

Our ref: 11192137-LTR-57

15 July 2024

Ms. Lubna Hussain
Director, West Central Region
Ontario Ministry of the Environment
119 King Street West, 12th floor
Hamilton, ON
L8P 4Y7

LANXESS Canada Co./Cie (LANXESS) Progress Report June 2024

Dear Ms. Hussain

This letter presents a summary of the June 2024 LANXESS Progress Report.

The following noteworthy items regarding the Combined Groundwater Collection and Treatment System (CTS) are discussed in the report text.

The average monthly pumping rates of PW4, PW5, W3R, W5A, W9, and E7 were less than their Target Average pumping rates during June 2024. PW4 was pumping at a slightly reduced flowrate in June 2024; LANXESS suspects either a pump/motor issue or decreased well yield. PW5 continued operating at a reduced pumping rate in June 2024. Despite not meeting the Target Average pumping rate, hydraulic monitoring data indicate PW5 currently generates an effective groundwater capture zone. LANXESS is in the process of connecting the new replacement well PW6 to the existing treatment system infrastructure and is working towards bringing the well online. W3R was shut down between May 31, 2024 and June 4, 2024 and intermittently between June 4 and June 6, 2024 due to additional communication issues. LANXESS replaced cellular components in the W4 communication system which corrected the issue. W5A was shut down from June 16 until June 25, 2024 as the well was unable to maintain its pumping rate due to low water level in the well. The W5A flow issue is currently being investigated. W9 continued pumping at a reduced rate during June 2024. The well pump is running at maximum capacity, therefore, LANXESS believes that the decreased pumping rate is due to an issue with the pump/motor and/or decreased well efficiency. Due to delays with contractor availability, LANXESS has re-scheduled inspection of the pump/motor and possible video inspection of the well for July 2024, subject to contractor availability. E7 was shut down between June 22 and June 28, 2024 as a result of communication issues. The faulty communication components were replaced, and the well was restarted at its Target Average rate on June 28, 2024.

During June 2024, the CTS operated within the Effluent Limits and within the Effluent Objectives for all compounds.

Please refer to the detailed information in the Progress Report for further information on these items.

Regards



Luis Almeida

Project Manager

+1 519 340-3778

luis.almeida@ghd.com

AB/kf/57

Encl.

Copy to: Jason Rice, MECP
Helder Botelho, LANXESS
Hadley Stamm, LANXESS
LANXESS Public Distribution List

Esther Wearing, MECP
Jamie Petznick, LANXESS
Michelle Yantzi, LANXESS

June 2024
Progress Report
LANXESS Canada Co./Cie
Elmira, Ontario

GHD has prepared this report on behalf of LANXESS Canada Co./Cie (LANXESS) and submitted it to the Ontario Ministry of the Environment, Conservation and Parks (MECP). This report complies with the administrative reporting requirements of the November 4, 1991 Control Order (Control Order), the Amended Environmental Compliance Approval (ECA) No. 0831-BX6JGD (Combined On-Site and Off-Site Groundwater Collection and Treatment Systems [CTS]), and Certificate of Approval (C of A) No. 4-0025-94-976 (E7/E9 Treatment Facility).

Unless otherwise stated, all data included in this report were collected in June 2024.

The Progress Report is organized as follows:

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1. Monitoring and Analytical Data

A summary of the LANXESS monitoring programs is provided in Table 1.

A summary of the analytical results for the CTS is presented in Attachment A.

A summary of the analytical results from the monthly June 2024 Environmental Appeal Board (EAB) monitoring of discharges to surface water through storm water outfalls 0200, 0400 and 0800, and the storm water drainage system (SWS), is included in Attachment B. Attachment B is not required under the Control Order but is provided for review.

A summary of the analytical results for surface water samples collected from Canagagigue Creek (the Creek), and groundwater and surface water elevation monitoring completed on June 3, 2024, as required by ECA No. 0831-BX6JGD Section 9, is presented in Attachment C. Further details related to this requirement are described in Section 8 of this report.

2. Correspondence, Meetings, and Events

June 13, 2024 Technical Remediation Advisory Committee (TRAC) meeting

June 14, 2024 May 2024 Progress Report submitted to MECP West Central Region (WCR)

3. CTS Monitoring and Performance

A schematic process flow diagram of the CTS is provided on Figure A.1 (Attachment A).

The June 2024 average pumping rates for the CTS containment wells PW4 and PW5, the CTS extraction wells W3R, W5A, W5B, W6A, W6B, W8 and W9, the Upper Aquifer Containment System (UA CS) wells, and E7, as compared to the target average pumping rates, are listed below, and shown graphically on Figures A.2 and A.3 (Attachment A).

Average Daily Pumping Rates		
June 2024 (Litres/second [L/s])		
Containment and Extraction Wells	Target Average ⁽¹⁾	Average
On Site Wells		
PW4	2.9	2.7
PW5	1.8	0.7
Upper Aquifer Wells	--	0.8
Off Site Wells		
W3R	18.5	15.6
W5A	4.5	1.2
W5B	2.8 ⁽²⁾	4.0
W6A	0.20	0.35
W6B	0.30	0.38
W8	0.05	0.10
W9	13.6	12.2
E7	23.9	18.6
Yara	--	0.3
Notes: (1) As wells and treatment system components require periodic downtime for maintenance, the Target Average pumping rate is set at 90% of the set point rate. GHD recommends that LANXESS maintain the target pumping rates greater than or equal to these rates. (2) The Target Average Pumping Rate for W5B has been temporarily reduced because a plume-wide decrease in groundwater elevations has limited the available drawdown and the corresponding well yield.		

With the exceptions discussed below, the containment and extraction wells, including the UA CS wells, are operating as intended.

The PW4 average monthly pumping rate was slightly less than its Target Average pumping rate in June 2024. PW4 was pumping at a slightly reduced flowrate throughout the month; LANXESS suspects either a pump/motor issue or decreased well yield. LANXESS will schedule inspection of the pump/motor and possible well rehabilitation, subject to contractor availability.

PW5 continued operating at a reduced pumping rate in June 2024. The well is currently unable to maintain its Target Average pumping rate. The PW5 Target Average pumping rate is an internal operational guideline LANXESS uses when operating extraction/containment wells, which includes a significant safety factor. Despite not meeting the Target Average pumping rate, hydraulic monitoring data indicate PW5 currently generates an effective groundwater capture zone. LANXESS is in the process of connecting new replacement well PW6 to the existing treatment system infrastructure and is working towards bringing the well online. Excavation work for the installation of the pit less adapter, effluent pipeline, and communication and power lines will commence in July 2024.

W3R was shut down between May 31, 2024 and June 4, 2024 and intermittently between June 4 and June 6, 2024 due to additional communication issues. LANXESS replaced cellular components in the W4 communication system which corrected the issue.

The pumping rate of W5A was below its Target Average pumping rate in June 2024. W5A was shut down from June 16 until June 25, 2024 as the well was unable to maintain its pumping rate due to low water level in the well. The W5A flow issue is currently being investigated. LANXESS is evaluating next steps as

the system appears to be in good working order. The well was last rehabilitated in May 2023, and the pump and motor were last replaced in July 2023.

W9 continued pumping at a reduced rate during June 2024. The well pump is running at maximum capacity, therefore, LANXESS believes that the decreased pumping rate is due to an issue with the pump/motor and/or decreased well efficiency. Due to delays with contractor availability, LANXESS has re-scheduled inspection of the pump/motor and possible video inspection of the well for the week of July 15, 2024.

E7 was shut down between June 22 and June 28, 2024 as a result of communication issues. The faulty communication components were replaced, and the well was restarted at its Target Average rate on June 28, 2024.

a) Bypass or Upset Conditions

The bypass or upset conditions encountered in the CTS are summarized in Table A.1 (Attachment A).

b) Data Summary and Interpretation

Table A.2 (Attachment A) presents the analytical results for the CTS samples collected in June 2024 and summarizes the effluent pH and temperature. The discharge pH was between 7.09 and 7.21 Standard Units (su), which is within the ECA discharge limit pH range of 5.5 to 9.5 su. The effluent temperature was between 13.4 and 17.8 degrees Celsius (°C), which is less than the discharge limit of 25°C.

The ATS removed ammonia to concentrations that were less than those required by the ECA.

The Combined Discharge Effluent¹ met the Effluent Limits and Effluent Objectives for all indicator parameters in June 2024.

Table A.3 (Attachment A) summarizes the effluent discharge flow rates. The total flow rate of treated groundwater discharged to the Creek via SS+890 was 36.02 L/s. The total flow rate of additional treated groundwater discharged to the Creek via Shirt Factory Creek (at storm water outfall 0800) was 2.33 L/s. The total flow rate of the combined treated groundwater discharged to the Creek (SS+890 discharge plus Shirt Factory Creek discharge) was 38.36 L/s, which was less than the discharge Effluent Limit of 92.2 L/s.

c) Supplementary Data

As part of the ongoing monitoring of on-Site carbon treatment performance, on June 4, 2024, LANXESS collected samples from the carbon tower influent (GCI) and carbon tower effluent (GCE) for volatile organic compound (VOC) and base/neutral and acid extractable compound (BNA) analyses. Table A.4 (Attachment A) presents the GCI and GCE analytical results.

On June 4, 2024, LANXESS collected samples from the influent to and treated effluent from the portable carbon adsorbers installed to pre-treat groundwater from UA CS wells U+500 and U+560. ECA No. 0831-BX6JGD does not require the collection of groundwater samples from UA CS wells; however, LANXESS has been collecting these samples on a voluntary basis to monitor and improve the performance of the on-Site granular activated carbon (GAC) Tower. LANXESS analyzed the samples for VOCs and BNAs. Table A.4 (Attachment A) presents the analytical results for the influent and pre-treated effluent samples from the U+500 and U+560 containment wells.

d) Broad Scan Data

On June 10, 2024, LANXESS collected W3R influent samples and analyzed the samples for the ECA offsite broad scan parameters. Table A.5 (Attachment A) presents the broad scan analytical results.

e) Routine Maintenance

Routine maintenance tasks completed on the CTS in June 2024 are summarized in Table A.6 (Attachment A). These activities are completed by LANXESS personnel as part of on-going preventative maintenance and system inspections. These maintenance activities do not typically cause a system

¹ The Combined Discharge Effluent value was calculated by multiplying the average flow rates by the concentration of the analytes at the SS+890 GE outfall and the additional effluent discharge location via Shirt Factory Creek.

bypass or shutdown and are not required by the Control Order or ECA. This information is being provided to demonstrate LANXESS' commitment to proactively maintain the CTS and ensure continued operations.

f) Receiver Water Quality Data

As per Amended ECA No-0831-BX6JGD, the receiver water quality monitoring program has been reduced from monthly to once every three (3) months. LANXESS will complete the next quarterly routine monitoring event in July 2024.

Summary of Efforts Made and Results Achieved

During June 2024, the CTS operated within the Effluent Limits and within the Effluent Objectives for all compounds.

4. Remedial Action Plan

There are no new activities to report for this item in June 2024.

5. E7 AOP

The average E7 pumping rate (18.6 L/s) was less than its recommended Target Average pumping rate (23.9 L/s) during June 2024 due to communication issues. The influent sample collected on May 29, 2024 contained n-nitrosodimethylamine (NDMA) at a concentration of 0.0512 micrograms per litre ($\mu\text{g/L}$), and the influent sample collected on June 28, 2024 contained NDMA at a concentration of 0.02 $\mu\text{g/L}$. NDMA was not detected in the effluent samples collected on May 29, 2024 (reporting detection limit [RDL] = 0.0170 $\mu\text{g/L}$) and June 28, 2024 (RDL = 0.01 $\mu\text{g/L}$).

6. Environmental Audit

There are no new activities to report for this item in June 2024.

7. Remediation of Former Operating Pond Area

There are no new activities to report for this item in June 2024.

8. Additional Work/Studies

ECA No. 0831-BX6JGD, Section 9 (Upper Aquifer Hydraulic Containment Requirements), states that LANXESS is to operate the UA CS with the requirement that the water level of the surface of the UA₁ in the southwest portion of the property along the west side of the Creek, is maintained at least one (1) centimetre (cm) below the surface water elevation of the Creek, except for periods of time less than 1 day. Exceptions to this requirement include periods of up to 5 days for routine maintenance and/or equipment repair, and periods greater than 5 days because of Creek water level fluctuations beyond the control of the Owner.

Figure C.1 (Attachment C) shows the continuous surface water and groundwater elevations measured at UOW+510 and USW+500 in 2024. The spring freshet and spring rains caused high surface water flows in the Creek and high Creek levels and the continuous monitoring data indicate a local loss of hydraulic containment in these areas. High surface water levels cause Creek bank storage effects. Bank storage effects refer to the inflow of surface water (from the Creek) into surrounding aquifer materials during periods of high levels, which results in a local increase in groundwater elevations. When the surface water elevation undergoes a rapid decrease, the response of the groundwater level in the Creek bank is to decrease, but at a much slower rate than the surface water, resulting in a temporary loss of containment. This is a common occurrence near UOW+510/USW+500 during the spring freshet and other high flow events in the Creek.

The continuous monitoring data indicate that groundwater and surface water elevations decreased throughout the month of June 2024, until June 20, 2024 when there was a significant rainfall event, and again on June 21, 2024 when there was a large increase in the flowrate from the Grand River Conservation Authority (GRCA) Woolwich dam. Elevations gradually decreased through the end of the month. Containment was restored at UOW+510/USW+500 on June 18, 2024 and was maintained throughout the remainder of the month.

When the required differential is not maintained due to Creek water level fluctuations, to demonstrate there are no practical alternatives to prevent the loss of containment, and document no adverse impact to surface water, LANXESS completes the following:

1. Collect manual water elevation measurements to confirm water elevation measurements from select stilling wells, creek bank monitoring wells, and surface water stake locations.
2. Confirm transducers are calibrated and functioning correctly at select continuous monitoring stations.
3. If routine surface water quality data are not available for the periods of time that the 1 cm differential is not maintained, collect monthly surface water monitoring samples along the west bank of the Creek at transect monitoring locations SS-110, SS+855, and the closest existing surface water sampling station to the area where the loss of containment occurred. Have these samples analyzed for the Primary Surface Water Quality Monitoring parameters in Schedule E.

LANXESS completed required groundwater and surface water elevation monitoring on June 3, 2024 and verified the functionality of the transducers. The elevation monitoring locations are presented on Figure C.2 (Attachment C). The difference between the manual surface water elevations and the manual groundwater elevations at the key monitoring pairs completed on June 3, 2024 have been plotted on Figure C.3 (Attachment C).

On June 3, 2024, LANXESS also collected surface water samples from SS-110 West, SS+770 West, and SS+855 West and analyzed the samples for the Schedule E list of parameters. The sampling locations are presented on Figure C.2 (Attachment C). Table C.1 (Attachment C) presents the analytical results for the surface water samples collected in June 2024. All the parameters analyzed as part of the June 2024 sampling event were either not detected at their respective RDLs or were present at concentrations that were less than their respective Provincial Water Quality Objectives (PWQOs), Interim PWQOs (IPWQOs), and/or ECA Schedule E criterion.

Based on the surface water data collected, during the period when the differential was not maintained in June 2024, there are no adverse impacts to the surface water.

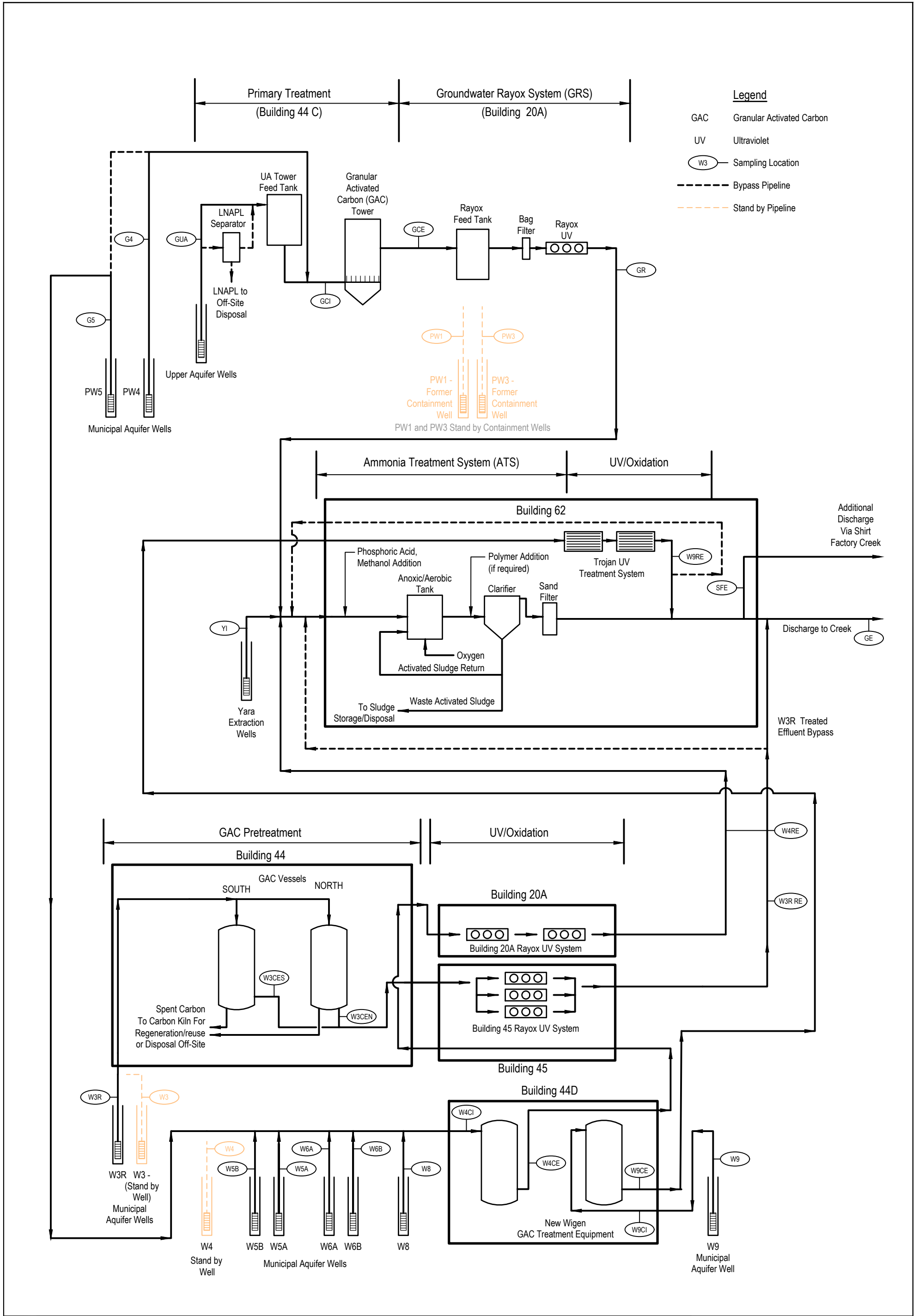
Table 1
Monitoring Program Summary
LANXESS Canada Co./Cie
Elmira, Ontario

Media and Sampling Program	Parameters	Frequency	June 2024 Results Location
Treatment System			
Off-Site Groundwater Collection and Treatment System (Off-Site CTS) Influent	Offsite Broad Scan (Schedule D)	Annual	-
On-Site Groundwater Collection and Treatment System (On-Site CTS) Influent	Effluent Broad Scan (Schedule C)	Annual	-
Combined On-Site and Off-Site Groundwater Collection and Treatment Systems (CTS) Effluent	Indicator parameters	Monthly	Attachment A
	Effluent Broad Scan (Schedule C)	Quarterly	-
CTS Effluent - Acute Toxicity	Not applicable	Quarterly	-
CTS Effluent - Chronic Toxicity	Not applicable	Semi-annual	-
Surface Water			
Environmental Appeal Board (EAB) Sampling	Select VOCs, semi-volatile organic compounds (SVOCs), pesticides, general chemistry	Monthly	Attachment B
Primary Surface Water Quality Monitoring	Indicator parameters	Quarterly	-
	Effluent Broad Scan (Schedule C)	Quarterly	-
Secondary Surface Water Quality Monitoring	Indicator parameters	Quarterly	-
	Effluent Broad Scan (Schedule C)	Quarterly	-
Upper Aquifer Hydraulic Containment Requirement	Schedule E	As required	Attachment C
Receiver Biomonitoring Program – Clams	See Biomonitoring Reports	Biennial (Even Years)	-
Receiver Biomonitoring Program – Benthic		Biennial (Odd Years)	-
Groundwater			
Groundwater Elevation Monitoring Program (GEMP)	Elevation	Semi-annual	-
Upper Municipal Aquifer (MU) Sentry Well Monitoring Program	n-Nitrosodimethylamine (NDMA), chlorobenzene	Semi-annual	-
NAPL Monitoring Program (NMP)	Elevation	Annual	-
Creek Bank Groundwater Monitoring Program – Spring Round	NDMA, chlorobenzene	Annual	-
Creek Bank Groundwater Monitoring Program – Summer Round	Selected pesticides and volatile organic compounds (VOCs)	Annual	-
Off-Site Sentry Well Monitoring Program	NDMA +/- chlorobenzene	Annual	-
Off-Site Plume Monitoring Program	NDMA +/- chlorobenzene	Biennial (Odd Years)	-

Attachment A

Analytical Results

Collection and Treatment System



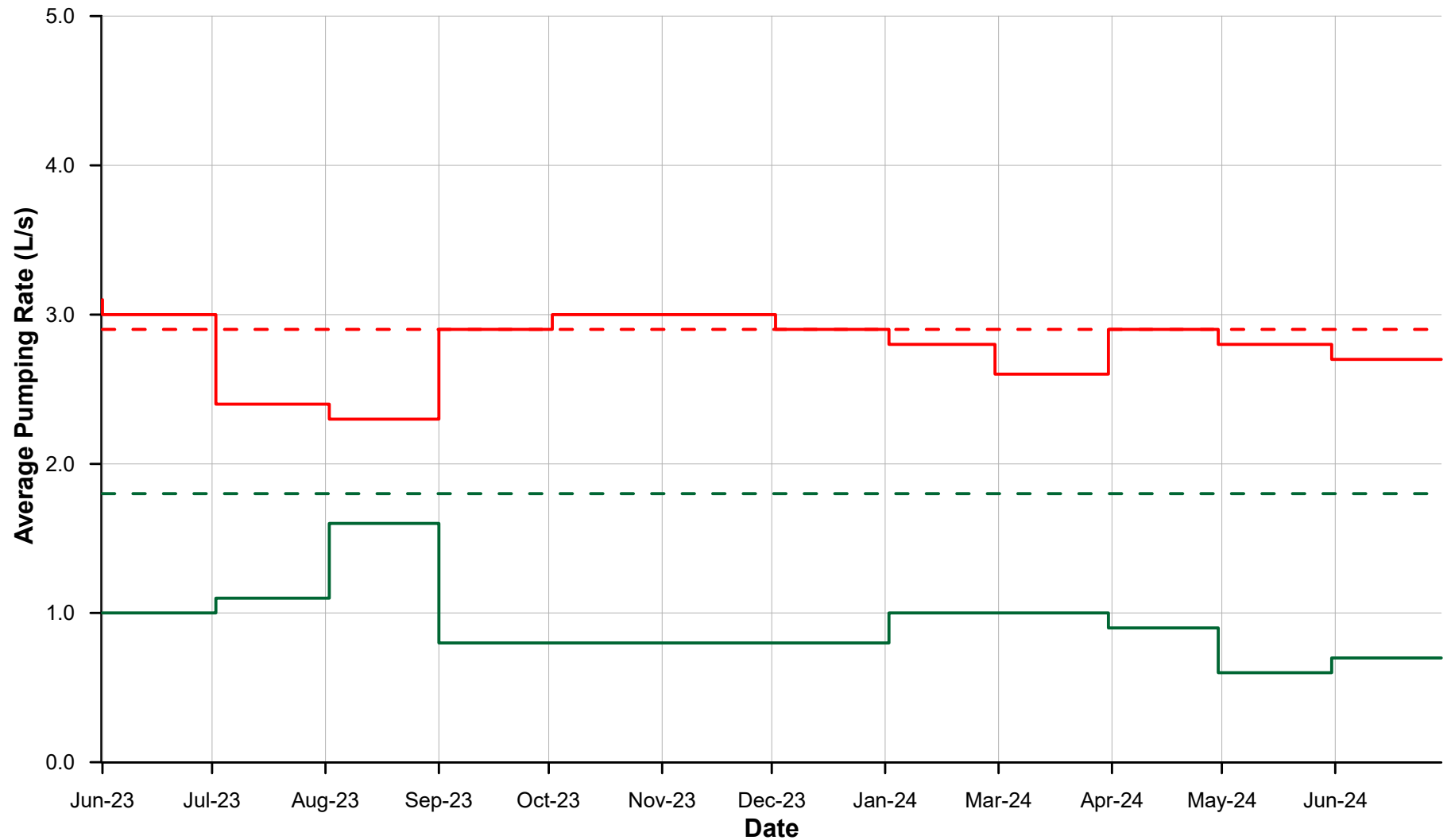
LANXESS CANADA CO./CIE
ELMIRA, ONTARIO

Project No. 11192137
Date June 2024



TREATMENT SYSTEM
PROCESS FLOW SCHEMATIC

FIGURE A.1



- PW4
- - - Target PW4
- PW5
- - - Target PW5

ON-SITE EXTRACTION WELL AVERAGE VS. TARGET PUMPING RATES

LANXESS CANADA CO./CIE

Elmira, Ontario

figure A.2

*Note: Target pumping rates were updated based on the average daily pumping rates recommended in the 2015 Model Check Point Analysis (GHD, June 2016). The Target Average pumping rates are 90% of the recommended daily Set Point pumping rates since the wells and treatment system components require periodic downtime for maintenance.



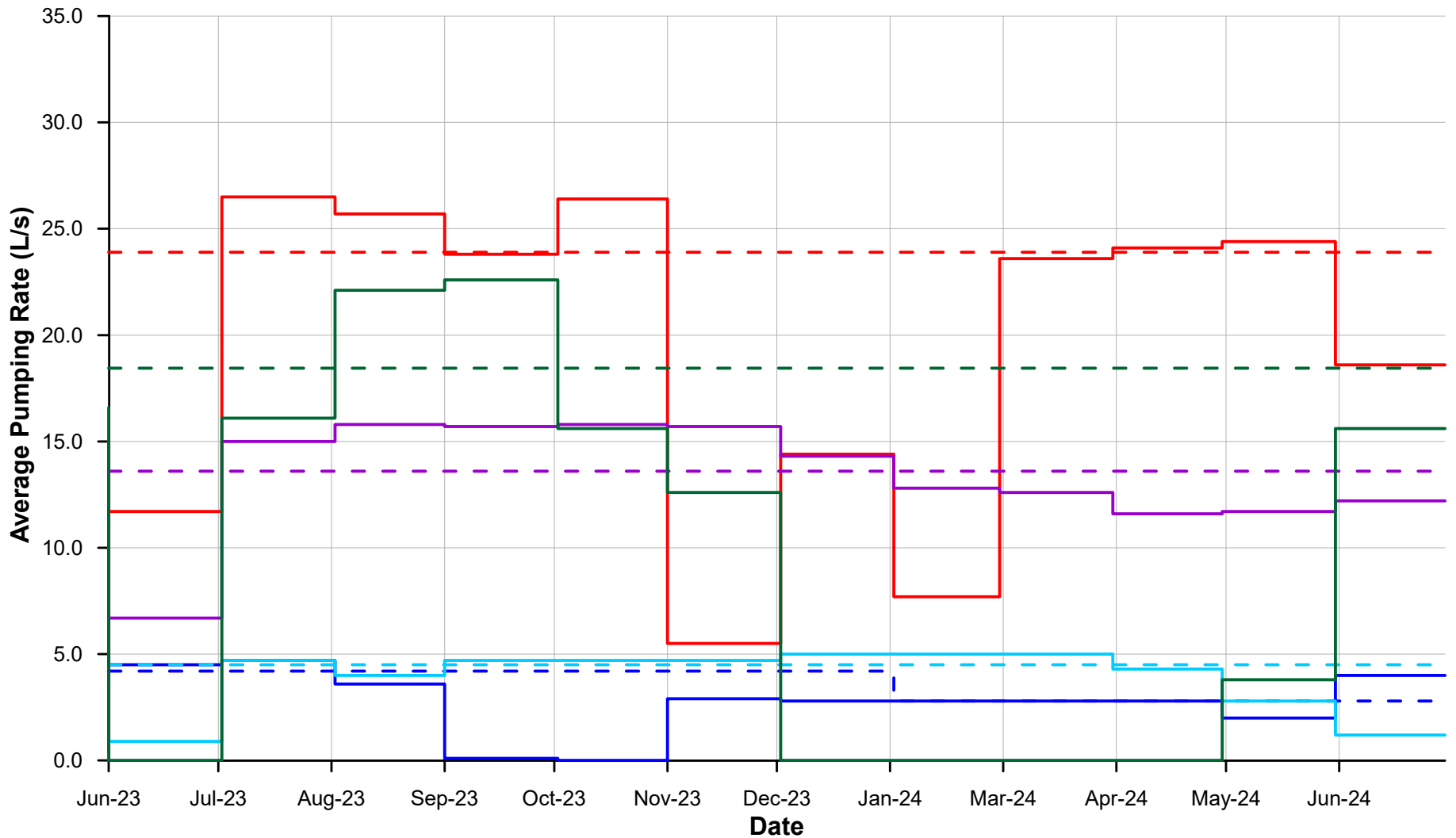


figure A.3a
**OFF-SITE EXTRACTION WELL AVERAGE
 VS. TARGET PUMPING RATES**
 LANXESS CANADA CO./CIE
 Elmira, Ontario



*Note: Target pumping rates were updated based on the average daily pumping rates recommended in the 2015 Model Check Point Analysis (GHD, June 2016). The Target Average pumping rates are 90% of the recommended daily Set Point pumping rates since the wells and treatment system components require periodic downtime for maintenance.

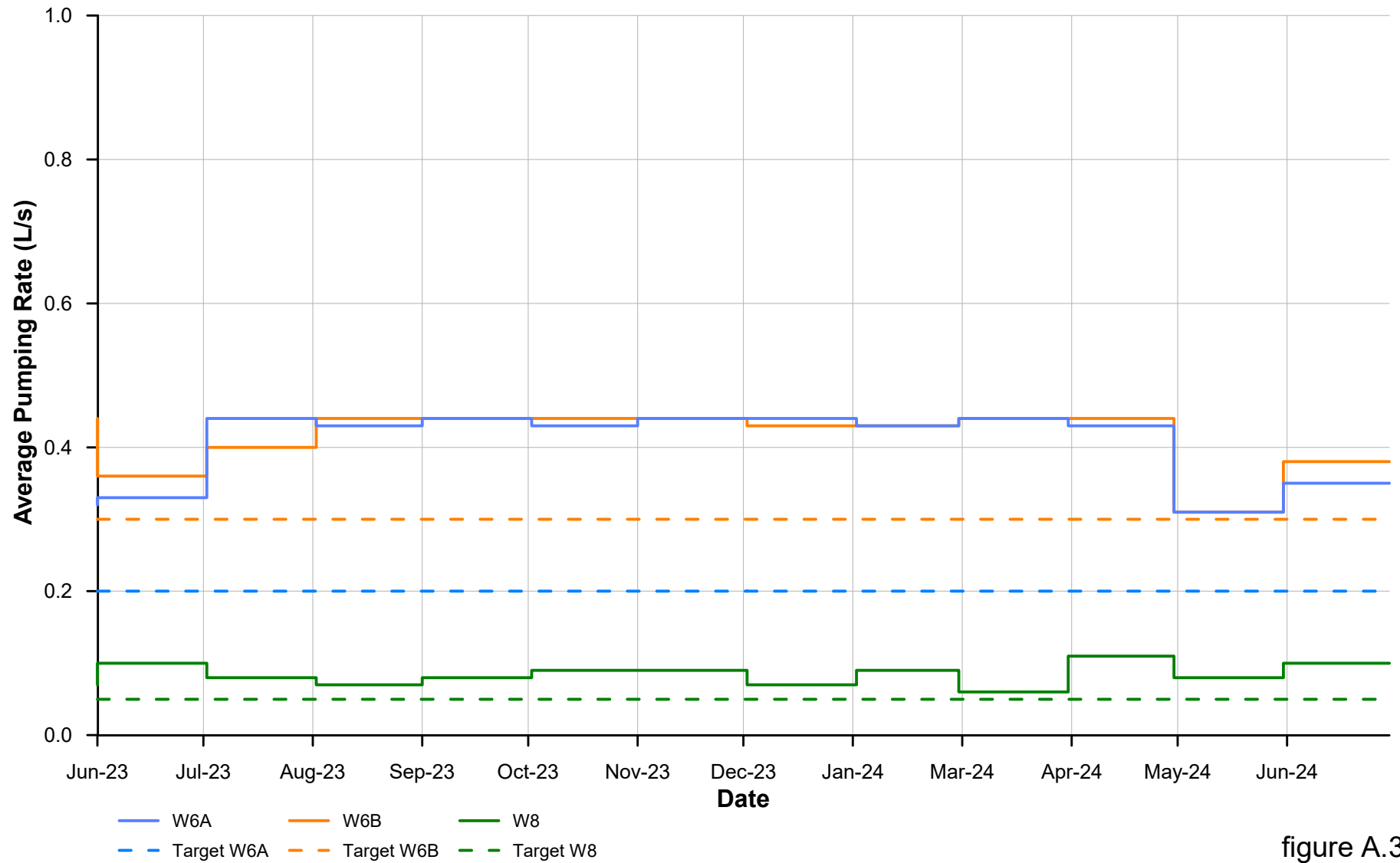


figure A.3b
 OFF-SITE EXTRACTION WELL AVERAGE
 VS. TARGET PUMPING RATES
 LANXESS CANADA CO./CIE
 Elmira, Ontario

*Note: Target pumping rates were updated based on the average daily pumping rates recommended in the 2015 Model Check Point Analysis (GHD, June 2016). The Target Average pumping rates are 90% of the recommended daily Set Point pumping rates since the wells and treatment system components require periodic downtime for maintenance.

LANXESS has reduced the W6A and W6B target average pumping rates as a result of reduced well capacity.



Table A.1

**Performance - Combined On-Site and Off-Site Groundwater Collection and Treatment System
Bypass/Upset Conditions - June 2024
LANXESS Canada Co./Cie
Elmira, Ontario**

ON-SITE GROUNDWATER CONTAINMENT AND TREATMENT SYSTEM

June 20	Shut down at 01:45 due to a power outage, and restarted at 02:30
June 28	Shut down at 07:56 due to an unknown reason, and restarted at 08:40

OFF-SITE GROUNDWATER COLLECTION AND TREATMENT SYSTEM**W3R Groundwater Rayox System**

May 31	Shut down at 00:30 due to loss of communication, and restarted June 4, 2024 at 11:16
June 5	Shut down at 13:48 due to communication issues, and restarted June 6, 2024 at 10:45
June 12	Shut down at 09:00 due to communication issues, and restarted June 13, 2024 at 15:00
June 20	Shut down at 01:45 due to a power outage, and restarted at 07:05
June 25	Shut down at 08:52 due to a power outage, and restarted at 14:57
June 28	Shut down at 07:56 due to an unknown reason, and restarted at 11:05

W5A/W5B/W6A/W6B/W8 Groundwater Rayox System ^[1]

May 27	Shut down at 15:05 due to communication issues, and restarted June 3, 2024 at 15:45
June 5	Shut down at 13:48 due to communication issues, and restarted June 6, 2024 at 10:45
June 10	Shut down at 08:10 due to communication issues, and restarted at 09:25
June 12	Shut down at 09:00 due to communication issues, and restarted June 13, 2024 at 15:00
June 20	Shut down at 01:45 due to a power outage, and restarted at 02:45
June 21	Shut down at 07:45 for PLC replacement, and restarted at 14:10
June 25	Shut down at 08:52 due to a power outage, and restarted at 09:02
June 28	Shut down at 07:56 due to an unknown reason, and restarted at 09:37

W9 Groundwater Trojan UV/Oxidation System

June 20	Shut down at 01:45 due to a power outage, and restarted at 04:00
June 25	Shut down at 08:52 due to a power outage, and restarted at 19:40
June 28	Shut down at 07:56 due to an unknown reason, and restarted at 08:27

Note:

- [1] Groundwater pumped by PW5 is treated in the W5A/W5B/W6A/W6B/W8 Groundwater Rayox and PW5 is, therefore, shut down when the W4/W5A/W5B/W6A/W6B/W8 system is shut down.

Table A.2

Combined On-Site and Off-Site Groundwater Containment and Treatment System
Analytical Results ^[1]
June 2024
LANXESS Canada Co./Cie
Elmira, Ontario

Sample Date	Parameter ^{[2] [3]}	Untreated Influent	Primary Treatment								Secondary Treatment				Tertiary Treatment		Combined Discharge Effluent ^[4]	Combined Discharge Effluent			
			W3R	W3R CEN	W3R CES	W4 CI	W4 CE	W9 CI	W9 CE	GCI	GCE	W3R RE	W4 RE	W9 RE	GR	SFE		GE	Limit	Adjusted Limit ^[5]	Objective
4-Jun-24	Ammonia-N (mg/L)														0.127	0.0448	0.050	0.84 ^[6]	0.84	0.62	
10-Jun-24	Ammonia-N (mg/L)	0.201																			
4-Jun-24	Total Phosphorus (mg/L)														ND(0.0020)	0.0221	0.021	0.5	0.5	--	
4-Jun-24	BOD ₅ (mg/L)														ND(2.0)	ND(2.0)	ND(2.0)	15	15	--	
4-Jun-24	Total Cyanide (µg/L)														ND(2)	ND(2)	ND(2)	14	14	ND(5)	
4-Jun-24	Formaldehyde (µg/L)														ND(2.0)	ND(2.0)	ND(2.0)	24	24	ND(5)	
10-Jun-24	Formaldehyde (µg/L)	ND(2.0)																			
4-Jun-24	pH (s.u.)														7.21	7.09	7.10	5.5 - 9.5	5.5 - 9.5	--	
10-Jun-24	pH (s.u.)	7.31																			
4-Jun-24	Temperature (°C)														13.4	17.8	17.5	<25	<25	--	
10-Jun-24	Temperature (°C)	11.6																			
4-Jun-24	Chlorobenzene (µg/L)		ND(0.20)	ND(0.20)	82.1	3.09	20.4	3.16	2000	6.00	ND(0.20)	16.3	1.63	3.75	1.20	ND(0.30)	0.27	10	12.0	ND(0.5)	
10-Jun-24	Chlorobenzene (µg/L)	25.2																			
24-Jun-24	Chlorobenzene (µg/L)										ND(0.20) UJ	11.2 J	1.97 J	2.51 J	1.53 J	0.24 J					
4-Jun-24	Toluene (µg/L)								70.3	0.53					0.71	ND(0.20)	0.14	5	6.0	ND(0.4)	
10-Jun-24	Toluene (µg/L)	ND(0.20)																			
4-Jun-24	1,1-Dichloroethane (µg/L)								0.44	ND(0.20)					ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	10	10	ND(1)
4-Jun-24	g-BHC (Lindane) (µg/L)														ND(0.0030)	ND(0.0030)	ND(0.0030)	0.14	0.17	ND(0.003)	
4-Jun-24	n-Nitrosodimethylamine (NDMA) (µg/L)										ND(0.0100)	ND(0.0100)	ND(0.0100)	ND(0.0100)	ND(0.01) ^[7]	ND(0.01) ^[7]	ND(0.01)	0.14	0.17	ND(0.01)	
10-Jun-24	NDMA (µg/L)	0.484																			
4-Jun-24	n-Nitrosodiethylamine (NDEA) (µg/L)														ND(0.06) ^[7]	ND(0.06) ^[7]	ND(0.06)	4	4	ND(0.06)	
4-Jun-24	Nitrosomorpholine (NMOR) (µg/L)														ND(0.06) ^[7]	ND(0.06) ^[7]	ND(0.06)	4	4.8	ND(0.06)	
4-Jun-24	Benzothiazole (µg/L)								96.0	ND(2.0)					ND(2.0)	ND(2.0)	ND(2.0)	4	4.8	ND(2)	
10-Jun-24	Benzothiazole (µg/L)	ND(2.0)																			
4-Jun-24	Carboxin (µg/L)								62.8	0.453					ND(0.100)	ND(0.100)	ND(0.100)	7	8.4	ND(2)	

SS+890 Discharge (GE) Flow Rate 36.02 L/s
 Shirt Factory Creek Discharge (SFE) Flow Rate 2.33 L/s
 Total Combined Discharge Effluent Flow 38.36 L/s

Table A.2

Combined On-Site and Off-Site Groundwater Containment and Treatment System
Analytical Results ^[1]
June 2024
LANXESS Canada Co./Cie
Elmira, Ontario

Notes:

- [1] All samples analyzed by ALS Canada Ltd. unless otherwise noted.
- [2] "Parameters" are the parameters identified in ECA No. 0831-BX6JGD.
- [3] The Sample Locations are coded as follows:
- W3R Extraction Well W3R Influent.
- W3R CEN W3R North Carbon Adsorber Effluent. W3R CES W3R South Carbon Adsorber Effluent.
- W4CI W4 Carbon Adsorber Influent. The influent may include influent from W5A, W5B, W6A, W6B, W8 and PW5.
- W4CE W4 Carbon Adsorber Effluent. The effluent may include effluent from W5A, W5B, W6A, W6B, W8 and PW5.
- W9CI W9 Carbon Adsorber Influent. W9CE W9 Carbon Adsorber Effluent.
- GCI On-Site Carbon Tower Influent. GCE On-Site Carbon Tower Effluent.
- W3R RE Effluent from the W3R UV system.
- W4 RE Effluent from the W4 UV system prior to treatment through the ATS. The effluent may include effluent from W5A, W5B, W6A, W6B, W8 and PW5.
- W9 RE Effluent from the W9 Trojan UV/oxidation system. GR On-Site Groundwater Rayox Effluent.
- SFE Additional Effluent Discharge via Shift Factory Creek. GE Effluent Discharge to Canagaguige Creek.
- [4] The Combined Discharge Effluent value is a calculated value determined by using average flow data from GE Effluent Discharge via SS+880 and Additional Effluent Discharge via Shift Factory Creek and monthly sample results from GE and SFE.
- [5] Adjusted Effluent Requirements are applicable to monthly average discharge flows greater than 46.0 L/s.
- [6] Total Ammonia Discharge Effluent Limit value is the greater of: calculated concentration, or 0.84 mg/L (May-October) or 2.4 mg/L (November-April) as per ECA No. 0831-BX6JGD.
- [7] Samples analyzed by the LANXESS lab, Elmira Ontario.
- ND(RDL) Not detected at the associated reporting detection limit.
- UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table A.3
Combined On-Site and Off-Site Groundwater Collection and Treatment System Flow Rates
June 2024
LANXESS Canada Co./Cie
Elmira, Ontario

Date	On-Site Flow Rate ^[1]	Off-Site Flow Rate ^[2]	ATS Influent Flow Rate ^[3]	W3R Bypass Flow Rate	W9 Bypass Flow Rate	SS+890 Discharge Flow Rate	Shirt Factory Creek Discharge Flow Rate (L/s)	Total Combined Discharge Effluent Flow Rate ^[4] (L/s)
	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)
6/1/2024	3.7	12.6	3.8	0.0	12.6	16.4	0.00	16.4
6/2/2024	3.7	12.6	3.8	0.0	12.6	16.4	0.00	16.4
6/3/2024	3.7	15.1	6.4	0.0	12.6	19.0	0.00	19.0
6/4/2024	3.7	30.2	11.4	10.1	12.6	31.5	2.52	34.1
6/5/2024	3.7	34.6	8.5	17.4	12.5	35.9	2.56	38.5
6/6/2024	3.7	41.0	14.2	18.1	12.5	41.5	3.34	44.8
6/7/2024	3.7	40.3	12.7	18.9	12.6	40.4	3.85	44.2
6/8/2024	3.6	40.0	12.6	18.9	12.6	40.4	3.67	44.0
6/9/2024	3.6	40.3	12.8	18.9	12.6	40.5	3.76	44.3
6/10/2024	3.6	40.0	12.5	18.9	12.6	40.2	3.70	43.9
6/11/2024	3.6	40.5	13.0	18.9	12.5	40.2	4.24	44.4
6/12/2024	3.6	25.8	8.2	9.4	12.1	28.3	1.38	29.7
6/13/2024	3.5	23.5	7.4	7.9	12.1	25.6	1.74	27.3
6/14/2024	3.5	39.2	11.8	18.9	12.3	40.3	2.75	43.0
6/15/2024	3.5	39.7	12.5	18.9	12.2	40.3	3.28	43.5
6/16/2024	3.5	39.0	11.8	18.9	12.1	40.4	2.41	42.8
6/17/2024	3.5	37.5	10.4	18.9	12.0	40.3	1.00	41.3
6/18/2024	3.6	37.4	10.4	18.9	11.9	40.3	0.96	41.3
6/19/2024	3.4	37.3	10.3	18.9	11.8	40.1	0.96	41.0
6/20/2024	2.8	30.6	7.7	14.7	11.3	33.3	0.46	33.8
6/21/2024	3.3	38.1	10.3	18.9	12.6	40.3	1.54	41.8
6/22/2024	3.5	38.1	10.4	18.9	12.6	40.2	1.65	41.9
6/23/2024	3.6	37.9	10.5	18.9	12.5	40.1	1.74	41.9
6/24/2024	2.9	37.8	9.8	18.9	12.3	40.4	0.57	41.0
6/25/2024	3.6	29.0	11.9	14.0	7.0	31.9	1.03	32.9
6/26/2024	3.6	40.5	12.9	18.9	12.6	40.0	4.40	44.4
6/27/2024	3.5	40.2	12.5	18.9	12.6	39.8	4.28	44.1
6/28/2024	3.4	36.9	11.9	16.3	12.3	36.9	3.70	40.6
6/29/2024	3.6	40.2	12.6	18.9	12.6	40.0	4.15	44.2
6/30/2024	<u>3.6</u>	<u>40.2</u>	<u>12.6</u>	<u>18.9</u>	<u>12.6</u>	<u>39.8</u>	<u>4.30</u>	<u>44.1</u>
Average	3.5	34.5	10.6	15.6	12.2	36.0	2.33	38.4
Minimum	2.8	12.6	3.8	0.0	7.0	16.4	0.00	16.4
Maximum	3.7	41.0	14.2	18.9	12.6	41.5	4.40	44.8

Notes:

L/s Litres per second

[1] The ECA requires that the influent flow rate to the on-Site Treatment System be less than 5 L/s.

[2] The ECA requires that the influent flow rate to the off-Site Treatment System be less than 87.2 L/s.

[3] The ECA requires that the influent flow rate to the Ammonia Treatment System be less than 46 L/s.

[4] The ECA requires that the monthly average effluent discharge flow rate be less than 92.2 L/s.

Table A.4

Supplementary Sample Analytical Results
June 2024
LANXESS Canada Co./Cie
Elmira, Ontario

Sample Location:	UA500I	UA500CE	UA560I	UA560CE	GCI	GCE
Sample Date:	6/4/2024	6/4/2024	6/4/2024	6/4/2024	6/4/2024	6/4/2024
Parameter [µg/L]						
Volatile Organic Compounds (VOCs)						
Benzene	14.9	4.08	10.6	26.8	9.50	ND(0.20)
Chlorobenzene	642	50.2	296	242	2000	6.00
1,1-Dichloroethane	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	0.44	ND(0.20)
Ethylbenzene	59.0	3.39	48.9	4.87	11.1	ND(0.20)
Toluene	1880	380	1280	2560	70.3	0.53
m/p-Xylenes ^[1]	102	4.92	118	6.98	10.8	ND(0.40)
o-Xylene ^[1]	62.6	3.48	67.6	4.47	6.38	ND(0.20)
Base/Neutral and Acid Extractable Compounds (BNAs)						
Aniline	699	294	650	1360	48.5	ND(2.0) UJ
Benothiazole	1780	54.2	23.6	5.7	96.0	ND(2.0)
Carboxin (Oxathiin)	1360	81.1	870	12.6	62.8	0.453
2-Chlorophenol	5.94	1.70	0.33	13.8	3.71	ND(0.30)
2-Mercaptobenzothiazole	3040	150	29	ND(25)	298	ND(20)
2,4-Dichlorophenol	20.4 J+	2.34 J+	ND(0.40)	ND(1.00)	0.50 J+	ND(0.20)
2,6-Dichlorophenol	1.96	0.34	ND(0.20)	0.27	0.38	ND(0.20)
2,4,5-Trichlorophenol	10.5	0.80	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2,4,6-Trichlorophenol	3.03	0.42	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)

Notes:

UA500I	Influent to the installed UA500R portable carbon drum.
UA500CE	Effluent from the installed UA500R portable carbon drum.
UA560I	Influent to the installed UA560 portable carbon drum.
UA560CE	Effluent from the installed UA560 portable carbon drum.
GCI	Carbon Tower Influent.
GCE	Carbon Tower Effluent.
ND(RDL)	Not detected at the associated reporting detection limit.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
J+	The result is an estimated quantity, but the result may be biased high.
[1]	Samples analyzed for m,p-Xylenes and o-Xylene only. No separate analysis for Total Xylenes.

Table A.5

**Off-Site Groundwater Collection and Treatment System
Influent Broad Scan Analytical Results - June 2024
LANXESS Canada Co./Cie
Elmira, Ontario**

Parameter [$\mu\text{g/L}$ unless otherwise noted] ^[1]	Sample Station
	W3R
<u>General Chemistry</u>	
Ammonia as N (mg/L)	0.201
Formaldehyde	ND(2.0)
pH (field)	7.31
Temperature (field) ($^{\circ}\text{C}$)	11.6
<u>Volatile Organic Compounds (VOCs)</u>	
Benzene	ND(0.20)
Chlorobenzene	25.2
Toluene	ND(0.20)
<u>Base/Neutral/Acid Extractables and Nitrosoamines</u>	
Aniline	ND(2.0)
Benzothiazole	ND(2.0)
n-Nitrosodimethylamine (NDMA)	0.484
<u>Metals (mg/L)</u>	
Aluminum	0.0086
Arsenic	0.00315
Beryllium	ND(0.000020)
Boron	0.054
Chromium	ND(0.00050)
Cobalt	0.00014
Copper	ND(0.00050)
Iron	1.04
Lead	ND(0.000050)
Nickel	ND(0.00050)
Vanadium	ND(0.00050)
Zinc	ND(0.0030)

Notes:

ND(RDL) Not detected at the associated reporting detection limit.

[1] Analyses completed by ALS Canada Ltd. unless otherwise noted.

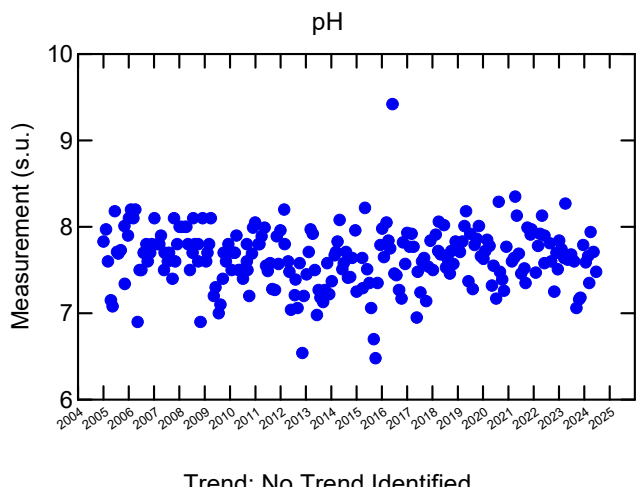
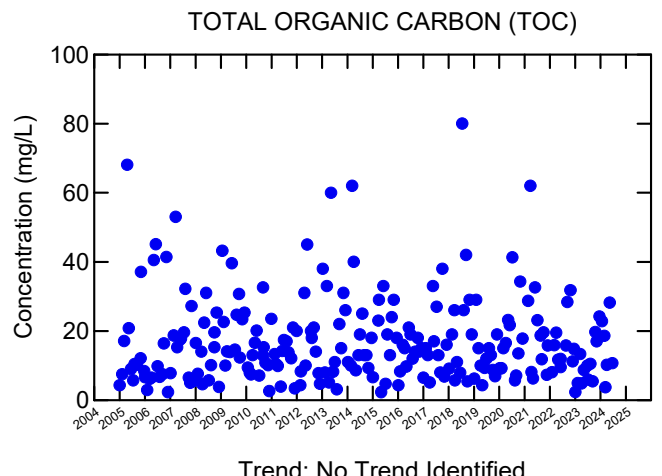
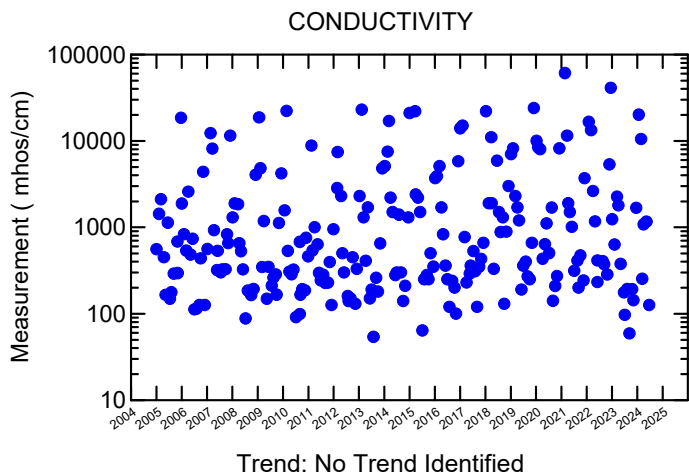
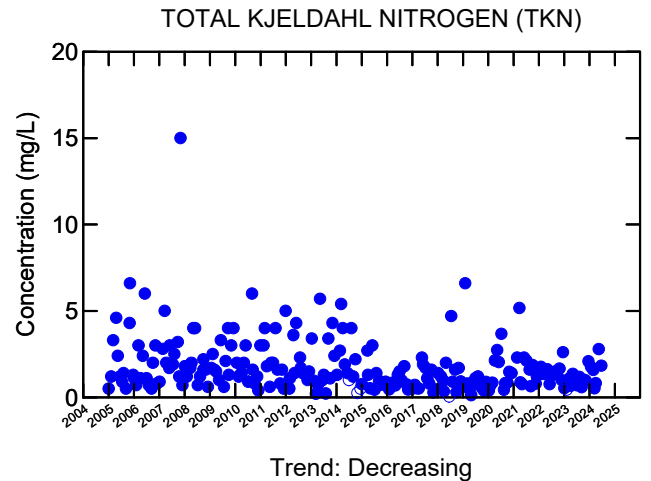
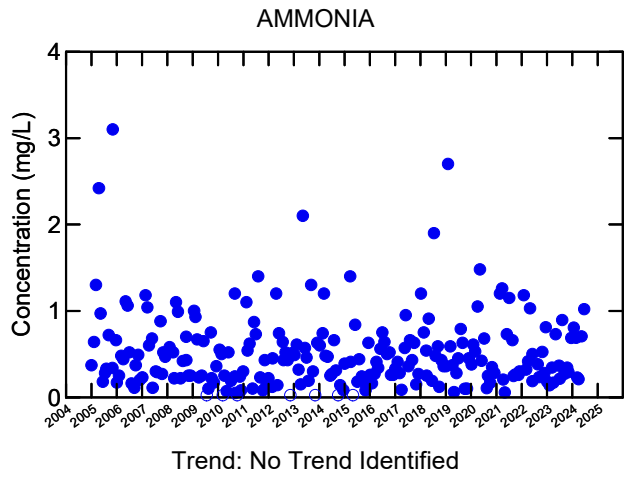
Table A.6

Maintenance Summary
On-Site and Off-Site Groundwater Collection and Treatment System
June 2024
LANXESS Canada Co./Cie
Elmira, Ontario

Start Date	Description	Work Type
06/06/2024	Check Fuses in Bldg. #62 North Aeration Pump	Electrical
06/06/2024	Communication from Bldg. #20 to W4	Instrumentation
06/06/2024	ATS South RAS Pump Turning but Not Pumping	Mechanical
06/07/2024	W6A Well Level Transmitter PV Won't Run	Instrumentation
06/11/2024	Change UA Carbon Drum U+560	Piping
06/18/2024	Check 62-LSHH-890 (62TA-03) - Bldg. #62 South Sump Level High-High Switch	Instrumentation
06/19/2024	Repair E7 South Compressor	Mechanical
06/20/2024	Repair Leak on North Carbon Adsorber in Bldg. #44D	Piping
06/26/2024	Check Communication with W9 and W8	Instrumentation

Attachment B

EAB Data



Legend:

- Detected Result
- Non-detect (plotted at one half the detection limit)

Notes:

Any detection limits elevated above target detection limit and/or detected values were not included in the trend analysis.

No Trend: trend analysis did not detect a significant trend above 95 percent confidence.

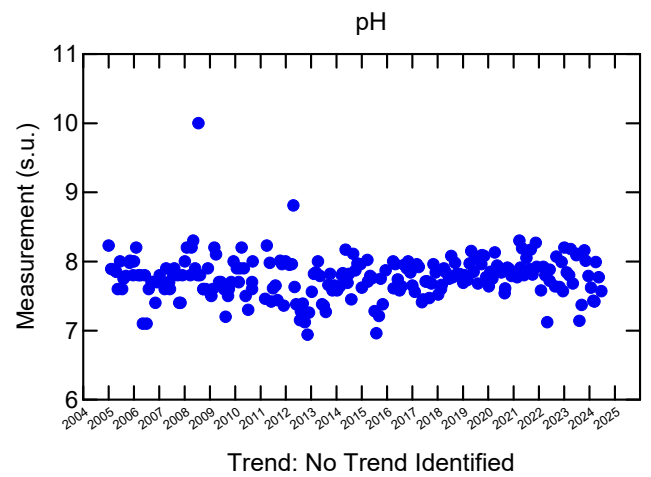
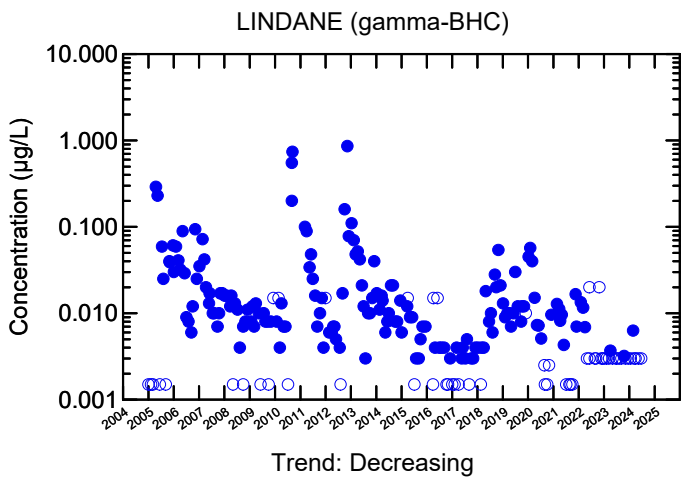
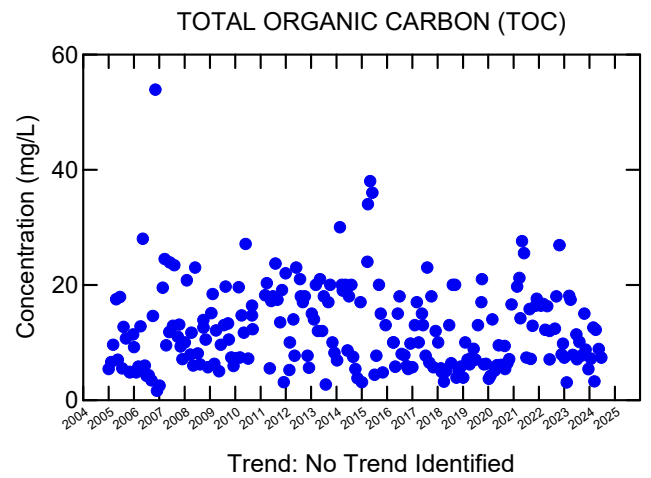
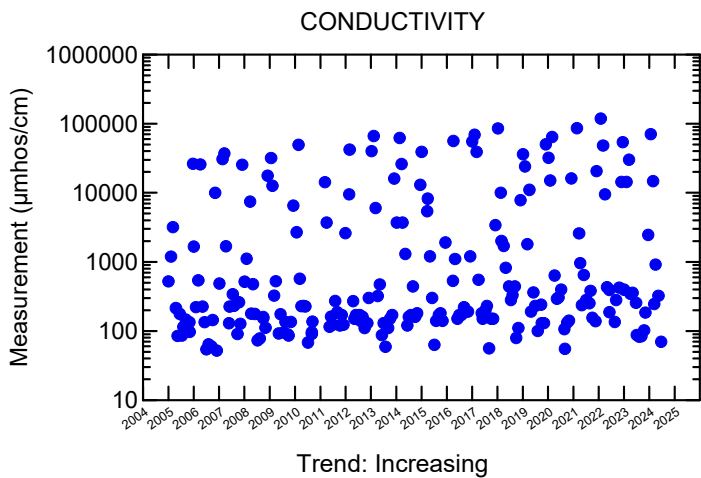
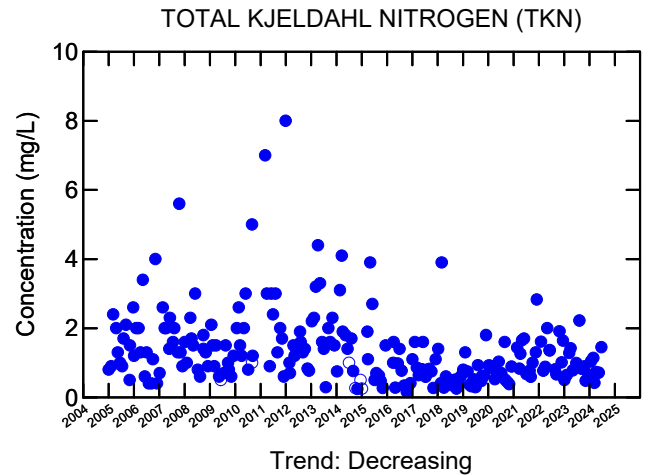
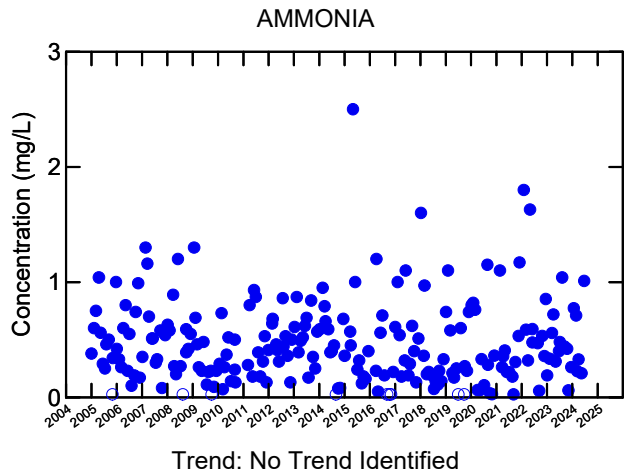


LANXESS Canada Co./Cie
Elmira, Ontario

Project No. 11192137-38
Date: July 11, 2024

ANALYTE CONCENTRATION vs. TIME
STORM WATER OUTFALL 0200

FIGURE B.1



Legend:

- Detected Result
- Non-detect (plotted at one half the detection limit)

Notes:

Any detection limits elevated above target detection limit and/or detected values were not included in the trend analysis.
 No Trend: trend analysis did not detect a significant trend above 95 percent confidence.

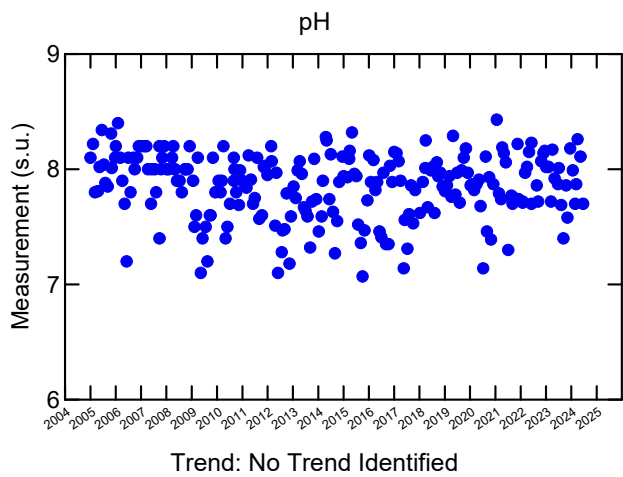
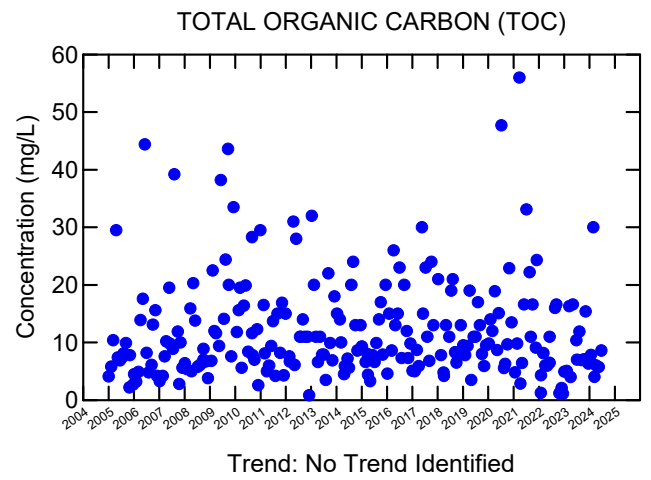
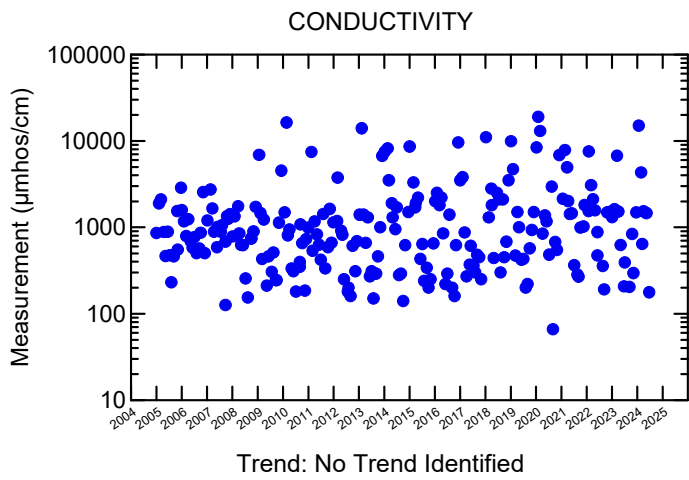
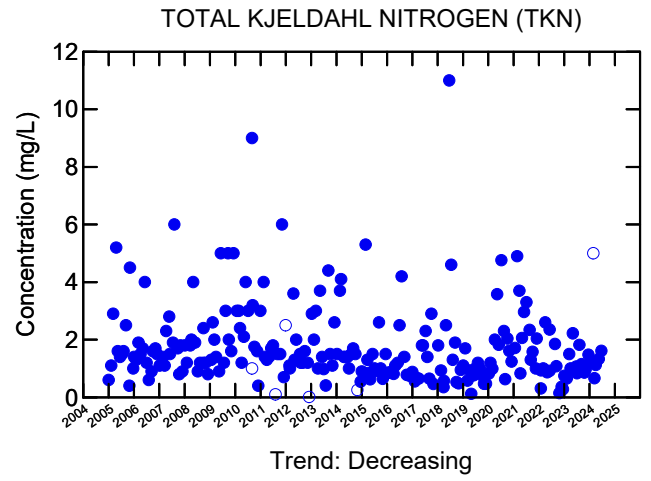
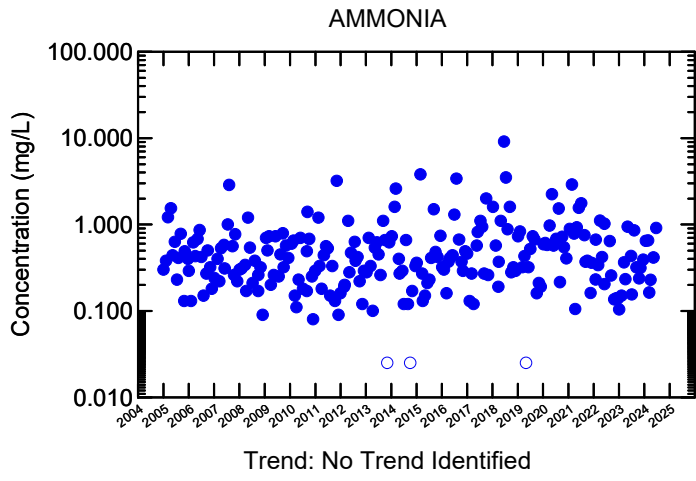


LANXESS Canada Co./Cie
 Elmira, Ontario

**ANALYTE CONCENTRATION vs. TIME
 STORM WATER OUTFALL 0400**

Project No. 11192137-38
 Date: July 11, 2024

FIGURE B.2



Legend:

- Detected Result
- Non-detect (plotted at one half the detection limit)

Notes:

Any detection limits elevated above target detection limit and/or detected values were not included in the trend analysis.
 No Trend: trend analysis did not detect a significant trend above 95 percent confidence.

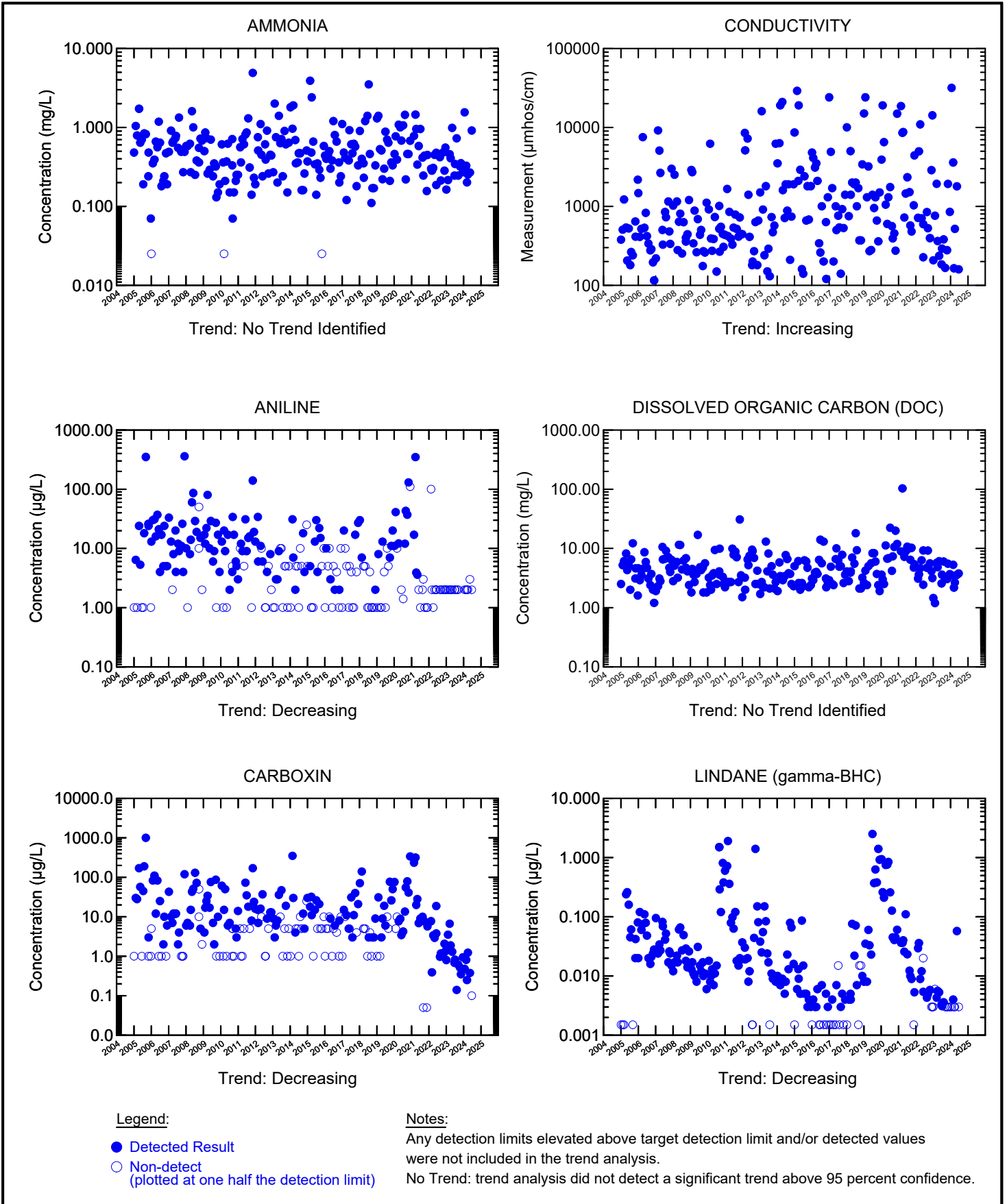


LANXESS Canada Co./Cie
 Elmira, Ontario

Project No. 11192137-38
 Date: July 11, 2024

ANALYTE CONCENTRATION vs. TIME
STORM WATER OUTFALL 0800

FIGURE B.3

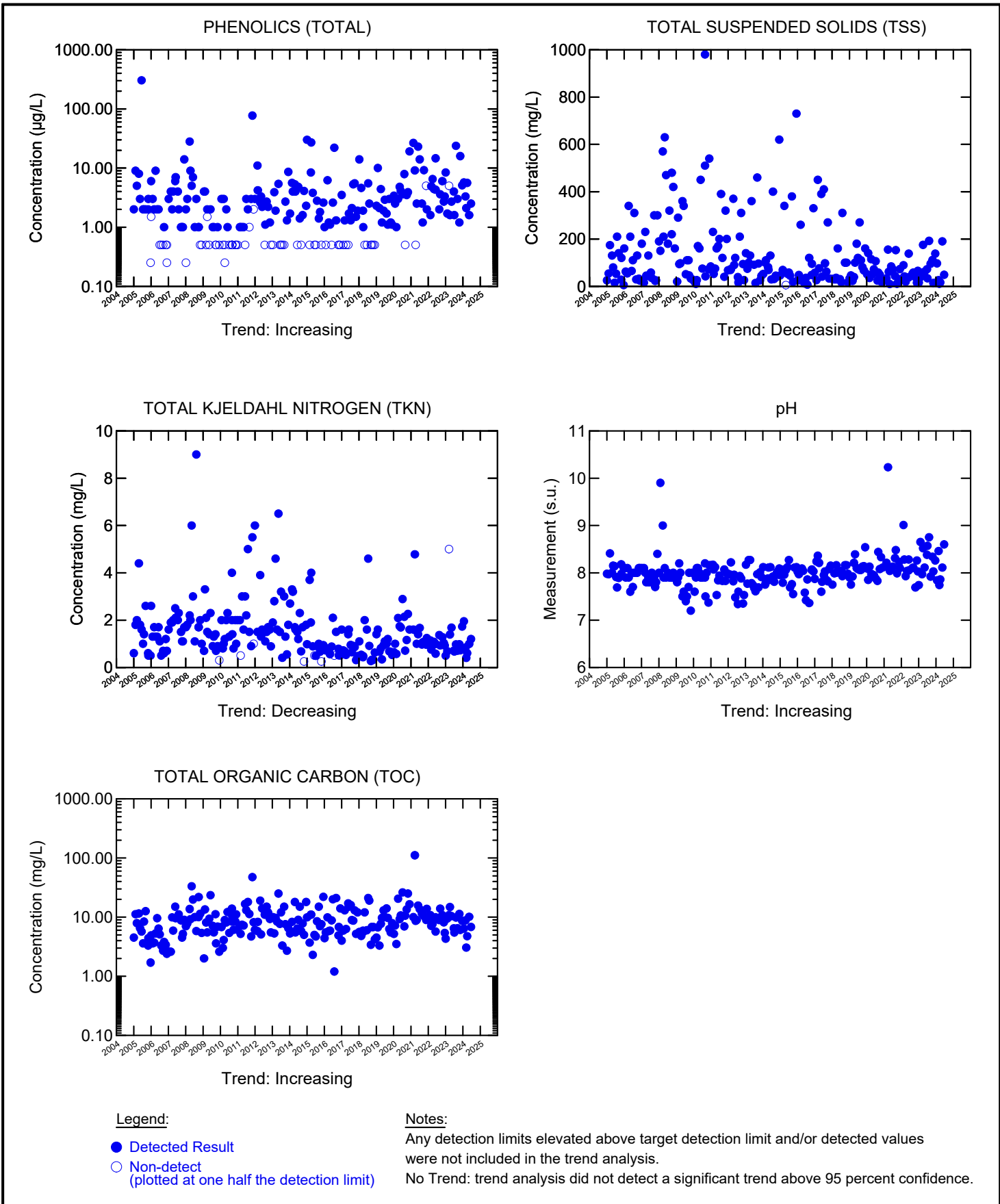


LANXESS Canada Co./Cie
Elmira, Ontario

Project No. 11192137-38
Date: July 11, 2024

**ANALYTE CONCENTRATION vs. TIME
STORM WATER SEWER**

FIGURE B.4



LANXESS Canada Co./Cie
 Elmira, Ontario

Project No. 11192137-38
 Date: July 11, 2024

ANALYTE CONCENTRATION vs. TIME
STORM WATER SEWER

FIGURE B.5

Table B.1

Environmental Appeal Board (EAB)
Analytical Results - June 2024
LANXESS Canada Co./Cie
Elmira, Ontario

Sample Location: Sample ID: Sample Date:		Storm Water Sewer SWS 062224 6/22/2024	Storm Water Outfall 0200 0200 062224 6/22/2024	Storm Water Outfall 0400 0400 062224 6/22/2024	Storm Water Outfall 0800 0800 062224 6/22/2024
Parameters	Units				
General Chemistry					
Ammonia-N	mg/L	0.912	1.02	1.01	0.913
Conductivity	umhos/cm	159	126	69.7	177
Cyanide (total)	mg/L	ND(0.0020)	ND(0.0020)	ND(0.0020)	ND(0.0020)
Dissolved organic carbon (DOC) (dissolved)	mg/L	3.77 J	--	--	--
pH, lab	s.u.	8.60	7.48	7.57	7.70
Phenolics (total)	mg/L	0.0025	--	--	--
Sulfide	mg/L	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)
Total kjeldahl nitrogen (TKN)	mg/L	1.20	1.83	1.45	1.61
Total organic carbon (TOC)	mg/L	6.81	10.7	7.37	8.60
Total suspended solids (TSS)	mg/L	48.6	--	--	--
Herbicides					
2,4,5-TP (Silvex)	µg/L	ND(0.250)	ND(0.250)	ND(0.250)	ND(0.250)
2,4-DB	µg/L	ND(0.250)	ND(0.250)	ND(0.250)	ND(0.500)
2,4-Dichlorophenoxyacetic acid (2,4-D)	µg/L	ND(0.250)	ND(0.250)	ND(0.250)	ND(0.500)
Pesticides					
gamma-BHC (lindane)	µg/L	ND(0.0030)	ND(0.0030)	ND(0.0030)	ND(0.0030)
Semi-Volatiles					
2-Mercaptobenzothiazole	µg/L	ND(20)	ND(20)	ND(20)	ND(20)
Aniline	µg/L	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Benzothiazole	µg/L	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Carboxin	µg/L	ND(0.100)	0.110	ND(0.100)	ND(0.100)
N-Nitrosodiethylamine	µg/L	ND(0.06)	ND(0.06)	ND(0.06)	ND(0.06)
N-Nitrosodimethylamine	µg/L	0.02	0.01	0.02	ND(0.01)
N-Nitrosodi-n-butylamine	µg/L	ND(0.06)	ND(0.06)	ND(0.06)	ND(0.06)
N-Nitrosodiphenylamine	µg/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
N-Nitrosodiphenylamine + Diphenylamine	µg/L	3.56 J+	0.48 J+	1.58 J+	ND(0.40)
Nitrosomorpholine	µg/L	ND(0.06)	ND(0.06)	ND(0.06)	ND(0.06)
Volatiles					
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	ND(20)	ND(20)	ND(20)	ND(20)
Ethylbenzene	µg/L	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
m&p-Xylenes	µg/L	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)
o-Xylene	µg/L	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Toluene	µg/L	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Misc					
Oil and grease	mg/L	ND(5.0)	--	--	--
Notes:					
ND(RDL)	Not detected at the associated reporting detection limit.				
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 parameter was not analyzed for.				

Attachment C

Upper Aquifer Hydraulic Containment Requirements

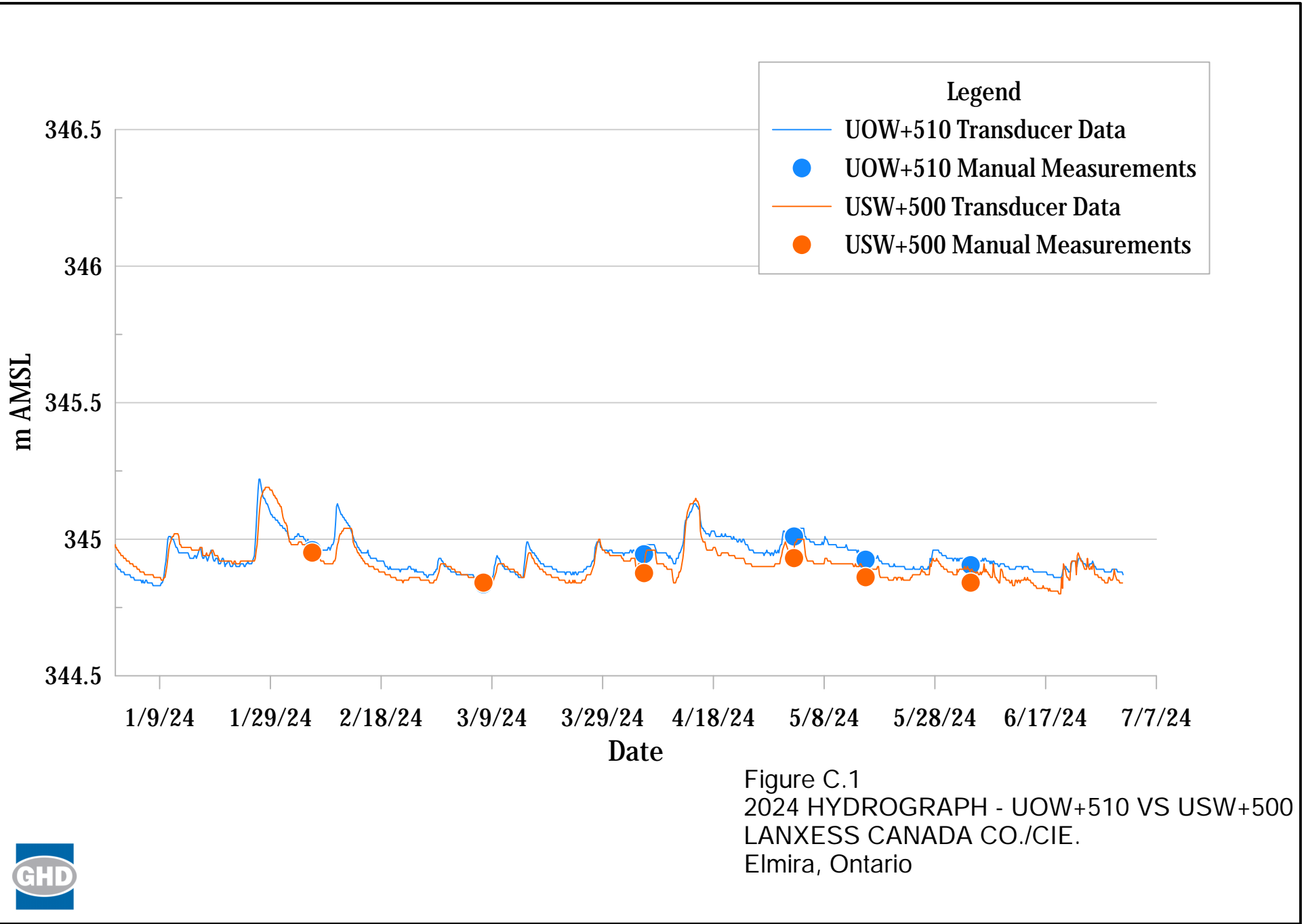
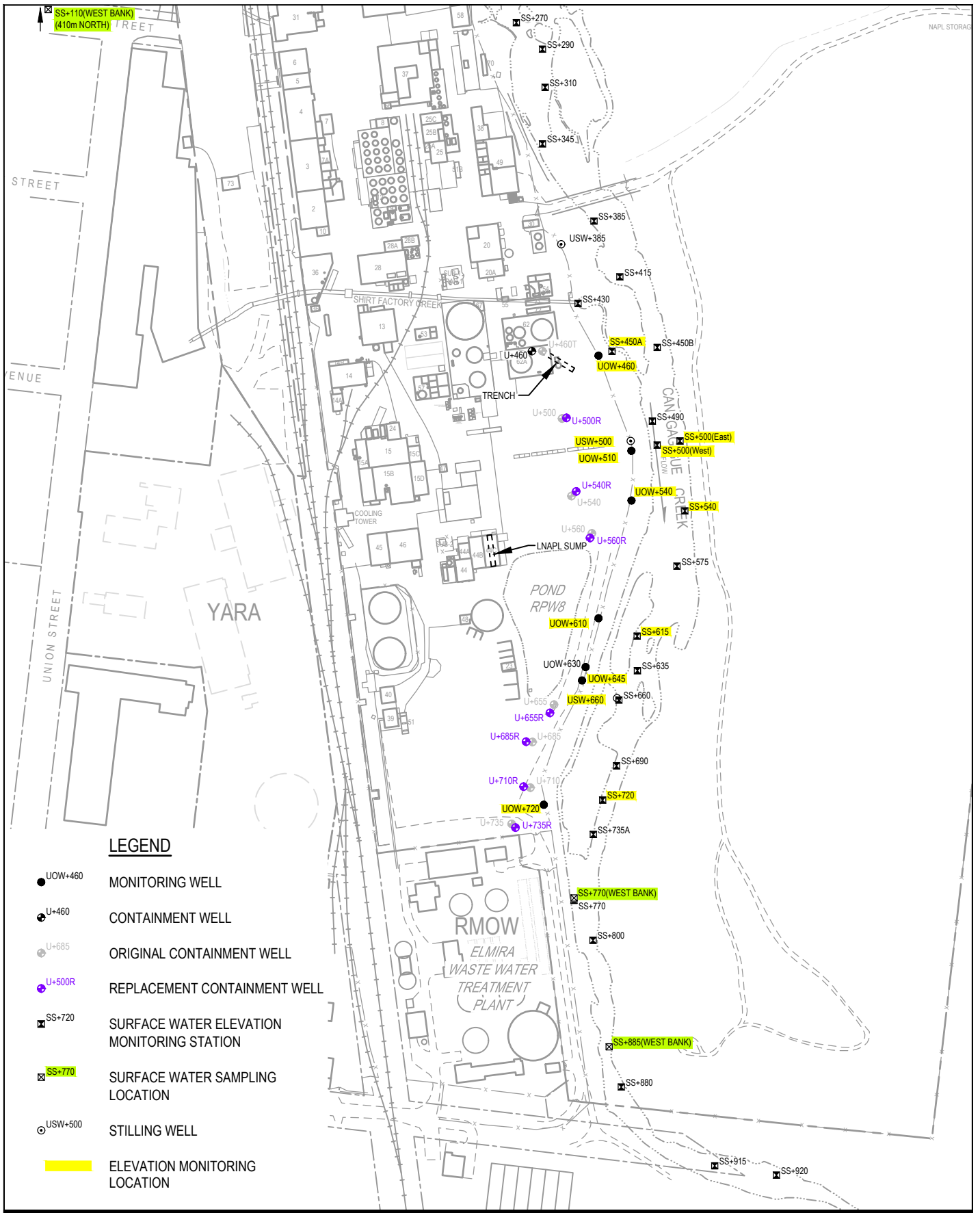
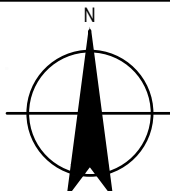


Figure C.1
2024 HYDROGRAPH - UOW+510 VS USW+500
LANXESS CANADA CO./CIE.
Elmira, Ontario





Coordinate System:
UTM NAD 27



LANXESS CANADA CO./CIE
ELMIRA, ONTARIO

Project No. 11192137
Date June 2024

**SURFACE WATER SAMPLING AND
ELEVATION MONITORING LOCATIONS**

FIGURE C.2

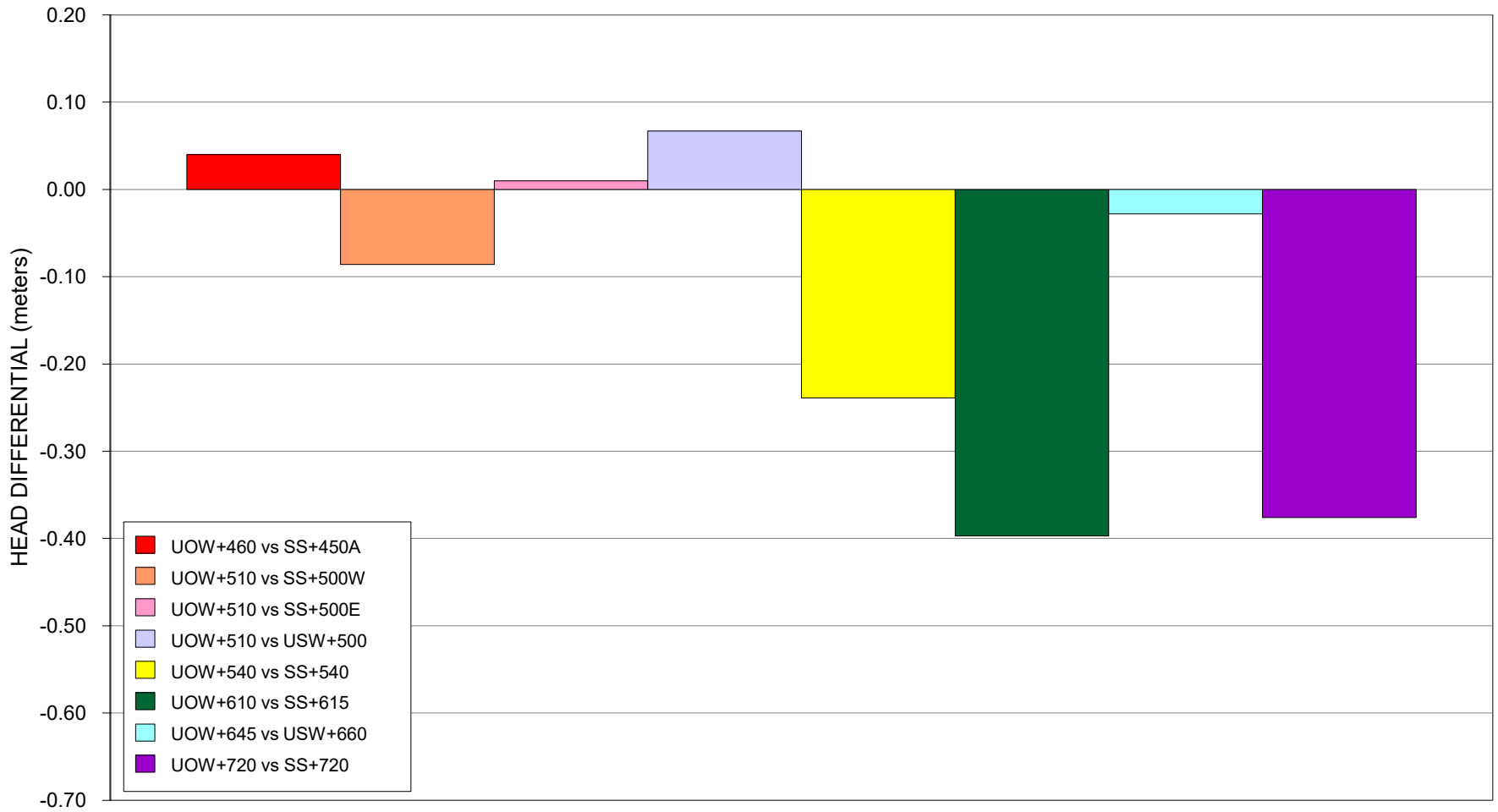


figure C.3
 HEAD DIFFERENTIAL AT KEY MONITORING PAIRS - JUNE 3, 2024
 UPPER AQUIFER CONTAINMENT SYSTEM
 LANXESS CANADA CO./CIE
 Elmira, Ontario



Table C.1

Summary of Detected Compounds in Surface Water
June 2024 ^[1]
LANXESS Canada Co./Cie
Elmira, Ontario

	Units	Sample Location			SS-110 West	SS+770 West	SS+855 West
					(Upstream)		
		PWQO		ECA			
		Status	Value	Schd. E Criteria			
Flow ^[2] = 470 L/s							
General Chemistry							
Ammonia as N	mg/L				0.208	0.212	0.209
Un-ionized Ammonia	mg/L	PWQO	0.020	0.016	0.0092	0.0145	0.0128
Temperature °C (Field)	°C				17.66	18.70	18.33
pH (Field)	su	PWQO	6.5-8.5		8.14	8.31	8.27
Volatile Organic Compounds (VOCs)							
All 7 VOCs Analyzed					ND	ND	ND
Base, Neutral and Acid Extractable Compounds (BNAs)							
2-Chlorophenol	µg/L	PWQO	7	7.0	ND(0.30) UJ	ND(0.30) UJ	ND(0.30) UJ
2,4,6-Trichlorophenol	µg/L	PWQO	18	2.6	ND(0.20)	ND(0.20)	0.21
Aniline	µg/L	IPWQO	2	4.0	ND(2.0) UJ	ND(2.0) UJ	ND(2.0) UJ
Remaining 14 BNAs Analyzed					ND	ND	ND
Pesticides & Herbicides							
All 2 Pesticide and Herbicide Analyzed					ND	ND	ND

Notes:

- [1] Samples were collected on June 3, 2024.
- [2] Flow measurement was obtained from the Grand River Conservation Authority (GRCA) Elmira (Arthur Street) gauge.
- L/s Litres per second.
- PWQO Provincial Water Quality Objective, MOE, February 1999.
- IPWQO Interim Provincial Water Quality Objective, MOE, February 1999.
- ND Not detected at the associated reporting detection limit.
- UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.