

## **STAGE 1 CONSTRUCTION SITE PLAN**

# CARMACKS COPPER PROJECT YUKON



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#### 1.0 INTRODUCTION

This document, prepared by Western Copper Corporation with input from Access Consulting Group of Whitehorse, M3 Engineering and Technology of Tucson, and Golder Associates of Vancouver, describes the plan for the first stage (year) of construction of the Carmacks Copper Project.

The current project development schedule for construction and operation activities is outlined in Section 2 of this Construction Site Plan. Section 3 outlines the overall layout of the project facilities and associated mineral claims for the project area and the access road. Section 4 details the construction activities proposed during the initial stages of construction, i.e. prior to the anticipated date of the issuance of a Type A Water Use Licence. Environmental management and monitoring plans that will be implemented during construction activities to assure compliance with environmental provisions included in permits, legislation, corporate policies and industry Best Management Practices are introduced within Section 5. Preliminary versions of these plans for project construction are appended and will be updated as the project progresses.

Project drawings are provided within Appendix A as well as within preliminary design reports, also appended to this document.

#### 1.1 PROJECT DESCRIPTION

The Carmacks Copper Project is located in the Dawson Range at latitude 62°-21'N and longitude 136°-41'W, some 220 km north of Whitehorse, Yukon. The Project site is located on Williams Creek, 8 km west of the Yukon River and some 38 km northwest of the Village of Carmacks. The property is presently accessible via the Klondike Highway to Carmacks, then 33 km along the Freegold Road to the property exploration road and a further 13 km to the site. Figure 1-1 shows the general project location within the Yukon Territory. Figure 1-2 shows the location in more detail.

The mining operation is designed to produce an average of 1.77 million tonnes of ore per year or approximately 28,400 tonnes (ore and waste) per day on a seven day per week, 24 hours per day operation. The mine will be operated year round but may temporarily suspend operations when winter temperatures are extreme. Ore production will likely be suspended in the coldest winter months but waste operations will continue in all but the worst weather. Acid leaching and processing will occur year round.

The mine will use a conventional spread of mining equipment, the main units comprising 10.5 cubic meter hydraulic excavators, 11.5 cubic meter loaders and 91-tonne haul trucks. Ore will be hauled by truck and dumped directly into the primary crusher, from where it will be conveyed to secondary and tertiary crushers. The final product will have a maximum size of 19 mm and a P80 of 13 mm. The crushed product will first be agglomerated with sulphuric acid and water and then conveyed by a series of overland (grasshopper) conveyors to a lined valley fill leach pad where it will be placed by means of a radial stacker.

An Events Pond (160,000 m<sup>3</sup>) is located down gradient from the leach pad to provide capacity for an emergency drain down of the pad and to manage the SXEW processing plant water balance during storm events and spring melt conditions.

The crushed ore on the leach pad will be irrigated with dilute sulphuric acid to leach copper from the ore. Pregnant leach solution will be collected and pumped to the solvent extraction plant where the dissolved copper in the solution will be transferred to a concentrated copper solution. This concentrated solution passes to the electrowinning plant where the dissolved copper is plated onto cathodes. Copper is stripped from the cathode and is then transported via truck to market.

Sulphuric acid is produced on site by means of a 145 tonne per day sulphuric acid plant. The plant will burn sulphur which will be transported to site in liquid form. Storage tanks will be provided for liquid sulphur to accommodate potential supply interruptions and for the concentrated acid to accommodate variations in demand for acid and allow for plant maintenance shutdowns. In the event of a spill the molten sulphur cools to solid sulphur which is relatively harmless.

Storage, mixing, and distribution are provided for other process reagents such as dilutent, extractant, guartec, and cobalt sulphate. Other facilities at site will include the following:

- A Truck Shop Service Complex providing adequate space for the maintenance of two 91-tonne trucks and associated warehousing;
- An Administration building;
- A Laboratory facility;
- An Operations Camp to accommodate non-local workers;
- A Security Gatehouse/First Aid post;
- Electrical Substation; and
- Explosives Storage and Manufacturing.

The overall general arrangement for the project is provided in Figure 1-3 as well Drawing 000-CI-001 in Appendix A. (Some of the drawings or figures in supporting documentation are earlier versions and may show slightly differing arrangements for mine components. These will be updated in due course.) This application is for Stage 1 construction only, which represents those activities that can be completed without a Water Use Licence, i.e. nominally the first year of construction.

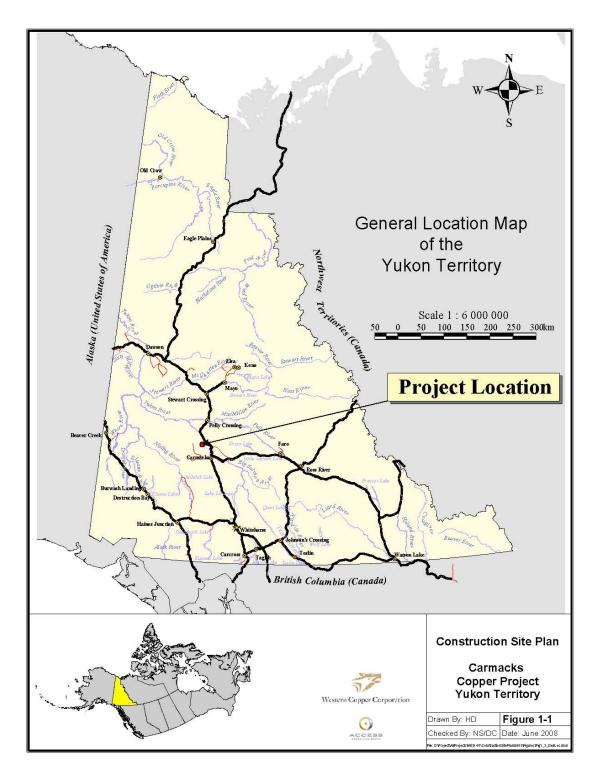
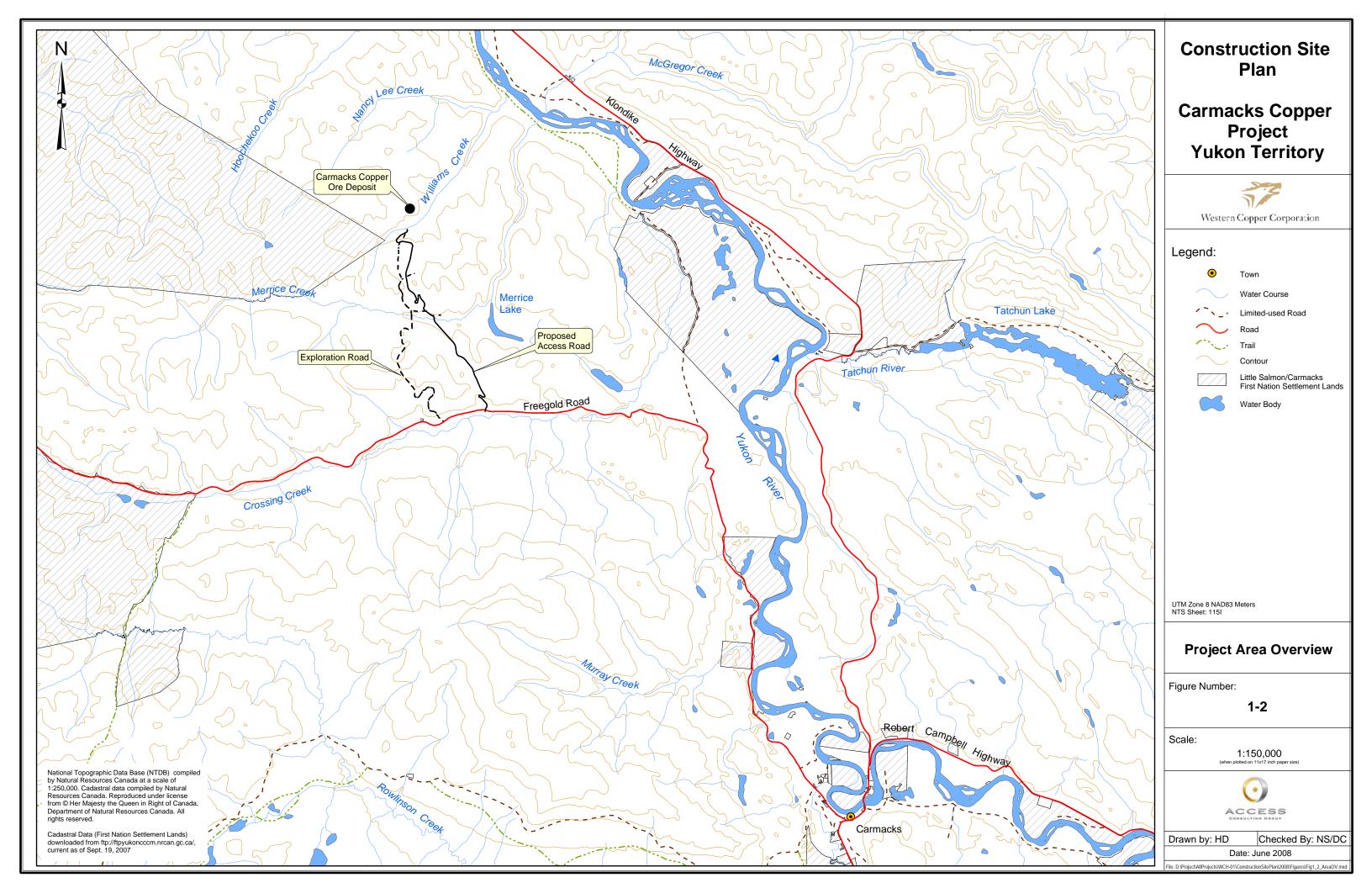


Figure 1-1 Project Location Map within Yukon

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#### 1.2 MINOR PERMITTING

In addition to a Quartz Mining Licence various minor permits will be required during the construction phase of the Carmacks Copper Project; these permits will have specific terms and conditions pertaining to installation and construction of facilities. Some typical permits required (but not limited to) are described below:

- An Access to Highway Permit is required from YG Highways and Public Works, Transportation Maintenance Branch for connecting the mine access road to the Freegold Road.
- An Air Emissions Permit is required from YG Environment in accordance with the
   <u>Environment Act</u> Air Emissions Regulations for an incinerator as it will be capable of
   incinerating more than 5 kg of solid waste per day.
- A Commercial Dump Permit is required from YG Environment in accordance with the Environment Act Solid Waste Regulations as well as the Public Health and Safety Act. The active working area of the dump will be located at least 100 m from the high water mark of any water body and at least 1.5 m from the groundwater table, and shall be located in a manner that neither solid waste nor leachate enters surface water. A detailed layout of the facility will be provided. Surface water run-off will be directed away from the disposal area.
- A Permit to Install a Sewage Disposal System will be required from YG Environmental Health Services. Sewage disposal facilities will be constructed to comply with the <u>Public Health and Safety Act</u>, Sewage Disposal Systems Regulations. In particular, septic tanks, sewage holding tanks or contained privies shall be located at least 15 m from the high water level of Williams Creek; while the soil absorption system (or pit privy) will be located not less than 30 m from the high water level of Williams Creek. Soil absorption systems will not be located where soil conditions are unsuitable for absorption of effluent.

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- A Special Waste Permit is required from YG Environment in accordance with the
   <u>Environment Act Special Waste Regulations</u> for burning waste oil, generating and/or
   storing waste batteries, waste oil, waste solvents, and other special wastes.
- A Land Treatment Facility Permit will be required from YG Environment in accordance with the <u>Environment Act</u> Contaminated Sites Regulation.
- A Storage Tank System Permit is required from YG Environment in accordance with the <u>Environment Act</u> Storage Tank Regulations for installation and operation of fuel storage tanks.
- Various permits will be required for building construction from YG Community Services.

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#### 2.0 PROJECT SCHEDULE

The project is presently in the permitting stage with a Final YESAA Screening Report issued July 2008 and in mid September 2008, a YG Decision Document which recommends the project proceed subject to recommended terms and conditions of mitigation measures. The completion of these two activities is a key step in the development of the project as only then can the Quartz Mining Licence (QML), which is required for construction to commence and ultimately for operation (in conjunction with the Type A Water Use Licence), be issued. It is understood that a phased QML will be issued that would enable initial project construction prior to issuance of the Water Use Licence. Financing for the project will also be tied to the issue of these two licences.

The schedule assumes commencement of construction in 2009. After a second project construction season is completed in the third quarter of 2010, first copper production could begin early in fourth quarter 2010.

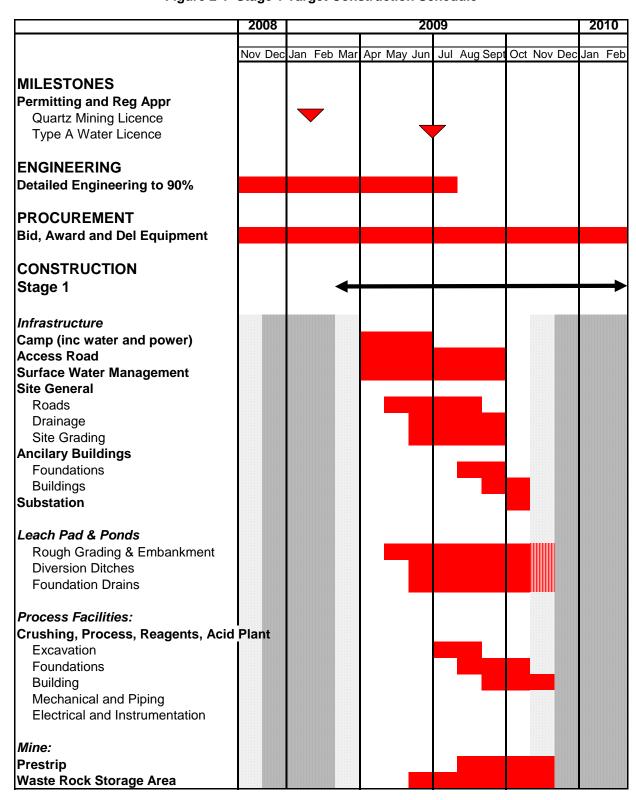
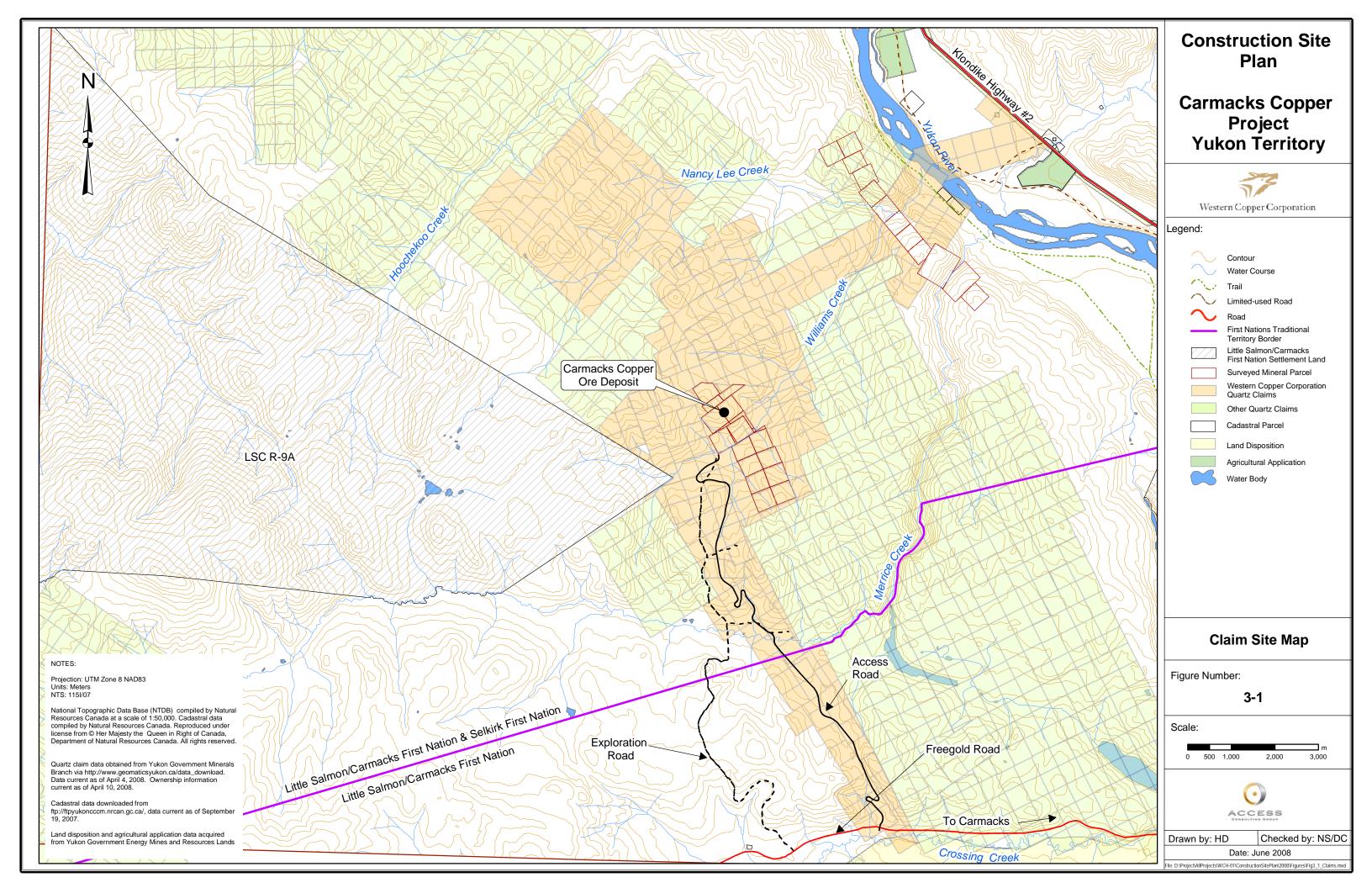


Figure 2-1 Stage 1 Target Construction Schedule

#### 3.0 SITE LAYOUT AND MINERAL CLAIMS

The project site is located in the Whitehorse mining division of the Yukon and consists of 308 quartz claims, quartz claim fractions, quartz leases, and quartz lease fractions as shown on Figure 3-1. This map was adapted from the Yukon Government's mining recorders' website. A complete listing of Western Copper's mineral claims and associated facilities is provided in Appendix B.

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#### 4.0 STAGE 1 CONSTRUCTION PLAN

This section describes in general terms construction activities associated with various components of the Stage 1 construction plan. A construction QA/QC manual will be developed and submitted to Yukon Government Energy, Mines & Resources prior to commencement of construction activities. Construction QA/QC is a planned system of activities which provides assurance that the project complies with the design specifications and drawings, and includes inspections, verifications and evaluations of materials and workmanship.

Project drawings are provided within Appendix A as well as within the design reports for specific mine components (also appended). As the project detailed engineering progresses, Drawings Issued for Construction will be provided to Yukon Government Energy, Mines & Resources as required. Design criteria for the project are included within Appendix C.

The following general areas and activities are scheduled during the initial year of project construction. These represent the construction activities to be accomplished prior to the issuance of the Type A Water Use Licence. In general, Stage 1 represents the preconstruction activities to be undertaken prior to the main construction program. These activities include those required to provide management of surface runoff to prevent sediment laden runoff from entering watercourses. A Construction Surface Water Management Plan has been prepared (Appendix D) and will be implemented to manage surface water runoff affected by project construction. Surface water management activities specific to Stage 1 Construction are outlined in Section 4.1 – Stage 1 Construction Surface Water Management Plans.

- The main access road to the site will be re-cleared, drainage and sediment control structures developed and the road graded;
- A clear span bridge will be constructed over Merrice Creek;
- Site roads will be cleared and built to final grades;

- Diversion ditches will be constructed and sediment barriers installed including: southern major diversion ditches around the heap leach facility and waste rock storage area and diversion ditches north and south of the pit area;
- Stockpile areas for stripped organic materials (overburden) will be constructed including: north of the open pit area; east of the heap leach facility sediment pond; and near the waste rock storage area sediment pond;
- Borrow pits will be developed at the plant site and waste rock storage area;
- Open pit will be stripped during pre-production development open pit material will be used for construction of site facilities;
- Sedimentation ponds and spillway and embankment will be constructed with temporary interceptor ditches to direct and control surface runoff; (sediment ponds below the heap leach facility and waste rock storage area). Less than 10,000 m³ will be stored within each of these ponds during Stage 1 Construction;
- Explosives storage area will be constructed;
- Camp installation will be completed including water supply, temporary power supply and waste disposal facilities;
- Main Process area and Crusher Area: general site grading will be completed along with buried services, building and equipment foundations, building erection, commencement of mechanical and electrical installation;
- Heap Leach Pad (initial phase): the area will be re-cleared and graded, foundation improvement and retaining embankment construction will be completed;
- Waste rock storage area will be cleared and grubbed;
- Ancillary facility building installation will commence: admin offices, first aid security gatehouse and truck shop service complex including fuel storage installation;
- Helicopter landing site will be prepared; and
- Progressive reclamation of disturbed areas will take place as required.

Soil testing has been or will be carried out to determine the extent of permafrost in the locations planned for mine infrastructure development. All organic soils, weak mineral soils, ice-rich soils and any other soils deemed to be unsuitable will be removed down to competent mineral soils or fractured bedrock so that structures (heap leach pad, waste rock storage area, event/sediment pond's retention embankments) will be constructed on a prepared foundation.

An updated schedule will be provided at least 30 days prior to the start of construction.

Prior to initial construction activities, the Yukon Water Board will be notified of planned water usage through the provision of a Schedule 3 – Notice of Water Use/Waste Deposit Without a Licence. As project permitting proceeds it is anticipated that a Type A Water Licence could be issued by mid-2009 and subsequently water related activities would be carried out in accordance with the licence.

Stage 1 of project construction is shown in Figure 4-1 and further details of the project construction plans and sequence follow. Civil grading plans for the project are provided in drawing 100-CI-010. See Figure 2-1 for the targeted development schedule for Stage 1.

Activities planned for Stage 2 of construction in 2010 will include:

- Heap leach pad: soil and geomembrane liner installation and overliner placement;
- Events pond: liner placement;
- Main Substation: installation completion and connection to Yukon Electrical Company power grid;
- Process Areas: mechanical and electrical installation completion in the following areas:
  - Ore crushing and conveying;
  - Solvent Extraction and Electrowinning;
  - Reagents area;
  - o Acid plant; and
  - Water treatment plant.
- Progressive reclamation of disturbed areas as required;
- Plant operation targeted to begin early in fourth quarter 2010.

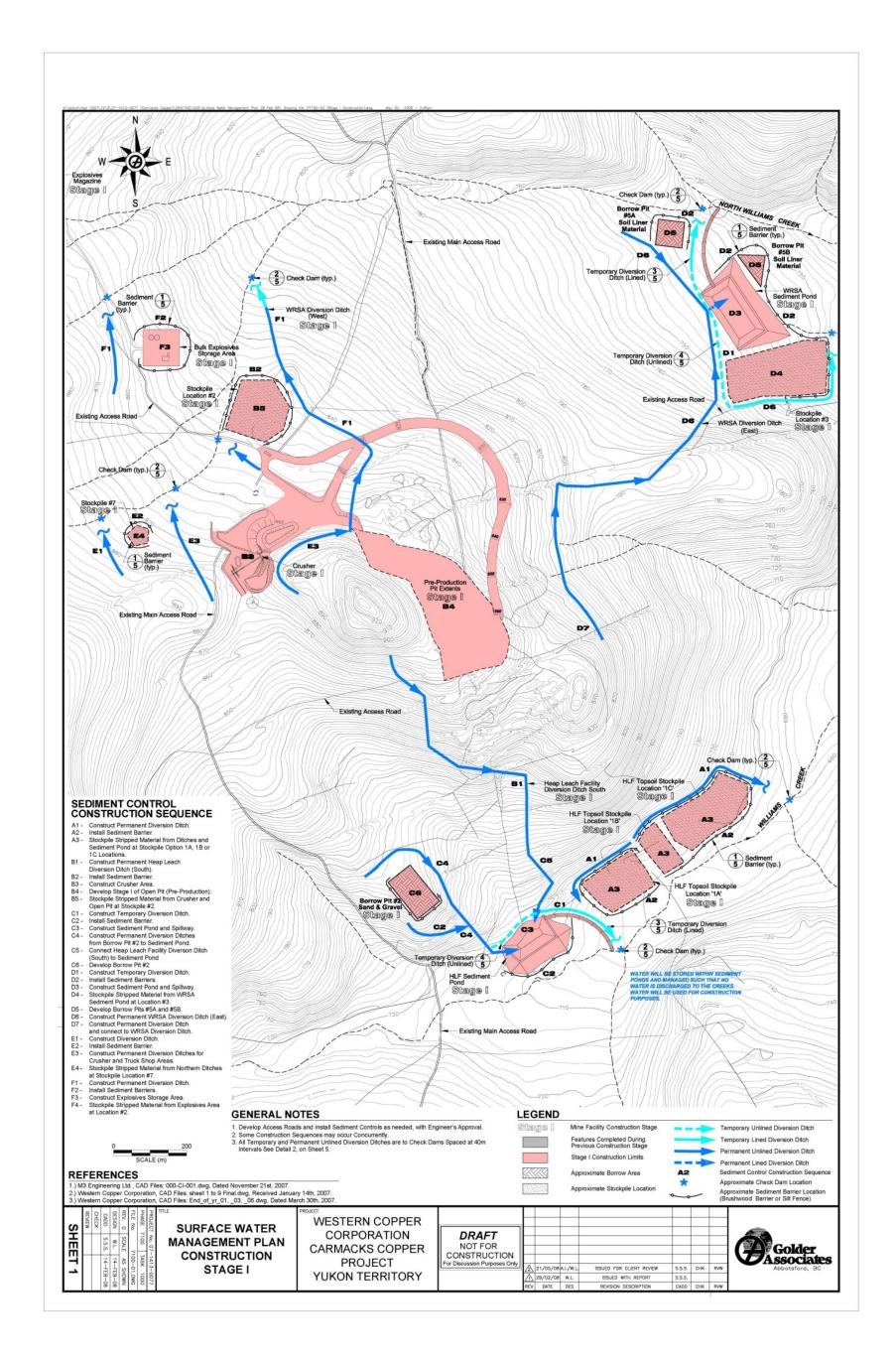


Figure 4-1 Construction Plan – Stage 1

#### 4.1 STAGE 1 CONSTRUCTION SURFACE WATER MANAGEMENT PLANS

#### 4.1.1 Erosion and Sediment Control

During construction the landscape will be modified and the stabilizing overburden layer may be removed to expose underlying soils. Potential effects on erosion and sediment loading will be minimized by reducing the area of disturbance and maintaining and developing a stable vegetation cover wherever possible during construction and all remaining project phases.

To avoid major erosion and sedimentation problems the following general practices will be implemented:

- The area of clearing and disturbed soil will be minimized existing trails and disturbed areas will be used where possible to minimize the addition of new linear corridors and there will be no unnecessary disturbance to the organic mat and soils;
- Highly erodible areas will be avoided;
- Erosion protection measures (riprap, earth breaks or cross ditches) will be implemented as required;
- Early construction of diversion ditches and sediment control ponds to manage runoff and provide for settling of suspended solids will be implemented with inspection to ensure effectiveness;
- Construction activities will be completed efficiently to minimize the length of time disturbed soils are exposed;
- Site clearing will be timed to minimize soil compaction. To the maximum extent possible, disturbances will be restricted to times when soils are dry or frozen and avoid or delay construction during wet site conditions;
- Riparian areas will not be unnecessarily disturbed a 30 m buffer will be maintained from watercourses to protect riparian areas;
- Construction Surface Water Management Plan (Appendix D) will be implemented to manage surface water runoff affected by project construction; and
- The Construction Surface Water Management Plan will be modified as required to manage changing or unexpected site conditions.

The Construction Surface Water Management Plan describes conveyance structures and erosion and sediment control measures to be used during construction of each of the major site facilities. Measures to be implemented are outlined in Table 4-1:

**Table 4-1 Surface Water Management Controls** 

Technique	Application
Diversion Ditches	Divert overland flow down gradient of the construction site or to sediment ponds.
Check Dams	Installed in ditches to reduce flow velocity.
Sediment Barrier	Brushwood wrapped in geotextile or sediment fences to trap sediment and reduce velocity of overland flow.
Sediment Ponds	Ponds to collect runoff through the construction site to settle out sediments.
Revegetation	Disturbed areas minimized and reclaimed as soon as practical by surface roughening (using tracked equipment) then seeding. Straw, wood fiber/chips, erosion control blankets, polyethylene sheeting, granular materials and rock can be placed when disturbed soils have been seeded to provide erosion protection until a stabilizing vegetation cover is established. Best practices will be undertaken to avoid the introduction of invasive species.

Figure 4-1 shows how surface runoff will be directed and stored and at the mine site. Appendix D contains details of the sediment control construction sequence in relation to construction stages. Surface water management plans specific to Stage 1 Construction are outlined below.

#### 4.1.2 Surface Water Management

During Stage I construction, the sediment ponds will function as storage ponds whereby stored runoff will be used for moisture conditioning of soils and general site use such as dust suppression. Also, during Stage I, non-contact runoff from undisturbed areas will be conveyed in the diversion ditches around construction areas and then will be released into wide, natural overland flow areas. The overland flow areas will promote sheet flow, thereby reducing flow velocities and encouraging infiltration.

The primary objective of the Stage 1 Construction Surface Water Management Plan (CSWMP) is to minimize construction related impacts to surface water quantity and quality, while also

facilitating construction works. Surface water management controls are to be implemented to divert overland flow around construction areas, reduce erosion and remove suspended sediments from surface water before it is released into wide, natural overland flow areas or back into natural watercourses.

This CSWMP considers construction areas to be disturbed non-industrial areas with a potential for inert sediment generation. No treatment or control measures have been included for any industrial chemicals or other contaminants. Additional controls or treatment facilities may be required for that purpose.

The CSWMP is based on four main principles for managing surface water during the construction phase of the project, as follows:

- Construction of surface water controls includes construction of sediment ponds, diversion ditches, check dams and sediment barriers, and establishment of stockpile areas prior to any large scale land clearing or construction activity begins.
- Diverting overland runoff from undisturbed areas includes interception and diversion
  of runoff from undisturbed areas around the construction sites to keep the construction
  areas dry and to minimize the potential for sediment transport into natural
  watercourses.
- Control of sediment near the source the size and number of erosion and sediment controls is reduced by controlling sediment near the source.
- Protect receiving waters downstream of the construction sites runoff from disturbed areas is collected and treated in sediment ponds to remove sediment prior to re-use at the site or release to natural watercourses (Stage 2 Construction).

A number of temporary water management control structures have been proposed for the CSWMP. These structures correspond to standard Best Management Practices (BMPs) which have been adopted for the Project. Construction guidelines for the proposed BMPs are provided in Appendix D. To assure continued performance and functionality, all control structures will be inspected regularly, maintained and repaired, as required.

#### 4.1.2.1 Permanent Diversion Ditches

Permanent diversion ditches are used to divert overland flow from undisturbed and disturbed areas and release it into wide, natural overland flow areas, natural watercourses or sediment ponds. Major diversions drains will have sufficient capacity to accommodate the 1:200 year, 24 hour return period peak flow (including snowmelt contribution) with a minimum freeboard of 300 mm. Minor diversion drains will have sufficient capacity to accommodate the 1:25 year, 24 hour return period peak flow (including snowmelt contribution) with a minimum freeboard of 300 mm. Corrugated steel pipe culverts are preferred for road crossings and will form part of the minor drain system and therefore will be designed to accommodate the same flow criteria as minor diversions. Additional design criteria for culverts include a velocity at the outlet that is less than 4 m/s. When diversions and drains are in native soils, the allowable velocity for an unlined drain will be 0.8 m/s. When the diversion drains are excavated in native rock the unlined drain velocity is increased to 2 m/s in weathered rock and 3.5 m/s in sound rock. Where drain lining is required, it will comprise durable rock riprap underlain by a non-woven geotextile. The detailed design of permanent diversion ditches and sediment ponds will be covered under a separate report.

#### 4.1.2.2 Temporary Diversion Ditches

Temporary diversion ditches will be used to capture overland water flow from undisturbed areas and divert it around the construction sites and into wide, natural overland flow areas or natural watercourses downslope. They will have sufficient capacity to accommodate the 1:5 year, 24 hour return period peak flow (including a snowmelt contribution) with a minimum freeboard of 300 mm. These measures will not only facilitate construction, but will also limit the volume of water requiring treatment and the amount of sediment potentially eroded from disturbed areas.

Several diversion ditches are proposed in the CSWMP. Ditches with less than 2% grade are unlined but contain check dams to reduce velocities and settle sediment. Ditches that exceed 2% grade are lined with non woven geotextile over which rock riprap will be placed.

#### 4.1.2.3 Check Dams

Check dams are small temporary structures installed within a ditch to reduce flow velocity, reducing potential to cause erosion in the channel and allowing sediment to settle.

For this project, it is recommended that check dams are installed along the sections of the diversion ditches that are not lined with rock riprap. Check dams will be spaced at approximately 40 m intervals.

#### 4.1.2.4 Minor Sediment Ponds

Minor sediment ponds will be designed to have a surface area designed to settle the 10 micron particle size for the average flow from the 1 in 10 year 24 hour storm event with 100% runoff plus snowmelt. The minor sediment ponds will have a riser outlet that slowly drains the treated pond water. The minimum settling depth will be 1.0 m, the minimum storage depth will be 0.5 m and the dead storage will be at least 50% of the storage volume. Their spillways will be able to safely pass the 1:200 year, 24 hour event with a freeboard of 0.5 m. These ponds will not be lined.

#### 4.1.2.5 Sediment Barrier - Brushwood Barriers and Sediment Fences

These are temporary filters made of brushwood available at the site wrapped in geotextile or sediment fences that provide a physical barrier to sediment and help reduce the velocity of overland surface water runoff. Sediment fences are linear filter barriers installed to prevent or minimize transport of sediment in overland runoff.

Brushwood barriers or alternatively sediment fences can be used downslope of disturbed areas and around stockpiles to capture sediment.

#### 4.1.2.6 Additional Considerations

In addition to the control structures described above, the following BMPs will be applied to the construction sites:

- Maintain as much of the existing vegetation as possible. Limiting the disturbance is recognized as the single, most effective method of reducing erosion.
- Limit the length and steepness of excavated slopes by benching.
- Surface compaction reduces the potential for suspending sediment. Roughening the surface of disturbed areas serves to increase infiltration into the ground surface during rainfall events. Roughening the surface of a disturbed area can be accomplished by tracking the area with heavy equipment, such as a bulldozer, or track mounted excavator.
- Prevent tracking of sediments off-site by implementing dust control measures for roads.

All water management structures will be monitored weekly and after each rain event for maintenance purposes. Accumulated sediment will be cleaned out and buried and away from drainage flow paths and natural watercourses. Additional erosion and sediment controls may need to be implemented as required.

#### 4.2 INFRASTRUCTURE

The following sections outline Stage 1 construction plans for project infrastructure including roads, buildings, a substation, and water supply and distribution.

#### 4.2.1 Project Access and Site Roads

#### 4.2.1.1 Site Access Road

Access to the site is presently obtained via the Exploration Road which takes off from km 33 of the Freegold Road. This road is unsuitable for the mine development and operation and will be replaced by the new Access Road. Both roads are shown on the project area overview map in Figure 1-2 (Section 1.1).

The main access to the site will be a new road constructed from km 31 on the Freegold Road to the project site. The road will be an all-weather gravel road, 5 metres wide, constructed to

Transportation Association of Canada RLU/LVR 60 single land resource road standards. The design speed limit is 60 km/hr and the maximum grade is limited to 8%.

Construction of the new access road commenced in 1997 with clearing of the corridor from the intersection with the Freegold Road to the plant site. The road right-of-way has been cleared and grubbed and a limited amount of grading has already been completed. In Stage 1 the road construction will be completed comprising re-clearing of new vegetation, cut and fill operations and surfacing, surface water control along the alignment, installation of a culvert at Williams Creek and a clear span bridge stream crossing at Merrice Creek. A Highways Access Permit will be sought from Yukon Government Highways for connecting the main access road to the Freegold Road.

- Speed limits will be enforced for mine traffic and posted along the access and site roads (maximum 40 km/hr, reduced to 20 km/hr at blind corners and bridge crossings).
   Mine traffic between Carmacks and the mine site will be radio controlled for safety and speed control.
- To the maximum extent possible employees will be encouraged to take advantage of project bussing and transportation from Carmacks to the mine site, thereby minimizing hunting opportunities and direct road mortalities;
- Private employee off-road and on-road vehicles will be prohibited on the access road and at the mine site.
- Existing trails and disturbed areas will be used where possible to minimize the addition of new linear corridors and there will be no unnecessary disturbance to the organic mat and soils.
- New trails, roads, or cut-lines will be doglegged to prevent predator line of sight into new habitat.
- Snow clearing equipment will be available on site to maintain the mine access road.
- Snow plows on the access road will create breaks in the snow berm every 0.5 km to allow for wildlife to escape from the access road.

Road or bridge construction and maintenance at the Merrice & Williams Creek crossings will be performed so as to ensure minimal riparian and aquatic disturbance (i.e. hand cutting). Construction will be minimized around streams during critical spawning periods (May-June for grayling). Construction of the Merrice Creek clear span bridge will follow the Department of

Fisheries and Oceans Operational Statement for construction of a clear span bridge. As Merrice Creek is less than 5 m in width at the ordinary high water mark, no water use licence is required for bridge construction.

Preliminary access road design details are shown in Drawings 100-CI-101 through 100-CI-109 in Appendix A. The road alignment was chosen to avoid impacting permafrost; however, once geotechnical conditions are confirmed the access road alignment may be refined as roads will be constructed to avoid permafrost exposure where possible. Otherwise roads will be engineered to maintain permafrost conditions under and surrounding the road. Cut and fill operations will be minimized to reduce road footprint and conducted to achieve the design grades and final surfacing with crushed gravel. Ditch construction along roadways will incorporate settling ponds and baffles to reduce erosion and settle out sediments. Refer to Section 4.3 for the potential location of borrow areas along the access road.

#### 4.2.1.2 Access Control

The access road to the site will be via private road and public use will not be allowed. A gate will be installed at the junction of the Freegold Road and the access road and will remain in place until the access road is decommissioned. Upon commencement of operation this gate will be controlled. A berm will be constructed to either side of the gate to prevent the possibility of someone driving around it.

A main security gatehouse/ first aid station will be located at the entrance to the mine site area near the operations camp (see Figure 1-3) and will be staffed during construction and operations. A trained first aid operator will staff the gatehouse once it is established. This operator will also control incoming mine traffic from both the exploration road and the main access road through the gate and prevent unauthorized vehicle access to the project area.

If for any reason work at site is suspended, gates will be locked at both ends of the access road and the gatehouse will be unmanned. During such occurrences the company will inspect the site periodically.

#### 4.2.1.3 Site Roads

Site roads are generally shown on Drawing 000-CI-001 in Appendix A while typical mine road details are shown on Drawing 000-CI-004. Detailed roadway drawings to the various facilities are forthcoming. Site roads will be constructed to Transportation Association of Canada RLU/LVR 60 single lane resource road standards.

#### 4.2.1.4 Helicopter Landing Site

No airstrip is planned for the property at present, however, a helicopter landing site will be located on the south side of Williams Creek near the Access Road to provide for emergency air support for the project

#### 4.2.2 Buildings

#### 4.2.2.1 250 Person Camp

The existing exploration camp and a temporary "road-builders" type camp provided by the initial earthworks contractor will service the project during the initial stages of construction; however, the main construction work force will be housed in a new camp to be constructed as soon as possible to the west of the new access road on the north side of Williams Creek (see General Arrangement Figure 1-3). The camp will be a typical modular unit type of camp with accommodation, recreation and kitchen facilities for about 250 employees.

Initial camp construction activities will commence when the weather is suitable and will comprise clearing, leveling and filling of the site. An engineered conventional septic tank and below ground tile field for sanitary waste disposal will be installed as soon as practical after that, pending approval by Yukon Government Environmental Health Services. A well will be located in the area to provide a potable water supply for the camp. The water will be purified by a packaged treatment unit located in a trailer adjacent to the camp. A potable water storage tank will be installed adjacent to the camp. General water storage tank details are provided in Drawing 000-M-002.

Electrical power for the camp will be supplied from a 0.3 MW diesel generator unit installed remote from the camp. This unit will also provide construction power and will ultimately be used as part of the back-up power for the plant.

A propane tank, supplied and installed by the propane vendor will be located close to the camp and will provide fuel for heating and cooking.

Trailers will be leveled on cribbing, assembled into building units and skirted. In addition to the accommodation/washroom units there will be a kitchen/dining/recreation unit and a project office/administration unit. Enclosed walkways will connect the building units. The camp is scheduled to be operational by the end of the first half of 2009.

Camp waste will be managed as per the Waste Management Plan within Appendix E.

#### 4.2.2.2 Administrative & Security / First Aid Buildings

An Administrative Building of modular construction (approximately 260 m<sup>2</sup>) will be constructed adjacent to the camp area (see Figure 1-3 General Arrangement).

A Security / First Aid Building, also of modular construction, will be placed at the entrance to the site (see Figure 1-3 General Arrangement). Security fencing will be provided in the immediate area of the entrance.

#### 4.2.2.3 Explosives Storage

The Explosives Facility will comprise two separate areas, an explosives (detonator) storage magazine and an explosives manufacturing area, approximately 500 m apart. They will be supplied and operated by a licenced explosives contractor on areas prepared by WCC. These areas are shown on the General Arrangement Figure 1-3.

Construction of the magazine will take place in Stage 1 construction. A bermed, fenced area will first be prepared with appropriate diversion ditches to direct surface water away (see

Appendix D Construction Surface Water Management Plan). Two pre-fabricated, purpose built 10' x 10' x 40' steel magazines will be place on a prepared gravel bed.

The explosives manufacturing facility will be erected on a leveled, gravel surface 100 m x 100 m enclosed in a security fence. The facilities will comprise a silo for prill storage and a small workshop for vehicle maintenance.

#### 4.2.2.4 Process Area

The main Process Area is located to the south of the leach pad and comprises the following facilities (shown on Figure 1-3):

- Acid Plant;
- Solvent Extraction;
- Electrowinning;
- Reagents Area; and
- Water Treatment Plant.

Drawings 400-GA-001, 400-GA-002 and 400-GA-004 in Appendix A also provide a site plan and sections for the process area.

Site grading of the process plant area and building construction is planned to take place in Stage 1. In general the area will be taken down to weathered or competent granodiorite bedrock to provide good foundation conditions for the buildings and equipment in the area. Installation of buried services in the area will also commence.

The Acid Plant will have storage to receive molten sulphur from delivery trucks and will convert the sulphur to sulphuric acid which will be stored in tanks adjacent to the building. The building will be a conventional steel framed building with sheet metal siding and roofing.

The SX plant receives solution from the heap leach pad and concentrates the copper solution before it is pumped to the EW facility. This facility will be housed in a fabric type structure.

The EW plant produces pure copper in plate form from the copper solution. The copper is stored in the building and packaged for shipment. This building also will be a fabric type structure.

The Water Treatment Plant, which will be housed within a building, is designed to treat excess process water prior to discharge into the receiving environment.

Work on the foundations for buildings in the process plant area is scheduled to commence late in Stage 1 or as early as practical in Stage 2 so as to enable buildings to be erected and closed in prior to the onset of winter conditions. Concrete will be provided from a temporary batch plant erected close to the plant area. Aggregate for the batch plant is expected to be produced from crushing of mine pre-strip material, subject to final testing. Civil Design Criteria is described in Appendix C.

#### 4.2.2.5 Truck Shop Service Complex and Fuel Storage Facility

A Truck Shop Service Complex will be constructed on a bench of unmineralized pit waste material to the west of the pit (see General Arrangement Figure 1-3). The facilities will comprise a simple insulated fabric covered structure on concrete foundations and concrete base slab. A sediment pond will be located down gradient of the truck shop (see Appendix D Construction Surface Water Management Plan).

Adjacent to the Truck Shop will be a truck ready line. Also in the same area will be the main fuel storage facility. This facility will be supplied by a fuel supply contractor. It will comprise two tanks 4.5 m x 4.5 m located in a bermed, lined secondary containment compound of sufficient capacity to contain 110% of the capacity of the stored fuel. No fuels or chemicals will be stored within 100 m of a watercourse. Permits will be obtained for fuel storage tanks as legislated.

Drawings 570-GA-001, 600-AR-11 and 600-AR-012 in Appendix A show the truck shop general arrangement plans and sections, while drawings 000-FS-015 and 000-FS-016 show flow sheets for lube storage and dispensing, fuel/waste oil and truck wash system. Structural steel tank standards are also provided in drawing 000-SS-001.

#### 4.2.2.6 Crusher Area

The Crusher Area is located north of the heap leach pad and will be constructed early in Stage

1. The area will be graded to the correct elevation and the retaining wall built.

Ore will go through three stages of crushing before being agglomerated with sulphuric acid and conveyed by means of a series of grasshopper conveyors to the leach pad. Once at the leach pad a radial stacker will deposit the ore on the pad in a series of predetermined cells.

#### 4.2.3 Substation

Permanent power for the operation will be provided from the Yukon Electric grid by means of a power tap at McGregor Creek. Yukon Electric will construct a spur line to the property which will terminate at the new Substation located in the process facilities area (see General Arrangement Figure 1-3). The Substation will be nominally 10MVA capacity and will transform the incoming 138kV power to 4160V for site distribution. Construction and backup power will be supplied by a 1 MW diesel generator unit located at the substation. Drawing 112-GA-001 in Appendix A shows this facility.

During Stage 1 the area will be constructed to grade and equipment and building foundations will be prepared for subsequent building erection and equipment installation. Buried services and duct banks will be constructed to connect the substation to other facilities.

#### 4.2.4 Water Supply & Distribution

To support the construction camp, a well will be located near the camp to provide a potable water supply. The water will be purified by a packaged treatment unit located in a trailer adjacent to the camp and stored within a tank installed near to the camp.

A series of wells on the north side of Williams Creek will provide make-up water for the property (see General Arrangement Figure 1-3). These will be developed in subsequent stages of construction. Makeup water from the wells will be pumped via pipeline to an

elevated storage tank near the pit rim. Drawing 000-FS-011 in Appendix A provides a flow sheet of water distribution.

#### 4.3 Borrow Areas

Construction of earthwork structures will require a range of soil and rock types with specific geotechnical properties to provide suitable construction materials. It is expected that these materials will be sourced from borrow areas on site as well as along the access road. Potential on site borrow areas for the initial stages of construction have been identified and are shown in Figures 4-1 for stage 1 of construction. A summary of results from investigations at potential borrow areas is found in Golders' 2007 Geotechnical Report. Appropriate material pre-stripped from the waste rock storage area and open pit will also be used as a source of borrow materials. Mine site borrow areas including material type and volume estimates are summarized in Table 4-2.

Potential borrow locations along the access road have been identified and are shown on Figure 4-2. Geotechnical investigations will be conducted at potential borrow locations prior to the extraction of materials to confirm the quality and quantity of granular resource present.

Prior to the development of any of the borrow sources, drainage ditches will be constructed to divert clean run-off around the borrow area. Borrow areas will be excavated in near-horizontal layers and in such a matter that water will not collect and stand therein. In the event that the topography results in water from within a borrow area being discharged, it will be directed by drainage ditches to a sediment pond to allow the turbidity to settle out before discharge.

Once borrow sources have been exhausted, the area will be scarified, fertilized and seeded.

Table 4-2 Mine Site Borrow Areas

Borrow Pit # <sup>1</sup>	Location	Material Type	Estimated Volume Available <sup>2</sup> (m <sup>3</sup> )	Probable Use
1	West of HLF	Soil Liner Material	45,500 to 130,000	Stage 2 construction - HLF liner material (high quality, high probability of use)
2	Within Plant Site area	Sand & Gravel	77,000	Stage 1 construction - Filter/Leak Detection or Drainage Blanket and Finger Drains (high quality, high probability of use)
3	West of Truck Shop Area	Soil Liner Material	7,000	Stage 2 construction HLF liner material (medium probability of use)
4	West of Waste Rock Storage Area	Soil Liner Material	15,500	Stage 3 construction - HLF Liner material (low probability of use)
5A and 5B	North of WRSA Sediment Pond	Soil Liner Material	10,500	Stage 1 construction - Liner material if required for sediment pond (high probability of use, otherwise low probability of use in HLF)
6	North of Events Pond	Sand & Gravel	72,000	Stage 2 construction - Filter/Leak Detection or Drainage Blanket and Finger Drains (high quality, high probability of use)
7	HLF footprint	Soil Liner Material	150,000	Stage 2 construction - HLF liner material (variabile quality, high probability of partial use - requires segregation)
N/A - Stripped Material	Open Pit	Stripped waste rock	2,885,000	Stage 1 construction - Embankment construction (heap and events pond), construction of sediment ponds, crushed for foundation drains and overliner

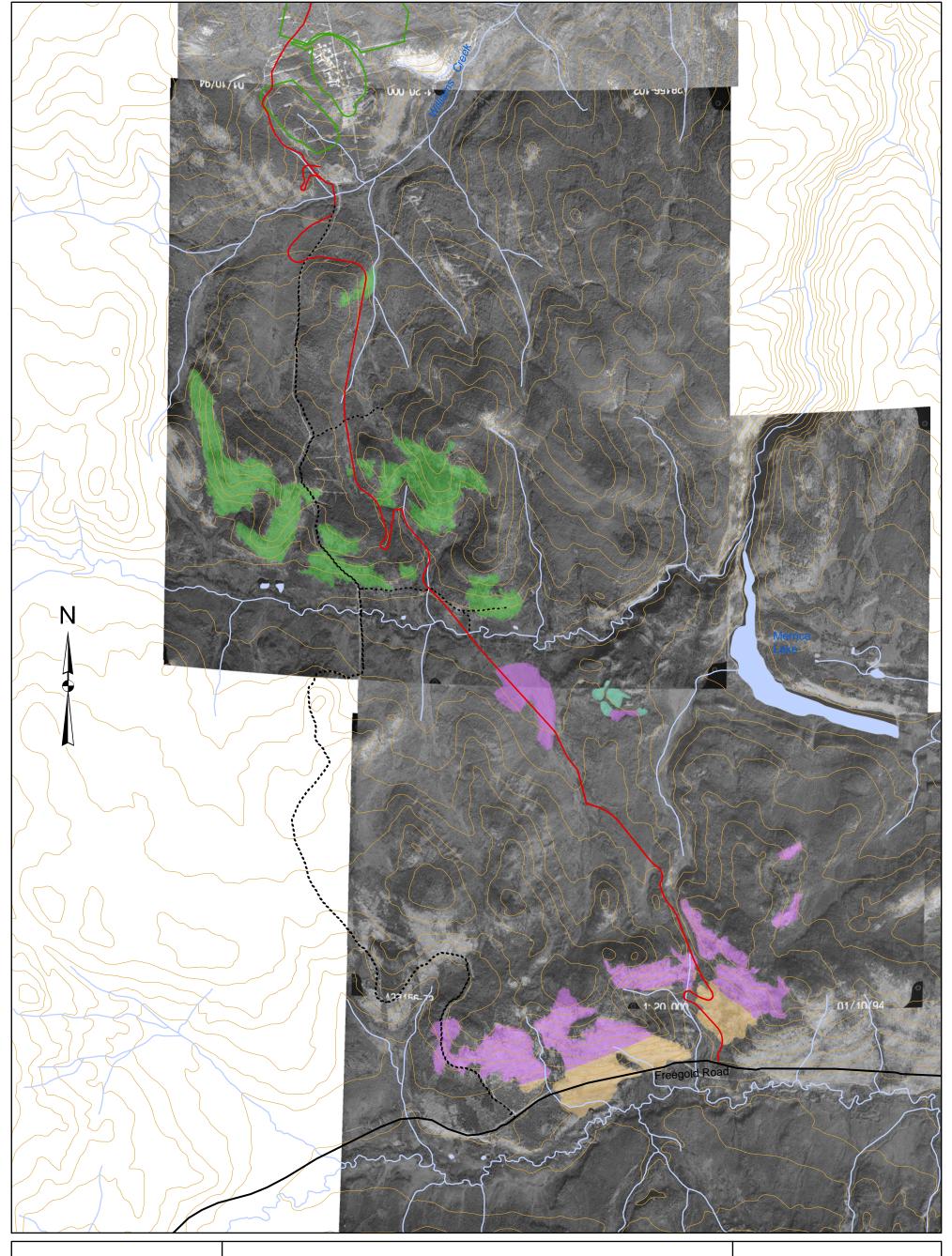
<sup>1.</sup> For borrow area locations, please refer to Surface Water Management Plan Construction Drawings Stage I to IV, issued June 24, 2008.

#### 4.3.1 Geochemical Evaluation Protocol

All aggregate and building material sources and potential 'cuts' related to road or infrastructure development will be characterized for ARD/ML prior to use (see appendix F). Only aggregate materials that do not demonstrate potential for ARD/ML will be used for construction. Where possible, sulphide or potentially acid-generating materials will not be disturbed for infrastructure development purposes. Any confirmed ARD/ML materials will be left in place and remain undisturbed. In the unlikely event that confirmed ARD/ML materials must be disturbed, a mitigation plan will be submitted to the Chief of Mining Land for approval at least 30 days prior to construction.

Refer to Appendix F for the ARD Protocol for Evaluation of Construction Materials.

<sup>2.</sup> This volume is estimated prior to screening to remove excess gravel and cobbles





Western Copper Corporation

Carmacks Copper Project Yukon

Construction Site Plan

# Legend:



Ore Deposit



Water Course Proposed Access Road



Exploration Road Limited-used Road Road



Contour



Water Body



Mine Site Infrastrucure Areas



Till veneer: diamicton, stony, silty sandy matrix; massive; discontinuous and may contain extensive areas of thin (<1m) and patchy colluvioum over bedrock.



Glaciofluvial ice stagnation complex sedi-ments: gravel, sand, diamicton, poorly to moderatly sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummoc-ks, kettles, esker and crevasse-fill ridges.



Till blanket: diamicton, stony, silty matrix; massive to crudely stratified; surface conforms to underlying topography; thickness 1 to 5m.



Till blanket: diamicton, stony, silty matrix; massive; discontinuous and may contain extensive areas of thin (<1m) and patchy colluvioum over bedrock.

# FIGURE 4-2

Access Road Granular Resources Airphoto Assessment

Scale:

1:35,000

UTM Zone 8 NAD83 Meters



Checked by: NS

Drawn by: RG Date: March, 2008

File: D:\Project\AllProjects\WCH-01\ConstructionSitePlan\ 2008\Figures\Fig4\_2\_GranRes.mxd

#### 4.4 STOCKPILES

Stripped organic and waste materials will be stockpiled (separately) in designated locations (see Figures 4-1 & 4-2) at the site during construction activities for future use during progressive reclamation or at closure. Table 4-3 lists the stockpile areas that will be used to store these materials as well as the location where the material originated from, anticipated volumes and any planned future uses.

Measures will be taken to prevent undue soil erosion from the stockpiles and sediment control measures can be installed around stockpiles to capture sediments (see Appendix D). During wet site conditions or precipitation events, runoff through erosive soils/stockpiles may be temporarily controlled and prevented by placement of an impermeable cover (plastic).

Any permanent stockpiles will be limited to a height of 4 - 5 meters with stable side slopes (maximum slope of 2.5h: 1v) and will be shaped and graded for suitable appearance and for proper drainage.

**Table 4-3 Mine Site Stockpiles** 

Stockpile <sup>1</sup>	General Location	Material Type	Material Origination	Anticipated Volume (m³)	Total Anticipated Volume to be Stored (m³)	Total Volume Available in Stockpile Area <sup>2</sup> (m³)	Future Use
			Borrow Area #1	4,636	Ì	86,300	Temporarily store topsoil for use at closure for HLF cover and other areas requiring topsoil / organics in closure to help re-establish vegetation.
			Borrow Area #2	1,650			
	Northeast of HLF	Stripped organic (topsoil)	Borrow Area #6	4,620	83,000		
			Borrow Area #7 (HLF)	40,150			
1A			Borrow Area #8	6,600			
		material	Sediment Pond	2,200			
			Events Pond	5,280			
			Stockpile 1A	3.060			
	Sediment Pond		Stockpile 1B	13,830			
			HLF Diversion Ditch (south)	4,445			If material is suitable for re-use (i.e. till for low permability layer or sand/gravel) then stockpiled temporarily and used as required. If unsuitable fo resue - stockpiled permanently.
		Not necessarily organics -	Events Pond Diversion Ditch	14,630			
1B		Other materials stripped if	PLS collection sump	3,300	28,000	30,600	
		unsuitable to be left in	Events Pond foundation drain	946	20,000		
		foundation	HLF foundation drain	4,150			
			BA #2A	48,000		138,300	Filter/Leak Detection or Drainage Blanket and Finger Drains (high quality, high probability of use)
1C		Sand and Gravel	BA# 8 (plant site)	77,000	125,000		
		Stripped organic (topsoil)	Borrow Area #4	2,750			
4		material	WRSA	83,600	87,000	91,400	Topsoil held until closure for reuse.
	1		Explosives storage area	2,310		85,500	Topsoil held until closure for reuse.
		L	Borrow Area # 3	3,740	70,000		
2	Northwest of	Topsoil held until closure	Open Pit Stage I	30,030			
	Open Pit.	for reuse.	Crusher Area and Truckshop	30,000			
	West to		Stockpile 2	3,600			
7	Southwest of WRSA	Other materials stripped if unsuitable to be left in foundation	Diversion ditches (North)	11800	11,800	13,200	If material is suitable for re-use i.e. till - soil liner; sand/gravel if suitable (ie roads, filter, drainage layers) then stockpiled temporarily and used as required. If unsuitalbe for reuse - stockpiled permanently.
		Stripped organic material	WRSA sediment pond	16,500	170,000	185,400	Reuse in closure.
3			Borrow Area # 5	6,600			
			WRSA	146,300			
			WRSA	188,100			
5, 6	East of WRSA		WRSA Diversion and Collection Ditching	12,500	201,000	270,000	Reuse in closure.
Optional stockpile	Leaching pad	Till	Stage I	-	-	-	Reuse when material required (HLF construction).

<sup>1.</sup> For stockpile location, please refer to to Surface Water Management Plan Construction Drawings Stage I to IV, issued June 24, 2008.

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<sup>2.</sup> Stockpile capacity calculation was based on a maximum height pile of 6m and 3H:1V side slope

#### 4.5 HEAP LEACH FACILITY AREA

The Heap Leach Facility (HLF) comprises three main units: the leach pad and embankment, the events pond and the sediment pond. The sediment control pond will be constructed first during Stage 1 (Figure 4-1).

#### 4.5.1 Sediment Pond

The Sediment Pond down gradient from the events pond is designed to accept uncontaminated run-off fed by a system of interceptor or diversion ditches, which will divert water around the facilities, and provides for settling of suspended solids. This unlined sediment pond will have a capacity of 14,000 m<sup>3</sup> and will be constructed at the site early in Stage 1 (see Figure 4-1). Further design details are included in the Construction Surface Water Management Plan included in Appendix D.

#### 4.5.2 Events Pond

The Events Pond is to be constructed later in Stage 2. It is located down gradient from the leach pad and is intended to provide short term storage for leach solution and capacity to absorb maximum run-off from the pad in the event of upset conditions in the plant. The Events Pond will be double lined with a LDRS between the two liners. Detailed engineered drawings will be provided within a Heap Leach Facility Detailed Design Report that will be provided prior to construction. Methods to isolate the area from wildlife and QA/QC measures will also be provided.

#### 4.5.3 Leach Pad and Embankment

The Heap Leach Facility is a modified valley fill heap leach. Ore from the mine is stacked on the heap and a weak acid solution is applied to leach the copper from the ore. At its largest extent it will cover approximately 38 ha, which will be developed throughout the life of the mine. The retaining embankment at the foot of the heap area and the lower heap pad area will be covered with a double layer geomembrane. The geomembrane will be covered with a layer of overliner material which will protect the geomembrane from the ore. The heap leach pad

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has a leak detection and recovery system between the two geomembrane layers. Below the lower geomembrane is a foundation drain. The upper heap area constructed in the later phases has a single geomembrane liner placed on a soil liner. This area also has a leak detection system.

The leach pad and embankment area was previously cleared in 1997 but regrowth since that time will require clearing. Design considerations will be included in the Detailed Design Report for the Heap Leach Facility to minimize settlement from soil consolidation and degradation of any remaining permafrost.

During Stage 1 the embankment will be constructed and the area to the north (upslope) will be graded to provide a uniform grade for later lining. The initial grading will comprise sufficient pad area for two years of ore production. The heap confining embankment will be about 22 m high and 350 m long with a crest elevation of about 780m. It will be designed to withstand horizontal peak acceleration of 10.3% of gravity and an allowable displacement of 0.15 m with a factory of safety greater than 1.15. The embankment spillway will be designed to safely pass the 1:200 year 24 hour precipitation event.

The Heap Leach Sediment Pond will hold a 1in 10 year 24 hour storm event with 100% runoff. It will be sized to remove inflowing suspended sediments down to fine silt sizes for a 10 year return period 24 hour duration storm. Its spillway will be designed to safely pass the 1:200 year 24 hour precipitation event with a freeboard of 1 m.

Later in Stage 2 of construction, the lining of the pad and embankment will not commence until primary settlement of the embankment has taken place first and it is ensured that liner materials are placed during non-freezing conditions.

#### 4.6 OPEN PIT MINE

Stage 1 open pit development will comprise of stripping organics and overburden for the preproduction pit as shown in Figure 4-1. Appropriate overburden material will be crushed and used as fill in embankment construction and potentially for other facilities as well (see Table 4-2). Early excavation will be achieved by ripping of the weathered rock. As the pit

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development progresses to more competent material, explosives will be used to fragment the rock.

As pit development continues, there will be less need for waste material in embankment construction and unmineralized waste rock will be diverted to the Waste Rock Storage Area (WRSA) to the north of the pit (see Appendix G).

Based on exploration drilling, water is not expected to be encountered in initial pit development activities. Diversion ditches will be constructed around the upper slopes of the pit to direct clean water away from the pit. Excess groundwater that accumulates in the pit area will be pumped to a sump and used as makeup water for construction purposes.

The preproduction pit is limit is shown in Figure 1-3.

#### 4.7 WASTE ROCK STORAGE AREA

Based on the WRSA design, proposed dumping sequence and the frozen silty sand beneath the WRSA, it is anticipated that during the pre-production pit stripping phase the following construction activities would be carried out across the WRSA footprint and sediment pond areas:

- general site development and site preparation removing all trees and vegetation;
- stripping the eastern area down to the mineral soil over the area to average depths of 30 to 50 cm;
- stockpiling the cleared material in a selected area north or west of the WRSA;
- site grading of the eastern area with construction of the surface water perimeter ditch and the internal ditches and french drains;
- excavation and construction of surface water sediment pond east of the WRSA;
- installation of instrumentation;
- construction of required section of main mine haul road in WRSA footprint; and
- start of the stripping and grading the west portion of the WRSA before the start of production of the mine operation.

The clearing of the east portion of the WRSA as noted above is proposed for at least 1 year before pre-production stripping for the open pit starts and this will allow time to install several ditches or french type drains to drain the upper silty sand that underlies the overall footprint of the WRSA.

The site drains or ditches would direct water or run off to the main perimeter ditch system on the north side of the WRSA. The north perimeter ditch will ultimately direct surface water flows to the WRSA sediment pond east of the site. It is anticipated that to ensure the silty sand under the WRSA drains some of the french drains will be installed at depths of 3 to 5 m. The french drains would be placed below grade with a coarse drain rock core and a sandy surround to allow the drains to function as the waste rock is placed.

The WRSA will also be operated in a manner to maintain efficient collection and management of surface water around and on the site of the WRSA. The surface water run off from the WRSA would be directed to a surface water sedimentation pond east and down slope of the WRSA (see Appendix D – CSWMP).

The WRSA sediment pond will have a total storage capacity of 65,000 m <sup>3</sup> to retain a 1 in 10 year 24 hour storm event with 100% runoff coefficient (35 mm) with 10,000 cubic meters of dead storage. The unlined settling pond will be sized to remove inflowing suspended sediments down to fine silt sizes for a 10 year return period 24 hour duration storm. Its spillway will be designed to safely pass the 1:200 year, 24 hour storm event with 0.5 m of freeboard above maximum routed water level.

No merchantable timber will be derived from this area. Timber that is salvaged will be made available for collection to local residents if they so desire. After clearing and grubbing, organic and unsuitable material will be removed from the area and stockpiled.

Please refer to the preliminary design report for the WRSA in Appendix G for further details and information.

#### 4.8 DECOMMISSIONING AND RECLAMATION PLAN

An updated Detailed Closure and Reclamation Plan that addresses both temporary and permanent closure for the Carmacks Copper Project has been prepared and is attached as Appendix H. Please refer to this plan for closure measures and estimated costs.

# 5.0 ENVIRONMENTAL MANAGEMENT & MONITORING FOR CONSTRUCTION ACTIVITIES

#### 5.1 Environmental Monitor

As a component of construction activities, environmental mitigation and monitoring will take place to provide assurance that activities comply with environmental provisions included in permits, legislation, corporate policies and industry Best Management Practices. An Environmental Monitor will be appointed to monitor construction activities and provide assurance that project environmental management commitments and standards are being achieved. A Construction Supervisor, who is a Professional Engineer (P.Eng.), will be responsible for supervising all construction activities.

The Environmental Monitor's objectives will be to:

- Ensure the effective implementation of environmental control measures laid out in the appended environmental management and protection plans (see Section 5.2 below);
- Ensure that the project is in compliance with project authorizations, applicable legislation/regulations and industry Best Management Practices;
- Provide Western Copper's construction and site management team with practical advice on site environmental management issues; and
- Monitor environmental parameters to assess the efficacy of control measures and make necessary adjustments if required.

The Environmental Monitor will oversee all phases of construction within the operations area (mine, heap leach pad, and process plant). The construction QA/QC manual will outline personnel responsibilities and be implemented by a professional engineer and inspectors all of whom are suitably qualified.

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#### 5.2 Environmental Management, Monitoring and Protection Plans

In addition to mitigating measures included within the mine design, a number of environmental management, monitoring and protection plans have been developed to address potential environmental and socio-economic effects during construction activities including:

- 1. Construction Surface Water Management Plan (Appendix D)
- 2. Waste Management Plan (Appendix E)
- 3. ARD Protocol for Evaluation of Construction Materials (Appendix F)
- 4. Detailed Closure and Reclamation Plan (Appendix H)
- 5. Environmental Monitoring Program (Appendix I)
- 6. Health and Safety & Emergency Response Guide (Appendix J)
- 7. Heritage Resources Protection Plan (Appendix K)
- 8. Wildlife Protection Plan (Appendix L)

The plans are appended and will require updating and revision as the project progresses and moves into the operational phase.