UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8

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| IN THE MATTER OF:<br><br>Arrow Midstream Holdings, LLC<br>811 Main Street, Suite 3400<br>Houston, Texas 77002<br><br>Respondent. | )<br>)<br>)<br>)<br>)<br>)<br>) | Docket No. CWA-08-2021-0014<br><br><br><br>CONSENT AGREEMENT |

## I. INTRODUCTION

1. This is an administrative penalty assessment proceeding pursuant to sections 22.13(b) and 22.18(b)(2) and (3) of the *Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits* (Consolidated Rules of Practice), as codified at 40 C.F.R. part 22.

2. Arrow Midstream Holdings, LLC (Respondent), owns and/or operates the Arrow Pipeline, LLC produced water pipeline near the Two Shields Butte 9-8-7 well pad (Two Shields Butte Pipeline) and the produced water pipeline near the Moccasin Creek 8-26 well pad (Moccasin Creek Pipeline), both of which are located within the Fort Berthold Reservation (Reservation), North Dakota.

3. EPA and Respondent, having agreed settlement of this action is in the public interest, consent to the entry of this consent agreement (Agreement) without adjudication of any issues of law or fact herein, and Respondent agrees to comply with the terms of this Agreement.

## II. JURISDICTION

4. This Agreement is issued under the authority vested in the Administrator of the EPA by section 309 of the Clean Water Act (Act), 33 U.S.C. § 1319. The undersigned EPA official has been duly authorized to institute this action.

5. The Regional Judicial Officer is authorized to approve this Agreement with a final order. 40 C.F.R. §§ 22.4(b) and 22.18(b).

6. The final order approving this Agreement simultaneously commences and concludes this proceeding. 40 C.F.R. § 22.13(b).

## III. GOVERNING LAW

7. Section 301(a) of the Act, 33 U.S.C. § 1311(a), prohibits, among other things, the discharge of a pollutant by any person into navigable waters, unless authorized by certain other provisions of the Act, including section 402 of the Act, 33 U.S.C. § 1342.

8. Section 402 of the Act, 33 U.S.C. § 1342, establishes a National Pollutant Discharge Elimination System (NPDES) program under which EPA may authorize discharges into navigable waters, subject to specific terms and conditions.

9. The term "discharge of a pollutant" means any addition of any pollutant to navigable waters from any point source. 33 U.S.C. § 1362(12).

10. The term "pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. 33 U.S.C. § 1362(6).

11. The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. 33 U.S.C. § 1362(14).

12. The term "person" means an individual, corporation, partnership, association, State, municipality, commission, or political subdivision of a State, or any interstate body. 33 U.S.C. § 1362(5).

13. The term "navigable waters" means the waters of the United States, including the territorial seas. 33 U.S.C. § 1362(7). In turn, "waters of the United States" has been defined to include, inter alia, all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce; and tributaries to such waters. 40 C.F.R. §§ 122.2 and 110.1.

14. EPA is the permitting authority for NPDES permits in Indian country, including the Reservation. 40 C.F.R. § 123.1(h).

15. Section 309(g) of the Act, 33 U.S.C. § 1319(g), authorizes the EPA to assess a class I or class II civil penalty against any person who violates section 301 of the Act, 33 U.S.C. § 1311.

## IV. FACTUAL ALLEGATIONS

16. Respondent Arrow Midstream Holdings, LLC, maintains its principal place of business at 811 Main Street, Suite 3400, Houston, Texas 77002. Arrow Midstream Holdings, LLC owns Arrow Pipeline, LLC, which owns the Two Shields Butte Pipeline and the Moccasin Creek Pipeline.

17. Respondent is a "person" as that term is defined in section 502(5) of the Act, 33 U.S.C. § 1362(5), and 40 C.F.R. § 122.2, for federal enforcement purposes.

### Two Shields Butte Pipeline

18. The Two Shields Butte Pipeline is located within the Reservation.

19. On September 20, 2019, Respondent identified an unauthorized release from the Two Shields Butte Pipeline of approximately 962 barrels of produced water.

20. The incident began on September 19, 2019, and impacted downgradient waterways.

21. The release traveled downslope and ultimately into an unnamed drainageway with fringing wetlands and five beaver dams. Due to significant precipitation before, during, and after the release, the

unnamed drainageway contained flowing water at all relevant times. The unnamed drainageway flows into Skunk Creek, which flows into Lake Sakakawea, a navigable waterbody.

22. The produced water described in paragraph 19 is a "pollutant" within the meaning of section 502(6) of the Act, 33 U.S.C. § 1362(6).

23. The release described in paragraph 19 is a "discharge of a pollutant" within the meaning of section 502(12) of the Act, 33 U.S.C. § 1362(12).

24. The Two Shields Butte Pipeline is a "point source" within the meaning of section 502(14) of the Act, 33 U.S.C. § 1362(14).

25. The waters identified in paragraph 21 are and were at all relevant times "navigable waters" within the meaning of section 502(7) of the Act, 33 U.S.C. § 1362(7).

26. Respondent did not have a permit under the Act for the release described in paragraph 19.

27. Respondent engaged in remedial activities to address the impacts of the release, as detailed in the Two Shields Butte remediation plan, Attachment 1 to this Agreement.

**Moccasin Creek Pipeline**

28. The Moccasin Creek Pipeline is located on the Reservation.

29. On September 30, 2019, Respondent identified an unauthorized discharge from the Moccasin Creek Pipeline of approximately 3,917 barrels of produced water.

30. The incident began on September 28, 2019, and impacted downgradient waterways.

31. The release flowed downslope into an unnamed drainage. Due to significant precipitation before, during, and after the release, the unnamed drainageway contained flowing water at all relevant times. The unnamed drainage leads to Woman Creek, which flows into Lake Sakakawea, a navigable waterbody.

32. The produced water described in paragraph 29 is a "pollutant" within the meaning of section 502(6) of the Act, 33 U.S.C. § 1362(6).

33. The release described in paragraph 29 is a "discharge of a pollutant" within the meaning of section 502(12) of the Act, 33 U.S.C. § 1362(12).

34. The Moccasin Creek Pipeline is a "point source" within the meaning of section 502(14) of the Act, 33 U.S.C. § 1362(14).

35. The waters identified in paragraph 31 are and were at all relevant times "navigable waters" within the meaning of section 502(7) of the Act, 33 U.S.C. § 1362(7).

36. Respondent did not have a permit under the Act for the release described in paragraph 29.

37. Respondent engaged in remedial activities to address the impacts of the release, as detailed in the Moccasin Creek remediation plan, Attachment 2 to this Agreement.

## V. ALLEGED VIOLATIONS OF LAW

38. Respondent discharged pollutants from the Two Shields Butte Pipeline into waters of the United States without a permit, in violation of section 301(a) of the Act, 33 U.S.C. § 1311(a).

39. Respondent discharged pollutants from the Moccasin Creek Pipeline into waters of the United States without a permit, in violation of section 301(a) of the Act, 33 U.S.C. § 1311(a).

## VI. TERMS OF CONSENT AGREEMENT

40. For the purpose of this proceeding, Respondent:

    a. admits the jurisdictional allegations in section II of this Agreement;

    b. neither admits nor denies the factual allegations stated in section IV of this Agreement;

    c. consents to the assessment of a civil penalty as stated below;

    d. consents to the conditions specified in this Agreement;

    e. consents to the issuance of any specified compliance or corrective action order;

    f. acknowledges this Agreement constitutes an enforcement action for purposes of considering Respondent's compliance history in any subsequent enforcement actions;

    g. waives any right to contest any final order approving this Agreement; and

    h. waives any rights it may possess at law or in equity to challenge the authority of EPA to bring a civil action in a United States District Court to compel compliance with the Agreement or Order, or both, and to seek an additional penalty for such noncompliance, and agrees that federal law shall govern in any such civil action.

41. Section 309(g) of the Act, 33 U.S.C. § 1319(g), authorizes EPA to assess a civil penalty in this matter.

42. In determining the amount of the penalty to be assessed, EPA considered the nature, circumstances, extent and gravity of the violations, ability to pay, any prior history of such violations, the degree of culpability, economic benefit or savings (if any) resulting from the violation, and such other matters as justice may require, in accordance with section 309(g)(3) of the Act, 33 U.S.C. § 1319(g)(3).

43. Based on the Alleged Violations of Law, and after consideration of the statutory factors in paragraph 42 above, EPA has determined a civil penalty of **$106,500** is appropriate to settle this matter.

44. Penalty Payment. Respondent agrees to:

a. pay a civil penalty in the amount of **$106,500** within 30 calendar days of the Effective Date of this Agreement;

b. pay the civil penalty using any method provided on the following website https://www.epa.gov/financial/makepayment;

c. identify each and every payment with the docket number that appears on the final order; and

d. within 24 hours of payment, email proof of payment to Emilio Llamozas and Matt Castelli at llamozas.emilio@epa.gov and castelli.matthew@epa.gov ("proof of payment" means, as applicable, a copy of the check, confirmation of credit card or debit card payment, confirmation of wire or automated clearinghouse transfer, and any other information required to demonstrate payment has been made according to EPA requirements, in the amount due, and identified with the docket number that appears on the final order).

45. If Respondent fails to timely pay any portion of the penalty assessed under this Agreement, EPA may:

a. request the Attorney General to bring a civil action in an appropriate district court to recover: the amount assessed; interest at rates established pursuant to 26 U.S.C. § 6621(a)(2); the United States' enforcement expenses;

b. refer the debt to a credit reporting agency or a collection agency, 40 C.F.R. §§ 13.13, 13.14, and 13.33;

c. collect the debt by administrative offset (i.e., the withholding of money payable by the United States to, or held by the United States for, a person to satisfy the debt the person owes the Government), which includes, but is not limited to, referral to the Internal Revenue Service for offset against income tax refunds, 40 C.F.R. part 13, subparts C and H; and

d. suspend or revoke Respondent's licenses or other privileges or suspend or disqualify Respondent from doing business with EPA or engaging in programs EPA sponsors or funds, 40 C.F.R. § 13.17.

46. Consistent with section 162(f)(1) of the Internal Revenue Code, 26 U.S.C. § 162(f)(1), Respondent will not deduct penalties paid under this Agreement for federal tax purposes.

47. The obligations of this Agreement apply to Respondent and its successors and assigns. Respondent must give written notice and a copy of this Agreement to any successors-in-interest prior to transfer of any interest in the Two Shields Butte Pipeline or Moccasin Creek Pipeline. Any change in ownership or corporate control of Respondent shall not alter Respondent's responsibilities under this Agreement.

48. The undersigned representative of Respondent certifies he or she is fully authorized to execute and enter into the terms and conditions of this Agreement and has the legal capacity to bind the party he or she represents to this Agreement.

49. Except as qualified by paragraph 45, each party shall bear its own attorney's fees, costs, and disbursements incurred in this proceeding.

## VII. EFFECT OF CONSENT AGREEMENT

50. In accordance with 40 C.F.R. § 22.18(c), completion of the terms of this Agreement resolves only Respondent's liability for federal civil penalties for the violations specifically alleged above.

51. The terms, conditions, and compliance requirements of this Agreement may not be modified or amended except upon the written agreement of both parties, and approval of the Environmental Appeals Board/ Regional Judicial Officer, or other delegatee.

52. EPA may use any information submitted under this Agreement in an administrative, civil judicial, or criminal action.

53. Nothing in this Agreement shall relieve Respondent of the duty to comply with all applicable provisions of the Act.

54. Nothing herein shall be construed to limit the power of EPA to undertake any action against Respondent or any person in response to conditions that may present an imminent and substantial endangerment to the public health, welfare, or the environment.

55. If and to the extent EPA finds, after signing this Agreement, that any information provided by Respondent was materially false or inaccurate at the time such information was provided to EPA, EPA reserves any and all of its legal and equitable rights.

## VIII. PUBLIC NOTICE

56. As required by section 309(g)(4)(A) of the Act, 33 U.S.C. § 1319(g)(4)(A), and 40 C.F.R. § 22.45, the EPA will provide public notice and a reasonable opportunity to comment on the penalty that Respondent has agreed to pay in this matter. The EPA may modify or withdraw its consent to this Agreement if comments received disclose facts or considerations which indicate this Agreement is improper or inadequate.

## IX. EFFECTIVE DATE

57. This Agreement shall become effective on the date the final order is filed by the hearing clerk.

**UNITED STATES**
**ENVIRONMENTAL PROTECTION AGENCY REGION 8,**
**Complainant.**

Date: March 26, 2021 By: COLLEEN RATHBONE Digitally signed by COLLEEN RATHBONE Date: 2021.03.26 08:29:37 -06'00'

Colleen Rathbone, Chief
Water Enforcement Branch

**ARROW MIDSTREAM HOLDINGS, LLC,**
**Respondent.**

Date: 3/19/21 By: _____

Joel C. Lambert, Executive Vice President, Chief Legal,
Compliance & Safety Officer

# Attachment 1

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**November 15, 2019**
**Two Shields Butte (TSB) 9-8-7 Release**

## Release Summary

On September 20, 2019, at approximately 9:45 AM, a low pressure alarm on a produced water line was identified near the TSB 9-8-7 Well Pad (the "Well Pad"). During a physical investigation of the area near the Well Pad, an unintended produced water release was identified around 11:00 AM. The pertinent segment of pipeline was immediately shut in. When investigating the release pathway, it was observed that produced water had collected on the hillside. Additional investigation showed the produced water accumulated upstream of a Beaver Dam. The release volume has been calculated from metered data, which indicates the release volume was 962 barrels of produced water. The location of the incident is near the Well Pad (approximately 47.73678°, -102.47453°).

Several days prior to September 20, 2019, the area near the Well Pad experienced significant precipitation. It continued to rain sporadically near the Well Pad on September 20-21, 2019.

## Immediate Response Actions

The initial response actions minimalized the impact of the unintended release, and prevented the additional spread of any potential contaminants. Beginning on September 20, 2019, hydrovacs were utilized to remove free standing fluid around the initial release area. Approximately Seventy (70) bbls of free fluid were collected. Sump holes and trenches were created in various locations to pool additional free fluid and prevent additional produced water from traveling further downstream. A dike was created immediately downstream of the initial collection pond (Beaver Dam internment) to contain the release from traveling beyond these two containment barriers.

Pumps were setup and surface hoses were placed in the collection impoundments to capture and remove potentially impacted surface waters. The pumps also allowed for additional freeboard in the collection impoundments to capture runoff from precipitation events. Water from the collection impoundments was pumped into tanks and the accumulated water in the trenches and sump holes was also removed for disposal. Approximately Eighteen Thousand Three Hundred and Eighty Nine (18,389) bbls of water were removed from the surface water impoundments.

Preliminary sampling began on September 20-21, 2019, and has been collected in numerous locations, including along the release flow path, at the surface water impoundments, and surface waters further downstream of the impoundments.

## Remediation Plan

The overall goal of this Remediation Plan is to bring the impacted area back to the same productivity as the non-impacted soils in the immediate area. To accomplish this goal, a combination of methodologies

are used to accommodate the terrain and variable landscape. The four areas outlined in the map attached (Area A, Area B, Area C, and Area D) have separate remediation methodologies to accommodate the topography and landscape.

**AREA A**

Area A encompasses the area from the release location, downslope approximately 1,200 ft, to a thick grove of trees. It includes the road ditch, as well as the culvert, which the release traveled down and through, as well as an upland drainageway dominated by grasses (see map attached).

All impacted trees and shrubs greater than one-inch (1") diameter at breast height (dbh) were identified, counted, and removed. Soils with an Electrical Conductivity (EC) greater than 6 mS/cm were excavated and removed at two locations: (i) along the roadway immediately adjacent to the release origin; and (ii) along the drainageway from the release origin for approximately 1,200ft. The removed material was hauled to a properly permitted disposal facility. The scoop and haul in Area A has been completed, approximately two hundred thirty-eight (280) semi-truck side dump loads were hauled off site for proper disposal.

A clean, compatible soil will be used to replace the removed materials. Pending landowner access, Crestwood anticipates that clean, compatible soil will fill the excavation area by December 15, 2019. The area will be seeded with a non-GMA U.S. Department of the Interior, Bureau of Indian Affairs ("BIA") approved grass and forbs seed mix, and the area will be visually monitored quarterly until the vegetation reaches 70% coverage. Impacted trees and shrubs will be replanted at a 2:1 ratio, and monitored for 2 years to insure 70% survival. A four-strand barbed wire fence was installed and will be maintained around the area to prevent livestock from entering the remediation area. Once vegetation is at 70% coverage the fence will be removed.

**AREA B**

Area B includes a heavily wooded drainage with multiple cattle trails and deep (two to three foot) gullies in which the release channelized (see map attached).

All impacted trees and shrubs, greater than one-inch (1") dbh were identified, counted, and removed. Due to the multiple channels of the fluid in this area, a mini excavator was utilized to minimize the disturbance to uncontaminated soils. Soils with an EC greater than 6 mS/cm were removed and hauled to a properly permitted disposal facility. Within areas that were deemed too intrusive (i.e. excavation would cause greater impact to the soils and surrounding landscape than the release), an in-situ approach is being taken. Calcium carbonate and/or calcium sulfate have been applied to these areas at 2 times the recommended application rate. The calcium amendments are used to provide a source of calcium to replace the sodium ions bound to the soil particles. The sodium from the release will preferentially be displaced by the calcium in the amendments; thereby, allowing the salts to leach downward through the soil profile. Reapplication of calcium amendments will occur semiannually until the remediation goals are met. The scoop and haul in Area B has been completed, approximately forty-six (46) semi-truck side dump loads were hauled off site for proper disposal.

The area will be seeded with a non-GMO BIA approved grass and forbs mix, and the area will be visually monitored quarterly until the vegetation reaches 70% of the pre-release coverage. Impacted trees and

shrubs will be replanted at a 2:1 ratio, and monitored for 2 years to insure 70% survival. A four-strand barbed wire fence has been installed and will be maintained around the area to prevent livestock from entering the remediation area. Once vegetation is at 70% coverage the fence will be removed.

**AREA C**

Area C comprises an area from the tree grove to the first beaver dam, including an unnamed drainageway with fringing wetlands (see map attached).

A qualified biologist delineated the site and determined where wetlands exist. In-situ remediation will be continued in any wetlands as an alternative to excavation and removal due to the erodibility of the wetlands within this pathway, and the steep terrain surrounding them. In the wetland areas, Calcium carbonate and/or calcium sulfate has been applied to areas without standing water at 1 to 2 times the recommended application rate. The calcium amendments are used to provide a source of calcium to replace the sodium ions bound to the soil particles. The sodium from the release will preferentially be displaced by the calcium in the amendments; thereby, allowing the salts to leach downward through the soil profile. Reapplication of calcium amendments will occur semiannually until the remediation goals are met.

As laboratory analysis indicated, no adverse impacts have occurred through the cessation of pumping and the pumps were removed on October 16, 2019. Crestwood will have a third party consultant continue to collect water samples for analysis, and determine if further remediation efforts will be warranted.

**AREA D**

Area D includes the drainageway downstream of the manmade dike, just downslope of the initial collection pond (beaver dam internment), and continues to the confluence of Skunk Creek, and eventually downstream to Lake Sakakawea's Skunk Creek Bay (see map attached).

There is no evidence to support that Area D has been negatively impacted. At this time, no active remediation efforts will take place within this area.

## Site Characterization and Sampling

A combination of field screening and laboratory analysis was used to determine the extent of contamination, as well as provide documentation displaying the site has been remediated in a manner which restores the site to its previous productivity.

Field screening was not used in wetland areas to determine if an area was impacted. Wetland areas, especially those with clay soils, tend to have higher conductivity due to the presence of materials that ionize when washed with water. The ions come from dissolved salts and inorganic materials such as alkalis, chlorides, sulfides, and carbonate compounds that are naturally occurring.

For the soils undergoing in-situ remediation, initial samples, to include background samples, were collected and sent in for laboratory analysis for Sodium Absorption Ratio (SAR), EC, chlorides, select metals and Total Petroleum Hydrocarbons (TPH). Crestwood has analyzed the laboratory data from the initial samples to understand background levels and develop a site-specific standard. This was required

to understand the highly variable ion composition in the wetlands along the release flow path. Quarterly sampling will be maintained (during non-frozen conditions) until the agreed upon standards are met, not to exceed two years of sampling.

Sampling efforts within each designated area are outlined below.

**AREA A**

Soil samples were taken prior to any excavation to understand the release impacts. Confirmation samples were taken within the excavation along the walls and the floor (including cores), as outlined below. Once laboratory analysis confirms that the confirmation samples achieve the goals outlined herein, these sample locations will no longer be sampled.

Field screening was performed with a direct soil EC meter. The EC meter was calibrated daily and used to identify elevated conductivity levels within the horizontal extent as well as vertical profile. Excavation walls and floors were tested with an EC meter at a minimum of every 100 sqft. When an EC reading higher than 6 mS/cm was found, removal of impacted soil continued to a maximum depth of eight feet (8').

Once the field screening process was complete within the excavated area and the field screenings indicated the area impacted has been remediated, samples were collected for laboratory analysis. Surface composite samples were collected along the wall and floor of the excavation, at a rate of one composite sample for every 5,000 sqft. Samples purposed as project closure samples were analyzed for SAR, EC, TPH, Arsenic (As), Barium (Ba), Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Sodium (Na), Lead (Pb), Selenium (Se), and Zinc (Zn). In addition to the surface samples, core samples were collected at a depth of 60 inches (12-inch lifts) below the floor of the excavation at a rate of one core per 10,000 sqft. These samples are to verify the excavation went down to a sufficient depth, as well as to ensure there are no hidden seams of fluids within the soil profile. For the purposes of this Remediation Plan, the following remediation standards apply to the excavated areas within Area A.

| TPH mg/kg | EC mS/cm | SAR - | As mg/Kg | Ba mg/Kg | Cd mg/Kg | Cr mg/Kg | Cu mg/Kg | Hg mg/Kg | Na wt. % | Pb mg/Kg | Se mg/Kg | Zn mg/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 6.0 | 15 | 13.10 | 953.00 | 0.90 | 64.00 | 39.10 | 0.09 | 1.35 | 21.20 | 0.90 | 102.00 |

Resampling at each sampling location will occur if one or more of the above remediation standard thresholds are exceeded. Any samples indicating that the remediation standards are below the threshold limit will be excluded from subsequent sampling.

**AREA B**

For the excavated portions of Area B, soil samples were taken prior to any excavation to understand the release impacts. Confirmation samples will be taken within the excavation along the walls and the floor (including cores), as outlined below. Once laboratory analysis confirms the confirmation samples are free of any contaminants, these sample locations will no longer be sampled.

For the in-situ remediation areas, soil samples were taken prior to any remediation activities to understand the release impacts. Calcium amendments have been applied and quarterly sampling will be maintained (during non-frozen conditions) until the agreed upon standards are met, not to exceed two years of sampling, unless conditions warrant additional monitoring.

Field screening was performed with a direct soil EC meter. The EC meter was calibrated daily and used to identify elevated conductivity levels within the horizontal extent as well as vertical profile. The excavation walls and floors were tested with an EC meter at a minimum of every 100 sqft.

Once the field screening process was complete within an excavated area and the field screenings indicate the area impacted has been remediated, samples were collected for laboratory analysis. Surface composite samples were collected along the wall and floor of the excavation, at a rate of one composite sample for every 5,000 sqft. Samples purposed as project closure samples were analyzed for SAR, EC, TPH, Arsenic (As), Barium (Ba), Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Sodium (Na), Lead (Pb), Selenium (Se), and Zinc (Zn). In addition to the surface samples, core samples were collected at a depth of 60 inches (12-inch lifts) below the floor of the excavation at a rate of one core per 10,000sqft. These samples are to verify the excavation went down to a sufficient depth, as well as to ensure there are no hidden seams of fluids within the soil profile. For the purposes of this Remediation Plan, the following remediation standards shall apply to the excavated areas in Area B.

| TPH mg/kg | EC mS/cm | SAR - | As mg/Kg | Ba mg/Kg | Cd mg/Kg | Cr mg/Kg | Cu mg/Kg | Hg mg/Kg | Na wt. % | Pb mg/Kg | Se mg/Kg | Zn mg/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 6.0 | 15 | 13.10 | 953.00 | 0.90 | 64.00 | 39.10 | 0.09 | 1.35 | 21.20 | 0.90 | 102.00 |

Resampling at each sampling location will occur if one or more of the above remediation standard thresholds are exceeded. Any samples indicating that the remediation standards are below the threshold limit will be excluded from subsequent sampling.

**AREA C**

Surface water samples were conducted weekly within the impacted drainageway (for four consecutive weeks), and will continue to be collected quarterly. Sample locations are outlined in the map attached. The samples were analyzed for TPH, EC, Chlorides, SAR, As, Ba, Cd, Cr, Cu, Hg, Na, Pb, Se, and Zn during the weekly sampling events, and will be reduced to EC, Chlorides and SAR for quarterly sampling. Quarterly sampling will cease after a period of two years.

With consideration to the lack of background data, the highly variable ion composition in wetland soils, and the naturally occurring metals common in western North Dakota drainageways, Crestwood has analyzed background samples and, as such, proposes the following soil remediation standards for SAR, As, Ba, Cd, Cr, Cu, Hg, Na, Pb, Se, and Zn within Area C. The standards reflect those above set for Area A and Area B, except for the constituents of which twice the background level is higher than the standards above. The TPH standard is maintained at 100 mg/kg for Area C. The creation of multiple beaver dams within the water way has caused these areas to become permanently ponded, and thus, the soils within these areas are permanently saturated. This saturation causes the minerals within the soil to dissolve and naturally rise through the soil profile. As the minerals concentrate in the soil it is accompanied by an elevated EC level that cannot be compared to in background samples as there is no comparable system upgradient; as such, Crestwood will not have a standard for EC, and will rely on the other quantitative

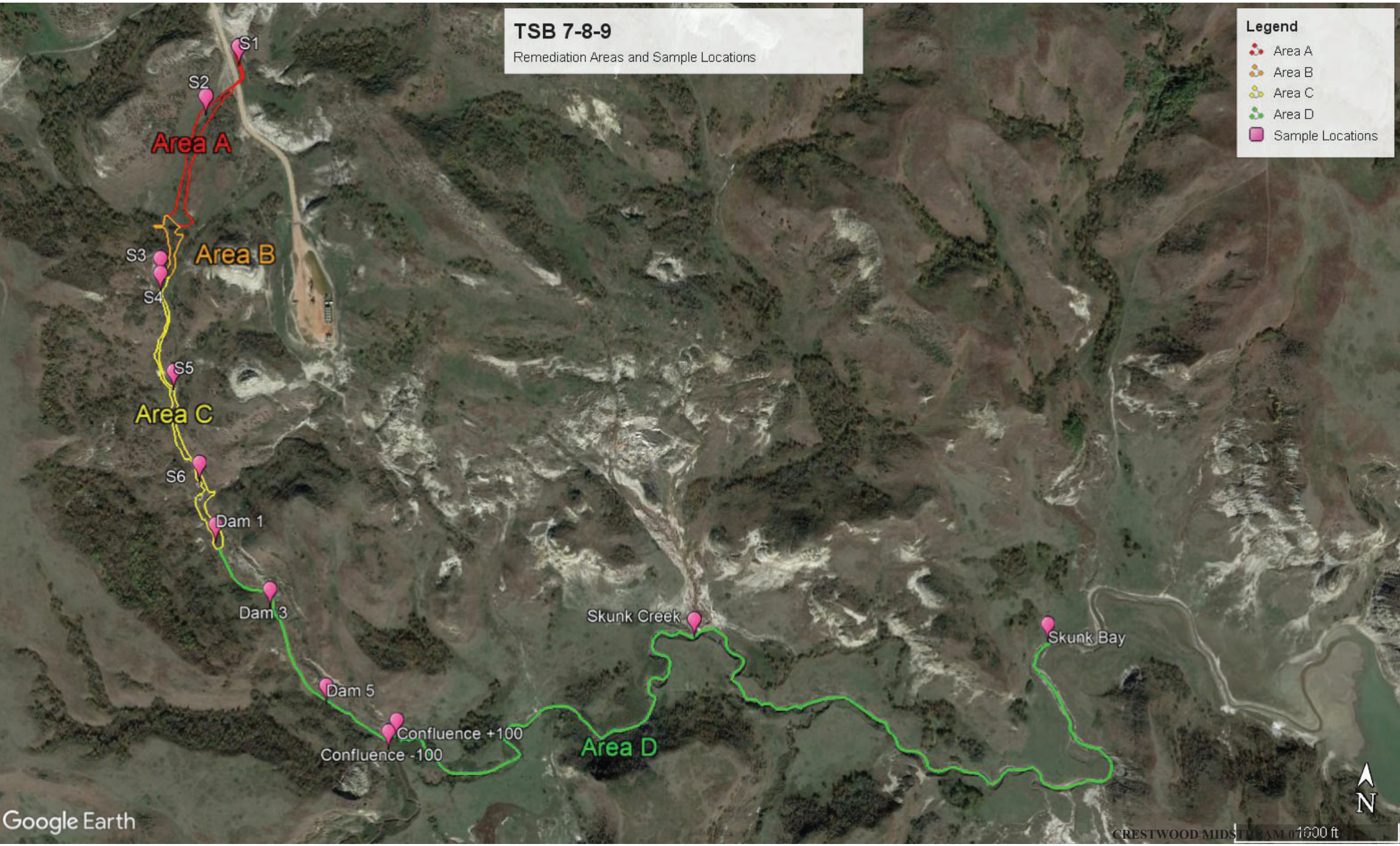
constituents. Quarterly sampling in Area C will be maintained (during non-frozen conditions) until the agreed upon standards are met.

| TPH mg/kg | SAR - | As mg/Kg | Ba mg/Kg | Cd mg/Kg | Cr mg/Kg | Cu mg/Kg | Hg mg/Kg | Na wt. % | Pb mg/Kg | Se mg/Kg | Zn mg/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 29.8 | 26.2 | 1042 | 1.14 | 82.6 | 119.8 | 0.108 | 1.35 | 50.8 | 0.90 | 268.00 |

Initial soil and water samples have been taken along the release path to understand the release impacts. Once the calcium amendments have been applied, quarterly sampling will be maintained (during non-frozen conditions) until the agreed upon standards are met, not to exceed two years of sampling, unless conditions warrant further sampling.

## AREA D

There is no evidence of negative impacts within Area D. Water samples were taken weekly for four consecutive weeks, and will continue quarterly to ensure no negative impacts to Area D occur. If negative impacts do arise, Crestwood will prepare an addendum to this Remediation Plan within fifteen (15) business days to address these impacts. The samples were analyzed for TPH, EC, Chlorides, SAR, As, Ba, Cd, Cr, Cu, Hg, Na, Pb, Se, and Zn during the weekly sampling events, and will be reduced to EC, Chlorides and SAR for quarterly sampling. Sampling will cease after a period of two years, unless conditions warrant further sampling.


TSB 7-8-9
Remediation Areas and Sample Locations
Legend
Area A
Area B
Area C
Area D
Sample Locations
S1
S2
Area A
S3
Area B
S4
S5
Area C
S6
Dam 1
Dam 3
Dam 5
Confluence +100
Confluence -100
Area D
Skunk Creek
Skunk Bay
N
Google Earth
1000 ft

# Attachment 2

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**November 15, 2019**
**Moccasin Creek 8-26 Release**

## Release Summary

Early in the workday on September 30, 2019, a low pressure alarm on a produced water pipeline near the Moccasin Creek 8-26 Well Pad (the "Well Pad") was identified. During a physical investigation of the pipeline segment identified in the low pressure alarm, a produced water release was identified at a connection point between Flexsteel pipe material and Fiberspar pipe material. The pertinent segment of pipeline was immediately shut in. Upon the initial investigation of the release pathway, it was observed that produced water flowed down the hillside and impacted an ephemeral drainage way. The release volume has been calculated from metered data, which indicates the release volume was Three Thousand Nine Hundred and Seventeen (3,917) barrels of produced water. The location of the incident is near the Moccasin Creek 8-26 Well Pad (approximately 47.6170°, -102.4897°).

## Immediate Response Actions

The initial response actions minimized the impact of the unintended release, and assisted in preventing the spread of any additional potential contaminants. The nearby BIA 17 Culvert created a natural chokepoint for the produced water. As a result, significant volumes of the produced water were able to be impounded behind the BIA 17 Culvert where they were intermingled with clean storm water. Beginning on September 30, 2019, water tankers were utilized to pull potentially impacted pooled surface water at the BIA 17 Culvert. A pump was placed upstream of the impounded surface water within an unimpacted drainage way to divert additional clean storm water around the impounded water and pump out location. This also further minimized uncontaminated water being removed from the system. Dikes were created at the pump out location (allowing potentially impacted fluids to be pulled out of the system) as well as upgradient of the unimpacted drainage way confluence (to prevent additional storm water from being impacted by mixing with the impounded produced water) (see map attached). Approximately Five Thousand One Hundred and Five (5,105) barrels of intermingled fluid had been collected as of October 8, 2019.

Once a containment system was in place and trucks were able to keep up with the stormwater flowing down the impacted drainage way, a calcium based soil amendment was applied upgradient of the impacted drainage way. The calcium based soil amendment assisted in preventing salts from binding to the soil, assisted in flushing the drainage pathway, as well as preventing dispersion of the clay soils. As storm runoff continued, hand tools were used in an effort to squeegee the impacted drainage way, and remove pockets of potentially impacted water; these potentially impacted waters and suspended solids were collected at the BIA 17 dike and pumped into water tankers for disposal.

Preliminary sampling has been collected in numerous locations, including along the release flow path, within the unimpacted drainageway, at the collection impoundment, and surface waters further downstream of the impoundment.

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## Remediation Plan

The overall goal of the Remediation Plan is to bring the impacted area back to the same productivity as the non-impacted soils in the immediate area. To accomplish this goal, a combination of methodologies are being utilized to accommodate the terrain and variable landscape. The three areas outlined in the map attached (Area A, Area B, and Area C) have separate remediation methodologies to accommodate the topography and landscape.

### AREA A

Area A encompasses the area from the release location, downslope approximately 2,400 feet, until entrance into an ephemeral unnamed drainage. The area is dominated by upland grasses, shrubs, and trees (see map attached).

All impacted trees and shrubs, greater than one inch (1") diameter at breast height (dbh) will identified, counted, and removed in the Spring of 2020 (after leaf out) to prevent removal of non-impacted trees. Soils with an Electrical Conductivity (EC) greater than 6 mS/cm have been excavated and staged for disposal. The removed material is being hauled to a properly permitted disposal facility.

After all the impacted soil has been removed, a clean, compatible soil will be used to replace the removed materials. The area will be seeded with a non-GMO BIA approved grass and forbs seed mix and the area will be visually monitored quarterly until the vegetation reaches 70% coverage. Impacted trees and shrubs will be replanted at a 2:1 ratio, and monitored for 2 years to insure 70% survival. A four-strand barbed wire fence has been installed and will be maintained around the area to prevent livestock from entering Area A. Once vegetation is at 70% coverage the fence will be removed.

### AREA B

Area B includes an ephemeral unnamed drainage approximately 2,400 feet downgradient from the release location to a culvert along BIA 17 (see map attached).

A qualified biologist delineated the site and determined where wetlands and waterbodies exist. Remediation for any impacted wetland and waterbody areas are being performed in-situ. In-situ remediation is being performed in any wetlands and/or drainages as an alternative to excavation and soil removal due to the erodibility of the wetlands and the steep terrain surrounding the waterbodies. In the wetland and waterbody areas, Calcium carbonate and/or calcium sulfate has been applied and will continue to be applied to areas without standing water at 1 to 2 times the recommended application rate. Reapplication of calcium amendments will occur semiannually until the remediation goals are met.

Trees identified as dead prior to the release will remain in place as habitat, while impacted trees and shrubs, greater than one inch (1") dbh will be identified, counted, and removed in the Spring of 2020 (after leaf out) to prevent removal of non-impacted trees. Impacted trees and shrubs will be replanted at a 2:1 ratio, and monitored for 2 years to insure 70% survival.

Water collected upgradient of the Dike at BIA 17 continued to be pumped out and disposed of until October 16, 2019; at which time laboratory analysis indicated the water being pumped consisted of a chloride concentration of 56.3 mg/L and pumping ceased. The USEPA maximum contaminant level for chloride is 250 mg/l, thus the chloride levels in the impacted drainage way are less than a quarter of the secondary drinking water standard.

### AREA C

Area C includes the area down gradient from the culvert at BIA 17 to the confluence with Woman Creek (see map attached).

Any impact to Area C has been deemed negligible. There is no evidence to support that soils in Area C have been negatively impacted. Any potential impact to water is negligible due to the additional runoff from persistent precipitation events that were occurring when the release was identified and continued for the next several days.

## Site Characterization and Sampling

A combination of field screening and laboratory analysis are being used to determine the extent of contamination, as well as provide documentation displaying the site has been remediated in a manner that restores the site to its previous productivity.

Sampling efforts within each designated area are outlined below.

### AREA A

Soil samples were taken prior to any excavation to understand the release impacts. Confirmation samples will be taken within the excavation along the walls and the floor (including cores). Once laboratory analysis confirms that the confirmation samples are below the set thresholds, samples at those locations will no longer be sampled.

Field screening is being performed with a direct soil EC meter. The EC meter is being calibrated daily and used to identify elevated conductivity levels within the horizontal extent as well as vertical profile. All excavation walls and floors will be tested with an EC meter at a minimum of every 100 sqft. When an EC reading higher than 6 mS/cm is found, removal of impacted soils continues to a maximum depth of eight feet (8').

Once the field screening process is complete within the excavated areas and the field screening indicates the soils impacted have been removed, samples will be collected for laboratory analysis. Surface composite samples will be collected along the wall and floor of the excavation, at a rate of one composite sample for every 5,000sqft. Samples purposed as project closure samples will be analyzed for Sodium Absorption Ratio (SAR), EC, Total Petroleum Hydrocarbons (TPH), Arsenic (As), Barium (Ba), Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Sodium (Na), Lead (Pb), Selenium (Se), and Zinc (Zn). In addition to the surface samples, core samples will be collected at a depth of 60 inches (12-inch lifts) below the floor of the excavation at a rate of one core per 10,000sqft. These samples are to verify the excavation went down to a sufficient depth, as well as to ensure there are no hidden seams of fluids present within the soil profile. For the purposes of this Remediation Plan, the following remediation standards shall apply to the excavated areas.

| TPH mg/kg | EC mS/cm | SAR - | As mg/Kg | Ba mg/Kg | Cd mg/Kg | Cr mg/Kg | Cu mg/Kg | Hg mg/Kg | Na wt. % | Pb mg/Kg | Se mg/Kg | Zn mg/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 6.0 | 15 | 13.10 | 953.00 | 0.90 | 64.00 | 39.10 | 0.09 | 1.35 | 21.20 | 0.90 | 102.00 |

Resampling at each sampling location will occur if one or more of the above remediation standard thresholds are exceeded. Any samples indicating that the remediation standards are below the threshold limit will be excluded from subsequent sampling.

**AREA B**

Field screening will not be used in wetland or waterbody areas to determine if soils were impacted. Wetland and waterbody soils, especially those with clay soils tend to have higher conductivity due to the presence of materials that ionize when washed with water. The ions come from dissolved salts and inorganic materials such as alkalis, chlorides, sulfides and carbonate compounds that are naturally occurring and increase the EC of the soil.

Initial soil and water samples, including background samples, were collected and sent in for laboratory analysis for SAR, EC, Chlorides, Metals and TPH. With consideration to the lack of background data, the highly variable ion composition in hydric soils, and the naturally occurring metals common in western North Dakota drainageways, Crestwood has analyzed background samples and, as such, proposes the following soil remediation standards for SAR, EC, As, Ba, Cd, Cr, Cu, Hg, Na, Pb, Se, and Zn within Area B. The standards reflect those set for Area A, except for the constituents of which twice the background level is higher than the standards above. The TPH standard will be maintained at 100 mg/kg for Area B. Quarterly sampling in Area B will be maintained (during non-frozen conditions) until the agreed upon standards are met.

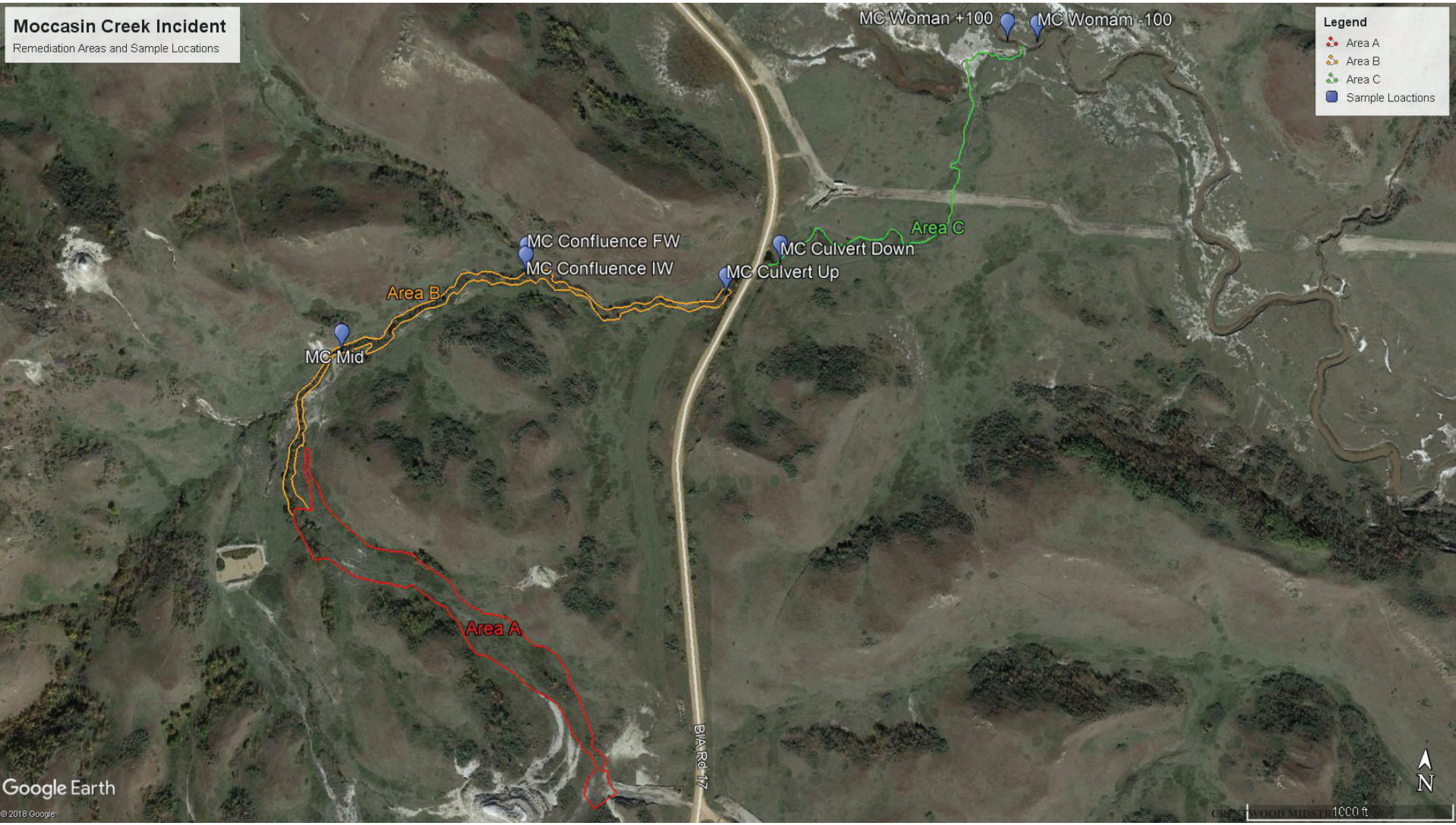
Three water sampling events took place in the three weeks after the incident; the lack of water within the drainageway prevented additional water sampling. Sample locations are outlined in the map attached. The samples are analyzed for TPH, EC, Chlorides, SAR, As, Ba, Cd, Cr, Cu, Hg, Na, Pb, Se, and Zn during the weekly sampling events, and will be reduced to EC, Chlorides and SAR for quarterly sampling. Additionally, three samples for Radium 226 and Radium 228 analysis were collected; as the results indicate no significant difference between the background (MC Confluence FW) and the two samples in the impacted pathway (MC Mid and MC Culvert Up) no additional radionuclide sampling is warranted. Quarterly sampling will be maintained (during non-frozen conditions and immediately following rain events) for a period of two years, unless Crestwood determines conditions warrant future sampling. For the purposes of this Remediation Plan, the following remediation standards shall apply to the Area B.

| TPH mg/kg | EC mS/cm | SAR - | As mg/Kg | Ba mg/Kg | Cd mg/Kg | Cr mg/Kg | Cu mg/Kg | Hg mg/Kg | Na wt. % | Pb mg/Kg | Se mg/Kg | Zn mg/Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 7.2 | 31.6 | 13.8 | 953.00 | 0.90 | 64.00 | 43.2 | 0.09 | 1.35 | 23.00 | 2.80 | 150.80 |

Resampling at each sampling location will occur if one or more of the above remediation standard thresholds are exceeded. Any samples indicating that the remediation standards are below the threshold limit will be excluded from subsequent sampling.

**AREA C**

There is no evidence of negative impacts within Area C. Three water sampling events took place in the three weeks after the incident and quarterly sampling will continue to ensure no impacts are present. If negative impacts do arise, Crestwood will prepare an addendum to this Remediation Plan with fifteen (15) business days to address these impacts. The samples were analyzed for TPH, EC, Chlorides, SAR, As, Ba, Cd, Cr, Cu, Hg, Na, Pb, Se, and Zn during the weekly sampling events, and will be reduced to EC, Chlorides and SAR for quarterly sampling. Sampling will cease after a period of two years, unless Crestwood determines conditions warrant future sampling.


Moccasin Creek Incident
Remediation Areas and Sample Locations
MC Woman +100
MC Womam -100
Legend
Area A
Area B
Area C
Sample Loactions
Area C
MC Confluence FW
MC Confluence IW
MC Culvert Down
MC Culvert Up
Area B
MC Mid
Area A
BIA Rd 17
Google Earth
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