



Fisheries and Oceans
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Your file *Votre référence*
EA0405-002

Our file *Notre référence*
SC04006

October 5, 2005

Martin Haeefele, Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Box 939
5102-50th Avenue
Yellowknife, NT X1A 2N7

Dear Mr. Haeefele:

**RE: DFO Technical Report – Canadian Zinc Corporation Phase III
Drilling Program (EA0405-002)**

The Department of Fisheries and Oceans, Fish Habitat Management – Western Arctic Area (DFO) has reviewed the environmental assessment documentation on the above project. Please find attached the DFO Technical Report which includes comments and recommendations for this project. Our review was limited to potential impacts of the project on fish and fish habitat pursuant to the responsibilities of DFO under the habitat protection provisions of the *Fisheries Act* and the *Species at Risk Act*.

DFO appreciates the opportunity to provide comments on the above project and material. Please contact me at (867) 669-4927 if you have any questions or wish to discuss any of the foregoing in more detail.

Sincerely,

Ernest Watson
Area Habitat Biologist
Fish Habitat Management
Department of Fisheries and Oceans - Western Arctic Area

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NON-TECHINICAL SUMMARY

Fisheries and Oceans Canada (DFO) has completed its technical review Canadian Zinc Corporation (CZN) Phase III Drilling Program based on information contained in the Detailed Development Description, the Developer's Assessment Report Information Requests responses. DFO review was limited to potential impacts of the project pursuant to the responsibilities of DFO under the fish and fish habitat protection provisions of the *Fisheries Act* and the *Species at Risk Act*.

DFO has identified areas of concern regarding the development:

1. Road Development and Stream Crossings. The use of existing roads that follow streams closely, and in some cases utilize the streams themselves, may cause the harm to fish habitat. Construction of new roads may lead to the erosion of exposed soils into streams and therefore harm fish habitat. The project will likely not impact fish or fish habitat if, in addition to the mitigation measures proposed by the proponent, the following recommendations are followed:

- The proponent should not use the Casket Creek Road.
- The existing road near Galena Creek should be relocated outside its floodplain.
- Appropriate and effective sediment and erosion control measures should be installed, monitored and maintained before, during and after starting work in order to prevent the entry of sediment into the watercourse.
- To protect spawning fish and their incubating eggs, crossing of streams should occur only during the period June 15th - August 30th, and only in areas of clean cobble.

2. Drilling Sites and Activities. Water withdrawn from fish-bearing watercourses may cause the entrainment of fish into intakes, or impingement of fish onto intake screens. Excessive amounts of water withdrawn from watercourses can lead to loss of fish habitat. The project will likely not impact fish or fish habitat if, in addition to the mitigation measures proposed by the proponent, the following recommendations are followed:

- All intakes should be screened to prevent the entrainment and impingement of fish.
- Total water withdrawal for all activities should not exceed 5% of the instantaneous flow rate of a single watercourse at the time of withdrawal.

DEPARTMENT OF FISHERIES AND OCEANS
TECHNICAL REPORT - CANADIAN ZINC CORPORATION (CZN)
PHASE III DRILLING PROGRAM
(EA0405-002)

1.0 INTRODUCTION

Fisheries and Oceans Canada Mandate, Role and Responsibilities

Fisheries and Oceans Canada (DFO) is responsible for the management and protection of fish and marine mammals and their habitats. The *Fisheries Act* provides the legal basis for this responsibility. It contains two fundamental provisions that pertain to the conservation and protection of fish habitat:

Section 35(1) of the *Fisheries Act* prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat without an authorization from the Minister of Fisheries and Oceans or through a regulation under the *Fisheries Act*. DFO's *Policy for the Management of Fish Habitat* (1986) provides general guidance on the application of the habitat protection provisions of the *Fisheries Act*, and applies to all projects that have the potential to harm fish habitat. In reviewing project proposals, DFO applies the No Net Loss principle, according to which DFO will strive on a project-by-project basis to maintain the productive capacity of habitats supporting fisheries resources. Under this principle, DFO works to achieve No Net Loss by avoiding impacts, by the application of mitigation and, failing that, to balance unavoidable habitat losses through habitat compensation. DFO does not issue an authorization in situations where adverse impacts to fish habitat are judged to be unacceptable.

Subsection 36 of the *Fisheries Act* prohibits the deposit of deleterious substance into fish bearing waters unless authorized by a regulation under the Act or by another law of Parliament. Environment Canada, on behalf of the Minister of DFO, administers section 36 of the *Fisheries Act*. DFO relies upon advice provided by Environment Canada regarding issues pertaining to water quality.

There are other sections of the *Fisheries Act* that pertain to the conservation and protection of fish and fish habitat. These include sections 20 (requires safe passage around obstructions, i.e. fishways), 22 (requires appropriate flows at obstructions), 30 (provides for fish guards or screens where needed) and 32 (prohibits the destruction of fish by means other than fishing without prior approval), among others.

The *Species at Risk Act (SARA)* came into force in June 2003. The purposes of *SARA* are to: (a) prevent Canadian indigenous species, subspecies and distinct populations of wildlife from being extirpated or becoming extinct; (b) provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and (c) manage species of special concern to prevent them from becoming endangered or threatened. The Minister of DFO is the competent minister for listed aquatic species including fish (as defined in section

2 of the *Fisheries Act*) and marine plants (as defined in section 47 of the *Fisheries Act*).

DFO's review of the Canadian Zinc Corporation (CZN) Phase III Drilling Program (EA0405-002) is limited to potential impacts of the project pursuant to the responsibilities of DFO under the fish and fish habitat protection provisions of the *Fisheries Act* and the *SARA*.

After review of the information contained in the Detailed Development Description (DPD) dated December 2004, the Developer's Assessment Report (DAR) dated May 2005 and responses to Information Requests (IR) submitted by the Developer and Parties to the Assessment, DFO concludes that the proposed project will likely not result in the harmful alteration, disruption or destruction of fish habitat if the appropriate mitigation is applied. As such, DFO is participating in this EA as a Party to the Environmental Assessment, and as a Responsible Minister for the development as defined under the *Mackenzie Valley Resource Management Act*.

This report focuses on the identification of issues potentially affecting fish or fish habitat as a result of the project.

2.0 ISSUE IDENTIFICATION AND TECHNICAL COMMENTS

2.1 Road Development and Stream Crossings (TOR B-1 and E-1)

Issue

- The use of existing roads that follow streams closely, and in some cases utilize the streams themselves, may cause the HADD of fish habitat.
- Construction of new roads may lead to the erosion of exposed soils and sedimentation of fish bearing waterways.

Developers Conclusion

Galena Creek: To minimize the impacts to Galena Creek and avoid crossing it multiple times, a new road section will be constructed along the creek (DPD p27; DAR p18).

Casket Creek: The preferred access to the Casket Creek drill site is a road that runs parallel and close to Casket Creek. To minimize impacts to Casket Creek, access to the area will therefore likely be gained by using the Zone 1 road network (DAR p18).

Little Quartz Creek: The road that follows Little Quartz Creek is located within 30 m of the creek over most its length (DAR p18). It will be inspected at the outset to assess if realignments are required or feasible, and review requirements for runoff and sediment control.

Rico Drilling: Drilling on the Rico claim will require using sections of the existing winter road to the mine site that closely parallels Prairie Creek and Funeral Creek (DAR p18). Some sections of the Prairie Creek road have been eroded away and “reclaimed” by the stream. These road sections will require a field inspection to determine if and how a skid-mounted rig is to drill at Rico.

Mitigation measures: Mitigation measures to be implemented will avoid or minimize impacts from vegetation clearance and road construction on water quality (input of sediment). In addition to guidance contained in the E3 Best Practices Guidelines (included as Appendix A of the DAR) mitigation proposed include:

- The new 100 m spur roads sections that will be built from existing roads to new drill hole locations will be located at least 30 meters from any waterbody (DPD p27)
- CZN will ensure that appropriate runoff and drainage controls are integrated into all roads, both old and new sections (DPD p28).
- Silt fences will be used where necessary as sediment and erosion control (DPD p36).
- Surface soil stockpiles will be covered with polyethylene sheeting to prevent erosion (DPD p 37).
- Field personnel will monitor perimeter ditches, erosion control measures, stockpile covers, stream buffer zones and bank protection on a daily basis (DPD p 36).
- Disturbed areas will be stabilized and/or revegetated when they are no longer required (DPD p 37).
- CZN will not cross Prairie Creek until after June 15 (DAR p27).
- When fording streams with heavy equipment: limit the number of crossings; cross when flows are low; wash undercarriages, tracks and tires before crossing; move slowly (DPD p 37).
- Stop work wherever uncontrolled sediment loads begin to increase (DPD p 37).

DFO Conclusion and Rational

Upon review of the DPD and DAR, and after visiting the project area on July 20, 2005, DFO has concluded the following:

Galena Creek Road Network: The lower portions of Galena Creek is known bull trout habitat. DFO concludes that by relocating the existing road to the southeast, outside the floodplain of Galena Creek and thereby limiting the number of crossings of Galena Creek to only one, the impact of the proposed development on fish and fish habitat will be minimized.

Casket Creek Road Network: The use and maintenance and use of the existing Casket Creek road network to access the proposed drill sites would likely result in the HADD of fish habitat and have significant impacts on fish and fish habitat.

DFO concludes that accessing the proposed Casket Creek drill sites via the Henderson Creek (Zone 1) road network would likely not result in the HADD of fish habitat provided the mitigation proposed by the developer and recommended by DFO is implemented.

Little Quartz Creek: Due to its high gradient and ephemeral nature, Little Quartz Creek is likely not fish habitat. If the mitigation measures that are intended to protect water quality (proposed by the developer and recommended by DFO) are adhered to, DFO concludes that the use of the road network in close proximity of Little Quartz Creek will not result in the HADD of fish habitat.

Rico Drilling: In some areas portions of the Prairie Creek / Funeral Creek Winter Road has eroded away. Forging these areas will likely not result in the HADD of fish habitat. Repair of these sections will likely result in the HADD of fish habitat and require regulatory approval. However, DFO concludes repair of these sections will likely not have significant impacts of fish or fish habitat.

Mitigation Measures: In general the mitigation measures proposed is comprehensive and, if implemented, will avoid or minimize impacts from vegetation clearance and road construction on water quality. However, DFO provides standard recommendations for work in and around water, and are included in the recommendations below.

Recommendations

- To prevent a HADD of fish habitat of fish and fish habitat in Casket Creek, access to the proposed drill area adjacent to Casket Creek should be made via the existing Henderson Creek (Zone 1) road network. Use of the Casket Creek Road should not occur.
- To minimize the impact to fish habitat of fish and fish habitat in Galena Creek, the existing road should be relocated to the southeast outside the floodplain of Galena Creek so that only one ford crossing is required.
- Appropriate and effective sediment and erosion control measures should be installed before starting work in order to prevent the entry of sediment into the watercourse. These measures should be inspected regularly during the course of the work and until any required re-vegetation is established to ensure they are functioning properly. Necessary repairs and adjustments should be made if any damage is discovered or if these measures are not effective in controlling erosion and sedimentation.
- Effective sediment and erosion control measures should be maintained until complete re-vegetation/stabilization of disturbed areas is achieved or until such areas have been permanently stabilized by other effective sediment and erosion control measures, in the event that re-vegetation is not possible.
- Waste materials should be removed from the work site and stabilised above the ordinary high water mark to prevent them from entering any watercourse. Spoil piles should be contained with silt fences, flattened,

covered with biodegradable mats or tarps, and/or planted with preferably native grass or shrubs.

- Disturbed areas should be vegetated by planting and seeding preferably native trees, shrubs or grasses and covered with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time in the growing season remaining for the seeds to germinate, the site should be stabilized (e.g., by covering exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and then vegetated the following spring. If re-vegetation is not possible due to climatic extremes and/or lack of appropriate seed or stock, the site should be stabilized using effective sediment and erosion control measures. In areas with permafrost, care should be exercised to prevent these measures from causing thawing or frost heave.
- To protect spawning fish and their incubating eggs, crossing of streams should occur only during the period June 15th - August 30th, and only in areas of clean cobble.
- If replacement rock is required to stabilize eroding banks at stream crossings, the following measures should be incorporated:
 - Appropriately-sized, clean, rocks should be placed into the eroding bank area only by hand or using machinery operating outside of the water.
 - Rocks should not be obtained from below the ordinary high water mark of any water body.
 - Rock should not interfere with fish passage or constrict the channel width.
 - To protect spawning fish and their incubating eggs and larval stages, in-water work should occur only during the period July 15th - August 30th.

2.2 Drilling Sites and Activities (TOR B-3 and E-1)

Issue:

- Some drilling sites are in close proximity to streams, which may lead to the deposit of sediment-laden water into fish bearing waterways.
- Water withdrawn from fish-bearing watercourses may cause the entrainment of fish into intakes, or impingement of fish onto intake screens.
- Excessive amounts of water withdrawn from watercourses can lead to loss of fish habitat.

Developers Conclusion

Dill sites and water management: The proposed drilling program will consist of diamond drilling at up to 60 dill sites, with up to three holes drilled at each site. At each site, a shallow pit will be dug for drill water returning at the hole collar to settle out drill cuttings. Water in the pit generally dissipates through a

combination of exfiltrations and evaporation. Pits will be backfilled once drilling operations cease (DAR p23).

Water sources: Water for drilling will be obtained from a local source, and will be pumped to the drill site by a small diesel-powered pump. A screen will be maintained on the water intake to prevent the entrainment of fish. CZN will develop pump sumps in excess of 30 m of local creeks, and were not possible, will request permission for a specific location (DPD p30).

DFO Conclusion and Rational

Dill sites and water management: DFO concludes that, in addition to the mitigation proposed by the developer, if the mitigation measures recommended above is applied to the project, the impacts of the proposed drilling activities on fish and fish habitat will be minimized.

Water sources: DFO concludes that the mitigation proposed is not sufficient to prevent impacts to fish and fish habitat. Water intakes must be properly screened not only to prevent the entrainment of fish, but also properly designed to reduce approach water velocities to prevent the impingement of fish onto the screen. Also, excessive amounts of water withdrawn from watercourses can lead to loss of fish habitat.

Recommendations

In addition to those listed above, DFO recommends that the following mitigation measures are applied to the project:

- **To prevent the entrainment or impingement of fish all intakes should be equipped with screens designed as per the Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995) or as approved by DFO. The intake should not disturb the sediment and the screen should be cleaned regularly.**
- **Total water withdrawal for all activities should not exceed 5% of the instantaneous flow rate of a single watercourse at the time of withdrawal.**

3.0 SUMMARY OF RECOMMENDATIONS

1. To prevent a HADD of fish habitat of fish and fish habitat in Casket Creek, access to the proposed drill area adjacent to Casket Creek should be made via the existing Henderson Creek (Zone 1) road network. Use of the Casket Creek Road should not occur.
2. To minimize the impact to fish habitat of fish and fish habitat in Galena Creek, the existing road should be relocated to the southeast outside the floodplain of Galena Creek so that only one ford crossing is required.
3. Appropriate and effective sediment and erosion control measures should be installed before starting work in order to prevent the entry of sediment into the

watercourse. These measures should be inspected regularly during the course of the work and until any required re-vegetation is established to ensure they are functioning properly. Necessary repairs and adjustments should be made if any damage is discovered or if these measures are not effective in controlling erosion and sedimentation.

4. Effective sediment and erosion control measures should be maintained until complete re-vegetation/stabilization of disturbed areas is achieved or until such areas have been permanently stabilized by other effective sediment and erosion control measures, in the event that re-vegetation is not possible.
5. Waste materials should be removed from the work site and stabilised above the ordinary high water mark to prevent them from entering any watercourse. Spoil piles should be contained with silt fences, flattened, covered with biodegradable mats or tarps, and/or planted with preferably native grass or shrubs.
6. Disturbed areas should be vegetated by planting and seeding preferably native trees, shrubs or grasses and covered with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time in the growing season remaining for the seeds to germinate, the site should be stabilized (e.g., by covering exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and then vegetated the following spring. If re-vegetation is not possible due to climatic extremes and/or lack of appropriate seed or stock, the site should be stabilized using effective sediment and erosion control measures. In areas with permafrost, care should be exercised to prevent these measures from causing thawing or frost heave.
7. To protect spawning fish and their incubating eggs, crossing of streams should occur only during the period June 15th - August 30th, and only in areas of clean cobble.
8. If replacement rock is required to stabilize eroding banks at stream crossings, the following measures should be incorporated:
 - Appropriately-sized, clean, rocks should be placed into the eroding bank area only by hand or using machinery operating outside of the water.
 - Rocks should not be obtained from below the ordinary high water mark of any water body.
 - Rock should not interfere with fish passage or constrict the channel width.
 - To protect spawning fish and their incubating eggs and larval stages, in-water work should occur only during the period July 15th - August 30th.
9. To prevent the entrainment or impingement of fish all intakes should be equipped with screens designed as per the Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995) or as approved by DFO. The intake should not disturb the sediment and the screen should be cleaned regularly.
10. Total water withdrawal for all activities should not exceed 5% of the instantaneous flow rate of a single watercourse at the time of withdrawal.