOC65-VEW30	24.5	24.21	↓	/	/	/	/	/	/
AOC65-VEW31	40	30.15	↓	1310	23.08	0.728	1.43	6.81	144.8
AOC65-VEW32	24	10.25	3/13/18	1320	/	/	/	/	/
AOC65-VEW33	24.5	24.25	3/12/18	/	/	/	/	/	/
0910 - AOC65-PZ01-LGR	132.35	119.89	3/12/18	0910	22.18.24	0.412	7.24	7.28	428.4
AOC65-PZ02-LGR	50.26	45.31	3/12/18	0940	22.04	3.259	4.86	7.12	405.1
AOC65-PZ03-LGR	134.2	128.41	↓	/	19.97	0.440	7.48	6.93	509.4
AOC65-PZ04-LGR	43.1	36.47	↓	/	22.89	0.589	2.80	6.78	555.1
AOC65-PZ05-LGR	126.87	115.78	3/12/18	0945	19.33	0.605	6.53	7.04	389.0
0902 - AOC65-PZ06-LGR	43.64	36.36	3/12/18	0900	22.80	0.524	3.62	6.78	459.4
AOC65-TSW-01	40	32.74	3/13/18	1240	/	/	/	/	/
AOC65-TSW-02	40	31.85	3/12/18	/	22.97	2.605	0.21	6.51	42.9
AOC65-TSW-03	40	28.50	↓	1040	22.96	18.27	0.81	6.97	-13.5
AOC65-TSW-04	40	28.52	↓	1030	22.57	24.12	0.36	6.41	33.1
AOC65-TSW-05	40	30.05	3/13/18	1410	/	/	/	/	/
AOC65-TSW-06	51	35.90	3/12/18	1350	22.61	0.575	0.33	6.90	-38.6
AOC65-TSW-07	40	28.18	↓	1010	22.47	6.232	0.95	6.61	-13.5
AOC65-SIW-01	25	13.43	3/13/18	1340	/	/	/	/	/
AOC65-North-IC	4.2	/	/	/	/	/	/	/	/
AOC65-Middle-IC	9.65	7.70	3/13/18	1430	/	/	/	/	/
AOC65-South-IC	11.77	8.48	↓	1440	/	/	/	/	/

265.9

light pink

grey/black

ISCO Sampling AOC-65

Personnel: Elliott & Defert

Permit required samples shaded gray.
Bold = Performance Monitoring Samples
candles installed

Well ID	TD / pump depth	Water Level ('BTOC)	Sample Date	Sample Time	Temp. (°C)	Cond. (ms/cm ²)	DO	pH	ORP
LS-5	NA								
LS-6	NA								
LS-7	NA								
OFR-3	NA								
RFR-10	NA								
RFR-11	NA								
CS-MW36-LGR	361.5								
CS-MW8-LGR	302								
CS-MW7-LGR	293								
CS-MW6-LGR	314								
AOC65-VEW13-LGR	41	35.84	6/25/18		23.10	0.657		6.78	7.4
AOC65-VEW14-LGR	61	60.48	↓		22.84	.929		6.77	129.3
AOC65-VEW15-UGR	13	7.20	6/25/18	1022	23.93	.530		6.91	170.7
AOC65-VEW16-LGR	41	29.98			23.07	.584		6.28	189.5
AOC65-VEW17-LGR	52.5	51.58			22.91	0.709		6.73	19.8
AOC65-VEW18-LGR	56	46.55	6/25/18	1100	23.20	5.534		6.83	181.8
AOC65-VEW19-UGR	26	13.67	↓	1325					
AOC65-VEW20	25.7	14.00	↓		22.34	0.638		7.08	125.1
AOC65-VEW21	27	14.02	↓		22.35	0.588		7.01	29.8
AOC65-VEW22	50.5	DRY	↓						
AOC65-VEW23	21	20.98	No sample						
AOC65-VEW24	50	DRY							
AOC65-VEW25	21.5	18.47	6/25/18	0820	22.40	9.564		7.08	304.4
AOC65-VEW26	50	48.23	↓		22.93	7.732		6.57	182.9
AOC65-VEW27	21	11.30	↓	1355					
AOC65-VEW28A	120		↓						
AOC65-VEW28B	179								
AOC65-VEW29	40	31.23	6/25/18	1030	23.20	1.045		6.75	-13.60
AOC65-VEW30	24.5	24.77	↓						
AOC65-VEW31	40	30.17	↓	1045	23.11	.889		6.49	13.9
AOC65-VEW32	24	10.35	↓	1415					
AOC65-VEW33	24.5	24.45	↓						
AOC65-PZ01-LGR	132.35	120.24	6/25/18	0805	22.33	0.4660		7.11	290.9
AOC65-PZ02-LGR	50.26	46.63	6/25/18	0837	22.53	3.387		6.89	302.8
AOC65-PZ03-LGR	134.2	128.50	↓		22.31	0.497		6.91	35.6
AOC65-PZ04-LGR	43.1	36.44	↓		23.00	0.669		6.77	42.3
AOC65-PZ05-LGR	126.87	118.63	6/25/18	0832	22.37	0.810		6.66	308.2
AOC65-PZ06-LGR	43.64	36.45	6/25/18	0755	22.82	0.588		6.68	292.9
AOC65-TSW-01	40	32.78	↓	1340					
AOC65-TSW-02	40	31.99	↓		23.04	3.169		6.60	-46.3
AOC65-TSW-03	40	28.58	6/25/18	0932	23.04	16.460		6.51	53.0
AOC65-TSW-04	40	26.44	28.56	0915	22.65	30.25		6.72	-56.16
AOC65-TSW-05	40	30.10	↓	1500					
AOC65-TSW-06	51	35.91	↓	1115	22.76	0.665		6.81	6.2
AOC65-TSW-07	40	28.20	↓	0900	22.41	6.910		6.91	-4.4
AOC65-SIW-01	25	13.51	↓	1305					
AOC65-North-IC	4.2	DRY	↓						
AOC65-Middle-IC	9.65	8.69	↓	1445					
AOC65-South-IC	11.77	8.65	↓	1430					

sample grayish black

ISCO Sampling AOC-65

Personnel: Elliott + Dieter

Bold = Performance Monitoring Samples
candles installed

Well ID	TD / pump depth	Water Level ('BTOC)	Sample Date	Sample Time	Temp. (°C)	Cond. (ms/cm ²)	DO	pH	ORP
AOC65-VEW13-LGR	41	31.65	9/26/18	1300	22.98	0.627	0.96	6.70	92.7
AOC65-VEW14-LGR	61	57.85	9/26/18		22.99	0.876	3.54	6.93	159.9
AOC65-VEW15-UGR	13	6.98	9/27/18	0810	26.11	0.541	0.68	7.23	142.3
AOC65-VEW16-LGR	41	29.93	↓	0825	22.75	0.554	0.30	6.91	112.9
AOC65-VEW17-LGR	52.5	48.58	9/26/18		22.98	0.643	4.52	6.82	149.0
AOC65-VEW18-LGR	56	35.42	9/27/18	0935	23.11	3.930	3.44	7.19	114.0
AOC65-VEW19-UGR	26	9.91	↓	1035	23.40	6.203	0.36	8.93	578.9
AOC65-VEW20	25.7	14.0	9/26/18	1325	23.22	0.675	0.19	7.27	112.9
AOC65-VEW21	27	11.82	9/26/18	0820	22.90	0.626	0.15	7.14	268.5
AOC65-VEW22	50.5	24.74	9/26/18		22.80	0.553	4.86	6.80	301.5
AOC65-VEW23	21	10.11	9/26/18	0850	24.07	0.525	4.80	7.04	250.7
AOC65-VEW24	50	46.43	↓		22.95	1.905	4.39	6.90	363.0
AOC65-VEW25	21.5	14.81	↓	0925	23.83	1.249	5.49	8.15	302.0
AOC65-VEW26	50	42.99	9/26/18		22.97	3.226	4.66	6.91	139.2
AOC65-VEW27	21	6.20	9/27/18	1045	23.94	16.45	0.26	6.63	666.7
AOC65-VEW29	40	29.58	↓	0835	22.93	0.641	0.16	6.87	-196.7
AOC65-VEW28A	120	106.56	↓	0850	21.30	0.605	8.72	7.08	-3.8
AOC65-VEW28B	179	109.61	↓	0900	20.87	0.580	5.79	7.12	-6.1
AOC65-VEW30	24.5	24.25	↓						
AOC65-VEW31	40	30.16	↓	0915	22.80	0.741	0.14	6.84	43.3
AOC65-VEW32	24	8.69	9/24/18	1300	23.75	0.939	0.25	7.16	581.7
AOC65-VEW33	24.5	24.30	9/27/18						
AOC65-PZ01-LGR	132.35	112.88	9/26/18	0835	22.59	0.320	8.89	7.03	299.0
AOC65-PZ02-LGR	50.26	30.56	↓	1015	22.61	1.442	4.32	6.95	299.1
AOC65-PZ03-LGR	134.2	125.23	9/26/18		22.91	0.711	3.39	6.76	284.4
AOC65-PZ04-LGR	43.1	36.14	9/26/18		22.14	0.554	5.43	6.94	286.4
AOC65-PZ05-LGR	126.87	50.27	↓	1025	23.09	0.731	8.84	7.03	292.5
AOC65-PZ06-LGR	43.64	36.42	9/26/18	0830	22.77	0.579	3.00	6.78	286.8
AOC65-TSW-01	40	32.47	9/24/18	1400	23.00	5.707	0.39	6.92	677.5
AOC65-TSW-02	40	31.20	9/26/18	1120	22.89	0.959	0.39	6.53	28.3
AOC65-TSW-03	40	28.59	9/26/18	1105	22.91	17.97	0.38	6.47	-142.7
AOC65-TSW-04	40	28.41	↓	1055	22.55	29.64	0.43	6.42	-233.0
AOC65-TSW-05	40	29.90	9/24/18	1325	22.76	0.995	0.22	6.90	616.9
AOC65-TSW-06	51	35.80	9/26/18	1345	22.72	0.769	0.15	6.88	-20.5
AOC65-TSW-07	40	27.97	9/26/18	1035	22.35	6.599	6.35	6.48	-26.0
AOC65-SIW-01	25	13.20	9/27/18	0950	23.06	78.08	3.58	8.95	565.0
AOC65-SIW-02	25.4	21.25	9/26/18		23.35	0.900	0.75	7.00	162.0
AOC65-North-IC	4.2	DRY	9/27/18						
AOC65-Middle-IC	9.65	6.86	9/24/18	1245	27.81	0.609	3.23	7.17	137.8
AOC65-South-IC	11.77	7.77	9/27/18	1015	26.62	2.455	2.88	7.03	644.0
IIW-01	116	105.31	9/26/18	0905	23.10	0.988	4.52	7.16	172.0
IIW-02	125	87.00	9/26/18	0935	22.92	6.120	8.64	7.18	389.1
IIW-03	125	28.40	↓	0950	23.71	4.356	2.37	10.48	202.2
IIW-04	125	87.10	↓	1005	23.33	4.372	4.54	7.02	293.1

purple

purple

deep red

light purple

gray red

purple

clear

28.40

double checked - its correct

ISCO Sampling AOC-65

Personnel: Elliott + Deterf

Bold = Performance Monitoring Samples

candles installed

Well ID	TD / pump depth	Water Level ('BTOC)	Sample Date	Sample Time	Temp. (°C)	Cond. (ms/cm²)	DO	pH	ORP
AOC65-VEW13-LGR	41	33.25	12/12/18	0910	22.87	0.609	1.36	6.89	242.7
AOC65-VEW14-LGR	61	57.50	↓		22.70	0.729	3.69	6.98	273.8
AOC65-VEW15-UGR	13	7.75	12/13/18	0935	23.63	12.12	6.60	6.25	723.5
AOC65-VEW16-LGR	41	29.92	12/12/18	0940	22.61	0.634	0.23	6.95	35.2
AOC65-VEW17-LGR	52.5	50.68	↓		22.68	0.731	3.58	6.96	263.2
AOC65-VEW18-LGR	56	39.38	12/13/18	1040	23.10	3.757	3.47	7.18	601.9
AOC65-VEW19-UGR	26	9.87	↓	0850	24.08	12.48	0.98	8.14	664.6
AOC65-VEW20	25.7	13.03	12/12/18	0920	23.65	0.721	0.15	7.28	180.1
AOC65-VEW21	27	11.45	12/11/18	1345	23.37	0.661	0.14	7.18	377.4
AOC65-VEW22	50.5	46.81			22.54	6.599	4.13	6.90	289.3
AOC65-VEW23	21	10.40		1425	23.82	0.513	6.02	7.28	245.3
AOC65-VEW24	50	49.02			22.34	1.724	3.39	6.96	247.7
AOC65-VEW25	21.5	16.44	↓	1440	23.74	6.147	4.54	7.65	223.1
AOC65-VEW26	50	46.33	12/12/18		22.69	5.847	4.58	6.97	284.3
AOC65-VEW27	21	8.57	12/13/18	0840	24.14	22.34	1.03	6.65	679.6
AOC65-VEW28A	120	86.15	12/12/18	1010	20.36	0.731	6.81	7.16	284.6
AOC65-VEW28B	179	86.25	↓	1015	21.39	0.643	6.93	7.19	265.3
AOC65-VEW29	40	30.53	12/13/18	0945	23.09	8.316	0.12	6.29	702.8
AOC65-VEW30	24.5	24.25	12/12/18						
AOC65-VEW31	40	31.00	12/13/18	1005	23.12	7.650	0.14	6.25	648.1
AOC65-VEW32	24	9.00	↓	1020	24.05	2.592	0.29	6.87	649.5
AOC65-VEW33	24.5	24.26	12/12/18						
AOC65-PZ01-LGR	132.35	91.94	12/11/18	1410	20.74	0.636	7.67	7.14	283.2
AOC65-PZ02-LGR	50.26	38.77		1450	22.39	2.204	4.54	7.14	228.7
AOC65-PZ03-LGR	134.2	102.45			20.91	0.605	8.20	7.03	425.1
AOC65-PZ04-LGR	43.1	36.14			22.88	0.791	0.85	6.84	469.1
AOC65-PZ05-LGR	126.87	85.39		1500	20.34	0.672	7.85	7.16	233.1
AOC65-PZ06-LGR	43.64	36.41	↓	1400	22.58	0.581	1.37	6.92	366.8
AOC65-TSW-01	40	32.50	12/13/18	0810	22.94	12.40	0.74	6.29	715.3
AOC65-TSW-02	40	31.34	12/11/18	1550	22.63	3.439	0.36	6.61	-145.8
AOC65-TSW-03	40	28.35		1535	22.94	16.93	0.29	6.55	-273.9
AOC65-TSW-04	40	28.45	↓	1525	22.48	25.43	0.36	6.49	-248.9
AOC65-TSW-05	40	30.57	12/13/18	0910	22.74	10.75	0.24	6.29	710.2
AOC65-TSW-06	51	35.89	12/12/18	1050	22.78	0.715	0.22	6.97	290.4
AOC65-TSW-07	40	28.07	12/11/18	1510	22.66	6.285	0.15	6.63	47.6
AOC65-SIW-01	25	13.45	12/13/18	1165	23.34	86.60	2.78	8.92	603.9
AOC65-SIW-02		19.90	12/12/18		23.75	0.958	0.21	6.99	459.6
AOC65-North-IC	4.2	DRY	↓						
AOC65-Middle-IC	9.65	7.05	12/12/18	0950	22.65	0.451	5.31	7.37	264.4
AOC65-South-IC	11.77	8.10		1025	24.41	5.367	3.59	6.97	624.7
IIW-01	116	85.76		0800	21.58	1.188	5.08	7.02	263.9
IIW-02	125	85.68		0810	20.26	7.762	5.15	6.96	279.9
IIW-03	125	28.27		0825	22.15	3.345	5.67	10.80	92.4
IIW-04	125	75.12	↓	0840	21.33	6.125	5.30	7.21	271.9

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