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INTERIM REVIEW OF BACKGROUND INFORMATION STANLEY ROAD WASTE FACILITY

This letter documents a review background information for the Stanley Road Waste Facility based on reports provided after my initial site visit and inspection completed in July.

Background

It is understood the site has been reported to the Dept of Environment Regulation (DER) as per reporting obligations under Section 11 of the CS Act. A copy of a letter from the DER dated 19 May 2017 was provided. The letter indicated:-

- the site is known as Lot 45 on Plan 17161 (51 Stanley Road) and has operated as a landfill and waste facility since approximately 1990;
- the site is currently operating under a Class II landfill license under Section 13 of the Environment Protection Act 1986;
- in 2007, the site was classified under Section 13 of the CS Act as 'possibly contaminated – investigation required',
- groundwater monitoring has been carried out as part of the EPA license requirements;
- there have been impacts reported in groundwater under the site that are considered by DER to be attributed to the landfill, and there is also evidence the impacts have migrated off-site under a property to the west known as Lot 42 on Diagram 67196 (35 Stanley Road);
- the classification was reviewed again in May 2017, and as a result both the subject site (Lot 45) and adjacent site to the west (Lot 42) have been classified as 'possibly contaminated – investigation required';
- DER considers the nature and extent of impacts associated with the landfill has only been partially investigated;
- DER required an accredited contaminated sites auditor to be appointed by 14 July 2017 to oversee further groundwater investigations to fully characterize the extent of potential groundwater contamination beneath the site and off-site;

- DER requires the groundwater investigation (and appropriate risk assessment) to commence on or before 29 September 2017, with the results to be documented in a Detailed Site Investigation (DSI), and for the DSI report to be submitted along with a Mandatory Auditor's Report (MAR) by 25 May 2018;

REPORTS PROVIDED FOR REVIEW

The following reports were provided for review:-

- Landfill assessment report dated June 2012;
- Phase 1 Desktop Hydrogeological Investigation dated March 2015;
- Groundwater monitoring reports for Jan, May, Aug and Oct 2016 (4 total);
- Groundwater monitoring report for Jan 2017 (1 total);

INITIAL IMPRESSIONS

These reports provide some indication of the groundwater regime in this area, and also some indication that the Stanley Road Waste Facility has impacted groundwater to some degree. It is acknowledged there are other adjacent properties that could also potentially be impacting groundwater. Further investigation is warranted to get a more complete assessment of the groundwater conditions at and in the vicinity of the Stanley Road Waste Facility to enable an informed judgement on this.

REQUIREMENTS FOR FURTHER INVESTIGATIONS AND RISK ASSESSMENT

The DER's letter requires further groundwater investigations to characterize and delineate the lateral and vertical extent of potential groundwater contamination beneath the site and off-site. It also requires a risk assessment to assess the risk to human health and the environment both on-site and off-site.

The following listing provides a series of questions that will be expected to be answered by this process and some comments to assist in guiding yourselves and your consultants in planning and executing the additional investigations:-

- Groundwater occurrence. There needs to be a more complete assessment of groundwater occurrence and the flow systems under the site. This should include better definition of the aquifers present and their properties that influence groundwater movement. This would be expected to include an assessment of basic properties such as hydraulic conductivity, porosity, hydraulic gradient, amount of organic carbon present in the aquifer materials, and the general aquifer chemistry for the aquifers of interest. This information is fundamental to feed into the risk assessment – ie. how fast and in which direction groundwater is moving, and the background chemistry of the groundwater.
- Has the Stanley Road landfill impacted groundwater? Based on current indications I agree there is sufficient evidence to conclude that it has clearly impacted groundwater to some degree, but the picture is incomplete.
- What chemicals / substances are involved? This is not completely understood based on the current information, and the suite of chemicals being monitored under the license does not cover all potential chemicals / substances that could potentially be associated with a

landfill site. The suite of chemicals / substances being monitored should be reviewed with regard to the site history and potential wastes deposited at the site, plus any chemicals / substances that are suspected from off-site sources. Aside from anything else, note that DER has recently provided guidelines highlighting the need for any landfill monitoring programs to check for possible impacts from per and polyfluorinated substances (PFOS).

- What is the extent of the impacts in groundwater? This question cannot be answered based on the information available. It is expected that the monitoring bore network is upgraded both within the site and also to delineate the extent of any impacts in groundwater from this landfill that have extended off-site beyond the boundary. This should include appropriate delineation both laterally and vertically.
- What are the risks posed by the impacts in groundwater? This will require several aspects to be considered including the lateral and vertical extent of the groundwater impacts, whether any adjacent properties are affected and also if any adjacent surface water is affected or under threat. For any impacts in groundwater, an important aspect of the risk is understanding the groundwater flow regime and the behavior of any impacts in the groundwater. Key questions would include how fast and in what direction the groundwater is moving (and any impacts dissolved in the groundwater), whether the impacts in groundwater are stable, contracting, or are continuing to migrate further off-site. Other important information to consider is the nature of any groundwater use in the area, and whether this is under threat from any impacts in groundwater from the Stanley Road Waste Facility. The other key question is the proximity of any waterbodies (rivers, creeks, wetlands, coastal areas) and whether these are under threat from the groundwater impacts.

In order to complete this work this will require the services of a consultant with experience in hydrogeology, contaminant fate and transport, and risk assessment. There is plenty of guidance available both state based, nationally and internationally in this field. I also note there are a number of other reports referred to in the background reports provided, including reports titled "Hydrogeological Assessments". Ideally, any future investigation should ensure that any relevant historical information and interpretation is consolidated into an updated detailed hydrogeological investigation report.

I would be happy to assist with discussions and planning of the additional works. Note that as the auditor I cannot be directly involved in the planning and conduct of the investigations, but can provide some overall direction and guidance.

Feel free to contact me if you have any queries in relation to these comments.

Yours sincerely,



Steven Kirsanovs
DER Accredited Contaminated Sites Auditor