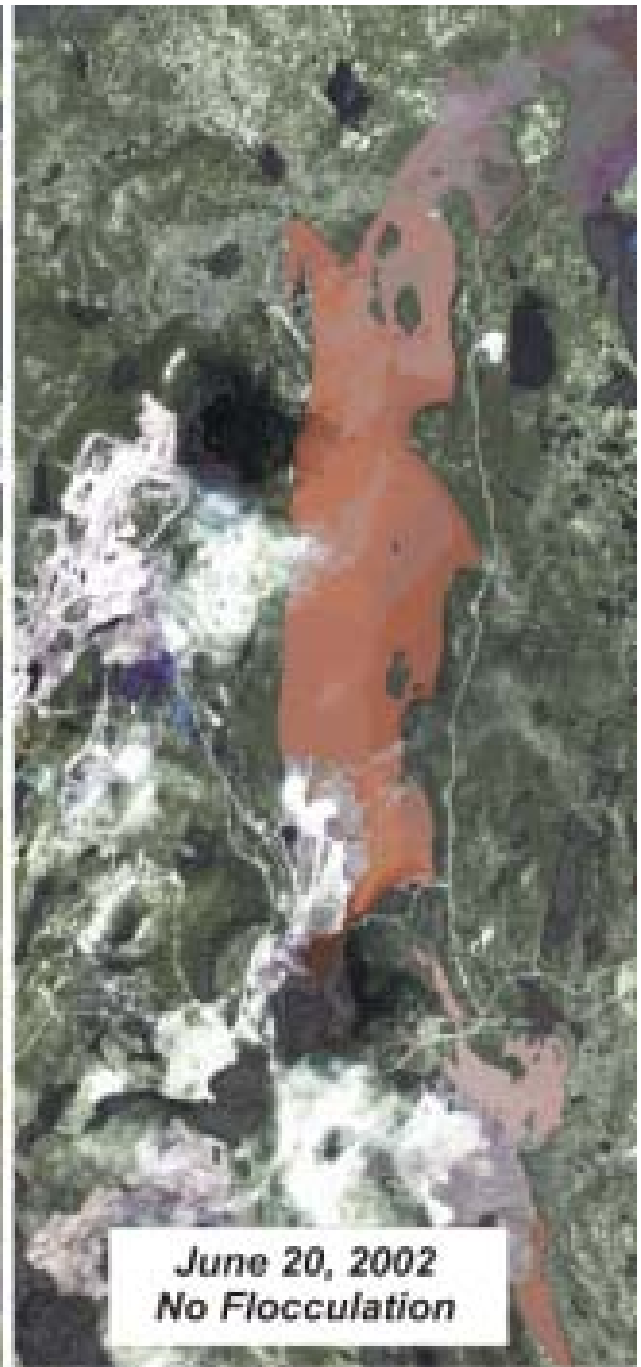


IOC CAROL PROJECT
REVISED TAILINGS MANAGEMENT PROJECT
REGISTRATION/REFERRAL



9 February 2006



**IOC CAROL PROJECT
REVISED TAILINGS MANAGEMENT PROJECT
REGISTRATION/REFERRAL**

PREPARED BY:

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February 9, 2006

EXECUTIVE SUMMARY

The Iron Ore Company of Canada (IOC) has operated a mine and associated processing facilities at the Carol Project property near Labrador City since 1962. While in operation, IOC has stored tailings within a designated portion of Wabush Lake, as per provincial authorizations.

In 1999, IOC began assessing options for tailings disposal and storage in order to comply with the new *Metal Mining Effluent Regulations* (MMER) and to manage the red water associated with the release of tailings into Wabush Lake. In April 2000, IOC submitted a Tailings Management Plan (TMP) that was assessed and released from both provincial and federal environmental assessment in June 2000 and January 2001 respectively.

IOC has continued to optimize the approved TMP 2001 to improve the environmental benefits by conducting flocculation and tailings deposition trials and assessing the potential environmental effects of flocculant use. As a result of these and other supporting studies, IOC is proposing to modify the tailings confinement from the 'in-lake rockfill dyke' based project approved in 2000/01 (i.e., the approved TMP 2001) to a 'minimum impact footprint' based project. This modification, named Revised Tailings Management Plan (Revised TMP) is the subject of this registration for provincial environmental assessment and federal environmental screening.

Elements of the approved TMP 2001 included:

1. Consolidation of all effluent releases to a single deposit at the leading edge of the exposed tailings beach.
 - Under the Revised TMP, this objective has not changed.
2. Construction of a 15 km long rockfill dyke to bisect Wabush Lake longitudinally and confine the deposited tailings within 45 percent of the lake, thus removing this area from public use.
 - Under the Revised TMP, this structure will not be required.
3. The effluent release from the approved TMP 2001 would be flocculated as required to remove suspended material and control red water.
 - Under the Revised TMP, the consolidated effluent will be flocculated prior to release to the tailings impoundment area and red water will be reduced throughout the whole lake.
4. The approved TMP 2001 would have a final point of discharge where MMER criteria would apply.
 - Under the Revised TMP, all water in Wabush Lake will be directed to a single channel that will form the final point of release.
 - Under the Revised TMP, the traditional navigation route will be preserved.
 - Under the Revised TMP, three short dyke structures will be required at the north end of the lake to direct the water through this channel.

The proposed modification will address the objectives of the approved TMP 2001 more effectively from an environmental and sustainable development perspective. The issues addressed in the approved TMP 2001 are basically unchanged or resolved more effectively as discussed in this registration.

Advantages of the Revised TMP

The proposed Revised TMP has several advantages over the approved TMP 2001 as described in the previous registration (April 2000).

1. Full scale plant flocculation trials conducted over a 4-month period (including freshet) verified that the water in the lake can be kept clear without the confining dyke.
2. The physical footprint of the harmful alteration, disruption, or destruction (HADD) of fish habitat is reduced in area (47 percent less).
3. The public will have access to a greater portion of the lake for recreational activities.
4. No interference with traditional navigation routes in Wabush Lake as compared to approved TMP 2001;
5. No requirement for new quarry development and associated access roads thus obviating the need to disturb up to 6 km² of terrestrial habitat;
6. Reduction in red water throughout the entire lake system instead of just the unconfined portion of the lake, therefore resulting in significant improvements in primary productivity and the recreational values of Wabush Lake;
7. A gradual filling of the HADD over life of mine as opposed to an immediate utilization of the HADD following construction of approved TMP 2001;
8. An immediate (one year) improvement in water quality as compared to approved TMP 2001 (six years).

Fish Habitat Compensation

The reduced HADD (47% as compared to the approved TMP 2001) noted above is based on the projected tailings deposition footprint. Compensation would be based on restoring degraded lake habitat to a state approaching natural conditions. Due to the strategy employed for the Revised TMP, only 37 percent of the designated tailings impoundment area (TIA) will be utilized for tailings deposition thereby preserving the remaining area for ecological and recreational use. The removal of the large dyke, as included in the approved TMP 2001, allows the HADD to be reduced from the entire confined area to just the projected footprint of the tailings (47 % less HADD); however compensation must be located outside of the TIA. Habitat in Beaver Bay and the north end of the lake will be restored as compensation for the projected tailings footprint (i.e., the HADD).

Changes to the Appearance of the Lake

The Revised TMP will not include the construction of the 15 km rockfill dyke which would have seen 45 percent of Wabush Lake removed from public use. Functionally, under the Revised TMP the lake will appear the same as for the approved TMP 2001 with two exceptions;

1. three short dyke structures will be constructed at the north end of the lake instead of the 15 km mid-lake dyke; and
2. flocculation will significantly reduce the red colour throughout the water column of the entire lake system.

Public Access to the Lake

It is anticipated that the public will have the same access to the lake as they do today, and greater access than they would have had under the approved TMP 2001. The Revised TMP maintains traditional navigation routes which were limited under the approved TMP 2001.

Public Consultation

IOC will hold a meeting in Labrador City to present the Revised TMP to the public and to receive comments on the revision.

A tabular comparison of the approved TMP 2001 and the changes attributable to the Revised TMP is summarized in Table 1.

Table 1 Comparison of the Approved TMP 2001 and Revised TMP

Feature	Approved TMP 2001	Revised TMP
Consolidate Discharges	<ul style="list-style-type: none"> All effluent consolidated to a single tailings discharge area 	<ul style="list-style-type: none"> All effluent consolidated to a single tailings discharge area
Flocculant	<ul style="list-style-type: none"> Included in tailings treatment at final release point if required 	<ul style="list-style-type: none"> Included in tailings treatment before release to TIA to ensure elimination of red water and confinement of solids
Final Point of Discharge	<ul style="list-style-type: none"> Effluent release at islands at end of dyke structure 	<ul style="list-style-type: none"> Effluent release at islands
Dyke	<ul style="list-style-type: none"> 15 km (north-south) down middle of lake (45 percent of lake removed) Permeable (no head) Filtering red water 	<ul style="list-style-type: none"> Joining islands (east-west) at upper end of lake (only impact is footprint of dykes) Permeable (no head) No filtering required
Quarry	<ul style="list-style-type: none"> New quarry development and access roads required 	<ul style="list-style-type: none"> No new quarry required; minor temporary access road required from existing IOC quarry
HADD	<ul style="list-style-type: none"> Total area within dyke 	<ul style="list-style-type: none"> Area of tailings footprint (i.e., reduced 47 percent)
Compensation	<ul style="list-style-type: none"> North end, east side of Lake, Beaver Bay Excludes Tailings Impoundment Area 	<ul style="list-style-type: none"> North end of lake, Beaver Bay Excludes Tailings Impoundment Area
Beaver Bay	<ul style="list-style-type: none"> No discharges – area closed 	<ul style="list-style-type: none"> No discharges – area closed
Public Use of Lake (boating)	<ul style="list-style-type: none"> Restricted to eastern half by dyke (45 percent of lake removed) Traditional navigation routes removed 	<ul style="list-style-type: none"> All existing area used for boating available Traditional navigation routes maintained

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1.0 IOC CAROL PROJECT - REVISED TAILINGS MANAGEMENT PROJECT

1.1 Identification of the Proponent

The Iron Ore Company of Canada (IOC) is the largest producer of iron ore products in Canada, exporting approximately 12.5 million long tons of pellets and 5.5 million long tons of concentrate per year to world-wide markets. IOC is majority-owned and operated by Rio Tinto Ltd. (58.72%) with minority interests held by Mitsubishi (26.18%) and the Labrador Iron Ore Royalty Income Fund (15.1%).

1.2 Contacts and Address

- (i) Name of Corporate Body: Iron Ore Company of Canada
- (ii) Address: 1000 Sherbrooke Street West
Suite 1920
Montreal, Quebec
H3A 2R7
- (iii) President and CEO: Terrence F. Bowles
- (iv) Principal Contact Person for Purposes of Environmental Assessment:
 - Name: Jody Clark
 - Official Title: Manager, Environment
 - Address: P.O. Box 1000
Labrador City, NL
A2V 2L8
 - Telephone Number: (709) 944-8572
 - Facsimile Number: (709) 944-8147

1.3 Background

The IOC Carol Project near Labrador City, Newfoundland and Labrador is an open-pit mining and associated processing operation, which has been in operation since 1962. The Project features include a crusher, pellet plant, concentrator, magnetic separation plant, spiral plant, warehouse, maintenance shops, administration building, automatic train operation (ATO) system (14 km), tailings pumphouses and disposal area, various stockpiles, an explosives plant, site haulage roads (50 km), power lines, waste rock sites, fuel storage tanks, pipelines, and conveyors.

The Labrador Mining and Exploration (LME) Act granted IOC a Mining Lease effective 13 July 1960, renewable every 30 years. This lease was renewed in July 1990. The Act also provided IOC a Tailings Disposal Licence within the confines of Wabush Lake effective 26 July 1962 to use that part of the lake for the purpose of recovering water and depositing tailings. This license was renewed in April 1995.

At present, active pits are the Luce and Humphrey pits, as mining has ceased at the Spooks and Lorraine pits. The Smallwood pit is also inactive and utilized as an in-pit waste rock dump. The operation has been expanded several times to meet commitments for increased production. Expansion has included the addition of a flotation plant and, most recently, concentrator mill upgrades.

The main tailings disposal area is located immediately to the north of the plant site, consisting of beach discharge into a designated area of Wabush Lake in accordance with the Provincial Water Lot Lease Provisions granted under the LME Act in 1962. The existing above-water tailings disposal area at the south end of Wabush Lake covers about 570 ha, including a 540 ha tailings delta area and a 30 ha tailings fill at Beaver Bay. All available inactive tailings storage areas have been re-vegetated through the introduction of native grasses and crops. Most recently, several wetlands areas have also been successfully created on the tailings landform as part of IOC's Tailings to Biodiversity initiative, a program which has resulted in IOC receiving the North American Waterfowl Management Plan's National 2004 Great Blue Heron Award. This award recognizes participants in the North American Waterfowl Management Plan who have made significant, long-term contributions that result in benefits to waterfowl and other migratory bird populations of North America. Recipients of this award are chosen from candidates located across North America.

IOC tailings are composed of sand, quartz and fine iron, are non-toxic and are non-acid generating. The current last point of control is the end-of-pipe. Due to solids concentrations, the only effluent parameter that exceeds the *Metal Mining Effluent Regulations* (MMER) limits, as measured at the last point of control, is Total Suspended Solids (TSS). As per section 35 of the MMER, IOC currently has a Transitional Authorization for TSS for the designated discharge points, and this Authorization is in effect until 06 June 2007. TSS concentrations within Wabush Lake are in compliance with federal and provincial regulations within several hundred metres of the active tailings discharge area. As noted earlier, most of the lake has a visible red colour ("red water") caused by fine colloidal iron stained quartz particles (Beak 1999) in the effluent.

In 1999, IOC began assessing options for tailings disposal and storage in order to comply with the new MMER. In conjunction with this, IOC also made a commitment to the local community to address their concerns regarding the red water associated with the release of tailings into Wabush Lake; this is not a legal compliance issue, but rather a social and community commitment.

In April 2000, IOC submitted a Tailings Management Plan (TMP) for registration/referral (IOC 2000) which met the requirements of MMER compliance and social commitments. The proposed TMP was released from environmental assessment requirements of the Newfoundland and Labrador *Environmental Protection Act* on 9 June 2000 and the *Canadian Environmental Assessment Act* on 30 January 2001. Since that time, IOC has continued to pursue optimizations to the approved project to ensure the best environmental and long term sustainable solution is implemented for the benefit of all stakeholders. As such, IOC implemented a rigorous research and development program to determine the suitability and benefits of a flocculated tailings system to (a) address the community concerns regarding red water and (b) ensure continued compliance with the MMER through confinement of tailings within the natural deep trench on the western portion of Wabush Lake.

The results of the 3 year flocculation R&D program, including a full-scale 4-month plant trial in which flocculant was added to the effluent streams, conclusively proved that flocculation will effectively remove the red water from Wabush Lake as well as ensuring that flocculated tailings discharged into the natural trench will not resuspend, thus providing confinement of tailings within the natural confines of the western portion of Wabush Lake.

As a result of this program and other supporting studies which clearly established the environmental benefits of flocculation, IOC is proposing to modify the tailings confinement from the 'in-lake dyke' based project approved in 2000/01 (i.e., the approved TMP 2001) to a 'minimum impact footprint' based project, (i.e., the Revised TMP).

1.4 Location

Wabush Lake lies to the east of Labrador City and north of Wabush and forms the eastern boundary for IOC's Carol Project (Figure 1.1). The lake is oriented in a north-south direction and is approximately 25 km long and 2 to 4 km wide. Wabush Lake covers an area of approximately 67 km², with a volume of approximately 1,225,000,000 m³.

Lake depth varies from 10 to 15 m on the east side and north end, to approximately 100 m at a deep trough along the west side. Wabush Lake has soft sediment of variable thickness, ranging from 1 to 2 m along the east side of the lake in the shallow areas (i.e., 10 to 15 m water depth), to over 20 m in the deep areas on the west side of the lake.

The catchment area of Wabush Lake is approximately 1540 km², including major tributary areas such as Little Wabush Lake and Flora Lake. Wabush Lake discharges into the Julienne-Shabogamo Lake complex, which covers an area of approximately 730 km². The outflow rate from Shabogamo Lake is controlled by the flow restrictions in Shabogamo River above the Marshall Rapids (Golder 1999a).

1.5 Approved Tailings Management Project (TMP)

The TMP 2001 was released from provincial environmental assessment in June 2000 and federal environmental assessment in January 2001. Many of the features of the approved TMP 2001 remain unchanged under the current proposal and these common elements are therefore not included in this assessment. Elements of the approved TMP 2001 included:

1.5.1 Consolidation of all Effluent Releases

IOC has a Lease Line Agreement with provincial regulators as per provisions of the LME Act (1962), which allows the discharge of tailings into Wabush Lake as long as the tailings remain inside the identified boundary. A description of the four MMER designated Final Discharge Point (FDP) locations into Wabush Lake is provided below.

- FDP-Beaver Bay discharges by gravity to the east into Wabush Lake. This site juxtaposes the main process facilities and is separate from, and located to the south of, the main tailings beach area. This discharge point contains effluent discharged from the Pellet Plant and Load-Out areas, as well as overflows and other miscellaneous discharges from the NTPH floor drains.
- FDP-Old Tailings Pumphouse discharges by gravity to the east into Wabush Lake. It is located north of Beaver Bay and immediately to the south of the main tailings beach area. This site discharges overflows and miscellaneous discharges from the OTPH, as well as tailings lines dump events during upset conditions.

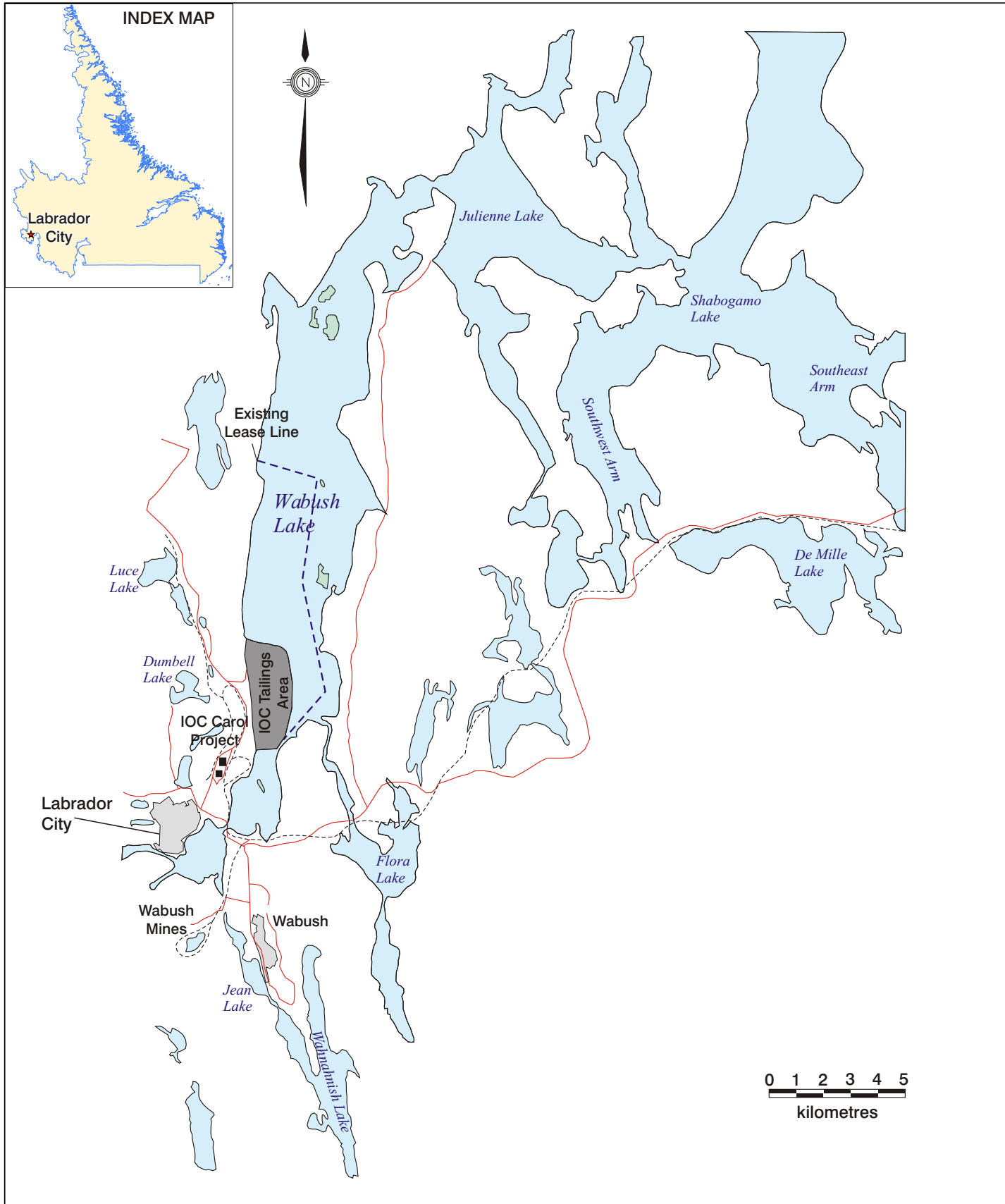


FIGURE 1.1

IOC CAROL PROJECT - SITE



- FDP-Ore Car Flume discharges by gravity into Wabush Lake at the northeast corner of the main tailings beach. This site contains the fine tailings from the Concentrator operations. The flow can also be discharged through the emergency discharge located at the head of the Ore Car Flume.
- FDP-Main Tailings Discharge discharges into Wabush Lake at the north end of the tailings beach via 5 tailings lines (4 operating lines and one spare line) with a triple stage pump system and is the main tailings discharge from IOC Concentrator operations.

As per IOC's lease line agreement, tailings have been deposited by simple beach disposal for the past 44 years, allowing the tailings to flow down a sand beach into Wabush Lake. The tailings beach above water lies at a slope of 1.5% and the near shore underwater profile has a slope of approximately 4%.

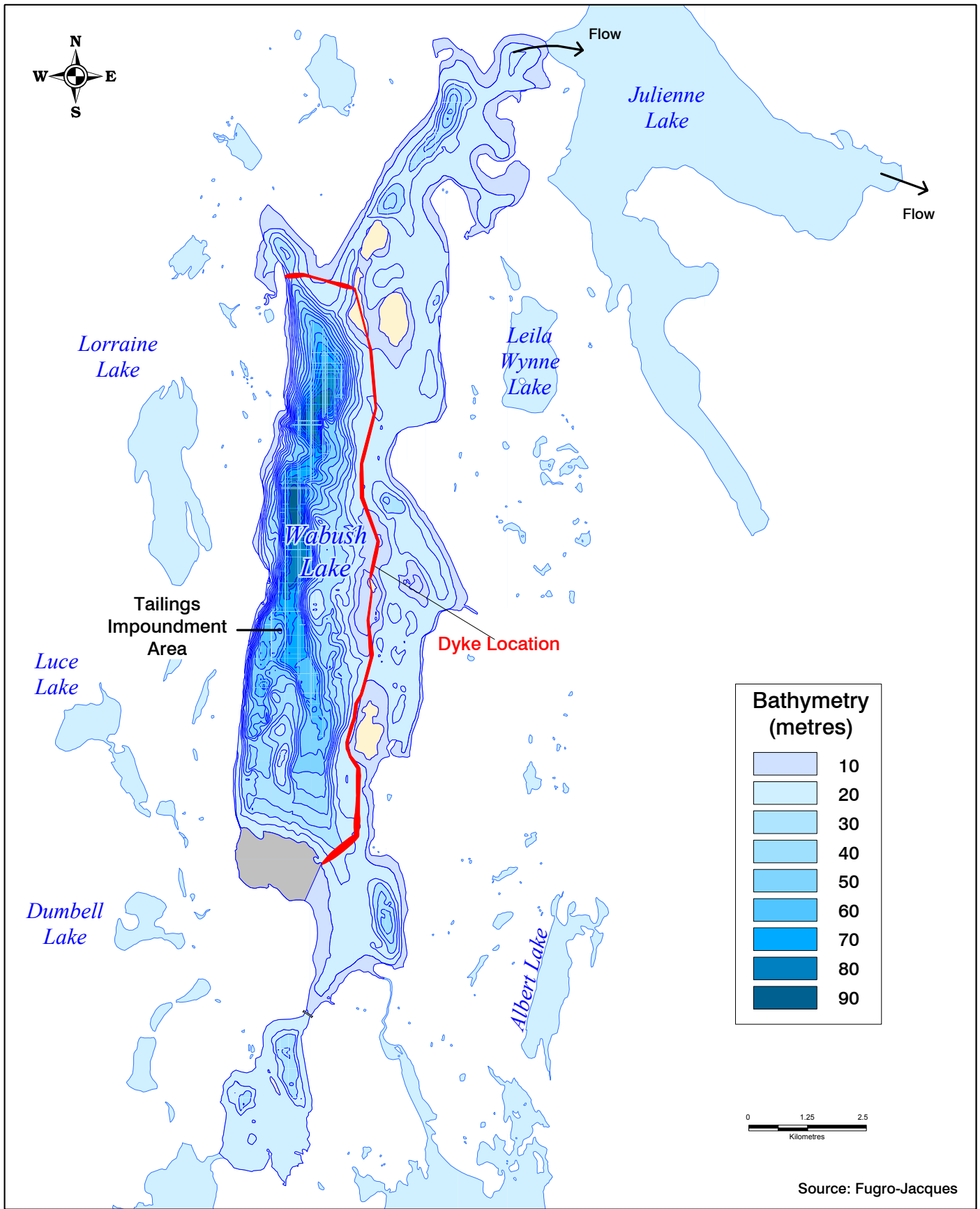
Under the approved TMP 2001, IOC would consolidate all effluent release points to a single location at the north end of the advancing tailings beach, and all such effluent discharges would thereby be confined within the boundary of the Tailings Impoundment Area. This is still the case under the Revised TMP proposal.

1.5.2 Tailings Impoundment Area

The Tailings Impoundment Area that was approved in 2000/01 under the approved TMP 2001 removed approximately 2707 ha (45 percent) of Wabush Lake (Figure 1.2) through construction of a 15-km long rockfill dyke to separate the tailings disposal area from the remainder of Wabush Lake, thus ensuring confinement of tailings effluent behind the dyke. This area would be permanently impounded and form the IOC Tailings Impoundment Area (TIA). Under the Revised TMP, there is no requirement to construct the 15-km rockfill dyke, thus significantly reducing the footprint of the tailings deposition area.

1.5.3 Flocculation of Released Effluent

The approved TMP 2001 included a provision for flocculation of the effluent released from the TIA at the final discharge point into the unconfined area of Wabush Lake. The flocculation would be required only if the red discolouration of the effluent persisted at the designated point of final release at the northeast corner of the TIA. There is no regulatory requirement related to colour of water discharged to the receiving environment and this is a social and community issue that IOC has committed to address as part of the overall project.



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FIGURE 1.2
TAILINGS MANAGEMENT PLAN
APPROVED IN 2001

2.0 PURPOSE AND ALTERNATIVES

2.1 Purpose/Rationale/Need for the Undertaking

The approved TMP 2001, as registered in 2000 (IOC 2000), was designed to comply with new statutory provisions under the MMER, address community and corporate concerns regarding red water, and restore the ecological and recreational values of Wabush Lake. Based on an extensive 4-year R&D program, IOC has identified improved technology and best practices that will enhance the environmental benefits of the approved TMP 2001, provide a more sustainable long-term solution, and continue to meet all project goals to the satisfaction of all stakeholders.

IOC is proposing to modify the approved TMP 2001 to achieve a significantly better environmental outcome which is sustainable in the long-term. This proposal is referred to as the Revised TMP. Under the Revised TMP, confinement of tailings will be achieved through flocculation of the consolidated effluent streams and discharge of the flocculated effluent into the naturally confining trench located in the western portion of Wabush Lake immediately to the north of the existing tailings beach, and within the confines of the existing IOC Lease Line allocation. This approach will confine the tailings within the trench, thus negating the requirement for construction of a 15-km long rockfill dyke within Wabush Lake, and will reduce the footprint of the tailings deposition area as compared to the approved TMP 2001 by approximately 47%.

The Revised TMP will include the construction of short in-lake dykes to connect the three small islands at the north end of Wabush Lake to the eastern shore, thus establishing a single flow channel at the northwest corner of the lake which will be designated as the final discharge point under the MMER. Weekly monitoring will be conducted at this location as required under section 19 of the MMER. Flow measurements will be undertaken with a continuous hydrometric station to be installed within the designated final discharge point.

Extensive pilot and full scale plant flocculation trials as well as supporting environmental studies, tailings rheological analysis and sediment resuspension studies have confirmed that the flocculated tailings will be confined to the deep trench on the western side of the lake. There will also be a significant improvement in the visual amenity of the lake as the fine suspended tailings particles that impart the red hue are settled via the flocculation process. Although there is no statutory requirement to control red water, IOC has recognized this as a community and aesthetic issue, and has incorporated these important control measures in the project.

2.2 Alternatives to the Undertaking

During development of the approved TMP 2001, approximately 70 on-land and in-water options for tailings and red water management were evaluated over a 6 month period. An external advisory group provided guidance during this process, several public consultations were held with stakeholders, and third party technical reviews were conducted to ensure the preferred option met all requirements under the law and also complied with IOC's goals to improve the ecological and recreational values of Wabush Lake.

At the time of the options analysis (1999-2000), the application of a flocculant to eliminate red water and to facilitate confinement of tailings within the trench was not a viable option due to technical uncertainties relating to the effectiveness of the proposal. The impact from the pump characteristics of the IOC tailings transport system, which resulted in introduction of shear forces which rendered the flocculation ineffective. The option selected for the original project was in-lake rockfill dyke construction for the purposes of isolating a portion of Wabush Lake for tailings confinement to achieve compliance with the MMER.

Since that time, numerous studies and a 4-year R&D program have been conducted to optimize the approved TMP 2001. The results of this workplan have provided IOC a flocculant able to withstand the harsh pumping conditions within the IOC transport system, and thus able to effectively control red water and facilitate tailings confinement within the designated tailings disposal area. The studies (summarized in Section 3.2.2) support the Revised TMP option described in this document.

2.3 Requirement for Environmental Assessment

The Revised TMP is subject to the *Canadian Environmental Assessment Act* (CEAA) and the environmental assessment provisions of the *Newfoundland Environmental Protection Act* (NEPA). In 2001, IOC entered into a Compensation Agreement with the federal Department of Fisheries and Oceans (DFO) based on the approved TMP dyke-based project to ensure No Net Loss of fish habitat as a result of the project. The Compensation Agreement will be revised to reflect the revised project.

The Revised TMP will require a Permit for Construction within Navigable Waters under Section 5 of the *Navigable Water Protection Act*, administered by Transport Canada and the Revised TMP will be required to be placed on Schedule 2 of the MMER. These two legislative requirements are “triggers” for the federal assessment process under CEAA.

In December 2004, IOC received from Environment Canada, under subsection (34)3 of the MMER, a Transitional Authorization for Total Suspended Solids for each designated final discharge point reporting to Wabush Lake. This Transitional Authorization expires on 06 June 2007 by which time the Revised TMP project will be completed.

3.0 DESCRIPTION OF THE UNDERTAKING

The Revised TMP will result in a significant net improvement to the existing conditions within Wabush Lake as well as a significant net improvement over the approved TMP 2001. Flocculated tailings will be confined within the designated deposition area (the area of the harmful alteration, disruption, or destruction or HADD), and red water will be mitigated to improve the primary productivity and visual amenity of Wabush Lake. The Revised TMP is a minimum footprint option, and over life of mine is expected to result in a 47% reduction in the HADD when compared to the approved TMP 2001. In addition, under the Revised TMP the HADD will be utilized in stages over life of mine, whereas the TMP 2001 saw the utilization of the full HADD immediately upon project completion.

3.1 Existing Tailings and Plant Effluent Disposal

The consolidation of effluent releases to Wabush Lake under the Revised TMP is common to the approved TMP 2001.

3.2 Project Description (Revised TMP)

3.2.1 Tailings Impoundment Area

IOC is proposing to designate a Tailings Impoundment Area (TIA) within Wabush Lake. The TIA will be bounded to the south by the northern front of the existing tailings beach and bounded to the north at approximately N53 06.5 W66 51 (Figure 3.1). IOC is further proposing to designate only a portion of the TIA for tailings deposition (i.e., the HADD) to meet the current and future requirements of the operation. This designated HADD area is 47% smaller than the HADD identified for the approved TMP 2001 (Figure 1.2), thus creating a significantly smaller footprint with less impact on fish, fish habitat, and recreational uses of Wabush Lake. As noted earlier, under the Revised TMP the HADD will be progressive over the life of mine, with the total HADD that is subject to compensation being realized at end-of-life-of-mine (Figure 3.2), whereas the approved TMP 2001 saw the application of the full HADD immediately upon completion of dyke construction. In spite of the progressive (i.e., 25-30 year) HADD in the Revised TMP, compensation will be made in full in the short-term.

Consolidated tailings will be flocculated and transported to the north face of the existing beach where the deposition strategy will be to maximize the infill capacity of the deep trench located immediately to the north of the tailings area, within the existing IOC Lease Line designation. This will ensure the tailings will be confined to the designated minimum footprint and not spread across the lake.

The northern limit of the TIA will be defined by the construction of short in-lake dykes to connect the three small islands at the north end of Wabush Lake to the eastern shore. This will create a single discharge from the TIA, thus establishing a Final Discharge Point at the northwest corner of the TIA. The TIA will be defined as occupying the full width of the lake but extending no farther north than did the approved TMP 2001. A temporary access road will be constructed to allow for construction of the in-lake structures. The small dyke structures and associated project features are illustrated on Figure 3.1. Figure 3.3 shows a typical cross-sectional depiction of the dykes to be constructed.

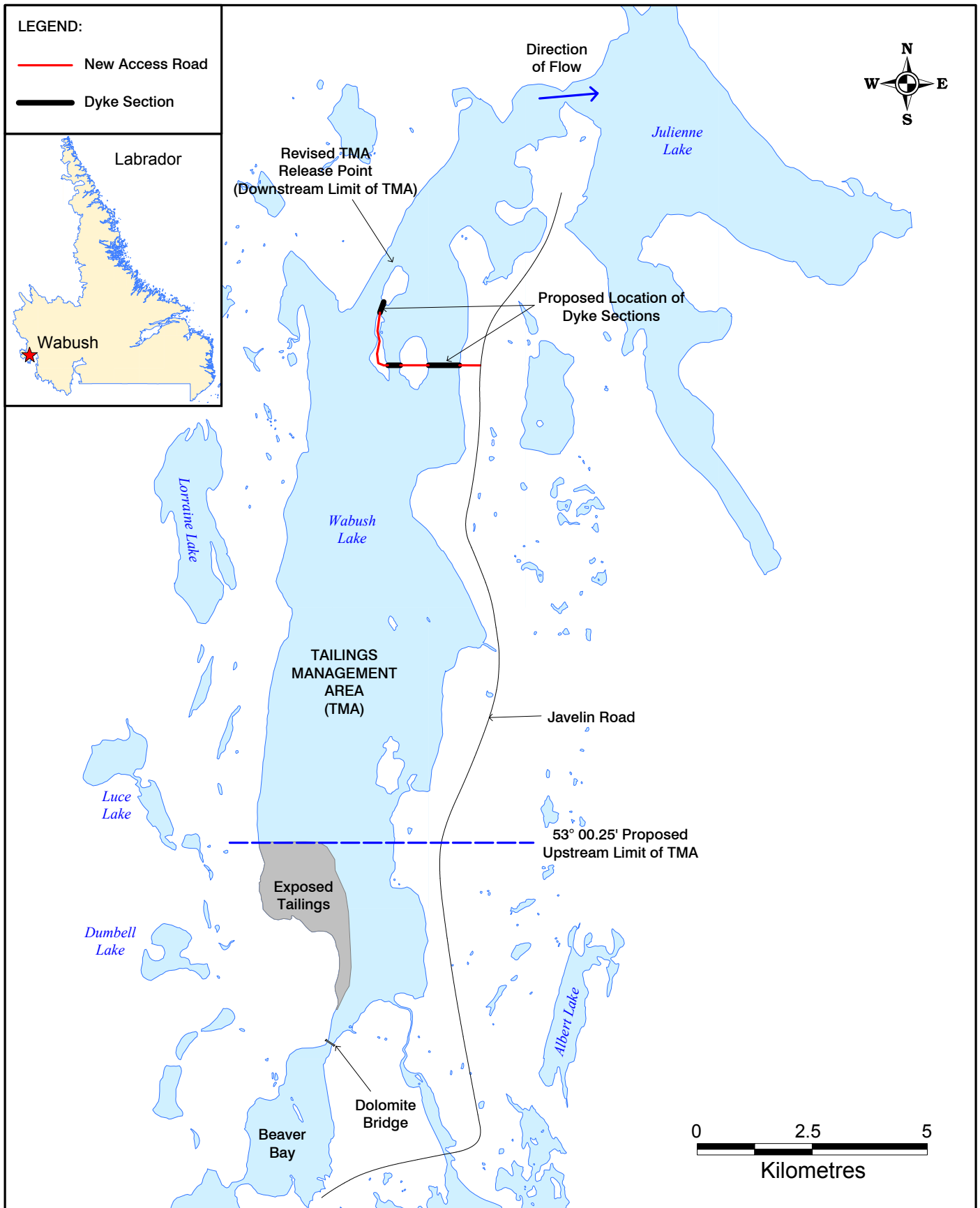
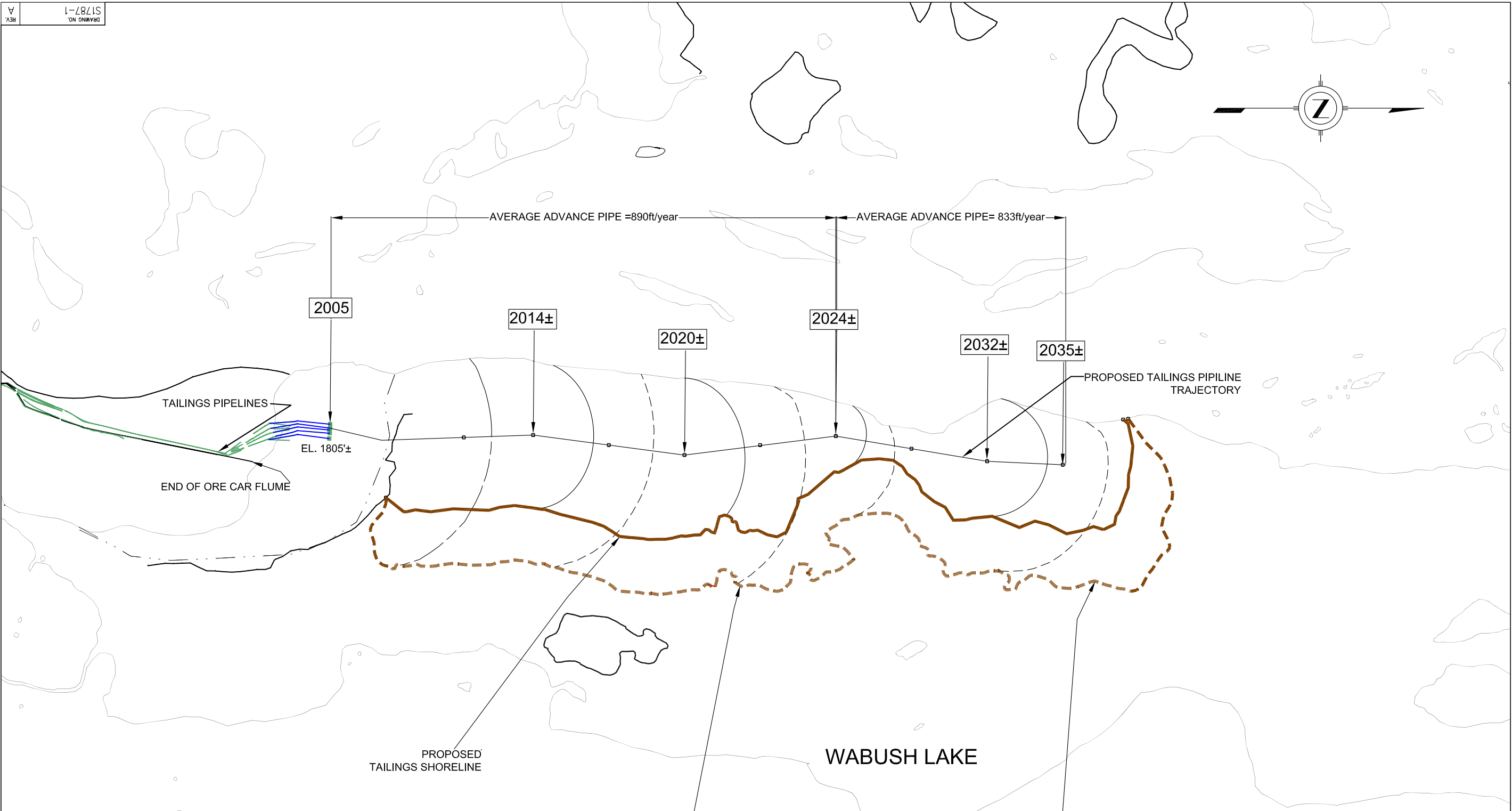
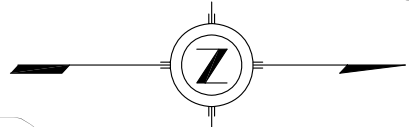


FIGURE 3.1
FEATURES OF THE REVISED TAILINGS
MANAGEMENT PLAN

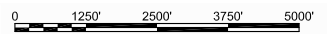




LEGEND:

- SHORELINE
- - - UNDERWATER TOE OF TAILINGS

TOTAL ESTIMATED DEPOSITED TAILINGS VOLUME = 626 925 490m³
 TOTAL ESTIMATED DEPOSITIONAL CAPACITY = 1 003 080 784 TONNES
 (FOR ASSUMED DEPOSITIONAL DENSITY = 100 pcf)
 AVERAGE ESTIMATED OVERALL PIPELINE ADVANCE = 813ft/year
 ESTIMATED LEASE LIFE = 30 years



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IRON ORE COMPANY OF CANADA
 LABRADOR CITY, NEWFOUNDLAND

No	REFERENCE DRAWINGS	No	REFERENCE DRAWINGS	No	DATE	REVISIONS	BY	APP.	No	DATE	REVISIONS	BY	APP.

SPECIFICATIONS NO.	1"=1250'	DATE
XXXXXXXXXXXXXZ	SIGNATURES	NAMES
FILE NO.	PROJECT BY :	N. SKIADAS, eng. 6 FEB 2006
XXXXX	DRAWING BY :	S.HENAU, T.Sc.A. 6 FEB 2006
	VERIFIED BY :	N. SKIADAS, eng. 6 FEB 2006
	APPROVED BY :	N. JOURNEAUX, eng. 6 FEB 2006
JOB NO.	DRAWING NO.	REV.
S-06-1787	S1787-1	A

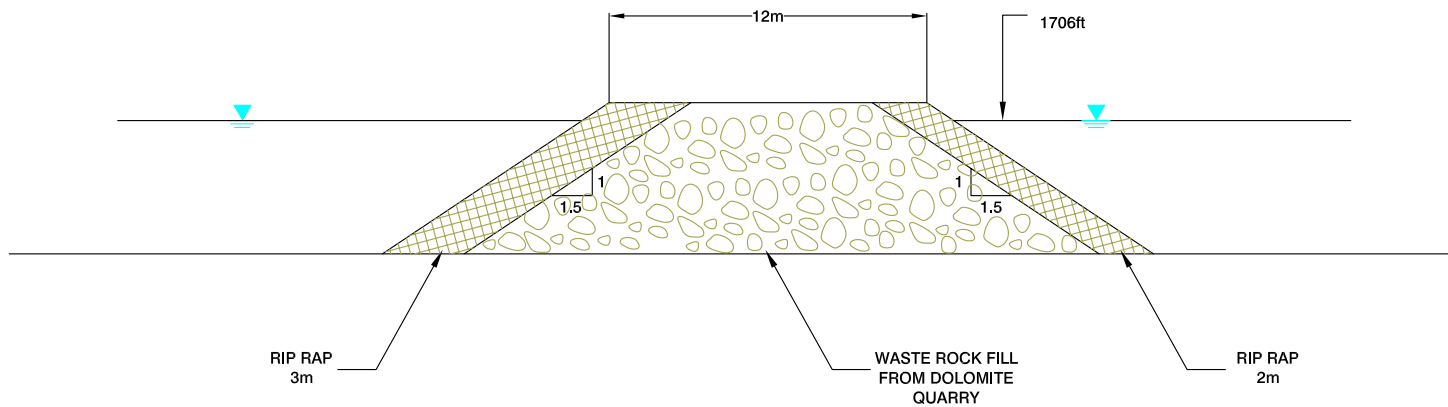


FIGURE 3.2

TYPICAL DYKE SECTION



3.2.2 Flocculation to Control Red Water

The consolidated tailings effluent will be flocculated prior to discharge to reduce suspended material that causes red water and allow for confinement within the trench. Construction works related to flocculation will be initiated in summer 2006, and flocculation will begin prior to June 2007.

Throughout 2002 and 2003, IOC conducted detailed investigations on the efficiency of several state-of-the-art flocculants to improve tailings settling and overall water clarity. These flocculants were not available during the initial examination of tailings management options in 1999 (Lorax Environmental 2004). Based on results of laboratory scale test work, and subsequent pilot tests and full-scale trials, the flocculant selected for the Revised TMP was Magnafloc 10.

During the full-scale 4 month flocculation trial, extensive toxicity analyses was conducted on tailings effluent treated with Magnafloc 10 to ensure the protection of aquatic life. Acute lethality testing (ALT) conducted on flocculated tailings reported zero percent mortality to rainbow trout and *Daphnia magna*. The ALT was repeated at dosage rates of 10X the maximum flocculant dosage rate, with zero percent mortality reported to rainbow trout and *Daphnia magna*. Sublethal toxicity testing on the flocculated tailings effluent did not exhibit toxicity to any of the four species tested. All toxicity tests were conducted as per standard testing protocols.

A study undertaken by CANMET Metal and Mining Laboratory Services on the potential environmental effects of the use of flocculant concluded that Magnafloc 10 toxicity will not be an issue for its application at Wabush Lake, and that the use of Magnafloc 10 will in fact have major environmental benefits to the overall ecology (CANMET 2005a).

A study undertaken by CANMET Metal and Mining Laboratory Services on the biodegradation of polyacrylamide flocculant concluded there is no evidence of polyacrylamide-degrading bacteria in Wabush Lake or in the flocculated tailings samples tested, and that Magnafloc 10 is chemically and biologically stable in IOC tailings (CANMET 2005b). Magnafloc 10 is in use at quarry operations in the Maritimes, including locations near municipalities and public water supplies. Magnafloc 1011, a similar product that is designed to remove waste water solids, is used by some municipalities.

During the full-scale flocculation trial conducted from March-June 2004, IOC demonstrated that lake water clarity is significantly improved throughout the entire water column, greatly increasing light penetration (Lorax 2004). This increased light penetration will result in improved primary productivity, thus increasing the productive capacity of Wabush Lake. A primary productivity survey conducted in June 2004 towards the end of the flocculation trial concluded that based on only 4 months of flocculation, there were improvements in primary productivity when compared to previous surveys at the same locations.

3.3 Design Criteria for the Proposed Changes to Tailings Management

The design criteria for the operational phase of the approved TMP 2001 were developed based on MMER requirements, IOC Best Practice, social and community concerns, and environmental considerations (Golder 1999b). The Revised TMP continues to apply these considerations as summarized below.

3.3.1 MMER Criteria

Tailings Impoundment Area and Compliance with Regulated Limits

The definition of Tailings Impoundment Area is a disposal area that is confined by anthropogenic or natural structures or by both. Confinement is understood to be physical separation from receiving waters. This allows for control of surface water discharge and enables water quality to be monitored under the MMER at the designated final point of discharge.

MMER also requires a final discharge point which is defined as an identifiable discharge point of a mine beyond which the operator of the mine no longer exercises control over the quality of the effluent.

3.3.2 IOC Criteria

Single Point of Discharge for Surface Water

Tailings effluent streams will be flocculated and discharged to the TIA where settlement/confinement of flocculated material will occur. There will be a designated final point of discharge at the northern end of the TIA.

3.3.3 Environmental Criteria

Beneficial Impacts on Lake Water Quality

The Revised TMP will have no perceptible impact on the natural levels of Wabush Lake. The diversion of flows from between the islands to the western channel will increase water velocity imperceptibly in that channel, and this will have no impact on navigation (Golder 2005). Flocculation will remove turbidity and colour from the lake water, thus improving water clarity throughout the entire water column across the lake system. The Revised TMP will see a reduction in the tailings deposition area by 47% (as compared to the approved TMP 2001), thus increasing the amount of the lake available for public use.

Erosion Control

Erosion control criteria adopted for the operational phase of the three small dyke sections to be constructed at the north end of Wabush Lake are dictated by the 100-year flood and 100-year wind waves. The objective of the criteria is to avoid excessive erosion during operation. The in-lake structures will be designed for long term sustainability, allowing gradual evolution in the long term (i.e., 1000 years) while preserving the function of the dykes. This will be accomplished by construction of waste rock dykes composed of coarse fractions that will protect the structures even though wave erosion may cause some flattening of the dyke slopes.

Dyke Freeboard

Dyke freeboard during operation will be provided to avoid submergence during the 100-year flood. A minimum freeboard of 2-m has been provided for normal lake level fluctuations up to 1.5 m plus a 0.5 m freeboard for wave run-up. Additional freeboard will be provided during construction to allow for settlement.

Dyke Crest Width

The crest width of the dykes will be dictated by dyke stability and safety requirements.

Reclamation and Closure

A sustainable closure configuration will be developed after mine closure, which is assumed to occur in 2025 for the purposes of closure planning. Closure criteria include aesthetic configuration (contouring) of the tailings landforms, restoration of aquatic and terrestrial habitat and long term integrity of landforms including slope stability, wave erosion, surface runoff erosion, flooding and vegetation cover. IOC was a recipient of the North American Waterfowl Management Plan 2004 National Great Blue Heron Award for its Tailings to Biodiversity project in which a mixture of rock and sand wetlands, uplands and riparian areas are being created from inert tailings. Active plans for further tailings reclamation include creation of additional wetland.

In general, the reclamation systems and abandonment facilities will be designed for long term stability allowing for gradual erosion and deformation at a geomorphic rate comparable to that of the natural environment.

3.4 Project Schedule

IOC has established a schedule for the development of the Revised TMP to comply with the MMER. Key milestones include:

- Release from environmental assessment process April 2006
- Obtain permits and begin construction of dykes June 2006
- Complete dykes December 2006
- Installation of flow monitoring equipment August 2006
- Commence flocculation April 2007
- Consolidation of Effluent Releases May 2007
- Expiration of Transitional Authorization for TSS May 2007

3.4.1 Construction Phase

Construction will consist of several activities including the construction of permanent and temporary features. Permanent features include flocculation systems to control red water and the three short dykes at the north end of the lake. A temporary access road will be required to allow material haulage from the existing IOC quarry to the dyke location. These elements are described below followed by an outline of environmental protection measures for the construction phase.

Flocculation to Control Red Water

A flocculation addition system will include reagent offloading, storage, handling and feedback control to the tailings pumping system. The flocculation system installed at the tailings pumphouses and used during the flocculation trials in 2004 will be re-commissioned. Commissioning and operation of the flocculant systems will be done by a contractor with expertise in this field.

Access Road Construction

An access road measuring approximately 195 m long from Javelin Road to the area of the three dykes will be built and operated in accordance with applicable regulations and will be decommissioned when no longer required. There are no watercourse crossings on the new access road between Javelin Road and Wabush Lake. Public access to the road will be restricted at all times during and after dyke construction.

The access road across the first island to the second dyke will be 627 m long and the access road across the second island to the third dyke will be 1.3 km long (Figure 3.1). There will be no access road on the island beyond the third dyke.

Construction of Dykes at North End of Wabush Lake

Three dykes will be constructed to connect three islands to the eastern shore of Wabush Lake. This will create a Final Discharge Point from the TIA. The dykes, from east to west, will be 657 m, 252 m, and 225 m long. The alignment of the three dykes is depicted in Figure 3.1. The dykes will be composed of waste rock fill from the nearby IOC Leila Wynne dolomite quarry. The dykes will be permeable as there is no requirement to maintain a head or to filter the water for purposes of maintaining water quality. Materials will be placed by end dumping from trucks with material spread by a dozer.

Waste Management

Waste generated on-site will be collected and stored in accordance with the Newfoundland and Labrador *Waste Material (Disposal) Act* and accompanying regulations. It will be disposed at the established waste disposal site in Labrador City, pending the approval of the Town. Portable toilets and/or existing septic systems will be used for sewage disposal.

The following environmental protection measures will be applied to waste management:

- Waste accumulated on-site prior to disposal will be confined so that it does not pose an environmental or health hazard. No waste material will be deposited in or within 30 meters of a water course.
- Any waste that may attract wildlife will be stored in covered containers.

Storage, Handling and Transfer of Fuels and other Hazardous Materials

Hazardous materials that may be required at site during dyke construction include diesel fuel, gasoline, oils and lubricants, coolants, cleaning solvents, explosives and detonators. These materials will be properly stored at site. Waste oils and lubricants will be retained in a tank or closed container and disposed at a licensed off-site facility.

The storage and transport of all hazardous materials will conform to the *Transportation of Dangerous Goods Act* and accompanying regulations. Practices to be followed include:

- All necessary precautions will be taken to prevent and minimize the spillage, misplacement or loss of fuels and other hazardous materials.

- Fuels and other hazardous materials will be handled only by persons trained and qualified in handling these materials in accordance with the manufacturer's instructions and government laws and regulations. Operators will be in attendance for the duration of a refuelling operation.
- Oils, greases, gasoline, diesel or other fuels will be stored at existing facilities which are at least 100 m from any surface water. The existing fuel storage is designed in compliance with the *Storage and Handling of Gasoline and Associated Products Regulations*.
- Handling and fuelling procedures will be such that contamination of soil or water will not occur.
- Fuel storage areas will be clearly marked or barricaded to ensure that moving vehicles does not damage them. The markers will be visible under all weather conditions. Barriers will be constructed in compliance with the *Storage and Handling of Gasoline and Associated Product Regulations*.
- Smoking will be prohibited within 10 m of a fuel storage area.
- Refuelling on land will be done 30 m distant from any watercourse. The contractor will be required to implement a protocol to minimize the risk of fuel spills and to confine and treat any spills that may occur.
- The contractor will be required to implement emergency measures in the event of a spill event to prevent the fuel or oil from entering the lake.
- WHMIS system will be used for labelling all hazardous materials and MSDS sheets will be maintained at storage areas.

Marshalling and Storage Areas

Marshalling areas will be located at the existing IOC Leila Wynne Dolomite Quarry to facilitate the receiving and storage of materials and equipment such as earth-moving machines and large haulage trucks. The marshalling area will be approximately 200 m by 200 m in size.

3.4.1.1 Employment and Occupations during Construction

Construction of the three dyke sections is anticipated to require between 200,000 and 300,000 cu. m of rockfill. This material will be transported and placed in the period from 1 June 2006 to 31 December 2006. The occupations and labour for this task will be contracted out and comprise a total estimated effort of 100,000 man-hours. Construction activities will be in two-8-hour shifts per day employing:

- 16 truck drivers;
- 4 dozer operators; and
- 2 supervisors for the combined two-shifts.

3.4.2 Operation Phase

The Revised TMP is scheduled for completion by 06 June 2007 after which it will be operational for the life of the mine.

3.4.2.1 Consolidation of Discharges and Flocculation

Tailings will be consolidated as noted in the approved TMP 2001. Under the Revised TMP the consolidated tailings will be flocculated as described in Section 3.2.

3.4.2.2 Maintenance during Operations

Dyke Maintenance

The dykes will be regularly inspected for erosion and embankment stability.

3.4.2.3 Environmental Protection during Operation

Storage, Handling and Transfer of Fuels and other Hazardous Materials

The storage and transport of all hazardous materials will conform to the *Transportation of Dangerous Goods Act* and accompanying regulations. Practices to be followed include:

- IOC will take all necessary precautions to prevent and minimize the spillage, misplacement or loss of fuels and other hazardous materials.
- IOC will ensure that fuels and other hazardous materials are handled only by persons who are trained and qualified in handling these materials in accordance with the manufacturer's instructions and government laws and regulations. Operators will be in attendance for the duration of a refuelling operation.
- Oils, greases, gasoline, diesel or other fuels will be stored at existing facilities which are at least 100 m from any surface water. The existing fuel storage is designed in compliance with the *Storage and Handling of Gasoline and Associated Products Regulations*.
- Handling and fuelling procedures will be such that contamination of soil or water will not occur.
- Fuel storage areas will be clearly marked or barricaded to ensure that they are not damaged by moving vehicles. The markers will be visible under all weather conditions. Barriers will be constructed in compliance with the *Storage and Handling of Gasoline and Associated Product Regulations*.
- Smoking will be prohibited within 10 m of a fuel storage area.
- Fuelling or servicing of mobile equipment will not be allowed within 30 m of a watercourse.

3.4.2.4 Employment and Occupations During Operation

The flocculation process will be managed through a contractor with expertise in this field. Dyke inspection and maintenance will be part of the regular duties of existing IOC personnel.

3.4.3 Decommissioning/Post-Decommissioning and Reclamation Phase

A rehabilitation and closure plan has been developed for the Carol Project in accordance with the Newfoundland and Labrador *Mining Act*.

Closure criteria include aesthetic configuration (contouring) of the tailings landforms, restoration of aquatic and terrestrial habitat and long term integrity of landforms including slope stability, wave erosion, surface runoff erosion, flooding and vegetation cover.

In general, the reclamation systems and abandonment facilities will be designed for long term stability allowing for gradual erosion and deformation at a geomorphic rate comparable to that of the natural environment.

Progressive Reclamation

The reclamation of the tailings disposal area will be staged over the life of the facility, resulting in minimal reclamation investment at the end of the mine life. Progressive reclamation activities will include contouring and re-vegetating inactive tailings areas as well as wetlands creation to establish an ecologically diverse area for wildlife.

3.4.4 Potential Accidental Events

Similar to the dyke structures under the approved TMP 2001, safety factors will be incorporated into the design of the dykes for seismic and storm events. Current IOC hazardous spill preventative measures will be extended to project activities.

Hazardous material such as fuel, lubricant, gasoline, oils, and coolants could potentially be spilled during re-fuelling or transportation. Emergency response procedures and contingency plans for environmental releases are in place at the Carol Project site to respond to and contain accidental spills, and would be implemented as required.

3.5 Project-Hydrology Interactions

As is characteristic of northern areas, streamflow in the project area is dominated by the spring snowmelt runoff. The date of the start of the spring runoff can vary by several weeks, depending on the spring temperature sequence. Once the spring runoff is over, streamflow increases or decreases in response to summer rains until the end of October, when temperatures drop below freezing and runoff declines. The lowest flows occur in the late winter.

Wabush Lake, Julienne Lake and Shabogamo Lake are interconnected and are at approximately the same elevation; the outflows are controlled at Marshall Rapids, at the outlet of Shabogamo Lake. The Wabush-Julienne-Shabogamo Lake system regulates inflows from all the surrounding watersheds, and is a part of the larger Churchill River watershed. Wabush Lake itself is a long, narrow lake, oriented in a north-south direction. It is approximately 25 km long and 2 to 4 km wide, with a surface area of approximately 67 km². Currently, the flow velocity (current) in Wabush Lake is so low that it is almost imperceptible. Although the general flow direction is from south to north, with outflow at the Julienne Narrows, surface velocities are low and may often be reversed in strong northerly winds.

The installation of the three short dykes at the north end of Wabush Lake will have negligible effect on the flow velocity in the remaining open channel (Golder 2005). As well, since the channel at the discharge point is bigger than the channel at the Dolomite Bridge and at Julienne Narrows, there is not expected to be any perceptible change in water levels in Wabush Lake.

IOC has also consulted with the local boating associations regarding the configuration of the three dykes at the north end of the lake to ensure that the preferred navigation channels are not impacted. Based on feedback from the association, IOC agreed to preserve the western flow channel as the navigable channel (see letters contained in Appendix A).

3.6 Potential Effects of the Environment on the Project

Best engineering practices will be used to design the dykes, including adherence to applicable MAC guidelines. Site-specific information will also be used in the design of the dykes. Environmental factors that may affect the dykes include:

Ice

To address the potential displacement of rockfill by lake ice, adequately sized rock fill will be incorporated into the dyke design as was the case for the approved TMP 2001.

Erosion Control

Erosion control criteria adopted for operation of any structures in Wabush Lake are the 100-year flood and 100-year wind waves. The objective of the criteria is to avoid excessive erosion during operation.

Soft Foundation

There is low likelihood that soft foundations will be encountered at the proposed dyke locations as they are relatively shallow areas and they are >10 km downstream from historical tailings depositional areas. IOC will investigate substrate and foundation conditions to determine any technical constraints. Construction methods and materials will be selected accordingly.

3.7 Environmental Management

IOC has a strong commitment to employee well-being and environmental protection, and demonstrates this commitment through its ESH Policy, its Missions and Values, and Sustainable Development. IOC is certified to ISO 14001:2004 (Environmental Management Systems (EMS)). IOC will implement environmental management procedures consistent with applicable legislation, a precautionary approach, and IOC and Rio Tinto Policies. Contractors are encouraged to implement an EMS and will be required to consider the best available technology for all activities and use appropriate measures to prevent adverse effects.

3.7.1 Monitoring

Under the MMER, there is a requirement for compliance monitoring. In addition an Environmental Effects Monitoring Program will be established, as guided by *MMER*. There may also be requirements for additional monitoring associated with issuance of a Section 35 (2) *Fisheries Act* Authorization.

3.7.2 Environmental Protection Plan

An Environmental Protection Plan (EPP) is a comprehensive document, which is designed to be field usable and facilitates the mitigation of predicted environmental impacts. In parallel with the environmental assessment process, IOC is preparing an EPP for the Revised TMP which will serve as the framework for the implementation of environmental requirements and mitigative measures. The EPP will be developed in full consultation with appropriate regulatory agencies and submitted to these agencies for approval.

3.8 Project Related Documents

In 2000, IOC provided several relevant project related reports and documents to NL DOEC – Assessment Division with the registration of the approved TMP 2001. The following project related documents are provided to NL DOEC in support of registration of the Revised TMP:

- CANMET (CANMET Mining and Mineral Sciences Laboratories). 2005a. Evaluation of the Potential Environmental Effects of the Use of Flocculent at IOC, Labrador City, NL. Prepared for Iron Ore Company of Canada. CANMET-MMSL 05-015(CR).
- CANMET (CANMET Mining and Mineral Sciences Laboratories). 2005b. Biodegradation of Polyacrylamide Flocculent – Final Report. Prepared for Iron Ore Company of Canada. CANMET-MMSL 05-017(CR).
- CANTOX Environmental. 2002. Particulate Matter Air Quality Risk Assessment Study for the Iron Ore Company of Canada Facility in Labrador City, Labrador. Prepared for Iron Ore Company of Canada.
- EcoMetrix. 2004. EEM Cycle 1 Study Design for the IOC Facility at Labrador City. Prepared for Iron Ore Company of Canada. Reference 04-1162.0.
- Golder Associates Ltd. 1999a. Wabush Lake Climate and Hydrology. Prepared for Iron Ore Company of Canada.
- Golder Associates Ltd. 1999b. Engineering Report on Tailings Disposal Options. Prepared for Iron Ore Company of Canada.
- Golder Associates Ltd. 2005. Modeling Analysis of Effects of Tailings Management on the Wabush Lake Currents. Memo from Golder Associates to IOC, December 9, 2005.
- Golder Associates Ltd. 2005. Modeling Analysis of Effects of Tailings Management on the Wabush Lake Currents. Memo from Golder Associates to IOC, December 9, 2005.
- Lorax Environmental. 2004. Wabush Lake Hydrodynamics and Flocculation Test Monitoring. Prepared for Iron Ore Company of Canada.

4.0 SCOPE OF THE ASSESSMENT

4.1 Scope of the Project

The scope of the Revised TMP includes:

- Access road construction;
- Construction of three small dykes at the north end of Wabush Lake; and
- Flocculation of effluent for red water management and confinement.

This registration identifies the potential environmental effects associated with the construction, operation, and decommissioning/post-decommissioning phases of the Revised TMP.

4.2 Issues Scoping

Issues scoping is the process used to focus the environmental assessment on issues and concerns identified by the public, technical experts and regulatory agencies. The comments received from consultations are organized and evaluated to identify the Valued Environmental Components (VECs), components, which are both, valued by society and can serve as indicators of change. The strategy used in preparing the environmental assessment design for this report is based on the framework for an environmental assessment recommended by Beanlands and Duinker (1983) and by the Canadian Environmental Assessment Agency (CEAA 1994).

Issues and concerns identified in the original registration of the TMP 2001 included dust control, red water, and effects to fish populations.

Information on the Revised TMP has been provided to regulatory agencies and stakeholders. The Labrador West Joint Buoy Committee is supportive of the changes to the Revised TMP as is the Town of Labrador City. Letters of support from these organizations for the Revised TMP are provided in Appendix A.

4.3 Selection of Valued Environmental Components

For the original registration document, the following VECs were identified:

- Air Quality;
- Water Quality;
- Fish and Fish Habitat
- Terrestrial Wildlife and Habitat; and
- Resource Use.

With the implementation of mitigations, no significant adverse environmental effects were identified for the approved TMP 2001. In fact, the environmental effects of the approved TMP 2001 were considered to be positive. With the Revised TMP as described in this document, further positive effects on the environment of Wabush Lake will be realized. In Section 5, Environmental Effect Analysis, a comparison will be made between the environmental effects of the approved TMP 2001 and the Revised TMP.

4.4 Project-VEC Interactions

The project activities that may interact with the VECs include:

Construction

- access road construction;
- vehicular movement;
- placement of dyke material;
- red water management (e.g., flocculation);
- tailings discharge modification (consolidation); and
- waste management.

Operation

- red water management (e.g., flocculation);
- tailings discharge modification (consolidation);
- point discharge of surface water; and
- dyke maintenance.

Decommissioning

- aesthetic configuration (contouring) of the tailings landforms.

Accidental Events

- fuel or hazardous material spill.

5.0 ENVIRONMENTAL EFFECTS ASSESSMENT

5.1 Air Quality

The fugitive dust associated with the tailings will be mitigated through the IOC annual progressive re-vegetation program, and as such the dust levels are not anticipated to increase.

Similar to the TMP 2001, particulates will be released in various quantities into the airshed during construction of the dykes and access roads for the Revised TMP, and during operation due to wind-blown resuspension from the tailings area. However, the amount of fugitive dust generated during construction of the Revised TMP will be less than that predicted for the TMP 2001 since the amount of construction will be greatly decreased (i.e., three small dykes versus the large 15-km rockfill dyke in the original project), no quarry construction is required, and the period of construction will be significantly reduced (i.e. one year of construction versus seven years in the original project). The level of fugitive dust generation during operation will remain unchanged.

Mitigations for fugitive dust releases that will be applied to the Revised TMP may include watering, chemical stabilization, reduction of surface wind speed with vegetation, windbreaks or source enclosures. The tailings will be re-vegetated in a progressive fashion and road surfaces and other physically disturbed areas will be watered as appropriate to control fugitive dust emissions.

In summary, the environmental effects on air quality of the Revised TMP will not be significant and it is anticipated that the amount of fugitive dust released during construction will be lower than under the TMP 2001 due to the decreased amount of dyke construction that will occur. Measurable increases of SPM will not occur in Labrador City.

Monitoring beyond current existing regulatory requirements is not required.

5.2 Water Quality

The Revised TMP will result in positive effects to water quality through flocculation of particulate matter that will result in significant improvement to water clarity in Wabush Lake and downstream in Julienne and Shabogamo lakes.

Under the TMP 2001, tailings were to be impounded and red water was to be flocculated at discharge if required, thus allowing the open portion of Wabush Lake to become clear of suspended particulate matter. However, subsequent studies (described in Section 3.3.1 and references provided in Section 3.7) have proven that effluent treatment with flocculation at source will significantly improve water quality within Wabush Lake and tailings will be confined to a discrete area on the west side of the lake. Therefore, construction of a large tailings impoundment dyke is not required and water quality will be improved in all of Wabush Lake through the flocculation process that will be implemented as part of the Revised TMP.

The Revised TMP will interact with Wabush Lake water during all phases. Secondary interactions with water during the construction phase include access road construction, drilling and blasting (if required), and construction of the three small dykes. No new quarries will be required since dyke construction material will be waste rock from the existing IOC Leila Wynne Dolomite Quarry. During operations red water will be managed, resulting in improved water quality in of Wabush Lake and downstream. Accidental events that could interact with water quality within Wabush Lake include spills of hazardous materials including fuels and lubricants and construction of access roads across the islands in Wabush Lake. With the Revised TMP, dyke failure will have less effect on water quality in

Wabush Lake since all water will be treated and the purpose of the dykes is simply to direct water flow through a single discharge point.

In the registration for the TMP 2001, the environmental effects of the project on water quality were predicted to be positive since a portion of Wabush Lake would become clear. The Revised TMP will result in greater positive environmental effects since the entire lake will become clear and tailings will be confined without the requirement for a large dyke.

Similar to the TMP 2001, the Revised TMP continues to be mitigative in nature, addressing a brownfield site and restoring it to near greenfield conditions.

In addition to consolidation of effluent and flocculation of effluent, other mitigative measures for water quality include:

- sediment will be controlled during dyke construction by careful selection of rock fill material, and monitoring local effects. Silt fences will only be used if necessary (note no watercourses will be crossed during access road construction);
- should blasting be required, blasting activities will comply with government laws and regulations, and follow blasting guidelines provided by DFO (Wright and Hopky 1998);
- clearing will be restricted to that required for construction of the access roads to each of the small dyke segments;
- refuelling and fuel storage will be conducted at least 30 m from waterbodies except for machinery stationed on the dykes; and
- contingency plans will be implemented for spill prevention and emergency preparedness programs.

5.2.1 Monitoring of Water Quality

IOC has conducted water quality EEM since the 1990s. The program commenced in 1994 following procedures that were developed for the Pulp and Paper Industry and those being developed by CANMET and the AETE for the mining industry.

Since 1978 effluents from the operation have not been acutely lethal to rainbow trout or *Daphnia magna*.

An environmental effects monitoring (EEM) program is required by MMER, and has been developed and implemented in consultation with the appropriate government authorities (Ecometrix 2004).

Additional water quality monitoring is conducted as required by the provincial Certificate of Approval.

5.3 Fish and Fish Habitat

The TMP 2001 proposed to partition Wabush Lake with a 15-km rockfill dyke, resulting in changes to fish habitat both within the confinement area and in the open water area. Construction of the confinement area would have isolated a portion of Wabush Lake and thus affected fish habitat. The Revised TMP will not isolate any portion of Wabush Lake

and the amount of fish habitat affected by dyke construction will be greatly decreased (47 percent less HADD). As well, the flocculation of red water will result in improved water quality within the entire lake area.

With the Revised TMP, the volume of runoff into and out of Wabush Lake will not change and there will be no perceptible change in water levels in the lake. As well, the rate of flow into and out of Wabush Lake will not change.

Accidental events which could interact with fish and fish habitat include spills of hazardous materials, access road construction across the islands in Wabush Lake and dyke failure. Failure of the dykes that are part of the Revised TMP would have less adverse effect on water quality in Wabush Lake since all water will be treated and the purpose of the dykes is simply to direct water flow through a single discharge point.

The TMP 2001 was a mitigation to improve the existing conditions of Wabush Lake and the overall environmental effects of that plan were considered to be positive. The Revised TMP described in this document will result in further improvement to fish and fish habitat in that no large dyke will be required (i.e., minimum footprint), no new quarry development will be required, and flocculation of red water will result in clear water in the entire lake. The placement of the three small dykes will result in the loss of fish habitat within the footprint of the dyke and the creation of good quality habitat on the dyke faces, although only the outside face will qualify as partial compensation for lost habitat. However, the total amount of HADD to productive habitat will be much less than the amount that would have occurred as a result of the tailings impoundment area considered in the approved TMP 2001.

Preliminary discussions have been ongoing between IOC and the Department of Fisheries and Oceans on HADD and compensation issues. It is expected that the improvements to water quality and fish habitat, outside of the TIA, that will be achieved with the consolidation and flocculation activities will compensate for the HADD.

Mitigation and environmental protection measures specifically related to the protection of fish and fish habitat include:

- work will be performed in a manner ensuring that no deleterious substances such as sediment, fuel and oil enter waterbodies;
- sediment will be controlled during dyke construction by careful selection of rock fill material, and monitoring local effects. Silt fences will only be used if necessary;
- should blasting be required it will comply with government laws, regulations and DFO guidelines (Wright and Hopky 1998). A blasting plan will be developed and followed by contractors;
- clearing will be restricted to that required for construction of the access roads to each of the small dyke segments;
- refuelling and fuel storage will be conducted at least 30 m from waterbodies except for machinery stationed on the dykes;
- contingency plans will be developed and implemented for spill prevention and emergency preparedness programs; and
- if necessary, fugitive dust from construction activities will be controlled by dust control agents such as water.

As previously indicated, the Revised TMP will be mitigation that improves fish habitat conditions in Wabush Lake. Therefore, residual effects will be positive overall. During construction positive effects will be realized through the

initiation of red water management, and subsequent improvement to water clarity. The operations phase will result in a positive effect to fish habitat by way of increased water clarity, improved phytoplankton and zooplankton communities, and consolidation and discharge of tailings to the north of the tailings beach, thus improving the quality of the benthic community in the remainder of Wabush Lake.

As described in the registration for the TMP 2001, an EEM program, as required by the MMER, was implemented at the site (Year 1 completed in 2005). Monitoring for fish and fish habitat will focus on the improvement to the substrate, the plankton community and fish health and productivity, as well as resource use. Monitoring programs will include as required: phytoplankton and zooplankton community and biomass changes, sediment toxicity and a benthic community structure study. In addition, a fish monitoring program will be initiated to determine if fish productivity and fish health change in Wabush Lake and at an appropriate control site. A phytoplankton and zooplankton sampling program could be initiated to monitor the positive changes in productivity.

5.3.1 Monitoring

The MMER-EEM program is intended to evaluate the effects of mining effluent on the aquatic environment, specifically fish, fish habitat, and the use of fisheries resources as defined in the *Fisheries Act*. IOC has completed the First Cycle EEM program and the report will be completed before June 2006. As well, ecotoxicological work was completed to confirm that the proposed flocculant (Magnafloc 10) is non-toxic to the receiving environment (CANMET 2005a) (Refer to Section 3.4.1).

A study aimed at understanding the long-term fate of the flocculant itself was conducted. Results show there is no evidence of polyacrylamide-degrading bacteria in Wabush Lake or in the flocculated tailings samples tested (CANMET 2005b).

Monitoring for the Fish Habitat Compensation Program focuses on the improvement to the substrate, the plankton community and fish health and productivity, as well as resource use.

5.4 Terrestrial Habitat and Wildlife

The only terrestrial physical disturbance associated with the Revised TMP will occur in areas where access roads are developed for dyke construction.

In the registration for the TMP 2001, the adverse environmental effects associated with terrestrial habitat in the study area during construction and operation were assessed to be negligible (not significant). Accidental events were assessed as having a minor (not significant) environmental effect on terrestrial habitat and wildlife since, in the terrestrial environment, only plant communities or wildlife in the immediate area of the event would be affected. Within the aquatic environment, the effect, though possibly not as localized as in the terrestrial environment, would be over a short period of time and would not affect other trophic levels or the integrity of wildlife populations. The effect at decommissioning and post-decommissioning was assessed as positive because the re-vegetation of the tailings will result in a net increase in terrestrial habitat. Improved water quality conditions within Wabush Lake will result in improved habitat for aquatic furbearers and waterfowl.

With the Revised TMP, although a small amount of terrestrial habitat will be temporarily lost due to access roads required during dyke construction (approximately 63 ha), a net gain will be realized (more than 10 km²) at project completion resulting from the re-vegetated tailings. The estimated amount of terrestrial habitat lost to access road

construction is conservative in that it assumes a 30 m-wide RoW and it is unlikely that the RoW for the access roads will be cleared to 30 m in any area. The amount of terrestrial habitat lost through the Revised TMP will be less than that identified for the approved TMP 2001 since no new quarries are required, the amount of access road construction is decreased, and the western shoreline of Wabush Lake will remain undisturbed. As well, elimination of red water will result in improved clarity over the entire lake rather than only a portion of it, thus providing increased foraging opportunities for piscivorous waterfowl (loons, mergansers).

In the unlikely event of a hazardous material spill on land, small areas of vegetation or individual animals in the immediate area could be affected. A spill in the aquatic environment could effect food resources for waterfowl or cause direct mortality through oiling. However, such events would not likely affect a large portion of the regional population of any particular species. Similarly, vehicular collisions would not adversely affect regional wildlife populations.

Specific mitigative measures for terrestrial plant communities and wildlife include the following:

- clearing of vegetation will be confined to those areas where it is absolutely necessary;
- tailings will be re-vegetated on an annual basis and will include wetlands development;
- implementation of erosion and sediment protection measures as required near and in water bodies;
- to reduce the incidence of road-kill, speed limits will be enforced on haul roads and vehicles will yield to wildlife;
- waste will continue to be managed and disposed so that wildlife (i.e., black bears) are not attracted; and
- fuel and hazardous materials handling, and oil spill response procedures will be implemented as and if necessary.

5.5 Resource Use

The Revised TMP will allow for the continued use of the majority of Wabush Lake for recreational purposes and will improve water quality and fish and fish habitat within Wabush Lake and downstream, thereby resulting in a positive effect for resource use. Unlike the approved TMP 2001, the Revised TMP will not require a change in the traditional navigation route through Wabush Lake (refer to letter from Labrador West Joint Buoy Committee, Appendix A).

Building the dykes at the northern end of Wabush Lake will affect resource use to a small degree. In-lake activity associated with constructing the dykes may interfere locally with boat use in Wabush Lake as the construction period for the dykes corresponds with the period in which boating occurs in the lake. The area of construction is not along the traditional navigation route in Wabush Lake. Wabush Lake is not used for recreational activities to any extent therefore construction activities will not directly affect use.

Noise and dust will be limited to the dyke construction areas. This noise or dust will be localized to the northeast part of the lake as compared to the larger dykes in the approved TMP 2001. The remainder of Wabush Lake and the downstream lakes will not be affected by noise and dust from dyke construction.

The Revised TMP will improve lake water quality and aesthetics more so than that predicted for the approved TMP 2001. The red colour will be eliminated by flocculation, improving the biological and aesthetic quality of water in Wabush Lake. This will have a positive effect on resource use in Wabush Lake and lakes downstream. The fact that the water will be clearer may lead to an increase in resource use throughout the lake system.

The three dykes at the northern end of Wabush Lake will be permanent features. Unlike the case under approved TMP 2001, the Revised TMP will maintain the traditional navigable channel along the western side of Wabush Lake for boat and snowmobile travel along the lake. Buoys and navigational aids will be placed at appropriate sites to provide sufficient visual recognition from all water based and winter recreational activities.

Any accidental event occurring at any phase of the project could have implications for resource use. However, the probability of an event, such as dyke failure, or the accidental release of flocculant into other nearby water bodies is low. An accident could result in adverse effects on fish and fish habitat. Any change in fish populations or the quality of the fish would affect resource use levels slightly. Failure of the dykes that are part of the Revised TMP would have less adverse effect on water quality in Wabush Lake since all water will be flocculant-treated and the purpose of the dykes is simply to control water flow through a single discharge point.

5.6 Cumulative Environmental Effects

Wabush Lake is affected by operations at IOC's Carol Project and municipal sewage discharge from Labrador City. Indirect effects on the lake arise from mining operations at Wabush Mines, municipal sewage discharge from Wabush via Jean Lake and Little Wabush Lake, and sewage discharge from the Harrie Lake trailer court into Harrie Lake and then into Little Wabush Lake. The approved TMP 2001 was predicted to reduce effects associated with IOC's operations and its contribution to cumulative effects. The Revised TMP will result in a greater reduction in cumulative effects in that all of Wabush Lake will see improved water clarity throughout the entire water column, thus significantly improving the recreational and ecological values of Wabush Lake as compared to the approved TMP 2001.

6.0 CONCLUSION

The Revised TMP will bring IOC's Carol Project into full compliance with the MMER upon expiration of the Transitional Authorization for TSS and will have increased benefits over the approved TMP 2001. Flocculation of red water, consolidation of discharges, and deposition/confinement of tailings in the deep water along the west side of Wabush Lake will result in improved water quality in all of Wabush Lake and adjacent downstream areas rather than just the unconfined area outside of the impoundment dyke as described under approved TMP 2001. This will result in a greater reduction in cumulative effects in that all of Wabush Lake will see improved water clarity throughout the entire water column, thus significantly improving the recreational and ecological values of Wabush Lake as compared to the approved TMP 2001.

Overall this project is positive:

- Air quality during construction will be a localized issue with effects that will be mitigated. In the long-term the tailings management plan incorporates annual revegetation and wetlands development strategies that will control fugitive dust.
- When flocculation is applied to the tailings effluent, water quality in Wabush Lake will improve. Localized construction impacts will be of short-duration and can be controlled. Natural flooding may occur in the future as it has in the past – but adverse effects will not be amplified and the infrastructure will not be at jeopardy from effects of local flooding.
- Fish habitat will improve significantly in Wabush Lake and to lesser effects in downstream lakes. This will lead to an improvement in overall fish health and productivity. Fish habitat compensation will be provided for habitat losses in accordance with DFO fish habitat management objectives and including DFO's guiding principle for no net loss of productive habitat.
- Minimum terrestrial habitat will be impacted as areas of access road development and wildlife/waterfowl species may be disturbed during dyke construction. Upon construction completion the access road will be revegetated. New terrestrial habitat will be developed on the exposed stable tailings beach through rehabilitation, revegetation and wetlands development programs. Improved water quality will result in improved conditions for waterfowl and aquatic furbearers.
- Recreation and cottage life will be enhanced with the improved water quality and related habitat improvements and the traditional navigation route through Wabush Lake will be maintained.
- The Revised TMP will result in significant improvement to Wabush Lake over and above the approved TMP 2001. This will result in IOC converting an impacted water body to as close to background as possible.

7.0 APPROVAL OF THE UNDERTAKING

A list of legislative permits, approvals and authorizations that have been obtained for the approved TMP 2001 are provided in Table 7.1. Those that may be required for the Revised TMP are listed in Table 7.2.

Table 7.1 Permits/Approval/Authorizations That Have Been Obtained for the Approved TMP 2001

Department/Agency	Applicable Legislation	Approval/Certificate/ Permit	Project Element
Federal Government Requirements			
Department of Fisheries and Oceans	<i>Canadian Environmental Assessment Act, 1995</i>	Release from EA process	Harmful Alteration, Disruption or Destruction (HADD) of fish habitat
	<i>Fisheries Act, Section 35(2)</i>	Authorization for the Harmful Alteration, Disruption or Destruction of fish habitat	Construction of dykes
Provincial Government Requirements			
Department of Environment and Conservation	<i>Environmental Protection Act</i>	Release from the EA process	Deposition of tailings; construction of dykes

Table 7.2 Permits/Approval/Authorizations That May Be Required for the Revised TMP

Department/Agency	Applicable Legislation	Approval/Certificate/ Permit	Project Element
Federal Government Requirements			
Department of Transport	<i>Navigable Waters Protection Act</i> <i>Canadian Environmental Assessment Act, 1995</i>	Permit for construction within navigable waters Release from EA process	Works or construction activity in navigable waters
Department of Fisheries and Oceans	MMER	Release from EA process	List TIA on Schedule 2 of MMER
Transport Canada	<i>Transportation of Dangerous Goods Act, 1992</i>	Permit to store, handle and transport dangerous goods	Storage, handling and transportation of fuel and chemicals
Provincial Government Requirements			
Department of Environment and Conservation	<i>Environmental Protection Act</i>	Release from the EA process	Revised TMP
	<i>Environmental Protection Act</i>	Certificate of environmental approval to alter a body of water	Construction of dykes
	<i>Environment Act, 1995</i> <i>Storage and Handling of Gasoline and Associated Products Regulations</i>	Certificate of approval for storage and handling of gasoline and associated products	Storage, handling and transportation of fuel and chemicals
	<i>Environment Act, 1995</i>	Certificate of approval for construction (site drainage)	Construction of dykes
	<i>Environment Act, 1995</i>	Certificate of approval for dams and appurtenant structures	Construction of dykes
	<i>Wildlife Act and Regulations</i>	Authorization to control nuisance animals	Construction activity
Department of Natural Resources	<i>Forestry Act</i> <i>Forest Fire Regulations</i>	Permit to burn	Construction activity
	<i>Forestry Act</i> <i>Cutting of Timber Regulations</i>	Permit to cut crown timber	Construction activity
Department of Works, Services and Transportation	<i>Dangerous Goods Transportation Act, 1995 and Regulations</i>	Compliance standard; no permit required	Storage, handling and transportation of fuel
Municipal Government Requirements			
Labrador City Town Council		Approval for waste disposal	Waste disposal

8.0 SCHEDULE

IOC has established a schedule for the development of the revised project to comply with MMER. Key milestones include:

- Release from environmental assessment process April 2006
- Obtain permits and begin construction of dykes June 2006
- Complete dykes December 2006
- Installation of flow monitoring equipment August 2006
- Commence flocculation April 2007
- Consolidation of Effluent Releases May 2007
- Expiration of Transitional Authorization for TSS May 2007

Construction is scheduled to begin in June 2006 with full project completion by June 2007. The tailings area is scheduled to be operational for life of the mine.

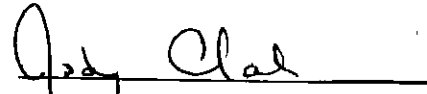
The latest date for release from the environmental assessment process by which IOC can still comply with the MMER is May 2006. In order to comply with the MMER, construction must be initiated by June 2006. Permits and approvals, and an approved fish habitat compensation plan must be obtained and negotiated between January and May 2006. IOC's schedule for compliance with MMER may be jeopardized if release from the environmental assessment process is delayed beyond June 2006.

9.0 FUNDING

The revised project is not dependent on government funding. IOC will fund the project.

09 February 2006

Date



Jody Clark
Manager Environment
Iron Ore Company of Canada

10.0 REFERENCES

10.1 Literature Cited

- Beanlands, G.E. & P.N. Duinker. 1983. An Ecological Framework for Environmental Impact Assessment in Canada. Institute for Resource and Environmental Studies, Dalhousie University in co-operation with the Federal Environmental Assessment Review Office. 132 pp.
- Canadian Environmental Assessment Agency, 1994. The *Canadian Environmental Assessment Act* - Responsible Authority Guide.
- IOC (Iron Ore Company of Canada). 2000. Carol Project Tailings Management Plan (to Comply with Proposed Metal Mining Effluent Regulations) Registration/Referral. Submitted by Iron Ore Company of Canada, Labrador City, NL.

APPENDIX A

Letters of Support for Revised TMP

Labrador West Joint Buoy Committee

LWJBC
C/O Alan Wallace
P.O. Box 184
Labrador City
A2V 2K5

To Mr. Jody Clark (IOCC Environmental)

Good Day Sir,

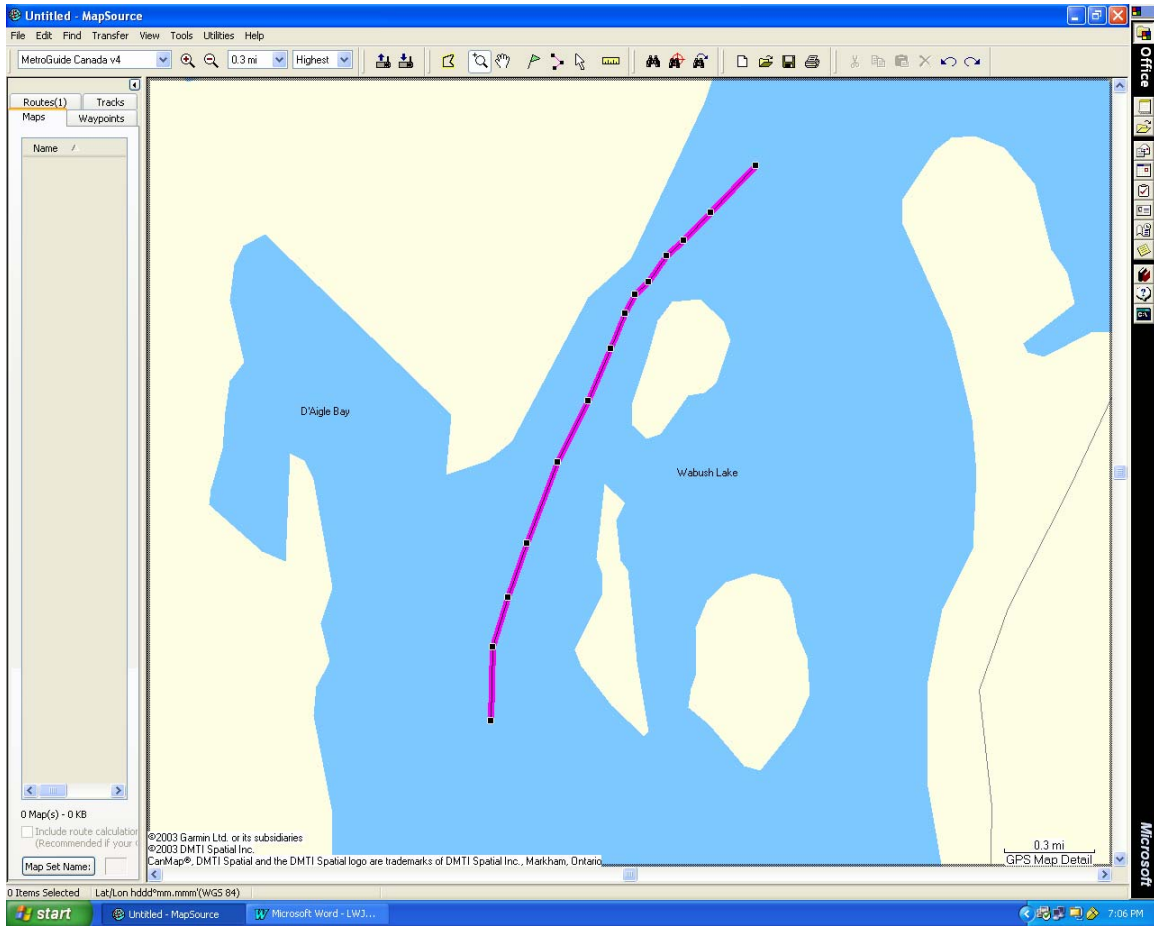
I'd like to take the opportunity to thank-you on behalf of the LWJBC on the opportunity to have input on the issue the placement of the of dyke system at the north/east end of Big Wabush Lake. As you know the core committee discussed the issue and we were all in agreement that the most commonly used channel (best water-preferred) was the last channel in the system (map attached, channel shown, page 2). The core committee (6 people) has on average 20 years each of Labrador West boating for a total of some 120 years of experience. However we asked for the input of some of the other boaters who "normally" travel Big Wabush to gain access to the other lakes in order to validate our own beliefs and support our knowledge of the systems. We were pleased to find that our understanding was in keeping with majority practice. Others (including myself) have traveled the other routes however it was either through ignorance of the "best" channel or with some alternative purpose in mind i.e. having a look-see. The dyke system will have no impact in limiting someone who is interested in going behind the dyke for a look-see.

As discussed regarding the visibility of the dyke as a potential boating hazard. We believe that the potential is very remote, however we are going to recommend the installation of temporary land based hazard-warning signs (for 2 seasons after the dyke completion). Again this is not because we believe that there is any potential for a boater familiar with the system to be at risk however someone new to the area and boating might require the additional alert. These land based hazard sign will be approximately 4' X 4' and be atypical of a floating hazard warning sign. The number and placement will be dependant on the final dyke configuration, however the placement will provide for sufficient visual recognition from all water based access points (upstream and downstream) during times of reasonable weather conditions. The signs will not be lighted however they will be painted with a light reflecting material so anyone traveling at night with the appropriate lighting will be able to identify the warning markers. We believe that over time the dyke system will be understood as being the new shoreline.

Again thank-you for the opportunity to have our input be a part of the decision of the dyke placement. We look forward to continue working with IOCC in the implementation of an Aids to Navigation buoy marker system that will make boating safer for the future of boating in this area of Labrador West.

Alan Wallace
Acting Chair of the LWJBC

Labrador West Joint Buoy Committee





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OFFICE OF THE MAYOR

November 19, 2004

Hon. John Efford
Minister of Natural Resources
House of Commons
Ottawa, ON
K1A 0A6

Dear Minister Efford:

Re: IOCC Tailings Project

Since the Iron Ore Company of Canada (IOCC) began operations at the Carol Project in Labrador City in the early 1960's, tailings effluent has been discharged into Wabush Lake in accordance with a Provincial Lease Line Agreement. In order to comply with the Metal Mining Liquid Effluent Regulations, IOCC received approval to impound their tailings within an already impacted area of Wabush Lake by means of a rock dyke. This option will require a considerable capital expenditure for IOCC over the next 5 to 6 years.

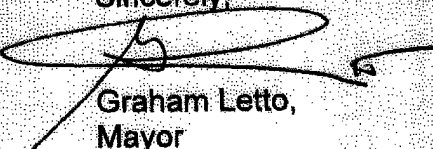
Recent advances in water treatment technology have assisted IOCC in identifying a potentially better solution for their Tailings Management Project. IOCC has indicated to Council that the results of a four-month full-scale trial with the flocculation process have proven to be successful. Based on the results of this trial period IOCC believes that they now have a "better" tailings management solution that will improve the water quality in Wabush Lake while minimizing the financial burden of the company.

.../2

Hon. John Efford
Nov 19, 2004
-Page 2-

Council is willing to extend its support "in principle" to this process of flocculation for tailings effluent treatment. This support is subject to there being a scientifically rigorous monitoring program to ensure the long-term effectiveness of the process and compliance with the applicable regulations.

Sincerely,



Graham Letto,
Mayor

Cc: Hon. Paul Martin, Prime Minister
Hon. Danny Williams, Premier