



1.13.2023

Renee Wawczak

Project Manager

United State Environmental Protection Agency

Region 5 (Mail Code LU-16J0

77 W. Jackson Boulevard

Chicago, Illinois 60604-3590

Wawczak.Renee@epa.gov

Dear Renee:

RE: Quarterly Progress Report – Q4-2022

EPA Docket No RCRA-05-2020-0006

Former Cities Refinery, East Chicago, Indiana

This submission has been prepared on behalf of OXY USA Inc. (OXY) in accordance with the Section 3008(h) Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h) Administrative Order on Consent (AOC) (RCRA Docket No: RCRA-05-2020-0006 with an effective date of January 24, 2020) for the Former Cities Refinery at 2500 Rear East Chicago Avenue, East Chicago, Indiana (EPA ID: INR000123927, formerly part of IND095267381) (Site).

This report is organized to address reporting requirements set out in Section VII of the AOC. This report summarizes the activities conducted for and at the Site from October 1, 2022 through December 31, 2022.

1. Summary of Work Performed during the Reporting Period (October 1, 2022 – December 31, 2022)

- Participated in project status calls including discussion on RFI progress with EPA, CITGO, OXY, and GHD on October 19th, November 17th, and December 15th, 2022.
- Conducted visual inspections of on-Site manhole structures on October 28th, November 21st, and December 9th, 2022.
- Conducted cleaning of on-Site manhole structures on October 28th. An estimated 15 gallons of oil and oily-water were recovered and containerized from the on-Site manhole structures. The oil and oily water will be disposed of off-Site in accordance with applicable laws.
- In accordance with the EPA approved work plan submitted September 30th, 2022, GSH completed the installation of 4 additional monitoring wells (2 on-Site (GSH-MW14-22 and GSH-MW15-22) and 2 off-Site (GSH-MW16-22 and GSH-MW17-22)) on November 9th, 2022.



- The 4 additional monitoring wells were sampled on November 21st, 2022.
- Quarterly groundwater gauging and sampling event was conducted between December 5th – 9th, 2022, which included the 4 additional monitoring wells installed in November 2022.

2. Summary of Reports, and Other Deliverables Completed During the Reporting Period

- Q3 2022 Quarterly Progress Report submitted October 12th, 2022.
- OXY submitted a work plan for the installation of an additional off-Site monitoring well on December 22nd, 2022. The work plan also included a request to extend the deadlines for the CA 750 environmental indicators report and the corrective measures proposal. EPA approved the work plan and deadline extension requests on December 23, 2022. The revised deadlines are as follows:
 - Environmental Indicators Report – to be submitted within 60 days following validation of two rounds of samples from the proposed monitoring well (estimated June 2023)
 - Corrective Measures Proposal – to be submitted within 90 days upon validation of two quarterly rounds of groundwater data (March 2023 and June 2023) from the proposed monitoring well (estimated October 2023)

3. Summary of Problems Encountered and Planned Resolutions

- None

4. Summary of Results of Sampling, Tests, or Other Data Received or Generated

- RFI field activities were completed in accordance with the plan outlined in the RFI Report submitted October 1, 2021, and slightly modified based on the response to EPA draft comments on the RFI dated January 31st, 2022.
- Figure 1 presents the groundwater contours for the December 2022 gauging event.
- Figure 2 presents a summary of exceedances of groundwater screening criteria including up to the quarterly groundwater monitoring event completed in September 2022 and the groundwater sampling event of the 4 newly installed monitoring wells completed in November 2022. The December 2022 sampling event data is undergoing data validation and will be provided in the next quarterly status report.
- Table 1 presents the validated groundwater sampling results from the September 2022 quarterly monitoring event and the November 2022 monitoring event of the 4 newly installed monitoring wells.



5. Anticipated Activities During the Next Reporting Period

- Complete validation of Q4-2022 quarterly sampling data.
- Install 1 off-Site monitoring well. OXY is in the process of coordinating with relevant parties (neighboring landowners, City of East Chicago, utility owners) to facilitate the well installation. The installation is tentatively scheduled for February 2023.
- Collect groundwater sample from new off-Site well following installation.
- Conduct Q1-2023 quarterly sampling event (March 2023), including new off-Site well to be installed in February 2023.
- Complete periodic inspections of on-Site manhole structures and removal of LNAPL, as needed.

6. Project Schedule

- Attachment A presents the currently anticipated project schedule.

7. Percent Project Completed

- At the time of this report, the project is approximately 70% completed.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Should you have any questions on the above, please do not hesitate to contact us.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rick Passmore", with a long horizontal stroke extending to the right.

Rick Passmore

VICE PRESIDENT OF OPERATIONS

GLENN SPRINGS HOLDINGS, INC.

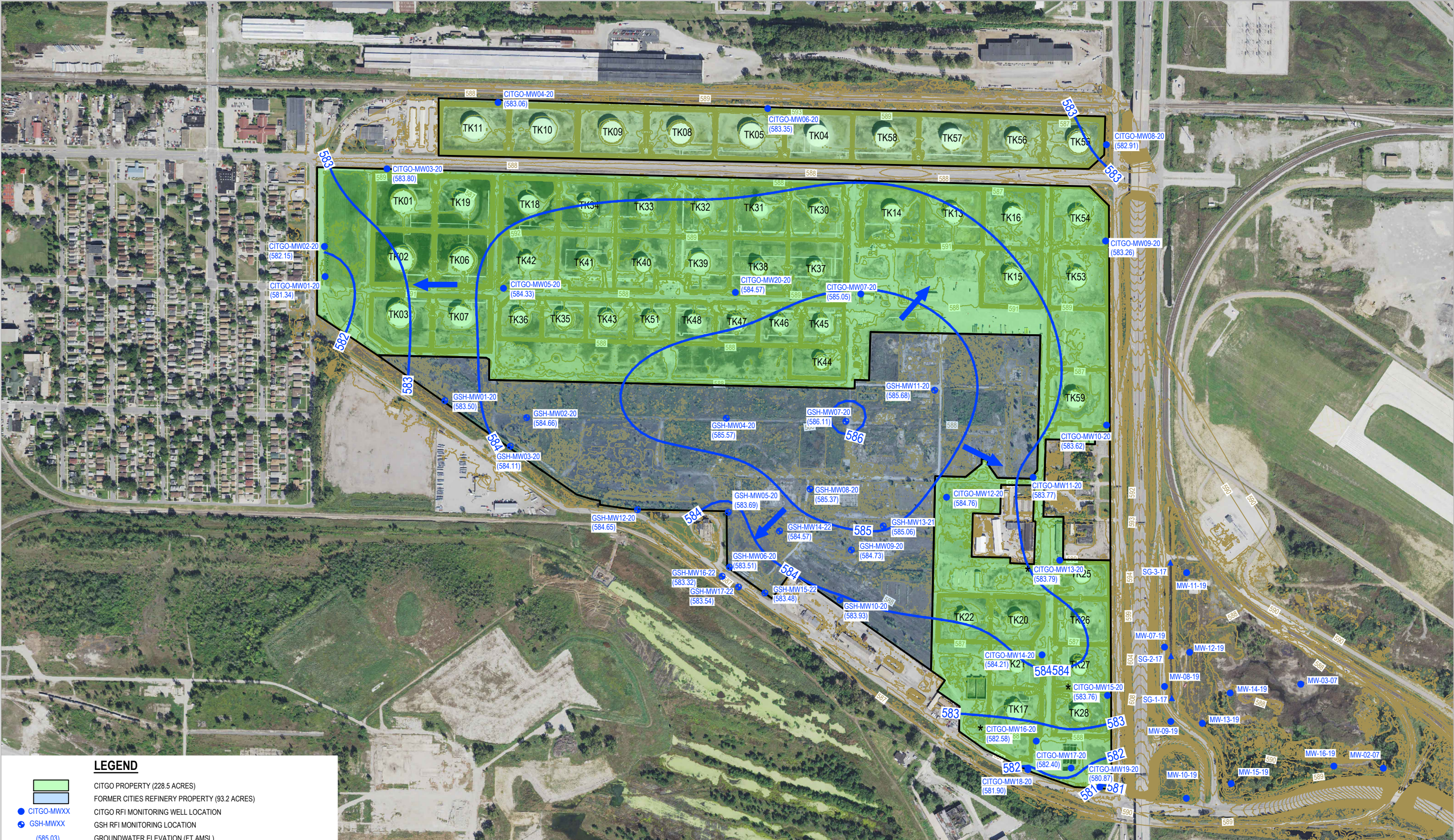
✉ Rick_Passmore@oxy.com

☎ 713.215.7622

📱 859.221.7616

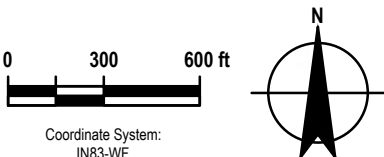
JEP/kf/32

cc: Gillian Asque, EPA (asque.gillian@epa.gov)
Frank Parigi, Glenn Springs Holdings (Frank_Parigi@oxy.com)
Lloyd Landreth, Landreth Law (landreth@landrethlaw.com)
Scott Buckner, CITGO (Sbuckne@citgo.com)
Mike Tomka, GHD (Michael.Tomka@ghd.com)
John-Eric Pardys, GHD (John-eric.Pardys@ghd.com)



LEGEND

- CITGO PROPERTY (228.5 ACRES)
 - FORMER CITIES REFINERY PROPERTY (93.2 ACRES)
 - CITGO-MWXX
 - GSH-MWXX
 - (585.03)
 - MW-10-19
 - SG-2-17
 - *
 - 584.00
 - 584.00
- MONITORING WELL LOCATION (SURVEYED SEPTEMBER 5, 2019. NAVD88)
- STAFF GAUGE LOCATION (SURVEYED JUNE 2, 2017. NAVD88)
- A CORRECTED GROUNDWATER WAS CALCULATED BY SUBTRACTING THE DEPTH TO PRODUCT FROM THE TOP OF CASING AND ADDING THE RELATIVE DENSITY OF THE LNAPL (0.9) MULTIPLIED BY THE THICKNESS OF THE LNAPL
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- GROUNDWATER FLOW DIRECTION

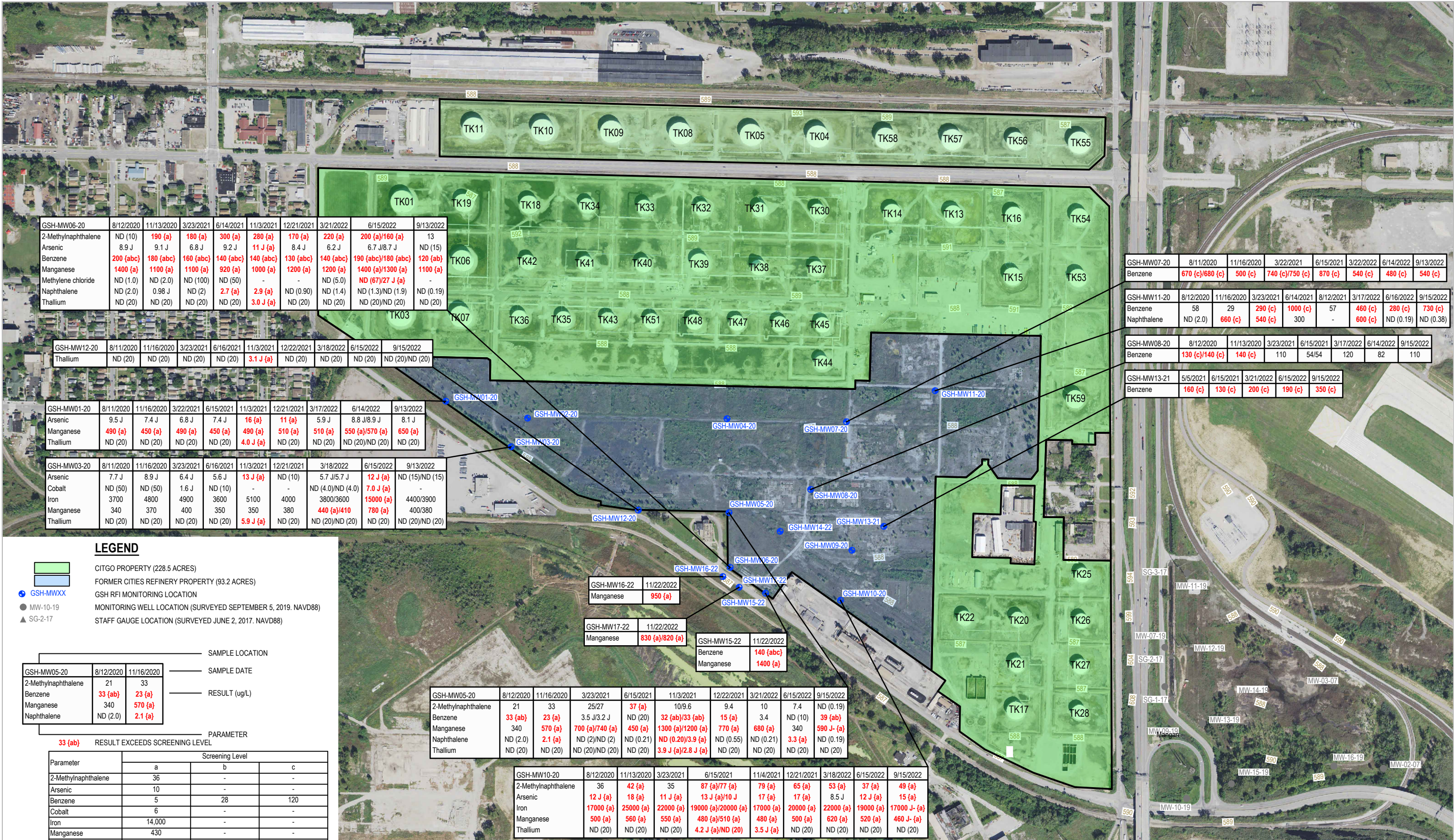


FORMER CITIES REFINERY
EAST CHICAGO, INDIANA

Project No. 11208111
Date December 2022

**GROUNDWATER CONTOUR MAP
DECEMBER 2022**

FIGURE 1



CITGO PROPERTY (228.5 ACRES)

FORMER CITIES REFINERY PROPERTY (93.2 ACRES)

GSH RFI MONITORING LOCATION

MONITORING WELL LOCATION (SURVEYED SEPTEMBER 5, 2019. NAVD88)

STAFF GAUGE LOCATION (SURVEYED JUNE 2, 2017. NAVD88)

GSH-MWXX

MW-10-19

SG-2-17

SAMPLE LOCATION

SAMPLE DATE

RESULT (ug/L)

PARAMETER

RESULT EXCEEDS SCREENING LEVEL

Parameter	a	b	c
2-Methylnaphthalene	36	-	-
Arsenic	10	-	-
Benzene	5	28	120
Cobalt	6	-	-
Iron	14,000	-	-
Manganese	430	-	-
Methylene Chloride	5	-	-
Naphthalene	1.7	110	460
Thallium	2	-	-

a - EPA - MCL OR IDEM - TAP/RESIDENTIAL

b - IDEM 2019 - GROUND WATER/RESIDENTIAL

c - IDEM 2019 - GROUND WATER/COMMERCIAL/INDUSTRIAL

NOTE:
RESULTS FROM MONITORING LOCATIONS GSH-MW02-20, GSH-MW04-20, GSH-MW07-20, GSH-MW08-20, GSH-MW09-20, AND GSH-MW11-20 ARE SCREENED AGAINST INDUSTRIAL SCREENING LEVEL ONLY

Filename: N:\CAI\Water\Projects\662111208111\Digital_Design\ACAD 2020\Figures\LTRO32\11208111-GHD-00-00-LTR-EN-D101_WA-032.dwg
Plot Date: 12 January 2023 8:38 AM

0

300

600 ft

Coordinate System:

IN83-WF

N

GHD

FORMER CITIES REFINERY
EAST CHICAGO, INDIANA

Project No. 11208111
Date January 2023

SUMMARY OF EXCEEDANCES OF
SCREENING LEVELS IN GROUNDWATER

FIGURE 2

Source: AERIAL IMAGE, 2016 NAIP; MONITORING WELL SURVEY BY CM LAVOIE DATED JULY 30, 2020.

Table 1
Former Cities Refinery
East Chicago, Indiana
Analytical Results Summary
Sampling

Sample Location:	GSH-MW01-20	GSH-MW02-20	GSH-MW03-20	GSH-MW03-20	GSH-MW04-20	GSH-MW05-20	GSH-MW06-20	GSH-MW07-20	GSH-MW08-20	GSH-MW09-20	GSH-MW10-20	GSH-MW11-20	GSH-MW12-20	GSH-MW12-20	GSH-MW13-21
Sample ID:	GW-091322-DS-04	GW-091322-DS-02	GW-091322-DS-06	GW-091322-DS-07	GW-091322-JL-03	WG-091522-DS-15	GW-091322-JL-01	GW-091322-JL-05	GW-091522-JL-08	GW-091522-JL-11	WG-091522-JN-12	GW-091522-JN-09	WG-091522-DS-13	WG-091522-DS-14	WG-091522-DS-10
Sample Date:	9/13/2022	9/13/2022	9/13/2022	9/13/2022	9/13/2022	9/15/2022	9/13/2022	9/13/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022
Parameters	Units														
VOAs															
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	ug/L	1.0 U	46	1.0 U	1.0 U	1.0 U	39	120	540	110	1.0 U	2.1	730	1.0 U	350
Bromodichloromethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropyl benzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acetate	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tert butyl ether (MTBE)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (CFC-113)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes (total)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOAs															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	ug/L	0.19 U	0.19 U	0.19 U	0.19 U	0.20 U	0.19 U	13	25	20	0.53	49	6.9	0.19 U	26
2-Methylphenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3&4-Methylphenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1
Former Cities Refinery
East Chicago, Indiana
Analytical Results Summary
Sampling

Sample Location:	GSH-MW01-20	GSH-MW02-20	GSH-MW03-20	GSH-MW03-20	GSH-MW04-20	GSH-MW05-20	GSH-MW06-20	GSH-MW07-20	GSH-MW08-20	GSH-MW09-20	GSH-MW10-20	GSH-MW11-20	GSH-MW12-20	GSH-MW12-20	GSH-MW13-21
Sample ID:	GW-091322-DS-04	GW-091322-DS-02	GW-091322-DS-06	GW-091322-DS-07	GW-091322-JL-03	WG-091522-DS-15	GW-091322-JL-01	GW-091322-JL-05	GW-091522-JL-08	GW-091522-JL-11	WG-091522-JN-12	GW-091522-JN-09	WG-091522-DS-13	WG-091522-DS-14	WG-091522-DS-10
Sample Date:	9/13/2022	9/13/2022	9/13/2022	9/13/2022	9/13/2022	9/15/2022	9/13/2022	9/13/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022	9/15/2022
Parameters	Units			(Duplicate)										(Duplicate)	
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	ug/L	0.19 U	0.19 U	0.19 U	0.19 U	0.20 U	0.19 U	0.19 U	1.3 U	0.38 U	0.19 U	1.0 U	0.38 U	0.19 U	5.6
Nitrobenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOAsSIM															
1,4-Dioxane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Aluminum	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	ug/L	8.1 J	14 J	15 U	15 U	19	15 U	15 U	14 J	9.7 J	15 U	15	15 U	15 U	4.8 J
Barium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	ug/L	13000	11000	4400	3900	17000	6300 J-	5300	7100	8500 J-	1600 J-	17000 J-	7300 J-	700 J-	8700 J-
Lead	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	ug/L	650	910	400	380	740	590 J-	1100	480	1100 J-	380 J-	460 J-	1400 J-	100 J-	1000 J-
Mercury	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	ug/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Vanadium	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wet															
Ammonia-N	ug/L	-	-	-	-	710	-	3200	7500	1700	-	-	2000	-	1900
Nitrate (as N)	ug/L	-	-	-	-	3500	-	76 J	77 J	100 U	-	-	86 J	-	140
Orthophosphate	ug/L	-	-	-	-	120	-	420	450	100 U	-	-	100 U	-	100 U
Sulfate	ug/L	-	-	-	-	2500	-	4900	420 J	740 J	-	-	1400	-	1100

Footnotes:
U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 1
Former Cities Refinery
East Chicago, Indiana
Analytical Results Summary
Sampling

Sample Location:	GSH-MW14-22	GSH-MW15-22	GSH-MW16-22	GSH-MW17-22	GSH-MW17-22
Sample ID:	WG-112222-NN-05	WG-112222-NN-04	WG-112222-NN-01	WG-112222-NN-02	WG-112222-NN-03
Sample Date:	11/22/2022	11/22/2022	11/22/2022	11/22/2022	11/22/2022
Parameters	(Duplicate)				
VOAs	Units				
1,1,1-Trichloroethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	13 U	6.3 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	13 U	6.3 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	130 U	63 U	10 U	3.3 J
2-Hexanone	ug/L	130 U	63 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	130 U	63 U	10 U	10 U
Acetone	ug/L	130 U	63 U	10 U	5.6 J
Benzene	ug/L	98	140	1.0 U	2.2
Bromodichloromethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
Bromoform	ug/L	13 U	6.3 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	13 U	6.3 U	1.0 U	1.0 U
Carbon disulfide	ug/L	13 U	6.3 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	13 U	6.3 U	1.0 U	1.0 U
Chlorobenzene	ug/L	13 U	6.3 U	1.0 U	1.0 U
Chloroethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	13 U	6.3 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	ug/L	13 U	6.3 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	13 U	6.3 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	13 U	6.3 U	1.0 U	1.0 U
Cyclohexane	ug/L	490 J-	280	1.0 U	61
Dibromochloromethane	ug/L	13 U	6.3 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	13 U	6.3 U	1.0 U	1.0 U
Ethylbenzene	ug/L	220	3.8 J	1.0 U	1.0 U
Isopropyl benzene	ug/L	32	18	1.0 U	8.3
Methyl acetate	ug/L	130 U	63 U	10 U	10 U
Methyl cyclohexane	ug/L	200	100	1.0 U	33
Methyl tert butyl ether (MTBE)	ug/L	13 U	6.3 U	1.0 U	1.0 U
Methylene chloride	ug/L	63 U	31 U	5.0 U	5.0 U
Styrene	ug/L	13 U	6.3 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	13 U	6.3 U	1.0 U	1.0 U
Toluene	ug/L	58	6.4	1.0 U	1.0
trans-1,2-Dichloroethene	ug/L	13 U	6.3 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	13 U	6.3 U	1.0 U	1.0 U
Trichloroethene	ug/L	13 U	6.3 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	13 U	6.3 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	13 U	6.3 U	1.0 U	1.0 U
Vinyl chloride	ug/L	13 U	6.3 U	1.0 U	1.0 U
Xylenes (total)	ug/L	270	7.9 J	2.0 U	1.2 J
SVOAs					
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	1.9 UJ	1.0 UJ	1.0 UJ	0.96 UJ
2,4,5-Trichlorophenol	ug/L	9.6 U	5.0 U	5.0 U	4.8 U
2,4,6-Trichlorophenol	ug/L	9.6 U	5.0 U	5.0 U	4.8 U
2,4-Dichlorophenol	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
2,4-Dimethylphenol	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
2,4-Dinitrophenol	ug/L	19 U	10 U	10 U	9.6 U
2,4-Dinitrotoluene	ug/L	9.6 U	5.0 U	5.0 U	4.8 U
2,6-Dinitrotoluene	ug/L	9.6 U	5.0 U	5.0 U	4.8 U
2-Chloronaphthalene	ug/L	1.9 U	1.0 U	1.0 U	0.96 U
2-Chlorophenol	ug/L	1.9 U	1.0 U	1.0 U	0.96 U
2-Methylnaphthalene	ug/L	38	2.3	0.20 U	2.1
2-Methylphenol	ug/L	1.9 U	1.0 U	1.0 U	0.96 U
2-Nitroaniline	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
2-Nitrophenol	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
3&4-Methylphenol	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
3,3'-Dichlorobenzidine	ug/L	9.6 U	5.0 U	5.0 U	4.8 U
3-Nitroaniline	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
4,6-Dinitro-2-methylphenol	ug/L	9.6 U	5.0 U	5.0 U	4.8 U
4-Bromophenyl phenyl ether	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
4-Chloro-3-methylphenol	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
4-Chloroaniline	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
4-Chlorophenyl phenyl ether	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
4-Nitroaniline	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
4-Nitrophenol	ug/L	19 U	10 U	10 U	9.6 U
Acenaphthene	ug/L	1.7	0.78	0.20 U	4.5
Acenaphthylene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U
Acetophenone	ug/L	1.9 U	1.0 U	1.0 U	0.96 U
Anthracene	ug/L	0.38 U	0.20 U	0.20 U	0.52
Atrazine	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
Benzaldehyde	ug/L	3.8 U	2.0 U	2.0 U	1.9 U
Benzo(a)anthracene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U
Benzo(a)pyrene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U

Table 1
Former Cities Refinery
East Chicago, Indiana
Analytical Results Summary
Sampling

Sample Location:		GSH-MW14-22	GSH-MW15-22	GSH-MW16-22	GSH-MW17-22	GSH-MW17-22
Sample ID:		WG-112222-NN-05	WG-112222-NN-04	WG-112222-NN-01	WG-112222-NN-02	WG-112222-NN-03
Sample Date:		11/22/2022	11/22/2022	11/22/2022	11/22/2022	11/22/2022
Parameters	Units					(Duplicate)
Benzo(b)fluoranthene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Benzo(g,h,i)perylene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Benzo(k)fluoranthene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Biphenyl (1,1-Biphenyl)	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
bis(2-Chloroethoxy)methane	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
bis(2-Chloroethyl)ether	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	9.6 U	5.0 U	5.0 U	4.8 U	5.0 U
Butyl benzylphthalate (BBP)	ug/L	3.8 U	2.0 U	2.0 U	1.9 U	2.0 U
Caprolactam	ug/L	9.6 U	5.0 U	2.2 J	4.8 U	5.0 U
Carbazole	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
Chrysene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Dibenz(a,h)anthracene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Dibenzofuran	ug/L	1.9 U	1.0 U	1.0 U	2.2	2.1
Diethyl phthalate	ug/L	9.6 U	5.0 U	5.0 U	4.8 U	5.0 U
Dimethyl phthalate	ug/L	3.8 U	2.0 U	2.0 U	1.9 U	2.0 U
Di-n-butylphthalate (DBP)	ug/L	9.6 U	5.0 U	5.0 U	4.8 U	5.0 U
Di-n-octyl phthalate (DnOP)	ug/L	3.8 U	2.0 U	2.0 U	1.9 U	2.0 U
Fluoranthene	ug/L	0.38 U	0.23	0.20 U	0.24	0.24
Fluorene	ug/L	1.4	0.83	0.20 U	4.4	4.4
Hexachlorobenzene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Hexachlorobutadiene	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
Hexachlorocyclopentadiene	ug/L	19 U	10 U	10 U	9.6 U	10 U
Hexachloroethane	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
Indeno(1,2,3-cd)pyrene	ug/L	0.38 U	0.20 U	0.20 U	0.19 U	0.20 U
Isophorone	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
Naphthalene	ug/L	43	0.55	0.20 U	0.19 U	0.20 U
Nitrobenzene	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
N-Nitrosodi-n-propylamine	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
N-Nitrosodiphenylamine	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
Pentachlorophenol	ug/L	19 U	10 U	10 U	9.6 U	10 U
Phenanthrene	ug/L	2.2	0.67	0.20 U	5.5	5.8
Phenol	ug/L	1.9 U	1.0 U	1.0 U	0.96 U	1.0 U
Pyrene	ug/L	0.38 U	0.67	0.20 U	0.47	0.44
SVOAsSIM						
1,4-Dioxane	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Metals						
Aluminum	ug/L	5800	200	530	200 U	200 U
Antimony	ug/L	20 U	20 U	20 U	20 U	20 U
Arsenic	ug/L	15	15 U	5.8 J	15 U	15 U
Barium	ug/L	92 J	91 J	56 J	54 J	54 J
Beryllium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Cadmium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Calcium	ug/L	160000	120000	220000	120000	120000
Chromium	ug/L	12	10 U	10 U	10 U	10 U
Cobalt	ug/L	7.1 J	10 U	2.7 J	10 U	10 U
Copper	ug/L	5.7 J	25 U	25 U	25 U	25 U
Iron	ug/L	22000	8500	11000	2300	2300
Lead	ug/L	17	4.2 J	4.6 J	3.5 J	4.6 J
Magnesium	ug/L	36000	8900	19000	15000	15000
Manganese	ug/L	880	1400	950	830	820
Mercury	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	ug/L	11 J	40 U	4.1 J	40 U	40 U
Potassium	ug/L	4400 J	2500 J	7400	4100 J	3900 J
Selenium	ug/L	20 U	20 U	20 U	20 U	20 U
Silver	ug/L	10 U	10 U	10 U	10 U	10 U
Sodium	ug/L	27000	7300	90000	160000	160000
Thallium	ug/L	20 U	20 U	20 U	20 U	20 U
Vanadium	ug/L	15 J	50 U	50 U	50 U	50 U
Zinc	ug/L	40 J	50 U	50 U	50 U	50 U
Wet						
Ammonia-N	ug/L	-	-	-	-	-
Nitrate (as N)	ug/L	-	-	-	-	-
Orthophosphate	ug/L	-	-	-	-	-
Sulfate	ug/L	-	-	-	-	-

Footnotes:
U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.



ATTACHMENT A

Project Schedule

Draft Project Schedule - AOC Former Cities Refinery East Chicago, IN																									
ID	Task Name	Duration	Start	Finish	2022 Q1	Q2	Q3	Q4	2023 Q1	Q2	Q3	Q4	2024 Q1	Q2	Q3	Q4	2025 Q1	Q2							
1	<u>Administrative</u>	965 days	<u>Fri 1/24/20</u>	<u>Mon 10/16/23</u>																					
2	Effective Date of AOC	1 day	Fri 1/24/20	Fri 1/24/20																					
3	Semi-Annual Meetings - Meeting with EPA either by phone or in person on at least a semi-annual basis	261 days	Fri 7/29/22	Fri 7/28/23																					
7	Quarterly Reports - Fifteenth day of the month after the end of each quarter	392 days	Fri 4/15/22	Mon 10/16/23																					
15	Financial Assurance Update (Updated annually and/or with subsequent work plans)	523 days	Mon 9/20/21	Thu 9/21/23																					
18	<u>RFI</u>	444 days	<u>Fri 10/1/21</u>	<u>Thu 6/15/23</u>																					
19	On-going Quarterly Groundwater Monitoring and Off-Site Investigation (Exact Dates TBD)	262 days	Wed 6/15/22	Thu 6/15/23																					
25	Additional RFI Work Plan(s), as needed	1 day	Mon 1/2/23	Mon 1/2/23					◆ To Be Determined																
26	EPA Review and Approval of RFI Work Plan(s), as needed	1 day	Mon 1/2/23	Mon 1/2/23					◆ To Be Determined																
27	RFI Field Activities, as needed	1 day	Mon 1/2/23	Mon 1/2/23					◆ To Be Determined																
28	Submit RFI Report - No later than October 1, 2021	1 day	Fri 10/1/21	Fri 10/1/21																					
29	<u>Interim Corrective Measures, as needed</u>	1 day	<u>Mon 1/2/23</u>	<u>Mon 1/2/23</u>																					
30	Interim Corrective Measures Work Plan(s), as needed	1 day	Mon 1/2/23	Mon 1/2/23					◆ To Be Determined																
31	Interim Corrective Measures Implementation, as needed (90 days following submittal of Interim Corrective Measures Work Plan and Schedule)	1 day	Mon 1/2/23	Mon 1/2/23					◆ To Be Determined																
32	Interim Corrective Measures Report (Either prior to or as part of the Environmental Indicators Report)	1 day	Mon 1/2/23	Mon 1/2/23					◆ To Be Determined																
33	<u>Final Corrective Measures</u>	793 days	<u>Mon 5/16/22</u>	<u>Wed 5/28/25</u>																					
34	Public Meeting, including 30-Day Comment Period (Exact Date TBD)	30 days	Mon 5/16/22	Fri 6/24/22	◆																				
35	Installation of Off-Site Monitoring Wells (Estimated Schedule)	2 days	Mon 2/6/23	Tue 2/7/23					◆																
36	Environmental Indicators Report(s) - 60 Days following validation of two rounds of data from off-Site Wells	1 day	Wed 6/28/23	Wed 6/28/23						◆															
37	Corrective Measures Proposal - Within 90 Days following 2 quarters of Data from Off-Site Monitoring Wells	1 day	Wed 10/18/23	Wed 10/18/23									◆												
38	EPA review and comments, supplemental information / investigation request (if needed)	3 mons	Thu 10/19/23	Wed 1/10/24																					
39	Public review and comment	2 mons	Thu 1/11/24	Wed 3/6/24																					
40	EPA Final Decision	2 mons	Thu 3/7/24	Wed 5/1/24																					
41	Final Corrective Measures Implementation - (According to the schedule in the Final Decision, i.e. much of the construction completed within one year, or within a reasonable period of time after EPA selects the final corrective measures)	12 mons	Thu 5/2/24	Wed 4/2/25																					
42	Final Remedy Construction Completion Report (Including an Operation and Maintenance Plan)	2 mons	Thu 4/3/25	Wed 5/28/25																					
Project: Former Cities Refinery, East Chicago, IN Date: Thu 1/12/2310:03 AM		Expected Timeframe ◆		Expected Date ◆	Summary																				
		Contingent Timeframe ◆		Fixed Date ◆	Manual Progress																				
Note: Per AOC, 'days' refers to calendar days Schedule subject to change based on regulatory reviews/approvals, weather, and other factors beyond Respondent's control DRAFT																				Privledged and Confidential - Prepared at the Request of Counsel					