

# Conformity Determination Report - Explor (For Discussion Only)

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**Applicant:** Explor Data Ltd

**Application #:** S05B-011

**Project Name:** Type A Land Use Permit for a 2D Seismic Program, Deline District

**WORKSHOP NOTE:** This application was chosen for its land use and location within the Deline District as a test case for the current drafting of the Sahtu Land Use Plan. The Sahtu Land Use Plan is not currently in effect and applications are not required to conform at this time. This application is 6 years old and was developed with the Preliminary Draft and different regulatory expectations as a guide. It is therefore unlikely to conform to the current draft. Findings of non-conformity in this report are intended as discussion tools only to illustrate where changes in process may be needed post-plan approval. They are not intended to reflect the quality of the applications themselves.

## Overall Questions / Comments

- Ignoring dates and completing this report as if it was an application submitted following plan approval
- Focusing on CRs specific to Great Bear Lake Watershed [other zones not given comprehensive analysis]
- In some cases, where the application doesn't conform as submitted (e.g. CR #4), conformity may be achieved by either having the applicant submit more information (assuming it was just an information gap and not a gap in process), or in some cases by the regulator attaching a condition to the authorization to ensure that the activity is carried out in conformity with the Plan. It is the regulator who has final responsibility to ensure that the activity is carried out in conformity with the Plan, not the proponent.
- The use of "Implementation Requirements" is fluid, depending on the type of land use and commitments made by the proponent. There are a few CRs that definitely require implementation by the regulator rather than the proponent (e.g. application of security in CR 13, reporting provisions in CR 6). For other CRs, Implementation Requirements can be used to achieve conformity where an application does not clearly demonstrate adherence.
- In future, would break "Analysis" section of these reports down into "Relevant impacts and mitigation measures", and "Analysis" to distinguish between proponent descriptions/determinations, and those of the conformity determiner.
- Finding that the Special Management Conditions (either CR #2 or #16) overlap to a large extent with all of the other CRs, except that in some cases they provide more specific geographical application of values. CR #3 - Site-Specific Monitoring still sets a higher requirement over and above general conditions. Area for discussion.

## Existing Use Exemption:

- No, not related to an exploration licence.
- [Application mentions National Energy Board Operating Licence but assume that that is like a business licence and doesn't grant any rights to explore in the area.]

## Overall Conformity Determination: DOES NOT CONFORM

- The activity as proposed does not conform to the following CRs:
  - CRs #1, 3, 4, 10, 16
- The activity as proposed conforms to the following CRs, subject to the further Implementation Requirements identified for each. Failure or inability to adhere to the identified Implementation Requirements for each means the activity does not conform and cannot be authorized:
  - CRs #6, 7, 8, 11, 12, 13
- The activity conforms as proposed to the following CRs:
  - CRs #5, 9, 14
- The following CRs are not applicable to this activity:
  - CRs #2, 15, 17, 18, 19, 20

## Project Description:

Explor Data Ltd, is planning to conduct a 2D seismic program in the Deline District during the winter of 2005-2006 with the intent that any unrecorded portions of the program will be obtained in future years. The program consists of nineteen seismic lines totaling 614.08 km. Explor will utilize the Tulita to Deline Winter Road and, where possible, existing cutlines to access the proposed seismic lines. Shoreline access will be utilized from Deline.

It is anticipated that the project will take approximately 107 days from start to completion. Access construction is planned to begin in December 2005. Recording will likely start in the southern part of the program area and proceed north, with project completion by March 31, 2006.

The seismic program consists of nineteen 2D seismic lines totaling 614.08 km with the following components:

- Opening the Tulita to Deline winter road to the standard required by seismic equipment and supply vehicles;
- Opening 72.83km of winter access between seismic lines using existing cutlines wherever possible;
- Construction of watercourse crossings along the access;
- Operation of a portable 30-person sleigh camp to accommodate the advance crew;
- Surveying & clearing 8m wide source lines;
- Use of tracked seismic vibrators as an energy source;
- Truck, helicopter and/or fixed wing transport of crew, supplies, equipment and fuel between Norman Wells, Tulita, and Deline and the program area;
- Clearing of airstrips on 2 lakes (or more if necessary) which are greater than 600m in length;

- Operation of a 49-person sleigh camp to accommodate the recording crew;
- Layout and recording of seismic data primarily using tracked vehicles but also on foot, snowmobile, and with the assistance of helicopters;
- Demobilization of equipment;
- Waste management; and
- Decommissioning/reclamation of cut lines and access as required.
- Shoreline access will be used from Deline to KA-08, and the west ends of KA-02, and KA-04. It may also be used between the north ends of SA-06, SA-12, and SA-09

The Sahtu-2006 Seismic Program is being proposed by Explor as one component of a larger seismic program in the Sahtu Region.

## CR #1 – Zoning

### Zones Impacted:

- Whitefish River Conservation Zone (fuel caches, 2 airstrips, some seismic)
- Great Bear Lake Watershed SMZ (fuel caches, seismic lines, 2 airstrips)
- Great Bear River SMZ (seismic)
- General Use Zone (seismic)
- ?ehdacho (For information only: as an established National Historic Site, this area is no longer subject to the Plan; appears to have an airstrip in its borders)

### Conformity Determination: **Does not conform**

### Analysis:

- Oil and gas exploration activities such as seismic are not permitted in Conservation Zones
- Activities are permitted in the Special Management and General Use Zones subject to conformity with the other conditions in the Plan

**Question/Discussion:** None

## CR #2 – Protection of Special Values

- Not Applicable within GBLW SMZ, see CR #16 instead
- Applicable to small portion of seismic crossing the Great Bear River SMZ but focusing on Great Bear Lake Watershed for this application so skipping this one. In a real conformity determination, this CR would apply to the Great Bear River SMZ, while CR #16 would apply to the GBLW SMZ.

## CR #3 – Project-Specific Monitoring

**Values to be protected:** [Focusing on Great Bear Lake SMZ only here, but otherwise would do the same for the Great Bear River SMZ and Whitefish River CZ]

Great Bear Lake Watershed (included only those within the area of activities and broader ecosystem values that occur throughout):

- The Great Bear Lake Watershed is the foundation of Sahtugot'ine cosmology, history and traditional law, of the transmission of the culture from Elders to the younger generation, and of Deline's renewable resource economy. The watershed, land and home of the people of Deline must be kept healthy.
- Specific values of management concern include:
  - Aquatic Ecosystem: Low water replacement rate, very little stratification, low productivity, simple food web make it vulnerable to disturbance activities and slow to recover
  - Lake Trout: Wide diversity of morphotypes of lake trout – one of the last Great Lakes with good genetic diversity
  - Winter Habitat for Bluenose East and Bluenose West, boreal woodland caribou, moose, furbearers (IWA for marten) and waterfowl
  - Subsistence fishery, primarily for lake trout, lake cisco and whitefish
  - Special Harvesting Areas for fish, moose and birds
  - Important harvesting and traditional use area, with many trails and legends
  - Several places identified as Heritage Sites in Places We Take Care Of: Saoyu-?ehdacho, Whitefish River

**Conformity Determination: Does not conform**

**Criteria:**

- "sufficient to monitor effectiveness of proposed mitigation measures in protecting zone values and impacts to those values"
- Expect to see evidence of a monitoring program in place to ensure that the activity is not affecting the key values within SMZ
- Requires assessment of potential for impact. Where little to no impact is anticipated, monitoring may also be minimal.

**Analysis:**

- Use of wildlife/environmental monitors will monitor for potential immediate impacts to wildlife species of concern
- Given frozen conditions and minimal activity on the lake beyond possible shoreline access, little to no impacts anticipated for GBL aquatic ecosystem or lake trout
- Assured that no activity will take place within ?ehdacho
- No monitoring of water withdrawal amounts, or longer term impacts on fish and wildlife in the area associated with extensive stream crossings and access created by seismic program.
- No real commitment to any kind of monitoring of the social or ecological values in the region (including those in the Whitefish River Conservation Zone), no apparent discussion of monitoring with communities

**Questions/Discussion:** None

**Implementation Requirements:** None

## CR #4 – Community Engagement and Traditional Knowledge

### Conformity Determination: **Does not conform**

#### Criteria:

- Looking for evidence of consultations with affected communities (land corps, band, RRC, public) on activities, concerns and TK
- In the future, will be looking for specific discussion on CRs that rely on community input to be fulfilled
- Looking for demonstration of how this information was considered and used in project design

#### Analysis:

- Consultations with Deline took place since Aug 2005, and earlier consultations in 2004 regarding Explor's TD-1 seismic line acquired along the Tulita-Deline winter road the previous winter
- Presented and discussed project with elected representatives of Deline – discussed project components, goods and service requirements and employment opportunities.
- Public consultation on Oct 11/05 – questions on energy source and its effects, locations of camps and lines, equipment, spills, bid processes, wildlife and impact mitigation.
- TK Workshop carried out Nov 23/04, (but mostly around Tulita-Deline winter road) identified important wildlife in the area, vegetation, hunting areas, location of Bluenose East caribou herd in the area during operating season, travel routes in the area, recreational and cultural sites, and types of use on winter road. The TK study does not appear to cover the area in which seismic operations will be focused, only the Tulita-Deline winter road.
- A TK Project was conducted in the study area in 2005. A report and maps were submitted to Explor and Explor have been considered by Explor in planning the project but will not be made public to protect confidentiality. The summary identified a list of possible impacts to wildlife and traditional use, sites to be avoided and recommendations on how to carry out the work to address some of these issues.
  - While some are addressed through general mitigation measures proposed, many do not appear to have been considered. There is no evidence to say if/how the others were considered or addressed.

#### Questions/Discussion:

- Fails to demonstrate how community concerns and TK were considered.

#### Implementation Requirements:

- Conformity could be achieved by the proponent providing additional information (if it's only an information gap), or by regulators attaching appropriate conditions to ensure that the activity is designed and carried out with due regard for community concerns (as described in the summary of TK study in EPP) and well-being.

## CR #5 – Community Benefits

### Conformity Determination: Conforms

**Criteria:**

- Looking for a summary of community benefits or public interest benefits in the application
- ABAs or an INAC Benefits Agreement would fulfill this CR where they are required

**Analysis:**

- Access and benefits agreement signed
- TK study done
- Local businesses and personnel to be used wherever possible
- Access into the area will be improved for traditional land users

**Questions/Discussion:** None

**Implementation Requirements:** None

## CR #6 – Community Land Use Monitors

**Conformity Determination:** Conforms, subject to implementation requirements below

**Criteria:**

- Looking for intent to use a community monitor, evidence of community input into values to be monitored, description of appropriate role in locating values and monitoring impacts to them in the field
- Reporting requirements can be handled through terms and conditions in authorizations

**Analysis:**

- Use of 1-2 local wildlife/environmental monitors (implied to be under RRC control from question and answer provided in consultation summary)
- No other information provided

**Questions/Discussion:**

- The main requirement is the hiring of a monitor. As long as they are under the control of the RRC, their role can be handled through their contract/job description so I wouldn't deem a proposal as non-conforming just because information of their duties is lacking.

**Implementation Requirements:**

- RRC to address role and responsibilities of monitor as per CR requirements
- SLWB to attach condition to implement reporting requirements

## CR #7 – Archaeological Sites, Historic Sites and Burial Sites

**Conformity Determination:** Conforms, subject to implementation requirements below

**Criteria:**

- Looking for identification of sites through both PWNHC and community engagement/TK studies and evidence that such sites are being avoided by 150m, and 500m for burial sites
- If there is high potential for undocumented sites, evidence that a heritage resource assessment is carried out

**Analysis:**

- Searched SLUPB (?) Archaeological Sites Database for known sites – 38 within program area; 6 within 1km of a seismic line.
- Burial sites and other significant historic sites were discussed in TK study
- Program will be restricted to winter operations, which reduces potential for conflict with known sites.
- If a suspected site is discovered, the crew will not disturb the site and will contact the SLWB for instructions.
- No evidence of following setbacks in CRs
- With 38 sites in the area, that indicates a concentration and the PWNHC may require an archaeological assessment to be carried out – no indication that this was done.

**Questions/Discussion:****Implementation Requirements:**

- PWNHC to determine if archaeological assessment is required and if so, it needs to be carried out before activities begin
- SLWB to attach condition requiring adherence to setbacks around burial and archaeological sites

## CR #8 – Watershed Management

**Conformity Determination:** Conforms, subject to implementation requirements below

**Criteria:**

- Need to assess potential impacts to water quality, quantity and rate of flow within SMZs or CZs
- Nothing significant would be allowed

**Analysis:**

- Potable water for camp use to be drawn from lakes near camp location (~12.5 m<sup>3</sup>/day). Water intakes will be screened as per DFO protocol. Drinking water will be bottled.
- Sewage solids will be handled with incinolets, bag toilets or stationary treatment plant (to be determined by camp contractor). Grey water will be filtered and disposed to ground. Only biodegradable detergents will be used.
- Clean snow fills will be used and maintained to cross permanent creeks, streams and ephemeral draws.
- Spill response equipment and spill contingency plans in place
- Conducted in frozen conditions

- No materials stored on ice surface or within 100 m of normal high water mark or any water body.
- Use of existing stream crossings wherever possible
- Vibrating will not take place on any water bodies not frozen to the bottom
- Limited potential for impact to water quality, quantity and rate of flow from the proposed activity – low water use, standard mitigation measures and contingency plans in place

**Questions/Discussion:** None

**Implementation Requirements:**

- Water withdrawal to adhere to DFO winter water withdrawal protocol

## CR #9 – Drinking Water

**Conformity Determination:** Conforms

**Criteria:**

- Need to assess potential impacts to downstream drinking water sources based on Map 6 of the Plan
- Nothing significant would be allowed
- Where there is significant risk, need to see specific evidence of discussions with the community on the topic, and either a commitment to do baseline water quality collection and regular monitoring, or it would have to be a condition of authorization to require those things.

**Analysis:**

- As per CR #8, limited impact to water
- Virtually no activity in Great Bear Lake itself – the drinking water source, other than limited shoreline access.

**Questions/Discussion:** None

**Implementation Requirements:** None

## CR #10 – Wildlife

**Conformity Determination:** Does not conform

**Criteria:**

- Looking for a statement that data was requested from appropriate organizations and discussed with community RRCs in community engagement and TK study
- Looking for evidence that key wildlife impacts are being mitigated, and particular attention to be given to special harvesting areas – if uncertain, additional measures can be imposed as conditions of authorizations where appropriate



- Looking for special consideration for protection of barren-ground caribou if in applicable area
- Look for adherence or commitment to horizontal setbacks and minimum flight altitudes for relevant species, or implement through conditions of authorizations

**Analysis:**

- Existing trails and cutlines will be used wherever possible. Lines will be cleared to 8 m width. Slash will be windrowed with 7 m breaks every 300 m to permit passage of wildlife. Some of the program crosses existing burn areas.
- Winter operations minimize activity during critical spring/fall periods
- Crews movement restricted to approved access and seismic lines; speed limits set to 50km/hr unless otherwise posted
- No personal firearms permitted on the job, though wildlife monitors may carry them for safety; no hunting permitted during work hours.
- Caribou and furbearers are active in the area and effort will be made to avoid unnecessary disturbance.
- Garbage will be burned at camp, no food waste will be left on line.
- Conclusions:
  - RRC and community consulted about wildlife of concern; data used from available data sources but no evidence that current information was requested from wildlife managers
  - General wildlife mitigation measures only – nothing specific included to address impacts to key species or areas of concern such as woodland caribou, furbearers, bluenose east herd of barren-ground caribou and special harvesting areas.
  - Creating lots of new access, which is a concern for boreal woodland caribou, no effort to minimize width of cutlines
  - No discussion of setbacks

**Questions/Discussion:**

- Standards, expectations and information availability have changed significantly in the last 6 years. The plan should help to identify specific features and areas of concern. This requires a change from a general approach to mitigation, to providing special consideration to these features and areas of concern, while still providing the general context.

**Implementation Requirements:**

- Would suggest the proponent redo the application giving careful consideration to the requirements in this CR.

**CR #11 –Species Introductions**

**Conformity Determination:** Conforms, subject to implementation requirements below

**Criteria:**

- Looking for basic precautions to be taken to avoid introduction of species
- Where revegetation is required, that seed mixes are approved by the GNWT, ENR

**Analysis:**

- If ground disturbance occurs, it will be reseeded with seed mix approved by AANDC inspector
- Care will be taken to clean all equipment prior to bringing into the program area to limit likelihood of introduction of non-native species.

**Questions/Discussion:**

- Current process seems to be to have seed mixes approved by AANDC inspector. Should ENR also have approval role as per this CR or does the CR need to change?

**Implementation Requirements:**

- Should require approval of any seed mixes by ENR to avoid introduction of non-native vegetation

## CR #12 – Sensitive Species and Features

**Conformity Determination:** Conforms, subject to implementation requirements below

**Criteria:**

- Looking for evidence that information was sought on the location of plants, karst, hot and warm springs, mineral licks, amphibian sightings, and ice patches from appropriate departments and adherence to setbacks other requirements as appropriate

**Analysis:**

- SLUPB data indicates that none of these features exist in the area
- However, the requirement is to check for the most recent information in case new locations have been identified, especially for rare or may-be-at-risk plants. That does not appear to have been done.

**Questions/Discussion:**

- Tough call between “conforms, subject to conditions”, “does not conform” and “not applicable”. Technically it does not conform – the applicant has not fulfilled the most basic requirement to check for the most current information. But based on available information, there is nothing here so the CR would not be applicable if that is in fact the case. If this were the only CR that the application failed on and there was nothing to indicate the presence of any features in the area, then I likely wouldn’t fail the application but instead put the onus on regulators or departments in the preliminary screening to satisfy themselves that there is nothing in the area to be concerned about.

**Implementation Requirements:**

- Resource managers to satisfy themselves that no such features exist in this area.
- Regulators to attach any conditions necessary to implement the CR’s requirements should any sites be identified during the project review.

## CR #13 – Closure and Reclamation

**Conformity Determination:** Conforms, subject to implementation requirements below

**Criteria:**

- Part 1: Security to be calculated to cover full cost of reclamation and required by SLWB as a condition of authorization
- Part 2: Expect to see discussion of long term use of the area with community orgs and government bodies to determine an appropriate reclamation goal, and a draft closure and reclamation plan to be included to achieve that goal.
  - Generally, the goal should be for full reclamation to the extent possible/reasonable.
  - Where a decision is made to not do that in order to accommodate further use, then that should be made explicit.
  - The "Plan" does not have to be a separate document but sufficient to describe intent, especially at early stages of land use.

**Analysis:**

- Clean-up done concurrently with recording phase. All lath, flagging and trash will be collected as the recording equipment is picked up. The manager will ensure all lines are inspected, that clean-up is complete and areas requiring reclamation are identified. Lines will be inspected in summer of 2006. Areas of ground disturbance will be repaired and reseeded with a seed mix approved by AANDC inspectors.
- No indication of discussions with communities on reclamation goal, but provide for clean-up, and reseeding if necessary.

**Questions/Discussion:**

- In future, would prefer to see better alignment with the requirements of the CR, but given that they are proposing a full and immediate clean-up, the activity could reasonably pass as proposed.

**Implementation Requirements:**

- Security sufficient to cover the full cost of reclamation to be required and collected by the SLWB as a condition of authorization.

## CR #14 – Permafrost

**Conformity Determination:** Conforms

**Criteria:**

- Looking for consideration of impacts to permafrost and mitigation measures in place to limit impacts to permafrost

**Analysis:**

- Discussion of permafrost in TK study to determine location and thickness
- Permafrost is extensive and discontinuous.

- Bulldozers to be equipped with mushroom shoes to prevent ripping and tearing; will ensure sufficient snow cover is left to protect vegetative mat.
- No topsoil disturbance will be necessary for conduction of the program, which will reduce the potential for impacts on the permafrost regime.
- If early warming occurs, consideration will be given to night time or 24-hr operations to limit work on soft ground

**Questions/Discussion:** None

**Implementation Requirements:** None

## CR #15 – Climate Change

- Not Applicable – content not yet determined

## CR #16 – Ecological Integrity

**Conformity Determination:** Does not conform

### Criteria (from Draft 3 Implementation Guide):

- Requires the development of ecological and cultural integrity statements that:
  - Assess the potential cumulative impacts of the proposed land use activities on the ecological and cultural integrity of the watershed, including impacts on the Valued Components (VCs) identified in the NWT Cumulative Impact Monitoring Program (CIMP) present within the GBLW ecosystems, using the indicators identified by CIMP as appropriate, and
  - Demonstrate that all aspects of the proposed activities are consistent with the maintenance of the ecological and cultural integrity of the GBLW.

### Analysis:

- Hired Northern EnviroSearch Ltd to assess impacts and produce EPP – concluded that the program can take place with minimal long-term effects. Local short-term effects can be easily mitigated through careful planning and reclamation of any impacts immediately following the program.
- CIMP VCs and indicators are attached to the end of this report. The following is an assessment of which VCs are applicable given the type of activity proposed and location:
  - Water and Sediment Quality – Applicable
    - Activities with potential impacts include stream crossings and shore access (sediment deposition, alteration of stream banks), fuel spills, deposit of grey water on the ground
    - Given frozen ground conditions, I see limited potential to affect any of the indicators listed
  - Water Quantity – applicable
    - Use of 12.5 m<sup>3</sup>/day for camp operations withdrawn from water bodies near camp
    - Could affect water levels/stream flows, but not ice phenology
    - Would be managed by DFO protocol for water withdrawal

- Snow, ground ice and permafrost – applicable
  - Active layer depth, ground temperature and snow cover duration could be affected on seismic lines (don't know what "Snow water equivalencies" means)
  - How does the proponent demonstrate that their activities are consistent with the ecological integrity of permafrost? Are the standard mitigation measures sufficient? Is there an expectation to monitor impacts to active layer depth, ground temperature and snow cover duration with this CR (which is actually CR #3)? What type of impact would have to be contemplated before it is considered to be inconsistent with ecological integrity?
- Fish habitat, population and harvest – Fish habitat is applicable – potential impacts from stream crossings and shoreline access on GBL, fish population and harvest are not applicable
  - Would consider "Aquatic habitat structure" and "spawning, rearing and over wintering locations" to be applicable here
  - Given frozen conditions, I see little potential for impact but would rely on DFO to recommend any habitat conditions they felt are required to ensure the ecological integrity of fish habitat
- Fish quality – not applicable - I don't see any direct impacts to fish quality from this activity
- Caribou – applicable
  - Suggest that only the following are generally applicable to the types of land use covered by the Plan – migration routes, habitat availability, movements and distribution
  - Would expect the proponent to assess impacts and provide mitigation measures for those
  - Didn't do a sufficient job here of assessing impacts on any wildlife
- Moose – applicable
  - None of the indicators identified in CIMP are directly related to anything that would be affected by land use – suggest instead impacts to key habitat or community harvest areas
- Other terrestrial mammals – applicable (furbearers)
  - Habitat quality, distribution applicable here
- Birds and Insects – applicable
  - Distribution and abundance, habitat quality
- Vegetation – applicable
  - Vegetation cover/abundance, forest fire regimes (slash could contribute to fuel build up?), habitat quality (habitat for what), distribution/migration (assuming this is of plants – invasive species), frequency (rare plants) are potentially applicable
  - Would want to see estimates of how much area is cleared, regeneration rates/time and analysis of anything that might hinder or improve regeneration, potential for non-native introductions or changes in plant community, impacts to rare plants
  - Would have to be long term potential to change the vegetation structure of the area before this would result in a non-conforming use
- Climate – not applicable

- Air quality – maybe applicable but limited direct impacts
  - Air emissions applicable but no one assesses this currently. Would Deline expect to see predicted emissions from vehicle use to fulfill this CR?
  - What level of change would have to occur to be considered inconsistent with ecological integrity?
- Human Health and Wellness – applicable
  - Education (training opportunities), Income and employment, and aboriginal culture are most applicable; maybe NWT economy (interests of all Canadians); human health could be applicable for other land uses if there are direct threats to it from a proposed land use
- Obviously, this level of assessment was not conducted here. Is this a reasonable level of assessment?

### **Questions/Discussion:**

- Question for Deline: Does hiring a company to assess the impacts and identify appropriate mitigation measures such as is typically done (and as Northern EnviroSearch Ltd did here) address the need for ecological and cultural integrity statements?
- The number of indicators identified for some of the VCs is extensive and a number of them would be inappropriate for any land use – need to be reasonable – need discussion on how to achieve that.
  - Recommend that some come off the list in all cases – area for discussion
  - Recommend that each project use the remainder as a checklist, identify those that are applicable given the area and the land use (potential for impacts), and assess impacts to those that are applicable.
  - Of those indicators for which there is potential for impact, recommend that proponents identify appropriate mitigation measures and the level of residual risk expected with those measures in place.
  - In order for something to be inconsistent with the ecological or cultural integrity, the conformity determiner must find that there is a reasonable potential for long-term significant impact on one of the valued components.

### **Implementation Requirements:**

- Would likely rely on various resource managers (e.g. DFO, ENR, EC) to confirm no long term impacts to the VCs and attach any further conditions they felt were warranted to ensure consistency with ecological and cultural values of the watershed.

## **CR #17 – Fish Farming and Aquaculture**

- Not applicable

## **CR #18 – Disturbance of Lakebed**

- Given frozen conditions, nothing proposed that could disturb the lakebed – Not applicable

## CR #19 – Uses of Du K’ets’Edi (Sentinel Islands)

- Not applicable

## CR #20 – Water Withdrawal

- Not applicable

## CIMP Valued Components and Indicators

Valued Component	Indicators
<b>Water and Sediment Quality</b>	<p><u>Primary:</u></p> <ul style="list-style-type: none"> <li>• Water temperature</li> <li>• pH*</li> <li>• Conductivity*</li> <li>• Turbidity/Colour*</li> <li>• Dissolved Oxygen*</li> <li>• Total Suspended Solids*</li> <li>• Total/Dissolved Organic Carbon*</li> <li>• Major Ions*</li> <li>• Nutrients*</li> <li>• Total/Dissolved Metals*</li> <li>• Polyaromatic Hydrocarbons (PAH)*</li> <li>• Bacteria such as:               <ul style="list-style-type: none"> <li>○ Fecal Coliform</li> <li>○ Fecal Strep.</li> <li>○ <i>E. coli</i></li> </ul> </li> </ul> <p><u>Secondary:</u></p> <ul style="list-style-type: none"> <li>• Clarity</li> <li>• Total Mercury</li> <li>• Extractable Organochlorine</li> <li>• Pesticides</li> <li>• Polychlorinated Biphenyls (PCBs)*</li> <li>• Dioxins/ Furans</li> <li>• BTEX</li> </ul>
<b>Water Quantity</b>	<ul style="list-style-type: none"> <li>• Water Levels*</li> <li>• Stream Flows*</li> <li>• Ice Phenology (freeze-up and break-up)*</li> </ul>
<b>Snow, Ground Ice and Permafrost</b>	<ul style="list-style-type: none"> <li>• Snow water equivalencies</li> <li>• Active layer depth*</li> <li>• Ground temperature*</li> <li>• Snow cover duration*</li> </ul>

<b>Fish Habitat, Population and Harvest</b>	<ul style="list-style-type: none"> <li>• Age distribution of fish stocks</li> <li>• Aquatic habitat structure (substrate cover) and quality (importance to species)</li> <li>• Fish abundance, size and distribution*</li> <li>• Maturity and fecundity</li> <li>• Spawning, rearing and over wintering locations</li> <li>• Winter depth/ velocity</li> </ul>
<b>Fish Quality</b>	<ul style="list-style-type: none"> <li>• Fish abundance and distribution</li> <li>• Presence of diseases/parasites</li> <li>• Water quality</li> <li>• Contaminant levels*</li> <li>• Invertebrates/insects</li> <li>• Fish health*</li> </ul>
<b>Caribou</b>	<ul style="list-style-type: none"> <li>• Calf/cow ratio</li> <li>• Parasites/diseases</li> <li>• Number harvested*</li> <li>• Pregnancy rates*</li> <li>• Migration routes</li> <li>• Habitat availability</li> <li>• Energetics</li> <li>• Body weight/fat</li> <li>• Levels of contaminants*</li> <li>• Population size and trends*</li> <li>• Movements and distribution*</li> <li>• Availability of forage</li> <li>• Wolf predation</li> </ul>
<b>Moose</b>	<ul style="list-style-type: none"> <li>• Population size and trend</li> <li>• Number harvested*</li> <li>• Twinning estimates</li> <li>• Areas of recent forest fires</li> <li>• Presence of diseases and parasites</li> <li>• Age structure</li> <li>• Calf/cow ratio</li> <li>• Adult sex ratio</li> <li>• Presence of contaminants</li> </ul>
<b>Other Mammals (Terrestrial)</b>	<ul style="list-style-type: none"> <li>• Population size and trend*</li> <li>• Number harvested*</li> <li>• Habitat quality</li> <li>• Reproductive rates</li> <li>• Presence of diseases and parasites</li> <li>• Age structure</li> <li>• Distribution</li> <li>• Food availability</li> <li>• Presence of contaminants*</li> </ul>
<b>Birds and Insects</b>	<ul style="list-style-type: none"> <li>• Population size and trend*</li> <li>• Number harvested*</li> <li>• Distribution and abundance</li> <li>• Rate of breeding success</li> </ul>



	<ul style="list-style-type: none"> <li>• Presence of diseases and parasites</li> <li>• Age structure</li> <li>• Habitat quality</li> <li>• Food availability</li> <li>• Presence of contaminants*</li> </ul>
<b>Vegetation</b>	<ul style="list-style-type: none"> <li>• Vegetation cover/abundance*</li> <li>• Phenology and growth changes</li> <li>• Forest fire regimes*</li> <li>• Presence of contaminants*</li> <li>• Disease and insect outbreaks</li> <li>• Habitat quality</li> <li>• Herbivory</li> <li>• Distribution/migration</li> <li>• Frequency (rare plants)*</li> <li>• Natural variation</li> </ul>
<b>Climate</b>	<ul style="list-style-type: none"> <li>• Air temperature*</li> <li>• Precipitation*</li> <li>• Evaporation</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>• Air Composition*</li> <li>• Air Emissions*</li> <li>• Air Deposition</li> </ul>
<b>Human Health and Community Wellness</b>	<ul style="list-style-type: none"> <li>• Human health*</li> <li>• Population*</li> <li>• Education*</li> <li>• Crime and safety*</li> <li>• Housing*</li> <li>• Families and children*</li> <li>• Income and employment*</li> <li>• NWT economy*</li> <li>• Aboriginal culture*</li> </ul>
<p>* Trend graphs are available for indicators on CIMP Website (<a href="http://www.nwtcimp.ca">www.nwtcimp.ca</a>)</p>	