

APPENDIX E

Remediation Plan Design and Support (QA) Services

PROJECT BRIEF / TERMS OF REFERENCE

FARO MINE COMPLEX

Faro, Yukon

FOR

**Public Services and Procurement Canada (PSPC) and
Crown-Indigenous Relations and Northern Affairs Canada
(CIRNAC)**

October 26, 2021

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LIST OF ACRONYMS AND DEFINITIONS

<u>Terminology / Acronyms</u>	<u>Definitions</u>
Affected Yukon First Nations / AYFN	The Ross River Dena Council, the Liard First Nation and the Selkirk First Nation.
Affected First Nations / AFN	The Ross River Dena Council, the Liard First Nation, the Dease River First Nation, the Kwadacha Nation and the Selkirk First Nation.
AHJ	Authority Having Jurisdiction.
Architectural and Engineering Services	Has the meaning prescribed in GC 1.1.
As-built drawings	Official record drawings prepared by the MCM or their Subcontractors showing the work completed and deviations from design. They represent as constructed conditions including location and size of equipment, devices, plumbing lines, mechanical and electrical equipment, structural elements etc. As-built drawings shall be updated in CAD.
Budget	The annual approved expenditures for the Work, organized according to the approved Work Breakdown Structure (WBS) into Work Packages (WPs), against which cost performance will be measured and assessed.
Buildings and Facilities	The Real Property, which includes, but is not limited to: the Faro Housing, all the buildings fixtures, and facilities included at FMC.
Canada	Government of Canada as represented by PSPC.
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CM	Construction Manager / Main Construction Manager / Contractor / Constructor.
Commissioning	Quality assurance process, in which the functional and operational requirements of facility and systems' management are proven to function as intended.
Commissioning process	Planned program of quality management and information transfer that extends through all phases of a project's development and delivery, up to and including the warranty period.
Construction Services	Has the meaning prescribed in GC 1.1.
Consultant or Engineering Consultant	Has the meaning prescribed in GC 1.1. <i>See definition of "RPD/SS Consultant" later in this section.</i>

<u>Terminology / Acronyms</u>	<u>Definitions</u>
Contract	The Contract Documents.
Contract Price	Has the meaning prescribed in GC 1.1
Contractor	See definition at GC 1.1. For this project, construction services will be provided by the MCM, “Contractor”, “Construction Manager” and “MCM”. They all refer to the same entity.
Construction Manager	For this project, construction services will be provided by the MCM, “Contractor”, “Construction Manager” and “MCM”. They all refer to the same entity.
Contingency	An amount of identified funds within the Budget that may be made available for payment to the MCM by Canada only through a contemplated change notice or change order as required, specifically to account for fluctuations in prices and quantities of goods or services or other changes required for completing the work.
CVPTP	The Cross-Valley Pond Water Treatment Plant, which is an approximately 2000 USgpm treatment system located adjacent to the Cross Valley Pond at the Faro Mine Site.
CxA	Commissioning Authority. The party responsible for leading the commissioning or re-commissioning of a facility.
DFO	Department of Fisheries and Oceans.
DR	Departmental Representative. Has the meaning prescribed in GC 1.1.
ERP	Emergency Response Plan. The overarching emergency response plan for Site is called “Site-wide ERP”. The Geotechnical emergency response plan is an Annex to the overall Site-wide ERP that details specific triggers/actions for physical stability of structures at Site.
Faro Housing	The four properties in the Town of Faro: 450 Campbell Street, 638 Yates Crescent, and 282 and 248 Dawson Drive.
FMC	Faro Mine Complex, which is comprised of the Faro Mine Site and the Vangorda / Grum Mine Site.
FMRP	Faro Mine Remediation Project. In this document, the term FMRP includes the remediation of the Faro Mine Site.
Geotechnical Consultant	The geotechnical team retained by Canada to provide detailed geotechnical advisory services to the Project.
IFT and IFC	Issued for Tender and Issued for Construction

<u>Terminology / Acronyms</u>	<u>Definitions</u>
Indigenous business	For the purpose of this Contract, it's an enterprise that is a sole proprietorship, limited company, co-operative, partnership, or not-for-profit organization where at least 51 per cent of the firm is owned and controlled by a member of the Kaska Nation. In the case of a joint venture, at least 51 per cent of the joint venture must be controlled and owned by an Indigenous Business, as defined above.
Infrastructure	The physical structures of the systems providing commodities and services essential to the function of the Site.
IOC	Indigenous Opportunities Considerations. Means a plan of action designed to maximize Indigenous Employment, training/Skills Development and subcontracting.
IWTS	6,000 USgpm Interim Water Treatment System at the Site; system based on lime precipitation and Actiflo technology, with post pH adjustment.
Kaska Dena Citizen	Defined as a member of the Kaska Nation; or a First Nation, Inuit or Metis living within the Kaska territory. Proof of residency may be requested (Driver's License, Territorial Health Card).
Kaska Dena Subcontractor / Supplier	Enterprise that is a sole proprietorship, limited company, co-operative, or not-for-profit organization in which Kaska persons have majority ownership and control; or a joint venture or consortium in which an Indigenous business or businesses as defined above have at least 51 percent ownership and control.
Material	Includes all commodities, articles, machinery, equipment, fixtures and things required to be furnished in accordance with the Contract for incorporation into the Work.
MCM	Main Construction Manager. For this project, construction services will be provided by the MCM, "Contractor", "Construction Manager" and "MCM". They all refer to the same entity
NFRC	North Fork of Rose Creek.
Notice	A written form of communication between the Parties that is transmitted in such manner as confirmation of receipt is required.
OGD	Other Governmental Department.
Proposal	The document submitted by a Proponent to Canada in response to the RFP.
Project Sponsor	CIRNAC

<u>Terminology / Acronyms</u>	<u>Definitions</u>
Project Team or FMC Project Team	This team includes staff from CIRNAC and PSPC, as it relates to the Faro Mine Complex.
PSPC	Means the Department of Public Works and Government Services Canada, also known as Public Services and Procurement Canada.
QA	Quality Assurance.
Records	Any works, information, data (including field data and metadata), reports, documents, databases, GIS maps, manuals, plans, drawings, sketches, designs, specifications, diagrams, certificates, illustrations, photos, videos, graphics, schedules, charts, inspection reports, permits, test results, products, correspondence, or materials that, directly or indirectly, are produced under, arise out of, or are related to the Work or this Contract, whether in electronic or written format.
Required Services	Means all the activities, services, goods, equipment, matters and things that are expected to be required to be done, delivered or performed under the Agreement;
RFP	Request for Proposal.
RPD/SS	Remediation Plan Design and Support Services
RPD/SS Consultant or RPD/SS Engineering Consultant	The consultant that will be awarded the work as a result of this RFP process and who will enter into a contractual relationship with Canada to perform the work, in accordance with the terms of this Contract.
Services	Means everything that is necessary to be done, furnished or delivered by the Consultant to perform the Contract and in accordance with the contract documents.
Site	The Faro Mine Complex located approximately 360 km northeast of Whitehorse, Yukon, and 22 km from the Town of Faro including, but not limited to: lands, buildings and other structures. The FMC is comprised of the Faro Mine Site and the Vangorda / Grum Mine Site.
Site Infrastructure	The infrastructure and systems, which are used or related to the performance of the Work.
Term 1	Term 1 is referred to in the MCM contract and involves management of the Site and supporting Canada during the completion of design and planning of the Remediation of the Faro Mine Complex (FMC). Term 1 – Initial Period will be from date of award to March 31, 2024. Term 1 – Option Periods could mean up to a 24-month extension option, exercised in 12-month periods.

<u>Terminology / Acronyms</u>	<u>Definitions</u>
Term 2	Term 2 is referred to in the MCM contract and involves the execution of the remediation of the Faro Mine Site. This project implementation phase is projected to occur over a period of 12 years, from approximately 2026 to 2038 and could possibly extend up to 2043. Term 2 will be broken down into 2 six-year periods, taking the Project Implementation Phase to 2038. In addition, there will be option periods to extend this phase by up to an additional five years, to 2043.
ToR	Terms of Reference (i.e. this document)
TRC	Technical Review Committee.
VGMRP	Vangorda / Grum Mine Remediation Project. In this document, the term VGMRP includes the remediation of the Vangorda / Grum Mine Site.
WL	Water License.
WMC	Water Management Committee.
Work Breakdown Structure (WBS)	The mandated framework, as may be amended by Canada, for organizing the Work activities. See Annex 7.1.
Work Package (WP)	The mandated organization of portions of the Work, typically occurring at the lowest levels articulated in the approved Work Breakdown Structure (WBS), to facilitate effective and efficient planning, management and control of scope, schedule and budget for included activities.

1. PROJECT BRIEF / DESCRIPTION OF PROJECT

1.1 CONTRACT OVERVIEW

1.1.1 General

- ..1 The Government of Canada (Canada) intends to engage the services of an Remediation Plan Design and Support Services (RPD/SS) Engineering Consultant to produce the design and support services for the Faro Mine Remediation Project (FMRP) and for the Vangorda / Grum Mine Remediation Project as defined herein.
- ..2 The RPD/SS Consultant will work with a highly collaborative team that includes the Government of Canada (Canada), a number of Consultants, the Yukon Government , Affected First Nations and other project partners.
- ..3 This ToR has been developed to ensure that the RPD/SS Consultant has a clear understanding of the project scope, procedures and services required to deliver the project, within the budget and schedule. Please note that the overall and generic active remediation schedule is shown at Annex 4.

1.1.2 Project Purpose

- ..1 The Faro Mine Complex (the “Site”) is comprised of the Faro Mine Site and the Vangorda / Grum Mine Site. Refer to Section 2 Project Background for Site history and context.
- ..2 The main purpose of this Contract is to provide engineering services for the remediation of the Faro Mine Site. The overall remediation approach is based on a “stabilize-in-place” concept and the active remediation phase is anticipated to take approximately 15 years to complete. Extensive decommissioning and remediation of the Faro Mine Area and Rose Creek Tailings Area will include consolidation of tailings, consolidation of waste rock, covering and revegetating waste rock and tailings landforms, decommissioning and removing mine infrastructure, and managing contaminated, treated and clean water. Water management will require and include use of existing water management infrastructure and addition of new water conveyance infrastructure and treatment facilities. Active remediation will also include the development of supporting infrastructure such as energy supply and transmission, as well as development of construction material borrow source areas.
- ..3 Prior to the start of active remediation, some urgent works and remedial actions will need to be accelerated during Term 1 of this Contract, due to deteriorating conditions on Site. The RPD/SS Consultant will be required to complete the majority of the tender-ready designs for those urgent work packages to take place at the Faro Mine Complex. This work will be reviewed, procured and managed by the Main Construction Manager (MCM), retained by Canada in a separate contract.
- ..4 This Contract also includes the designs for continued care and maintenance and Site operations at the Faro Mine Complex (for both the Faro Mine Site and the Vangorda / Grum Mine Site). This includes water management and treatment, repairing, maintaining and upgrading infrastructure; in a cost-effective manner so as to prevent adverse effects on persons, property and the environment, and to counteract, mitigate and remedy adverse effects that occur.

- ..5 The Vangorda / Grum Mine site will also need to be remediated in the future. A draft remediation plan was previously prepared in 2010 and an updated estimate was completed in 2021. It will be made available to the RPD/SS Consultant.

1.1.3 Project Objectives

The objectives of the project are to define, design and remediate the Faro Mine Complex in a manner that:

- 1.1.3.1 protects human health and safety;
- 1.1.3.2 protects and, to the extent practicable, restore the environment including land, air, water, fish and wildlife;
- 1.1.3.3 returns the mine site to an acceptable state of use that reflects pre-mining land use where practicable;
- 1.1.3.4 maximizes local and Yukon socio-economic benefits; and
- 1.1.3.5 manages long-term site risk in a cost-effective manner.

1.2 Project Background

1.2.1 Site History

- ..1 The Faro Mine Complex (FMC) is an abandoned lead-zinc mine located in south-central Yukon, approximately 90 km driving distance, northwest of Ross River, and approximately 350 kilometers northeast of Whitehorse. The site is approximately 25 square kilometers in size. The access road to the Faro Mine Complex extends approximately 22 km from the Town of Faro to the mine, gaining over 400 m in elevation.
- ..2 The Faro Mine Site was in production from 1969 to 1992 (with production rates of 5,000 and 9,300 tons of ore per day), and the Vangorda Plateau Mine was in production from 1986 to 1998. The ore at the Faro Mine site contained valuable quantities of lead, zinc, gold and silver.
- ..3 When Anvil Range Mining Corporation declared bankruptcy in 1998, the site was subsequently entered into receivership and Deloitte and Touche was court appointed as Interim Receiver to manage the environmental care and maintenance of the mine site. As the Faro Mine is located on Crown land, once it was abandoned by operators, it became the financial responsibility of the Government of Canada who funded the care and maintenance of the site under the management of the Receiver. On April 1, 2003 a new Yukon Act came into effect reflecting the Government of Yukon's increased control. The authority to manage public lands and resources in the Yukon Territory, including abandoned mine sites, was transferred from the Government of Canada to the Government of Yukon pursuant to the Yukon Northern Affairs Program Devolution Transfer Agreement. In 2009, the Government of Yukon took over responsibility for care and maintenance at the site. In 2017, the Government of Yukon along with Affected Yukon First Nations requested the governance of the FMRP be revised further. In May 2018, the Government of Canada took over responsibility for care and maintenance of the site and implementation of construction activities.
- ..4 The overall remediation approach is based on a "stabilize-in-place" concept and all future design work must follow this approach.

1.2.2 Geographic Context

- ..1 The FMC includes two main areas:
 - .a Faro Mine Site, situated in the Rose Creek watershed, which drains to the Pelly River via Anvil Creek. The Faro Mine Site consists of the Rose Creek Tailings Area and the Faro Mine Area (i.e., the Faro Pit, waste rock dumps and former mill, associated buildings and the Emergency Tailings Area). During the operation of the Faro Mine, a 3.8 km long channel was constructed to divert the flow of Rose Creek, such that 70 million tonnes of tailings were deposited in the Rose Creek Valley. A series of dams were built to retain the tailings and to allow for storage of water prior to its treatment and release into the environment. The Faro Mine site has two (2) water treatment plants (the IWTS and the CVPTP), both are anticipated to be decommissioned following planned construction and commissioning of a permanent water treatment plant. The Faro Pit is approximately 1,675 m long and 975 m wide at the crest; and,
 - .b Vangorda / Grum Mine Area, located in the Vangorda Creek watershed, which joins the Pelly River at the Town of Faro. The Vangorda / Grum Mine Site includes the Vangorda and Grum pits and their associated waste rock. The Vangorda / Grum Mine shares a single water treatment plant. The Vangorda Creek is diverted around the perimeter of the Vangorda Pit.
- ..2 Site plans showing the Site boundaries and all FMC features are included in Annex 1.
- ..3 The Faro Mine Complex is found primarily on National Topographic System Map 105K/6, with a small portion on 105K/3, within Watson Lake Designated Office district. Vehicle access to/from Faro is served by the Robert Campbell Highway, which is an approximate 5 hour drive from Whitehorse, YT.
- ..4 Faro has very cold winters and mild to warm summers. The average temperature in January is around -20°C and 15°C in July. Months with above zero mean temperatures are May, June, July and August. Snow accumulation at the Faro tailings impoundment typically begins in October and the snow cover is generally melted by the end of April. Prevailing wind direction in the region is from the southeast.
- ..5 Faro's high latitude causes a large variation between day and night. Daylight hours range from five hours of daylight in December to twenty hours in June. Twilight lasts all night from late May to July.

1.2.3 Cultural Context

- ..1 The 25 sq. km Faro Mine Complex is located in the Kaska Traditional Territory (see map at Annex 8), as claimed by the Kaska Nation. At present time, the Kaska Nation is comprised of four Indian Act bands. This includes Ross River Dena Council and Liard First Nation in the Yukon, and the Dease River First Nation and Kwadacha First Nation in British Columbia. None of these First Nations have a land claim agreement at present, but several land sections surrounding the FMC are currently subject to interim protection for the Ross River Dena Council.
- ..2 This section is provided by the Ross River Dena Council and is included at their request to highlight the history and importance of the area encompassing the Faro Mine Complex and the impact of mining activity to the Ross River Dena:

- ..3 Tse Zul (Mt. Mye) lies in a unique ecological setting. Here two major rivers converge in the rain-shadow of the Pelly Mountains, separated by blocks of mountains where changes in elevation yield a variety of habitats. Scattered wetlands add further diversity. Three different caribou types/herds used the area, moose were at densities believed to be the highest in the Yukon, and a unique colour phase of thinhorn sheep, called Fannin sheep, were abundant here. These sheep were of special importance to the Ross River Dena; many wintered along the Pelly River and were accessible to hunters in the winter. The Tintina Trench that runs at the foot of Tse Zul was the migration corridor for thousands of migrating geese, ducks and cranes, and the hills around Blind Creek were home to Blue Grouse. Along the Pelly River, sharp-tailed grouse could be found - the only place in the region where they occurred. The diversity of habitats produced many different medicinal and food plants, and one of few places where birch trees could be harvested (birch was used for many purposes). Salmon were more abundant here than anywhere else in the region - so abundant that "nets had to be checked three times a day". It is also one of few places where fishing wheels were used. The Tse Zul area was one of the most important breadbaskets to the Ross River Dena, or as Weinstein (1992) remarked, "one of the rare places where, as the elders say 'there is everything' – moose, caribou gophers, whistlers, fresh water fish and salmon".
- ..4 As well as being a special place for a variety of animals that lived there, Tse Zul was also special for the unique rocks found there. In fact, even the name Tse Zul is a reference to the "Hollow Rock" on the mountain. Al Kulan got to know some of the local people that lived in the area. In a kind and welcoming gesture, three Ross River Dena - Dena Cho, Joe Ladue and Arthur John Sr. - showed this prospector some of the special rocks at Tse Zul that eventually led to the Anvil Mine. For their part, the three men received no recognition or benefits from the mine.
- ..5 The importance of the Tse Zul area to Ross River Dena was exemplified by the significant use of the area. At least eight extended families lived here. There were three permanent centres of habitation in the area, and seasonal encampments were scattered everywhere. The area was also a major transportation hub, laced by a network of trails. A number of sacred areas are also found here, signifying a deep reverence to the area, and a long history of occupation. At least 26 archaeological sites found in the area provide further physical evidence of the importance of this place to the Ross River Dena.
- ..6 The development of the Faro mine and its infrastructure was one of the most debilitating events in the Ross River Area, causing significant environmental and social impacts. Heavy metal leaching, acid rock drainage, and airborne pollutants poisoned the region. This, combined with habitat destruction, displacement of animals, and an invasion of outside hunters, resulted in declines of most fish and wildlife species. A population of wintering caribou disappeared, as did lake trout and grayling from a number of creeks. The Ross River Dena were displaced, further depriving them of the bush economy. The late Arthur John senior sadly commented; "Now no one goes there. The mine tore up half the mountain now. People from that country try other areas, could not find anything as good." Racism and bigotry also played a role. As Weinstein (1992) pointed out, "The changes to Ross River which accompanied the mine development affected all band members. The village changed fundamentally and very rapidly, from an isolated Indian community to a mixed- racial regional service centre. Indians became a marginalized minority, facing bigotry and discrimination... The traumas that resulted were profound, leading

to alcoholism, family breakdowns, and self-inflicted violence”. Indeed, the social and environmental impacts of Faro have been disastrous to the Ross River Dena.

1.2.4 Site Conditions – Faro Mine Site

- ..1 The main components of the Faro Mine Site include: open pits, waste rock dumps, tailings storage facilities and associated dams, water treatment facilities, access roads, haul road, stream diversions, water storage areas, and buildings previously used for milling-related activities. The Faro Mine Site is within the watersheds of Rose and Vangorda creeks, which both drain into the Pelly River upstream of the Town of Faro.
- ..2 Some of the waste rock dumps and parts of the Rose Creek Tailings Area are producing acid rock drainage resulting in the deterioration of the surface water quality in the receiving environment, with increasing trends in the concentrations of sulphate and a number of metals, including iron (total and dissolved), manganese, and zinc.
- ..3 Groundwater under the Rose Creek Tailings Area and waste rock dumps, and water in the Faro Pit are contaminated with metals at concentrations that, without treatment, would result in adverse effects to aquatic organisms, wildlife, and people. Over time, site-wide acid drainage is expected to occur. As a result, the trend of increasing contaminant concentrations in groundwater and surface water is expected to continue into the foreseeable future.
- ..4 Existing conveyance structures at the Faro Mine Site include the Faro Creek Diversion, the West Valley Interceptor Ditch, North Fork Rose Creek clean water diversion, Rose Creek Diversion Channel, Upper Guardhouse Creek and the North Wall Interceptor Ditch. Many of these conveyance structures are currently being impacted by contaminated groundwater. In addition, many of these structures for non-contact water, including the Rose Creek Diversion, are too small to convey large scale flood events. If such an event should occur, it could lead to catastrophic failures and the release of contaminants into the downstream environment.
- ..5 The Faro Pit, waste rock dumps, and Rose Creek Tailings Area each have stabilization and contamination challenges. Stability is of concern for the waste rock dumps, the Secondary Dam and Intermediate Dam in the Rose Creek Tailings Area and along the northwest side of the Faro Pit, which has the potential to threaten the Faro Creek Diversion.

1.2.5 Site Conditions – Vangorda / Grum Mine Site

- ..1 There is a possibility that the Vangorda / Grum portion of the Site will be sold over the course of the RPD/SS Engineering Consultant contract. As a result, this will remove the requirement in the long term to develop a remediation plan and to provide care and maintenance and construction management services to this portion of the Site, thereby reducing the scope of the overall design requirements of this Contract.

1.2.6 Environmental Risks

- ..1 The Faro Mine Complex is one of the largest contaminated sites within the federal sites inventory. There are 70 million tonnes of tailings, 320 million tonnes of waste rock, areas of contaminated soil, open pits, various types of structures, 3 water treatment plants, and a highly contaminated mill. There are ongoing concerns related to the capacity of the interim water treatment plant to treat additional volumes of water while maintaining discharge standards, the

migration of contaminants downstream of the North Fork and the Cross Valley / Rose Creek areas, potential impacts from, contaminated groundwater appearing in wells down gradient of Cross Valley Pond in the Rose Creek Valley, the physical instability of the Faro Pit walls and deteriorating structures on site, are examples of the environmental hazards on site.

..2 The Site is a heavily contaminated abandoned industrial site, which contains many hazards, both evident and hidden, posing risk to human health and safety and the environment. These general hazards include, but are not limited to:

- 1.2.6.2.1 Mine workings: there are 3 partially flooded open pits containing contact water.
- 1.2.6.2.2 Dams and diversions of insufficient capacity / robustness: the current flood-routing capacity of the major tailings retention structures and associated diversions on the site are insufficient to provide adequate risk mitigations over the long term. Upgrades to flood routing capacity may be executed during Term 1 of this contract.
- 1.2.6.2.3 Acid-generating waste rock and tailings: the tailings impoundment contains approximately 70 million tonnes of acidic lead/zinc tailings. Much of the 330 million tonnes of waste rock is acid generating and many of the seeps emanating from waste rock piles across the Site contain elevated levels of metals and sulphate;
- 1.2.6.2.4 Contaminated groundwater: Contaminated groundwater underlying the waste rock piles and tailing impoundment area is contaminated and the movement of these contaminant plumes is being monitored;
- 1.2.6.2.5 Metal contaminated soil: there is an undetermined quantity of lead/zinc contaminated soil throughout the Site, most noticeably in the vicinity of the former concentrate storage and load-out building;
- 1.2.6.2.6 Hazardous materials: there are many decommissioned buildings and facilities at the Site that are contaminated with lead concentrate dust, asbestos and other harmful substances, and are awaiting demolition as part of the remediation effort. Despite previous removal efforts, there is a possibility that hazardous materials may remain in other locations on the Site;
- 1.2.6.2.7 Hydrocarbon contaminated soil: there is an estimated 90,000 cubic meters of un-remediated hydrocarbon contaminated soil at the Site;
- 1.2.6.2.8 Faro mine road: this road is a public roadway that passes through the Site adjacent to the tailings impoundments and ends at the Site Guardhouse. Yukon Government Highways and Public Works is responsible for maintenance of the road which can be made challenging by weather conditions, glaciation, and/or competing maintenance priorities as the road is classified as secondary. Seasonally, there are hunters and recreational users camping on this road;
- 1.2.6.2.9 Limited access control: site security facilities would consist primarily of a few sections of fence and lockable gates at key areas. The site has a long-standing history of public use for activities such as hunting and recreational use; and
- 1.2.6.2.10 Unsafe infrastructure: aged and deteriorating buildings and other types of built infrastructure are located throughout the Site and pose a challenge for the protection of worker and public health & safety.

- ..3 Other known hazards include, but are not limited to:
 - 1.2.6.3.1 Dust Hazards: the contaminated soils can be disturbed by vehicles or heavy equipment use. The resulting dust can pose a risk to human health.
 - 1.2.6.3.2 Terrain Hazards: Steep/slippery slopes, cliffs, open water, remote areas, partially buried debris and sinkholes exist.
 - 1.2.6.3.3 Wildlife Hazards: The Site is accessible to wildlife, including bears, wolves, foxes, and ungulates.
 - 1.2.6.3.4 Other Contractor/Activity Hazards: Multiple contractors may be present on the Site at all times, and may be performing hazardous operations.
 - 1.2.6.3.5 Vehicle Hazards: Vehicles move around the Site, both on- and off-road. Road systems include one- and two-way traffic sections.
 - 1.2.6.3.6 Temperature Hazards: Extreme cold conditions are frequently encountered.
 - 1.2.6.3.7 Electrical Hazards: High AC voltages.
 - 1.2.6.3.8 Contaminated Water: some surface water and groundwater within and around the Site may be contaminated.
 - 1.2.6.3.9 Confined Space Hazards exist.
 - 1.2.6.3.10 Elevated work areas.

1.2.7 Socio-economic benefits

- ..1 CIRNAC's mandate is to meet the Government of Canada's obligations and commitments to First Nations, Inuit and Métis and for fulfilling the federal government's constitutional responsibilities in the North.
- ..2 CIRNAC's mandate for the FMRP includes providing socio-economic benefits to indigenous and local communities. In support of some of the goals of the overall socio-economic framework that is being prepared by CIRNAC, the RPD/SS Engineering Consultant will be required to develop and implement a socio-economic plan and engage with local groups on upcoming work.

1.3 Permitting and Licensing Requirements

1.3.1 Environmental Assessment

- ..1 The Faro Mine Complex is subject to an assessment pursuant to the Yukon Environmental and Socio-Economic Assessment Act (YESAA) at the Executive Committee level under the Assessable Activities, Exceptions and Executive Committee Projects Regulations (SOR/2005-379). This assessment process is currently underway for FMRP, the Project Team having prepared and submitted a Project Proposal in 2019 to document the Project, the environmental and socio-economic baseline conditions, and the Project's potential effects.
- ..2 The Project Proposal has not yet been prepared for the Vangorda / Grum Mine Remediation Project. However, Canada's intent is to initiate this work as the design gets developed.

1.3.2 Government of Canada Role in Permitting

- ..1 CIRNAC currently holds and/or will be obtaining the following permits in order to support on-going Care & Maintenance and Remediation Activities:
 - 1.3.2.1.1 Yukon Water License for care and maintenance and remediation works;
 - 1.3.2.1.2 Fisheries Act Authorization(s) from Department of Fisheries and Oceans (DFO) for any remediation activities that may involve the alteration or destruction of fish habitat.
- ..2 Water Management at the Faro Mine Complex is currently conducted under the expired licence #QZ03-059 . See the existing licenses and permits at Annex 3 and the existing FMC monitoring program at Annex 6.
- ..3 The RPD/SS Consultant might be required to obtain further permits, based on the site activities they might have to lead. If this is the case, the RPD/SS Consultant will apply for, obtain and meet the conditions of any permits and approvals necessary for the work.
- ..4 Remediation planning needs to continue through advancement of design, development of specifications, as well as overall coordination of the remediation work. Also, due to the delay in starting the overall remediation, urgent works were initiated in 2018, in order to mitigate significant risks to the environment and health and safety.

1.4 Scope of remediation work

1.4.1 Remediation overview

- ..1 The remediation of the Faro Mine Site generally consists of the following activities:
 - 1.4.1.1.1 Site and borrow development
 - 1.4.1.1.2 Construction of landform and covers on tailings
 - 1.4.1.1.3 Relocation, landforming and construction of covers on waste rock
 - 1.4.1.1.4 Construction of a new permanent water treatment plant
 - 1.4.1.1.5 Stabilization of dams
 - 1.4.1.1.6 Construction of a contact water conveyance system
 - 1.4.1.1.7 Construction of miscellaneous interception systems for seepage in the Down Valley, ETA and NFRC areas for example.
 - 1.4.1.1.8 Demolition and disposal of buildings on site (many of which contain hazardous materials), collection and disposal of debris scattered over the site, development of engineered landfills and disposal areas
 - 1.4.1.1.9 Diversion of the Faro Creek and of the Rose Creek.
 - 1.4.1.1.10 Construction of infrastructure (electrical, roadways, etc.) to support the long term operation of the treatment plant and various interception systems, as well as long term site environmental monitoring.

1.4.2 RPD/SS Consultant Scope

- ..1 The RPD/SS Consultant is required to complete the design of the various Design Packages of the overall mine remediation, provide the technical documents (specifications, drawings, etc.), cost estimates for each package, as well as oversee the implementation of the work, mainly for Quality Assurance purposes. This includes, but is not limited to:

- 1.4.2.1.1 Preparing design options, alternatives and recommendations;
 - 1.4.2.1.2 Completing the design for the work and for coordinating and directing the work of their sub-consultants and specialists. The services outlined apply not only to the RPD/SS Consultant, but to any Sub-Consultant that may be required for a specific project.;
 - 1.4.2.1.3 Preparing the technical documents for each tender package identified by Canada;
 - 1.4.2.1.4 Providing a wide range of civil engineering, geotechnical (soil and rock mechanics), geo-scientific and 3D-modeling services;
 - 1.4.2.1.5 Preparing design level Cost Estimates;
 - 1.4.2.1.6 Preparing design schedules and providing input on construction durations, as well as on overall sequencing of work packages;
 - 1.4.2.1.7 Providing input into the Project Risk Plan;
 - 1.4.2.1.8 Supporting Canada by managing engineering quality assurance and assisting in responding to site conditions / issues, as required;
 - 1.4.2.1.9 Supporting Canada by developing Performance Based Specifications to support a Design-Bid-Build project delivery approach;
 - 1.4.2.1.10 Defining conceptual commissioning procedures and confirming that performance requirements have been met; verifying operating manuals, and ensuring that record drawings are provided and are accurate;
 - 1.4.2.1.11 Adhering to all the Standards and Guidelines outlined in this document, as may be applicable to each scope of work;
 - 1.4.2.1.12 Preparing designs for the continuing care and maintenance and Site operations at the Faro Mine Complex (for both the Faro Mine Site and the Vangorda / Grum Mine Site), including possible designs for urgent works;
 - 1.4.2.1.13 Supporting Canada by providing warranty period inspections; and
 - 1.4.2.1.14 Communicating and consulting, as and when required, on the design and support services work with other project team members, with stakeholders, YESAB and regulators.
- ..2 The RPD/SS Consultant may also be requested to provide engineering and related Consulting Services for the Remediation Plan Design and Support (QA) Services, required on an as needed basis.

1.4.3 Design Packages

- ..1 The “assumed” design packages that will support the Remediation Work are outlined in the 2019 Project Proposal Submission Pursuant to the Yukon Environmental and Socio-economic Assessment Act. Details of the remediation plan can be found in Annex 5A of Section 5 of this Project Proposal document. See the ‘Documents’ tab related to this Project Proposal in the following link: <https://yesabregistry.ca/projects/39ca43c0-bd52-4dcd-90c7-37d55a305ebd>

- ..2 A summarization of the expected FMRP and VGMRP design packages to be developed by the RPD/SS Consultant as part of this contract can be found below in table 1. This list will be refined after contract award. A more detailed list of those design packages is attached at Annex 2.
- ..3 Canada expects to issue Task Authorizations (TAs) on a yearly basis in the future, that would be comprised of various Design Packages per TA. Canada would also expect to issue additional TAs as and when required, as urgent designs need to be prepared.

Table 2. Design Packages

Components	Design Packages	General Scope of Services
Faro Mine Area Stabilization, Landforming and Covers	Faro Pit Waste Rock Dumps Rose Creek Tailings Area Revegetation of Waste Rock Dumps and Rose Creek Tailings Area	Investigations, Detailed Design, Substantive Cost Estimate, Performance Based Criteria and Technical Documents, QA on the following (but not limited to): Construction of a safety berm around the pit perimeter Relocation of some waste rock dumps Relocation of some of the tailings Modification and stabilization work on various dams Waste rock stabilization work: overall landform, plateau areas, external and internal slopes Construction of various types of waste rock covers and of tailings area covers Vegetation of covered areas Water Management of cover surfaces

Project Brief / Terms of Reference
 EZ897-212881 - Remediation Plan Design and Support (QA) Services

Components	Design Packages	General Scope of Services
Borrow Development for the Faro Mine Site	Borrow Development Borrow Source Requirements Borrow Design Borrow Reclamation	Investigations, Detailed Design, Substantive Cost Estimate, Performance Based Criteria and Technical Documents, QA. Four (4) main material types are expected to be required: Fine-grained soil for covers or general fill Granular soils for use for erosion protection, filter or drain material, liner bedding, stabilizing fill, roads, etc. Coarse rock fill for riprap in channels, ponds, dam buttresses and for road ballast Organics to promote soil profile development, moisture retention and vegetation.
Non-Contact Water Management Infrastructure for the Faro Mine Site	Northeast Perimeter Water Management South Perimeter Water Management Northwest Perimeter Water Management	Investigations, Substantive Cost Estimate, Detailed Design, Specifications and Drawings, Inspections. This includes, but not limited to: Realignment of the Faro Creek diversion Modification of the confluence of the North Fork Rose Creek, South Fork Rose Creek and the Rose Creek Diversion Channel inlet Diversion of the Rose Creek channel Reestablishment of Lower Guardhouse Creek, construction of a conveyance ditch along the north perimeter of the covered tailings

Project Brief / Terms of Reference
 EZ897-212881 - Remediation Plan Design and Support (QA) Services

Components	Design Packages	General Scope of Services
<p>Contact Water Management for the Faro Mine Site</p> <p>*Note the design of the Permanent Water Treatment Plant (PWTP) is not in scope</p>	<p>Groundwater Capture Systems</p> <p>Intermediate Tailings Sump</p> <p>Contact Water Conveyance System</p> <p>Faro Pit</p> <p>Water Treatment</p> <p>Rose Creek Tailings Area</p> <p>Faro Mine Site</p>	<p>Investigations, Detailed Design, Substantive Cost Estimate, Performance Based Criteria and Technical Documents, QA. This includes, but not limited to:</p> <p>Construction of the Down Valley Seepage Interception System</p> <p>Construction of the Emergency Tailings Area Seepage Interception System</p> <p>Construction of the North Fork Rose Creek Seepage Interception System</p> <p>Collection points including Zone 2 Pit and the Intermediate Tailings Sump.</p> <p>Collection year-round and pumping to the Faro Pit for storage and treatment</p> <p>Construction of a permanent water treatment plant, with a capacity of 61,000 cu. m. per day.</p>
<p>Demolition and Waste Management for the Faro Mine Site</p>	<p>Buildings, Equipment and Facilities</p> <p>Historical Disturbances and Utilities (buried and above ground)</p> <p>Historical Disturbances (e.g. borrow sources and access roads)</p> <p>Hazardous Waste</p> <p>Landfill</p> <p>Contaminated Surficial Materials</p>	<p>Investigations, Detailed Design, Substantive Cost Estimate, Performance Based Criteria and Technical Documents, QA. This includes, but not limited to:</p> <p>Demolition of 19 buildings</p> <p>Removal of buried historic waste such as decommissioned pipelines and utilities</p> <p>Removal of buried infrastructure, such as tanks, pipes and utility corridors</p> <p>Removal of hazardous wastes from buildings, to be handled and disposed of according to Yukon regulations</p> <p>Construction of a non-hazardous waste landfill</p> <p>Construction of a new purpose-built incinerator, to dispose of domestic waste</p> <p>Construction or renovation of administration facilities to meet long term site requirements</p> <p>Soil treatment and use of risk management measures (by containing contaminants or installing engineering controls for example)</p>

Components	Design Packages	General Scope of Services
Overall Vangorda/Grum Mine Remediation design services	Stabilization, Landforming and Covers Borrow Development Non-Contact Water Management Infrastructure Contact Water Management Demolition and Waste Management	Investigations, Detailed Design, Substantive Cost Estimate, Performance Based Criteria and Technical Documents, QA on the following (but not limited to): Relocation of some waste rock dumps Waste rock stabilization work and construction of covers, vegetation of covered areas Borrow development for fine-grained, granular soils, for coarse rock and organics Modification, realignment of channels Construction of various interception systems Construction or major recapitalization of the Vangorda / Grum Water Treatment Plant Soil treatment and use of risk management measures Recapitalization work at various dams

1.4.4 Milestones

- ..1 Environmental and Socio-Economic Assessment: The project is currently undergoing an EA with Report of findings from the Yukon Environmental and Socio-Economic Assessment Board (YESAB) expected to be issued in 2023-24.
- ..2 Water Licence (WL): The WL application (including the Consolidated Project Report) is to be developed throughout 2022-2023 and submitted in 2023-24 after receipt of the findings of the EA Report. The WL is anticipated to be obtained in 2024-25.

1.4.5 Constraints and Challenges

- ..1 The work of this Contract must be coordinated with other work on the site, such as the Main Construction Manager, urgent works, investigations and studies to support other components of the design of the Overall Site Remediation planning, and construction of a new Permanent Water Treatment Plant (PWTP).

1.5 SOCIO-ECONOMIC BENEFITS

1.5.1 Socio-Economic Benefits

- ..1 The remediation of the Faro Mine Complex is an important mechanism for ensuring socio-economic benefits to the First Nations and communities affected by the project. A Faro Mine Remediation Project Socio-economic Framework is being developed to support the overarching project objective of maximizing socio-economic benefits from the remediation of the Faro Mine

Complex. It will identify the Project's socio-economic commitments, and provide guidance to support the RPD/SS Consultant in meeting its responsibilities.

- ..2 To support the socio-economic objectives of the Project, the RPD/SS Consultant is required to develop and implement a Socio-economic plan that describes the approach the RPD/SS Consultant will undertake to provide lasting benefits to the area of the project.

The Socio-economic plan must include, but is not limited to, the following components:

- 1.5.1.2.1 Statement of RPD/SS Consultant 's corporate social responsibility commitments;
- 1.5.1.2.2 A community outreach plan for engaging with communities on a regular basis;
- 1.5.1.2.3 A plan for maximizing Indigenous employment, contracting and business opportunities;
- 1.5.1.2.4 A plan for enhancing skills through targeted training opportunities; and
- 1.5.1.2.5 Additional provisions to be implemented by the RPD/SS Consultant to maximize local and indigenous opportunities from the Project.

The Socio-economic plan is to consider the full length of the contract, with a focus on the implementation of the Socio-economic strategy over a two-year period. It is to be updated every 2 years and/or at significant points of economic changes during Project Implementation (e.g. reflective of changes in capacity).

1.5.2 Indigenous Opportunities Considerations (IOC)

- ..1 The intent of the IOC is to maximize the involvement of Kaska Dena Citizens and Suppliers through the course of this Contract.
- ..2 The IOC guarantee made with the Consultants RFP applies to the Initial Period of the Contract. For future optional periods, the IOC commitments under the Contract will be proposed by the Consultant and accepted by Canada, subject to negotiation, on an annual basis, unless otherwise agreed.
- ..3 The application of the IOC requires the RPD/SS Consultant to set targets and make commitments to maximize employment, training, subcontracting, Suppliers and other socio-economic opportunities for the Kaska Dena.
- ..4 The responsibility for coordinating the evaluation of the IOC will reside with the RPD/SS Consultant.

2. PROJECT ADMINISTRATION

2.1 ROLES AND RESPONSIBILITIES

2.1.1 General Information – Project Administration

- ..1 The management of all project administration services is the responsibility of the RPD/SS Consultant and can be performed at the location of their choice.
- ..2 This section describes the requirements of the RPD/SS Consultant to provide management and administration of their own activities as well as of their Sub-Consultants in accordance with the needs of Canada.
- ..3 The administration and project management requirements outlined in this section apply to both Terms 1 and 2 and any of option periods of the Contract.
- ..4 This project is to be organized, managed and implemented in a collaborative and integrated manner between PSPC and CIRNAC.
- ..5 The following sections provide an overview of the members of the FMC Project Team and other project participants.

2.1.2 Role of Canada (General Overview)

- ..1 Canada intends to create a working environment where all parties bring a high degree of commitment and collaboration to the Project. The RPD/SS Consultant will work with the FMC Project Team (that includes Canada, the MCM and the other Consultants) in delivering the design and construction for this project.
- ..2 Canada is the sole proponent of a project involving the care and maintenance and remediation of the Faro Mine Complex.

2.1.3 Role and Responsibilities of RPD/SS Consultant

- ..1 The RPD/SS “Consultant Team” includes the RPD/SS Consultant’s staff, sub-consultants and specialists:
 - 2.1.3.1.1 The team must include qualified Engineering, Geoscience and Scientific professionals registered (or eligible for registration) in the Yukon Territory (or in another Canadian jurisdiction, in instances where Yukon registration for a specific profession is not currently available), with extensive relevant experience, capable of providing all required services for the duration of the contract.
 - 2.1.3.1.2 Team members may be qualified to provide services in more than one discipline.
 - 2.1.3.1.3 The RPD/SS Consultant may be asked by the Departmental Representative to expand the team to include additional disciplines.
- ..2 The RPD/SS Consultant and their teams are responsible for, but not necessarily limited to:
 - 2.1.3.2.1 Being the Engineer of Record (EOR) for all works designed under this Contract.

- 2.1.3.2.2. Working as part of a collaborative team including CIRNAC, PSPC, a Main Construction Manager (MCM), and other consultants and contractors, as identified by PSPC Preparing design criteria and RFPs that meet project requirements.
 - 2.1.3.2.3 Coordinating and directing the work of all design team activities, including sub-consultants and specialists
 - 2.1.3.2.4 Obtaining Departmental Representative acceptance for each project phase before proceeding to the next phase.
 - 2.1.3.2.5 Accurately communicating design, budget, and scheduling issues to staff, sub-consultants and specialists.
 - 2.1.3.2.6 Coordinating input for the Departmental Representative's Risk Management Plan
 - 2.1.3.2.7 Reviewing on behalf of the Departmental Representative approvals from all levels of government, including provincial and municipal governments, that have been attained. Adjusting the documentation to meet the requirements of these authorities.
- ..3 During the design phase, the RPD/SS Consultant will:
- 2.1.3.3.1 Attend meetings,
 - 2.1.3.3.2 Record the issues and decisions,
 - 2.1.3.3.3 Prepare and distribute minutes within two working days of the meeting,
 - 2.1.3.3.4 Ensure all meetings are green i.e. using electronic documents or double-sided hard copies and
 - 2.1.3.3.5 Ensure sub-consultants attend required meetings
- ..4 During the construction phase, the RPD/SS Consultant will:
- 2.1.3.4.1 Attend meetings and provide site inspection services
 - 2.1.3.4.2 Ensure sub-consultants provide site inspection services and attend required meetings.
- ..5 The RPD/SS Consultant must:
- 2.1.3.5.1 Obtain written authorization from the Departmental Representative before proceeding from one phase of work to the next phase of a project.
 - 2.1.3.5.2 Coordinate all services with the Departmental Representative.
 - 2.1.3.5.3 Deliver each project utilizing best practices, respecting the approved financial budget, schedule, scope and quality requirements.
 - 2.1.3.5.4 Establish a cohesive functional partnership and open communication between all members of the project delivery team and stakeholders throughout all phases of the project life,
 - 2.1.3.5.5 Ensure that the RPD/SS Consultant team has an in-depth understanding and collective 'buy-in' of the project requirements, scope, budget and scheduling objectives, working constructively to build a collaborative and cooperative team approach with knowledgeable and timely input and contribution by all project team

- members, including representatives from PSPC, CIRNAC, other consultants and the MCM Team.
- 2.1.3.5.6 Conduct rigorous quality assurance reviews during the design and construction phases, including the application of value engineering principles during the design of all systems.
- 2.1.3.5.7 Provide a written response to all PSPC comments included in Quality Assurance reviews conducted throughout the design of the project.
- 2.1.3.5.8 Develop a rigorous quality management plan in order to respond to and correct, in a timely and effective manner, all issues as they occur,
- 2.1.3.5.9 If any alterations are required during the development of the design, analyze the impact on all project components and provide results to the Departmental Representative;
- 2.1.3.5.10 Establish and maintain a change control procedure for scope changes;
- 2.1.3.5.11 Ensure that an experienced Project Engineer or Project Geoscientist is assigned to each project, who will be responsible for the production, coordination and delivery of all design criteria and RFP documents for all project disciplines,
- 2.1.3.5.12 Prepare a continuous risk identification and management program employing effective methodologies to ensure construction safety as well as claims avoidance,
- 2.1.3.5.13 Provide continuous and comprehensive documentation of the project at all stages of the project implementation,
- 2.1.3.5.14 Ensure continuity of key personnel and maintain a dedicated working team for the life of the project.
- 2.1.3.5.15 Ensure that all subconsultants and subcontractors reside at the camp at site while working at FMC.

2.1.4 Departmental Representative

- ..1 The Departmental Representative (DR) from PSPC provides direction to the RPD/SS Consultant. The DR will act as the Technical Authority for all work packages. Within the context of this document, the term Departmental Representative (DR) refers to the person exercising the roles and attributes of Canada under the contract.
- ..2 The DR is responsible for managing the RPD/SS Consultant's Contract. The DR:
 - ..2..1 Is directly concerned with this Contract and is responsible for its progress;
 - ..2..2 Liaises with the FMC Project Team, obtains their requirements, and conveys these requirements to the RPD/SS Consultant;
 - ..2..3 Briefs and directs the RPD/SS Consultant, seeks approvals, exchanges information between the RPD/SS Consultant and the FMC Project Team, and authorizes the RPD/SS Engineering Consultant to act under the Contract; and
 - ..2..4 Liaises with the PSPC Contracting Authority who is responsible for the establishment of the Contract agreement, its administration and any contractual issues related to it.

2.1.5 Role and Responsibilities of PSPC

- ..1 Administration: PSPC administers the project and exercises continuing control over the project during all phases of development.
- ..2 Reviews:
 - ..2..1 PSPC will review the work at various stages and reserves the right to reject unsatisfactory work at any stage.
 - ..2..2 If later reviews show that earlier acceptances must be withdrawn, the RPD/SS Engineering Consultant will redesign and re-submit at no extra cost.
- ..3 Acceptance:
 - ..3..1 PSPC acceptance of submissions from the RPD/SS Engineering Consultant simply indicates that, based on a general review, the material complies with governmental objectives and practices, and meets overall project objectives
 - ..3..2 Acceptance does not relieve the RPD/SS Engineering Consultant of professional responsibility for the work and for compliance with the contract.
- ..4 PSPC Project Management:
 - ..4..1 The Project Manager assigned to the project is the Departmental Representative.
 - ..4..2 The Departmental Representative is directly responsible for:
 - The progress and administration of the project, on behalf of PSPC
 - Day-to-day project management and is the RPD/SS Engineering Consultant's single point of contact for project direction.
 - Providing authorizations to the RPD/SS Engineering Consultant on various tasks throughout the projects.
 - The liaison amongst and between the RPD/SS Consultant, PSPC, CIRNAC, the MCM Team and other consultants and contractors and also manages the internal federal government stakeholders.
- ..5 PSPC Professional & Technical Resources Team:
 - ..5..1 As required, provides professional advice and quality assurance reviews of consultant deliverables by Engineering, Geoscience professional disciplines (using in-house and external resources).
 - ..5..2 As required, offers expert technical advice on related project issues, such as options analysis, risk management, cost planning, scheduling, contract interpretation, specifications, terms of reference, commissioning, claims management, project delivery approach and project compliance.
 - ..5..3 As required, participates as necessary in design phases and may attend (during construction), contractor meetings and conduct field reviews on behalf of the Departmental Representative.
- ..6 PSPC Commissioning Specialist represents the Departmental Representative's interests in the commissioning process by:

- ..6..1 Providing technical advice on operation & maintenance (O&M) matters, operational criteria and quality assurance on the commissioning process throughout the project life cycle;
- ..6..2 Coordinating and overseeing internal PSPC commissioning activities during all project phases to ensure that O&M concerns are addressed;
- ..6..3 Working closely with the RPD/SS Consultant, the Design-Build team's Commissioning Manager, and the Departmental Representative for Commissioning activities and,
- ..6..4 Reviews all documentation and reported results relative to commissioning throughout the project delivery.

2.1.6 Role and Responsibilities of CIRNAC

- ..1 The Project Sponsor and Client Department referred to throughout this ToR is Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). CIRNAC's mandate is to meet the Government of Canada's obligations and commitments to First Nations and for fulfilling the federal government's constitutional responsibilities in the North. CIRNAC is the Project Sponsor responsible for the remediation and for the continued care & maintenance of the Faro Mine Complex. It is responsible for protecting the environment, the public and the site infrastructure. It is also responsible for keeping the FMC in compliance with all applicable Acts and regulations, as well as ensuring the FMC is secure and contamination is addressed within the risk management strategy. As the Project Sponsor, CIRNAC has the following role:
 - Securing Funding and Project Approval from Treasury Board.
 - Accountability for the expenditure of public funds and outcomes of the project in accordance with terms accepted by the Treasury Board.
 - Accountable to Treasury Board for the overall planning, management, and execution of the project, including quality and risk management. Providing Project Scope Definition to the FMC Project Team and verifying:
 - ..1..1 CIRNAC project scope requirements are thoroughly understood.
 - ..1..2 The functional and operational requirements are met.
 - ..1..3 CIRNAC approvals, as required, are signed off.
 - Providing overall direction on technical matters pertaining to the project. This explains why technical discussions and determination of scope changes will include CIRNAC.
 - Securing the necessary authorizations to proceed with the Project.
 - Engagement and Consultation with First Nations, Indigenous, and other interested parties (including Media relations).
 - Liaising with internal and external stakeholders and other groups and reporting on project progress and performance.
 - Co-Monitoring (with PSPC) of the success of implementation of the RPD/SS Consultant Socio-Economic plan.

2.1.8 Technical Review Committee

- ..1 The Technical Review Committee (TRC) is led by CIRNAC and includes members of the Project team, First Nation partners, PSPC and Yukon Government. The committee provides technical support to the Project through all phases of investigation, planning, design and implementation to help ensure alignment with project objectives and that technical requirements are suitably defined and incorporated. The TRC is also a venue for ongoing regular engagement by the Project team with its project partners.
- ..2 The TRC will participate regularly in design phases, will facilitate the review of deliverables and will engage expert support when required to support its review function.
- ..3 On occasion, the RPD/SS Consultant will have to attend, present and defend their design work during these meetings.

2.1.9 Independent Peer Review Panel

- ..1 The Independent Peer Review Panel (IPRP) is a group of independent technical subject matter experts in the areas of Mine waste, contaminants, water treatment, reclamation and associated engineering and environmental requirements. The IPRP provides a neutral, third party review, assistance, comment and advice on the technical merits of the design, for the purpose of assuring the owner, regulators and/or stakeholders that the design is feasible, appropriate, sound, safe, and will achieve the Project objectives in a compliant manner.
- ..2 The RPD/SS Engineering Consultant will have to attend, present and defend their design work at these meetings.

2.1.10 Water Management Committee

- ..1 The Water Management Committee (WMC) includes members of CIRNAC, PSPC, The RPD/SS Consultant, representatives of the other Consultants, and MCM staff . Additional participants involved in water management for care and maintenance, urgent works and remediation planning, may support the WMC, as determined necessary by CIRNAC.
- ..2 The WMC provides a forum for team members involved in water management at Faro to work collaboratively to develop and monitor a strategic, holistic, and integrated approach to water management. The WMC is a coordination, integration, and communication body and not a decision-making body. Line responsibility and accountability for water management rests with the assigned managers.

2.1.11 Other government departments and stakeholders

- ..1 There may be numerous representatives of other government departments (OGDs) and project stakeholders from Canada, Yukon Government, Affected First Nations, and the Town of Faro involved in the Project. The RPD/SS Engineering Consultant may attend these meetings only when a representative from the FMC Project Team is in attendance. Other government department representatives or stakeholders will:
 - Be responsible for functional issues on the project related to their respective organizations.

- Have input to functional and operational design requirements and subsequent changes through the FMC Project Team.
- Provide assurance that: the OGD program requirements are thoroughly understood by all, the functional and operational requirements are met and OGD approvals, as required, are signed off.

2.1.12 Other Engineering, Environmental Monitoring and Geotechnical Consultants

- ..1 The Consultants for the FMRP are or will be engaged by Canada under separate contracts: the RPD/SS Consultant (this Contract), Environmental Monitoring Services Consultant, Geotechnical Monitoring Consultant, Permanent Water Treatment Plant (PWTP) Design Consultant, and Regulatory Services Consultant.
- ..2 The RPD/SS Consultant shall co-operate with the Main Construction Manager, Canada, and other Consultants.
- ..3 The Permanent Water Treatment Plant Consultant has been previously procured by Canada through a separate contract. Their team is responsible for providing a detailed design and construction documents for a permanent water treatment plant to be installed at the Firo Mine Site. The RPD/SS Consultant must work closely with the PWTP Consultant to coordinate work packages for the FMRP.
- ..4 The Environmental Monitoring Services Consultant and their teams are responsible for, but not necessarily limited to:
- Providing a comprehensive environmental monitoring program at the FMC outside of MCM work areas, and auditing for environmental compliance; and
 - Providing on-Site laboratory data management and analysis services, and for effluent samples provided by the MCM as part of the MCM's compliance sampling program for MCM work areas and water treatment facilities on-site.
- ..5 The Geotechnical Consultant team are to provide guidance and recommendations on the safe operation of the dams, open pits, diversions and waste rock facilities. They are responsible for, but not necessarily limited to:
- Providing guidance on safe operation of the dam system in accordance with best practices;
 - Providing operational guidance for all facilities at site;
 - Providing guidance on geotechnical emergency response;
 - Responding to geotechnical emergencies as per the ERP, and;
 - Performing detailed inspections of dams, diversions, pits and waste rock dumps on behalf of Canada.
- ..6 The Regulatory Services Consultant is responsible for providing professional advisory and technical services in the area of Regulatory Services to assist Canada in successfully implementing measures at the Faro Mine Complex. This scope of work includes but is not limited to:
- ..6..1 Support to FMRP's YESAA executive committee level assessment
-

- ..6..2 Response to Information Requests
 - ..6..3 Additional field work or modelling
 - ..6..4 Preparation and attendance to workshops and public hearings by YESAB
 - ..6..5 Preparation of a water licence application.
 - ..6..6 Preparation of a fisheries act authorization application
 - ..6..7 Provide professional advisory, subject matter expertise and technical regulatory services to support CIRNAC, the Faro Mine Remediation Project (FMRP) and the Vangorda / Grum Remediation Project (VGRP).
 - ..6..8 Professional advisory and technical services to support the finalization and approval of all applications for the FMRP to regulatory authorities.
- ..7 Other Consultants may be retained by Canada (e.g. for engagement, communications, regulatory and other technical support).

2.1.13 Main Construction Manager (MCM)

- ..1 The Main Construction Manager (MCM) shall be contracted directly with Canada. The MCM will coordinate and cooperate with all members of the FMC Project Team.
- ..2 In general terms, the MCM will provide the following services:
 - Assign and maintain qualified staff or engage the services of specialist contractors to provide the required services to implement all tasks as outlined in this Terms of Reference.
 - Provide all necessary personnel to perform the Work and duties for the Contract, either by assignment of Main Construction Manager qualified staff or by engagement of services contracted directly to the Main Construction Manager.
 - Engage and manage the services and work of qualified and experienced individuals or firms to provide the Work for which the Main Construction Manager does not have qualified personnel on staff.
 - Ensure continuity of experience of key personnel, as required, and maintain dedicated Core Staff for the life of this project.
 - Have an in-depth understanding of the project requirements, including scope, budget and scheduling objectives.
 - Work constructively to ensure a collaborative and cooperative team approach with knowledgeable and timely input and contribution. The MCM's Construction Manager will be required to participate in a regular project team meetings, at a frequency determined by Canada for the duration of the Contract.

3. Project Communications and Submissions

3.1.1 General

- ..1 In general, communications will be through the Departmental Representative, unless directed otherwise. This includes formal contact between the RPD/SS Consultant, the Construction Manager, other construction Contractors, the PSPC Project Team, and CIRNAC.
- ..2 Develop a communication protocol, to be approved by the DR.
- ..3 All correspondence from the RPD/SS Consultant shall be distributed as directed by the DR, and must include the Contract name/number, WBS, Project title and Project number. The date format will be yyyy-mm-dd. WBS codes to be used are listed at Annex 7.1.
- ..4 Direct communication between Canada and the RPD/SS Consultant on routine matters may be required for resolution of technical issues. However, this will not alter project scope, budget or schedules, unless confirmed in writing by the Departmental Representative.
- ..5 During construction tender call for the Overall Remediation, the MCM will conduct all correspondence with Proponents-bidders-Proponents and award the contract.
- ..6 If any direct communication with CIRNAC results in the need for any change to the Project scope of work, quality, cost or schedule, the RPD/SS Consultant will inform the Departmental Representative, and seek direction, before taking any action.
- ..7 No communication will alter the terms of the project scope, budget or schedules unless directed in writing by the Departmental Representative.
- ..8 The Departmental Representative will arrange for the RPD/SS Consultant and MCM to obtain access to the PSPC secure shared document management site.
- ..9 Correspondence:
 - All correspondence from the RPD/SS Consultant will be distributed as directed by the Departmental Representative.
 - There will be no correspondence between occupants or users of the site and the RPD/SS Consultant unless directed by the Departmental Representative.
 - All correspondence must carry the Contract name/number, WBS, Project title, Project number and a date (i.e. yyyy-mm-dd).
 - Automatic date fields will not be used, except when preceded by the text "Printed on:"

3.1.2 Meetings During The Design Phase(s)

- ..1 Meetings during the design phase(s) with PSPC, CIRNAC, the RPD/SS Consultant, the MCM, and other consultants will normally be held remotely, using Microsoft Teams.
- ..2 The Departmental Representative will arrange meetings bi-weekly (or on a frequency applicable to the scope of the project), throughout the design phases of the project, with representatives from:
 - PSPC ;

- RPD/SS Consultant team;
- CIRNAC;
- Main Construction Management (MCM) Team; and
- Other consultants (as required).

..3 The RPD/SS Consultant will:

- Prepare minutes of meetings during the design phases.
- Forward minutes to all attendees and invitees, and to additional people as directed by the Departmental Representative.
- These meetings are for the accurate exchange of information.
- All requests and decisions taken must follow the formal lines of communications.
- Endeavour to hold all meetings as Green Meetings (i.e. Electronic copies of documents where possible or double sided hard copies).
- Attend all design meetings.
- Respond to minutes as required prior to the next meeting.

3.1.3 Meetings During the Construction Phase(s)

..1 The RPD/SS Consultant will attend all regular bi-weekly (or on a frequency applicable to the scope) construction meetings on site through the duration of the project and respond to minutes, prepared by the MCM, within two (2) working days of the meeting.

..2 Meeting during the Construction Phase(s) will normally be held remotely, using Microsoft Teams and/or at the Faro Mine Complex, Faro, YT.

3.1.4 Regulatory Meetings

..1 The RPD/SS Consultant will participate in meetings and public forums / hearings to support PSPC, CIRNAC and the Regulatory Services Consultant on technical matters relating to the Environmental and Socio-Economic Assessment, Water Licence, Fisheries Act Authorization or Consultation processes, as requested.

3.1.5 Project Response Time

..1 The RPD/SS Consultant must ensure that all key personnel are personally available to attend meetings as required and respond to inquiries promptly. During the Project, the MCM's Core and Key Staff shall be:

- Available to attend virtual meetings and respond to inquiries within three (3) working days' notice.
- Able to respond to emergencies within four (4) hours, including those occurring during off-hours and on weekends / holidays.
- On occasion, there may be urgent, problem-solving meetings. The RPD/SS Consultant must be available to attend such meetings on site within one (1) day.

3.1.6 Format of Submissions to the DR / Canada

- ..1 For all documents or reports submissions to the DR, a draft template for that type of document is to be submitted to DR for review and acceptance prior to using the template. Updates and resubmissions of the templates may be required for approval and acceptance.
- ..2 Provide one (1) electronic copy in unprotected native format and one (1) unlocked electronic copy in portable document format (*.pdf), unless otherwise specified. Paper copies of all design drawings to be submitted, and if requested one paper copy of any other submissions to DR.
- ..3 All Team participants including Canada, Engineering Consultants and the Main Construction Manager must be able to communicate electronically by e-mail and using software acceptable to Canada.
- ..4 Acceptable software is (use most recent versions):
 - For written reports and studies: MS Word (*.doc)
 - For Spreadsheets and budgets: MS Excel (*.xls)
 - For Presentations: MS Power Point (*.ppt)
 - For Schedules: MS Project
 - For Drawings: AutoCAD (*.dwg)
 - For Specifications: use of National Master Specifications (NMS) in MS Word (*.doc)
 - For Web Adobe: PDF, HTML, Macromedia Flash
 - For Web Conferences: MS Teams
 - Formats may be updated by Canada over Terms 1 and 2. The MCM is expected to align to and use the most recent Canada software standards.
- ..5 Documents will be shared between the Project Team members using the existing secure file transfer site hosted by PSPC. The DR will provide access to the site and sub-contractors as required.

3.1.7 Media Relations and Social Media

- ..1 No personnel from either the RPD/SS Consultant Team, or any Subcontractors are to communicate with the media unless requested to do so by the DR. If contacted by reporters or others, refer reporters to the CIRNAC Communications Manager immediately and notify Canada's representative immediately. Do not publish or agree to have published information on this Project or this Contract without the prior written approval of the DR.
- ..2 All personnel from the RPD/SS Engineering Consultant Team and all sub-consultants are to follow Canada's guidelines in reference to the use of social media. The RPD/SS Consultant's Team and all Subcontractors must not share any project information, videos or photographs pertaining to the Project publicly, including but not limited to, by social media or other online platforms unless previously authorized by Canada.
- ..3 The RPD/SS Engineering Consultant must receive Canada's and the MCM's prior permission to provide any public or media tours of the Site and for any capture of video or photographic footage by any parties (including MCM personnel and Subcontractors).

3.1.8 Doing Business with PWGSC Manual

- ..1 This ToR document must be used in conjunction with Appendix D of the RFP: Doing Business with PWGSC – Documentation and Deliverables Manual as the two documents are complementary.
- ..2 This ToR describes Project-specific requirements, services and deliverables while the document at Appendix D of the RFP outlines minimum requirements for producing deliverables for projects in order to ensure a well-documented design / delivery process, and to facilitate review by PSPC staff.
- ..3 In the case of a conflict between the two documents, the requirements of the ToR override the Doing Business with PWGSC Manual.

3.1.9 Existing Documentation

- ..1 Reference information will be available in the language in which it is written.
- ..2 The documentation is offered “as-is” for the information of the RPD/SS Engineering Consultant.

3.2 SCHEDULE MANAGEMENT

3.2.1 Project Schedule

- ..1 A Detailed Project Schedule is a schedule developed in reasonable detail to ensure adequate Time Management planning and control of the project.
- ..2 Project Schedules are used as a guide for the planning, design and implementation phases of the project, as well as to communicate to the project team when activities are to happen, based on network techniques using Critical Path Method (CPM).
- ..3 When building a Project Schedule, the RPD/SS Consultant must consider:
 - The level of detail required for control and reporting;
 - The reporting cycle will be monthly, unless otherwise identified in the Terms of Reference. The generic reporting template to Canada is included at Annex 5;
 - What is required for reporting in the Project Teams Communications Plan; and
 - The nomenclature and coding structure for naming of scheduled activities, which must be submitted to the Project Manager for acceptance.
- ..4 PSPC presently utilizes Microsoft Project and Primavera for its current Control Systems and any software used by the RPD/SS Consultant should be fully integrated with either of these programs, using one of the many commercially available software packages.

3.2.2 Milestones

- ..1 The Major Milestones are standard Deliverables and Control Points and are required in all schedule development.
- ..2 These Milestones will be used in Time Management Reporting within PSPC as well as used for monitoring project progress using Variance Analysis.

- ..3 Milestones may also be external constraints such as the completion of an activity, exterior to the project, affecting the project.

3.2.3 Activities

- ..1 All activities will need to be developed based on:
- Project Objectives,
 - Project Scope,
 - Milestones,
 - Meetings with the project team and
 - The scheduler's full understanding of the project and its processes.
- ..2 Subdivide the elements down into smaller more manageable pieces that organize and define the total scope of work in levels that can be scheduled, monitored and controlled.
- ..3 Each activity will describe the work to be performed using a verb and noun combination (i.e. Review Design Development Report).
- ..4 These elements will become activities, interdependently linked in the Project Schedule.
- ..5 If unforeseen or critical issues arise, the Scheduler will advise the Project Manager and submit proposed alternative solutions in the form of an Exception Report. An Exception Report will include sufficient description and detail to clearly identify:
- Scope Change: Identifying the nature, reason and total impact of all identified and potential project scope changes affecting the project.
 - Delays and accelerations: Identifying the nature, the reason and the total impact of all identified and potential duration variations.
 - Options Enabling a Return to the project baseline: Identifying the nature and potential effects of all identified options proposed to return the project within baselined duration.
- ..6 At each submission or deliverable stage, provide an updated schedule and exception report.

3.3 PROJECT REVIEW AND APPROVAL

3.3.1 Federal Government

The federal authorities having jurisdiction over this project, include but are not limited to: Environment and Climate Change Canada, Health Canada and Department of Fisheries and Oceans (DFO) for environmental regulations.

3.3.2 PSPC / CIRNAC Reviews, Approvals & Presentations

..1 Senior Management Approval

The projects are subject to approval by senior managers of PSPC and CIRNAC. These authorities are responsible for final decisions on the projects.

These authorities may require both formal oral presentations and written submissions at key project phases.

..2 Project Delivery Team Approval

This includes both the PSPC Professional & Technical Team reviews and CIRNAC approval.

- ..2..1 The purpose of this review is technical quality assurance;
- ..2..2 Submission documents will be in the following format: reports, drawings and specifications, oral presentation and other formats as required;

Submissions will be reviewed at the following milestones:

- ..2..1 Recommended type and level of design criteria
- ..2..2 Reports, analysis and schematic design phase
- ..2..3 Conceptual design phase (if required)
- ..2..4 Design Criteria draft
- ..2..5 Design Criteria and Cost Estimate completion

Expected turnaround time is three (3) weeks.

..3 PSPC Review

The Departmental Representative will conduct Quality Assurance Reviews on reports, drawings, schedules, and costs estimates prepared by the RPD/SS Consultant, in a manner and at stages noted herein. The RPD/SS Consultant will respond in writing to PSPC's comments, in a timely manner and will be held accountable for delays if proper and timely responses do not occur.

Such reviews are not intended as a check against errors or omissions contained within the documents submitted. The RPD/SS Consultant is responsible for any such errors or omissions, regardless of any review by PSPC.

While PSPC acknowledges the RPD/SS Consultant's obligations to meet project requirements, the project delivery process entitles PSPC and CIRNAC to review the work. PSPC reserves the right to reject undesirable or unsatisfactory work. The RPD/SS Consultant will obtain the Departmental Representative's acceptances during each of the project stages.

Acceptances indicate that, based on a general review of material for specific issues, the material is considered to comply with governmental and departmental objectives and practices and that overall project objectives should be satisfied. The acceptance does not relieve the RPD/SS Consultant of professional responsibility for the work and compliance with the terms and conditions of the Contract.

The Departmental Representative acceptances do not preclude the possibility that the work may be determined to be unsatisfactory at later stages of review (e.g. there may be more than one (1) draft version of a report required). If progressive design development or technical investigation reveals that earlier acceptances should be withdrawn, the RPD/SS Consultant is responsible for redesigning work and resubmitting for acceptance at the RPD/SS Consultant's cost

Acceptances by other agencies and levels of government will be obtained to supplement the Departmental Representative acceptances. The RPD/SS Consultant will assist the Departmental Representative in securing all such acceptances and adjust all documentation as required by such authorities when securing acceptance.

3.3.3 Treasury Board (TB) Submissions

- ..1 Projects that are subject to TB approval are normally submitted twice:
- The first submission is for Preliminary Project Approval (PPA) at Pre-Design or Schematic Design stage of a project and must include an Indicative Estimate for the cost of the work.
 - The second submission is for Effective Project Approval (EPA) at the completion of Design Development or Pre-Tender stage of a project and must include a Substantive Estimate for the cost of the work.
- ..2 The Treasury Board estimate definitions are:
- Indicative Estimate (at minimum Class 4):
- ..2..1 A low quality, order of magnitude estimate that is not sufficiently accurate to warrant TB approval as a Cost Objective.
- Substantive Estimate (at minimum Class 2):
- ..2..1 An estimate which is of sufficiently high quality and reliability as to warrant TB approval as a Cost Objective for the project phase under consideration.
- ..2..2 It is based on detailed systems and component design, taking into account all project objectives and deliverables.
- ..3 TB Terminology:
- Constant dollar estimate:
- ..3..1 This is an estimate expressed in terms of the dollars of a particular base fiscal year.
- ..3..2 It includes no provision for inflation.
- ..3..3 Cash flows over a number of fiscal years may also be expressed in constant dollars of the base year including no allowance for inflation in the calculation of costs.
- ..4 Budget-year (BY) dollar estimate:
- Budget year dollars is also be referred to as Nominal dollars or Current dollars
- ..4..1 This is an estimate based on costs arising in each Fiscal Year of the project schedule.
- ..4..2 It is escalated to account for inflation and other economic factors affecting the period covered by the estimate.
- The costs and benefits across all periods should initially be tabulated in budget year dollars for three following reasons:
- ..4..1 First, this is the form in which financial data are usually available.
- ..4..2 Second, adjustments, such as tax adjustments, are accurately and easily made in budget year dollars.

- ..4..3 Finally, working in budget-year dollar enables the analyst to construct a realistic picture over time, taking into account changes in relative prices.

3.3.4 Territorial Authorities

- ..1 The federal government generally defers to Territorial authorities for specific regulations, standards and inspections but in areas of conflict, the more stringent authority prevails.
- ..2 Fire safety at the shall be in accordance with all applicable Yukon laws and regulations, and in accordance with any direction provided by the Yukon Fire Marshal's Office.
- ..3 Unless directed otherwise by the Departmental Representative, the RPD/SS Consultant should consider and take for granted that the main construction manager shall:
 - Adhere to the applicable Occupational Health and Safety Act at the Faro Mine Complex, its amendments and its regulations including, but not limited to:
 - ..3..1 Yukon Occupational Health and Safety Regulations;
 - ..3..2 Commercial Diving Regulations;
 - ..3..3 Occupational Health Regulations;
 - ..3..4 Workplace Hazardous Materials Information System Regulation;
 - ..3..5 Mine Rescue Standard; and
 - ..3..6 First Line Supervisors Certificate
 - In addition to the related Canada Occupational Safety and Health Act and its Regulations, adhere to the requirements of the Yukon Territory at the Faro Mine Complex for:
 - ..3..7 Employment Standards;
 - ..3..8 Construction Safety;
 - ..3..9 Designated Substance Management; and
 - ..3..10 Workers Compensation Act.
 - Adhere to any and all relevant Regulations, Standards and Inspections.

3.3.5 Codes and Standards

- ..1 All criteria will be in accordance with the current edition of Canadian Codes and Standards, and any other relevant Codes as applicable. If local codes and bylaws are more stringent, they will take precedence.
- ..2 Regulations, by-laws, and decisions of "Authorities having jurisdiction" will be observed. In cases of overlap, the most stringent will apply.
- ..3 The RPD/SS Consultant will identify and communicate with all jurisdictions applicable to the project.
- ..4 For material properties (both physical and chemical), methods of fabrication, tests, etc., reference should be made to the latest editions of Canadian Standards Association (CSA)

Standards and the Canadian General Standards Board (CGSB), or to local standards if they are more stringent.

3.3.6 Project Budget and Cost

- ..1 The approved budget for the project must not be exceeded unless otherwise approved in writing by the DR. Effective cost estimating and cost control is of prime importance.

4. REQUIRED SERVICES

RS 1 PRE-DESIGN SERVICES

1.1 Summary Description of Required Services

1.1.1 The RPD/SS Consultant will be responsible for providing and coordinating full professional engineering, science, and other specialist consultant services for the Faro Mine Remediation Project, from planning and investigative services to design and construction services.

1.1.2 A summary of professional experience requirements for this Contract include, but are not limited to the following:

- 1.1.2.1 Project management
- 1.1.2.2 Program management
- 1.1.2.3 Geotechnical engineering and geoscience
- 1.1.2.4 Environmental engineering and science
- 1.1.2.5 Water resources engineering (including hydrology and hydrotechnical engineering)
- 1.1.2.6 Transportation (road) engineering
- 1.1.2.7 Structural engineering
- 1.1.2.8 Civil engineering
- 1.1.2.9 Other engineering disciplines including but not limited to process/chemical engineering, mechanical engineering and electrical engineering
- 1.1.2.10 Hydrogeology
- 1.1.2.11 Surveying
- 1.1.2.12 Drafting
- 1.1.2.13 Specifications writing
- 1.1.2.14 Senior technical review
- 1.1.2.15 Construction field review and QA services
- 1.1.2.16 Commissioning, including providing services as a CxA
- 1.1.2.17 Cost estimating and planning/control
- 1.1.2.18 Schedule planning and control
- 1.1.2.19 Architecture, including landscape architecture
- 1.1.2.20 Material testing services
- 1.1.2.21 Wildlife biology
- 1.1.2.22 Fisheries biology
- 1.1.2.23 Archaeology
- 1.1.2.24 Climate specialists services

1.1.3 The technical expertise listed in RS 1.1 will be required at all project stages and is applicable to all other RS sections.

1.1.4 All work under all RS sections shall be carried out according to applicable IOC requirements.

1.2 Feasibility Studies / Options Analysis

1.2.1 Intent

1.2.1.1 An investigation, summarized in a report, which outlines the research and subsequent analysis to determine the viability and practicality of a project (or part of a project). A feasibility study analyzes economic, financial, market, regulatory, environmental/sustainable and technical issues.

1.2.1.2 The purpose at this stage is to investigate and analyze site conditions, including soil conditions, bylaws, , service capacities, support systems, special purpose support systems, required functionality, operations, maintainability and provide recommendations.

1.2.2 Scope and Activities

1.2.2.1 Attend project start up meeting;

1.2.2.2 Visit the site, investigate and analyze the needs of the project;

1.2.2.3 Investigate the requirements for the particular site, including existing and new technologies;

1.2.2.4 Analyze the project requirements/program;

1.2.2.5 Review all available existing material related to the site;

1.2.2.6 Investigate and analyze all applicable codes and regulations. Standards as a minimum: National Building Code, Canada Labour Code, National Fire Protection Association (NFPA) requirements, Yukon Occupational Health and Safety Act, Navigation Protection Act; Yukon Environmental and Socio-economic Assessment Act (YESAA) and DFO Acts and regulations.

1.2.2.7 Evaluate existing infrastructure including (but not limited to): civil, environmental, mechanical, electrical and structural systems, functional adaptability, code compliance, hazardous and non-hazardous waste;

1.2.2.8 Identify and verify all authorities having jurisdiction over the project;

1.2.2.9 Establish a policy for this project to minimize environmental impacts consistent with the project objectives and economic constraints, and the application of the YESAA;

1.2.2.10 Review the proposed project milestones for verification that all dates are achievable;

1.2.2.11 Review the cost plan/budget for verification that the costs are realistic and achievable; and

1.2.2.12 Prepare recommendations on the feasibility of the project.

1.2.2.13 Prepare options analysis, as a minimum:

1.2.2.13.1 Test the feasibility study recommendations using a minimum of three (3) options, schematic (sketch) only;

1.2.2.13.2 Pro / Cons of each option;

1.2.2.13.3 Financial analysis (Class 'D') including life cycle analysis and best value for operation and maintenance;

1.2.2.13.4 Indication of the preferred option.

1.2.3 Deliverables

1.2.3.1 Comprehensive summary of the requirements, conditions, feasibility and options analysis, demonstrating an understanding of the scope of work, including (as applicable):

1.2.3.1.1 Report on existing infrastructure including its condition, deficiencies and life expectancy;

1.2.3.1.2 Report on existing facilities and systems requirements;

1.2.3.1.3 Report on all applicable codes, regulation, standards and authorities having jurisdiction;

1.2.3.1.4 Describe options being investigated and analyze the economic, social, and environmental advantages and disadvantages of each option relative to the project objectives;

1.2.3.1.5 Report on environmental impact, sustainability and preliminary environmental assessment;

1.2.3.1.6 Report on recommendations and options analysis;

1.2.3.1.7 Confirmed or adjusted project cost and time plans;

1.2.3.1.8 Written identification of the problems, conflicts or other perceived information/clarifying assumptions for the acknowledgment of the Departmental Representative;

1.2.3.1.9 Report on Class 4 Order of Magnitude Cost for each option.

1.3 Project Approach

1.3.1 Intent

1.3.1.1 A written statement which describes various criteria and data for a project including design objectives, site requirements and constraints, equipment and systems, and requirements. The purpose of this stage is to describe the requirements which must be met to satisfy the requirements of the project. The process seeks to answer the following questions:

1.3.1.1.1 What is the nature and scope of the problem?

1.3.1.1.2 What information is required to develop a proper engineering solution to the problem?

1.3.1.1.3 How much and what type of construction is needed?

1.3.1.1.4 What are the future requirements of this site?

1.3.2 Scope and Activities

- 1.3.2.1 In preparing a functional program, the RPD/SS Consultant's main task is to examine the project/ site in detail so as to define the Client's needs and objectives. These requirements will establish criteria for evaluating potential design solutions and other strategic alternatives. Assistance from the Regulatory Services Consultant may be obtained in this case.
- 1.3.2.2 The RPD/SS Consultant must understand:
 - 1.3.2.2.1 The impacts of the project on the environment;
 - 1.3.2.2.2 The social impacts of its program on the community;
 - 1.3.2.2.3 The impacts on the existing infrastructure;
 - 1.3.2.2.4 Long term maintenance requirements and operational needs.
- 1.3.2.3 The RPD/SS Consultant shall then develop approximate sketches and technical requirements for the proposed works including:
 - 1.3.2.3.1 Details for proposed works;
 - 1.3.2.3.2 Environmental criteria.
- 1.3.2.4 The RPD/SS Consultant shall also advise Departmental Representative on alternatives, such as the engineering and financial implications of various options. The RPD/SS Consultant shall assist in assessing the advantages or benefits and the disadvantages or costs - of each alternative.

1.3.3 Deliverables

- 1.3.3.1 The final Project Review is a report including as a minimum:
 - 1.3.3.1.1 Site requirements;
 - 1.3.3.1.2 Explicit space requirements for the future of the site including:
 - 1.3.3.1.2.1 Definition of the function of each type of infrastructure;
 - 1.3.3.1.2.2 The functional relationships between different types of infrastructure or areas;
 - 1.3.3.1.2.3 Site and sketch of the different infrastructures;
 - 1.3.3.1.2.4 Special technical requirements of each of the items.
 - 1.3.3.1.3 Financial requirements and a preliminary "Order of Magnitude "Class 4 budget;
 - 1.3.3.1.4 Scheduling and time frame for the project;
 - 1.3.3.1.5 Other requirements including:
 - 1.3.3.1.5.1 Regulatory issues;
 - 1.3.3.1.5.2 Other requirements from Authorities having Jurisdiction;
 - 1.3.3.1.5.3 Community goals and concerns;
 - 1.3.3.1.5.4 Ecological and environmental concerns.

1.4 Implementation Strategy and Schedule

1.4.1 Intent

- 1.4.1.1 The purpose of this stage is to detail an implementation strategy to meet the project goals and objectives.

1.4.2 Scope and Activities

- 1.4.2.1 As a minimum:
 - 1.4.2.1.1 Prepare a detailed implementation strategy that documents, in a report, all activities, milestones and deliverables required for the effective delivery of the project including time frames for submissions, reviews and approvals;
 - 1.4.2.1.2 Prepare a project schedule that identifies, in a graphic format such as Critical Path Method (CPM) or Program Evaluation Review Technique (PERT), all activities, milestones including critical deadlines, long lead delivery items and drop dead dates, required for the effective delivery of the project deliverables, including time frames for submissions, reviews and approvals;
- 1.4.2.2 The Implementation Strategy and Schedule described above shall include as a minimum:
 - 1.4.2.2.1 Site Master Plan;
 - 1.4.2.2.2 Sequencing of project tasks including items not included as part of constructed works;
 - 1.4.2.2.3 Move sequencing;
 - 1.4.2.2.4 Client construction requirements (i.e. Security and training, etc.);
 - 1.4.2.2.5 Construction strategy;
 - 1.4.2.2.6 Advise the Departmental Representative of any changes to the scope that may affect schedule or are inconsistent with instructions or written approvals previously given. The RPD/SS Consultant shall detail the extent and reasons for the changes and obtain written approval before proceeding;
 - 1.4.2.2.7 Submit the Implementation Strategy and Schedule for review. Revise as required. Resubmit for final approval. The original approved schedule will become the "Baseline" schedule to monitor project progress;
 - 1.4.2.2.8 Throughout the project, monitor critical path and deadlines for submissions, revisions and approvals and as a minimum submit monthly updates.

1.4.3 Deliverables

- 1.4.3.1 Implementation strategy
- 1.4.3.2 Time Plan (Schedule)

1.5 Site Assessments and Analysis

1.5.1 Intent

- 1.5.1.1 To evaluate a site in order to determine the most appropriate management strategy to support the FMRP and satisfy current and future client requirements.
- 1.5.1.2 To outline the specific project requirement issues such as, but not limited to, discharge off site, erosion control and water management, environmental protection, waste management and permitting.
- 1.5.1.3 To confirm/delineate current constraint mapping conditions from any management plans (e.g. fish, species at risk, migratory birds, watercourses, wetlands) that is based on habitat characterization. Cultural resource constraint mapping will be verified on an opportunistic basis only;
- 1.5.1.4 To collect the required environmental baseline information to input into an environmental assessment.

1.5.2 Scope and Activities

- 1.5.2.1 Coordinate all site visits with the Departmental Representative and the MCM and obtain required permissions before going on site. The MCM will have care of the site. All personnel must obtain required orientation/training as specified by the MCM and follow MCM requirements and procedures while on site.
- 1.5.2.2 Conduct pre-inspection review of the existing documentation in order to confirm the range of information available and to identify any missing components or areas of concern which will require special attention.
- 1.5.2.3 Conduct investigations to obtain the required information to prepare and carry out the activities necessary to establish the required infrastructure or equipment for the site or project.
- 1.5.2.4 Environmental Protection Plans for will be required for any site disturbances that may be caused by a site visit during an investigation.
 - 1.5.2.4.1 Identity which plans are required;
 - 1.5.2.4.2 Prepare the following as required:
 - 1.5.2.4.2.1 erosion and sedimentation control plans,
 - 1.5.2.4.2.2 water management plans,
 - 1.5.2.4.2.3 waste management plans, and
 - 1.5.2.4.2.4 other environmental protection plans as applicable.
 - 1.5.2.4.3 Submit to the Departmental Representative for review before undertaking work that may cause a site disturbance.
- 1.5.2.5 Field data will be recorded in a spatial database utilizing Global Positioning System (GPS) technology and information will be managed and analyzed using a relational database management system. GPS/Geographic Information System (GIS)

Specifications will be compatible with requirements specified. Updates to the constraints mapping will also be required.

- 1.5.2.6 No areas will be excluded from the field survey, and the approach will be to assess the perimeter of a potentially suitable habitat or resource and possibly a cross section to determine if the area would be or is habitat for a species, or highly likely that the species is actually present or may contain resources. Opportunistic observations will be made where applicable and where possible.
- 1.5.2.7 Analyze site conditions and requirements and determine project design requirements.
- 1.5.2.8 Prepare report on each investigation clearly describing what information was required, why it was required and what the results were.

1.5.3 Deliverables

- 1.5.3.1 Submit report to Departmental Representative for review, revise as required, and resubmit for final acceptance.

1.6 Infrastructure Assessments and Analysis

1.6.1 Intent

- 1.6.1.1 To identify and evaluate existing infrastructure including as a minimum civil infrastructure, existing structures on site and all other infrastructure which will be utilized in the current and future operation of the site.
- 1.6.1.2 The cyclical review of infrastructure consists of the performance of a range of major evaluation and analysis studied:
 - 1.6.1.2.1 Management Plans
 - 1.6.1.2.2 Condition Reports
 - 1.6.1.2.3 Performance Reviews
 - 1.6.1.2.4 Serviceability
- 1.6.1.3 The scope of these cyclical reviews provides, in general terms an examination of inventory performance in five major areas:
 - 1.6.1.3.1 Operational Performance
 - 1.6.1.3.2 Functional Performance
 - 1.6.1.3.3 Financial Performance
 - 1.6.1.3.4 Technical Performance
 - 1.6.1.3.5 Environmental Performance

1.6.2 Scope and Activities

- 1.6.2.1 Prepare a detailed inventory of existing infrastructure and equipment. Include drawings identifying existing location, layout.
- 1.6.2.2 Based on parameters developed in conjunction with the Departmental Representative and the client department, prepare an evaluation report that assesses the condition

of existing infrastructure and equipment. Assess the current inventory against the client department's functional requirements. Include an examination of the following:

- 1.6.2.2.1 Demolition of existing infrastructure and equipment; and/or
 - 1.6.2.2.2 Procuring/ constructing new infrastructure and equipment; and
 - 1.6.2.2.3 Current technologies and innovative solutions for the site;
 - 1.6.2.2.4 Prepare a detailed cost analysis that compares the reuse/refurbishment of existing infrastructure and equipment, with the purchase of new. Consideration should be given to cost effectiveness and time frames required for refurbishment of existing infrastructure and equipment and/or the procurement of new.
- 1.6.2.3 Undertake a detailed review of the current performance conditions of the infrastructure with respect to Operational, Functional, Technical, Environmental and Financial Performance.
- 1.6.2.4 With respect to maintenance, the RPD/SS Consultant will:
- 1.6.2.4.1 Assess the levels of maintenance with respect to infrastructure meeting its anticipated life cycle;
 - 1.6.2.4.2 Ensure that maintenance is completed to a level so as to avoid failure that could impact on users;
 - 1.6.2.4.3 Ensure that systems are evaluated for maintenance and testing;
 - 1.6.2.4.4 The on-site review will be structured in such a manner as to identify and document the inter-relationship of the findings for each specific set of performance criteria as they are affected by other sets of criteria.
- 1.6.2.5 After inspections data is analyzed with respect to condition, remaining useful life, code compliance, condition descriptions, and their impact on the functionality of the asset, and priorities for intervention are established.

1.6.3 Deliverables

- 1.6.3.1 Submit report for review, revise as required and resubmit for final approval.

1.7 Environmental and Socio-Economic Assessments

1.7.1 Intent

- 1.7.1.1 To assist the Regulatory Services Consultant in identifying by investigation and reporting any potential environmental effects, as may be required on a Task Authorization basis, in support of or in addition to the YESAA process currently underway for the site as a whole, or as a separate YESAA process.
- 1.7.1.2 To assist the Regulatory Services Consultant in planning mitigation measures so that they may be incorporated into the project design thereby avoiding or minimizing any effects and to determine whether there are any environmental constraints to the decision making options.

- 1.7.1.3 The RPD/SS Consultant will be required to support and actively participate in the regulatory processes, for example, during YESAA and water licensing processes. Design plans (both preliminary and detailed) will have to be integrated, explained and defended during these regulatory processes.

1.7.2 Scope and Activities

- 1.7.2.1 To meet the requirements of the Yukon Environmental and Socio-economic Assessment Act (YESAA), the RPD/SS Consultant will be required to;
 - 1.7.2.1.1 Identify any significant or ecological sensitive areas in the vicinity of the project area;
 - 1.7.2.1.2 Identify any potential impacts from the projects interactions with environmental and social components;
 - 1.7.2.1.3 Recommend mitigation measures to address potential effects on environmental and social components;
 - 1.7.2.1.4 Evaluate whether the project will cause significant adverse environmental effects;
 - 1.7.2.1.5 Provide recommendations of the necessity of a follow-up program and recommend whether there are any environmental constraints to supporting the project.
- 1.7.2.2 Environmental assessments will be done on each project in accordance with the YESAA.

1.7.3 Deliverables

- 1.7.3.1 Submit report that identifies and meets all environmental aspects necessary for the proposed project for review, revise as required and resubmit for final approval.
- 1.7.3.2 Draft sections of project proposal and water licensing submissions regarding design work.
- 1.7.3.3 During the regulatory process, answer questions related to those submissions, explain and defend design work.

RS 2 CONCEPT/SCHEMATIC DESIGN

2.1 Intent

- 2.1.1 To translate the project requirements into preliminary design to explore design options and analyze them with respect to priorities and program objectives previously identified. Out of this process, one option will be recommended to proceed to Design Development.

2.2 Scope and Activities

- 2.2.1 Obtain written approval from Departmental Representative for development of schematic design options based on the analysis of the Project Brief;
- 2.2.2 Provide alternative design options exploring possible technical and environmental strategies which are viable and have potential for development;
- 2.2.3 Analyze each solution with regard to the project goals including cost and schedule;
- 2.2.4 Write a preliminary project-description report outlining the various components and system options;
- 2.2.5 Produce an environmental assessment and YESAA Screening Report, if requested;
- 2.2.6 Minimize the use of hazardous/toxic materials and products made from endangered or rare species (i.e. tropical hardwoods);
- 2.2.7 Recommend one option for further development with all supporting background and technical justifications;
- 2.2.8 Produce a Class 3 cost estimate for the various options; and be prepared to further develops the cost estimate to level Class 1 - ready for tender.
- 2.2.9 Produce an implementation schedule, including alternative procurement and construction strategies.

2.3 Deliverables

- 2.3.1 Schematic Design Drawings;
- 2.3.2 Site plan showing proposed works, existing infrastructure, existing and proposed
- 2.3.3 Description of the options with recommendation of preferred solution;
- 2.3.4 Waste Management plan
- 2.3.5 Project specification amendment;
- 2.3.6 Environmental Assessment Report and recommendations of decisions for the YESAA, if requested;
- 2.3.7 Cost Plan, including cost analysis, "what if" scenarios, potential risks, alternative procurement and construction strategies;
- 2.3.8 Class 3 Cost Estimate, including methodology of the estimate, assumptions made, costing alternatives and life cycle costs. Document all unit pricing, analysis, and valuation;

- 2.3.9 Prepare project master schedule and identify potential risks to schedule;
- 2.3.10 Report on deviation from schedule and recommend corrective measures or updated time line.

RS 3 DESIGN DEVELOPMENT

3.1 Intent

- 3.1.1 To further develop one of the options presented at the Concept Design stage. The Design Development documents consist of drawings and other documents to describe the size and character of the entire project as to engineering, structural, environmental, mechanical and electrical systems, materials and such other elements as may be appropriate.

3.2 Scope and Activities

- 3.2.1 Obtain written approval from Departmental Representative for development of one of the proposed concept design options;
- 3.2.2 If any alterations are demanded, document all required changes, analyze the impact on all project components, and resubmit for approval if required;
- 3.2.3 Expand and clarify the Concept Design intent for each design discipline;
- 3.2.4 Present the design materials to the client, design review or other committees as indicated by the Departmental Representative;
- 3.2.5 Present the design to the government or local authorities where required;
- 3.2.6 Ensure coordination of all disciplines' design development;
- 3.2.7 Analyze the constructability of the project and advise on the construction process and duration;
- 3.2.8 Based on all material available at the time, prepare a milestone schedule for the consideration with special attention to the impact on tenants;
- 3.2.9 Continue to review all applicable statutes, regulations, codes and by-laws in relation to the design of the project;
- 3.2.10 Define Commissioning Requirements;
- 3.2.11 Provide all services related to being a CxA; and
- 3.2.12 Provide a list of all National Master Specification (NMS) sections to be used, complete with a full draft specification, catalogue cuts and sustainable development/green choices.

3.3 Deliverables

- 3.3.1 Plans for all works, including all disciplines, showing all infrastructure. Indicating all key dimensions;
- 3.3.2 Preliminary works plans and plans for site preparation;
- 3.3.3 Engineering, engineering details.
- 3.3.4 Elevations;
- 3.3.5 Site models and/or tools for use in public presentations for example and as required;
- 3.3.6 Outline specifications for all systems and principal components or equipment;

- 3.3.7 Updated cost plan and cash flow;
- 3.3.8 Class 2 (substantive) cost estimate showing changes from Class 3 (indicative) cost estimate
- 3.3.9 Update time plan (Schedule) with highlighted changes to the time plan:
- 3.3.10 Preliminary construction schedule including long term delivery items;
- 3.3.11 Project dossier detailing the basic assumptions of the project and the justifications for all major decisions;
- 3.3.12 Prepare a commissioning Brief describing major commissioning activities which include, as a minimum, civil, mechanical, electrical, municipal and integrated system testing;
- 3.3.13 Updated sustainable development strategy report.

RS 4 CONSTRUCTION DOCUMENTS

4.1 Intent

- 4.1.1 Based on approved Design Development documents, the RPD/SS Consultant is required to prepare drawings and specifications setting forth in detail the requirements for the final cost estimate and construction of the project.
- 4.1.2 To prepare drawings and specifications setting forth in detail the requirements for the construction and final cost estimate of the project.
 - 4.1.2.1 33% indicates technical completeness of all working documents;
 - 4.1.2.2 66% indicates substantial technical development of the project - well advanced engineering and engineering plans, details, schedules and specifications;
 - 4.1.2.3 99% is the submission of complete Construction Documents ready for submission to the MCM to prepare for tendering;
 - 4.1.2.4 Develop project specific Systems Operations Manual (SOM) as required;
 - 4.1.2.5 100% (IFT) Submission incorporates all revisions required in the 99% version.
 - 4.1.2.6 IFC (Issued for Construction) Drawings will incorporate any changes from the tendering phase, including addendums.

4.2 Scope and Activities

- 4.2.1 Activities are similar at all three stages; completeness of the project development should reflect the stage of a submission.
- 4.2.2 Obtain Project Manager's approval for Design Development submissions (33%, 66%, 99% and final)
- 4.2.3 Requirements pertaining to such elements as format, type, content, number of copies, etc. For the preparation and submission of Construction Documents are presented in ToR Section 3 Project Communications and Submissions and in Doing Business with PWGSC.
- 4.2.4 Confirm format of drawings and specifications;
- 4.2.5 Clarify special procedures (i.e. phased construction);
- 4.2.6 Submit drawings and specifications at the required stages. (33%, 66%, 99%);
- 4.2.7 Provide written response to all review comments and incorporate them into Construction Documents where required;
- 4.2.8 Advise as to the progress of cost estimates and submit updated cost estimates as the project develops;
- 4.2.9 Update the project time plan (schedule);
- 4.2.10 Prepare a final Class 1 (substantive) estimate;

- 4.2.11 Review and approve materials and construction processes specifications to meet sustainable development objectives.

4.3 Details

4.3.1 Technical and Production Meetings:

- 4.3.1.1 Production of construction documents at the 33%, 66%, and 99% submissions will be reviewed during the meetings arranged by Departmental Representative and RPD/SS Consultant;
- 4.3.1.2 Representatives from Client Department(s) and PSPC/Other Government Department (OGD) support staff will be present as arranged by the Departmental Representative;
- 4.3.1.3 RPD/SS Consultant shall ensure that their staff and the sub-consultant representatives attend the technical and production meetings as required;
- 4.3.1.4 RPD/SS Consultant shall ensure all documents are coordinated with all sub-consultants and disciplines;
- 4.3.1.5 RPD/SS Consultant shall arrange for all necessary data, progress prints, etc.;
- 4.3.1.6 RPD/SS Consultant shall prepare minutes of the meetings and distribute copies to all participants.

4.3.2 Progress Review

- 4.3.2.1 As work progresses on construction drawings, submit, from each discipline, drawings, schedules, details, pertinent design data and updated Cost Plan and Project Schedule as required.

4.4 Deliverables

- 4.4.1 Deliverables are similar at the 33%, 66%, and 99% submission stages; completeness of the project development should reflect the stage of a submission.
- 4.4.2 To be included within 99% Submission:
 - 4.4.2.1 Complete specification and working drawings.
 - 4.4.2.2 99% Commissioning plan and Systems Operations manual
 - 4.4.2.3 One copy of site information, soil investigation report, borehole logs, etc.
 - 4.4.2.4 One copy of support data, studies, calculations, etc., required by Engineering disciplines for final checking and record.
 - 4.4.2.5 One copy of updated Cost Plan and Project Schedule
- 4.4.3 Final Submission: This submission incorporates all revisions required by the review of the 99% submission. Provide the following:
 - 4.4.3.1 Provide one (1) complete sealed drawing set in electronic format and native (source) files. Provide up to a maximum of 10 complete printed sets upon request;

- 4.4.3.2 Provide one (1) complete sealed specification set in electronic format and native (source) files. Provide up to a maximum of 10 complete printed sets upon request;
- 4.4.3.3 Class 1 estimate;
- 4.4.3.4 Complete Commissioning Plan;
- 4.4.3.5 Complete Systems Operations Manual;
- 4.4.3.6 As a safeguard against loss or damage to the originals, retain a complete set of drawings in reproducible form and one copy of specification;
- 4.4.3.7 Inspection Authorities Submission; and
- 4.4.3.8 Submit and obtain approval on plans and specifications required by Inspection Authorities before tender call.

RS 5 TENDER CALL, BID EVALUATION & CONSTRUCTION CONTRACT AWARD

5.1 Intent

- 5.1.1 The RPD/SS Consultant shall support the MCM in the tendering, evaluation and award processes, to ensure clarity to potential constructors of the design and specifications, and to assist the MCM in the process resulting in the selection of qualified construction contractor(s).

5.2 Scope and Activities

5.2.1 Tender Call

- 5.2.1.1 The RPD/SS Consultant shall be responsible for the production of the required number of copies of the Tender Documents and for such other documents as are necessary for tender call purposes.

- 5.2.1.2 The RPD/SS Consultant shall:

- 5.2.1.2.1 Prepare, sign, seal and submit complete sets of approved tender-ready, Construction Drawings and Specifications to the Departmental Representative and to the MCM.

- 5.2.1.2.2 Provide the Departmental Representative and MCM with all information required by tenderers to fully interpret the Construction Documents. The Contracting Authority will issue the addenda to all participants.

- 5.2.1.2.3 Provide a presentation, including delivery of associated visual materials (e.g., PowerPoint, etc.), of the finalized detailed design and associated specifications at community meetings, industry information sessions or Bidder conferences/site visits held prior to or during the tendering period (assuming one (1) trip to site with the appropriate Key Disciplines, comprised of a joint site tour including industry and AFN community representatives).

- 5.2.1.2.4 Attend tenderers briefing meeting(s) (i.e. Job Showing), upon request.

- 5.2.1.2.5 Prepare addenda based on questions arising in such meetings for issue by the Contracting Authority. The Contracting Authority will issue the addenda to all participants; and

- 5.2.1.2.6 Procurements tendered by the RPD/SS Consultant should always include an IOC, unless otherwise approved by Canada.

5.2.2 Bid Evaluation and Construction Contract Award

- 5.2.2.1 Provide subject matter expertise, technical review and support in evaluation of submissions received in response to the construction tender. This may include, as a minimum, on such elements as;

- 5.2.2.1.1 The completeness of tender documents in all respects;
 - 5.2.2.1.2 Factual subject matter guidance or opinions of the technical aspects of the tenders;
 - 5.2.2.1.3 Evaluation of submissions against the technical requirements of the tender, including documentation of the same;
 - 5.2.2.1.4 The effect of alternatives and qualifications which may have been included in the tender;
 - 5.2.2.1.5 The tenderers capability to undertake the full scope of work;
 - 5.2.2.1.6 The availability of adequate equipment to carry out the work;
 - 5.2.2.1.7 Examine and report on any cost and schedule impact created by the issue of tender / contract addenda.
- 5.2.2.2 Provide technical review, subject matter expertise and support in drafting of responses to questions received from potential construction Bidders to ensure overall clarity of requirements.
- 5.2.2.3 If the Departmental Representative and/or the MCM decides to re-tender the project, provide advice and assistance to the DR and to the MCM;
- 5.2.2.4 Revise and amend, at your cost, the construction documents to bring the cost of the work within the limits stipulated.

5.3 Deliverables

- 5.3.1 Originals of drawings and specifications;
- 5.3.2 Electronic copies of drawings and specifications;
- 5.3.3 Presentation to potential bidders
- 5.3.4 Addenda where needed;
- 5.3.5 Full notes of all inquiries, and related correspondence, during the bidding period;
- 5.3.6 Changes to the documents, if re-tendering is necessary;
- 5.3.7 Updated cost estimate or schedule;
- 5.3.8 Submission Requirements for Construction Drawings and Specifications;
- 5.3.9 Provide sets of approved Construction Drawings as follows:
 - 5.3.9.1 Provide one (1) complete sealed drawing set in electronic format and native (source) files. Provide up to a maximum of 10 complete printed sets upon request;
- 5.3.10 Provide approved Construction Specifications as follows:
 - 5.3.10.1 Provide one (1) complete sealed specification set in electronic format and native (source) files. Provide up to a maximum of 10 complete printed sets upon request;

- 5.3.11 The electronic true copy of drawings and specifications is for tendering purposes only and is required to be signed and sealed.
- 5.3.12 Electronic Versions of Construction Drawings and Specifications
 - 5.3.12.1 Electronic true copy of the final submission drawings and specifications to be provided using secure file sharing platform acceptable to PSPC and the MCM.
 - 5.3.12.2 The PDF files should to the greatest extent possible be derived from the native software in which they were created and must not have any password protection and printing restrictions.

RS 6 CONSTRUCTION, CONTRACT ADMINISTRATION, POST CONSTRUCTION WARRANTY REVIEW

6.1 Construction and Contract Administration

6.1.1 Construction Schedule

6.1.1.1 As soon as practical after the award of the Construction Contract, request from the MCM an updated and detailed construction schedule for the Task/project;

6.1.1.1.1 Provide results of schedule review to Departmental Representative.

6.1.1.2 Monitor and report the progress of the construction;

6.1.1.3 Notify the Departmental Representative of any known and anticipated delays which may affect the completion date of the Project, and keep accurate Records of the causes of delays.

6.1.1.4 The Departmental Representative shall evaluate all requests from the MCM for time extensions, and shall issue directions to the MCM and the RPD/SS Consultant.

6.1.2 Construction Meetings

6.1.2.1 Attend all construction meetings organized by the MCM;

6.1.2.2 While the MCM will be providing meeting minutes, the RPD/SS consultant should maintain their own notes of the proceedings of such meetings and provide them to the Departmental Representative upon request.

6.1.3 Clarification and Interpretation

6.1.3.1 Provide clarification and interpretation of the construction documents in written or graphic form, to the MCM for the proper execution and progress of the construction as and when necessary

6.1.4 Shop Drawings

6.1.4.1 Specify in the construction documents the shop drawings that are to be submitted by the MCM;

6.1.4.2 Review in a timely manner the shop drawings provided by the MCM to determine conformity with the general concept and intent of the construction documents and indicate to the MCM such conformance with the general concept or lack thereof;

6.1.4.3 Provide one (1) copy when such conformity is confirmed.

6.1.5 Testing and Inspection

6.1.5.1 Recommend the need for, and review, test reports of materials or construction;

6.1.5.2 Recommend quality assurance testing to be undertaken during construction, evaluate the results and advise accordingly;

6.1.5.3 Request the MCM to take remedial action when observed material or construction fails to comply with the requirements of the Construction Contract, and advise accordingly;

6.1.5.4 Specify in the construction documents product and performance testing to be undertaken by the MCM.

6.1.6 Site Visits

6.1.6.1 Make visits to the site to determine, on an adequate sampling basis, whether this work is in conformity with the construction documents;

6.1.6.2 Record and report on the progress, non-conformities and deficiencies observed during each site visit, and provide the MCM (with CC to the Departmental Representative) with written progress reports and lists of deficiencies observed;

6.1.6.3 Recommend the action to be taken; and

6.1.6.4 Strongly encourage that all subconsultants and subcontractors reside at the camp during overnight site visits.

6.1.7 Changes to Construction Contract

6.1.7.1 Submit all requests and recommendations for changes to the Construction Contract and their implications for approval;

6.1.7.2 Obtain quotations from the MCM for contemplated changes, review the prices for acceptability, assess the effect on construction progress, and submit recommendations.

6.1.7.3 The Departmental Representative shall issue Change Orders for all approved changes.

6.1.8 Contractor's Progress Claims

6.1.8.1 Request from the MCM a cost breakdown of the Construction Contract Award Price in detail appropriate to the size and complexity of the Project, or as may otherwise be specified in the Construction Contract, and submit the cost breakdown prior to the Contractor's first progress claim;

6.1.8.2 Examine progress claims in a timely manner and, if acceptable, certify the progress claims for work completed and materials delivered pursuant to the Construction Contract, and submit for approval and processing; and

6.1.8.3 If the construction is based on unit prices, measure and record the quantities of labour, materials and equipment involved for the purpose of certifying progress claims.

6.1.9 Interim Completion of the Project

6.1.9.1 Review the construction with the Departmental Representative and the MCM, and record all unacceptable and incomplete work detected;

6.1.9.2 Request, review for completeness and adequacy and submit all operation and maintenance manuals or items to be provided by the MCM, in accordance with the Construction Contract;

6.1.9.3 Prepare and submit for approval, and as a basis for payment to the MCM, an Interim Certificate of Completion as required by the Construction Contract, together with supporting documents properly signed and certified.

6.1.10 As-built and Record Drawings

6.1.10.1 Before issuance of the Final Certificate of Completion:

6.1.10.1.1 Provide one (1) complete electronic set, native (source) files, and one (1) complete printed set of record drawings in Arch D size. Electronic set and native files to be provided using secure file sharing platform acceptable to PSPC;

6.1.10.1.2 Verify that record drawings incorporate all recorded changes to the original working drawings based on as-built prints, drawings and other information provided by the MCM, together with change orders and site instructions;

6.1.10.1.3 Verify that record drawings are labelled "Record", dated and signed by the RPD/SS Consultant;

6.1.10.1.4 Provide one (1) complete marked-up electronic specification set, and native (source) files. Electronic set and native files to be provided using secure file sharing platform acceptable to PSPC.

6.1.11 Final Completion of the Project

6.1.11.1 Advise when the construction has been completed in general conformity with the Construction Contract;

6.1.11.2 Make a final review of the construction with the Departmental Representative and the MCM and, if satisfactory, prepare and submit for approval and final payment to the MCM, a Final Certificate of Completion as required by the Construction Contract, together with supporting documents properly signed and certified, including manufacturer's and supplier's warranties.

6.2 Post-Construction Warranty Review

6.2.1 If requested, review any defects during the Contractor's warranty period;

6.2.2 30 days prior to the expiry of any warranty period, visit the site, and record any defects observed or reported;

6.2.3 At the end of any warranty period, carry out a final review of the Project and report the status of defects. If the Departmental Representative accepts the rectification of the defects, a notice of "Final Warranty Inspection" shall be issued to the MCM.

RS 7 COMMISSIONING, WHERE RPD/SS AS COMMISSIONING AUTHORITY

7.1 Intent

- 7.1.1 The RPD/SS Consultant shall provide the commissioning services and act as the designated Commissioning Authority (CxA) to verify that the department's functional requirements are correctly interpreted during the design stage, and that the building systems operate consistently at the peak efficiencies, under all normal load conditions, and within the specified energy budget.
- 7.1.2 The RPD/SS may be requested to engage a third-party CxA to commission a facility and/or building envelope, and such request will be described in the applicable Task Authorization.
- 7.1.3 The RPD/SS may be asked to act as the Commissioning Authority for works or facilities designed by others, and such request will be described in the applicable Task Authorization.

7.2 Design Phase – CxA Scope

- 7.2.1 The CxA shall plan a site meeting or meetings in order to become completely familiar with the SoW of the project, the layout of the complex and the buildings and systems within the complex. The CxA will coordinate this meeting(s) with the designer, Departmental Representative, and MCM.
- 7.2.2 The CxA will establish and document the project requirements for system function, performance, acceptance criteria and maintainability. The CxA will verify and document compliance with these criteria throughout the design, construction and start-up phases and during the first year of operation. It is expected that the CxA will update the project requirements as design develops and if changes occur during the life of the project.
- 7.2.3 Assemble commissioning team, develop an agenda, hold a scoping meeting and identify / clarify responsibilities. Develop a draft design-phase commissioning plan.
- 7.2.4 Coordinate and or attend commissioning meetings with the project team at regular intervals as design progresses. The frequency of the meetings will be as described in a Task Authorization.
- 7.2.5 Develop full commissioning specifications for all systems to be commissioned (systems to be listed in the Commissioning Plan). Coordinate with design consultants to ensure commissioning specifications are integrated in the design specification. The commissioning specifications will include but not be limited to:
 - 7.2.5.1 a detailed description of the responsibilities of all parties including, as applicable, those of the designer, the MCM, the MCM's CxA representative, contractors, suppliers etc. for all stages of the commissioning process;
 - 7.2.5.2 details of the commissioning process and requirements including differences between static, startup, functional performance testing and functional testing of integrated systems;
 - 7.2.5.3 reporting and documentation requirements, including formats;

- 7.2.5.4 alerts to coordination issues;
 - 7.2.5.5 deficiency resolution;
 - 7.2.5.6 construction checklist and startup requirements;
 - 7.2.5.7 the functional testing process;
 - 7.2.5.8 specific functional test requirements including testing conditions and acceptance criteria for each piece of equipment being commissioned.
- 7.2.6 Coordinate a commissioning meeting where the project team, the engineering design team and the Commissioning Manager meet to discuss integration issues between equipment, systems and controls to ensure that all responsibilities, including those of the suppliers, are clearly described in the specifications.
- 7.2.7 Review and provide comment on the 99% and Final Tender design submissions.
- 7.2.8 Provide Checklists and Test Procedures. Plan and prepare preliminary checklists (static, start-up, functional and integrated), and procedures.

7.3 Tendering Phase

- 7.3.1 Attend Meeting(s) upon request and prepare and present an overview of the Preliminary Commissioning Plan, commissioning specifications and contractor's responsibilities as outlined in the plan and specifications.
- 7.3.2 Upon request, provide advice and recommendations to the Departmental Representative and/or MCM regarding enquiries or tenders received.

7.4 Pre-Construction and Construction Phase

- 7.4.1 Requirements:
 - 7.4.1.1 Implement the Commissioning Plan.
 - 7.4.1.2 Integrate Commissioning Activities into Project Schedule. At the earliest possible stage, the commissioning activities will be integrated into the project's schedule.
 - 7.4.1.3 Hold Construction Phase Commissioning Kickoff and Progress Meetings. At the earliest practical point, plan and hold a kickoff meeting to review the Commissioning Plan and contractor requirements / expectations. Regular commissioning meetings will be scheduled and when possible, will coincide with regular project meetings.
 - 7.4.1.4 Review MCM/contractor submissions and shop drawings and provide comment / reports.
 - 7.4.1.5 Regular updates of the project requirements document will be done to reflect decisions and changes made during the design and construction phases.
 - 7.4.1.6 Perform and document commissioning activities at all appropriate stages of the construction process. Verify, participate in, and document static verification, start-up, functional and performance and integrated testing. The

activities will be recorded and will be as per the checklists and test procedures provided in the design stage.

- 7.4.1.7 Prepare and update the Issues Log. An Issues Log will be provided and will be kept up-to-date as problems are identified and resolved. Every effort will be made to resolve issues early and quickly in order to keep the list of unresolved issues short.
- 7.4.1.8 Participate in training. Attend and assist in the training of operations and maintenance staff and insure that training is provided as per the specification documents.
- 7.4.1.9 Assemble system manuals. Assemble contractor and supplier product information and maintenance requirements into an agreed-to, and organized format. The format will be electronic with paper backup. The required format of the contractor and supplier Submittals will have been defined in the design stage.
- 7.4.1.10 Prepare commissioning reports. Commissioning reports will be provided at regular intervals outlining activities and decisions made during the construction phase.
- 7.4.1.11 Update the Commissioning Plan. The commissioning plan will be reviewed and updated as required to insure it remains accurate and that activities planned for the Occupancy and Operations phase are current.

7.5 Occupancy and Operations Phase

As noted in project description due to the long span of this project some areas of the FMC will be in the post-construction Phase while others may be in the Construction Phase. This may necessitate recommissioning of systems previously commissioned but not completed due to other stages of the project having an effect on previous stages. Note that this section includes responsibilities of the CxA related to warranties.

- 7.5.1 Resolve outstanding commissioning issues. As noted in RS 7.4.1.7 above, every effort will have been made to resolve all issues noted in the Issues Log during the Construction Phase. Any items still outstanding will be resolved at this time.
- 7.5.2 Perform Seasonal and Deferred Testing. Any commissioning activities that could not have been carried out before substantial completion will be completed at this time. This will also include testing that can only be carried out in an operational environment and applicable season. Participation by the contractors and suppliers will have been defined during the design stage and will have been included in the specifications.
- 7.5.3 Perform a Post Construction Warranty Review. Conduct a 10-month warranty inspection to insure that all systems are operating as expected before the end of the warranty period.

7.6 Building envelope commissioning

- 7.6.1 The principal objective of commissioning the building envelope is to provide documented confirmation that the building envelope components are performing as

they are intentioned in the design construction documents, in accordance with the CSA Z320 Standard and as defined in this section.

- 7.6.2 The CxA will plan, manage, perform and provide written reports on the commissioning activities according to the project schedule. It is extremely important that all commissioning tasks be conducted in a transparent manner and involve the project Architect, the Contractor, all Sub- Trades, Owner's representatives and other related stakeholders as necessary.
- 7.6.3 The CxA will be involved at all stages of the project through the end of construction and warranty period.
- 7.6.4 The Building Envelope CxA shall be a third-party, fully independent firm not associated with any other part of the design and project construction. The CxA must be accredited for the specific required tests and services with valid certification from:
 - 7.6.4.1 Standard Council of Canada (SCC)
 - 7.6.4.2 CSA International
 - 7.6.4.3 National Fenestration Rating Council (NFRC)
 - 7.6.4.4 American Architectural Manufacturers Association (AAMA)
 - 7.6.4.5 American Society of Nondestructive Testing (ASNT) Level I competency for staff operating thermographic camera and Level II competency for staff preparing thermographic reporting.
- 7.6.5 The Building Envelope CxA must also provide references attesting to their relevant experience on at least three (3) projects of scope and size similar to the contemplated project within the past five (5) years.
- 7.6.6 Requirements
 - 7.6.6.1 Assist Design Team with determination of appropriate thermal performance and condensation resistance, as well as performance levels and test pressures for evaluation of air leakage and water penetration control.
 - 7.6.6.2 Perform peer review of envelope component design & detail documentation including:
 - 7.6.6.2.1 Drawings prepared by the Design Team, at 66% and 99% completion stages.
 - 7.6.6.2.2 Specifications prepared by the Design Team, at 66% and 99% completion stages.
 - 7.6.6.2.3 Shop drawing submittals following approval by Design Team for layout and overall conformance to design concept.
 - 7.6.6.3 Perform laboratory performance testing of a full-scale mock-up of the exterior wall systems (as must be defined in the Design Documents) to validate the proposed materials, assemblies and installation techniques. To demonstrate the performance of the mock-up, undertake the following sequence of tests:
 - 7.6.6.3.1 Air Infiltration/Exfiltration (ASTM E283)

- 7.6.6.3.2 Water Penetration – Static Method (ASTM E331)
- 7.6.6.3.3 Water Penetration – Dynamic Method (AAMA 501.1)
- 7.6.6.3.4 Uniform Load Deflection at Design Pressure (ASTM E330)
- 7.6.6.3.5 Repeat Air Infiltration/Exfiltration
- 7.6.6.3.6 Repeat Water Penetration – Static Method
- 7.6.6.3.7 Repeat Water Penetration – Dynamic Method
- 7.6.6.3.8 Interstory Horizontal movement (AAMA 501.4)
- 7.6.6.3.9 Repeat Air Infiltration/Exfiltration
- 7.6.6.3.10 Repeat Water Penetration – Static Method
- 7.6.6.3.11 Repeat Water Penetration – Dynamic Method
- 7.6.6.3.12 Interstory Vertical movement (AAMA 501.7)
- 7.6.6.3.13 Repeat Air Infiltration/Exfiltration
- 7.6.6.3.14 Repeat Water Penetration – Static Method
- 7.6.6.3.15 Repeat Water Penetration – Dynamic Method
- 7.6.6.3.16 Thermal Cycling (AAMA 501.5)
- 7.6.6.3.17 Condensation Resistance (AAMA 1503/CSA A440)
- 7.6.6.3.18 Repeat Air Infiltration
- 7.6.6.3.19 Repeat Water Penetration – Static Method
- 7.6.6.3.20 Repeat Water Penetration – Dynamic Method
- 7.6.6.3.21 Interstory Horizontal Ultimate Displacement Test (AAMA 501.4)
- 7.6.6.3.22 Uniform Structural Overload at 150% Design Pressure (ASTM E330)
- 7.6.6.4 Chair on-site pre-installation meetings with each of the primary building envelope sub-trades to review key characteristics of envelope, key factors governing performance as revealed by laboratory testing program and to outline commissioning activity to be undertaken during construction.
- 7.6.6.5 Witness installation of on-site mock-ups of each of the primary building envelope assemblies, and provide report of observations.
- 7.6.6.6 Perform on-site performance testing to include evaluation of each principal building envelope assembly and one sample of each juncture between principal envelope assemblies (as must be defined in the Design Documents), including the following sequence of tests:
 - 7.6.6.6.1 Qualitative Air Leakage (ASTM E1186) using artificial fog as tracer.
 - 7.6.6.6.2 Quantitative Air Leakage (ASTM E783)
 - 7.6.6.6.3 Resistance to Water Penetration – Dynamic Method (AAMA 501.1) provided testing can be conducted at a height less than 15 m, otherwise Static Method (ASTM E1105)

- 7.6.6.7 Perform periodic, on-site review of building envelope construction to supplement Design Team review. Undertake two (2) visits per week of construction activity to sample for conformance to contract documents. Prepare weekly reports to summarize observations made and to confirm recommendations regarding necessary remedial work or modification of construction practices.
- 7.6.6.8 Conduct an Infrared Thermographic Survey of Vertical Envelope (ASTM C1060 and E1186):
 - 7.6.6.8.1 Undertake when full envelope enclosure is completed and building HVAC system has been commissioned.
 - 7.6.6.8.2 Include all areas of each building elevation that can be scanned from ground level.
 - 7.6.6.8.3 Conduct and record one full scan when building is intentionally positively pressurized and a second full scan when building is intentionally negatively pressurized.

RS 8 COMMISSIONING, WHERE RPD/SS SUPPORTS INDEPENDENT COMMISSIONING AUTHORITY

8.1 Intent

- 8.1.1 In instances where Canada chooses to engage an independent third-party Commissioning Authority (CxA) to commission works designed by the RPD/SS Consultant, the RPD/SS Consultant shall support commissioning authorities as described in this RS section, and as elaborated in a Task Authorization.

8.2 Scope and Activities

- 8.2.1 The RPD/SS Consultant shall provide technical expertise and quality assurance support to Canada, the MCM/Care & Maintenance and CxA during all commissioning and start-up activities including (but not limited to):
 - 8.2.1.1 Provide and install control (PLCs, HMIs, DCS and local controllers) programs prior to commissioning.
 - 8.2.1.2 Perform necessary and required inspections to ensure that completed installations are in accordance with the latest engineering and design information and specifications.
 - 8.2.1.3 Verify that all electrical wiring is installed and terminated in accordance with design documents prior to commissioning.
 - 8.2.1.4 Verify that all mechanical equipment and piping are installed in accordance with design documents and manufacturers specifications prior to commissioning.
 - 8.2.1.5 Verify that all instrumentation devices are installed and calibrated in accordance with design documents prior to commissioning.
- 8.2.2 The RPD/SS Consultant shall provide technical expertise and quality assurance support during start-up of operations, initial turn-over training and in completion of the warranty period to support assurance of that operational and performance requirements are met.
- 8.2.3 The RPD/SS Consultant shall participate in regular project meetings (assuming every week) to report on status, issues and resolutions, in accordance with the schedule established by the MCM and CxA.
- 8.2.4 The RPD/SS Consultant will:
 - 8.2.4.1 Review Commissioning Plan(s) produced by the CxA.
 - 8.2.4.2 Assist in preparation and implementation of quality management processes for on-going operations.
 - 8.2.4.3 Review and verify the contents of operation and maintenance manuals, including standard operating procedures, for compliance to requirements and support assurance that operating personnel have all information required to understand and optimally operate the facility's systems.

- 8.2.4.4 Review As-Built Drawings prepared by the MCM/construction contractor to verify accuracy.
- 8.2.4.5 Provide signed and sealed Record Drawings and ensuring their accuracy.
- 8.2.4.6 Review functional and performance test routines developed by the CxA and MCM. Participate in selected systems and functional and performance tests.
- 8.2.4.7 Provide technical guidance and assistance to the CxA in the preparation and conduct of initial training sessions for operational personnel to support ensuring proper operation and maintenance of the facility's systems, integrations, and infrastructure to meet compliance and performance requirements. Participate in training sessions.
- 8.2.4.8 Review and evaluate established quality assurance programs to support assurance of adequacy for operations. Provide support to the Project in review of Project and/or independent assessment of readiness for turnover and operations start-up, including as required assistance in documentation of quality issues, non-conformances or deficiency reports and the status of their resolution, and verification that drawings and operational documentation has been approved and released.
- 8.2.4.9 Review oversight plan or strategy for the start-up of operations, to be prepared by the CxA, which will include on site presence and support to initial commissioning and start-up (assuming four (4) weeks) .
- 8.2.4.10 Recommend interim acceptance of the facility to Canada.
- 8.2.4.11 Provide input to the CxA in preparation of a Final Commissioning Evaluation Report.
- 8.2.4.12 Support the conduct of warranty period inspections, including providing ad hoc on-site support to troubleshoot and resolve issues (assuming 4 ad hoc visits), two (2) detailed inspections each with 2-3 days on site during the 12 month warranty period, and a final warranty inspection to assist in verifying achievement of the requirements for Final Completion prior to the end of the warranty period. This should assume 2 days per Key Discipline.
- 8.2.4.13 Summarize observations and results of all inspections in narrative format and assist in responding to questions on the same.
- 8.2.4.14 Support ensuring the establishment, implementation and documentation of formal quality control procedures, including timely quality problem identification, reporting, assessment, correction and documentation processes.
- 8.2.4.15 Following Final Completion participate in a Technical Lessons Learned session led by the MCM to evaluate successes, issues, changes associated with the work package, including review and confirmation of any associated lessons learned report.

RS 9 RISK MANAGEMENT

9.1 Intent

- 9.1.1 The RPD/SS Consultant is to provide support to the Departmental Representative in identifying risks throughout the project life cycle.

9.2 Scope and Activities

- 9.2.1 Identify risk events based on past experience and using proposed checklist or other available lists;
- 9.2.2 Qualify/quantify probability of risk event (Low, Medium, High) and their impact (Low, Medium, High);
- 9.2.3 Prioritize risk events (i.e. concentrate efforts on risk events with High probability and Medium to High impact);
- 9.2.4 Develop risk response (i.e. evaluate alternatives for mitigation. This is the real added-value of risk management); and
- 9.2.5 Implement risk mitigation.

9.3 Deliverables

- 9.3.1 Prepare Risk Management Reports at Design Development, 66% Design Documents, and 100% Design Documents stages;
- 9.3.2 Include input from all sub-consultants, and from Client;
- 9.3.3 Take steps to implement risk mitigation. This includes as a minimum further recommendations, analysis, investigations, site meetings and site supervision.

RS 10 TECHNICAL / PEER REVIEW

10.1 Intent

- 10.1.1 To provide technical insight on previously completed investigations and recommendations.

10.2 Scope and Activities

- 10.2.1 The RPD/SS Consultant shall conduct an independent desktop technical review of work completed by others, including PSPC staff and other consultants.
- 10.2.2 An investigation may be requested or required to review or verify the work of others, with additional details and requirements provided in each call-up.

10.3 Deliverables

- 10.3.1 Technical review results shall be summarized in technical memorandum or report format.

RS 11 PROJECT TEAM COORDINATION / LIAISON

11.1 Intent

- 11.1.1 To provide coordination, communication, and engagement between the RPD/SS consultant and other consultants working on the project (such as the regulatory services consultant, environmental monitoring consultant, geotechnical consultant, and Permanent Water Treatment Plant design consultant).
- 11.1.2 Act as a technical translator and assist with collaboration, obtaining approvals, and task sequencing. This role would also liaise with Canada's technical team and the MCM.

11.2 Scope and Activities

- 11.2.1 Provide input to the Departmental Representative on task sequencing for the overall project, or portions thereof, in relation to site investigations, design, regulatory approvals, and construction. Provide recommendations in written format (email, memorandum, report) upon request, as specified in a Task Authorization.
- 11.2.2 Organize and chair Project Team meetings as requested by the Departmental Representative, with the frequency to be described in a Task Authorization. Prepare presentation material such as visual aids upon request. The attendees of each meeting will depend on the subject and will be provided by the DR.
- 11.2.3 Facilitate discussions between the Project Team as based upon the meeting agenda.

11.3 Deliverables

- 11.3.1 Circulate meeting minutes for Project Team review. Revise and finalize as required.

RS 12 ESTIMATING AND COST PLANNING

12.1 Intent

- 12.1.1 To assist in the accomplishment of project cost objectives. It is a continuous and interactive process involving planning, action, measurement, evaluation and revision.
- 12.1.2 To provide varying classes of total cost of the project, based on the user's functional requirements to the degree known at the time. It is based on historical cost data for similar work, suitably adjusted for such factors as: effect of inflation, location, risk, quality, size and time. All related factors affecting cost are considered to the extent possible.
- 12.1.3 This estimate may be used to establish the indicative estimate required by Treasury Board for Preliminary Project Approval.

12.2 Scope of Services

- 12.2.1 Provide an interactive and continuous cost consulting service from the commencement of project design through to construction completion and subsequent evaluation, including the preparation of complete estimates for all construction trades, escalation, inflation and contingency costs, as noted in the previous RS sections.
- 12.2.2 Provide a cost advising, and cost monitoring / reporting service.
- 12.2.3 Attend all relevant project and production meetings throughout the design phases and be prepared to present and defend the estimates directly to the Departmental Representative.

12.3 Classes of Estimates

- 12.3.1 Apply these estimate classifications at the project stages as detailed at Annex 7.2 and defined herein:
- 12.3.2 CLASS 4 (INDICATIVE) ESTIMATE
 - 12.3.2.1 Based upon a comprehensive statement of requirements and an outline of potential solutions, this estimate is to provide an indication of the final project cost, and allow for ranking of all the options being considered.
 - 12.3.2.2 Submit Class 4 cost estimates in elemental analysis format.
 - 12.3.2.3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.
 - 12.3.2.4 The level of accuracy of a Class 4 cost estimate will be such that no more than a 20% design contingency allowance is required.
- 12.3.3 CLASS 3 ESTIMATE
 - 12.3.3.1 Based on a comprehensive list of requirements and assumptions, including a full description of the preferred Schematic Design option, construction experience, design experience and market conditions, this estimate must be sufficient for making the correct investment decision.

12.3.3.2 Submit Class 3 cost estimates in elemental analysis format.

12.3.3.3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

12.3.3.4 The level of accuracy of a Class 3 cost estimate will be such that no more than a 15% design contingency allowance is required.

12.3.4 CLASS 2 (SUBSTANTIVE) ESTIMATE

12.3.4.1 Based on design development drawings and outline specifications, which include the preliminary design of all major systems and subsystems, as well as the results of all site/installation investigations, this estimate must provide for the establishment of realistic cost objectives and be sufficient to obtain effective project approval.

12.3.4.2 Submit Class 2 cost estimates in both elemental analysis format and trade divisional format.

12.3.4.3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

12.3.4.4 The level of accuracy of a Class 2 cost estimate will be such that no more than a 10% design contingency allowance is required.

12.3.5 CLASS 1 (PRE-TENDER) ESTIMATE

12.3.5.1 Based on completed construction drawings and specifications prepared prior to calling competitive tenders, this estimate must be sufficient to allow a detailed reconciliation and/or negotiation with any contractor's tender.

12.3.5.2 Submit Class 1 cost estimates in both elemental analysis format and trade divisional format.

12.3.5.3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

12.3.5.4 The level of accuracy of a Class 1 cost estimate will be such that no more than a 5% design contingency allowance is required.

12.4 Cost Estimate and Planning Report

12.4.1 Provide continuous cost monitoring, timely identification and early warning of all changes that affect or potentially affect the estimated construction costs of the project.

12.4.2 If the estimate falls short of or exceeds the Construction Cost Limit due to such changes, the RPD/SS Consultant shall fully advise the Departmental Representative and propose alternative design solutions.

12.4.3 Cost Estimating - Develop cost estimates of projects:

12.4.3.1 Prepare order of magnitude Class 4 cost estimates; and further develops the cost estimate to level Class 1 (ready for tender).

12.4.3.2 Quantify design and construction costs, contingencies and risks;

- 12.4.3.3 Prepare and investigate costing alternatives to assist in the identification of the most cost-effective design and/or construction approach; Investigate and report on life-cycle costs;
- 12.4.3.4 Document all unit pricing, analysis, and valuation.
- 12.4.4 Cost Planning - Specific tasks include as a minimum:
 - 12.4.4.1 Prepare cost plans from project briefs, preliminary concepts or other preliminary information;
 - 12.4.4.2 Prepare cost analysis;
 - 12.4.4.3 Prepare option analysis and "what if" scenarios;
 - 12.4.4.4 Provide advice and recommendations on project planning in order to achieve the most cost effective project sequence;
 - 12.4.4.5 Identify and quantify potential risks and make contingency recommendations in order to minimize negative cost impacts;
 - 12.4.4.6 Advise on alternative procurement and construction strategies to create efficiencies wherever possible;
 - 12.4.4.7 Identify, forecast and analyze project-related issues including possible market shortages and potential price fluctuations.
- 12.4.5 A Cost Estimate and Planning Report will include sufficient description and cost detail to clearly identify:
 - 12.4.5.1 Scope Change: Identifying the nature, reason and total cost impact of all identified and potential project scope changes affecting Construction Cost Estimate;
 - 12.4.5.2 Cost Overruns and Under runs: Identifying the nature, the reason and the total cost impact of all identified and potential cost variations;
 - 12.4.5.3 Options Enabling a return to the Construction Cost Estimate: Identifying the nature and potential cost effects of all identified options proposed, in order to return the project within the Construction Cost Estimate.

12.5 Responsibilities

- 12.5.1 The RPD/SS Consultant must review their own work on a continuing basis to determine the validity and completeness of the information provided.
- 12.5.2 In the event areas of concern are identified, including errors and omissions as well as areas of inadequate detail or areas that require further explanation, the RPD/SS Consultant shall re-examine the estimates provided and make such revisions required and / or provide ample acceptable evidence that such corrections or amendments are unnecessary.

12.6 No Action Abrogates Consultant's Responsibilities

- 12.6.1 No acceptance or approval by PSPC, whether expressed or implied, shall be deemed to relieve the Cost Specialist, or the RPD/SS Consultant, of professional or technical responsibility for the estimates and cost reports.
- 12.6.2 Neither does acceptance of an estimate by PSPC in any way abolish the RPD/SS Consultant's responsibility to maintain the specified Construction Cost Limit throughout the life of the project, or the requirement to redesign should the lowest acceptable bid differ significantly from the agreed Construction Cost Plan, unless and until the Departmental Representative indicates otherwise in writing.

12.7 Deliverables

- 12.7.1 Cost Planning:
 - 12.7.1.1 Cost plans;
 - 12.7.1.2 Cost analyses and "what if" scenarios;
 - 12.7.1.3 Cash flows; and / or
 - 12.7.1.4 Reports on alternative procurement and construction strategies or other project-related issues.
- 12.7.2 Cost Estimating:
 - 12.7.2.1 Fully detailed cost estimate. Order of magnitude Class 4 accuracy; and further develops the cost estimate to Class 1 (ready for tender).
 - 12.7.2.2 Documentation of the methodology of the estimate and any assumptions made;
 - 12.7.2.3 Documentation of all pricing and valuation calculations;
 - 12.7.2.4 Reports on investigation of costing alternatives; and / or
 - 12.7.2.5 Reports on life-cycle costs.