Environmental Protection Agency Region 5

Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

WORK ORDER

Printed: 10/3/2017 2:05:43PM

1709003

US EPA Region 5 Chicago Regional Laboratory

Client: Water Division, WECA Region 5
Project: U.S. Steel - Minntac Tailings Basin Area Facility
Project Manager: Angela Ockrassa Davis
Project Number: 02DM17

Report To:

Dean Maraldo
Water Division, WECA Region 5

77 West Jackson Boulevard
Chicago, IL 60604

Phone: (312) 353-2098
Fax: (312) 886-2001

Date Due: Oct-30-17 15:00 (45 day TAT)
Received By: Robert Snyder
Logged In By: Robert Snyder
Date Received: Sep-14-17 13:26
Date Logged In: Sep-15-17 14:44

Samples Received at:
Sample tags/labels: Yes
Seals Intact: Yes
Received on ice: Yes
Paperwork Included: Yes

Cooler #1 Temp: 3.1 °C
Cooler #2 Temp: 2.3 °C

Work Order Comments:
See QAPP for metals list
pH paper used in SC = 16H2601

Sample ID: 1709003-01 **Sampled:** Sep-12-17 09:57 **Matrix:** Water

Sample Name: S01 **Sample Location/Comments:** Seep A

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 09:57	pH = 7
Anions by IC	28	Oct-10-17 09:57	pH = 7
Ca ICP (W)	180	Mar-11-18 09:57	pH = 2
Hardness by calc	180	Mar-11-18 09:57	pH = 2
Hg Total CVAA	28	Oct-10-17 09:57	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 09:57	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 09:57	pH = 2
Mg ICP (W)	180	Mar-11-18 09:57	pH = 2
Solids, TDS	7	Sep-19-17 09:57	pH = 7
Solids, TSS	7	Sep-19-17 09:57	pH = 7

Sample ID: 1709003-02 **Sampled:** Sep-12-17 10:23 **Matrix:** Water

Sample Name: S02 **Sample Location/Comments:** Dark River Pond Seep

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 10:23	pH = 7
Anions by IC	28	Oct-10-17 10:23	pH = 7
Ca ICP (W)	180	Mar-11-18 10:23	pH = 2
Hardness by calc	180	Mar-11-18 10:23	pH = 2

ED_004744_00033962-00001

WORK ORDER

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Project Manager: Angela Ockrassa Davis
Project Number: 02DM17

Sample ID: 1709003-02 **Sampled:** Sep-12-17 10:23 **Matrix:** Water

Sample Name: S02 **Sample Location/Comments:** Dark River Pond Seep

Analysis	Hold time (days)	Expires	Comments
Hg Total CVAA	28	Oct-10-17 10:23	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 10:23	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 10:23	pH = 2
Mg ICP (W)	180	Mar-11-18 10:23	pH = 2
Solids, TDS	7	Sep-19-17 10:23	pH = 7
Solids, TSS	7	Sep-19-17 10:23	pH = 7

Sample ID: 1709003-03 **Sampled:** Sep-12-17 10:50 **Matrix:** Water

Sample Name: S03 **Sample Location/Comments:** Seep 3

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 10:50	pH = 7
Anions by IC	28	Oct-10-17 10:50	pH = 7
Ca ICP (W)	180	Mar-11-18 10:50	pH = 2
Hardness by calc	180	Mar-11-18 10:50	pH = 2
Hg Total CVAA	28	Oct-10-17 10:50	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 10:50	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 10:50	pH = 2
Mg ICP (W)	180	Mar-11-18 10:50	pH = 2
Solids, TDS	7	Sep-19-17 10:50	pH = 7
Solids, TSS	7	Sep-19-17 10:50	pH = 7

Sample ID: 1709003-04 **Sampled:** Sep-12-17 11:08 **Matrix:** Water *QC Source Sample*

Sample Name: S04 **Sample Location/Comments:** SD001

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 11:08	pH = 7
Anions by IC	28	Oct-10-17 11:08	pH = 7
Ca ICP (W)	180	Mar-11-18 11:08	pH = 2
Hardness by calc	180	Mar-11-18 11:08	pH = 2
Hg Total CVAA	28	Oct-10-17 11:08	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 11:08	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 11:08	pH = 2
Mg ICP (W)	180	Mar-11-18 11:08	pH = 2
Solids, TDS	7	Sep-19-17 11:08	pH = 7

ED_004744_00033962-00002

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Project Number: 02DM17

Sample ID: 1709003-04 **Sampled:** Sep-12-17 11:08 **Matrix:** Water *QC Source Sample*

Sample Name: S04 **Sample Location/Comments:** SD001

Analysis	Hold time (days)	Expires	Comments
Solids, TSS	7	Sep-19-17 11:08	pH = 7

Sample ID: 1709003-05 **Sampled:** Sep-12-17 11:08 **Matrix:** Water

Sample Name: D05 **Sample Location/Comments:** SD001 Duplicate

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 11:08	pH = 7
Anions by IC	28	Oct-10-17 11:08	pH = 7
Ca ICP (W)	180	Mar-11-18 11:08	pH = 2
Hardness by calc	180	Mar-11-18 11:08	pH = 2
Hg Total CVAA	28	Oct-10-17 11:08	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 11:08	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 11:08	pH = 2
Mg ICP (W)	180	Mar-11-18 11:08	pH = 2
Solids, TDS	7	Sep-19-17 11:08	pH = 7
Solids, TSS	7	Sep-19-17 11:08	pH = 7

Sample ID: 1709003-06 **Sampled:** Sep-12-17 11:30 **Matrix:** Water

Sample Name: S06 **Sample Location/Comments:** Seep 7

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 11:30	pH = 7
Anions by IC	28	Oct-10-17 11:30	pH = 7
Ca ICP (W)	180	Mar-11-18 11:30	pH = 2
Hardness by calc	180	Mar-11-18 11:30	pH = 2
Hg Total CVAA	28	Oct-10-17 11:30	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 11:30	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 11:30	pH = 2
Mg ICP (W)	180	Mar-11-18 11:30	pH = 2
Solids, TDS	7	Sep-19-17 11:30	pH = 7
Solids, TSS	7	Sep-19-17 11:30	pH = 7

Sample ID: 1709003-07 **Sampled:** Sep-12-17 11:51 **Matrix:** Water

Sample Name: S07 **Sample Location/Comments:** Seep 13

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 11:51	pH = 7

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Sample ID: 1709003-07 **Sampled:** Sep-12-17 11:51 **Matrix:** Water

Sample Name: S07 **Sample Location/Comments:** Seep 13

Analysis	Hold time (days)	Expires	Comments
Anions by IC	28	Oct-10-17 11:51	pH = 7
Ca ICP (W)	180	Mar-11-18 11:51	pH = 2
Hardness by calc	180	Mar-11-18 11:51	pH = 2
Hg Total CVAA	28	Oct-10-17 11:51	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 11:51	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 11:51	pH = 2
Mg ICP (W)	180	Mar-11-18 11:51	pH = 2
Solids, TDS	7	Sep-19-17 11:51	pH = 7
Solids, TSS	7	Sep-19-17 11:51	pH = 7

Sample ID: 1709003-08 **Sampled:** Sep-12-17 14:03 **Matrix:** Water

Sample Name: S08 **Sample Location/Comments:** East "Background" Wetland

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 14:03	pH = 7
Anions by IC	28	Oct-10-17 14:03	pH = 7
Ca ICP (W)	180	Mar-11-18 14:03	pH = 2
Hardness by calc	180	Mar-11-18 14:03	pH = 2
Hg Total CVAA	28	Oct-10-17 14:03	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 14:03	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 14:03	pH = 2
Mg ICP (W)	180	Mar-11-18 14:03	pH = 2
Solids, TDS	7	Sep-19-17 14:03	pH = 7
Solids, TSS	7	Sep-19-17 14:03	pH = 7

Sample ID: 1709003-09 **Sampled:** Sep-12-17 15:00 **Matrix:** Water

Sample Name: S09 **Sample Location/Comments:** CB-12 outside sheet pile

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 15:00	pH = 6
Anions by IC	28	Oct-10-17 15:00	pH = 6
Ca ICP (W)	180	Mar-11-18 15:00	pH = 2
Hardness by calc	180	Mar-11-18 15:00	pH = 2
Hg Total CVAA	28	Oct-10-17 15:00	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 15:00	pH = 2

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Sample ID: 1709003-09 **Sampled:** Sep-12-17 15:00 **Matrix:** Water

Sample Name: S09 **Sample Location/Comments:** CB-12 outside sheet pile

Analysis	Hold time (days)	Expires	Comments
Metals ICP-MS (w)	180	Mar-11-18 15:00	pH = 2
Mg ICP (W)	180	Mar-11-18 15:00	pH = 2
Solids, TDS	7	Sep-19-17 15:00	pH = 6
Solids, TSS	7	Sep-19-17 15:00	pH = 6

Sample ID: 1709003-10 **Sampled:** Sep-12-17 15:15 **Matrix:** Water

Sample Name: S10 **Sample Location/Comments:** CB-12 inside sheet pile

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-26-17 15:15	pH = 7
Anions by IC	28	Oct-10-17 15:15	pH = 7
Ca ICP (W)	180	Mar-11-18 15:15	pH = 2
Hardness by calc	180	Mar-11-18 15:15	pH = 2
Hg Total CVAA	28	Oct-10-17 15:15	pH = 2
Metals ICP-AES (w)	180	Mar-11-18 15:15	pH = 2
Metals ICP-MS (w)	180	Mar-11-18 15:15	pH = 2
Mg ICP (W)	180	Mar-11-18 15:15	pH = 2
Solids, TDS	7	Sep-19-17 15:15	pH = 7
Solids, TSS	7	Sep-19-17 15:15	pH = 7

Sample ID: 1709003-11 **Sampled:** Sep-13-17 09:44 **Matrix:** Water

Sample Name: S11 **Sample Location/Comments:** CB-5 outside sheet pile mid

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-27-17 09:44	pH = 7
Anions by IC	28	Oct-11-17 09:44	pH = 7
Ca ICP (W)	180	Mar-12-18 09:44	pH = 2
Hardness by calc	180	Mar-12-18 09:44	pH = 2
Hg Total CVAA	28	Oct-11-17 09:44	pH = 2
Metals ICP-AES (w)	180	Mar-12-18 09:44	pH = 2
Metals ICP-MS (w)	180	Mar-12-18 09:44	pH = 2
Mg ICP (W)	180	Mar-12-18 09:44	pH = 2
Solids, TDS	7	Sep-20-17 09:44	pH = 7
Solids, TSS	7	Sep-20-17 09:44	pH = 7

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Sample ID: 1709003-12 **Sampled:** Sep-13-17 09:49 **Matrix:** Water

Sample Name: S12 **Sample Location/Comments:** CB-5 inside sheet pile

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-27-17 09:49	pH = 7
Anions by IC	28	Oct-11-17 09:49	pH = 7
Ca ICP (W)	180	Mar-12-18 09:49	pH = 2
Hardness by calc	180	Mar-12-18 09:49	pH = 2
Hg Total CVAA	28	Oct-11-17 09:49	pH = 2
Metals ICP-AES (w)	180	Mar-12-18 09:49	pH = 2
Metals ICP-MS (w)	180	Mar-12-18 09:49	pH = 2
Mg ICP (W)	180	Mar-12-18 09:49	pH = 2
Solids, TDS	7	Sep-20-17 09:49	pH = 7
Solids, TSS	7	Sep-20-17 09:49	pH = 7

Sample ID: 1709003-13 **Sampled:** Sep-13-17 09:55 **Matrix:** Water

Sample Name: S13 **Sample Location/Comments:** CB-5 outside sheet pile north

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-27-17 09:55	pH = 7
Anions by IC	28	Oct-11-17 09:55	pH = 7
Ca ICP (W)	180	Mar-12-18 09:55	pH = 2
Hardness by calc	180	Mar-12-18 09:55	pH = 2
Hg Total CVAA	28	Oct-11-17 09:55	pH = 2
Metals ICP-AES (w)	180	Mar-12-18 09:55	pH = 2
Metals ICP-MS (w)	180	Mar-12-18 09:55	pH = 2
Mg ICP (W)	180	Mar-12-18 09:55	pH = 2
Solids, TDS	7	Sep-20-17 09:55	pH = 7
Solids, TSS	7	Sep-20-17 09:55	pH = 7

Sample ID: 1709003-14 **Sampled:** Sep-13-17 10:23 **Matrix:** Water

Sample Name: S14 **Sample Location/Comments:** Dark River Pond

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-27-17 10:23	pH = 7
Anions by IC	28	Oct-11-17 10:23	pH = 7
Ca ICP (W)	180	Mar-12-18 10:23	pH = 2
Hardness by calc	180	Mar-12-18 10:23	pH = 2
Hg Total CVAA	28	Oct-11-17 10:23	pH = 2

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Project Number: 02DM17

Sample ID: 1709003-14 **Sampled:** Sep-13-17 10:23 **Matrix:** Water

Sample Name: S14 **Sample Location/Comments:** Dark River Pond

Analysis	Hold time (days)	Expires	Comments
Metals ICP-AES (w)	180	Mar-12-18 10:23	pH = 2
Metals ICP-MS (w)	180	Mar-12-18 10:23	pH = 2
Mg ICP (W)	180	Mar-12-18 10:23	pH = 2
Solids, TDS	7	Sep-20-17 10:23	pH = 7
Solids, TSS	7	Sep-20-17 10:23	pH = 7

Sample ID: 1709003-15 **Sampled:** Sep-13-17 11:10 **Matrix:** Water

Sample Name: S15 **Sample Location/Comments:** Timber Creek

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-27-17 11:10	pH = 7
Anions by IC	28	Oct-11-17 11:10	pH = 7
Ca ICP (W)	180	Mar-12-18 11:10	pH = 2
Hardness by calc	180	Mar-12-18 11:10	pH = 2
Hg Total CVAA	28	Oct-11-17 11:10	pH = 2
Metals ICP-AES (w)	180	Mar-12-18 11:10	pH = 2
Metals ICP-MS (w)	180	Mar-12-18 11:10	pH = 2
Mg ICP (W)	180	Mar-12-18 11:10	pH = 2
Solids, TDS	7	Sep-20-17 11:10	pH = 7
Solids, TSS	7	Sep-20-17 11:10	pH = 7

Sample ID: 1709003-16 **Sampled:** Sep-13-17 12:52 **Matrix:** Water

Sample Name: R16 **Sample Location/Comments:** Field Blank

Analysis	Hold time (days)	Expires	Comments
Alkalinity	14	Sep-27-17 12:52	pH = 5
Anions by IC	28	Oct-11-17 12:52	pH = 5
Ca ICP (W)	180	Mar-12-18 12:52	pH = 2
Hardness by calc	180	Mar-12-18 12:52	pH = 2
Hg Total CVAA	28	Oct-11-17 12:52	pH = 2
Metals ICP-AES (w)	180	Mar-12-18 12:52	pH = 2
Metals ICP-MS (w)	180	Mar-12-18 12:52	pH = 2
Mg ICP (W)	180	Mar-12-18 12:52	pH = 2
Solids, TDS	7	Sep-20-17 12:52	pH = 5
Solids, TSS	7	Sep-20-17 12:52	pH = 5

Reviewed By _____ Date _____

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Project:	**U.S. Steel - Minntac Tailings Basin Area Facility**	**Project Number:**	**02DM17**

Analysis groups included in this work order

Hardness by calc

Mg ICP (W) Ca ICP (W)

PROJECT COMMENTS: See QAPP for metals list
Anions: Br, Cl, Fl, SO4

Reviewed By

Date