GlencoreXstrata

WASTE MANAGEMENT PLAN

HACKETT RIVER EXPLORATION PROJECT

Water Licence No. 2BE-HAK0915
AANDC Land Use Permit No. 2010C0015
KIA Land Use Licence No. KTL304C010-Renewed

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DOCUMENT CONTROL

Revision No.	Date	Details	Author	Approved
1	May 2013	Standardize format with other GlencoreXstrata documents General edits for readability. Update Figures 1 and 2. Updated discussion of mineral waste to reflect current practices. Added discussion of contaminated soil, snow and water management. Addressed EC comments (2010[1]). Addressed AANDC comments (2013). Updated Waste Generator #. Updated designated waste receiver. Added discussion of permitted open burning. Included reference to 2012 open burning permit. Updated list of References.	S. Burgess	D. Hamel

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1. INTRODUCTION

GlencoreXstrata is actively exploring the Hackett River area under the land use, mineral tenure, water use permits and licences listed in **Error! Reference source not found.**.

Table 1: List of Licenses and Permits issued for Hackett River Project

Permit No.	Permit Name	Expiry	Issuing Agency
Surface lease 76F16-1-4	Hackett River Camp	2017-03-17	AANDC
Land Use Permit N2010C0015	Exploration activities	2013-10-31	AANDC
Land Use Licence KTL304C010	Hackett River	2013-03-17	KIA
Land Use Licence KTL304C002	Wishbone	2012-03-16	KIA
Water Licence 2BE-HAK0915	Hackett River Camp	2015-12-31	NWB
Land Use Licence KTL111C009	Hackett River	2012-05-04	KIA

The purpose of this document, the *Waste Management Plan, Hackett River Exploration Project* (the Plan), is to outline current waste management infrastructure and practices in place at the Hackett River Exploration Project (the Project) in order to meet requirements of the above listed permits and licenses as well as Xstrata's corporate *Sustainable Development Policy*.

GlencoreXstrata commits to implementing this Plan and will continue to look for opportunities to minimize or eliminate negative impacts to the environment as a result of its activities, products and services relating to the Project.

1.1 Scope

The goal of the Plan is to outline practices to reduce waste and prevent impacts to the environment associated with waste management at the Hackett River camp and associated exploration activities. Managing wastes and working responsibly also ensures personnel safety while involved in mineral exploration activities.

This Plan applies to the Hackett River Camp and all associated mineral leases and claims. Subject to annual internal review and revision, it will remain applicable throughout the duration of the NWB license, or until a material change in the scope of the Project occurs.

1.2 Xstrata Zinc Sustainable Development Policy

As a diversified and metallurgical company, GlencoreXstrata recognizes that our operations may have an impact on the communities where we operate. We are therefore committed to sustainable development (SD) by integrating economic, environmental and social responsibility aspects into our governance. This commitment is based upon the following principles:

- Implementation and maintenance of ethical business practices including upholding fundamental human rights, and respecting the traditional rights of local communities.
- Prevention of environmental degradation, occupational injuries and diseases.
- Continuous improvement through the assessment, establishment, control and management of SD objectives and targets, and the allocation of appropriate resources to achieve them.
- Compliance with legislation as well as adopting the requirement of other applicable standards, and exceeding them where reasonably practical.
- Open and honest engagement with relevant stakeholders to consider their opinions, suggestions, complaints and concerns regarding SD issues, taking these into

account in our decision-making process, as well as managing responses in a positive way.

We address sustainability throughout our product life cycle and supply chain, and we expect our suppliers and partners to comply with Xstrata's *Sustainable Development Policy and Framework*.

1.3 Site Location and Description

The Hackett River Project is located in the West Kitikmeot Region of Nunavut, about 104 km south of Bathurst Inlet (Figure 1) approximately 65° 55' North Latitude, 108° 22' West Longitude. The Project consists of a single exploration camp located on the southwest shore of Camp Lake (Figure 2) and seven crown mineral leases. The camp can house up to 95 people to directly support exploration activities involving surficial mapping, geophysical surveys, core logging, and diamond drilling, as well as environmental baseline studies. The exploration camp is located on Surface Lease 76F 16-1-4.

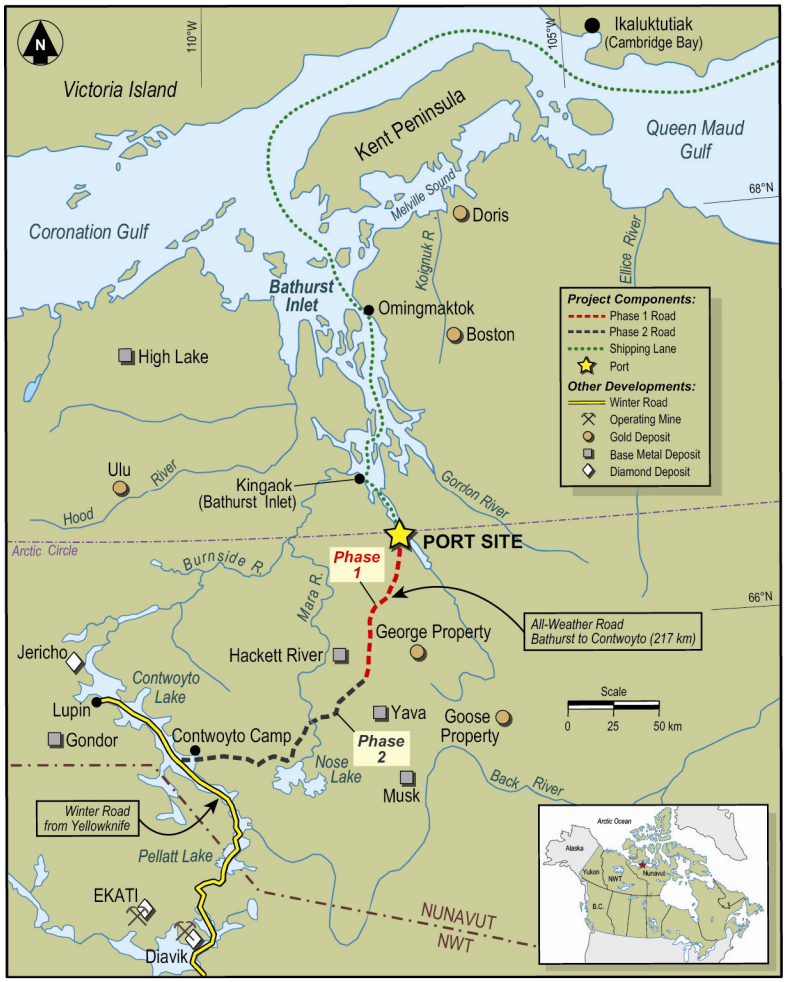

Figure 1: Location of Hackett River Project

Figure 2: Hackett River Camp

2. WASTE STREAMS

This Plan addresses wastes generated as a result of Hackett River exploration program operations including, but not limited to:

- Exploration (drill sites, core cutting): spent oil, filters, antifreeze, absorbent pads, greases, lubricants and batteries; scrap metal; empty fuel drums; timber/lumber scraps; used drill rods; spent drilling fluids and additives; drill cuttings; spent aerosols; rock saw sludge; hydrocarbon-contaminated snow, soil and water.
- Generators and Heavy Equipment: spent oil, filters, antifreeze, absorbent pads, greases, lubricants, batteries; scrap metal; empty fuel drums; spent aerosols; hydrocarbon-contaminated snow, soil and water.
- Camp (kitchen, offices and sleeping quarters): plastic, glass and metal recyclables; food; wood; cardboard; plastic; rubber; glass; spent batteries, solvents and aerosols; scrap metal; empty fuel drums; sewage; grey water; construction debris; paint hydrocarbon-contaminated snow, soil and water.

3. WASTE MANAGEMENT PRACTICES

Whenever practical waste is sorted at the source and divided into the following categories:

- Non-hazardous.
    - Combustible.
    - Non-combustible.
        - Recyclables.
        - Re-useables.
        - For disposal.
- Hazardous.

Waste storage, handling and transport is managed according to:

- *Environmental Guideline for Burning and Incineration of Solid Waste* (GN 2012).
- *Environmental Guideline for the General Management of Hazardous Waste*(GN 2010).
- *Environmental Guideline for Industrial Waste Discharges (GN 2002)*
- *Fire Prevention Act* (GN 2006[2]).
- *Interprovincial Movement of Hazardous Waste Regulations* (MOE 2002).
- *Mine Health and Safety Act* (GN 2003[1]).
- *Mine Health and Safety Regulations* (GN 2003[2]).
- *National Fire Code of Canada* (NRC 2010).
- *Safety Act* (GN 2006[1]).
- *Technical Document for Batch Waste Incineration* (EC 2010[2]).
- *Worksite Hazardous Materials Information System Regulations* (GNWT 1990).

The following sections outline management of hazardous and non-hazardous materials on site.

3.1 Non-Hazardous Waste Management

Non-hazardous waste includes food waste, sewage, wood, cardboard, plastic, rubber, glass scrap metal, empty fuel drums, drill cuttings, additives, and fluids.

3.1.1 Handling

Non-hazardous wastes are separated at source, where possible, to avoid handling materials multiple times. Materials are disposed of in separate, labeled containers including: garbage; plastic and aluminum drink containers; printer cartridges; metal containers; plastics (#1 thru #6); glass; scrap metal; cardboard and paper. Sewage waste collected from Pactos remains in appropriate plastic bags and are handled by designated staff only. Wood is sorted and re-used wherever possible. Wood not suitable for reuse is segregated along with combustible inert wastes.

Waste produced at drill sites (with the exception of drill cuttings) is transported back to camp for appropriate segregation and storage/disposal.

A drill cuttings and salt water re-circulation system (closed loop) has been implemented on all active drills. The system greatly reduce the amount of water and salt consumed, and provides total control over drill cuttings release location. Accordingly, drill cuttings are deposited a predetermined location within natural depression. Where mineral exploration drilling occurs near, or on lakes, the drill return water containing drill cuttings will be pumped, at least 31m away of the High Water Mark (HWM) of any water body.

3.1.2 Storage

Recyclable and reusable wastes are stored in appropriate containers (plastics stored in garbage bags) in a designated, covered area until they can be backhauled to Yellowknife for inclusion in their recycling program. Inert combustible wastes are stored in a dry, designated area until they can be disposed of. Camp garbage and Pacto waste is stored in a covered, secure area adjacent to the kitchen until daily transport to the incinerator. When volumes of Pacto waste exceed the maxim allowable to be included in each burn cycle (20% of each burn cycle), waste is stored in designated, secure, double-walled plastic tubs and backhauled for disposal at a designated waste receiver in Yellowknife.

Scrap metal, including binding straps, construction waste and equipment parts, is stored in empty 205 L barrels, stacked and stored in secondary containment.

Greywater from the camp kitchen and the two drys is currently collected by drainage pipes and gathered in a 500-gal (1893 L) open tub and then pumped by a trash pump to a greywater disposal pit located approximately 110 m from Camp Lake with an automatic, float-controlled pump.

3.1.3 Transportation

Waste materials not disposed of onsite are backhauled to a designated waste receiver in Yellowknife. Backhaul quantities are tracked and recorded by camp management, including the type and volume of waste backhauled and identification of final waste destination.

3.1.4 Treatment and Disposal

Combustible wastes are incinerated daily as per *Technical Document for Batch Waste Incineration* (Environment Canada 2009) and/or open burned under permit. Incinerated wastes include kitchen waste, Pacto sewage waste, garbage from camp, offices and the drills, and scrap wood. Wherever possible, wood is sorted and re-used, and no painted wood, or wood containing glues (plywood) is burned. Records of incineration are kept by camp personnel.

Used drill rods are backhauled to Yellowknife for disposal by the drilling company.

Non-combustible inert waste are backhaul to a designated waste receiver in Yellowknife, and then for inclusion in recycling programs and/or disposal as appropriate. KBL Environmental in Yellowknife is the designated waste receiver for all wastes backhauled from Hackett River.

Drill cuttings are deposited in a predetermined location within natural depression. All drill cutting disposal locations are surveyed and recorded. Because drill cuttings are mechanically pulverized rock, they are geologically similar to the locally present glacial till; however sulphide-rich cuttings have the potential for acid rock drainage/metal leaching. Typically, it is expected that drill cuttings will, in time be colonized by plants and lichens. Current drilling practice involves significant water reuse, and so the cuttings deposited are quite dry. A study is currently under way to understand the acid-generating potential of these cuttings and to outline appropriate management and monitoring. A *Drill Cuttings Management Plan* will be submitted as an addendum to this report in October 2013 to address the Inspector's concerns (AANDC 2013).

3.2 Hazardous Waste

Hazardous waste includes used oil, oil filters, used absorbent pads, paint, chemicals, batteries, used grease, hydrocarbon-contaminated soil, snow and water, incinerator ash and rock saw sludge.

3.2.1 Handling

All hazardous materials and wastes are segregated and labeled accordingly to comply with regulations and to inform personnel/contractors of the contents. Materials Safety Data System (MSDS) sheets are available for all hazardous materials and are located in a binder in the office, helicopter shacks and drill foreman's tent. MSDS sheets are also included in the *Spill Contingency Plan*. Personnel/contractors handling hazardous materials will be trained appropriately.

In addition, hydrocarbon-contaminated snow, soil and water are collected into a used 205 L barrels. Snow is melted and free product is removed with absorbent pads.

Incinerator ash is left to cool before transferring to an appropriate container.

Mineral wastes associated with rock/core sampling include approximately 1/2 m^3 of sludge cleaned from the bottom of the settling container in the course of the season. To eliminate saw sludge release, a re-circulation water system (closed loop) has been implemented and is being tested. The new system involves adding flocculants to the sludge to help settling of saw cuttings.

3.2.2 Storage

Hazardous waste storage occurs in compliance with the current legislation and the *National Fire Code*, ensuring safe, dry storage with clear labeling and secondary containment. All storage areas are clearly identified with proper signage, and are inspected as required by regulations. Waste petroleum products are stored at least 31m from the high water mark of any water body, within secondary containment.

Hydrocarbon-contaminated water and soil are placed in sealed barrels in secondary containment.

Waste ash from the incinerator is stored in used 205 L barrels. Core saw cuttings are stored in used 205 L barrels.

3.2.3 Transportation

All hazardous wastes are manifested and backhaul to a designated waste receiver in Yellowknife. The waste generator number for Hackett River is NUG 100050.

3.1.4 Treatment and Disposal

All hazardous wastes are backhauled to a designated waste receiver in Yellowknife are disposed of appropriately by the waste receiver.

4. WASTE MANGEMENT INFRASTRUCTURE

Waste management infrastructure at Hackett River includes an incinerator and a burn pit.

4.1 Incinerator

The incinerator system at Hackett River camp is an Eco-waste Oxidizer model CA 50 installed in 2008 (Figure 3). It is a diesel-fired, two stage, dual chambered controlled air batch incinerator contained within its own building on site. It can accommodate the current camp size of up to 90 people. The capacity of the incinerator, based on typical mixed camp waste, is about 200 lbs per burn; 2 to 4 cycles can be processed on a daily basis to incinerate the camp waste.

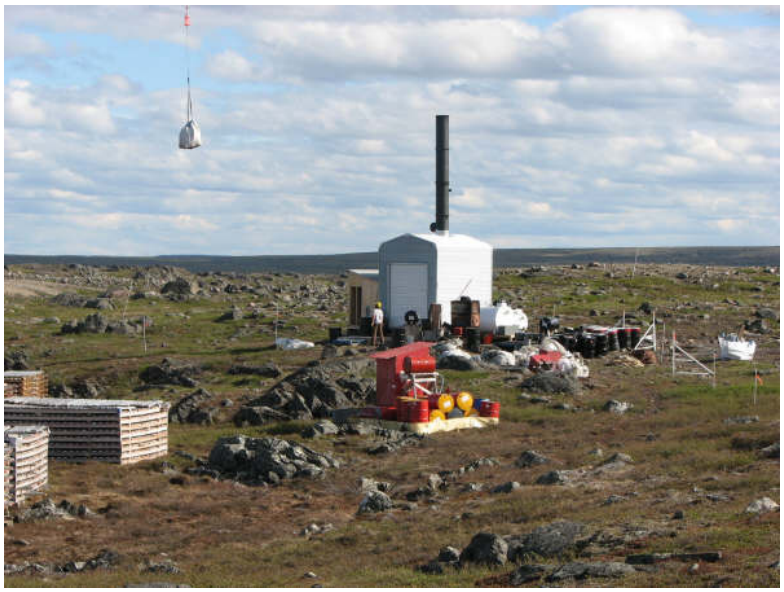

Figure 3: Hackett River Camp Incinerator

Only trained personnel participate in incineration. Incineration guidelines implemented at Hackett River include:

- Wear appropriate Personal Protective Equipment (PPE) including gloves, goggles, dust mask and face shield while handling waste or incinerator ash.
- Ensure waste has been appropriately segregated (combustible vs. non-combustible, hazardous, vs. non-hazardous).
- Burn food and Pacto wastes daily to avoid accumulation of garbage (minimizes wildlife attractant).
- Record incinerator operation on a daily basis.
- Record type of waste and weight in each batch incinerated. Note that Pacto toilet waste should make up no more than 1/5 (20%) of each batch.
- When the incinerator is charged with the appropriate mix and quantity of waste, close and lock the door, and ensure the burn cycle has started.
- Do not add waste to the burn cycle once started.
- Do not use waste oil or any hydrocarbon as an accelerant.
- Personnel can leave the incinerator area during the burn cycle only once satisfied that the burn is proceeding in a controlled manned.
- Let the incinerator cool prior to opening and removing ash.
- Place ash in an empty drum, which will be sealed, labeled and properly stored for backhaul and disposal in approved landfill. Record the weight of ash for backhaul.
- Remove ash prior to recharging for the next burn cycle.
- Keep the area around the incinerator tidy.

4.2 Opening Burn Pit

Although GlencoreXstrata actively incorporates reduction and reuse of wood products in its day-to-day operations, there remains residual wood waste that needs to be disposed of. Some material is difficult to incinerate or backhaul for safety and logistical reasons and accordingly, permitted open burning is a preferred method of disposal. In 2012, open burning occurred under motion no. 2012-00-L03. An application has been submitted to the NWB for open burning in 2013.

Only non-treated wood waste is burned on-site in the designated area. Wood sources include paper products, paperboard packaging, and untreated wood such as damaged (unpainted/untreated) pallets, construction lumber, building demolition waste, and core boxes. Painted wood and plywood or laminates are not burned, but are stockpiled and sent back to Yellowknife for disposal.

A single burn pit approximately 15 m from the current incinerator location toward the southwestern area of the camp has been established. This area is in excess of 30 m away from Camp Lake and other waterways, is typically downwind of camp facilities. When a permit is in place, controlled burning of clean wood waste is undertaken on a periodic and as required basis in accordance with established Government of Nunavut guidelines. Only trained personnel participate in open burning. Open burning guidelines implemented at Hackett River include:

- Wear appropriate PPE including gloves, goggles, dust mask and face shield while handling waste or ash.
- Ensure firefighting equipment and personnel are available.

- Trained personnel are in attendance throughout the entire burn.
- Ensure waste has been appropriately segregated (combustible vs. non-combustible, hazardous, vs. non-hazardous).
- Record each open burns.
- Material is kept as dry as possible before burning, or kept covered to the greatest extent possible before burning
- No treated wood, plywood or contaminated waste petroleum-based material or petroleum derivatives will be burned or used as an accelerant.
- The size of the burn pile is minimized and a "hot burn" maintained to create an efficient burn using consistent/constant feed rates to avoid over-feeding and damping the fire.
- Burning is undertaken during favorable weather conditions, primarily consisting of periods where wind direction is blowing away from Camp Lake. Burning will be restricted during periods of high winds, or during particularly hot, dry conditions.
- Fires are completely extinguished to ensure that any smoldering material does not persist.
- Open burning will be controlled and within an ash collection system that provides a means to protect the ash from wind and water.
- Once cooled the ash placed in an empty drum which will be sealed, labeled and properly stored for backhaul to a designated waste receiver in Yellowknife.
- The weight of ash for backhaul will be recorded.
- Keep the area around the open burn area tidy.

5. TRAINING

Training is an important component of successful waste management. Personnel participating in waste management are designated and trained in hazardous material handling, open burning and incinerator operation.

Eco-waste Solutions, the incinerator manufacturer, provides on-site training to GlencoreXstrata personnel and incinerator maintenance. Camp management track who completes this training and any refresher courses completed. They will also record all preventative maintenance activities undertaken on the equipment. A maintenance plan, which will include testing by the manufacturer, is being implemented for 2013, with at least 2 site visits anticipated.

6. REFERENCES

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