

**Table S1.3 Improvement programme requirements**

Reference	Requirement	Date
1a	<p>The operator shall review existing operating techniques against the Agency guidance documents:            “How to Comply with your Environmental Permit Getting the basics right” Part 1 Managing your activities and the Sector Guidance Note: “How to Comply EPR 5.02”.</p> <p>The Operator shall submit a report to the Agency in writing for approval outlining:</p> <ul style="list-style-type: none"> <li>• its ability to comply with the standards in the guidance;</li> <li>• detailing any areas to be addressed in order to meet the requirements specified; and</li> <li>• Specifying implementation timescales.</li> </ul> <p>The Operator shall undertake any measures or recommendations approved in writing by the Agency to the timescales indicated in the approval.</p>	16/03/11
1b	<p>The operator shall review the existing operating techniques for phases 1 and 2 and the required standards in condition 1.a above in light of the consolidation of the permits in order to produce a consolidated management system and consolidated management plans with clear operational standards including but not limited to: leachate, gas, surface water, odour, emergency &amp; contingency plans for the installation</p>	16/03/11
1c	<p>Upon written approval by the Agency the report required by condition 1.a and consolidated management plans required by 1.b shall form part of the operating techniques for the installation under table s1.2</p>	With immediate effect from receiving written approval
2a	<p>The Operator shall submit to the Agency, for approval, a report assessing the effectiveness of current leachate abstraction versus the risk of retro drilling new leachate monitoring wells for cells 1-10 and 12 to allow a compliance limit to be set for inclusion in Table s4.1 The report should seek to establish basal lining contours, review existing infrastructure including the need for extension of the abstraction and monitoring network in terms of number of points and depths in order to achieve leachate monitoring levels and/ or abstraction rates on site that can be demonstrated to minimise leachate heads and encourage hydraulic containment in accordance with the Agency Guidance document “Guidance on monitoring of landfill leachate, groundwater and surface water (LFTGN02)”</p>	16/09/11
2b	<p>On written approval from the Agency any new monitoring points required by 2a above shall be installed, in accordance with conditions 2.6.4 and 2.6.6, and the relevant leachate management and monitoring plans updated.</p>	16/03/11
3a	<p>The Operator shall undertake and submit to the Agency in writing (and for approval) a review of the number, location and construction of existing perimeter and off-site gas monitoring points (pertaining to the old Phase 1 site) in accordance with the requirements of the Agency guidance document “Guidance on the management of landfill gas. LFTGN03”.</p>	30/06/11

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	Any deficiencies identified by the review shall be outlined in the review report (including an appropriate mitigation plan to remedy any deficiencies noted).	
3b	On written approval from the Agency, the operator shall undertake the mitigation work identified as part of the review required by condition 3a above and to a timescale specified by the Agency.	Following agency approval of 3a.
4a	For all off-site and perimeter gas monitoring locations in phase 1 and 2, as indicated on plan WHV9 Version 2, the operator shall review all available monitoring data and submit to the Agency for approval proposed assessment levels for Carbon Dioxide to take into account background levels.	16/09/11
4b	On written approval from the Agency, the assessment levels and action plans agreed by S1.3 (4a) above, shall be incorporated into the site gas management and monitoring plans and monitored and reported in accordance with the requirements of Table S4.5 and Schedule 5 of this permit.	Within 3 months of completion of S1.3 (4a).
5	<p>For all groundwater boreholes identified in references 1a to 1d of Table S1.4B (Pre operational measures), the operator shall submit to the Agency, for approval, a CQA plan detailing the:</p> <ul style="list-style-type: none"> <li>• Design and specification, scale drawings and locations for each proposed monitoring borehole</li> <li>• Maintenance programme and deadlines for its repair and replacement.</li> </ul> <p>The operator shall implement any improvements or measures as agreed in writing with the Environment Agency.</p>	At least 14 days prior to the proposed date of borehole installation.
6	<p>Following completion of improvement condition 5 of Table S1.3 the operator shall provide to the Agency a CQA report that includes the following details:</p> <ul style="list-style-type: none"> <li>• As built drawings of the groundwater monitoring boreholes. installation.</li> <li>• As built location plan of groundwater monitoring boreholes.</li> </ul> <p>All boreholes must be surveyed to Ordnance Datum All new boreholes installed shall be incorporated into the site monitoring plan and monitored and reported in accordance with the requirements of tables S4.5, S4.11 and Schedule 5. The operator shall implement any improvements or measures as agreed in writing with the Agency.</p>	No later than 28 days after the date of borehole
7a	<p>The operator shall produced a new consolidated Hydrogeological Risk Assessment for the installation including an Agency approved model that models both phases 1 and 2 as one landfill and represents the combined impact of the site. The model should use the latest monitoring data available and be accompanied by full justifications of all input parameters and assumptions made including:</p> <ul style="list-style-type: none"> <li>• Review and justification of any inclusion of biodegradation within pathways</li> </ul>	16/09/11

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	<ul style="list-style-type: none"> <li>• Justifications of half lives incorporated into the model</li> <li>• Justification of and incorporation of any uncertainty of leachate heads within the model</li> <li>• Revised parametisation of the unsaturated zone ( and associated retardation parameters) within the valley feature between phase 1 and 2</li> </ul>	
7b	<p>Following completion of the consolidated HRA the operator shall review trigger levels to groundwater. The operator shall review all relevant groundwater monitoring data, and produce a written report which shall include, but not be limited to, the following issues:</p> <ul style="list-style-type: none"> <li>• Based on the monitoring data new trigger levels for groundwater shall be derived and/ or existing levels justified for inclusion in table S4.5</li> <li>• Previous estimates made in relation to travel time and peak concentrations from the plume of groundwater contamination from phase 1 should be reviewed.</li> <li>• Future Control and Trigger levels for groundwater, in order to reduce trigger levels once plume has passed, should be proposed.</li> <li>• The operator shall propose action levels for leachate parameters for phase 1 of the landfill for inclusion in table S4.9</li> <li>• The above reviews shall be in accordance with Agency guidance document “Hydrogeological Risk Assessment for Landfills”(LFTGN01) and section 4.2 of Golders Report “Groundwater Control and Trigger Levels” dated September 2008 ( Reference 08514290087.500/A.2) and LFTGN02 Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water</li> </ul>	16/03/12
7c	<p>Following the completion of s1.3 7a and 7b the operator shall submit to the Environment Agency, for approval a feasibility study and action plan for groundwater beneath phase 1 of the landfill. The study should identify and consider leakage in Phase 1 and possible attenuation techniques for reducing the contamination plume in order to demonstrate that all possible steps are being taken to bring the groundwater quality into compliance with the Groundwater Directive requirements.</p> <p>The plan shall include long term trigger levels to be incorporated once the contaminant plume has been demonstrated to have passed beneath the site.</p> <p>The plan shall also review the Groundwater monitoring network and include proposals for the inclusion of additional monitoring points to ensure that up hydraulic gradient of the site is well characterised.</p> <p>The plan should also take into consideration the findings following completion of Improvement Condition 2a above.</p>	16/03/12
7d	<p>Upon approval from the environment Agency the HRA, Trigger levels, groundwater action plan for phase 1 and additional monitoring points required by s1.3 7a -c shall be incorporated into the operating techniques Table s1.2.</p>	With immediate effect from receiving written approval

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8	<p>The Operator shall undertake a review of the leachate management plan which shall assess the options for the pre treatment of leachate prior to disposal and / or recirculation in accordance with Agency Guidance EPA 5.03 Parts 1 &amp; 2 Treatment of landfill leachate.</p> <p>The operator shall submit to the Environment Agency the revised plan and implement any measures as agreed in writing by the Environment Agency.</p>	16/09/11
9	<p>The operator shall undertake a review of Air Dispersion modelling Report for the Landfill Gas Compound (dated November 2006 Reference: 06529234.503/A.0). The review shall include re – running of the air dispersion modelling programme, using site specific emission data derived from the landfill gas compound.</p> <p>The modelling data and assessments of the results shall be incorporated into the site specific Gas Risk Assessment and submitted to the Agency. The operator shall implement any improvements or measures as agreed in writing with the Environment Agency.</p>	16/03/12
10a	<p>The operator shall propose a location for a new surface water monitoring point (for Rudbaxton Water) which will be sited at a point downstream of the Phase 2 Landfill. The details of the location of this new monitoring point shall be submitted to the Agency for approval.</p>	12 December 2008
10b	<p>The new surface water monitoring point (required by table S1.3 reference 10a) shall be incorporated into the site monitoring plan and monitored and reported in accordance with requirements of Table S4.10 and Schedule 5 of the permit.</p>	With immediate effect from receiving written approval
11a	<p>The operator shall propose a location for a new Groundwater Monitoring borehole, at a point down gradient of the leachate storage tanks. The details of the location of this monitoring point shall be submitted to the Agency for approval.</p>	16/03/11
11b	<p>Following approval of the new groundwater borehole location (required by Table S1.3 reference 11a), the construction of the monitoring borehole shall commence at the agreed location.</p> <p>The borehole shall be designed and built in accordance with LFTGN02 Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water, unless otherwise agreed in writing with the Environment Agency.</p>	Within 8 weeks of written approval from the Agency
11c	<p>On completion and commissioning of the new Groundwater monitoring borehole ( required by Table S1.3, reference: 11a) this new monitoring point shall be incorporated into the site monitoring plan and monitored and reported in accordance with the requirements of Table S4.11 and Schedule 5 of this permit.</p>	Within eight weeks of written approval from the Agency

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12	<p>Unless otherwise agreed in Writing with the Agency, the operator shall update the groundwater Contingency plans for the facility. This revised contingency plan shall include the following requirement:</p> <p>In the event that mecoprop concentrations are detected above 0.00041mg/l the operator shall undertake a review of the Hydrological Risk assessment.</p>	16/03/11
13a	The Operator shall propose a location for a new surface water monitoring point to be sited on the watercourse between TP10 and SP1. The design and location of the monitoring point shall be in compliance with LFTGN02 Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water.	Date 1 month from permit issue TBC
13b	The new surface water monitoring point (required by 13a) shall be incorporated into the site monitoring plan and monitored and reported in accordance with the requirements of Table s4.10 and Schedule 5 of the permit.	Within 2 months on completion of IC 13a
14	<p>The operator shall review the current surface water management system in phase1 against the requirements of: LFTGN02 Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water. The review shall:</p> <ul style="list-style-type: none"> <li>• Identify existing discharges( including D1 and Storm overflow) and any proposed new discharges from the lagoon system</li> <li>• Review discharge point structures</li> <li>• Quantify flow from D1 AND Storm overflow by continuous monitoring over a 12 month period</li> <li>• Propose flow rate monitoring method and limits for D1 for inclusion in table S4.3 based on 12 months monitoring data</li> <li>• Quantify and assess the additional loading of discharges from D1 on the Rudbaxton Water by collection of 12 months monitoring data and H1 assessment and associated modelling.</li> <li>• Justify existing and /or propose new Emission Limit Values for D1 for inclusion in table S4.3</li> </ul>	30/06/13
15	The Operator shall permanently cap the remaining area of cells 1 to 10 and cell 12 (as shown on drawing number Whg-PCA-0411-01). The works will be undertaken in accordance with the requirements permit conditions 2.6.	31/12/12
16a	The operator shall submit a drawing for the location of a new Groundwater Monitoring Borehole, at a point up-gradient of the leachate storage tanks. The details of the location of this new monitoring point shall be submitted to the Agency, for approval.	1 month. From date of issue
16b	<p>Following the approval of the new groundwater borehole location, the operator shall submit a CQA Plan for the construction of the new borehole.</p> <p>The Borehole shall be designed and built in accordance with LFTGN02 Guidance on Monitoring of Landfill Leachate,</p>	Within 2 weeks of completion of S1.3(16a)

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	Groundwater and Surface Water, unless otherwise agreed in writing with the Environment Agency.	
16c	Following the approval of the CQA plan the construction of the monitoring borehole shall commence at the agreed location.	Within 1 month of completion of S1.3(16b)
16d	On completion of the construction (for the new Groundwater monitoring borehole) this new monitoring point shall be shall be incorporated into the site monitoring plan and monitored and reported in accordance with the requirements of Table S4.11 and Schedule 4 of this permit.	Within two weeks of the installation of the new borehole
17	The operator shall install an engineered capping system along the remaining uncapped section of the western section of the phase 1 landfill by the deadline specified, unless otherwise agreed in writing with Natural Resources Wales.  The capping works shall be undertaken in accordance with the engineering provisions of condition 2.6 of the permit	31st December 2016
18	The operator shall review and update the interim leachate quality control levels for the phase 1 landfill. The review shall take into account all of the relevant leachate quality monitoring data collected for the phase 1 site. The operator shall submit, for approval, proposals for the new leachate quality control levels to the deadline specified  Once approved by Natural Resources Wales, the new control levels shall form part of the site permit.	1 st March 2015
19	The operator shall complete the construction of a temporary engineered capping system on the remaining uncapped areas of the valley cells and adjacent uncapped cells (being the area shown marked in red on drawing reference: 30348/WH/VCC/02. Revision 00. Dated 14 May 2018).  The capping works shall be undertaken in accordance with the approved Construction Quality Assurance plan (document reference: "Withyhedge Landfill Site Valley Cells VCS1 - VC3 Capping and Restoration -Specification and Construction Quality Assurance Plan Ref. No. 30348" Dated August 2018), unless otherwise agreed, in writing, with Natural Resources Wales.	31st September 2019 unless otherwise agreed in writing with Natural Resources Wales