Appendix 1

1.0 PURPOSE AND SCOPE

The purpose of this procedure is to provide instruction for the use of water during exploration activities. This procedure includes potable water, waste water (grey water and sewage), drill water, and processing (treatment) plant water. The latter includers water within any treatment plant, processed ore or drill cuttings containment facility.

2.0 RESPONSIBLE PERSON

The person with first-line responsibility for water management in the camp setting is the Project Geologist. Where there is a Camp Manager, the Camp Manager is the responsible person for potable water and wastewater. Where sample processing (treatment) is undertaken, the Treatment or Plant Supervisor or responsible for process water and for treatment or drill cuttings containment water. The Manager – Technical Services has overall responsibility for water in connection with large diameter drilling, processing/treatment plants and for any containment facilities for drill cuttings or processed ore.

3.0 PROCEDURE

3.1 POTABLE WATER:

a. Potable water must be taken from sites that are upstream from any camp or treatment plant area in order to avoid any possibility of contamination.
b. All due care must be taken to ensure that "clean" (uncontaminated) water is obtained.
c. Regulations must be checked to establish whether the quantity of water to be used requires a permit. If this is the case, a suitable permit must be obtained.

d. Where a water treatment plant is required by legislation or by size of camp, suitably trained individuals must operate this, and the performance of the plant must be monitored and recorded.
e. Such water treatment plants must be operated in accordance with the manufacturer's instructions.

3.2 WASTE WATER

a. Waste water includes "grey water' from the kitchen, and grey water from any personal washing facilities (e.g. showers, sinks).
b. Wastewater must be discharged into a French drain or soak-away area situated at least 31 metres from any body of water, and on the down-stream side of any water intake.
c. Where "grey water" from a kitchen contains appreciable amounts of grease, a suitable grease trap must be incorporated into the system (Annexure 'A' describes one such system).
d. Kitchen staff and employees are encouraged to use biodegradable detergents and cleansing agents where practical.

3.3 SEWAGE

a. Disposal of water-borne sewage must follow the directions and regulations within the permits issued by the regulating authority.
b. Care must be taken to protect any sewage lines from freezing. "Heat trace" cables or similar continuous electrical heat source must be installed. It is recommended that a visible light indicator (either in the switch or in the form of a light in series) should be installed in the heat trace circuit so that there is visible evidence that the heat trace circuit is energised.
c. Care must be taken to ensure that the sewage disposal pipe is adequately protected from damage where any vehicular traffic may pass over the pipe. Wherever possible, pipes should be sited in areas where there is no traffic.

d. Any sewage tank for containment of "solid" biodegradable human wastes must be inspected at least once every twelve months to confirm that the tank has sufficient storage space for at least a further twelve months. Where this is not the case, the tank must be pumped out. It is recommended that tanks should not be permitted to fill to greater than 75% of their capacity wherever possible.
e. Any areas where fluid discharge from any septic tank stands (i.e. any sewage lagoon) must be checked for biological hazards such as *e. coli* and similar 'organisms' on a regular basis. Water samples are to be collected for the specified parameters and submitted to a certified laboratory for analysis.
f. The results of such analysis are to be forwarded to a qualified person for interpretation and comment to ensure that the discharge is within provincial and/or territorial and/or permit guidelines. If they are not, then appropriate corrective action must be taken immediately and continued until such time as the discharge is back in compliance.
g. Where water-borne sewage systems are used, each facility must also have an appropriate number of pit privies or latrines for use in case the water-borne system fails.
h. All pit privies must be supplied with lime for "sterilisation" of the faeces.
i. Where the wastes from the privy/latrine are contained in a bag, such as in the "Pacto" style latrines, care must be taken that such bags are adequately 'double-bagged' prior to shipment to an approved sanitary waste disposal (or incineration where permitted) site.
j. In areas where the water table is very close to surface and where waterborne sewage or related effluents are wholly or partly contained in underground (buried) tanks, care must be taken when pumping out the tanks to ensure that a sufficient mass of material overlies the tank to prevent it from becoming buoyant, rising and fracturing the sewage pipes.

3.4 DRILL WATER

a. Where required by legislation, appropriate permits or licences must be obtained for the use of water for drilling purposes.
b. Where drilling on ice on lakes, all drilling water and cuttings must be contained in circulating tanks, or pumped onto land.
c. No drilling water and circulating fluids or muds or cuttings are to be discharged onto any ice. If this should inadvertently happen, an immediate clean up must be undertaken.
d. Where "dirty" water from drilling is pumped to land for discharge, care must be taken to ensure that:
   i) The water line does not freeze;
   ii) The water line discharges a minimum of 31 metres away from any body of water (i.e. any creek, river, or lake);
   iii) The water that is discharged can not run back into any nearby body of water. In winter, care must be taken that the discharged water does not build up as a frozen delta that can accumulate and build up and then subsequently flow as an ice tongue down-slope into any body of water.

3.5 PROCESS WATER AND CONTAINMENT FACILITY WATER

a. Regulations must be checked to establish whether the quantity of water to be used requires a permit. If this is the case, a suitable permit must be obtained.
b. Regulations must be checked to establish whether the quantity of water to be discharged requires a permit. If this is the case, a suitable permit must be obtained.
c. Process water from sediment sample processing should be passed through a series of sumps, or through a similar device to allow the majority of the suspended solids to be deposited before any process (treatment) water is discharged in to any sewer system.
d. Suspended solids that have been removed from process water should be sent to a suitable disposal facility. In most instances, the undersize from sediment samples that has been recovered as suspended solids can be disposed of as "clean fill". However, check

with the local by-laws before disposing of any materials to ensure whether or not there are any local regulations that would indicate otherwise (see WIT 031 Effluent water testing).

e. Process water from temporary kimberlite treatment plants must be tested to ensure the water quality is within the jurisdiction's regulated water quality limits prior to discharge. In most instances, such waters will be pumped to a containment facility of some type. This may be a trench, or it may be a facility with a containment dam (see WIT 031 Effluent water testing).
f. Where any dam is used, such a dam must be constructed and maintained in terms of the Mining Association of Canada publication "A Guide to Management of Tailings Facilities" (available on the MAC web site at http://www.mining.ca/english/publications/tailingsguide.pdf), and according to any other governing federal, provincial or territorial guidelines. In addition, see also the Canadian Dam Association. 1999. "CDA Dam Safety Guidelines", and OP 023.
g. Where any dam is used, a sufficient number of bales of peat must be available to temporarily make an emergency berm to filter the suspended solids out of any waters that should overtop or flow from a breach in such a dam wall. Note, in winter, bales should be stored in such a way that they are accessible, and not frozen together.
h. Provision must be made during planning for control of any erosion caused by run off from any containment facility, or from any burst water pipe(s). Bales of peat should be useful in this regard.

ANNEXURE 'A'

Incorporation of Grease Trap into a "French Drain".

A pit is excavated approximately 1 metre wide by five metres long, and i.5 metres deep, and two empty 200 litre drums with their tops removed are placed in the pit at one end so that they are aligned along the long axis of the pit. The discharge pipe for 'grey water' enters the first drum near the top. A pipe approximately 50mm in diameter (2 Inches) is positioned through the sidewall of the first drum into the second drum, about 20cm from the top of the drum. This forms a simple double drum container. An out flow pipe about 50mmin diameter is placed on the opposite side of the second drum as an outlet. A square piece of burlap sacking is cut from a sack and secured over the end of the outlet pipe to trap grease. The water that passes through the burlap then filters through a graded bed ranging from large cobbles to medium fine sand. This graded bed fills the remainder of the pit.

GREYWATER SYSTEM