



## Soil and Groundwater Industrial Controls

### Purpose

To manage *Risks*<sup>1</sup> due to soil and groundwater Impact.

Activities associated with construction and operation activities may involve the transport, storage and handling of hazardous materials. These include, but are not limited to, fuels, oils, lubricants, batteries, oil filters, oily rags, waste oil, other waste mechanical fluids, wastewater, pesticides, herbicides, and fertilizers. Uncontrolled management of these hazardous materials may result in contamination of soil, surface water and/or groundwater.

### Requirements – Preventative Controls

**Managers are *Accountable* for requirements 1 to 7 in their own organization:**

1. **Secondary spill containment facilities** are used to manage any uncontained release of hazardous fluid materials into the environment (soil, groundwater and surface water) in the process of their storage, transportation or any handling.

**Effective secondary spill containment facilities include:**

- Berms, dikes or embankments made of impermeable materials;
- Contaminant recovery or containment systems that are segregated from other drainage systems (such as oil traps, and not connected to AOC<sup>2</sup> systems);
- Various sumps (used primarily for small volume vessels);
- Double-wall vessels for storage of hazardous materials;
- Other alternative engineering or practical solutions preventing the release of hazardous fluid materials into the environment.

The following requirements shall be observed in the design of secondary spill containment facilities.

- 1.1. For single tank or container (e.g. drum) intended for storage of fuel, lubricants and other hazardous liquids: the minimum capacity of a secondary spill containment facility must be at least 110 %<sup>3</sup> of the tank holding capacity.
- 1.2. For two or more tanks and/or containers (e.g. drums) intended for storage of fuel, lubricants and other hazardous liquids: the minimum holding capacity of the secondary spill containment facility must be:
  - at least 150 %<sup>4</sup> of the largest tank/container OR
  - at least 25 %<sup>3</sup> of the total holding capacity of all the tanks and containers
  - Hydraulically linked stand-alone tanks will be considered to be one large tank and fall under the requirement 1.1, that the secondary spill containment facility must have holding capacity at least 110 %<sup>3</sup> of the total capacity of all such tanks.
- 1.3. Roofing of storage areas may be applied where practicable. Review and document the feasibility to install a roof (or any other rain/snow protection) over the materials storage/handling site or to install an effective drainage system for rainwater disposal.

<sup>1</sup> Italicized terms in this document are included in the Sakhalin Energy HSE Glossary.

<sup>2</sup> AOC - Accidentally oil contaminated system.

<sup>3</sup> 110% and 25% of holding capacity – is required as per Work Bank standards ([http://www.ifc.org/ifcext/sustainability.nsf/Content/EHSGuidelines\\_Russian](http://www.ifc.org/ifcext/sustainability.nsf/Content/EHSGuidelines_Russian)) and ([http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui\\_EHSGuidelines2007\\_GeneralEHS\\_Russian/\\$FILE/General+EHS+-+Russian+-+Final\\_.pdf](http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS_Russian/$FILE/General+EHS+-+Russian+-+Final_.pdf)).

<sup>4</sup> 150 % of holding capacity is determined as per best international (USA) practices <http://www.unidocs.org/hazmat/aboveground/un-083.html>.

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- 1.4. Bunded areas shall be drained as required to remove accumulated water.
  - 1.5. In case of excavation pits used for temporary hazardous liquids storage/handling (e.g. during construction), their walls and bottoms must be made of double-walled impervious materials. To the extent possible, it is advised to avoid such hazardous liquids storage/handling method and to use dedicated double-walled storage facilities for this purpose.
  - 1.6. Storage of hazardous liquids in specially designated buildings with liquid-resistant surface (e.g. lubricants storage with a concrete floor) in small containers (drums, jerry cans) requires the use of standard trays with the holding capacity sufficient to contain oil trickle or minor spills (approximately 10 % of the drum/jerry can capacity). Such buildings shall be within the catchment of AOC<sup>2</sup> drainage system.
  - 1.7. Temporary use only (e.g. during a single working week) of small receptacles (drums, jerry cans) outside the specially designated buildings (e.g. lubricants storage, garage) on the premises covered by liquid-resistant surface (e.g. asphalted premises) with appropriate curbing will require installation of standard drip trays (to contain liquid trickle, approximately 10 % of the holding capacity) and regular monitoring actions. The concrete/asphalt surface must be intact (no cracks or loss of curbing integrity) to be able to prevent the release of hazardous fluids onto soil and into groundwater.
2. **Hazardous material storage** areas shall not be located within the area of influence (the SPZ) of water wells. Well casings shall be appropriately sealed to prevent downhole migration of contaminants.
  3. **Operations adjacent to a watercourse:** [EIA V4: 3-16, EIA V6:3-45; FERC Comparison]
    - a. Maintenance activities, fueling/refilling operations or storage of hazardous wastes or materials of any volume shall not occur within the stated legally defined limit of a perennial or intermittent stream, riparian habitat or wetland.
    - b. Hazardous chemicals, fuels or lubricating oils shall not be stored within 30m of a watercourse, or greater if specified by RF law.
    - c. Refueling, equipment maintenance activities involving hydrocarbons, and concrete-coating activities (excluding field joints) shall not be carried out within 30m of a watercourse, or greater if specified by RF law.
    - d. Wherever possible, all equipment shall be parked overnight at least 30m from a waterbody, or in an upland area at least 30m from a wetland boundary, or greater if specified by RF law. These activities can occur closer only if the construction spread Environmental Monitor or Asset HSE Manager finds, in advance, no reasonable alternative and the operator/contractor has taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.
  4. **Fuel management** [EIA V6:3-45; FERC Comparison].
    - a. Operations shall be conducted and materials appropriately stored so as to minimize the potential for spills or releases. Where it is necessary to store fuels, they shall be stored within secondary containment in order to contain any accidental spillages or leaks.
    - b. Light vehicles shall generally be refueled in town or at approved refueling facilities with impervious floors. Heavy vehicles (machinery) are refueled at approved work locations with special care and refueling procedure.
    - c. Vehicle refueling points shall be provided with appropriate tap and drainage systems where practicable.
    - d. All containers, hoses, and nozzles shall be free of leaks. Operators shall be trained and stationed at both ends of the hose during fuelling unless the ends are visible and are readily accessible by one operator. Hydraulic, fuel and lubrication systems shall be maintained in good repair to avoid leakage.
    - e. Fuel trucks transporting fuel to on-site equipment shall only travel on approved access roads.
    - f. Fuel and spill service vehicles shall carry appropriate amounts of suitable absorbent material for spill response, e.g. onshore pipelines fuel and service vehicles shall carry a minimum of 25kg of suitable sorbent material, 30m<sup>2</sup> of 6 mm polyethylene, a shovel and one empty fuel barrel (lid removed).
    - g. Permanent vehicle maintenance areas shall be designed with spill containment.
    - h. All vehicles and machinery fuelling and maintenance shall be undertaken within lined and bunded areas with drainage to a suitable holding separation or treatment facility wherever possible.

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- i. Portable impermeable liners and sorbent materials shall be used to provide spill containment for fueling and maintenance operations conducted at locations that are not equipped with permanent containment.

### Requirements – Operational Monitoring

#### 5. Pipeline operation and integrity.

- a. Operate all pipelines and facilities in accordance with applicable industry standards. [EIA V4:2-64]
- b. Maintain an onshore and offshore pipeline leak detection system, including Accidental Release Shutdown Procedures and training for engineers and operators. The system shall be an integral component of a Supervisory Control and Data Acquisition (SCADA) system and shall meet the internationally recognised Alaskan standard for leak sensitivity (Alaskan Administrative Code Title 18 Chapter 75 – Regulation of pipeline leak detection systems). Pipeline pressure and temperature shall be continuously monitored. [EIA V2-3; 3-35 and Addendum on Oil Spill Response]
- c. Implement a schedule for continuous monitoring, inspection and maintenance of the pressure regulating equipment and corrosion control systems. [EIA V2-3; 3-35]
- d. Undertake internal cleaning of oil and gas pipelines by pigging to minimize build up of corrosive material. The frequency of intelligent pigging operations (internal pipeline integrity inspections) shall be determined by Risk-Based Inspection methodology.
- e. Undertake routine cathode protection inspections.
- f. Undertake regular ground and aerial observations along the length of the Onshore pipeline right of way to assess pipeline integrity, any third-party interference, or the presence of oil. [EIA Addendum on Oil Spill Response] Frequency of such observations shall be determined by the Company considering safety risks and business needs.
  - At the time of publication of this Specification, subject to weather, ROW inspection was undertaken once every 3 weeks by helicopter. In the spring thaw and during the summer months, this frequency may increase. Depending on the outcome of the inspections and also risk, frequency may be modified, but not to a level lower than six flights per year.

6. **The quality of any Wastewater discharged to land** (e.g. hydrotesting, trench de-watering, domestic or sanitary wastewater, etc.) shall be monitored against permit conditions and applicable water quality standards. For situations not covered by permit or regulation, appropriate disposal options shall be determined in consultation with the relevant regulatory authorities. Refer to [Water Use Standard](#).

7. **Conduct regular monitoring of soil and groundwater** in accordance with HSE Monitoring Overview to determine if operational controls are effective at managing risk to *ALARP*.

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