DE BEERS
CANADA

Corporation and Exploration

OP 028 –USE AND HANDLING OF WATER DURING EXPLORATION ACTIVITIES

1. Purpose and Scope

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

2. Responsibilities

- Responsible Person
- Treatment or Plant Supervisor (where applicable)

3. Procedures – Water Consumption

3.1. Water for Human Consumption and Use

3.1.1. Water that is to be used for washing and consumption shall be taken from sources located upstream from any camp or treatment plant area to reduce health risks associated with possible contamination from site activities.

3.1.2. All due care must be taken to ensure that “clean” (uncontaminated) water is obtained, and that the water is fit for human consumption.

3.1.3. Regulatory requirements for use of surface and groundwater vary in different jurisdictions. The Responsible Person shall refer to the applicable legislation to determine levels of treatment required for human consumption of surface water or well water.

3.1.4. Local, regional, provincial and federal regulations shall be referenced to establish whether “Water Taking Permits” are required, based on the quantity of water to be taken. If this is the case, the Responsible Person shall ensure that the appropriate permits are in place prior to commencing water taking.

3.1.5. Where a water treatment plant is required by legislation, due to the quality of source water, or by size of camp, suitably qualified and trained individuals shall be made available to operate any required treatment

systems. The performance and operation of the plant shall be monitored and recorded as required by the manufacturer's instructions, applicable legislation, or as a minimum, at a level deemed appropriate to ensure consistent suitable water quality for human consumption. The Responsible Person shall ensure that adequately trained person only operate water treatment facilities and equipment.

3.1.6. Where wells have been drilled for the purpose of taking water for human consumption, legislation may apply with respect to the closing out of those wells. Refer to applicable legislation in the appropriate jurisdiction for direction regarding the close-out of wells.

3.2. Drill and Process Water

3.2.1. The Responsible Person, or their delegate, will ensure that all applicable legislation is reviewed and applied for water taking (water taking permits) for all activities and operations.

3.2.2. Water consumption will be minimized, as appropriate. Water shall not be left running when water lines are not in use or when water is not required for maintenance or operation of equipment. The installation and use of shut-off valves, heat tracing, or other devices to reduce water wastage, where appropriate, is required.

3.3. Grey Water (Waste Water)

3.3.1. Waste water includes "grey water' from kitchen facilities, as well as grey water from any personal washing facilities (e.g. showers, sinks).

3.3.2. All appropriate legislation shall be adhered to regarding the handling and disposal of grey water/waste water from exploration activities. It is the responsibility of the Responsible Person to ensure that all applicable legislation has been referred to and applied as required.

3.3.3. Waste water shall be discharged into a "French drain" or soak-away area situated at least 31 metres from any natural body of water, and on the down-stream side of any water intake.

3.3.4. Where “grey water” from a kitchen contains appreciable amounts of grease, a suitable grease trap must be incorporated into the system (See Annex ‘A’ for description of a suitable system.

3.3.5. Kitchen staff and employees are encouraged to use biodegradable detergents and cleansing agents where practical.

3.4. Sewage

3.4.1. All appropriate legislation shall be adhered to regarding the handling and disposal of sewage wastes at exploration sites. It is the responsibility of the Responsible Person to ensure that all applicable legislation has been referred to and applied as required.

3.4.2. In order to reduce the risk of discharge of raw sewage to the natural environment, appropriate maintenance and inspection programs shall be developed and implemented with respect to sewage treatment facilities and their pipelines. In particular, the following items must be included in the regular maintenance activity schedules with respect to sewage treatment facilities:

- Sufficient heat tracing or a similar continuous electrical heat source must be installed to prevent line freezing. It is recommended that a visible light indicator be installed in the heat trace circuit so that there is visible evidence that the heat trace circuit is energised.

- Sewage disposal pipes must be 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, and protected from traffic with the use of fencing, flagging or barriers.

- Sewage lines must be inspected on a regular basis, as deemed appropriate to ensure no leakage has occurred to the natural environment.

- 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

- Sewage holding tanks 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 in accordance with the DBC Waste Disposal Procedures (OP-022). *Note: It is recommended that tanks should not be permitted to fill to greater than 75% of their capacity wherever possible.*

3.4.3. 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 as required by law. Water samples are to be collected for the specified parameters and submitted to a certified laboratory for analysis.

3.4.4. Results of analysis obtained for the monitoring of sewage treatment facilities shall be interpreted by qualified persons. Applicable provincial and/or territorial regulations will be referenced.

3.4.5. 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.

3.4.6. All pit privies must be supplied with lime for "sterilisation" of wastes.

3.4.7. Where the wastes from the privy/latrine are contained in a bag, such as in the "Pacto" style latrines, waste must be 'double-bagged' prior to shipment to an approved sanitary waste disposal (or incineration where permitted) site, and in accordance with DBC Waste Disposal Procedures (OP-022).

3.5. Waste Water from Drilling Activities

3.5.1. All appropriate legislation shall be adhered to regarding the handling and disposal of waste water from drilling. The Responsible Person shall ensure that all applicable legislation has been referred to and applied as required.

3.5.2. Where drilling on ice on lakes, all drilling water and cuttings must be contained in circulating tanks, or pumped onto land.

3.5.3. No drilling water and circulating fluids or muds or cuttings are to be permanently discharged onto any ice or open water. If this should inadvertently happen, an immediate clean up must be undertaken, and the Spill Response Procedure shall be referred to (OP 031).

3.5.4. In order to reduce the risk of a spill to natural waterways from pumping waste water to land, the Responsible Person shall ensure that:

- Measures are put in place to ensure the pipeline does not freeze (heat tracing, where appropriate)
- The waste water line discharges a minimum of 31 metres away from any body of water (i.e. any creek, river, or lake);
- The waste 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 subsequently flow as an ice tongue down-slope into any body of water.

3.6. Waste Water from Processing Activities

3.6.1. All appropriate legislation shall be adhered to regarding the discharges of waste water. The Responsible Person shall ensure that all applicable legislation has been referred to and applied as required.

3.6.2. Process water from sediment sample processing shall 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 or to the natural environment.

3.6.3. Suspended solids that have been removed from process water should be sent to a suitable disposal facility, in accordance with DBC Waste Management Procedures (OP 022). In most instances, the undersize from sediment samples that has been recovered as suspended solids can be disposed of as “clean fill”. However, local by-laws shall be referred to before disposing of any materials to ensure these materials are accepted.

3.6.4. 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).

3.6.5. Where any dam is used, such a dam must be constructed and maintained as per of the Mining Association of Canada publication "A Guide to Management of Tailings Facilities" 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 DBC Tailings Management Procedure OP 023.

3.6.6. 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.

3.6.7. Emergency Response Plans shall be developed, during planning activities, for control of any erosion caused by run off from any containment facility, or from any burst water pipe(s) as per the Emergency Response Procedures (OP 036)

4. References

4.1.1. Waste Management Procedure (OP 022)

4.1.2. Emergency Response (OP 036)

4.1.3. Spills procedure (OP 031)

4.1.4. Tailings management procedure (OP 023)

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ANNEX 'A'

Incorporation of Grease Trap into a "French Drain"

1. A pit is excavated approximately 1 metre wide by five metres long, and 1.5 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.

2. 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.

3. An out flow pipe about 50mmin diameter is placed on the opposite side of the second drum as an outlet.

4. 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.

MATT – A PHOTO OR DIAGRAM WOULD BE APPROPRIATE HERE