Denison Mines Corp.
Wheeler River Operation

Spill Management Plan

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Approval for Use

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1	April 2025	Initial version for CNSC review	Ryan Nagel	Sarah Benson Cameron McCarty Janna Switzer Tracy Gaudry Jennifer Skilnick	Kevin Himbeault

Revision History

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1	April 2025	Initial version for CNSC review

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1 Introduction

This *Spill Management Plan* (Plan) for the Wheeler River Operation supports the *Environmental Management Program* for the Wheeler River Operation. The *Spill Management Plan* establishes the requirements to manage environmental spills, including spills to land, air, and water, as defined in applicable legislation. The applicable legislation includes:

Canadian Environmental Protection Act

Environmental Emergency Regulations (E2 Regulations SOR/2019-51)

The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) *Regulations* (Chapter E-10.22 Reg 2)

Discharge and Discovery Reporting Standard, Saskatchewan Environmental Code

Nuclear Safety and Control Act

Canadian Nuclear Safety Commission (CNSC)

REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures,* Version 1.2

REGDOC-2.9.2, *Controlling Releases to the Environment*

REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills,* Version 1.1

REGDOC-3.2.2, *Indigenous Engagement,* Version 1.2

The Fisheries Act

This plan addresses environmental spill management which interacts closely with the *Emergency Preparedness and Response Program*.

1.1 Purpose

This plan provides the framework for responding to accidental environmental spills at the Wheeler River Operation. These spills may or may not contain radiological materials, depending on the source of the spill. This plan provides responses for both types of spills.

1.2 Scope

A spill is defined in this document as the accidental or uncontrolled release or discharge of substances that may cause or is causing an adverse effect to the environment.

The magnitude of the spill is defined by the type of material and the quantity released. Denison adheres to the *Saskatchewan Discharge and Discovery Reporting Standard* defined reportable quantities of substances for onsite or offsite releases at the Wheeler River Operation (see Appendix A).

This spill management plan outlines the framework in place to prevent spills, the controls in place to identify spills, the actions to be taken upon discovery of a spill, and the regulatory requirements for reporting spills.

2 Prevention and Planning

Spill prevention and planning for the Wheeler River Operation has been completed so that the potential for a release of nuclear or hazardous substances at the site is limited. Spill prevention measures at the site include secondary containment on pipelines and other site infrastructure that transport uranium and refrigerant, site runoff collection and management, and the proper management of spilled materials (to prevent further releases to the environment).

2.1 Engineering Design

Denison's management system and in particular the *Facility and Equipment Management Program* ensures alignment to Denison's goal of protecting and promoting the health, safety, well-being of people, and the environment through all phases of the project.

The *Facility and Equipment Management Program* speaks to Denison's engineering design management, including risk and hazard assessment and design review standards. These details are outlined within the *Engineering Design Control Plan.* The Program outlines asset maintenance, aging management, and asset type specific plans where asset-specific risk criteria or maintenance processes/strategy may be necessary.

Denison has also developed a number of design criteria documents that serve as the basis of design for the Wheeler River Operation. Best examples of design criteria in place to prevent spills or releases at the Operation include the Process, Piping, Well, Wellfield Containment, and Civil Earthworks design criteria.

2.2 Training and Procedure Testing

The *Emergency Preparedness and Response Program* includes training and procedure testing for environmental emergencies, including spill responses. Please consult the *Emergency Preparedness and Response Program* for more details.

Adherence to the *Training Management Program* ensures that all workers have been deemed competent and qualified to perform duties related to spill management and activities being performed. Refer to that Program and subsequent Procedures for more information.

2.2.1 Environmental Emergency Plans

The Environmental Emergency Plan is a part of the *Emergency Preparation and Response Program* to comply with the requirements of the *Environmental Emergency Regulations* under the *Canadian Environmental Protection Act*. The Environmental Emergency Plan includes a descriptive list of chemicals stored at each project facility, how they are used, and how they could affect surrounding facilities (e.g., buildings, wildlife habitats and water features) in the event of an environmental emergency. It also includes a description of environmental emergencies and the measures to prevent, prepare for, and respond to them.

2.3 Contractor Management

Contractors performing work at the site are responsible to plan for and prevent spills at the site associated with their work activities. Contractors are responsible for consulting the list of chemicals in the *Emergency Preparedness and Response Program*, and their training, as well as identifying chemicals

they are bringing to the site to conduct their work and providing a list of chemicals to the environmental superintendent.

Contractors will receive site orientation on the prevention of spills, and how to activate the emergency response to spills they identify while at the site. This could include secondary containment (drip pans) beneath contractor-operated equipment during refueling, maintenance activities, or when parked at the site.

Further information on management of contractors can be found in the *Contractor Management Plan.*

3 Identification

Activities to identify and manage the environmental and human health risks associated with spills at the site include monitoring for spills, and the provision and maintenance of spill kits at the site. The monitoring activities include the development of a groundwater monitoring well network to monitor water quality and hydraulic conditions within and without the mining area; a surface water quality monitoring network; automated monitoring of leak detection systems, pipeline and well pressure systems; and routine site inspections of above ground infrastructure. The frequency of monitoring of these systems is contained in the *Environmental Management Program* and the associated *Environmental Monitoring Plan, Groundwater Protection and Monitoring Plan* as well as the *Facility and Equipment Management Program* and its associated plans.

In the event that a liquid spill or release is detected, the ability to contain the spill in a timely manner is key to success. CNSC REGDOC-2.3.2 also requires that personnel responding to accidents have the material resources to carry out accident management actions. The availability of spill kits to manage releases is therefore important to the *Spill Management Plan*.

4 Control and Response

4.1 Spill Response

Steps to be followed during spill response include:

1. Evacuation – upon discovery of hazardous material spill, non-critical workers present must vacate the immediate area. If safe to do so, isolate the source of the material.
2. Identification - determine the type and quantity of the spill.
3. Inform and Contain – unit leader or supervisor must be notified of the spill. Including information such as:
    - Type of hazardous substance spilled or released
    - Location of spill or release
    - Size/volume of the spill or release
    - Nature of special risks such as fire, explosion, radioactive, or toxic gases

    Unit leader or supervisor must pass on information immediately to Wheeler River Site Lead.
4. Response Team – response team will consist of the individual or lead responsible for the spill and/or site lead. Ensure/assist in area evacuation. Ensure personnel involved wear appropriate

PPE. Use every reasonable effort to contain the spill. Ensure isolation of vessel and elimination of the source of the spill.

5. Site Lead – proceed to in incident scene and take charge. Initiate measure to contain spill or release if safe to do so. Record spill details with photographs if possible.
6. Unit Lead/Shift Supervisor – Obtain appropriate SDS to use at the incident scene. Arrange for spill clean-up and waste disposal. Initiate and complete incident investigation and reporting.

4.2 Spill Containment

If safe to do so, response team, site lead, or unit lead/supervisor should take measures to immediately stop the spread of the spill or release and isolate the source.

As described in Section 3.1, the project components include several preventative measures at the site to prevent spills, and to manage spills should they occur. These include the provision of secondary or tertiary containment, and leak detection systems, as required by CNSC REGDOC-2.9.1.

REDOC-2.9.1 also specifies the requirement for regular maintenance programs to ensure the integrity of these barriers, which is addressed in the *Facility and Equipment Management Program* and its associated plans. Substances will be handled away from waterbodies to prevent potential spills into water.

4.3 Spill Clean-up and Waste Disposal

Following the initial response to the spill, disposal of spilled materials and materials used to facilitate the spill clean-up is required. The disposal options will vary depending on the nature of the material spilled. The following list summarizes the preferred disposal options at the site.

Spills of hazardous materials should be disposed of at an approved hazardous materials landfill licensed to accept the specific hazardous materials.

Spills of liquid effluent (brine and mining solution) should be treated using site contact water treatment infrastructure.

Disposable materials used to facilitate the clean-up of spills that are non-hazardous will be disposed at the industrial landfill at the site.

An investigation of the residual impacts of the spill to the soil, groundwater, and surface water at the site will be initiated by ton-site Environment personnel and will be conducted by a Qualified Person as defined by the Saskatchewan Environmental Code. Should the residual impacts exceed the Saskatchewan Environmental Quality Guidelines, a corrective action plan for remediation and closure will be developed by the Qualified Professional to remediate these impacts, as outlined in the Saskatchewan Ministry of Environment (2015) Guidance Document: Impacted Sites.

5 Reporting

Spills must be reported to different regulatory agencies as per applicable legislation at the site, and the nature of the material released. Specific timeframes for reporting are also required, as outlined in this section.

The Environmental Management and Protection Act, 2010 of Saskatchewan requires reporting of a discharge of a substance that causes or may cause adverse effects, with some exemptions for quantities,

concentrations, or release rates that do not exceed the Act, federal Acts, approvals, permits or licences, the Saskatchewan Environmental Code, or an accepted environmental protection plan. Specifically, the *Saskatchewan Discharge and Discovery Reporting Standard* defines reportable quantities of substances for onsite or offsite releases (see Appendix A). Reportable quantities of these substances are to be reported within 30 days of the release.

The *Environmental Emergency Regulations* require the reporting of environmental emergencies that:

has or may have an immediate or long-term harmful effect on the environment;
constitutes or may constitute a danger to the environment on which human life depends; or
constitutes or may constitute a danger in Canada to human life or health.

The CNSC REGDOC-3.1.2, *Reporting Requirements* requires immediate preliminary reporting of spills, with a full report within 21 days for spills meeting one or more of the following conditions:

- any failure to control the release of a hazardous substance in quantities in excess of any federal or provincial regulation, or a licence, permit or certificate issued by a municipal, provincial or other federal authority; or
- any event that has adversely affected or has the potential to adversely affect the environment.

Preliminary reports are to include the following (REGDOC-3.1.2):

- the location;
- the circumstances, including:
- a description,
- date and time of the onset and the duration (if known), and date and time of discovery, and
- whether the situation, event or dangerous occurrence is ongoing;
- a description of any actions the licensee has taken or proposes to take; and
- for situations and events, any preliminary information that is available regarding the effect on the health, safety and security of persons or the environment.

A full report shall contain the following information as far as practicable and applicable (REGDOC-3.1.2):

- reference to the original preliminary report or notification;
- the date, time and location where the situation or event occurred or, if unknown, the approximate date, time and location and the date and time of becoming aware of the situation or event;
- the probable cause of the situation or event;
- a description of the situation or event and the circumstances including, if applicable, any problem with a radiation device;
- the effects on:
- the health, safety and security of persons or the environment,
- the maintenance of security, and
- if applicable, international obligations that have resulted or may result from the situation or event;
- the effective dose and equivalent dose of radiation received by any person as a result of the situation or event, including the measured or estimated doses to the public;

- if the situation or event involved an exposure device, the qualifications of the workers, including any trainees, who were involved;
- if applicable, information on the nuclear substance and the name, model and serial number of the radiation device involved;
- the actions that the licensee has taken or proposes to take, including actions identified and taken to re-establish normal operations and actions taken or proposed to prevent a recurrence;
- any actions that the licensee has taken to inform the public and target audience about the situation or event; and
- the information specified for action level reports (see Section 4.3 of REGDOC-3.1.2).

Some examples of events that should be reported to the CNSC include:

- radioactive release or hazardous substance release to the environment due to pipes, vessels or fuel failures
- any line leak causing a release of radioactive mine water into the environment
- failure of air pollution abatement equipment, resulting in an atmospheric release of a radioactive substance or hazardous substance
- Additional annual compliance monitoring reports to the CNSC are required.

6 Notification, Investigation, Preventive & Corrective Actions and Follow-up

Following the initial response, the appropriate regulatory agencies will be notified following DMC-QUA-105, *Non-Conformance Procedure*. An investigation will be conducted to determine the root cause(s). . This will be conducted as per the procedure DMC-QUA-105, *Non-Conformance Procedure*. Corrective and preventive actions will be developed and implemented as required and found in DMC-QUA-105-11, *Preventive & Correctives Actions*. Once an investigation has been completed and preventive and corrective actions implemented, a verification of effectiveness on all implemented actions will be completed. Further information can be found in DMC-QUA-105-13, *Verification of Effectiveness.*

7 Trend Analysis

The analysis of non-conformances, including spill trends provides an opportunity to identify potential issues that result in spills, potential opportunities for improvements to spill response and prevention, this can be found in WRE-QUA-108, *Use of Experience & Continual Improvement*, as well as WRE-QUA-109, *Self Assessment & Management Review*.

Reportable spill records will be retained indefinitely.

8 References

8.1 Internal

Document Number	Document Name
	Emergency Preparation and Response Program
	Health and Safety Management Program
	Contractor Management Plan
	Facility and Equipment Management Program
	Engineering Design Control Plan
	Environmental Management Program
	Environmental Monitoring Plan
DMC-QUA-105	Non-Conformance Procedure
DMC-QUA-105-11	Preventative & Corrective Actions
DMC-QUA-105-13	Verification of Effectiveness
DMC-QUA-108	Use of Experience & Continual Improvement
DMC-QUA-109	Self Assessment & Management Review

8.2 External

Federal

Nuclear Safety and Control Act

Canadian Environmental Protection Act

Environmental Emergency Regulations (E2 Regulations SOR/2019-51)

REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures,* Version 1.2

REGDOC-2.9.2, *Controlling Releases to the Environment*

REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills,* Version 1.1

REGDOC-3.2.2, *Indigenous Engagement,* Version 1.2

Packaging and Transport of Nuclear Substances Regulations, 2015

Provincial

The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations (Chapter E-10.22 Reg 2)

Discharge and Discovery Reporting Standard, Saskatchewan Environmental Code

Guidance Document: Impacted Sites, Ministry of Environment (2015)

Appendix A Reportable Quantities of Substances under Saskatchewan Environmental Code

Substance	Onsite Reportable Quantity	Offsite Reportable Quantity
Class 1: Explosives	Any quantity that could pose a public safety risk or 50 kg	
Class 2.1: Flammable Compressed Gas	Any quantity that could pose a public safety risk; 50 kg; or a sustained release of 10 minutes or more	
Class 2.2: Non-Halocarbon containing Compressed Gas (including oxygen)	Any quantity that could pose a public safety risk or a sustained release of 10 minutes or more	
Class 2.2: Halocarbon containing Compressed Gas	Any quantity that could pose a public safety risk or 100 kilograms	
Class 2.3: Toxic Compressed Gas	Any quantity any time	
Class 3: Flammable Liquids	500 L or any subsurface loss	200 L or any subsurface loss
Class 4: Flammable/Reactive Solids	100 kg	25 kg
Class 5.1: Oxidizer Packing Groups I and II	50 kg or 50 L	2.5 kg or 2.5 L
Class 5.1: Oxidizer Packing Group III	100 kg or 100 L	50 kg or 50 L
Class 5.2: Organic Peroxide	2.5 kg or 2.5 L	1 kg or 1 L
Class 6.1: Acute Toxic Packing Group I	2.5 kg or 2.5 L	1 kg or 1 L
Class 6.1: Acute Toxic Packing Groups II and III	10 kg or 10 L	5 kg or 5 L
Class 6.2: Infectious	All	All
Class 7: Radioactive	As per permit/approval conditions for the operation/facility. Where there is no permit/approval, consider discharge as offsite.	A discharge of any quantity of a Class 7 substance from a means of containment being used to store, handle or transport the substance.
Class 8: Corrosive	10 kg or 10 L	5 kg or 5 L
Class 9.1: Miscellaneous except PCB Mixtures	100 kg	25 kf or 25 L
Class 9.1: PCB Mixtures	50 g net PCB content	
Class 9.2: Aquatic Toxic	1 kg or 1 L	
Class 9.3: Chronic Toxic Wastes	10 kg or 10 L	5 kg or 5 L
Plant-based oils and fuels (not Class 3)	500 L	250 L
Glycols (inhibited and uninhibited)	100 L	50 L

Non-Class 3 Petroleum Substances	500 L	200 L
Industrial Wastes	1,000 kg or 1,000 L	500 kg or 500 L
Sewage	Not applicable	300 L
Emulsion	2,000 L	Any quantity any time
Refined chemicals used in or in association with the maintenance, production or operation of a well, facility, pipeline or flowline	500 L	Any quantity any time
Oil, salt water, condensate, oil and gas waste or product	2,000 L	Any quantity any time
Hydrogen sulphide gas	1,000 ppm or 1 mole/Kmole	
Drilling Wastes/Frac Wastes/Oil Byproducts (Oily Produced Sands)	2,000 L	Any amount