De Beers Canada Inc. – Exploration Division

OP 005 – FIRST RECONNAISSANCE PROGRAMS

1. Purpose And Scope

This operating procedure provides direction for the day-to-day operations undertaken on a routine basis during exploration by DBCE. This section consists of the procedures for first reconnaissance programmes. This procedure should be read in conjunction with OP 27, which considers archaeological heritage sites.

2. Responsible Person

- Responsible Person
- SHE Management Representative

3. Procedure

3.1 Be familiar with statutes, regulations, amendments, and guidelines governing mineral exploration in the area in which you are working. Consult with the appropriate federal, provincial, territorial and/or local agencies for information about required permits, bonds, standards and environmental control procedures. Before the start of the programme, ensure that all necessary permits have been acquired and are in place. Have a copy of the relevant legislation available.

3.2 Legislation and regulations in the following areas should be considered (Note: this list is not exhaustive, and additions or deletions will be required depending upon the project and jurisdiction):

- Mines Act, Exploration, Borehole and Geophysical Survey legislation (Note many of the Mines Acts are accompanied by a series of regulations that spell out the rules to be followed in each jurisdiction);
- Forest Fires Act (many jurisdictions stipulate what equipment is required for various activities and camp/crew sizes);
- Environmental Protection Act;
- Workmen's Compensation Act;
- Safety equipment requirements (many jurisdictions have lists of equipment required for various camp sizes);
- Workplace Hazardous Materials Information System (WHIMS);
- Spills reporting (petroleum products), and clean up;

- Firearms storage, use and carrying;
- Labour and employment standards (hours of work, mandatory breaks etc).

3.3 Investigate local land ownership requirements. Some jurisdictions, for example, have specific landowner notification requirements, which may apply to a programme. Avoid undue conflict and delay by having a good understanding of ownership laws. When in doubt, obtain the necessary assistance.

3.4 Prior to commencing work in areas that include aboriginal Traditional or Customary lands off reserve, establish contact with the aboriginal group in question or local community and ask for information on the boundaries of their Traditional and Customary lands. If necessary, consult with an archaeologist. Ascertain whether there are any sensitive sites that should be avoided (Sensitive sites would include sites such as burial sites, hunting, trapping, gathering, fishing, wildlife habitat, areas where wildlife congregates, and harvesting sites, medicinal herb gathering areas, sacred sites and the like) or periods when areas should be avoided e.g. during the breeding season (rut) or migration.

3.5 Check for evidence of old camp sites (e.g. fish drying frames).

3.6 Check that the site is safe and there is no pre-existing environmental disturbance. Where possible, use a camera that automatically records the time and date.

3.7 Ensure that all employees, as well as contractors hired for an exploration project, understand and comply with environmental and safety protection measures, industrial hygiene requirements, regulatory requirements and environmental obligations and are properly trained to carry out the procedures pertaining to environmental protection, response and remediation.

3.8 Ensure that the contractors and subcontractors know their responsibilities and liabilities and that they discharge their duties correctly.

3.9 Minimise the disturbance of livestock, vegetation, crops and trees.

Abide by any fences and gates. Observe signs posted by landowners and respect the rights of others.

3.10 If mineral claims are staked over/around an anomaly, keep the clearing or cutting boundary lines as narrow as possible (enough for a person to walk along). Avoid cutting any timber larger than 5 cm in diameter. Realign cut lines locally to go around larger trees.

3.11 The above procedure may have to be modified where anomalies are selected for drilling when snow obscures the ground and drill testing is to be carried out before the snow has melted. If this occurs, the site should be discussed with the appropriate person from the aboriginal community.

3.12 Avoid unnecessary disturbance of vegetation and wildlife. Keep vehicles on established roads whenever possible. Obtain permission and guidance from landowners when travel to off road sites is necessary.

3.13 When operating in new areas, be alert for ecologically sensitive sites such as raptor nesting sites, denning areas for bears, wolverines, wolves, foxes etc, and heronries. If these are observed, try to avoid disturbing them, and record the location on the field maps for future reference in order to minimise disturbance to such sites. Where activities are essential, operations must be structured in such a way as to minimise disturbance to such sites.

3.14 Ecologically sensitive sites for rare or protected species (both flora and fauna) must be avoided. Contact the SHE Management Representative for additional information.

3.15 Similarly, be alert for previously unknown archaeological sites (see OP 027).

3.16 Where a proposed drill target is in the middle of a "sensitive site" and a satisfactory alternate drill hole collar position cannot be identified, then the hole may not be drilled unless authorization is given by all parties (government, aboriginal, etc.).

3.17 In principle, carry out whatever you carry in. Use proper receptacles for refuse, and try to leave an area cleaner than it was upon your arrival. With

proper approvals, reusable items such as lumber, frames, floors etc. may be neatly piled and stored at the site. Where local people request that something (e.g. frames, floors or empty drums) be left for their use, obtain their request in writing together by an undertaking from the individual/entity to be responsible for the drum or other object.

3.18 Check for local regulations governing the lighting of fires. In some areas, the lighting of fires is prohibited at certain times of the year. Carry appropriate fire fighting equipment. Some land management agencies make this a requirement during the fire seasons.

3.19 Some jurisdictions permit the use of incinerators to destroy non-toxic wastes. Where an incinerator is used, the vegetation must be stripped back to the mineral soil in the vicinity of the incinerator, so that there is no chance for the undergrowth to catch fire. A spark arrestor (usually in the form of a very fine aperture wire mesh) must be fitted to the smokestack of all incinerators.

3.20 Ensure that work camps are located, constructed and operated in such a way that they will have the minimum impact on the environment. Always keep camps neat, orderly, safe and clean and in accordance with the local regulations. Follow the Procedure for Environmental Protection at Campsites (OP 009).

3.21 Ensure that sanitary waste and 'grey water' are disposed of in an approved manner.

3.22 Avoid any disturbance to community watersheds by familiarising yourself with their location. Do not operate vehicles or heavy equipment in streams, or on stream or pond banks. Observe regulated setbacks for clearing, grubbing, excavating or other surface disturbances near streams, ponds or lakes.

3.23 Handle all fuel and hazardous materials with care and store properly. Control any spills and/or leaks by establishing berms around storage containment areas and by placing all fuel-powered equipment (i.e. water pumps, generators, drill motors) in metal drip trays. In the event of a spill, notify the appropriate government agency as soon as possible. If any equipment is seen to have oil or fuel leaks or drips, drip trays or other fugitive containers

must be used until the leak or drip is fixed. Absorbent material must be used at the bottom of drip trays to absorb any leaks or spills. Such absorbent material must be disposed of in an approved manner. For handling of petroleum products, see operating procedure OP 030 Handling and Storage of Petroleum Products for the Protection of the Environment.

3.24 Use on-site field vehicles and equipment for exploration activities only. Avoid unnecessary disturbance of nearby residents and wildlife.

3.25 Before any sampling trips are commenced the following details are to be left in the Field Office:

- Complete details of the names of the sample party,
- Mode of transport (including registration (plate) numbers where applicable),
- Map sheets to be covered,
- Destination, probable route, and
- Anticipated date and time of return.

4. Monitoring and Measurement

4.1 First reconnaissance sampling is monitored through completed sample information cards.

5. Records

5.1 Completed sample information cards are maintained in the Sudbury office.

In order to facilitate sample collection and the organisation of field crews, the following checklists of equipment required may be useful. While the duties are described below for the various individuals involved in sample collection will aid allocation of the tasks to be performed, it is recognised that sampling requirements may vary from project to project. Depending upon the objectives, these checklists and details of duties may require fine-tuning on a project by project basis. Furthermore the equipment listed in these checklists may require "fine tuning" according to the requirements of individual projects, or to take into account the varying conditions in the different geographic regions of Canada. For example, an

axe may not be required in the Barren Lands, but is it of use to break through ice in winter. The Responsible Person in charge of the project, in consultation with the appropriate Senior Manager, must decide this.

Where very rapid reconnaissance programmes are undertaken that require frequent camp moves every few days, the Responsible Person in charge may amend the frequency of the data card input to suit the particular circumstances. Data cards should be entered into the database at least once a week. However, quality assurance needs indicate that daily input is preferable, as mistakes or questions are more easily rectified while it is possible to revisit the site, and while facts are fresh in the sampler's memory.

The following four checklists indicate:

1. The equipment required to collect a sample
2. The sequence to be followed at each to collect a sample

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Check List 001 – Example of Detailed Sampling Equipment List

Sampling Material:

- Shovel
- Auger (optional)
- Grub hoe (optional)
- "Brute" Pail (10 litres)
- Expanded metal Screen (20 mm)
- Sample bags (Cloth)
- Kraft paper geochemical sample packets
- Plastic cable ties
- Sandwich bags (Ziploc style)
- Luggage tags
- Sample tickets (with bar code)
- Gloves (leather/rubber)

Documentation Material:

- Sample cards
- Metal clipboard
- Topographic maps (or aerial photo)/Map bag
- Compass
- Pens, pencils, marker, stencil, ruler, stapler, spare staples, masking tape
- Note Book
- Hydrochloric acid (HCl), 10M
- Hammer
- Hand magnet
- Hand lens
- Knife
- GPS
- Batteries AA
- Flagging tape

Field Accessories:

- Backpack
- Headset/ear plugs
- First aid kit (small survival material for helicopter drop off)
- Bug repellent/Sun protection
- Duct tape
- Helicopter signal mirror
- Chopper flag
- Safety glasses
- Counter (optional)
- Chain (hip optional)
- Spare cotton thread refills for hip chain (only required if carrying hip chain)
- Plastic sample bags
- Matches
- Flare pen/"bear banger"
- Axe or Swede saw (may not be required above the 'tree line')
- Axe file
- Bug hat/Net
- Rain gear
- Food/Water

Survival Box:

- Tent
- Stove - MSR
- Dry-food/Power bar
- Pots/plates/cups/utensils
- Soap
- Sleeping bag/warm sheets
- Candle/ Waterproof Matches
- First aid kit (level one)
- Aluminium sheet
- Blue tarp
- Duct tape
- Spotlight/Flashlight

- Bug hat/Net
- Knife
- Set of cutlery
- Instant meals
- Lighter

Check List 002 - List of Actions to be undertaken at each sample site.

- Choose optimum sample site based on GPS and/or map position, and availability of desired material.
- A pre-sample hole is dug to determine what type of material is available in the area, and if it changes with depth.
- When the desired material is found, two persons carry out the duties: the navigator and the digger.

Navigator Duties

Record observations on a sample card about the:

- Date
- Map number
- UTM zone
- Co-ordinates
- Datum
- Project number
- Type of transport
- Sample bag number
- Sample ticket number
- Volume of material
- Type of sample
- Colour of sample
- Type of landform sample was derived from
- Soil horizon sampled
- Depth of the sample hole
- Where processing will take place
- Whether or not the sample hole was back-filled

- Whether or not the site was inspected at the end of the sample to ensure that it is environmentally "clean".
- The material sampled is divided into four sub-textures [clay (<0.004 mm), silt (0.004 mm to 0.0625 mm), sand (0.0625 mm to 2.0 mm), and oversize (>2.0 mm)]; and assigned an estimated percentage for each category.
- The size, angularity, sphericity, lithology and abundance of clasts in the material are noted.
- A general description of the material, with respect to materials in surrounding areas may be made.
- Any peculiarities or unique qualities of the material are also noted.
- The local area is described with respect to topography, relief, vegetation, and possible drainage influences.
- If any bedrock is visible the lithology is noted and an attempt is made to observe striations or other glacial impact features.
- A sketch of the surrounding area is drawn on the back of the sample card and any features, which may help to relocate the area for follow up work, are noted.
- If the sample requires a more thorough description, observations may be documented in a field notebook.
- A notation is made to indicate that the site was cleaned and inspected at the end of the sample.
- The Navigator should also know the location of any archaeological or sensitive sites in the area where work is contemplated, so that such sites may be avoided.
- The Navigator should also note any previously unknown sensitive sites or ecologically sensitive sites such as raptor nest, wildlife denning areas, or heronries.

Digger Duties

- Ensure all sampling equipment is cleaned prior to every sample taken.
- Fill graduated bucket with 10 litres of material. (Note: Sometimes 2 buckets may be needed depending on the required sample volume).

- Put sample into clean sample bag, place sample tickets (which are encased in a plastic zip-lock bag), into sample bag, and tie bag shut with

plastic cable ie. The sample bag should also be labelled with the corresponding sample ticket in an attached luggage tag.
- Back fill sample hole to ensure a minimal environmental impact.

Where requested:

- Collect geochemical sample and place in labelled Kraft geochemical sample bag. Staple bag closed.

6. References

6.1 Heritage and Archaeological Study Requirements (OP 028)

6.2 Detailed Sampling Equipment List (CL 001)

6.3 List of Actions to be undertaken at each sample site (CL002)

De Beers Canada Inc. – Exploration Division

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 DBCE 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/Manager (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 only adequately trained persons 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.

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

3.2. Drill and Process Water Consumption

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 should be considered 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 DBCE Waste Disposal Procedure (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. Where permits are required for septic systems, or where legislation applies, conditions must be adhered to as specified. Where sampling is required, 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 legal requirements will be referenced.

3.4.5. All outhouses/privy pits must be supplied with lime for "sterilisation" of wastes.

3.4.6. 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 DBCE Waste Disposal Procedure (OP 022).

3.4.7. In the event of sewage system failure:

- Immediately shut down the toilet and shower facilities to prevent further sewage from being generated
- Communicate that washrooms are out of service
- Advise all kitchen staff to stop using sinks
- Provide wash basins for temporary use by personnel
- Refurbish and immediately start using the outhouse/privy pit, for human waste. In severely cold weather, the Responsible Person, or, delegate may allow the use of buckets inside the heated washroom building for this purpose.
- If a major blockage or break in the pipe leading to the septic tank is the problem, wash-water that has been collected in buckets may be manually dumped into the first chamber of the septic tank. Take precautions to control health and safety risks (e.g. exposure to sewage, slipping hazards, open manhole).

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. Land, surface and groundwater sources shall be protected from contamination through the use of settling pits or sediment control structures.

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

3.5.4. No drilling water and circulating fluids, 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).

3.5.5. 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 flow 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 DBCE 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 Testing Kimberlite Processing Effluent Water and Process Waste Solids).

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".

3.6.6. Where any dam is used, emergency response equipment must be available for use should overtopping or breaches occur.

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 Generic Emergency Response Plan (OP 036).

4. Monitoring and Measurement

4.1. Water Consumption tracking

4.1.1. All water consumption volumes shall be monitored by Responsible Person, or delegate, and reported via the project reports or equivalent.

4.1.2. Where required by legislation, water consumption shall be monitored and reported as appropriate, by the Responsible Person, or delegate.

4.1.3. Exceedances of Water Taking or consumption related permits shall be handled in accordance with the procedure for Non-Conformance, Corrective and Preventive Action (PROC 4.5.3 SYS), and reported to regulatory authorities, as required.

4.2. Water Quality Monitoring

4.2.1. Where required by legislation or site-specific procedures, water quality monitoring will be carried out as specified.

4.2.2. Results of water quality monitoring shall be forwarded to a suitably qualified person for review and assessment.

4.2.3. Non-conformances shall be handled in accordance with the procedure for Non-Conformance, Corrective and Preventive Action (PROC 4.5.3 SYS).

5. Records

5.1. Records of water consumption and water quality shall be maintained in accordance with the procedure for Control of SHE Records (PROC 4.5.4 SYS).

6. References

6.1.1. Waste Management Procedure (OP 022)

6.1.2. Generic Emergency Response Procedure (OP 036)

6.1.3. Spills Response and Clean up Procedure - Generic (OP 031)

6.1.4. Testing Kimberlite Processing and Process Waste Solids (WIT 031)

6.1.5. Non-Conformance, Corrective and Preventive Action (PROC 4.5.3 SYS)

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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 50 mm in 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.