INDICATIVE STAGING

1. Construct the preferred stormwater solution (main in Houghton Valley Road or localised lines to an open channel)
   - Monitor leachate flows in culvert,
   - Monitor ground water flows,
   - Monitor landfill gas,
   - Monitor stream and fish passage measures.

2. Install groundwater barrier wall
   - Monitor leachate flows in culvert,
   - Monitor ground water flows,
   - Monitor landfill gas.

3. Landfill cap works (impermeable cap or re-profiling)
   - Monitor leachate flows in culvert,
   - Monitor ground water flows,
   - Monitor landfill gas.

4. Landfill gas works (if required)
   - Monitor landfill gas solutions.

LANDFILL GAS

- There is little information on LFG.
- Monitoring has only recorded LFG once?
- Anecdotal information indicates LFG odours occur more often.
- The age of the landfill, the hydrogeological setting, the healthy vegetation and the relatively porous cap indicate that the LFG risks are probably low.
- Remedial measures for LFG would probably not be required based on risk.
- Odours at the Houghton Bay Outlet could be controlled via leachate measures proposed.
- Discharges through the cap could be addressed via increased surface cover or localised LFG capture.
- Controlling LFG in and around the culvert would be more difficult. Cutting off the stormwater connections will minimise pathways to public spaces. Could vent by retrofitting wind driven passive ventilation.
- Capture and treatment via a LFG collection system either active or passive would be expensive. This is not considered necessary based on information to date.
- LFG migration will change as a result of the leachate control measures. LFG should be monitored once these works are complete to assess the best practical option for managing LFG.

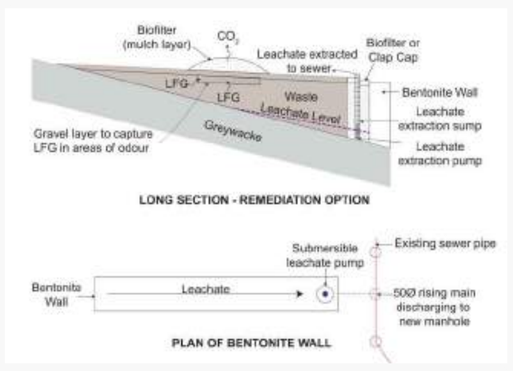
LANDFILL CAP

- Current cap appears to be both thin (0.25m in places) and relatively porous.
- Installing an impermeable clay or artificial cap is the best way to reduce infiltration. The cost might be prohibitive and it would increase the need for a LFG solution.
- Re-profiling the cap to shed more rainfall and reduce ponding would be more cost effective. Gradients would need to be minimal to maintain existing uses and may not be possible in some areas such as sports fields … so infiltration will still be a major contributor to leachate.
- The cap thickness should be increased to a minimum of 0.5m. Some re-profiling would be required when additional surface cover is installed.
- Material would need to be imported for any new impermeable cap or re-profiling which would add to the costs.
- Surface runoff should be directed to a perimeter drainage system or stream to stop infiltration elsewhere along landfill wherever possible.

INDICATIVE WATERFALL

INDICATIVE STREAM CROSS-SECTION

INITIAL BARRIER WALL DESIGN



RETROFIT INTEGRATED BAFFLE SYSTEM

Open surface swale

Pipe

Proposed stream

Existing streams

New stormwater main in Houghton Bay Road

New drain to collect leachate from upper section of landfill

New stormwater drain in Houghton Bay Road to direct surface/stream water to Houghton Bay.

Retrofit/fit integrated baffle/ spatrope system

New stormwater main in Houghton Bay Road

LEGEND

EXISTING:

- CATCHMENT BOUNDARY
- CONTOURS - 5m
- STREAMS
- SEWER PIPE
- STORMWATER PIPE
- OVERLAND FLOW PATH

PROPOSED:

- OPEN SURFACE SWALE
- STREAM
- NEW STORMWATER MAIN
- LEACHATE COLLECTION DRAIN

0 20 40 60 100 200m

scale 1:2000

HOUGHTON BAY CLOSED LANDFILL REHABILITATION INVESTIGATION

WELLINGTON CITY COUNCIL | DRAFT CONSULTATION | OPTIONS ANALYSIS PLAN #2

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