

Winsor, Jennifer (CWS)

Subject: FW: Request for review & comments- Closing date: SEPTEMBER 20, 2013 - TANCO - Crown Pillar Mitigation Project - File: 1906.30

From: Sigurdson,Shauna [CEAA] [<mailto:Shauna.Sigurdson@ceaa-acee.gc.ca>]

Sent: August-30-13 9:47 AM

To: Winsor, Jennifer (CWS)

Cc: Susan.Tiege@ceaa-acee.gc.ca

Subject: RE: Request for review & comments- Closing date: SEPTEMBER 20, 2013 - TANCO - Crown Pillar Mitigation Project - File: 1906.30

Hello Jennifer

The project as proposed does not contain any activities that are on the Regulations Designating Physical Activities (CEAA 2012). Therefore no federal EA will be required under CEAA 2012.

Shauna Sigurdson
Regional Director Prairie and Northern Region
Directrice Région des Prairies et du Nord
Canadian Environmental Assessment Agency
Agence canadienne d'évaluation environnementale
780 495 2236
CDI Building 425, 10115 – 100A Street
Edifice CDI 425, 10115 – 100 A rue
Edmonton, Alberta, T5J 2W2

Winsor, Jennifer (CWS)

Subject: FW: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

From: Kelly, Jason (CWS)

Sent: September-09-13 9:13 AM

To: Winsor, Jennifer (CWS)

Subject: RE: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

Parks and Natural Areas Branch has reviewed the proposal filed pursuant to the Environment Act for the Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30. The Branch has no comments to offer as direction of water flow is away from Nopiming Provincial Park and there are no parks or ecological reserves downstream.

Jason Kelly, M.N.R.M.
Ecological Reserves and Protected Areas Specialist
Parks and Natural Areas Branch
Conservation and Water Stewardship
Box 53, 200 Saulteaux Cres
Winnipeg, MB R3J 3W3

Phone: 204-945-4148

Cell:

Fax: 204-945-0012

Email: Jason.Kelly@gov.mb.ca

Winsor, Jennifer (CWS)

Subject: FW: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

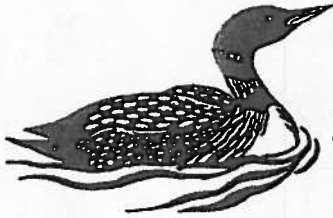
From: Gauer, Elaine (MAFRI)

Sent: September-10-13 3:13 PM

To: Winsor, Jennifer (CWS)

Subject: FW: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

MAFRI has no concerns from an agricultural perspective.



Lac du Bonnet WILDLIFE ASSOCIATION

BOX 25, LAC DU BONNET, MB R0E 1A0



September 16, 2013

Environmental Approvals Branch
Conservation and Water Stewardship
129 Main Street, Suite 160
Winnipeg, MB
R3C 1A5

Dear Branch Personnel:

Re: Public Registry File 1902.3 – Tantalum Mining Corporation of Canada Limited (Tanco)

I am writing on behalf of the Executive and 360 members of the Lac du Bonnet Wildlife Association with regard to the proposal put forward by the Tantalum Mining Corporation of Canada Ltd. (Tanco) to drain Bernic Lake into Bernic Creek and its watershed to reduce pressure on the mine (situated under the lake) and hopefully ensure its long-term safety and viability. Undoubtedly, this project has the ability to impact on Bernic Creek, the Bird River, Lake Lac du Bonnet, the Winnipeg River, Lee River and ultimately Lake Winnipeg.

The Vision of our organization is ***“To make north eastern Manitoba a better place to live, hunt and fish by protecting and enhancing our wildlife and fishery habitat and resources”***. Given our concern for the environment and its wildlife and water-dwelling assets, our Executive was invited by Mr. Will Brits, Facility General Manager, to tour the Tanco site on July 31, 2013 and learn more about their proposed drainage strategy. Needless to say, the tour was extremely enlightening and helpful in our understanding of the work performed by Tanco and its plans for the future.

Members of our association do not profess to have expertise in the mineral extraction and processing industry. Nevertheless, we do share a passion for the protection of our environment and the bounty it provides to us as its caretakers.

The Lac du Bonnet Wildlife Association recognizes and acknowledges the economic contribution Tanco makes to our province and region. However, we further recognize that this economic contribution cannot come at the expense of the environment and its resources.

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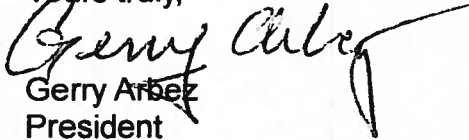
Of particular concern to the Lac du Bonnet Wildlife Association is the following:

- The quality of the water to be discharged from Bernic Lake and the possible release of chemicals, phosphorous and other toxins into the downstream watershed.
- Drainage flows and its influence on the extensive watershed and water-dwelling organisms, including plant life.
- The increased flow of water and its potential impact on winter ice conditions.

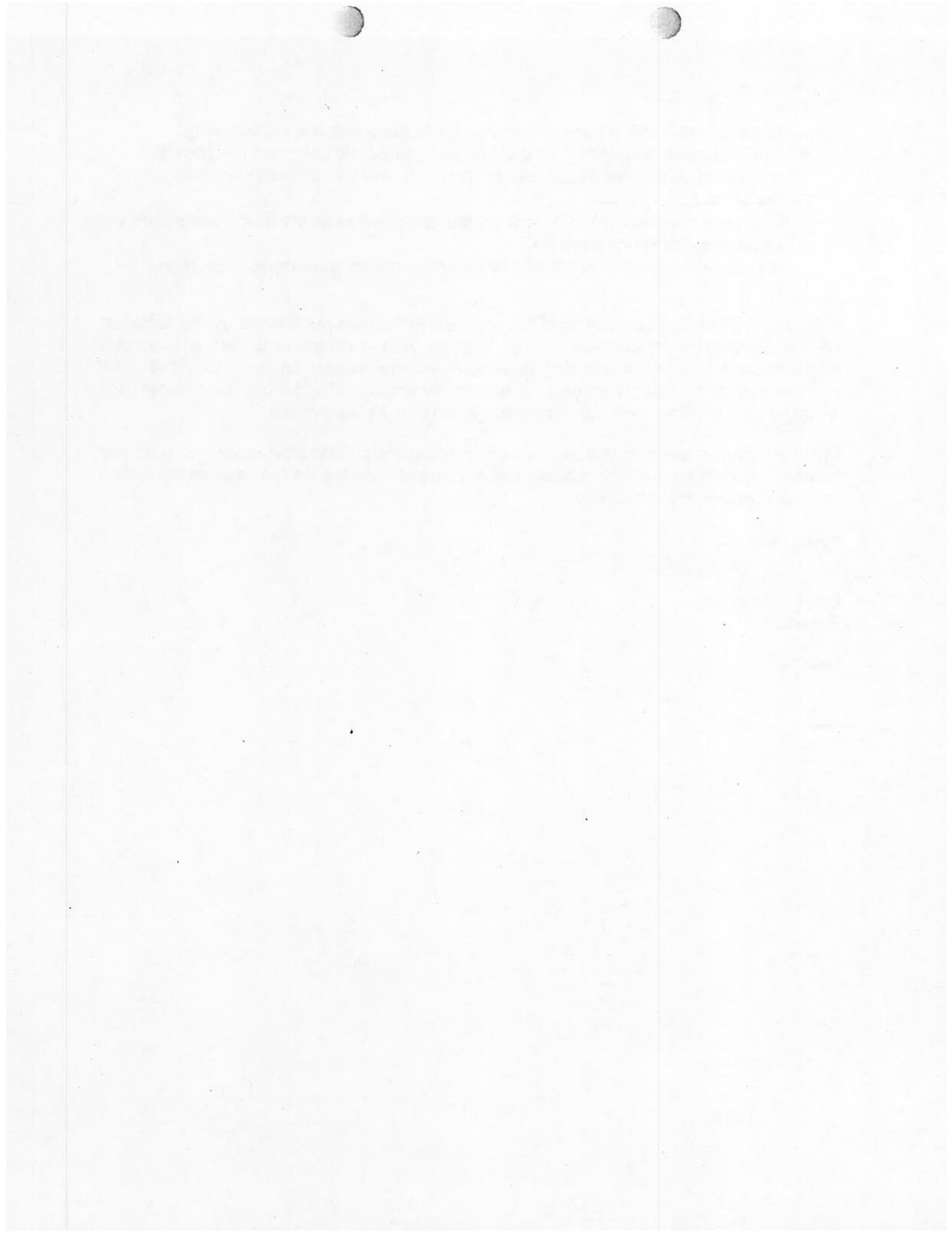
With this in mind, our association is not opposed to the plan put forward by the Tantalum Mining Corporation of Canada Ltd. as long as your department undertakes full due diligence and required monitoring to ensure minimal impact on the ecosystem. As representatives of our government, with fiduciary responsibility for our environment, we count on you to safeguard these important assets for all Manitobans.

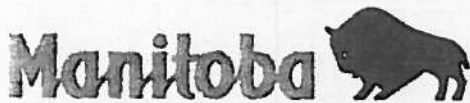
We trust you understand our position on this important ecological issue. Should you have any questions, or require additional explanation, please do not hesitate to contact me at the above-noted address.

Yours truly,


Gerry Arbez
President

GA/drh





Infrastructure and Transportation
Highway Planning and Design Branch
Environmental Services Section
1420 - 218 Garry St., Winnipeg, MB R3C 3P3
T (204) 619-4359 F (204) 945-0593

September 16, 2013

Tracey Braun, M. Sc.
Director, Environmental Approvals Branch
Manitoba Conservation and Water Stewardship
123 Main St., Suite 160
Winnipeg, MB R3C 1A5

RE: Tantalum Mining Corporation of Canada Limited
Client File No. 1902.30

Dear Ms. Braun:

MIT has reviewed the proposal noted above and while we do not have concerns with the development as proposed, we would like to offer the following reminders:

- **The proposed project may require a permit from MIT for:**
 - **any new, modified or relocated access connection onto PR 315;**
 - **any construction, above or below ground level, within 38.1 m (125 ft) from the edge of the right of way of PR 315;**
 - **any plantings within 15.2 m (50 ft) from the edge of the right of way of PR 315; or**
 - **discharge of water or other liquid materials into the ditch on PR 315.**

For further information on permit application, please contact Murray Chornoboy at (204) 346-6287 or by email at Murray.Chornoboy@gov.mb.ca.

Thank you very much for providing us the opportunity to review the proposal.

Sincerely,

Ryan Coultter, M. Sc., P. Eng.
Manager of Environmental Services

Winsor, Jennifer (CWS)

Subject: FW: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

From: Kubish, Cheryl (OFC)
Sent: September-19-13 9:57 AM
To: Winsor, Jennifer (CWS)
Subject: RE: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

The Office of the Fire Commissioner has reviewed the file and has no comments at this time.

Cheryl Kubish
Administrative Assistant
Office of the Fire Commissioner
508-401 York Avenue
Winnipeg MB R3C 0P8
Phone: 945-3328
Fax: 948-2089

E-Mail address: Cheryl.Kubish@gov.mb.ca

From: Sumner, Kevan (MLG)
Sent: September-20-13 10:54 AM
To: Winsor, Jennifer (CWS)
Cc: Shaler, Samantha (MLG); Vivekananda, Prashanna (MLG)
Subject: FW: Request for review & comments- Closing date: SEPTEMBER 20, 2013 – TANCO - Crown Pillar Mitigation Project - File: 1906.30

Hi Jennifer,

I have reviewed the Environmental Act Proposal for the Crown Pillar Mitigation Project on behalf of Community and Regional Planning. As the site in question is located in an unincorporated area east of the Rural Municipality of Alexander, the proposal has been reviewed for compliance with the Provincial Land Use Policies. We have no concerns with the proposed Project.

Kevan Sumner

Kevan W. Sumner
Regional Manager
Community and Regional Planning - Beausejour Regional Office
Manitoba Local Government
PO Box 50, 125 - 20 First Street
Beausejour, MB ROE OCO
Ph: (204) 918-3538
Fx: (204) 268-6007
Email: kevan.sumner@gov.mb.ca



Family Services and Labour
Workplace Safety and Health Division
143 Main Street, Flin Flon, Manitoba, Canada R8A 1K2
T 204-687-1621 F 204-687-1623
www.safemanitoba.com

25 September, 2013

Environmental Approvals Branch
Conservation and Water Stewardship
123 Main Street, Ste. 160
Winnipeg, Manitoba
R3C 1A5

Attention: Jennifer Winsor, P. Eng., Environmental Engineer

Re: Tanco Mine Crown Pillar Mitigation Project

We attended the meeting for the TAC members on September 23, 2013, and have reviewed the documentation provided on the Tanco Mine Crown Pillar Mitigation Project. Our concerns relate to the following:

1. The safety and health of the workers involved with the project.
2. The integrity of the dam structures.
3. The excavation of the quarries.

We will be dealing with these concerns directly with the Tanco management and their consultants.

Sincerely

J. Edward (Ted) Hewitt, P. Eng.
Senior Mining Engineer/District Manager

cc: Dennis Fontaine, Larry Poleschuk, Lorne Uruski



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Winsor, Jennifer (CWS)

From: Stibbard, James (CWS)
Sent: September-26-13 10:15 AM
To: Winsor, Jennifer (CWS)
Subject: Re: 1906.30 Tanco Mine Crown Pillar EAP

Ms. Winsor,

I reviewed the above noted EAP and found no cause for concern respecting drinking water safety with the EAP or proposed project.

If you have any questions, please call.

Regards,

James Stibbard P. Eng.

Approvals Engineer

Office of Drinking Water

1007 Century Street

Winnipeg MB R3H 0W4

phone: (204) 945-5949

fax: (204) 945-1365

email: James.Stibbard@gov.mb.ca

website: www.manitoba.ca/drinkingwater

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124 Claremont Ave
Winnipeg MB R2H 1W2

September 27, 2013

In regards to: TANKO - Crown Pillar Mitigation Project

Jennifer Winsor
Conservation and Water Stewardship
123 Main St, Suite 160
Winnipeg, MB R3C 1A5

Dear Jennifer Winsor,

Please accept this letter as opposition to the proposal put forth by the Tantalum Mining Corporation of Canada regarding the Crown Pillar Mitigation Project, File: 1906:30. I find this proposed project carries far too much risk and had too many unknowns to be considered environmentally responsible.

I have read the lengthy proposal submitted by TANKO, including the attached report by consultants Tetra Tech. My concerns could fill many pages, however I will summarize them in point form for your review:

- The proposal cover letter stated that representation regarding the proposal be made by September 20th, however the proposal was only filed on August 31st. I request that the full proposal be re-filed with the proper public assessment period granted.
- Phosphorus concentrations are elevated from mine activities, and drainage of Bernic Lake may have negative effects on the water quality downstream, including the Bird River. The effect of phosphorus on water quality and algae bloom has been well researched in Manitoba.
- It is stated that the de-watering of Bernic Lake into the wetland will have "unknown effects" on the wetland, and that the process is "being studied." I believe that the full impact of the dewatering be researched and stated in the proposal so proper assessment can be made.
- Mention of "Pre-Treatment" of the discharge water is made if nutrient concentrations are deemed to be outside of acceptable limits. No mention of what this pre-treatment process would entail, or the impact of such pre-treatment on the water quality.
- Increasing the winter flow rate of the Bird River may compromise winter ice conditions, making animal migration and recreation unsafe. This has not been addressed anywhere in the proposal.
- In the proposal there is little exploration of the logical solution to this problem, which is the use of backfill to fill the unstable region of the mine. This would

provide the simplest and most environmentally responsible way to proceed, yet it is dismissed.

- Many mentions of the 1996 JD Smith study were made, seemingly to place blame regarding the reckless and un-sustainable removal of crown pillar material. The current proposal should do more to explore why these practices were recommended, despite the practice being “well outside the standard practice.” If the cost of an environmentally responsible solution is cited as the barrier to proceeding, the liability should lie with the previous consultants.
- The timeline outlined by the proposal indicates that construction will begin on the road and dike prior to regulatory approval. I feel this need to be expanded and clarified.
- Despite the consensus that the pillars are “well outside usual mining practice,” there is little or no mention of regulatory bodies intervening after the initial fall to ground event, or in any inspections by regulator officials.

As mentioned, the above makes up only a small portion of the areas which have not been adequately addressed in this proposal. The mining practices which lead to the potentially catastrophic event at the TANKO mine are shocking. I feel that if TANKO can not be trusted to operate their mine in a responsible manner, they can not be trusted to carry out a mitigation plan responsibly. An error in judgment by mine officials should not allow to be mitigated at an environmental cost that is “to be determined.”

Mining operations are very valuable to the economy of this region and to Manitoba as a whole. Mining needs to be sustainable and address the safety of employees and the environment above all else. This plan does little to re-assure the residents of the region that we will enjoy the water and wildlife for generations to come.

Please feel free to contact me regarding any questions regarding this project.

Regards,

Keith Sutherland
Bird River Cottager
36 Pioneer Drive

cc: Greg Selinger, Dave Chomiak, Wayne Ewasko

Winsor, Jennifer (CWS)

From: Arnold, Ginger (CWS)
Sent: September-27-13 3:25 PM
To: Winsor, Jennifer (CWS)
Cc: Missyabit, Ron (CWS)
Subject: Tanco Mine Comments from ARB

Environmental Approvals Branch Projects:

This proposed project may affect an Aboriginal right; and as such, the Aboriginal Relations Branch recommends an initial assessment of the proposal be completed to determine if it will require consultation.

For more information on the consultation process please refer to:

http://www.gov.mb.ca/ana/crown_consultations.

Ginger

p.s. I no longer have a land line (945-0007). In future, you can reach me on my cell phone listed below.

*Senior Policy Analyst
Aboriginal Relations Branch
Corporate Policy Division
Conservation and Water Stewardship
200 Saulteaux Crescent
Winnipeg MB, R3J 3W3
Ginger.Arnold@gov.mb.ca
(204) 771-4277*



TANCO Crown Pillar Mitigation Project (File # 1906.30) Environment Act License Review

Land Management & Planning Section Comments:

Land Management & Planning Section has reviewed the EAL proposal submitted by Tantalum Mining Corporation and has the following comments based on the following proposed infrastructure developments in Phase 1 and 2 of the proposal, as the developments proposed will have an impact on Crown lands.

Requirements under *The Crown Lands Act* Section 7 (1), all pending developments on Crown land require a *Crown Lands Act* disposition (e.g., General Permit) in order to authorize or legalize their tenure on the land. All structures and/or developments on Crown land that have not been authorized under a *Crown Lands Act* disposition are considered an illegal occupation or use of Crown land and hence subject to section 29 of the act.

Proposal:

Phase 1--The construction of temporary access roads, the construction of a temporary dyke at the narrows of Bernic Lake, temporary dewatering and water management of the west basin of Bernic Lake and temporary relocation of the existing polishing pond effluent discharge point from Bernic Lake to Bernic Creek.

Based on the review of the proposal (*specifically information identified in Phase 1 of the project*) Land Management & Planning Section has determined that the following developments are considered to imply an impact and/or occupancy of Crown lands, and will require the proponent to secure a Crown Lands Act Disposition for the proposed developments, that will not be located on lands under current Surface Mining Lease disposition held by Tantalum Mining Corporation.

The construction of temporary access roads, construction of the temporary dyke at the "Narrows", structures related to the temporary dewatering and water management of the west basin of Bernic Lake (i.e., *pumping stations*), monitoring stations where and if applicable and will require on ground infrastructure, and the temporary relocation of the existing polishing pond, are to be tenured under a Crown Lands General Permit disposition. All proposed developments and pending infrastructure can be identified and administered on a single over-arching General Permit disposition. As part of the application the proponent is urged to provide a sketch map or plan that references all facets of the development and infrastructure and appended to the General Permit

Where the developments; or parts thereof are located on the current Mining Surface Lease lands (SL-01, SL-03) held by Tantalum Mining Corporation, the requirement for Crown Lands General Permit disposition may be exempt as activities proposed for these lands shall be administered via IEM recommendation; including all applicable Aboriginal Consultation requirements. This exclusion of requiring permits for development on surface lease lands is conditional to the Surface Mining Lease lands being referenced and identified on the Crown Land Registry.

Please note that all works on Crown lands; including works planned for the Mining Surface lease area, will require the issuance of a Crown Lands Work Permit. The Crown Lands Works Permit is also a condition under *The Crown Lands Act* and will be required prior to any commencement of working. The work permit will set out site specific working conditions (i.e., set back requirements, avoidance areas, fire mitigation requirements etc...), and is required to be available onsite at all times. The authority to issue the Work Permit comes from the issuance of the General Permit which must be obtained firstly.

The Crown Lands Work Permit may be issued for works to occur on the Surface Mining Lease as the authority to issue the work permit for these works can be the current and valid Surface Mining Lease disposition, issued from IEM. Please note that generally two weeks are required for IRMT (Eastern Region) review of all work permit applications, however noting the sensitivity of the project a shortened review period can be accommodated for.

Proponent is requested to:

- contact/apply for the required General Permit disposition via Crown Lands and Property Agency (CLAPA) www.clp.gov.mb.ca, and ensure that the General Permit application details all developments and infrastructure – as identified in Phase 1, to be part of the same General Permit disposition and delineated/referenced by applicable legal description (sketch map/plan required):

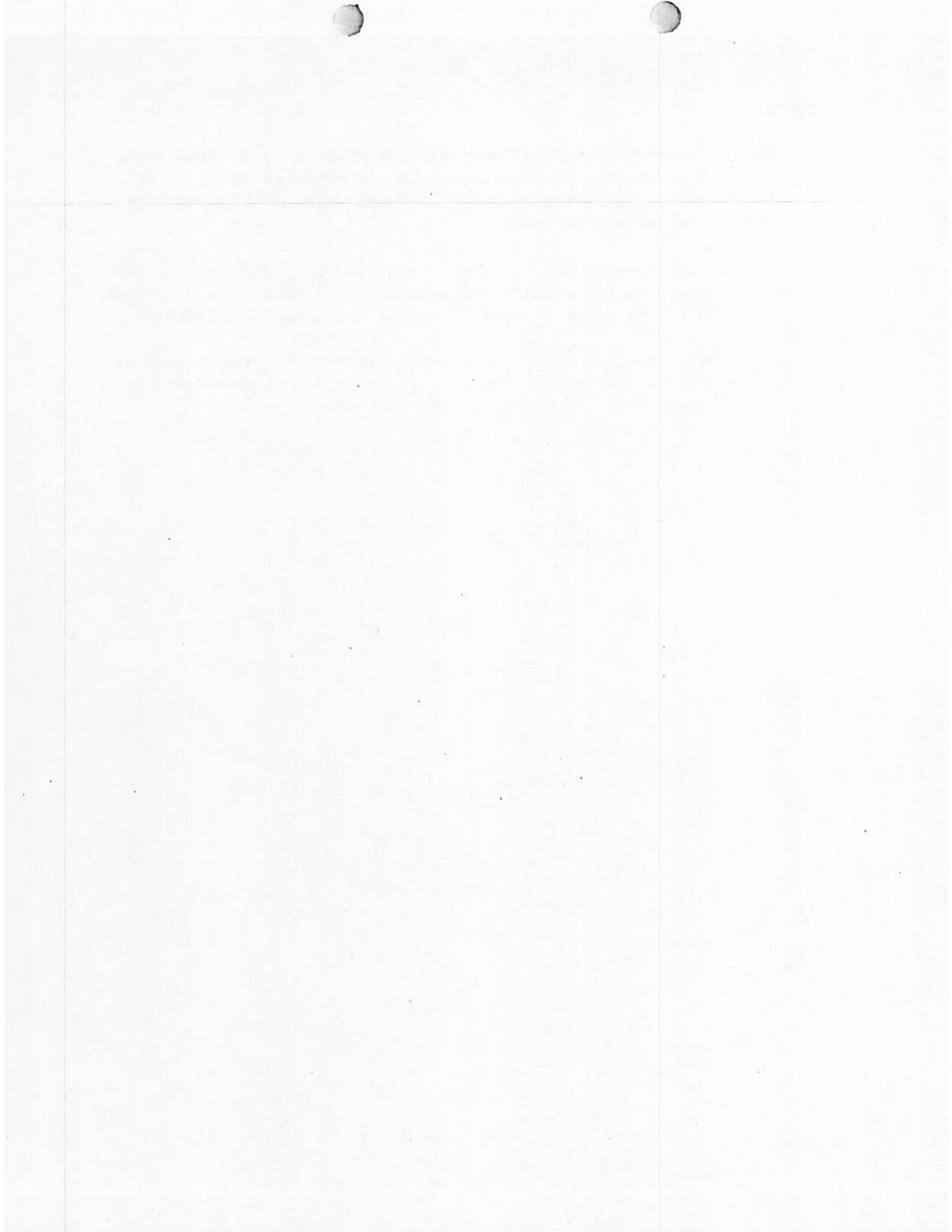
Sketch map or plan to include:

- Temporary Dike (The Narrows) located in W ½ 11-017-15E*
 - The new Narrows Access road located in NW11-017-15E*
 - Pumping Station / infrastructure located at the Narrows located on NW11-017-15E*
 - Outlet structure at Bernic Creek SE18-017-15E*
 - Remote Monitoring Stations (where applicable) – specific legal descriptions required when locations identified.*
- Any/all new developments proposed for and to be located on the Mining Surface Lease lands will be subject to IEM approval and any/all new developments located on or off the Surface Lease area will be subject to IEM Aboriginal Consultation.
 - Proponent is advised to contact Manitoba Conservation Lands Branch (att: Dale Sobkowich 204-945-6660) when the application for General Permit has been submitted to CLAPA, to ensure that the shortened circulation procedure for the General Permit Disposition has been enabled; at the discretion of the Director of Lands Branch.
 - Proponent is to ensure that the lands under valid Surface Mining Lease have been registered and referenced in the Provincial Crown Lands Registry.

Proposal:

Phase 2-- The construction of a permanent dyke in Bernic Lake at a location closer to the mine workings which would remain in place until the end of mine life and the decommissioning of the temporary structures of Phase 1 including the temporary dyke located at the narrows of Bernic Lake.

- **Any/all new developments proposed for and to be located on the Mining Surface Lease lands will be subject to IEM approval and any/all new developments located on or off the Surface Lease area will be subject to IEM Aboriginal Consultation.**
- **Where works are planned for lands within the Mining Surface Lease the proponent is to ensure that the lands under valid Surface Mining Lease have been registered and referenced in the Provincial Crown Lands Registry.**



TANCO Crown Pillar Mitigation Project (File # 1906.30) Environment Act License Review

Eastern Regional Comments:

Manitoba Conservation – Eastern Region has reviewed the EAL proposal submitted by the proponent (Tantalum Mining Corporation) for the Crown Pillar Mitigation Project and has the following comments based on the proposed developments and activities identified in Phase 1 and 2 of the project and the anticipated impacts the proposal will have on Crown lands.

The Crown Mitigation Project proposal; as presented, essentially deals with levels of risk primarily to the mine and mine infrastructure. In order to mitigate the risk to the mine, the proponent has proposed a mitigation strategy identified in the carry-out of phase 1 and phase 2 of the proposal.

Phase 1--The construction of temporary access roads, the construction of a temporary dyke at the narrows of Bernic Lake, temporary dewatering and water management of the west basin of Bernic Lake and temporary relocation of the existing polishing pond effluent discharge point from Bernic Lake to Bernic Creek.

Phase 2-- The construction of a permanent dyke in Bernic Lake at a location closer to the mine workings which would remain in place until the end of mine life and the decommissioning of the temporary structures of Phase 1 including the temporary dyke located at the narrows of Bernic Lake.

The Eastern Region is concerned that the proponent has not adequately quantified and evaluated the risks and effects to the downstream environment and the citizens who live in it. Environmental risks, assessments and related impacts have been addressed in a very cursory manner, with no recent on-site inventories or assessments conducted to verify aspects of the physical, terrestrial and aquatic environments described in the project overview.

The proponent has acknowledged in appendix A section 4.1, that the standard permitting process for a project of this nature requires extensive upfront environmental studies to support the license application. The proponent acknowledges the expectation to demonstrate an understanding of the natural environment, assess potential effects, provide mitigation measures, and provide plans for managing and monitoring potential environmental effects prior to construction and operation. However, a review of the information package fails to provide a comprehensive analysis of quantitative information in order to provide a complete and absolute recommendation.

Based on review of the information provided, it has been assessed by the Eastern Region Integrated Resource Management Team (IRMT) that there is not enough quantitative information provided in the proponent's proposal to make an informed decision at this time.

The review completed by the IRMT has determined that there are numerous risks to the aquatic and terrestrial environments, with little to no baseline data available to evaluate, qualify and quantify the project's objectives and proposed activities. The levels of risk associated to Phase 2 of the project have many unknowns, supported by the lack of available data provided in the proponent's assessment of the project.

It is the recommendation of the Eastern Region not to approve or support the current project proposal; as presented, at this time. The paucity of environmental information in the form of quantitative and qualitative analysis has hampered the review of this proposal and created uncertainty as to the potential scope and magnitude of impacts to the aquatic and terrestrial environments, affecting the ability of the regional expertise to make an initial assessment of the project.

Manitoba Conservation – Eastern Region acknowledges the urgency of the project precludes following the standard linear permitting process as the process cannot be completed within the acceptable risk window identified by the proponent. It is anticipated that the proponent may have to make some commitments to the regulators to conduct environmental studies and develop management plans in order to expedite the process if the project is provided conditional approval. Notwithstanding the urgency of the proposal, current data collected (spring/fall 2013) on physical, terrestrial and aquatic components would have been invaluable in facilitating an assessment of effects and determining related mitigative and monitoring recommendations.

Manitoba Conservation – Eastern Region recognizes the ultimate decision of approval will weigh the unknown environmental effects against social and economic factors. Should those in a position of authority be required to make a decision that will balance environmental, social, and economic needs with endorsement of the project; the Eastern Region has specific comments, concerns, and action requirements that will address different components of the affected and impacted ecosystems. The following statements should be considered in formulating the conditional approval.

With respect to the above paragraph, it is recommended that the project options should be re-examined with an emphasis on reducing the "ecological footprint" caused by the dewatering process of Bernic Lake. It is recommended that the re-evaluation of the project's intent involve a reduction in the total volume of water discharged through Bernic Creek and into its adjacent wetlands. Eastern Region recommends that the project eliminate the requirements of using the Horse-shoe wetlands altogether. The resultant lower water discharge volume would have less of an impact on wetland habitats (less flooding, less phosphorus and less sedimentation), and reduce the risks associated to the wetland-upland mosaic habitats and the species that utilize these areas. The 'V – dike' option (as presented in Phase 2 of the project) without dewatering of the entirety of the west basin of Bernic Lake (as presented in Phase 1 of the project) would

accomplish these recommendations and preserve large tracts of wetland habitat in their natural state.

In the event that this option is not suitable to the proponent, it is then recommended that all waters released into Bernic Creek and/or surrounding environments should be pre-treated in Bernic Lake; prior to discharge through the Bernic Creek watershed in order to meet *Manitoba Water Quality Standards, Objectives, and Guidelines for the Protection of Aquatic Life*. Treatment actions such as the incorporation of *alum* to reduce and minimize heavy metal contaminate and phosphorous levels in the water before they leave the lake are recommended.

In addition, it is further advised that the proponent should ensure that appropriate consultation and information has been provided to downstream communities, including affected First Nations and other Aboriginal communities with respect to the project goals and objectives and the potential risks associated with the incorporation of Phase 1 and Phase 2 of the project.

Potential impacts to fisheries resources

Potential risk to the fish community, fishery, and human health in Bernic Lake

If the project were to proceed as planned, it is anticipated that the size of the fish population would be decreased during the dewatering period and for some time after. The project assumes colonization of fishes from the East Basin, but a contingency is not offered if the colonization does not take place in a reasonable time frame.

Action Required:

- *Contingency plan or strategy required to assure the re-colonization of the Bernic Lake West basin fishery.*

With the proposed de-watering of the West basin the quality of the fishery will be reduced; for the short term, as the total area of the lake is reduced and numbers of fish are reduced. In the long term, the disturbance of the sediments from dewatering the western basin of the lake may have a negative impact on fish health. The project describes the components of the sediments (i.e., heavy metals) but does not assess the risk of these components and the anticipated impacts of these sediments on the fish community. It is possible that some of these sediments contain harmful elements that could pose a risk to fish health. Furthermore, if these fish are consumed by humans, there is a significant and long term risk to human health. Fish species such as North Pike (*Esox lucius*), a common species in Bernic Lake, are apex predators in the food chain and the bioaccumulation of some elements occurs in its flesh. Persons consuming this flesh may be exposed to heavy metals that originated from the mining sediments.

Action Required:

- *The proponent requested to quantify the risk to fish health as well as the risk to human health caused by increased phosphorus and heavy metal contaminate within the sediment.*

Potential risk to the fish community of Bernic Creek

The project has not adequately assessed the risk to the fish community of Bernic Creek. The potential impacts to the fish community result from siltation and loss of habitat, as well as eutrophication, as the waters of Bernic Lake carry an excessive quantity of phosphorus. The project has not adequately described the current habitat or fish community of Bernic Creek or the 'horse-shoe' wetlands which it intends to use as a treatment facility for the high levels of phosphorus, as well total suspended solids. Manitoba Conservation staff recently collected several fish species that had not been described or previously identified in Bernic Lake.

The project indicates that extensive siltation (infilling of the wetlands) surrounding Bernic Creek is expected, yet the level of risk to the fish community is not assessed as part of the project review. The addition of water high in phosphorus also poses a risk to the current fish community as eutrophication favours some fish species over others. The proponent assumes that the wetlands sequester much of the phosphorus, but has not provided a model which describes how much phosphorus can be sequestered or at what rate. It is accepted in the scientific community that sequestration of phosphorus does not occur during plant senescence (fall and winter), yet the proponent intends to begin pumping water during winter.

The proponent indicates that it will rely on the Bernic Creek and the Horseshoe wetlands to filter sediment and sequester phosphorus so that water quality is acceptable at the terminus of Bernic Creek at the conjunction of the Bird River. The project does not indicate what action it will take if water quality standards are not met at this location. Additionally once the mine is back in operation and until the larger dike is in place, the effluent from the tailings pond will be discharged directly to Bernic Creek.

While the proponent will need to adhere to the federal Environmental Effects Monitoring (EEM) program, it is recommended that there should be some discussion on the potential effects to the Bernic Creek fish community. Certainly through the EEM process there have been significant effects in certain metrics of the benthic invertebrate communities found in the exposure area of Bernic Lake compared to the reference area.

Action Required:

- *Proponent to undertake an adequate fish community survey of Bernic Lake and Bernic Creek;*
- *Proponent to undertake a vegetative survey of the Bernic Creek and Horse-shoe wetland complex that will include predictive modelling to identify potential changes to the vegetative composition if changes to the hydrologic regime are experienced (timing, duration, frequency, magnitude and rate of flow) which could impact fish species and habitat;*
- *Proponent to establish monitoring program(s) to evaluate phosphorus levels and water quality, as the water enters Bernic Creek and the Bernic Creek / Horse-shoe wetlands (if required), in addition to providing a mitigation strategy to be*

implemented if water quality standards are not met or have exceeded at this location;

- *Proponent requested to provide a model that will monitor wetlands sequestering ability for phosphorous uptake including rates of uptake; including a mitigation strategy to be enabled if wetlands sequestering fails or is limited in its function;*
- *Proponent to provide mitigation strategy and/or recovery plan for impacted fish communities of Bernic Lake and Bernic Creek; including the habitat that supports them in a reasonable time frame after conclusion of the project.*

Potential risk to the fish community, fishery, and human health in the Bird River and Lac du Bonnet

If the upstream wetlands are unable to adequately absorb the excess of sediment and phosphorus from Bernic Lake, it is anticipated that the fish community, fishery, and human health for the Bird River and Lac du Bonnet area may be put at risk.

As previously mentioned, increased sediment load and increase in phosphorus can alter habitat and affect the fish communities in these downstream watercourses. The project does not offer a risk assessment to the fish community of the Bird River or Lac du Bonnet. The fish community near the mouth of the Bird River includes the Carmine Shiner (*Notropis percobromus*), a listed fish under the federal *Species at Risk Act*. This Act provides substantial protection to habitats required by these species listed under it. The act also makes provision for substantial penalties if people or organizations are found to contravene the Act. It should be noted that while there are some turbidity tolerant stocks found in some streams, Carmine Shiner are generally intolerant of turbidity. Increased sediments could impact this species and other fish species present. There is no substantive analysis of changes to the timing, duration, frequency magnitude and rate of change of flow in either Bernic Creek or the Bird River.

The fish community in the lower Bird River and Lac du Bonnet supports an important recreational fishery. If water quality in this aquatic system is negatively affected due to phosphorus, the composition of the fish community may change and quality of the current fishery may be at risk. Furthermore, if contaminants found in the sediments in Bernic Lake reach Lac du Bonnet, there is a risk that certain fish may ingest these contaminants. Species such as Walleye (*Sander vitreus*) and Northern Pike; the primary species targeted by the recreational fishery, are most likely to accumulate these contaminants. If these species of fish become contaminated, it would have a significant negative impact on the fishery and the tourism industry in the region.

Action Required:

- *Proponent to undertake adequate fish community survey of Bird River and Lac du Bonnet and to include an analysis of changes to the timing, duration, frequency magnitude and rate of change of flow in either Bernic Creek or the Bird River.*
- *Proponent to provide an action plan or mitigation strategy if Carmine Shiner (or habitat) impacted by increased sediment loads and/or increased phosphorus levels.*

- *It is recommended that the proponent assess potential impacts of increased phosphorous levels / sediment loading on the regional tourism industry with specific emphasis on the recreational / sport fishery on Bird River and Lac du Bonnet.*

Potential risk to the fish community, and fisheries in the Winnipeg River and Lake Winnipeg

The fish community of the Winnipeg River downstream of Lac du Bonnet and Lake Winnipeg support valuable domestic, recreational, and commercial fisheries. Many individuals and communities rely on fish as an important component of their diet. Lake Winnipeg is listed as the most preferred destination for ice fishing in the province. Lake Winnipeg currently supports the largest Walleye commercial fishery in the world. The landed value of the commercial fishery is approximately \$20 million per year and supports many small communities around the lake.

Lake Winnipeg is currently suffering from eutrophication caused by an excess of phosphorus. The proposal risks adding additional phosphorus into this already compromised aquatic system. If phosphorus levels increase in Lake Winnipeg, it further elevates the risk to some of the most valuable fisheries in the Province of Manitoba. A reduction of the quantity or quality of fish in these water bodies may have negative impacts to fulfilling constitutionally protected rights, recreation and tourism industries, as well as commercial enterprise. The Province of Manitoba has recognized the state of water quality in Lake Winnipeg and has committed considerable resources to reduce phosphorus contributions to the lake.

Action Required:

- *It is recommended that the proponent assess the risk and prepare a mitigation action plan or strategy if increased phosphorous levels from Bernic Lake impact water quality and health of the Winnipeg River and Lake Winnipeg*

Potential impacts to wildlife and wildlife habitat resources

Notably absent in the project information is any acknowledgement of anticipated commitments related to wildlife, wildlife habitat or wildlife effects monitoring, despite the anticipated alterations to wetland habitats and associated wildlife species. There are numerous statements within the scope of the project indicating that environmental effects will be "*not significant*", "*insignificant*", "*negligible*", "*temporary*" and "*reversible*", however these statements are not supported by any scientific data as they relate to effects on wildlife and wildlife habitat. No flora or fauna inventories have been conducted within the scope of the project area, and characterization of the wetland complex was conducted via topographic maps, aerial photos and "*reconnaissance-level surveys*", rather than through ground truthing. These "*desk-top*" techniques are inadequate for conducting an assessment of this magnitude for wildlife impacts and effects. Potential impacts on wetland and terrestrial flora and fauna are, for the most part, not addressed in the document, with the exception of impacts related to road construction.

Action Required:

- *Proponent to undertake adequate wildlife surveys and wildlife habitat inventories of all terrestrial and aquatic communities impacted by the scope of the project.*

Appropriate avoidance, minimization and mitigation measures related to wildlife and wildlife habitat are not described in the project information, and the overall effects on flora and fauna may likely be significant. Dike construction and lake dewatering will affect wetland habitats and the species that inhabit these areas throughout the lake dewatering process and permanent dike construction period. In the absence of mitigation to control sedimentation, these effects may be long lasting or permanent. Habitats in the open creek channel and surrounding floodplain will be directly and immediately affected by sedimentation accumulation (may exceed 50cm) with the dewatering of the lake. Overloading the wetlands with sediment and excessive phosphorous will impair their ability to function at an anticipated level /capacity.

The proponent acknowledges that the magnitude of the sediment retention is currently unknown, and the depths estimated herein represent an expected upper bound accumulation. These critical missing estimates, along with hydrological and elevation modelling (also absent in this proposal), are required to form a more accurate assessment of the project's short and long term impacts on the environment. More precise calculations can be made if data addressing sediment concentrations and sediment gradations are collected through the geotechnical investigation.

Once the sediment load and retention in the water can be determined, depths of sedimentation accumulation can then be estimated. In the absence of precise calculations, there is no confidence that the estimates presented in the project information represent the actual "upper bounds" of sediment accumulation depths that will be deposited in the wetland. The .5 metre depth estimated in the project information would alter the floodplain significantly to the extent that it will cease functioning as a wetland.

Assurance from the proponent is required to ensure that hydrological movement through the wetlands is as planned and that the wetlands will be utilized for their intended purposes without exceeding their capacity and capability to function adequately. Results of the recommended studies (see below) should be used to determine whether the volume of the discharge waters, estimated sedimentation depths and phosphorus concentrations in the sediments warrant further imitative action or strategies.

Action Required:

- *Proponent to provide modelling for total dissolved solids (TDS) /sedimentation and phosphorous accumulation rates within the lake, creek, adjacent wetlands, and downstream water courses associated with the dewatering process.*

- *Proponent to provide a monitoring plan to assess the health and function of the wetlands during the active periods of sequestration, and mitigation strategy for the re-establishment / restoration of impacted wetlands.*
- *Geotechnical, elevation, and hydrological modelling is required to ensure that water movement through the wetland complex is as planned.*

The wetland areas currently provide seasonal habitats for a variety of wildlife species (e.g. nesting sites for waterfowl and songbirds, aquatic feeding areas for moose, winter feeding areas for deer), year- round habitats for furbearers (e.g., beaver, muskrat, mink, otter), and amphibians and reptiles, not to mention various small mammals and their associated avian and mammalian predators.

Short-term effects may occur immediately to beaver and other year-round inhabitants of the wetland through mortalities associated with winter flooding of the floodplain zone. Longer-term effects will depend on the depth of sediments deposited, contaminants contained therein, and associated alterations in plant communities, water table levels and drainage patterns. The ability of wetlands to function properly; including the sequestering of phosphorus as required as part of the mitigation strategy identified in the project, is dependent of the presence of healthy vegetation to trap sediments. If excessive sedimentation due to lake dewatering results in smothering of the existing plant communities the wetlands may be degraded and may not be able to function properly. If dewatering alters the hydrology of the wetland, its ability to function may also be compromised.

Action Required:

- *Proponent recommended to provide an inventory of furbearing species within the scope of the project area*
- *Proponent is recommended to engage the RTL trapper(s) with a proposal to remove all the beaver in the area to be flooded to ensure that the fur resource is maximized.*

Dewatering of the lake may also be associated with indirect effects on adjacent upland habitats. At larger scales, mobile species such as moose, white-tailed deer and black bear (all species found within the scope of the project) select habitats where the wetland-upland mosaic offers an appropriate mix of seasonal foods and shelter. If the habitat quality of a wetland is degraded, the value and use of adjacent upland areas may also be affected. Anticipated short-term effects may include displacement from the area and/or mortalities related to winter flooding, including flooding of dens of hibernating species. Longer-term effects would be dependent on the volume of sediments deposited, the types and levels of contaminants associated with the sediments/water, and the length of time the lake remains dewatered.

Bernic Lake in itself provides habitat for numerous wildlife species such as several species of waterfowl (e.g., cormorants, swans and pelicans) and various shore and near-shore species of

avian. The dewatering of the west basin will result in temporary loss of wildlife habitat for these species.

Manitoba Conservation Data Center records indicate that the Canada Warbler, a species listed as endangered under the ESA and threatened by COSEWIC and the SARA, has been reported to exist within the scope of the project area. Canada warblers are ground nesters that inhabit dense shrubbery in moist mixed forests and wetlands, often along the edges of streams or on slopes near rivers and lakes. In addition, there are occurrences of the common snapping turtle (a species of special concern) habituating the area as well. Snapping turtles are almost entirely aquatic, inhabiting slow moving waters and lakes. They hibernate in shallow "digs" in muddy lake, river and creek bottoms, or under submerged logs. If the hibernating sites of turtles are drained and exposed to freezing temperatures, winter mortalities would occur.

Anticipated Forestry impacts

Proponent should be advised that there may be associated impacts of flooding on lowland forested areas downstream of Bernic Lake with the dewatering process. Any/all impacts to timber resources; including wetland / riparian area forest communities may be subject to applicable timber damage appraisals.

In addition to the associated impacts caused by the dewatering process (flooding) all impacts to forest resources related to infrastructure developments identified in the project (i.e., temporary access roads, quarry works etc...) will be subject to timber damage appraisal and or applicable forest permits where resources can/may be salvaged.

Parks Comments

Poplar Bay Provincial Park may be impacted due to its adjacency to the Bird River outlet as it enters Lac du Bonnet. Poplar Bay Provincial Park is a recreation park containing seasonal cottages and a seasonal campground. Recreational use of the Lake and River may be impacted (boating, sport/recreational fishing, swimming and other domestic uses) by increased levels of phosphorus or sediment loading.

Environment Section Comments:

Although Regional Environment Operations will be commenting directly to Environment Approvals Section, there is a request that the proponent commit to an ongoing monitoring program and provide a mitigation strategy that details actions and responsibilities if established criteria for water quality and water standards are exceeded, in addition to an action plan if the planned mitigation strategy is not effective.

Lands Branch Comments

With respect to the use of Crown lands to accommodate the infrastructure developments identified in Phase 1 and 2 of the project, Crown Lands Act disposition(s) as per the *The Crown Lands Act* will be required and secured by the proponent to tenure the occupancy of affected Crown lands. Crown Lands Act disposition(s) will not be required for developments located on the existing Surface Mining Lease area however will be subject to IEM approval and required First Nation / Aboriginal Consultation requirements.

DATE: September 30, 2013

TO: Jennifer Winsor, Environmental
Engineer
Environmental Approvals (Box 80)
Conservation and Water Stewardship
123 Main Street
Winnipeg MB R3C 1A5

FROM: Environmental Compliance and
Enforcement
Conservation and Water Stewardship
Box 4000
Lac du Bonnet MB R0E 1A0
P: (204) 345-1486
F: (204) 345-1400

SUBJECT: Notice of Alteration #20 – Crown Pillar Mitigation Project – Tantalum Mining Corporation of
Canada Limited (File No. 1906.30)

The Notice of Alteration does not contain adequate information to determine the potential for the release of pollutants into the downstream environment during the dewatering phase, or the risks associated with the release of pollutants, or how such risk will be mitigated.

According to C.C.S.M. c. E125 *The Environment Act*:

1(2) In this Act

“**pollutant**” means any solid, liquid, gas, smoke, waste, odour, heat, sound, vibration, radiation, or a combination of any of them that is foreign to or in excess of the natural constituents of the environment and

- a) affects the natural, physical, chemical, or biological quality of the environment, or
- b) is or is likely to be injurious to the health or safety of persons, or injurious or damaging to property or to plant or animal life, or
- c) interferes with or is likely to interfere with the comfort, well being, livelihood or enjoyment of life by a person;

No release of pollutants in excess of limits

30.2 No person shall release or allow the release of a pollutant in an amount or concentration, or at a level of rate of release, that exceeds the limit that is expressly provided under this Act, another Act of the Legislature, or an Act of Parliament, or in a regulation, licence, permit, order, instruction, directive or other approval or authorization issued or made under one of those acts.

Environmental Compliance and Enforcement Branch requests that prior to the dewatering of the west basin of Bernic Lake, the proponent provides a detailed impact assessment that is based on quantifiable data, and a mitigation plan for each of the risks identified in the impact assessment. This information is required to verify that pollutants will not be released into the Bernic Creek wetlands and that the level of risk posed to the downstream environment is acceptable.



WASHINGTON STATE UNIVERSITY

Department of Biology

General Biology I

Lab Manual

1998-1999

Author: [Name]

Editor: [Name]

Reviewer: [Name]

Printer: [Name]

ISBN: [Number]

Copyright: [Year]

Printed in the USA

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Wildlife Comments

TANCO Mine: Crown Pillar Mitigation project

GENERAL COMMENTS:

The proponent states that (Appendix A, Section 4.1)::

The standard permitting process for a project of this nature requires extensive upfront environmental studies to support the permit application. Proponents are expected to demonstrate an understanding of the natural environment, assess potential effects, provide mitigation measures, and provide plans for managing and monitoring potential environmental effects prior to construction and operation. The urgency of the project precludes following the standard linear permitting process as the process cannot be completed within the acceptable risk window. It is anticipated that Tanco may have to make some commitments to the regulators to conduct environmental studies and develop management plans in order to expedite the process.

The submission provides a thorough description of risks and assessments related to the operations and maintenance of the mine. Environmental risks, assessments and related impacts, however, have been addressed in a very cursory manner, with no recent on-site inventories or assessments conducted to verify aspects of the physical, terrestrial and aquatic environments described in the document. The paucity of environmental information has hampered the review of this proposal and created uncertainty as to the potential scope and magnitude of effects. Notwithstanding the urgency of the proposal, current data (collected spring-fall 2013) on physical, terrestrial and aquatic components would have been invaluable in facilitating an assessment of effects and determining related mitigative and monitoring recommendations.

Sections 4.2 – 4.7 subsequently describe “*the key items where we anticipate the regulators may require commitments*”. These sections address fish and fish habitat, surface hydrology, lake dewatering, water management, dust/sediment control and environmental effects monitoring. Notably absent is any acknowledgement of anticipated commitments related to wildlife, wildlife habitat or wildlife effects monitoring, despite the alterations to wetland habitats associated with the project.

There are numerous statements within the document indicating that environmental effects will be “*not significant*”, “*insignificant*”, “*negligible*”, “*temporary*” and “*reversible*”. These statements are not supported by any scientific data as they relate to effects on wildlife and wildlife habitat. No flora or fauna inventories have been conducted within the project area, and characterization of the wetland complex was conducted via topographic maps, aerial photos and “*reconnaissance-level surveys*”, rather than through ground truthing. These techniques are inadequate for conducting an assessment of wildlife effects. Potential impacts on wetland and terrestrial flora and fauna are, for the most part, not addressed in the document, with the exception of impacts related to road construction.

COMMENTS ON INDIVIDUAL SECTIONS:

excerpts from the document are italicized;

5.3.8 *Species at Risk*

*No aquatic species listed under the Species at Risk Act are known to occur in the TANCO project study area. The Carmine Shiner (*Notropis percobromus*) is known to occur in the region but the nearest location is 15 km downstream of the TANCO road crossing at the first set of rapids on the Bird River (COSEWIC 2006). A recent, intensive fish community survey along the Bird River conducted by DFO was unable to extend the distribution upstream in the Bird River (Watkinson unpubl. data).*

COMMENTS:

There are no known aquatic SAR with the exception of Carmine Shiner in the area based on existing data known to the Manitoba Conservation Data Centre. These data are dependent on the research and observations of CDC staff and others who have shared their data, and reflect our current state of knowledge. **An absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present;** in many areas, comprehensive surveys have never been completed. Therefore, this information should be regarded neither as a final statement on the occurrence of any species of concern, nor as a substitute for on-site surveys for species as part of environmental assessments. For this reason a comprehensive survey for Carmine Shiner is recommended. There are also potential downstream effects on Carmine Shiner which are not evaluated in this report.

The data for Carmine Shiner should have been included in the report. There is no data to evaluate the claim in the Cabot documents that no shiners are found in Bird River near the Bernic creek outflow.

6.0 ENVIRONMENTAL IMPACT ASSESSMENT & MITIGATION PLAN

6.2 TERRESTRIAL ENVIRONMENT

6.2.1 *Flora and fauna:*

Overall effects to the terrestrial environment, given implementation of appropriate avoidance, minimization and mitigation measures, are estimated to be not significant. All predicted effects are associated with road construction required to implement dike construction and the dewatering plan.

COMMENTS:

These comments are inaccurate. Appropriate avoidance, minimization and mitigation measures related to wildlife and wildlife habitat are not described in the document, and the overall effects on flora and fauna may be significant.

Wetland Habitats:

Dike construction and lake dewatering will affect wetland habitats and the species that inhabit these habitats throughout the dewatering and permanent dike construction periods. In the absence of mitigation to control sedimentation, these effects may be long lasting or permanent. Habitats in the open creek channel and surrounding floodplain will be directly and immediately affected by dewatering of the lake. These areas currently provide seasonal habitats for a variety of wildlife species (e.g. nesting sites for waterfowl and songbirds, aquatic feeding areas for moose, winter feeding areas for deer), and year-round habitats for beavers, muskrats, reptiles and amphibians, various small mammals, and their associated avian and mammalian predators. MBCDC records indicate that the Canada Warbler, a species listed as endangered under the ESA and threatened by COSEWIC and the SARA, has been reported in the project area. Canada warblers are ground nesters that inhabit dense shrubbery in moist mixed forests and wetlands, often along the edges of streams or on slopes near rivers and lakes.

Short-term effects may occur immediately to beaver and other year-round inhabitants of the wetland through mortalities associated with winter flooding of the floodplain zone. Longer-term effects will depend on the depth of sediments deposited, contaminants contained therein, changes occurring to water table levels and drainage patterns, and associated alterations in plant communities. The ability of wetlands to function properly is dependent of the presence of vegetation to trap sediments. If lake dewatering results in excessive sedimentation and smothering of plant communities occurs, the wetland may no longer be able to function properly. If dewatering alters the hydrology of the wetland, its ability to function may be compromised.

Adjacent Upland Habitats:

Dewatering of the lake may also be associated with indirect effects on adjacent upland habitats. At larger scales, mobile species such as moose, white-tailed and black bear select habitats where the wetland-upland mosaic offers an appropriate mix of seasonal foods and shelter. If the habitat quality of a wetland is degraded, the value and use of adjacent upland areas may also be affected. During a brief site visit on September 20, 2013, our staff found sign of moose, white-tailed deer and black bear on the lower margins of the uplands along the edges of the floodplain. Potential short-term effects may include displacement from the area and/or mortalities related to winter flooding, including flooding of dens of hibernating species. Longer-term effects would be dependent on the volume of sediments deposited, the types and levels of contaminants associated with the sediments/water, and the length of time the lake remains dewatered.

Lake Habitat:

The lake, in itself, provides habitat for numerous wildlife species; accordingly, dewatering of the west basin will result in temporary loss of wildlife habitat. Wildlife observed on the water during our brief September 20 site visit included several species of waterfowl, a pair of swans and several cormorants. TANCO Mine staff have advised

our staff that pelicans are commonly seen in the west basin during the summer. MB Conservation records indicate that the common snapping turtle (a federal species of special concern) has been reported in the project area. Snapping turtles are almost entirely aquatic, inhabiting slow moving waters and lakes. They hibernate in shallow "digs" in muddy lake, river and creek bottoms, or under submerged logs. If the hibernating sites of turtles are drained and exposed to freezing temperatures, winter mortalities would occur.

6.2.2 WETLANDS

A primary concern with the proposed plan relates to the potential for sedimentation in the wetland(s) from the dewatered volume.

While the magnitude of the sediment retention is currently unknown, and the depths estimated herein represent an expected upper bound, more precise calculations can be made if data addressing sediment concentrations and sediment gradations are collected through the geotechnical investigation.

Once the sediment loads and retention in the wetlands are estimated, depths of sedimentation can be estimated.

COMMENTS:

In the absence of precise calculations, there is no confidence that the estimates presented in the document represent the actual "upper bounds" of depths that will be deposited in the wetland. These critical missing estimates, along with hydrological and elevational modelling (also absent in this proposal), are required to form a more accurate assessment of the project's short and long term impacts on the environment.

RECOMMENDATIONS:

Fieldwork should be conducted this fall to provide baseline information on vegetation communities and wildlife species in the receiving wetlands.

Studies should be conducted to provide the following information:

- Phosphorus concentrations in the lake sediments
- Hydrological modelling
- Elevational modelling
- Estimated sedimentation depths in the receiving wetlands

As the environmental risks can be reduced by reducing the area of the lake to be dewatered, it is recommended that the proponent proceed with Option 1A or 1B, as identified in section 3.0: *Mitigation Options*. Either of these options will significantly reduce the volume of water and sediments to be discharged from the lake into the wetland. Results of the recommended studies should be used to determine whether the

volume of the discharge waters, estimated sedimentation depths and phosphorus concentrations in the sediments warrant further mitigative actions.

If either of these options are unacceptable and no studies are conducted to enable more accurate estimates of impacts it is recommended that the following further mitigation actions should be required:

- Minimize the area of wetlands to be flooded. Use of the horseshoe-shaped wetlands should be avoided
- Employ active methods to remove TSS and phosphorus from the lake water prior to discharge into the receiving wetland
- It may be necessary to remove the beavers in the receiving wetland prior to freeze-up if the volume of discharge water is projected to result in mortalities due to winter flooding

Additionally, the proponent should submit an environmental monitoring plan for review.



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Memorandum

Date: September 30, 2013
To: Jennifer Windsor P.Eng
Climate Change and Environmental
Protection Division
Environmental Approvals Branch
123 Main Street, Suite 160
Winnipeg MB R3C 1A5

From: Kevin. Jacobs M.Sc.
Water Quality Management Section
Manitoba Conservation and Water
Stewardship
123 Main Street, Suite 160
Winnipeg MB R3C 1A5

<http://www.gov.mb.ca>

Subject: TANTALUM MINING
CORPORATION OF CANADA
LIMITED (TANCO) CROWN
PILLAR MITIGATION
PROJECT

Telephone: 204-945-4304
Facsimile: 204-948-2357

On behalf of the Water Quality Management Section of Manitoba Conservation and Water Stewardship please find comments regarding the proposed crown pillar stabilization proposal submitted by Cabot Corporation for the Tanco Mine located at Bernic Lake Manitoba.

The proposal appears to be deficient in a number of areas. The proposal does not provide a clear assessment of potential impacts to water quality, aquatic life, aquatic habitat, and hydrology. All of the alternative scenarios dismissed by the proponent would appear to have a lesser impact on Bernic Lake and pose less risk for the downstream environment.

The proposal indicates that the west basin of Bernic Lake will refill within 17 months.

- How was this calculated and what assumptions were made? What is the nature of the lake sediments? Will oxidation for several years impact future lake chemistry?

No discussion has been provided regarding potential changes to hydrology, water chemistry, and aquatic habitat in Bernic Lake and how that may influence downstream biota.

Bernic Lake is known to be eutrophic, containing higher than recommended guideline phosphorus concentrations to prevent the nuisance growth of algae and aquatic plants. Results of environmental effects monitoring studies show that the elevated phosphorus concentrations in Bernic Lake result from mining operations and the nature of the orebody and subsequent effluent from the tailings area (Tetra Tech 2011). By draining Bernic Lake to downstream waterbodies phosphorus and nitrogen are likely to be exported downstream. The proposal suggests that drainage will occur to a number of wetlands in the area, however, drainage will be largely over the winter when little to no biological uptake of nutrients and other contaminants is expected. During spring melt, this water would be flushed into downstream water bodies providing nutrients for algae growth. While limited monitoring of the Bird River shows that water quality currently is quite good, Lac du Bonnet can occasionally experience algal blooms. No assessment of the relevant nutrient uptake by the wetlands is provided and no nutrient modelling has been submitted by the proponent. The proponent has not provided an estimate of the nutrient load that would be transported downstream. This information would be particularly helpful if it was put in context with the current nutrient load of the Bird River and Lac Du Bonnet. Given the large

volume of water to be emptied from Bernic Lake ($9.77 \times 10^6 \text{ m}^3$), even under the best case scenario, a considerable mass of phosphorus and nitrogen could be anticipated to be deposited into the Bird River system and Lac du Bonnet.

- The proponent should describe in greater detail how natural wetlands would be augmented as necessary to improve the performance in reducing nutrients and total suspended solids (TSS). Have any of these wetlands been used as tailings containment areas historically?
- Based on what evidence would constructing a channel increase the overall capacity and effectiveness of the natural wetlands by fivefold?
- The proponent should provide a complete water balance for the proposed pumping operation. If pumping is at a rate of $2.5 \text{ m}^3/\text{s}$ and discharge is $0.7 \text{ m}^3/\text{s}$ where is the rest of the water going? A digital elevation model and other topographic data such as LIDAR mapping would support hydrologic modelling.
- How was the pumping rate determined? How does the pumping rate affect nutrient uptake by the wetlands?
- How does the proposed dewatering period affect nutrient sequestration and nutrient loads to receiving waters?
- The proposal should include an overall high quality map of the proposed drainage area.
- The report notes that total suspended solids are likely to be elevated in discharge water in particular as re-suspension of the sediments occurs when the bottom of the lake is drained. It is noted that sufficient sedimentation may occur to alter the natural hydrology and infill wetlands. What area of wetlands would be affected? What are the characteristics of the wetlands to be used? Has the proponent considered a compensation plan for any wetlands in-filled? How will sediment be managed within the wetlands should the project be completed?

It is noted no fish out or live capture and relocation of fish and other biota is planned. Neither details of a fish compensation plan, nor any mortality management plan are provided in the report. It is noted that the only report on fish populations is a single report on a survey conducted in 1969 (Crowe 1972). The proponent should provide a comprehensive survey of aquatic life in Bernic Lake including information on rare, threatened, and endangered species.

Water quality data:

The proponent provides water quality data for Bernic Lake. However, it is not known if these data are from the surface or bottom layer. The concentrations of total phosphorus and total metals are expected to be higher in the bottom layer of the lake. The proponent should provide a more thorough assessment of water quality in Bernic Lake and should assess the impact of this water downstream. In particular, the assessment should include nutrients (as described above) and metals.

Relocation of Final Discharge Point:

Biological effects monitoring studies have shown that mine related effects as defined by the federal Metal Mining Effluent Regulation are for the most part contained with the west basin of the lake. Limited effects downstream have been attributed to the intermittent nature of the flow from Bernic Lake to Bernic Creek and then to the Bird River. By moving the final discharge point to Bernic Creek, the amount and frequency of flow is expected to increase. The proponent should provide a more thorough assessment as to how the change in final discharge point may impact Bernic Creek, the Bird River and Lac du Bonnet.

Concerning dike construction:

Limited information is provided regarding dike construction methods, materials, and expected seepage rates.

Although the report notes that there is sufficient material in the area for dike construction there is limited information provided. Please provide results from any acid/base or alkali accounting performed. Were any leach tests done? If blast rock is used will there be residual ammonia? Once the lake level is restored how will fill and rock be removed from the site?

Will dike construction result in any flooding of the East Basin of Bernic Lake?

Other:

No monitoring plan was provided by the proponent.
An updated mine closure plan should be submitted

References:

Crowe, J.M.E. 1972. Bernic Lake Survey 1969. Manitoba Dep. Mines Nat. Res. Fish Br. MS. Rep. No. 71-5, 19pp.

Tetra Tech 2011. 2011 Environmental Effects Monitoring Investigation of Cause Study. Report prepared for the Tantalum Mining Corporation of Canada, Lac du Bonnet, MB by Tetra Tech Winnipeg, MB. June 6, 2011.



Forestry Branch Comments:

There are a couple of forest related issues caused by the draining of Bernic Lake. The issues can be divided into the following categories: immediate timber losses, potential losses caused by flooding through the dewatering process, and the permanent effects of loss of productive land. The first two can be dealt with through the damage appraisal process. The third issue is a more involved process and may require an in depth assessment of the growth and yield models for the forest management unit.

Immediate impact caused by the removal of timber for access to a quarry for the rock material that will be used in the development of the dike and construction roads and other clearing. A shape file of the planned timber removal areas will be required to complete the assessment. If the applicant is unable to provide this information forestry staff will complete a field review and costs incurred will be included in the damage appraisal.

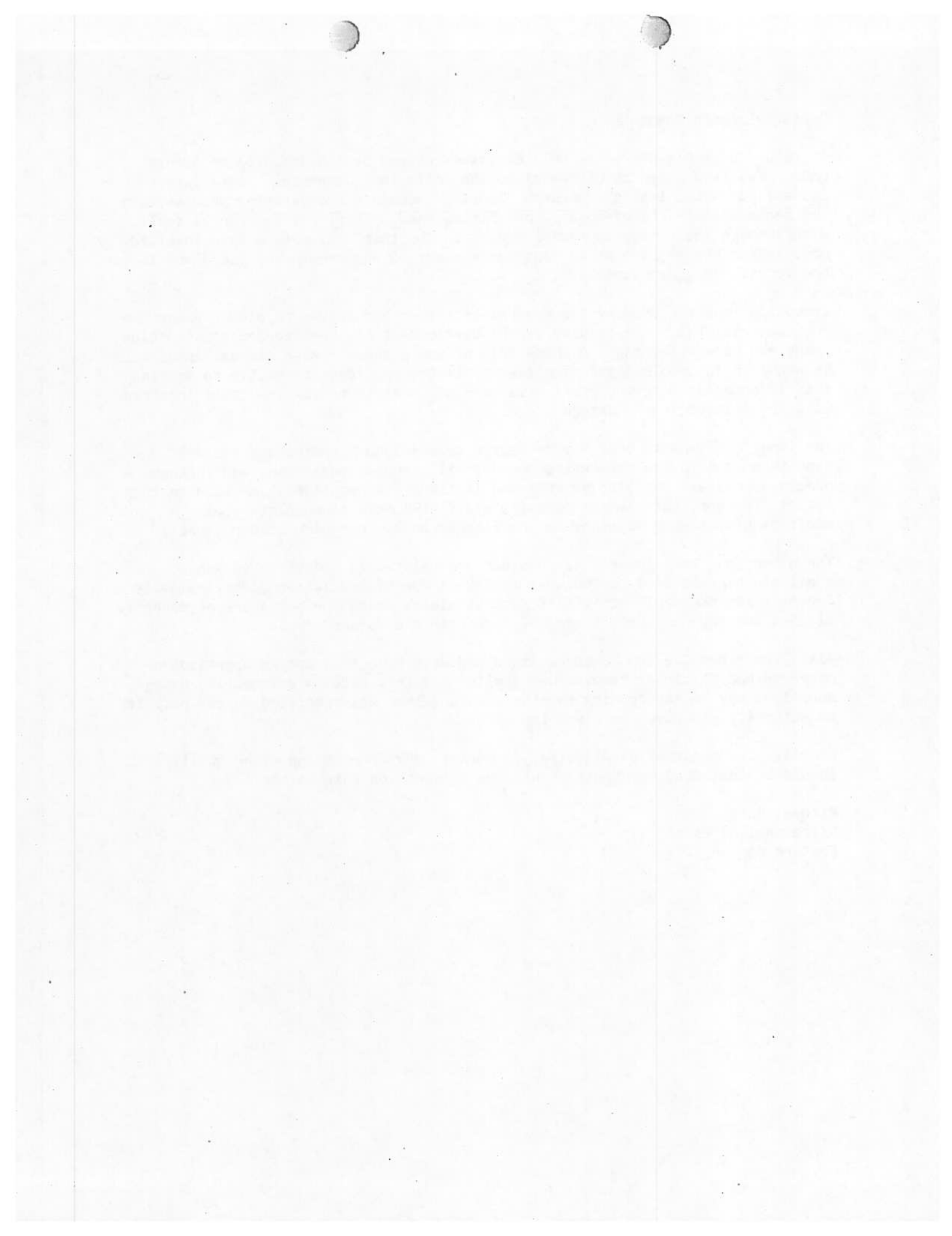
The long term impacts that may be caused by overland flooding and sediment deposition due to the dewatering process will require monitoring and further damage appraisals may also be assessed if timber is negatively impacted in the future. The applicant and/or forestry staff will need to complete field monitoring of timber adjacent to the flooded areas to review timber impacts.

The other long term impacts to consider are related to reduction in annual available harvest area and volumes in FMU 31 due to cumulative timber removals for many non-renewable activities such as mining where the sites are permanently altered and may not support healthy forest in the future.

Also, the mine site should be reviewed and determine if a damage appraisal or other method of timber removal was applied for this site. A retroactive damage appraisal may be forthcoming for the clearing that was completed in the past if no authority was given to clear the site.

Finally, the branches of wildlife, fisheries, environment and water quality should be contacted for their respective comments on this matter.

Michael Doig
A/Regional Forester
Eastern Region



Winsor, Jennifer (CWS)

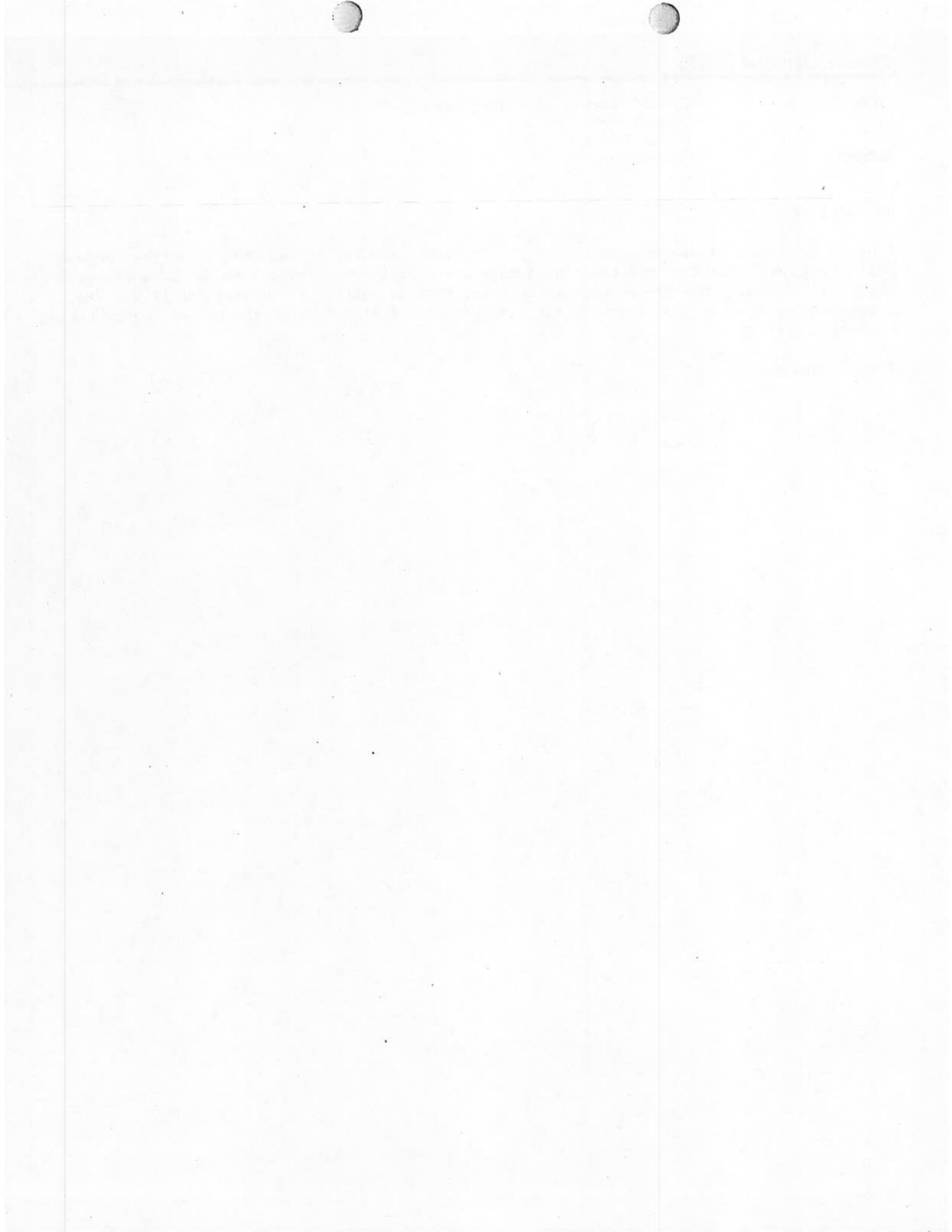
From: VICKI VERVILLE [vickiverville@shaw.ca]
Sent: September-30-13 7:54 AM
To: Winsor, Jennifer (CWS)
Subject: Bucko Lake

Hi Jennifer

I heard the end of a discussion about draining Bucko Lake for a mine that is on the verge of collapsing, and that the environmental damage would be irreversible. I am not sure if you are the person to lodge my vote of opposition (not that it really is a vote!) but if you are, please add my name to that list. IF not, can you please direct me to the person who is taking comments on this?

Thanks Jennifer!

Vicki



Winsor, Jennifer (CWS)

From: Chris Randall [mr.chris.randall@gmail.com]
Sent: September-30-13 8:29 AM
To: Winsor, Jennifer (CWS)
Subject: TANCO – CROWN PILLAR MITIGATION PROJECT – FILE: 1906.30

Dear Ms Winsor

I wish to object to the proposed application by Tanco for an Environmental Licence to carry out the works detailed in File 1906.30

The application clearly involves works which will result in a HADD in both Bernic lake and the wetland downstream of mine yet no details of a compensation plan have been provided. No assessment has been made upon the plant communities from the additional flow and sediment or the migratory bird communities that would likely be present during the period when de-watering is proposed.

The proposed roadway and dam will almost certainly use fill that is contaminated with invasive no-native plant species, further spreading these pernicious weeds into the boreal forest.

The effects of the proposed works upon the wetland and watercourses downstream of the site are based upon assumption with no baseline survey data provided.

The monitoring proposals lack substance and are insufficiently detailed for the province to come to a conclusion as to whether they are adequate to address the needs of this development.

No information has been provided as to what actions will be taken if the wetland proves insufficient to mitigate discharges or if fish populations do not recover.

I understand that the plan is intended to reduce the likelihood of a more serious incident occurring but do not feel this justifies granting a permit based on such poor information.

Chris Randall



THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

REPORT OF THE COMMITTEE ON THE PHYSICS DEPARTMENT

FOR THE YEAR 1964-1965

CHICAGO, ILLINOIS

1965

PHYSICS DEPARTMENT

CHICAGO, ILLINOIS

1965

PHYSICS DEPARTMENT

CHICAGO, ILLINOIS

Winsor, Jennifer (CWS)

From: SARAH HILL [sarah_hill@shaw.ca]
Sent: September-30-13 10:55 AM
To: Winsor, Jennifer (CWS)
Subject: TANCO Mine

Hi Jennifer,

Just wanted to share my concerns regarding the TANCO mine. I would like to see Conservation and Water Stewardship take over operation/remediation of the TANCO Mine. I do not support Cabot's application to dam and drain Bernic Lake. I hope Conservation will fully investigate this situation and not allow discharge of Bernic Lake waters into the Bird River.

Thank you,

Sarah Hill



To: Jennifer Winsor Manitoba Conservation/
Water Stewardship Licensing & Approvals

Re: TANCO Crown Pillar Mitigation Project

From: Bird River Cottage Owners Association (BRCOA)

Date: September 30, 2013

The following are our comments and concerns with respect to the TANCO Environmental Assessment Proposal #1906.3.

In summary, as cottage owners with a significant stake in the quality of the receiving waters of the Bird River we need an ongoing system of communication- what is being done and on what timeline, actual flows and assays as water is pumped from the east basin into the wetlands and finally to the Bird River. Safeguarding the water quality for wildlife, human and recreational use is of prime importance to our constituents.

Detailed concerns and questions are as follows:

1. The rate of pumping from the west basin into the wetlands
 - a. During low flow periods this could add 10-15% of total flow to the Bird River. Will this be too high to ensure a suitable contact time in the wetlands area (for chemical remediation by the flora)?
2. The establishment of suitable monitoring points for both the mine discharge and the liquid pumped from the west basin in order to protect the Bird River. The tailings discharge point is going to be moved and selection of this and a discharge point to the Bird River is important. There should be an assurance of ongoing monitoring that is reported to Manitoba Conservation and the BRCOA on a timely basis.
 - a. The levels of phosphorus and other metals discharged to the Bird River must meet Manitoba Water Quality Standards Objectives and Guidelines (MQWSOG) and other licensing requirements. This may require an additional sample point at the head waters of the Bird River during this project.
 - b. Dewatering or tailings discharge flows must be reduced or stopped on a timely basis if water quality is compromised.
3. The levels of sediment to be deposited in the wetlands:
 - a. Minimizing the amount of sediment transferred with the water from the east basin should be a project objective.

- b. As the west basin is pumped down to near bottom it is likely that significant levels of poor quality lake bottom sediment will report to the wetlands. Flowrates should be slowed until the concentrations and composition of the sediment and thus the amount of deposition and the efficacy of the wetlands in treating this flow are well understood.
 - c. Too much sediment deposited may change the drainage pattern as there is a small elevation change between the Bernic west basin through the wetlands to the Bird River (and thus the water flows and where they enter the river).
4. We would like confirmation of the water quality levels in the Bird River especially during and also after the project is completed. (Note that sampling in the Bird River was done by TANCO's consultants during 2008 and we also have the 2012 BRCOA results for comparison).
5. We would like additional detail on the method of removing & disposal of the dike material between the east and west basin at the end of the project to ensure minimal further impact on the environment.
6. It is essential that there is a clear line of communication of information to the BRCOA with appropriate contact personnel at TANCO and Manitoba Conservation.
 - a. Notification of approval dates, details of final project plans and timelines, timely reporting of rates of pumping and discharge and receiving waters assays.

Sincerely,

Catherine Stewart
On behalf of the Bird River Cottage Owners Association

Xc: M. Kinghorn -Councillor Ward 4 RM Alexander

Winsor, Jennifer (CWS)

From: Kaita, Adara (CWS) on behalf of +WPG1212 - Conservation_Circulars (CWS)
Sent: September-30-13 10:49 AM
To: Winsor, Jennifer (CWS)
Subject: EA Proposal – TANCO - Crown Pillar Mitigation Project - File: 1906.30

Hi Jennifer,

Please note that the Watersheds and Protected Areas Branch have no concerns. Dale has already sent you the comments from the Lands Branch.

Thank you,

Adara Kaita
Crown Land Programs and Policy Manager
Conservation and Water Stewardship
Box 25, 200 Saulteaux Crescent
Winnipeg, MB R3J 3W3
Cell: (204) 945-6301
F: (204) 948-2197

From: Sobkowich, Dale (CWS)
Sent: September-30-13 10:28 AM
To: Winsor, Jennifer (CWS)
Cc: Kaita, Adara (CWS)
Subject: TANCO - Crown Pillar Mitigation Project - File: 1906.30

Please see the attached Lands Branch comments as they pertain to the TANCO - Crown Pillar Mitigation Project.

Dale Sobkowich, Resource Planner
Lands Branch
Department of Conservation and Water Stewardship
Box 25 200 Saulteaux Crest.
Winnipeg, Manitoba R3J 3W3
ph: (204) 945-6660
fax: (204) 948-2197
email: Dale.Sobkowich@gov.mb.ca



[The page contains extremely faint, illegible text, likely bleed-through from the reverse side. The text is too light to transcribe accurately.]