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MEMO

TO	Katie Daugherty, ODEQ
FROM	Brendan Robinson, PE, ERM; Todd Slater, LSS
DATE	17 October 2024
REFERENCE	0732445.204
SUBJECT	Groundwater Source Control Measure Monthly Performance Monitoring Report

1. INTRODUCTION

The Oregon Department of Environmental Quality (ODEQ), in its letter dated 31 May 2019 and in the subsequent meeting with Legacy Site Services LLC (LSS) and Environmental Resources Management, Inc. (ERM) on 2 July 2019, requested that LSS initiate monthly status reports associated with the onsite groundwater source control measure (GW SCM) at the Arkema site (Site) consistent with the Performance Monitoring Plan (PMP; ERM 2014[1]) beginning July 2019. The 2014 PMP was prepared pursuant to the Order on Consent issued by ODEQ, signed on 31 October 2008 (ODEQ No. LQVC-NWR-08-04; Consent Order). The purpose of the PMP was to present the monitoring, reporting, and adaptive management processes used during implementation of the GW SCM. On 30 November 2021, ODEQ directed LSS that following the October 2021 Monthly Performance Monitoring Report (MPR), subsequent MPRs would be suspended pending the implementation of the Groundwater Extraction Enhancement (GEE) project in 2022. During that time, ODEQ requested monthly schedule updates in lieu of MPRs. The trench wells installed as part of the GEE project were started on 27 November 2022, and MPR writing restarted in December 2022. The purpose of the GEE project was to install new extraction capacity to achieve the Capture Zone Objectives.

On 6 June 2024, ODEQ requested that LSS and ERM reduce the scope of future MPRs to facilitate faster review. On 11 September 2024, ODEQ agreed for the first amended MPR to be the August 2024 MPR submitted in October 2024.

[1] ERM-West, Inc. 2014. *Revised Final Performance Monitoring Plan – Groundwater Source Control Measure, Arkema Inc. Facility, Portland, Oregon*. July 2014.

2. GWET SYSTEM PERFORMANCE

The average system influent flow rate was 24.03 gallons per minute (gpm) for the entire month of August 2024, including non-operational periods. The average operational influent flow during operational periods was 35.56 gpm, a decrease from July 2024.

Extraction pumps become fouled with accumulated solids over time. A proactive pump removal and maintenance program is in place to address fouling and maximize flow rates. A low pressure Hydropuls redevelopment was completed at Trenches 5 and 6 during August 2024 to mitigate accumulation of silt in the filter pack. A smaller Hydropuls tool was used that produced insufficient power, and therefore the redevelopment effort was not effective. Ongoing redevelopment is anticipated in September and October 2024 to maintain the productivity of the groundwater extraction trenches, and conveyance line cleaning will be conducted as needed based on analysis of backpressure. The reduction in groundwater extraction rate in August 2024 compared to July 2024 is believed to be a result of a significant decline in river elevation and average groundwater elevation as shown on Attachments A-1 and A-2.

LSS is continuing to optimize extraction rates within the system to increase flow rates at each operational well until either the extraction rates specified in the *Final Design Report* (ERM 2022[2]) are achieved, the wells are producing the maximum quantity of water possible, or until the Capture Zone Objectives are met.

2.1 GWET PLANT OPERATIONS

The groundwater extraction and treatment (GWET) plant operated within permit conditions during the reporting period. There were four shutdowns:

- 2 August 2024: The GWET system was shut down for 1 hour to clean the plate separator (PS-1).
- 11 August 2024: The wellfield was shut down for 8 hours due to failed pump P-6 at tank T-3.
- 16 August 2024: The wellfield was shut down for 3 hours to install recirculation pump P-7.
- 26 August 2024: The wellfield was shut down due to MCR (Media Capture and Recovery Vessel) failure and remained off for the remainder of August.

[2] ERM-West, Inc. 2022. *Final Design Report, Arkema Inc. Facility, Portland, Oregon*. May 2022.

3. CAPTURE ZONE EVALUATION

As described in the PMP, the purpose of hydraulic monitoring (i.e., groundwater elevation data) is to provide sufficient data to demonstrate an inward hydraulic gradient across the groundwater barrier wall (GWBW) and to evaluate the effective hydraulic capture produced by the GW SCM.

3.1 GROUNDWATER ELEVATION MONITORING

Groundwater elevation monitoring was completed on 9 August 2024. The Serfes (1991)[3] method was used to account for tidal variations as described in the PMP. Using Serfes corrected data, both horizontal and vertical gradients were calculated and plotted over time (Attachment B). Groundwater elevations, horizontal gradients, and vertical gradients from 9 August 2024 are shown in Table 1-2 and Table 1-3.

3.2 POTENTIOMETRIC SURFACE, GROUNDWATER ELEVATION DIFFERENCE MAPS, AND GROUNDWATER FLOW DIRECTIONS

Groundwater elevation data collected on 9 August 2024 were used to prepare potentiometric surface maps based on manual measurements and averaged transducer groundwater elevations (Figures 2 through 4) and vertical difference maps (Figures 5 and 6).

The generalized flow direction indicated by the potentiometric surface maps shows overall groundwater flow from upgradient toward the GWBW. Potentiometric maps (Figures 2, 3, and 4) indicate generalized groundwater movement to the extraction trenches in the Shallow, Intermediate, and Deep Zones due to GW SCM pumping, and cones of depression are apparent around each groundwater extraction trench. Horizontal gradients at gradient control clusters (GCCs) across the Site are mixed, with some areas trending toward an inward gradient, and some areas losing improvements made in June in all three hydrogeological zones. Horizontal gradients and trend lines are shown in Attachments B-1 and B-3.

River elevations are shown over time on Attachments A-1 and A-2, and in an inset on the potentiometric surface maps (Figures 2 through 4). The river elevation in August 2024 had an average elevation of 8.04 feet North American Vertical Datum of 1988 (NAVD88) with a minimum elevation of 5.58 feet NAVD88 and a maximum elevation of 11.04 feet NAVD88, a decrease compared to July 2024. The average Shallow Zone groundwater elevation decreased from July by 0.69 feet and the average Intermediate Zone groundwater elevation decreased from July by 0.15 feet, and the river elevation has largely been trending downward since January 2024. There was not a significant seasonal rise in Willamette River level this year compared to previous years.

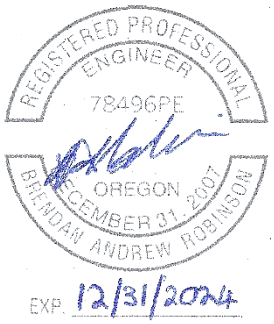
Vertical gradients were calculated for each vertical well pair and are plotted on Figures 5 and 6. Vertical groundwater gradients and trend lines are shown in Attachments B-2 and B-4. Vertical groundwater gradients interior and exterior to the GWBW were primarily downward between the Shallow and Intermediate Zones and between the Intermediate and Deep Zones.

[3] Serfes, Michael. 1991. "Determining the Mean Hydraulic Gradient of Ground Water Affected by Tidal Fluctuations." *Groundwater* 29(4): July–August.

4. CONCLUSIONS

Recovery rates indicate that the active recovery wells (RWs) and extraction wells (EWs) are operating as designed, except for the troubleshooting discussed above. The extraction rates throughout the GWET system will continue to be optimized to meet Target Capture Objectives. Redevelopment of the trenches is planned for September 2024 to mitigate accumulation of silt in the filter pack in both the vertical and horizontal sections using impulse redevelopment techniques. These efforts will be targeted at trenches that are currently underperforming, including Trenches 1, 4, 5, and 6. LSS will continue to optimize new EWs, including pump maintenance and upgrades. Additional modifications to the system, if needed to progress toward capture objectives, will be included in subsequent MPRs. The project schedule provided as Attachment C summarizes planned activities.

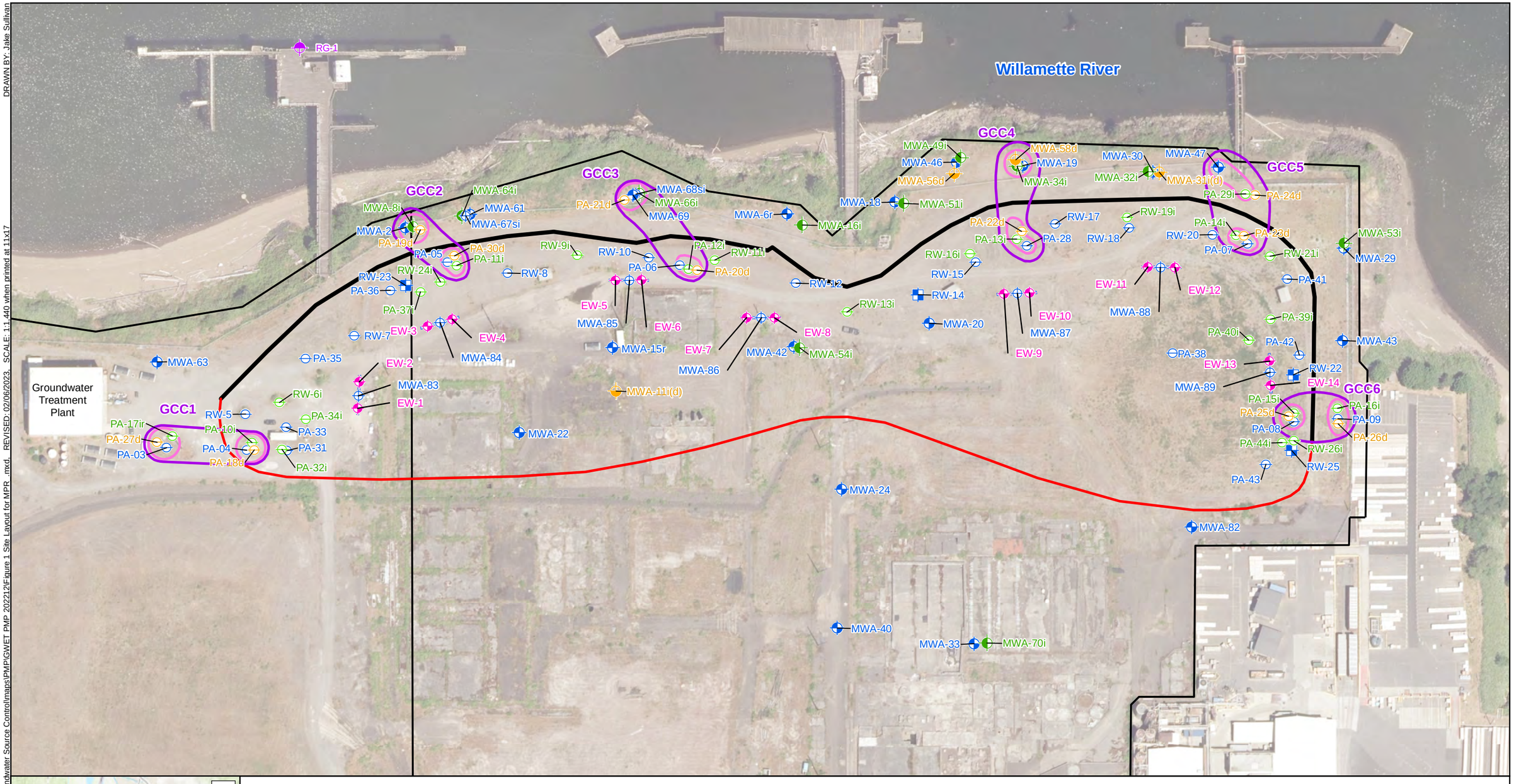
Regards,



Brendan Robinson, PE
Partner

ATTACHMENTS

FIGURES



Legend

- Shallow Zone Monitoring Well
- Intermediate Zone Monitoring Well
- Shallow-Intermediate Zone Monitoring Well
- Deep Zone Monitoring Well
- Shallow Zone Piezometer
- Intermediate Zone Piezometer
- Deep Zone Piezometer
- Shallow Zone Recovery Well
- River Gauge
- Trench Extraction Well
- Target Capture Zone
- Barrier Wall Alignment
- Parcel and Property Boundaries

GradientClusters

Type

- Gradient Control Cluster
- Vertical Flow Cluster
- Extraction Trench

N

0 120 240

Feet

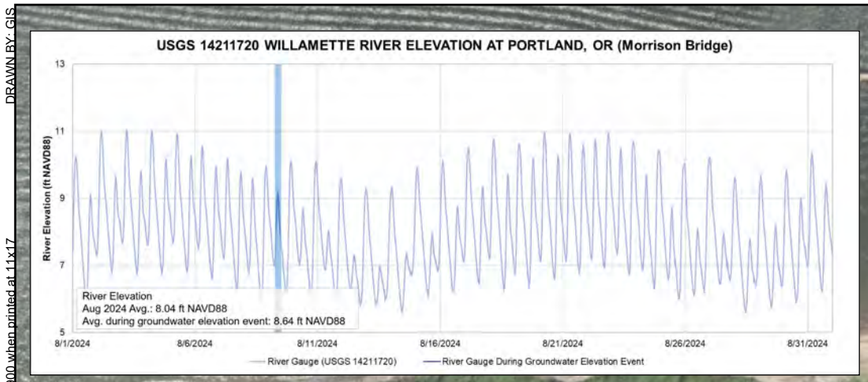
Figure 1
Site Layout
Monthly Progress Report
Groundwater Source Control Measure
Arkema Inc.
Portland, Oregon

Environmental Resources Management
www.erm.com

Source: City of Portland Aerial Imagery, flown Summer 2021; NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl

DRAWN BY: Jake Sullivan

M:\US\Projects\S-U\Total\Arkema_Portland\Groundwater Source Control\maps\PMP\GWET PMP 2022\2Figure 1 Site Layout for MPR_mxd_ REVISED 02/06/2023 SCALE: 1:1,440 when printed at 11x17



Willamette River

Groundwater Treatment Plant

Sand Filter Basin

Detention Basin

MWA-46 9.12
MWA-19 9.24
MWA-47 8.76
MWA-18 9.20
RW-17 13.84
RW-20 13.66
RW-18 13.41
MWA-69 8.58
MWA-2 8.62
MWA-61 8.66
RW-10 10.92
PA-06 11.46
PA-07 13.79
MWA-29 9.47
PA-05 6.71
RW-08 8.13
RW-12 12.27
RW-15 13.61
PA-28 13.97
MWA-88 -1.49
PA-41 17.49
PA-36 5.60
RW-23*
MWA-85 -0.54
MWA-87 1.24
RW-14*
MWA-84 -0.09
MWA-86 4.65
MWA-20 13.35
RW-07 7.05
MWA-15r 10.51
MWA-42 12.34
PA-38 13.73
PA-42 12.40
MWA-43 9.93
MWA-63 9.84
PA-35 8.71
MWA-89 -1.45
RW-22 12.82
RW-05 21.65
MWA-83 7.02
PA-33 23.59
PA-08 12.31
PA-09 11.24
RP-02-31 10.89
MWA-22 15.76
PA-03 24.62
PA-31 25.15
PA-04 25.10
PA-43 12.71
RW-25*
MWA-41 11.79
MWA-24 14.88
MWA-82 13.84
MWA-40 17.36
MWA-33 19.26
RP-10-30 28.33
MWA-71 26.42
MWA-72 29.36
MWA-73 29.07

Legend

- Shallow Zone Piezometer
- Shallow Zone Monitoring Well
- Active Recovery Well; Not Used During Contouring
- Shallow-Intermediate Zone Monitoring Well
- 27.70 Groundwater Elevation (ft NAVD88)
- Shallow Zone Groundwater Contours (ft NAVD88) Dashed where Inferred
- Target Capture Zone
- Barrier Wall Alignment
- Extraction Trench (Not To Scale)

Notes:
* Value not used for contouring.
Water levels collected August, 2024.
ft NAVD88: feet North American Vertical Datum of 1988.
Aerial Photo: City of Portland, Summer 2017.

N

0 160 320
Feet

Figure 2
August 2024 Shallow Zone Groundwater Contours
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

Environmental Resources Management
www.erm.com
ERM

NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl

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SCALE: 1:1,900 when printed at 11x17
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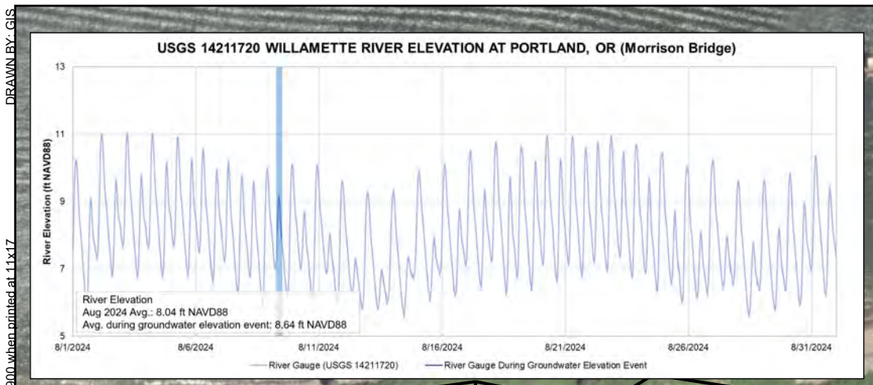

Legend

- Intermediate Zone Piezometer
- Intermediate Zone Monitoring Well
- Shallow-Intermediate Zone Monitoring Well
- 27.70 Groundwater Elevation (ft NAVD88)
- Intermediate Zone Groundwater Contours (ft NAVD88) Dashed where Inferred
- Target Capture Zone
- Barrier Wall Alignment
- Extraction Trench (Not To Scale)

Notes:
* Value not used for contouring.
Water levels collected August, 2024.
ft NAVD88: feet North American Vertical Datum of 1988.
Aerial Photo: City of Portland, Summer 2017.

N

0 160 320
Feet

Figure 3
August 2024 Intermediate Zone Groundwater Contours
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

Environmental Resources Management
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NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl

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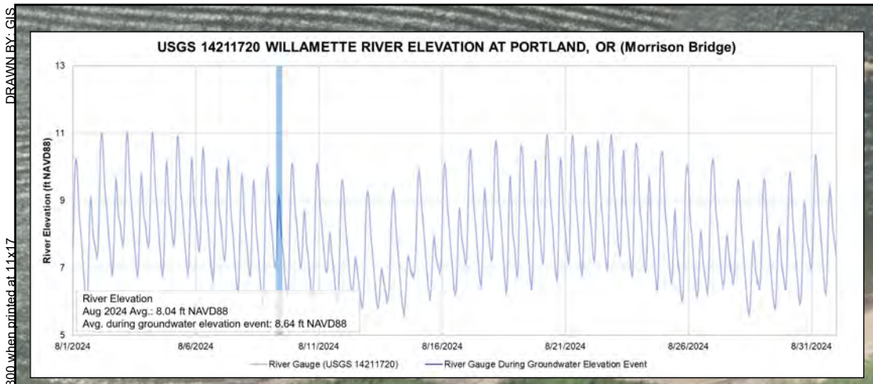

Willamette River

MWA-56d 7.85
MWA-58d 8.57
PA-19d 7.55
PA-21d 8.60
PA-24d 8.35
PA-22d 9.60
PA-23d 8.52
PA-30d 8.41
PA-20d 8.48
MWA-11i(d) 9.59
PA-27d 9.80
PA-18d 9.76
PA-25d 10.38
PA-26d 10.28
MWA-12i(d) 24.36
MWA-77g*
MWA-76g*

8
10
12
14
16
18
20
22

Legend

- Deep Zone Piezometer
- Deep Zone Monitoring Well
- Gravel Zone Monitoring Well
- 27.70 Groundwater Elevation (ft NAVD88)
- Deep Zone Groundwater Contours (ft NAVD88) Dashed where Inferred
- Target Capture Zone
- Barrier Wall Alignment

Notes:
* Value not used for contouring.
Gravel zone wells not used in contouring.
Water levels collected August, 2024.
ft NAVD88: feet North American Vertical Datum of 1988.
Aerial Photo: City of Portland, Summer 2017.

N

0 150 300
Feet

Figure 4
August 2024 Deep Zone Groundwater Contours
Monthly Performance Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

Environmental Resources Management
www.erm.com
ERM

NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl

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Legend

- Shallow Zone Monitoring Well
- Intermediate Zone Monitoring Well
- Shallow Zone Piezometer
- Intermediate Zone Piezometer
- Shallow Zone Recovery Well
- Trench Extraction Well
- Active Recovery Well
- Trench Extraction Well
- Target Capture Zone
- Barrier Wall Alignment
- Extraction Trench
- Gradient Control Cluster
- Vertical Flow Cluster
- Downward Flow
- Upward Flow

Notes:
Brown gradient: Downward flow.
Green gradient: Upward flow.
Vertical gradient calculated as shallow zone minus intermediate zone potentiometric surfaces.
Water levels collected August, 2024.
Aerial Photo: City of Portland, Summer 2017.

N

0 130 260
Feet

Figure 5
August 2024 Shallow to Intermediate Zone Vertical Head Difference
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

Environmental Resources Management
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NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl

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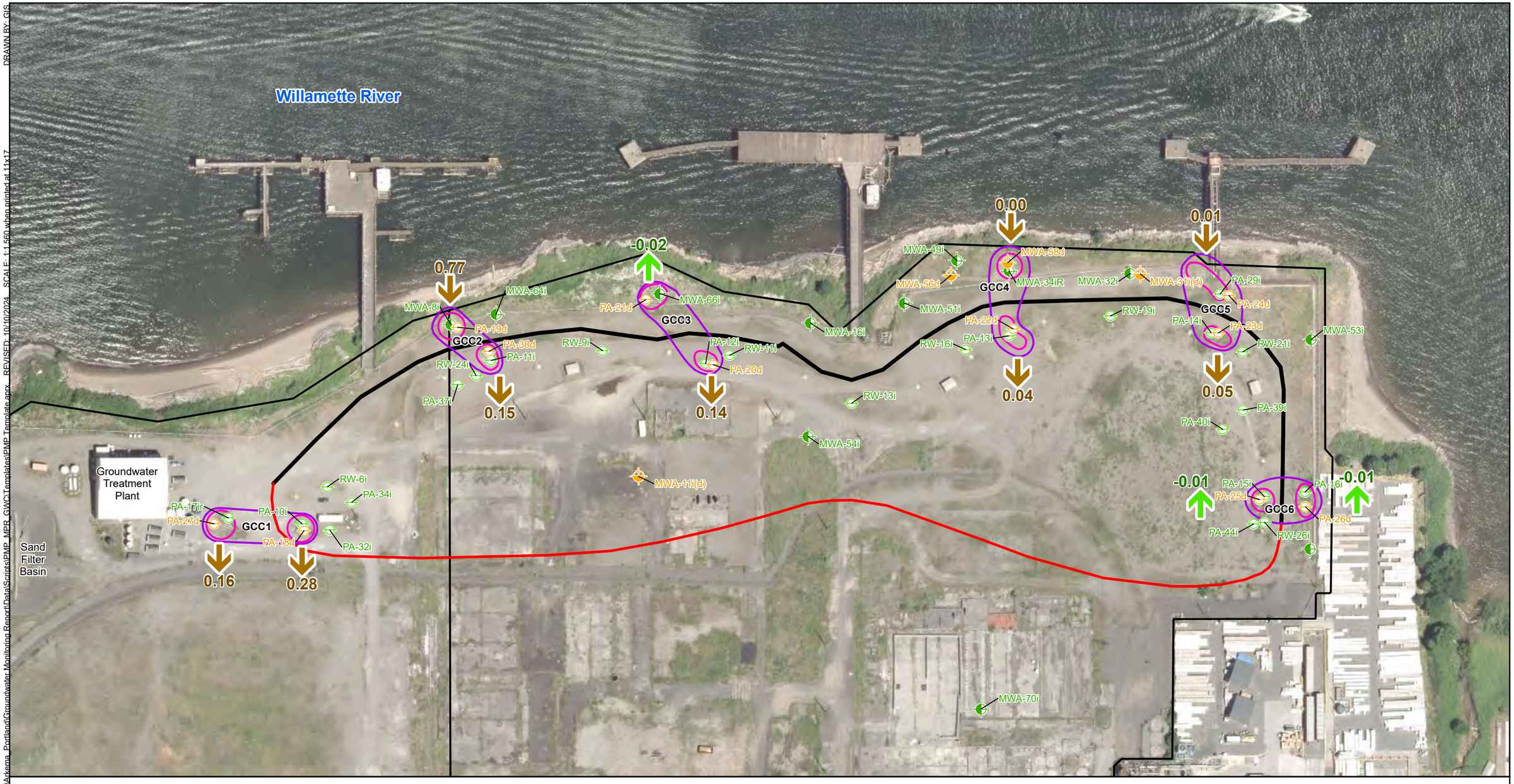

Legend

- Intermediate Zone Monitoring Well
- Deep Zone Monitoring Well
- Intermediate Zone Piezometer
- Deep Zone Piezometer
- Shallow-Intermediate Zone Monitoring Well
- Trench Extraction Well
- Active Recovery Well
- Target Capture Zone
- Barrier Wall Alignment
- Extraction Trench
- Downward Flow
- Upward Flow

Notes:
Brown gradient: Downward flow.
Green gradient: Upward flow.
Vertical gradient calculated as intermediate zone minus deep zone potentiometric surfaces.
Water levels collected August, 2024.
Aerial Photo: City of Portland, Summer 2017.

N

0 130 260
Feet

Figure 6
August 2024 Intermediate to Deep Zone Vertical Head Difference
Monthly Progress Report
Groundwater Source Control Measures
Arkema Inc.
Portland, Oregon

Environmental Resources Management
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NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl

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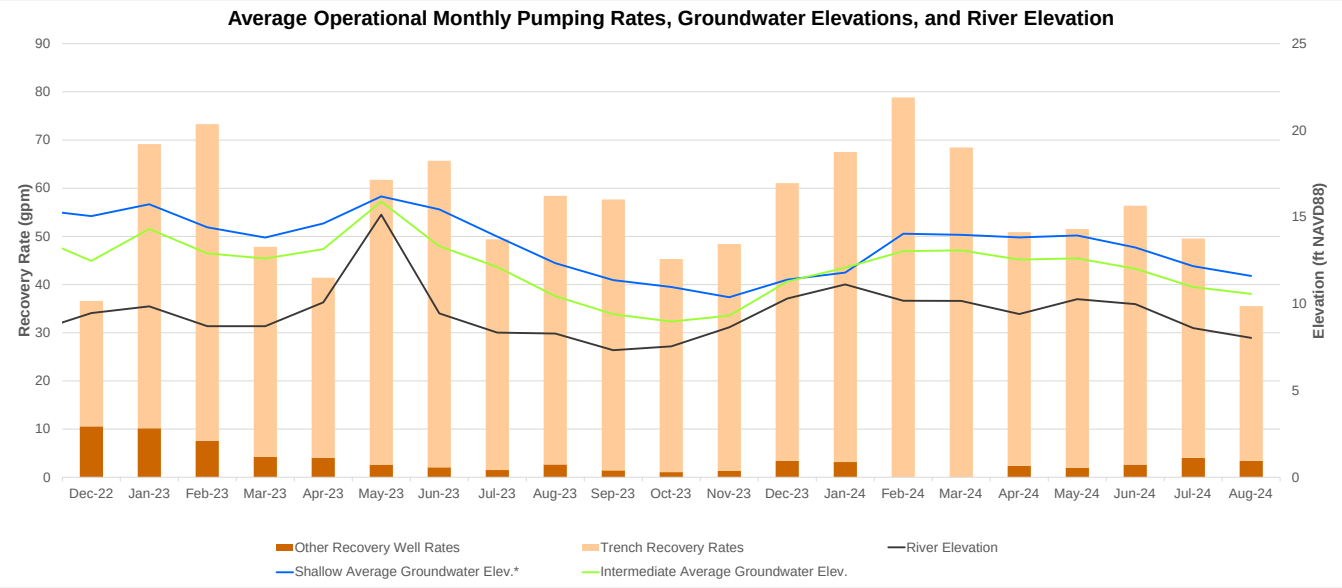
ATTACHMENT A-1 OPERATIONAL PUMPING RATE GRAPH

Attachment A-1

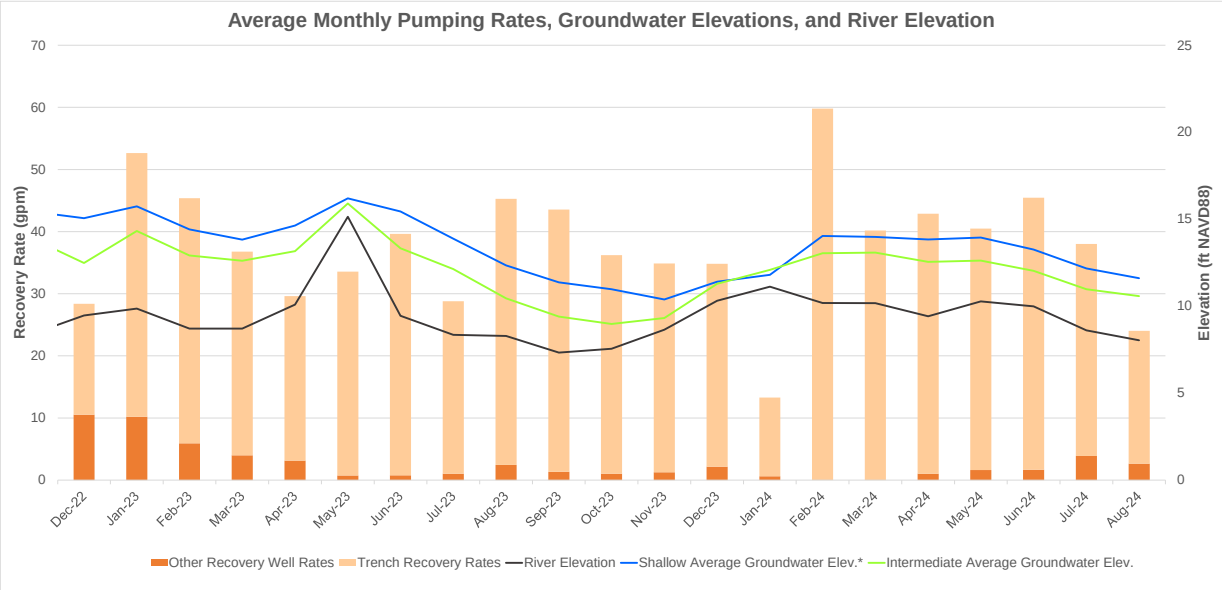
Operational Pumping Rate Graph
Arkema Inc. Facility
Portland, Oregon



ATTACHMENT A-2 AVERAGE MONTHLY PUMPING RATE GRAPH

Attachment A-2

Average Pumping Rate Graph
Arkema Inc. Facility
Portland, Oregon



ATTACHMENT A-3 GWET SYSTEM GROUNDWATER EXTRACTION RATES TABLE

Attachment A-3

GWET System Groundwater Extraction Rates Table
Arkema Inc. Facility
Portland, Oregon

Recovery Well	August 2024 Average Operational Pumping Rate (gpm)	August 2024 Average Monthly Pumping Rate (gpm)
RW-14	1.36	0.92
RW-22*	0.00	0.00
RW-23	0.30	0.24
RW-25	1.77	1.48
EW-01	0.60	0.50
EW-02*	0.00	0.00
EW-03	9.61	8.06
EW-04	0.00	0.00
EW-05	5.20	3.19
EW-06	4.62	1.49
EW-07*	0.00	0.00
EW-08	1.29	1.09
EW-09	1.59	0.41
EW-10	1.76	0.62
EW-11	1.24	0.80
EW-12*	0.00	0.00
EW-13*	0.00	0.00
EW-14	6.22	5.22
Total	35.56	24.03

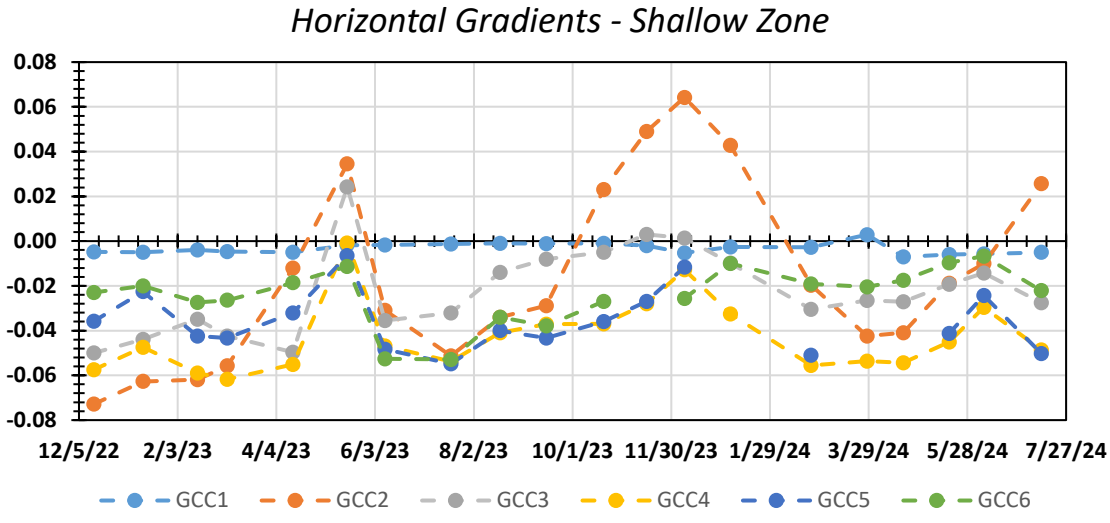
* = Recovery well not in service during reporting period

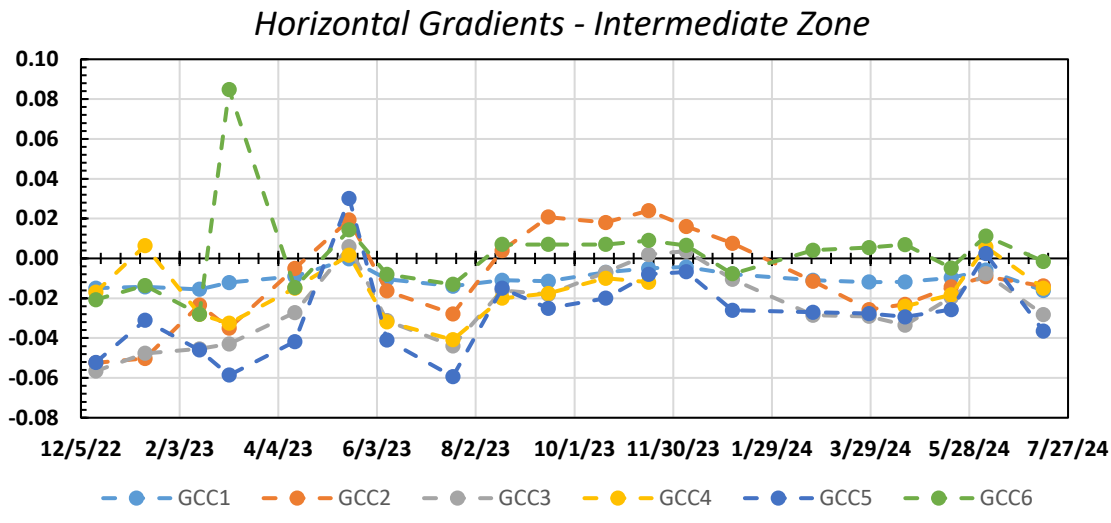
gpm = gallon per minute

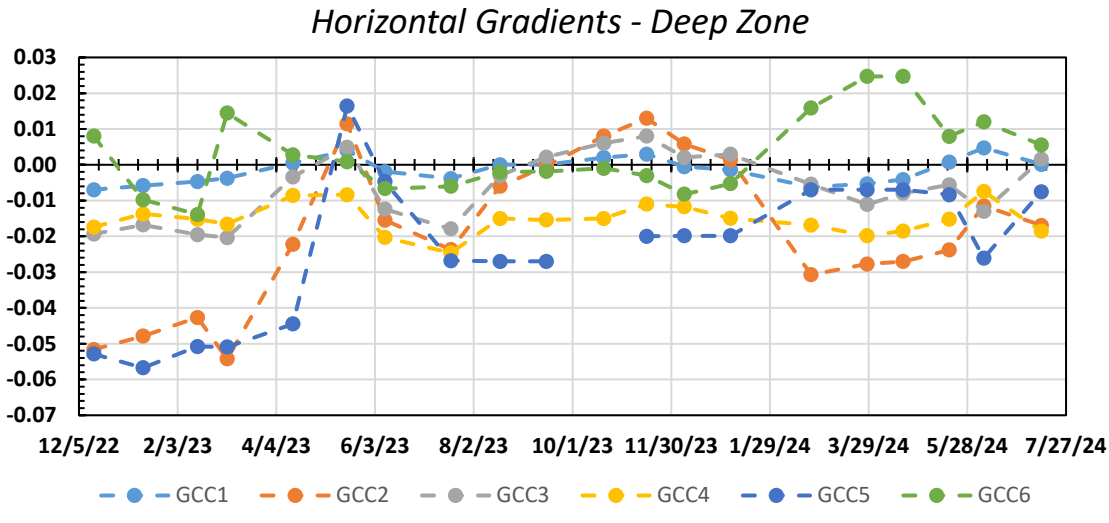
ATTACHMENT B-1 HORIZONTAL GRADIENTS SUMMARY GRAPH

Attachment B-1

Horizontal Gradients Summary: August 2024
Arkema Inc. Facility
Portland, Oregon







Positive horizontal gradient indicates an inward hydraulic gradient across the GWBW.

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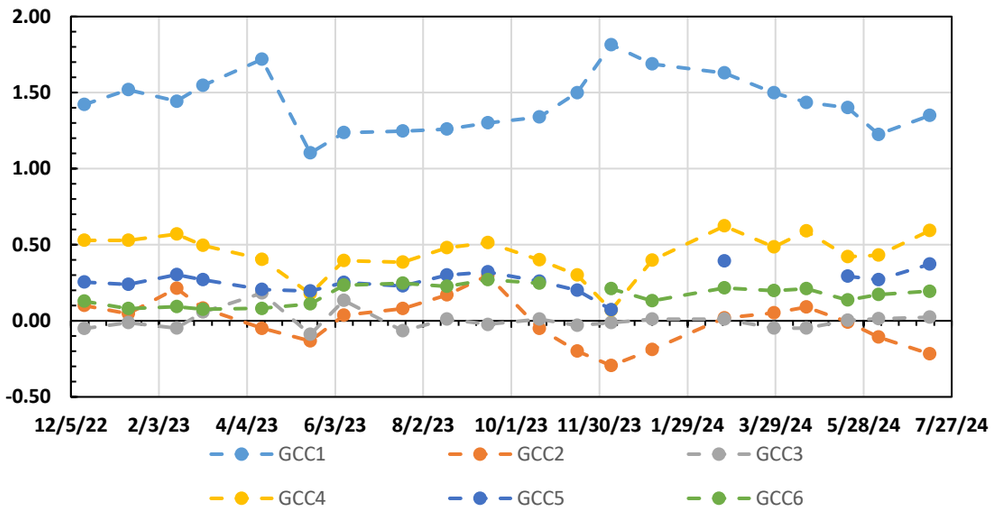
ATTACHMENT B-2 HORIZONTAL GRADIENTS

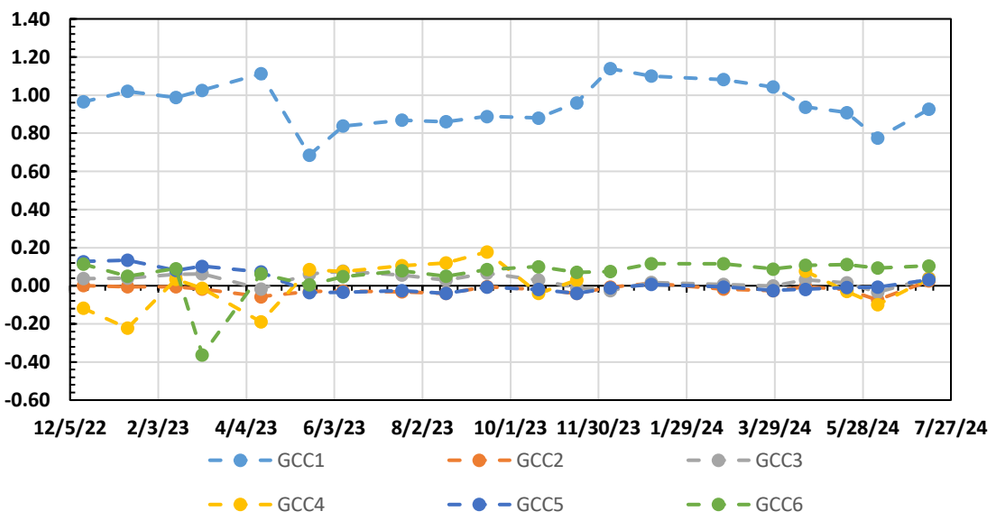
Attachment B-2

Vertical Gradients Summary: August 2024
Arkema Inc. Facility
Portland, Oregon

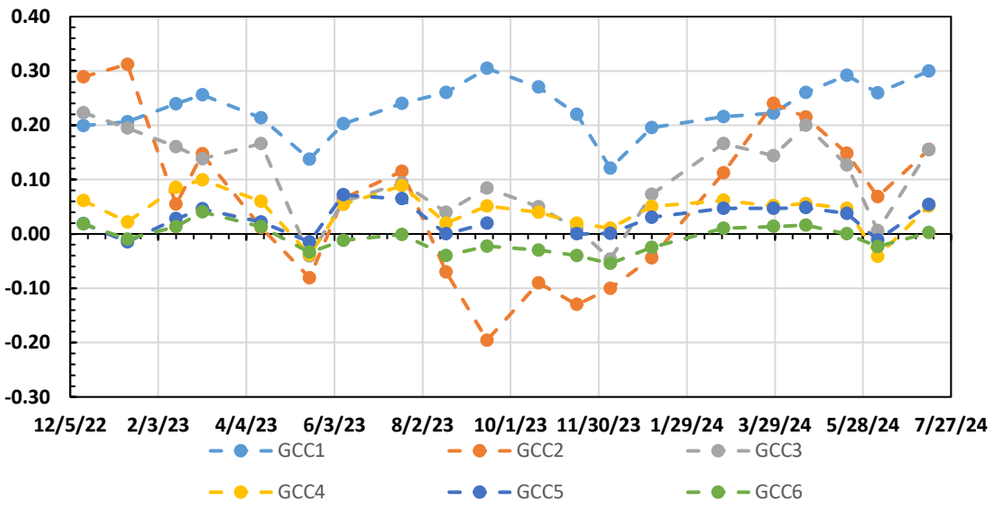
Vertical Gradients - Interior SZ-IZ



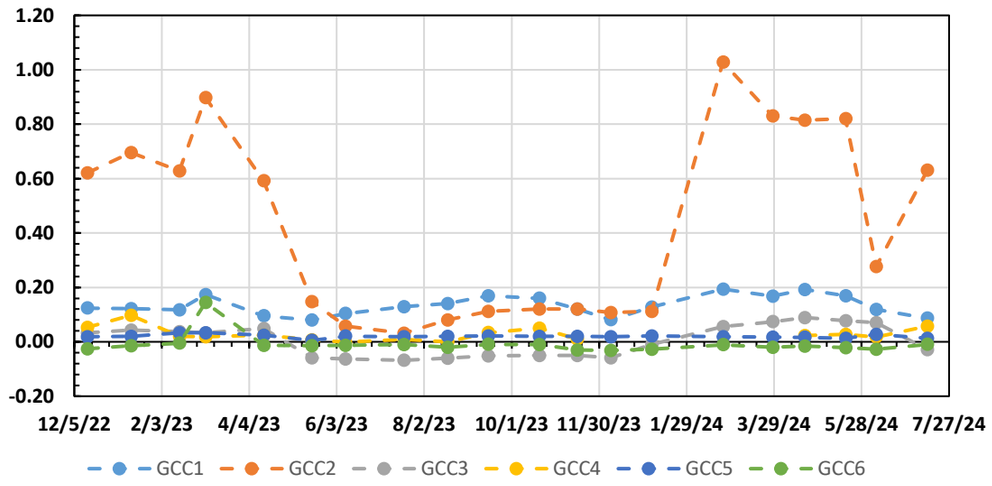
Vertical Gradients - Exterior SZ-IZ



Vertical Gradients - Interior IZ-DZ



Vertical Gradients - Exterior IZ-DZ



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ATTACHMENT B-3 VERTICAL GRADIENTS

Attachment B-3

Water Levels and Horizontal Gradients Table
Arkema Inc. Facility
Portland, Oregon

Gradient Cluster	Well Pair Zone	Exterior Well	Water Elevation (ft NAVD88)	Interior Well	Water Elevation (ft NAVD88)	Horizontal Gradient (ft/ft)
GCC1	Shallow	PA-03	24.62	PA-04	25.10	-0.005
	Intermediate	PA-17iR[M]	10.84	PA-10i	11.84	-0.010
	Deep	PA-27d	9.80	PA-18d	9.76	0.000
GCC2	Shallow	PA-03	8.62	PA-04	6.71	0.028
	Intermediate	PA-17iR[M]	8.75	PA-10i	9.42	-0.009
	Deep	PA-27d	7.55	PA-18d	8.41	-0.016
GCC3	Shallow	PA-03	8.58	PA-04	11.46	-0.027
	Intermediate	PA-17iR[M]	8.36	PA-10i	11.21	-0.025
	Deep	PA-27d	8.60	PA-18d	8.48	0.001
GCC4	Shallow	PA-03	9.24	PA-04	13.97	-0.047
	Intermediate	PA-17iR[M]	8.65	PA-10i	10.37	-0.019
	Deep	PA-27d	8.57	PA-18d	9.60	-0.011
GCC5	Shallow	PA-03	8.76	PA-04	13.79	-0.049
	Intermediate	PA-17iR[M]	8.69	PA-10i	10.34	-0.031
	Deep	PA-27d	8.35	PA-18d	8.52	-0.003
GCC6	Shallow	PA-03	11.24	PA-04	12.31	-0.019
	Intermediate	PA-17iR[M]	9.98	PA-10i	9.90	0.001
	Deep	PA-27d	10.28	PA-18d	10.38	-0.002

Positive horizontal gradient indicates an inward hydraulic gradient across the GWBW.

Horizontal gradient calculated as (Exterior Elevation – Interior Elevation) / Horizontal distance.

* = anonalous groundwater elevation

** = horizontal gradient cannot be calculated due to anomalous elevation reading

ft NAVD88 = feet North American Vertical Datum of 1988

[M] = manual groundwater elevation measurement

ATTACHMENT B-4 WATER LEVELS AND VERTICAL GRADIENTS TABLE

Attachment B-4

Water Levels and Vertical Gradients Table
Arkema Inc. Facility
Portland, Oregon

Region	Pair	Gradient Cluster	Upper Well	Water Elevation (ft NAVD88)	Lower Well	Water Elevation (ft NAVD88)	Vertical Gradient (ft/ft)
Interior	SZ-IZ	GCC1	PA-04	25.10	PA-10i	11.84	1.34
		GCC2	PA-05	6.71	PA-11i	9.42	-0.26
		GCC3	PA-06	11.46	PA-12i	11.21	0.02
		GCC4	PA-28	13.97	PA-13i	10.37	0.56
		GCC5	PA-07	13.79	PA-14i	10.34	0.36
		GCC6	PA-08	12.31	PA-15i	9.90	0.19
	IZ-DZ	GCC1	PA-10i	11.84	PA-18d	9.76	0.28
		GCC2	PA-11i	9.42	PA-30d	8.41	0.15
		GCC3	PA-12i	11.21	PA-20d	8.48	0.14
		GCC4	PA-13i	10.37	PA-22d	9.60	0.04
		GCC5	PA-14i	10.34	PA-23d	8.52	0.05
		GCC6	PA-15i	9.90	PA-25d	10.38	-0.01
Exterior	SZ-IZ	GCC1	PA-03	24.62	PA-17iR[M]	10.84	0.88
		GCC2	MWA-2	8.62	MWA-8i	8.75	-0.01
		GCC3	MWA-69	8.58	MWA-66i	8.36	0.02
		GCC4	MWA-19	9.24	MWA-34iR	8.65	0.09
		GCC5	MWA-47	8.76	PA-29i	8.69	0.01
		GCC6	PA-09	11.24	PA-16i	9.98	0.10
	IZ-DZ	GCC1	PA-17iR[M]	10.84	PA-27d	9.80	0.16
		GCC2	MWA-8i	8.75	PA-19d	7.55	0.77
		GCC3	MWA-66i	8.36	PA-21d	8.60	-0.02
		GCC4	MWA-34iR	8.65	MWA-58d	8.57	0.00
		GCC5	PA-29i	8.69	PA-24d	8.35	0.01
		GCC6	PA-16i	9.98	PA-26d	10.28	-0.01

Positive vertical gradient indicates an donward hydraulic gradient.

Vertical gradient calculated as (Upper Elevation – Lower Elevation) / Screen Midpoint distance.

* = anonalous groundwater elevation

** = vertical gradient cannot be calculated due to anomalous elevation reading

DZ = Deep Zone

ft NAVD88 = feet North American Vertical Datum of 1988

IZ = Intermediate Zone

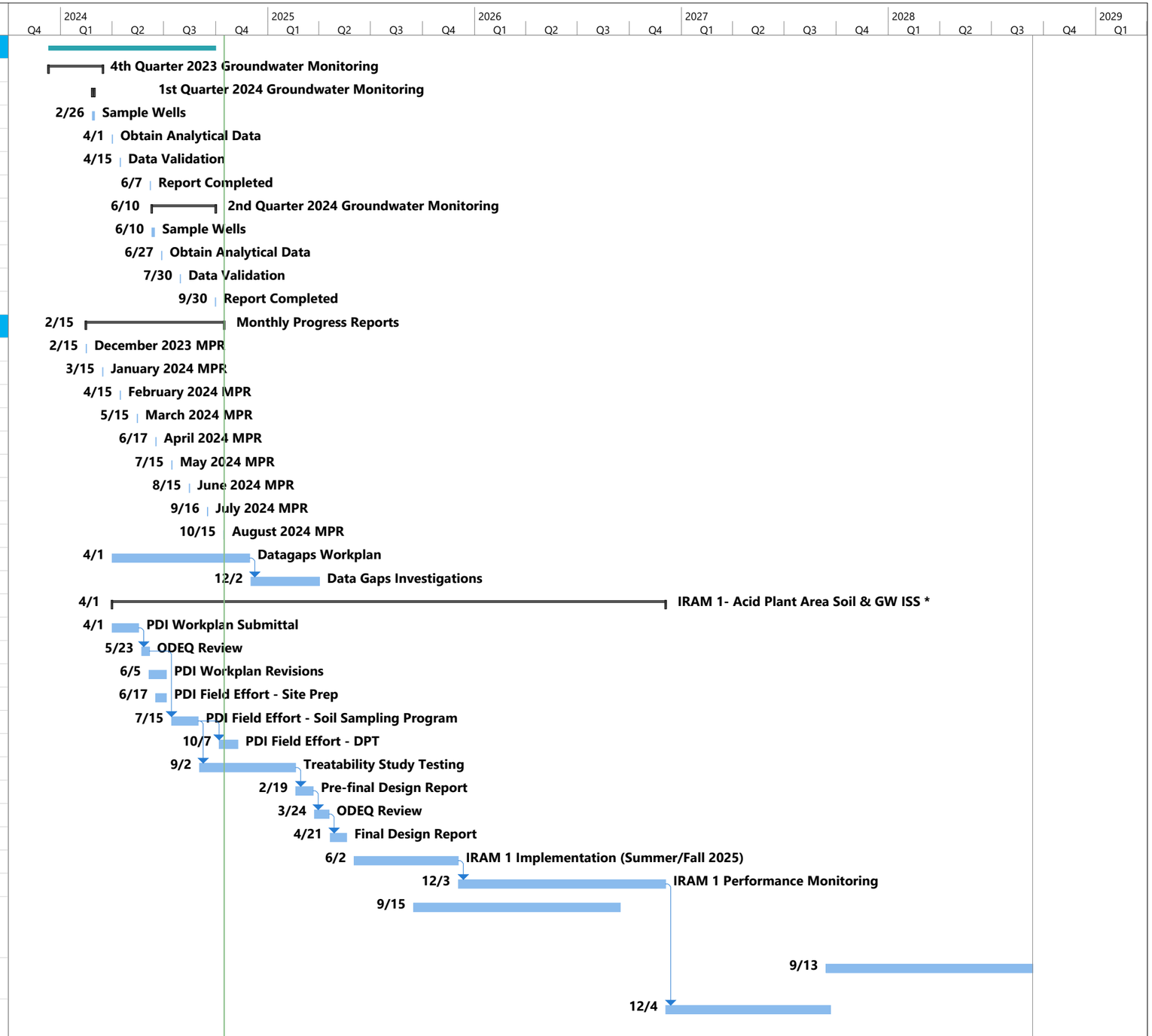
[M] = manual groundwater elevation measurement

SZ = Shallow Zone

ERM

ATTACHMENT C PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Quarterly GW Monitoring**			
2	4th Quarter 2023 Groundwater Monitoring	70 days	Mon 12/11/23	Fri 3/15/24
7	**1st Quarter 2024 Groundwater Monitoring**	**4 days**	**Mon 2/26/24**	**Thu 2/29/24**
8	*Sample Wells*	*4 days*	*Mon 2/26/24*	*Thu 2/29/24*
9	*Obtain Analytical Data*	*1 day*	*Mon 4/1/24*	*Mon 4/1/24*
10	*Data Validation*	*1 day*	*Mon 4/15/24*	*Mon 4/15/24*
11	*Report Completed*	*1 day*	*Fri 6/7/24*	*Fri 6/7/24*
12	**2nd Quarter 2024 Groundwater Monitoring**	**81 days**	**Mon 6/10/24**	**Mon 9/30/24**
13	*Sample Wells*	*5 days*	*Mon 6/10/24*	*Fri 6/14/24*
14	*Obtain Analytical Data*	*1 day*	*Thu 6/27/24*	*Thu 6/27/24*
15	*Data Validation*	*1 day*	*Tue 7/30/24*	*Tue 7/30/24*
16	*Report Completed*	*1 day*	*Mon 9/30/24*	*Mon 9/30/24*
17	**Monthly Progress Reports**	**175 days**	**Thu 2/15/24**	**Tue 10/15/24**
18	*December 2023 MPR*	*1 day*	*Thu 2/15/24*	*Thu 2/15/24*
19	*January 2024 MPR*	*1 day*	*Fri 3/15/24*	*Fri 3/15/24*
20	*February 2024 MPR*	*1 day*	*Mon 4/15/24*	*Mon 4/15/24*
21	*March 2024 MPR*	*1 day*	*Wed 5/15/24*	*Wed 5/15/24*
22	*April 2024 MPR*	*1 day*	*Mon 6/17/24*	*Mon 6/17/24*
23	*May 2024 MPR*	*1 day*	*Mon 7/15/24*	*Mon 7/15/24*
24	*June 2024 MPR*	*1 day*	*Thu 8/15/24*	*Thu 8/15/24*
25	*July 2024 MPR*	*1 day*	*Mon 9/16/24*	*Mon 9/16/24*
26	August 2024 MPR	1 day	Tue 10/15/24	Tue 10/15/24
27	**Datagaps Workplan**	175 days	Mon 4/1/24	Fri 11/29/24
28	**Data Gaps Investigations**	87 days	Mon 12/2/24	Tue 4/1/25
29	**IRAM 1- Acid Plant Area Soil & GW ISS ***	**699 days**	**Mon 4/1/24**	**Thu 12/3/26**
30	*PDI Workplan Submittal*	*35 days*	*Mon 4/1/24*	*Fri 5/17/24*
31	*ODEQ Review*	*10 days*	*Thu 5/23/24*	*Wed 6/5/24*
32	*PDI Workplan Revisions*	*23 days*	*Wed 6/5/24*	*Fri 7/5/24*
33	*PDI Field Effort - Site Prep*	*15 days*	*Mon 6/17/24*	*Fri 7/5/24*
34	*PDI Field Effort - Soil Sampling Program*	*35 days*	*Mon 7/15/24*	*Fri 8/30/24*
35	PDI Field Effort - DPT	25 days	Mon 10/7/24	Fri 11/8/24
36	Treatability Study Testing	122 days	Mon 9/2/24	Tue 2/18/25
37	Pre-final Design Report	23 days	Wed 2/19/25	Fri 3/21/25
38	ODEQ Review	20 days	Mon 3/24/25	Fri 4/18/25
39	Final Design Report	21 days	Mon 4/21/25	Mon 5/19/25
40	IRAM 1 Implementation (Summer/Fall 2025)	132 days	Mon 6/2/25	Tue 12/2/25
41	IRAM 1 Performance Monitoring	262 days	Wed 12/3/25	Thu 12/3/26
42	**IRAM 2-Enhanced ISCR Perchlorate & CrVI In Chlorate Plant Area, if needed (Summer 2026 implementation)**	261 days	Mon 9/15/25	Mon 9/14/26
43	**IRAM 3-Remove Human Health Direct Contact Hot Spots, if needed (Summer 2028 implementation)**	261 days	Mon 9/13/27	Mon 9/11/28
44	**IRAM 4-Enhanced ISCR of Acid Plant Vicinity, if needed (Summer 2027 implementation)**	207 days	Fri 12/4/26	Mon 9/20/27



Arkema Portland
Monthly Progress Report
Attachment C

Task | Summary | Inactive Milestone | Duration-only | Start-only | External Milestone | Manual Progress
Split | Project Summary | Inactive Summary | Manual Summary Rollup | Finish-only | Deadline
Milestone | Inactive Task | Manual Task | Manual Summary | External Tasks | Progress