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Alberta

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Bid Fax: (418) 566-6167

**SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
Northern Contaminated Site Program
Canada Place/Place du Canada
10th Floor/10e étage
9700 Jasper Ave/9700 ave Jasper
Edmonton
Alberta
T5J 4C3

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Title - Sujet Rayrock Remediation Project Rayrock Remediation Project | |
| Solicitation No. - N° de l'invitation EW699-220778/B | Amendment No. - N° modif. 007 |
| Client Reference No. - N° de référence du client PCC-EW699-220778 | Date 2021-11-02 |
| GETS Reference No. - N° de référence de SEAG PW-\$NCS-003-12159 | |
| File No. - N° de dossier NCS-1-44063 (003) | CCC No./N° CCC - FMS No./N° VME |
| Solicitation Closes - L'invitation prend fin at - à 02:00 PM Mountain Standard Time MST on - le 2021-11-16 Heure Normale des Rocheuses HNR | |
| F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/> | |
| Address Enquiries to: - Adresser toutes questions à: Bilous, Isabelle | Buyer Id - Id de l'acheteur ncs003 |
| Telephone No. - N° de téléphone (780) 782-8714 () | FAX No. - N° de FAX (418) 566-6167 |
| Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: | |

Instructions: See Herein

Instructions: Voir aux présentes

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Delivery Required - Livraison exigée | Delivery Offered - Livraison proposée |
| Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur | |
| Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur | |
| Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie) | |
| Signature | Date |

This amendment is raised to modify solicitation EW699-220778/B as follows:

1. REVISED CLOSING DATE OF:
02:00 PM MST on 2021-11-16

2. ANNEX A – SPECIFICATIONS AND DRAWINGS

REVISE the following Specification sections as follows:

| Section 44 41 13 – Process Water Treatment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Type | Clause | Page | Revision(s) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insert | 1.4.7.2 | 2 | Total reactive chlorine to the tabulated list under Item 1.4.7.2. See below: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th>Parameter</th><th>Units</th><th>Mill Lake Surface Water⁽¹⁾ (AVG / MAX)</th><th>Water Licence Treated Water Maximum Grab Concentration</th></tr><tr><td>pH</td><td>Unitless</td><td>7.5 to 8.6</td><td>6.0 to 9.0</td></tr><tr><td>Total Suspended Solids (TSS)</td><td>mg/L</td><td>6 / 20</td><td>25</td></tr><tr><td>Dissolved Fluoride</td><td>µg/L</td><td>90 / 98</td><td>120</td></tr><tr><td>Nitrate</td><td>µg-N/L</td><td><10</td><td>13,000</td></tr><tr><td>Nitrite</td><td>µg-NO₂/L</td><td><33</td><td>197</td></tr><tr><td>Total Ammonia</td><td>µg-N/L</td><td>40 / 90</td><td>499</td></tr><tr><td>Total Copper</td><td>µg/L</td><td>4.8 / 14</td><td>2.8</td></tr><tr><td>Total Iron</td><td>µg/L</td><td>77 / 190</td><td>300</td></tr><tr><td>Total Nickel</td><td>µg/L</td><td>1.9 / 4.3</td><td>25</td></tr><tr><td>Total Uranium</td><td>µg/L</td><td>92 / 190</td><td>15</td></tr><tr><td>Total Zinc</td><td>µg/L</td><td>9 / 28</td><td>23</td></tr><tr><td>Total Reactive Chlorine</td><td>µg/L</td><td>-</td><td>0.5⁽²⁾</td></tr></table> | | | | | Parameter | Units | Mill Lake Surface Water ⁽¹⁾ (AVG / MAX) | Water Licence Treated Water Maximum Grab Concentration | pH | Unitless | 7.5 to 8.6 | 6.0 to 9.0 | Total Suspended Solids (TSS) | mg/L | 6 / 20 | 25 | Dissolved Fluoride | µg/L | 90 / 98 | 120 | Nitrate | µg-N/L | <10 | 13,000 | Nitrite | µg-NO ₂ /L | <33 | 197 | Total Ammonia | µg-N/L | 40 / 90 | 499 | Total Copper | µg/L | 4.8 / 14 | 2.8 | Total Iron | µg/L | 77 / 190 | 300 | Total Nickel | µg/L | 1.9 / 4.3 | 25 | Total Uranium | µg/L | 92 / 190 | 15 | Total Zinc | µg/L | 9 / 28 | 23 | Total Reactive Chlorine | µg/L | - | 0.5 ⁽²⁾ | | | | | | | | |
| Parameter | Units | Mill Lake Surface Water ⁽¹⁾ (AVG / MAX) | Water Licence Treated Water Maximum Grab Concentration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | Unitless | 7.5 to 8.6 | 6.0 to 9.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Suspended Solids (TSS) | mg/L | 6 / 20 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissolved Fluoride | µg/L | 90 / 98 | 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nitrate | µg-N/L | <10 | 13,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nitrite | µg-NO ₂ /L | <33 | 197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Ammonia | µg-N/L | 40 / 90 | 499 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Copper | µg/L | 4.8 / 14 | 2.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Iron | µg/L | 77 / 190 | 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Nickel | µg/L | 1.9 / 4.3 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Uranium | µg/L | 92 / 190 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Zinc | µg/L | 9 / 28 | 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Reactive Chlorine | µg/L | - | 0.5 ⁽²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <div>(1) Mill Lake Samples were collected above the in-situ sediment layer (taken within the Mill Lake water column, approximately 1 m below water's surface).</div> <div>(2) Applies to the sum of all reactive chlorine species concentrations (i.e., hypochlorous acid, monochloramine, and others). Maximum concentration from the CCME Freshwater Guideline.</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insert | 1.4.8 | 3 | Total reactive chlorine to the tabulated list under Item 1.4.8. See below: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th>Parameter</th><th>Units</th><th>Inline Monitoring and Field Probe Requirement</th><th>Daily Sampling and Analysis (On-site)</th><th>Weekly Sampling and Analysis (Offsite, 3rd Party)</th></tr><tr><td>Discharge Flow Rate</td><td>m³/hr</td><td>X</td><td></td><td></td></tr><tr><td>pH</td><td></td><td>X</td><td>X</td><td>X</td></tr><tr><td>Temperature</td><td>°C</td><td>X</td><td>X</td><td></td></tr><tr><td>Conductivity</td><td>µS/cm</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Redox Potential</td><td>mV</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Total Dissolved Solids</td><td>mg/L</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Turbidity</td><td>NTU</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Dissolved Oxygen</td><td>mg/L</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Total Copper</td><td>µg/L</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Total Uranium</td><td>µg/L</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Total Reactive Chlorine</td><td>µg/L</td><td>X</td><td>X</td><td>X</td></tr></table> | | | | | Parameter | Units | Inline Monitoring and Field Probe Requirement | Daily Sampling and Analysis (On-site) | Weekly Sampling and Analysis (Offsite, 3 rd Party) | Discharge Flow Rate | m³/hr | X | | | pH | | X | X | X | Temperature | °C | X | X | | Conductivity | µS/cm | X | X | X | Redox Potential | mV | X | X | X | Total Dissolved Solids | mg/L | X | X | X | Turbidity | NTU | X | X | X | Dissolved Oxygen | mg/L | X | X | X | Total Copper | µg/L | X | X | X | Total Uranium | µg/L | X | X | X | Total Reactive Chlorine | µg/L | X | X | X |
| Parameter | Units | Inline Monitoring and Field Probe Requirement | Daily Sampling and Analysis (On-site) | Weekly Sampling and Analysis (Offsite, 3 rd Party) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discharge Flow Rate | m³/hr | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature | °C | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conductivity | µS/cm | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Redox Potential | mV | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Dissolved Solids | mg/L | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turbidity | NTU | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Copper | µg/L | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Uranium | µg/L | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Reactive Chlorine | µg/L | X | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Section 44 41 13 – Process Water Treatment

| Type | Clause | Page | Revision(s) |
|----------------|-----------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Replace | 1.8.4 | | Payment for Process Water successfully treated, tested, reclassified as Approved Discharge Water, and discharged to Sherman Lake shall be measured for payment by cubic metre discharged only where it complies with the full Water Licence by using a certified, calibrated flow meter in combination with in-line water quality sensors (provided in the Table under Item 1.4.8 of this Section), and as indicated under BID ITEM 44 41 13-2 PROCESS WATER TREATMENT, as indicated in the Basis of Payment Schedule. |
| Insert | 1.8.4 | | Payment for Process Water successfully treated, tested, reclassified as Approved Discharge Water, and discharged to Sherman Lake shall be measured for payment by cubic metre discharged only where it complies with the full Water Licence by using a certified, calibrated flow meter in combination with in-line water quality sensors AND THIRD PARTY TESTING (provided in the Table under Item 1.4.8 of this Section), and as indicated under BID ITEM 44 41 13-2 PROCESS WATER TREATMENT, as indicated in the Basis of Payment Schedule. |
| Insert | 2.4.1.6 | 10 | ELEMENT F - Ammonia Removal |
| Insert | 2.5.6 | 21 | ELEMENT F - Ammonia Removal |
| Insert | 2.5.6.1 | 21 | Includes facilities for removal of total ammonia-N through use of three separate tanks for chemical oxidation, oxidant quenching and post-treatment monitoring. The ammonia removal system shall be capable of removing up to a maximum of 5,000 µg/L total ammonia-N to below the Water Licence value. |
| Insert | 2.5.6.1.2 | 21 | Facilities, appurtenances and equipment associated with breakpoint ammonia oxidation and oxidant quenching shall follow all requirements outlined under Item 2.5.5 (Chemical Feed Facilities) of this Section. |
| Insert | 2.5.6.2 | 21 | The allowable oxidants for breakpoint ammonia removal consist only of sodium hypochlorite and calcium hypochlorite, which shall conform to NSF 60 Certification for trace contaminants. |
| Insert | 2.5.6.3 | 21 | The allowable oxidant quenching chemicals consist only of sodium bisulphite, sodium thiosulphate, and ascorbic acid. |
| Insert | 2.5.6.4 | 21 | Only liquid chemical dosing to the ammonia removal system may be performed. |
| Insert | 2.5.6.5 | 21 | The contractor shall strive to achieve breakpoint oxidation, with a maximum total reactive chlorine in the treated water conforming to the CCME Freshwater Guideline of 0.5 µg/L. |
| Insert | 2.5.6.6 | 21 | A total reactive chlorine analyzer shall be located in the Post-Treatment tank and shall be interlocked to an automatic isolation valve at the tank discharge to prevent flow of excess reactive chlorine into the discharge pipeline and Sherman Lake. If the analyzer reads greater than 0.5 ug/L total reactive chlorine and the condition is not rectified within 60 seconds, the tank discharge isolation valve shall automatically close and notify operations personnel through a local and remote WTP annunciation system. |
| Insert | 2.5.6.7 | 21 | The Post-Treatment tank shall be connected to the WTP recycle discharge system for emergency discharge as described under Item 2.4.7 of this Section. |

Section 44 41 13 – Process Water Treatment

| Type | Clause | Page | Revision(s) |
|--------|---------|------|------------------------------------|
| Insert | 2.5.6.8 | 21 | <i>Added Table. See below.</i> |

Minimum Design Criteria:

| Data Sheet F1: Ammonia Oxidation | |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reactor Design | |
| Number of Trains: | n+1 |
| Unit Configuration: | An Oxidation Tank followed by Quenching Tank and final Post-Treatment Tank shall comprise the fundamental components of each train. All tanks in this system to be complete mixed. |
| Cl ₂ to Total NH ₃ -N Ratio | 10:1 |
| Sodium Bisulphite to Cl ₂ Ratio | 1.46:1 |
| Sodium Thiosulphate to Cl ₂ Ratio | 1.34:1 |
| Ascorbic Acid to Cl ₂ Ratio | 2.5:1 |
| pH Range: | 7.0 – 8.5 |
| Contact Time (Oxidation Tank): | 3 min (at peak WTP capacity) |
| Contact Time (Quenching Tank) | 3 min (at peak WTP capacity) |
| Contact Time (Post-Treatment Tank) | 10 min (at peak WTP capacity) |
| Mixing Type | Jet or Mechanical Hydrofoil |

2. ANNEX E – SUPPORTING DOCUMENTS**INSERT:**

2021 Field Investigation Summary – Mill Lake Surface Water Sampling (AECOM, 2021); located in Amendment007.zip

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.