

<b>SCOTTISH ENVIRONMENT PROTECTION AGENCY</b>  <b>POLLUTION PREVENTION AND CONTROL (SCOTLAND)</b> <b>REGULATIONS 2000</b>  <b>PPC Technical Guidance Note 2 (Site Reports)</b>	<b>Guidance No:</b> PPC TG2
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## PPC TECHNICAL GUIDANCE NOTE

### CONTENT AND SCOPE OF SITE REPORTS

Issued: 21/06/2006

#### IMPORTANT NOTES – PLEASE READ

This guidance sets out SEPA's expectations for the site report section of PPC applications. It is intended to assist SEPA staff and operators in preparing and assessing applications. This guidance may be subject to change in the light of regulatory changes, future Government guidance, Regulations or experience in its use. It has no legal status other than guidance to staff and operators.

Landfill operators undertaking a Hydrogeological Risk Assessment for the purposes of making a PPC application should refer to the specific guidance for Landfills:

[www.sepa.org.uk/pdf/guidance/landfill\\_directive/hydrogeological\\_risk\\_assessments.pdf](http://www.sepa.org.uk/pdf/guidance/landfill_directive/hydrogeological_risk_assessments.pdf)

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Figure 3      **Conceptual Site Models and geological cross-sections,**  
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## 1.0 INTRODUCTION

The PPC (Scotland) Regulations 2000 (“the Regulations”) require a site report to be submitted both at the time of application for a permit to operate a Part A installation or Part A mobile plant (Reg 7(1) by reference to Part 1 of Sch 4), referred to here as the Initial Site Report, and at surrender of the permit (Reg 15), referred to here as the Final Site Report.

The relevant sections of the Regulations are summarized in section 3 and appendix 1 for information. The reader is directed to the Regulations for the full text, interpretation and context.

## 2.0 PURPOSE AND SCOPE OF THIS GUIDANCE

### 2.1 Purpose of this Guidance

- Assist the operator in preparing an initial site report
- Assist SEPA staff in assessing the initial site report
- Assist the operator in preparing a final site report
- Assist SEPA staff in assessing the final site report
- Provide guidance to the operator on information which could be collected during operation of the site under the PPC permit

### 2.2 Scope of this Guidance

- Provides the legislative background to the requirement for a site report
- Provides interpretation of the legislation
- Based on this interpretation provides a suggested report structure, a discussion of the likely content and suggests how the data may be presented

It should be noted that this guidance is not prescriptive and has no legal status. Separate guidance is available in England and Wales.

## 3.0 REGULATIONS

The parts of the Regulations describing the requirements for the site reports are set out below. Other associated sections of the Regulations are included in appendix 1

### 3.1 At Application for a Permit (Initial Site Report)

Schedule 4, Part 1, paragraph 1(1)(d) requires a site report to be submitted with an application for a permit to operate a Part A installation or Part A mobile plant (except for an installation or mobile plant falling within paragraph (d) or (e) of Part A of section 5.1 of Part 1 of Schedule 1 i.e. certain non-hazardous waste incineration activities).

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Schedule 4, Part 1, paragraph 1(2) states:

“the site report required by paragraph 1(d) shall describe the condition of the site of the installation or Part A mobile plant and shall, in particular, identify any pollutants in or on the land”.

### 3.2 At Surrender of a Permit (Final Site Report)

Regulation 15(3)(c) and (d) state that an application for surrender of a permit to operate a Part A installation or Part A mobile plant (except for an installation or mobile plant falling within paragraph (d) or (e) of Part A of section 5.1 of Part 1 of Schedule 1 i.e. certain non-hazardous waste incineration activities) must include:

“(c) a site report describing the condition of the site or the identified part of the site, as the case may be (“the report site”), identifying, in particular, any changes in the condition of the site as described in the site report contained in the application for the permit; and  
(d) a description of any steps that have been taken to avoid any pollution risk on the report site resulting from the operation of the Part A installation or Part A mobile plant or to return it to a satisfactory state.”

### 3.3 Definition of Terms in the Legislation

Reg 2 (1) provides the following definition of terms:

“**Emission**” means –

“(a) in relation to Part A installations, the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in an installation into air, water or land;”

“(c) in relation to a Part A mobile plant, the direct or indirect release of substances, vibrations, heat or noise from the mobile plant into the air, water or land;”

“**Installation**” “means –

“(a) a stationary technical unit where one or more activities listed in Part 1 of Schedule 1 are carried out; and

(b) any other location on the same site where any other directly associated activities are carried out which have a technical connection with the activities carried out in the stationary technical unit and which could have an effect on pollution, and, other than in Schedule 3, references to an installation include references to part of an installation;”

“**Mobile Plant**” means “plant which is designed to move or to be moved whether on roads or otherwise and which is used to carry out one or more activities listed in Part 1 of Schedule 1;”

“**Substance**” “includes any chemical element and its compounds and any biological entity or micro-organism, with the exception of radioactive substances within the meaning of Council Directive 80/836/Euratom(a), genetically modified micro-organisms

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within the meaning of Council Directive 90/219/EEC(b) and genetically modified organisms within the meaning of Council Directive 90/220/EEC(c)

“**Pollution**” means “emissions as a result of human activity which may be harmful to human health or the quality of the environment, cause offence to any human senses, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment;” and

“**Pollutant**” means “any substance, vibration, heat or noise released as a result of such an emission which may have such an effect;”

**Satisfactory State:** The Regulations do not define satisfactory state.

### 3.4 Interpretation of the Legislation

“**Identify any pollutants**”: the purpose of PPC is to prevent or, where that is not possible, control pollution arising from installations or mobile plant during their operation under a PPC permit. Therefore “any substances”, in terms of initial site report requirements, is interpreted to refer only to those substances to be handled at the installation under the PPC permit.

In addition, for a substance to require to be identified in the initial site report it:

- i. must fit the definition of substance given in Reg 2(1) (see s.3.3 above)
- ii. must be “in or on the land” (see below)

Any other substances present which do not fit all of these criteria do not need to be considered in terms of the site report.

“**in or on the land**” this is a very broad term and includes anything with a potential to cause pollution such as above ground storage, stockpiles of materials, substances in below ground pipes, tanks etc as well as contamination already present in the ground, groundwaters and perched waters.

“**pollutant**”: any substance which, given the circumstances present on site, has the potential to cause pollution, should be considered. Pollution does not have to have occurred, for example, prior to permit surrender where a site is to be vacated chemicals should be removed from a tank to prevent possible pollution risk resulting from their accidental release to the environment.

“**satisfactory state**”: the Regulations do not provide a definition of satisfactory state however, as it is used in addition to the term “pollution risk” it suggests that it is intended to cover something other than this. Possible situations where satisfactory state may be used are:

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to require remediation of the ground where an emission has occurred and caused a deterioration in ground condition but the change itself does not represent a risk to an identifiable receptor;

to require removal of floating product from groundwater where dissolution of the product is so slow as to not directly affect the water quality,

to address general housekeeping issues, for example, to require removal of empty drums/ containers, or accumulated sludge from within bunds.

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#### 4.0 RELATIONSHIP BETWEEN INITIAL SITE REPORT AND FINAL SITE REPORT

The initial site report provides a factual statement of the current condition of the site at the time of application for a permit to operate under PPC. In particular it describes the nature and distribution of potentially polluting substances in the ground and groundwater at the site. The substances of interest are those which are to be handled at the site under the PPC permit.

The final site report provides a factual statement of the condition of the site at the time of application to surrender the permit. In particular it identifies any change in site condition since the initial site report, describes any steps taken to avoid pollution risk and includes other information as appropriate to demonstrate that the site is in a satisfactory state.

When considering an application for surrender of a permit SEPA is required to consider whether there is any pollution risk arising from the operation of this site under the PPC permit and whether the site has been returned a satisfactory state.

In doing so SEPA will have regard to the condition described in the initial site report and any deviation from it identified by the final site report, but will not make a decision based solely on a comparison of the two. This is because it recognises that changes to the operations, substances handled etc may occur during the operation of the site under PPC, however, the Regulations do not require amendments or addition to the site report during the life of the PPC permit (except where additional land is being included in the site of the installation/mobile plant). The initial and final site reports will therefore be used together with other available data relating to the operation of the activity under the PPC permit, e.g. SEPA inspection reports, site management techniques, records of accidents and incidents, remedial works undertaken, notifications of changes in operation, variation notices etc. in order to produce as full a picture as possible on the likely condition of the site and to establish whether any deterioration in the condition of the site has occurred as a result of the operation under the PPC permit, whether the site has been returned to a satisfactory state, and whether there is any pollution risk.

It is therefore in the applicant's interest to determine the initial site condition as fully as possible and to keep detailed records of operational practice under PPC since, at surrender the applicant will need to demonstrate that operation of the installation/mobile plant under the PPC permit has not resulted in a pollution risk and that the site has been returned to a satisfactory state. If this is not demonstrated to SEPA's satisfaction, SEPA may require the operator to undertake remediation to avoid or remove pollution risk and/or return the site to a satisfactory state as a pre-requisite to acceptance of the application for surrender. If SEPA is not satisfied in this respect it must refuse the application for surrender of the permit.



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## 5.0 OUTLINE OF BASIC REQUIREMENTS OF INITIAL SITE REPORT

The purpose of the initial site report is to provide a factual statement of the condition of the site at the time that the application for a permit to operate under PPC is made. To comply with the requirements of the Regulations it needs to "...identify any substances in, or on the land...".

As described above, the initial site report will not be used to set a baseline to remediate back to at surrender of the permit, as SEPA will not make a judgement on the state of the site at the time of submission of the initial site report.

Table 5.1 provides a summary of the main stages which need to be undertaken to produce an initial site report. Further details of the information required by each stage are included in section 6 together with suggested sources for the information and examples of how it may be presented.

Additional guidance is provided in Appendix 4 for operators who have a direct discharge to ground or groundwater and for operators of landfill sites.

Note, where there is more than one operator at an installation the Regulations require each operator to apply for a PPC permit in respect of the relevant part of the installation. In this respect it is necessary for each operator to make a statement of site condition for their part of the site. This could either be a separate initial site report relating to the area of the site occupied by their part of the installation or, a single site report in respect of the whole installation, however in the latter case it must be clear which data/information applies to which part of the installation.

Some of the information required for a site report is likely to have already been provided in other sections of the PPC application. It is not necessary to reproduce this information in the site report, however clear reference must be made to exactly where the information can be found. Table 5.1 below shows the applications form questions which overlap with site report requirements.

**Table 5.1 Main Stages of the Initial Site Report**

Stage	Activity	Objectives and Relevant Section of Legislation
1.	Identify what substances are currently used at the installation (Raw materials, products, by-products, intermediaries, wastes, auxiliaries)	Produce a list of all materials handled at the site  <i>(Sch 4 Part 1, 1(1), (f) to the Regs</i>
2.	Identify which of the substances in stage 1 are a theoretical pollution risk based on consideration of the chemical and physical constituents. Discard those substances which do not represent a theoretical pollution risk.	To reduce the list such that only those substances which have the potential to cause pollution are considered further

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Stage	Activity	Objectives and Relevant Section of Legislation
	Justify your decisions.	<i>(Sch 4 Part 1, 1(1), (f) to the Regs)</i>
3.	<p>In respect of each of those substances brought forward from stage 2, identify the actual pollution potential at the installation, including the probability of release and the consequences of release, taking account in particular of:</p> <ul style="list-style-type: none"> <li>• The quantity of each substance handled</li> <li>• How and where they are stored</li> <li>• How they are transported around the installation</li> <li>• How they are used</li> <li>• Measures that have been and will be adopted to prevent emission to land and associated groundwaters</li> <li>• The toxicity, mobility and persistence</li> </ul>	<p>To identify which of the substances from stage 2 represent a potential pollution risk at the site based on the likelihood of emissions occurring during handling, storage or use.</p> <p><b>These are the substances for which a statement of site condition should be made</b></p> <p><i>(Sch 4 Part 1, 1(1), (g), (f) and (h))</i></p>
4.	<p>Provide site history. Consider both:-</p> <p>i) History of operation of existing installation (as in stage 3 to identify any emissions which have occurred which may give rise to pollution. In particular, consider: accidents or incidents, drips or spills from routine operations, changes in operational practice, site surfacing, chemicals used, etc. Any changes in chemicals used) (“existing” used in widest sense to mean any installation which is already in operation at the site) and</p> <p>ii) Previous uses of the site - are substances likely to be similar to those to be used under PPC (as identified in stage 3) and if so are emissions likely to have occurred?</p> <p>If emissions are likely, identify indicative areas for those actual or likely emissions and relate back to potential emission points identified at stage 3 to identify coincident areas.</p> <p>Previous site investigation reports may assist in compiling this data.</p>	<p>Identify potential sources which may have resulted in the substances identified in stage 3 being present on site prior to operation under PPC</p> <p><i>(Sch 4 Part 1, 1(2))</i></p>

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Stage	Activity	Objectives and Relevant Section of Legislation
5.	Identify the site's environmental setting, including: <ul style="list-style-type: none"> <li>• Topography</li> <li>• Geology and hydrogeology</li> <li>• Direction of groundwater flow</li> <li>• Other potential migration pathways such as drains, services, airborne emissions</li> <li>• Nearby industries</li> <li>• Surrounding landuse</li> </ul>	Determine where emissions may go once emitted and where to look for them. Also identifies what environmental media and receptors are potentially at risk and whether there are other activities in the area which may release the same substances and cause them to migrate onto the site.  <i>(Sch 4 Part 1, 1(1) (g) of the Regs)</i>
6.	Using (3) to (5) to demonstrate the location of historic and potential future emissions and the strata and groundwater bodies likely to be affected by those emissions. i.e develop a series of conceptual site models which describe the site.	Identify the location, nature and extent of existing pollution on the site and determine which strata and groundwater bodies could be affected. Compare with potential future emissions to see if areas are coincident.  <i>(As 3 – 5 above)</i>
7.	If there is sufficient information to describe the site on the basis of (1) – (6) go directly to stage 8. If not, consider intrusive investigation or other means to provide details of initial site condition	Collect additional data as necessary to allow a statement of site condition to be made.  <i>(Reg 7(1), Sch 4 Part 1 1(2) of the Regs)</i>
8.	Describe site condition for the substances identified in stage 3 on basis of (1) – (7)	Provide a statement of site condition  <i>(Reg 7(1), Sch 4 Part 1 1(2) of the Regs)</i>

## 6.0 DETAILED CONTENT OF INITIAL SITE REPORT

The following section provides an indication of the type of detail required in each of the above stages, indicates possible sources for that information and suggests methods of presenting the data, which could be used along with relevant text.

Applicants may wish to contact SEPA, after consideration of this guidance, to discuss the site and the requirements for the initial site report prior to commencing any works and also at the end of stages 6 and 8 to ensure there are no obvious issues omitted which SEPA would require to be addressed.

Some pointers for a good site report:

- Keep it simple

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- Make it relevant
- Use diagrams, tables etc where appropriate rather than dense text
- Focus on the substances associated with the PPC installation
- Report on the actual condition, even if nothing is detected
- Provided justification for your assumptions, decisions etc
- Provide a clear statement of site condition not a risk assessment or an assessment of whether the site is “suitable for use”

A checklist of issues to be included in the report is included in appendix 5, SEPA will use this checklist when assessing the report.

Appendix 6 shows the mechanism used by SEPA in respect of the initial site report to determine whether it is duly made and whether additional information is required to be obtained via a Schedule 4(4) Notice.

## **6.1 Stage 1: Identify the Substances Used at the Installation**

### **6.1.1 Information Required**

Before you can describe the condition of the site in respect of those “substances in, on or under the land which may cause a pollution risk” you need to know what substances are handled at the site and which of these have the potential to cause a pollution risk.

The first stage therefore is to produce a list of all substances handled within the installation boundary (raw materials, products, intermediaries, by-products, wastes and auxiliaries). This should include all substances associated with listed activities and directly associated activities which have a technical connection to the activities carried out and which could have an effect on pollution.

Where substances are listed under trade names the chemical constituents should also be identified. For mixtures or compounds the relative proportion of the main chemicals should be provided.

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### 6.1.2 Sources of Information

- Site records,
- Suppliers material safety data sheets

### 6.1.3 Example of Data Presentation

An example of how the data may be presented is included in Table 6.1 at the end of stage 3.

## 6.2 Stage 2: Identify Those Substances Which Represent a Theoretical Pollution Risk

### 6.2.1 Information Required

From the list produced in stage 1 determine the theoretical pollution risk of each substance by considering its chemical and physical constituents such as: composition, state (solid, liquid, gas), solubility, toxicity, mobility, persistence, etc. This information should be used to determine whether or not the substance has the potential to cause pollution. The data considered together with the rationale used to interpret it should be presented so it is clear to the assessor why substances have been dismissed or included.

Where a group of substances display similar characteristics they may be considered together provided that justification for the grouping is provided.

Those substances identified as being a theoretical pollution risk should be taken forward to stage 3 for further consideration as described below.

### 6.2.2 Sources of Information

- Material safety data sheets (for basic information)

For more detailed information (if required):

- Croner Substances Hazardous to the Environment
- Croner Substances Hazardous to Health
- The Merck Index
- The CRC Handbook of Chemical and Physics
- Fate and Transport of Organic Chemicals in the Environment (NEY)

(see List of References on Page 45 for full details)

### 6.2.3 Example of Data Presentation

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An example of how the data may be presented is included in Table 6.1 at the end of stage 3

### 6.3 Stage 3: Assessment of Site Specific Pollution Risk

#### 6.3.1 Information Required

Each substance brought forward from stage 2 should be considered in the context of the site to determine whether circumstances exist on site which may result in the release of the substance in sufficient quantities to represent a pollution risk, either as a result of a single emission or as a result of accumulation from multiple emissions. See examples below.

#### Examples of Possible Interpretation of Data

A substance may not be considered to be of concern where:

- The substance is highly toxic and persistent but used in such small quantities that it could never enter the environment (even on a cumulative basis) at levels which could result in a pollution risk or an unsatisfactory state
- The substance is highly toxic and a pollution risk if released, however is so expensive that the operator has sufficient measures in place to ensure it could never be released
- Large quantities of relatively benign substance are used, but even if there were a catastrophic leak it could not result in a pollution risk or the site being in an unsatisfactory state
- Occasional drips have occurred over the history of the site under PPC but the volume released and biodegradability of the substance is such that accumulation will not have occurred

A substance may be considered to be of concern where:

- The substance is highly toxic and persistent and if released, even in small quantities, could result in a pollution risk and / or an unsatisfactory state
- The substance is relatively benign, but the quantity handled is such that the effect of a catastrophic leak could result in a pollution risk or an unsatisfactory state
- Many small seemingly insignificant drips have occurred over a long period of time and may have resulted in an accumulation of the substance in the environment
- There is insufficient information on which to determine the potential risks

Specific issues to be considered include:

- i. The amount of substance handled per year relative to its toxicity (table 6.1).

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- ii. The location of each substance on site e.g where it is delivered, stored, used, moved around the site. etc. (Figure 1)
- iii. At each of the above locations identify the method of storage, handling and use of raw materials, products, wastes etc and whether or not there are any containment mechanisms in place to prevent emissions occurring; e.g. bunds, hardstanding, handling procedures, (and/or procedures etc. (figure 1 and table 6.1)

Where no containment mechanisms are present determine the likelihood of emissions to ground and groundwater occurring.

- iv. Undertake a detailed physical inspection of the site to determine integrity of containment mechanisms, nature and condition of site surfacing, location of drains, services or other potential conduits for migration. Examples of the types of information which could be gathered are:
  - are structures cracked or damaged?
  - are there signs of chemical attack to concrete surfaces?
  - is brickwork and pointing intact?
  - are process drains in good condition? Where safe to do so, manholes, gullies and open drains should be inspected and where possible a CCTV survey would be beneficial
  - identify drainage routes, service corridors etc and locate outfalls (figure 2)
  - identify signs of emissions already having been made and their visible nature and extent. Could the emission reoccur in future?
  - what is the nature and integrity of the site surfacing? (concrete, tarmac, gravel, open ground etc). Are joints or cracks present in the vicinity of potential emission points?
  - identify whether any direct or indirect emissions of List I or List II substances to ground or groundwater occur on site (where a direct discharge is to be made or the site is a landfill see additional information in Appendix 4)

Where some form of emission may occur either directly or due to an inadequacy or deterioration in a particular containment mechanism or procedure determine the likelihood of emissions being made or having already been made to ground or groundwater.

Based on the above describe the circumstances under which an emission to the environment may occur during operation under PPC e.g.

Accidents/Incidents e.g tanker overturning on site road; vessel rupturing; leaking underground tank, seal breaking; accidental discharge; leaks from drain ruptures

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Routine operations e.g. drips during delivery or from pipe joints, small spills during decanting/transfer of product, leaks from blocked or broken drains, cracks in concrete hardstanding

Planned emissions e.g. discharges to land or groundwater;

and identify which substances may be emitted to the environment and result in a potential pollution risk

**These are the substances for which the initial site condition will need to be stated.**

### 6.3.2 Sources of Information

- Site records, e.g. building/ drainage/ utility plans, maintenance records, incident records, site reports/ audits
- Management procedures,
- Site walk over/Visual site inspection

### 6.3.3 Example of Data Presentation

An example of how the information collected from stages 1 – 3 could be presented is included in table 6.1 and figure 1. Where appropriate these tables and figures should be supported by accompanying text as details of procedures.



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**Table 6.1 Determining substances which may represent a pollution risk**

Stage 1 Chemicals Handled	Stage 2 Chemical Characteristics and Toxicity					Stage 3 Site Specific Characteristics			Stage 4 Site specific Risk
Substance	State	CAS Number	Risk Phrases (CHIP)	Environmental fate and behaviour	Potential Pollution Risk	Quantity	Storage Arrangements	Delivery, storage and use details	Comments/ Chemical of Concern?
Plastic sheeting	S	N/A	N/A	Essentially inert	N	N/A	N/A (no further information required)	N/A (no further information required)	None
Charcoal	S		-	Material is solid, low solubility and unlikely to have significant effect.	N	1 tonne	Bags inside warehouse	N/A (no further information required)	Spillages could be easily swept up therefore not considered to be a potential risk.
Hexane	L		R11, 62, 65, 48/20, 38, 67, 51, 53	Low solubility, floats on water. Moderate to high toxic effects and bioaccumulation potential.	Y	1000000 litres	above ground steel tank, installed 1980,	Delivery by tanker, fill point within bund. Brick bund (110% capacity), constructed 1985. Direct feed above ground pipeline to plant	Site containment and handling procedures good but bund is brick and shows signs of wear. Large volume handled makes this a potential risk.
Methanol	L		R11, 23/24/25, 39/23/24/25	Miscible with water, high toxicity	Y	90,000 litres	Above ground steel tank installed 1995. Overfill alarm fitted	Delivery by flexible pipeline from tanker over gravel area, fill point within bund. Bund (110% capacity), constructed 1995, Direct feed above ground pipeline to plant	Delivery system and permeable gravel surfacing make this a potential chemical of concern.

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Stage 1 Chemicals Handled	Stage 2 Chemical Characteristics and Toxicity				Stage 3 Site Specific Characteristics			Stage 4 Site specific Risk	
Bromine	L			Denser than water (DNAPL), high toxicity and solubility therefore is a potential risk,	Y	4,000 Litres	IBCs in warehouse	Delivery by lorry, IBCs stored on large drip trays, separate from other chems in warehouse (concrete floor, no surface water drains). Delivery to production building by forklift	Emissions unlikely while stored, but potential for spills if IBC dropped during unloading or delivery to production building, so potential chemical of concern.
Key: S = Solid                      L = Liquid                      G = Gas									

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## 6.4 Stage 4: Site History

### 6.4.1 Information Required

The purpose of this section is to determine which of the substances identified by stage 3 have the potential to be present on site already as a result of activities to date and to determine whether they are coincident with potential future emission points.

The site history should consider both (i) the history of the site prior to development of the current/ proposed installation and (ii) the operational history of the current/ proposed installation as follows:

- i. List the former uses of the site from green field to development of the proposed installation. Identify whether these uses are likely to have handled any of the substances identified in Stage 3. If so, where were they likely to have been handled, what is the likelihood of emissions having occurred, what remediation, if any, has been undertaken? Where available site specific data should be used, however, where this is not available for a previous activity a subjective assessment should be made and the response qualified accordingly.
- ii. For an installation which is already operationally at the time of the application for a PPC permit what is the likelihood of emissions having occurred during the history of operations at the site? Specific points worth considering are:
  - Location, nature and extent of accidents, incidents, or direct discharges made historically (authorised or otherwise) which might have caused a release of substances to the ground or groundwater
  - What changes or improvements have been made to the process, chemicals handled, storage locations, disposal methods etc. and why? For example where they as a result of a previous incident, accident, near miss etc, were they made to reduce the risk of emissions, to comply with new legislation, to improve efficiency, reduce waste etc. Do they indicate emissions may have occurred?
  - Maintenance records – do these show good integrity for drains, tanks, bunds, pipelines etc? Have they been kept since the start of the activity or were they introduced recently?
  - Details of site investigations undertaken previously and remedial works carried out.
  - Site walkover data gathered during Stage 3 may also provide information on the presence of staining, evidence of corrosion, presence of new surfacing, etc.

### 6.4.2 Sources of Information

- OS maps
- Planning applications

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- Site investigation reports (divestiture, audit, site condition, incident investigation etc)
- Visual Site inspection
- Site records
- Anecdotal information
- SEPA/ Local Council records

#### 6.4.3 Example of Data Presentation

An example of how the information collected from Stage 4 could be presented is included in Table 6.2 below and figure 2.

Where appropriate copies of the relevant historic maps may be included to identify the specific location/layout of a former use or changes in use. However inclusion of all historic maps is not necessary if they do not demonstrate relevant information or changes.

**Table 6.2 Summary of Site History**

<b>Date</b>	<b>Use</b>	<b>Comment</b>
Pre 1975	Agricultural land	Possible residual levels of nitrates, ammonia and phosphates all of which coincide with chemicals handled on site. Pesticides and herbicides may be present but are not similar to materials handled on site so are not of interest.
Approx 1965	-	River valley infilled. Source of fill not known. Potential for contamination to be associated with this.
1975 to date	Chemical works	<p>The current site was developed in the mid 1970's. Although some changes in layout and process materials have occurred the materials handled are largely the same as present and therefore overlaps between historic and future pollution are likely.</p> <p>Specific incidents known to have resulted in the release of chemicals are as follows:</p> <p>1982 Heating Oil spill to south east of boiler house. Remediation undertaken at time, residual levels as indicated in remediation report (ref XXX the report and include relevant sections in an appendix).</p> <p>1990 Caustic leak from drain at SW of site (indicate on diagram). Drain repaired but no soil or groundwater remediation undertaken. Further information on this area likely to be necessary.</p> <p>Other issues:</p> <p>1994 Bunding installed around all storage tanks to reduce potential environmental liability. Prior to this reliance on concrete hardstanding preventing emissions entering ground some pollution</p>

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Date	Use	Comment
		<p>may have occurred at joints in concrete. Potential for emissions to have occurred at tank fill points, tank valves etc – which are outside of the bunds and at pipe joints as indicated on figure 2.</p> <p>Bund inspection and integrity testing undertaken annually. No issues noted.</p>

## 6.5 Stage 5: Environmental Setting

In Stages 1 - 4 the locations on the site where emissions could occur in future and those locations where emissions may already have occurred were identified. The aims of stage 5 are to determine the fate of any such emissions, the strata and groundwater bodies which may be affected and to establish the extent and depth to which the land needs to be characterised. This requires an understanding of the characteristics of the ground and groundwater in the vicinity of the site. The types of information likely to be required are considered below.

Where available site specific data should be used, however where this is not available the applicant could use reference data, qualitative/subjective assessment, inferred or extrapolated data. In each case the source of the data should be identified, and where this is not site specific justification for the use of the selected data and details of any margins of error which apply should be included.

In considering the site characteristics the following data should be collated:

### 6.5.1 Topography

Local topography and type of ground surface (concrete, open ground etc) in the vicinity of each emission point will dictate the immediate effect of any emissions, as will the location of the emission in relation to the ground surface (e.g. ground level, above ground, overhead pipe work, below ground level etc)

The type and slope of the ground surface etc can be shown on a site plan. In addition, the base of bunded compounds, pits etc relative to the surrounding ground level should be clearly identified, particularly where they are below ground level (either in part or in full).

### 6.5.2 Sources of Information

- Visual site inspection
- Site survey data
- Construction drawings.
- Maintenance records
- Ordnance Survey maps

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### 6.5.3 Example of Data Presentation

See figure 2

### 6.5.4 Geology and Hydrogeology

Provide a description of the soil and rock strata beneath the site and the physio-chemical properties of each strata which may influence the movement of substances through the ground.

Identify whether groundwaters (including perched waters) are present, or are likely to be present, in each of the strata and, where known, indicate the hydraulic gradient.

Provide an indication of what the soil and groundwater properties mean in terms of the movement of substances through the ground.

A simple summary of the data, rather than a full geotechnical description, is sufficient in the report, further details can be provided as an appendix or made available for future reference as required.

In addition, this should draw together all available information to present the conditions present at the site, rather than separating out published geology and hydrogeology from previous investigation findings and current investigation findings.

### 6.5.5 Sources of Information

- Site investigation data
- BGS records (logs, geological sheets and memoirs)
- Geotechnical test results or references for physio chemical parameters
- Groundwater vulnerability maps

### 6.5.6 Example of Data Presentation

Table 6.3 indicates how the data may be summarised and figure 3 presents typical cross sections which may be used to show the variation in geology across the site.

**Table 6.3 Geological and Hydrogeological Summary**

Typical Depth	Strata	Physio – Chemical Properties and Comment	Comment
0 – 0.2m	<b>Made Ground</b> Concrete or gravel chippings Grass to edges of site (see fig 1)	local slope to concrete (see figure 3). Grass and gravel roughly level.	
0.2 – 1.2m	<b>Made Ground</b> Red brown sandy gravel with	Permeability likely to be high,	Based on the available information it is likely that

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Typical Depth	Strata	Physio – Chemical Properties and Comment	Comment
	clay lenses. (reworked natural)  Perched Groundwater at 0.8m	Likely to have low organic matter content and low sorption and cation exchange capacity. Hydraulic gradient: Initial measurements indicate slight fall to SE, however water is discontinuous in NE of site.	chemicals will migrate through this horizon fairly rapidly. Some retardation may occur in clay lenses.
1.2 – 13.3m	<b>Red brown sandy, silty CLAY</b> Soft sandy, slightly silty clay with many sand lenses becoming more firm and less sandy with depth (below 5 m approx)	Permeability: Mod – low, (approx $7 \times 10^{-4}$ , to $3 \times 10^{-6}$ cm/sec, pH: 7.2 – 7.9) Noted to have some organic matter present in the upper 3-5 m. No free water present but upper 2-3 m quite moist.	(Permeability data from previous SI.) The upper layers of sandy clay are likely to permit migration of chemicals down to the firmer clays. Some adsorption and retardation would be expected, this would most likely increase with depth. The thickness and firmness of clays should provide protection to the sandstone aquifer below.
13.3 – 16.8m	<b>Yellow SANDSTONE</b> Weathered at surface, heavily fissured.  Groundwater at 13.7m (major aquifer)	Fault line trending W - E in the vicinity of building 5 Hydraulic gradient: 1:18 east to west	Any chemicals entering this horizon are likely to migrate via fissures on the sandstone. Light oils, solvents, etc would float on the water table. More dense substances may migrate to considerable depth.

### 6.5.7 Hydrology

Indicate the presence of surface water features, their direction of flow, quality/classification and location of bed depth relative to the site surface. Provide an indication of how each water body identified might be affected by emissions from the site.

### 6.5.8 Sources of Information

- OS maps
- Water Quality Data from SEPA
- Site inspection

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- Level survey data

### 6.5.9 Example of Presentation of Data

An example of how the data may be presented is included on Figures 1 and 2.

**6.5.10 Manmade Pathways:** Identify manmade pathways, service corridors, drains, mines etc, which may act as migration routes and identify the likely migration direction remembering that this may be against the natural topographic or hydraulic gradient.

### 6.5.11 Sources of Information

- Site records,
- Construction drawings (Planning and site)
- Mining reports
- Service authorities

NB: Commercial database searches such as “Envirocheck™” can be useful in obtaining environmental setting information, but SEPA does not expect the full reports to be provided in the Site Report.

### 6.5.12 Example of Presentation of Data

Figure 1 or text

### 6.5.13 Surrounding landuse

Identify surrounding landuse to determine industries/activities, especially those upgradient, that may handle the same substance, and may cause pollution to migrate onto the site. In terms of pollution migration on to the site at the time of surrender of the permit it is for the applicant to demonstrate that they have not caused pollution whilst operating under the Permit. It is therefore important to know if adjacent properties could be a source of similar pollutants.

### 6.5.14 Sources of Information:

- Visit to area
- OS plans
- Trade directories

### 6.5.15 Example of Presentation of Data

Figure 1 or text



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## **6.6 Stage 6: Conceptual Site Model**

Rather than provide a single general model of the site, either as a drawing, or text, it is preferable to produce more detailed individual models for each area of concern at the installation. For example, a conceptual model of the area around a tank farm, which could indicate the construction of the bund, the direction of slope of the ground, whether fill points are inside or outside the bund, the type of surfacing around the area, and the underlying geology and water table. This information would then be used to suggest where any chemicals may end up, if spilled.

### **6.6.1 Information Required**

Information obtained in stages 3-5 should be used to produce conceptual models of the site, identifying existing and potential sources, their migration, pathways and likely destination. The purpose of this stage is to determine the nature and extent of the strata and groundwater bodies which require characterising in order to describe the initial site condition.

### **6.6.2 Sources of Information**

Stages 3 – 5

### **6.6.3 Example Data Presentation**

Example of CSM's is provided in figure 3

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## 6.7 Stage 7: Site Investigation

Consider the information from stages 1 – 6 above. If there is sufficient information to characterise the site both laterally and vertically and to allow the statement of site condition to be made without further works the applicant may go directly to stage 8. If however only part of the site can be characterised or there is insufficient information on which to make a statement of site condition then additional information should be obtained by site investigation or other means.

### 6.7.1 The Need for an Investigation

It is not possible to provide prescriptive guidance for when site investigations will be necessary or what their content should be as this will need to be determined on a site specific basis, however some general points for consideration are provided below.

A site investigation is likely to be necessary where:

- the desk study has produced insufficient information to satisfy the requirements of Schedule 4, Part 1, paragraph 1 (1)(d) and 1(2)
- there is a direct discharge to ground or groundwater (see also Appendix 4)
- site specific data is required to enable SEPA to determine the permit and/or set permit conditions
- historic and potential future emission points for a particular substance are coincident

A site investigation may not be necessary where:

- there is sufficient data from the desk study to satisfy the requirements of Schedule 4, Part 1, paragraph 1 (1)(d) and 1(2) and no further data is required to enable SEPA to determine the permit and/or to set permit conditions
- the installation is a greenfield development and the substances to be handled are not likely to be naturally occurring
- historic contamination differs from substances to be handled at the installation
- historic contamination is the same as substances to be handled but historic and potential future emission points are not coincident and migration paths do not cross

Where an application has been received and includes an initial site report, but SEPA considers that a site investigation is required to provide information necessary for the purposes of determining whether or not to grant the permit application and/or the conditions to be included in the permit, SEPA may serve a notice under Schedule 4(4) requiring that information to be obtained and submitted.

### 6.7.2 Requirements of an Investigation

The specific requirements of an investigation should follow on logically from the desk study information collected in stages 1 to 6. ***It is important to recognise that the site investigation differs in purpose to an assessment of historically contaminated***

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***land in that it seeks to characterise the ground and groundwater only for those substances associate with the PPC installation, it is not a risk assessment nor is it an assessment of whether the site is “suitable for use”.***

The nature, extent and purpose of the site investigation should be planned prior to being undertaken, and this should be reviewed and amended, as necessary, as the investigation proceeds, this is particularly important where conditions encountered differ from those anticipated.

Every exploratory hole and sample should have a purpose and the depth, strata and groundwater bodies to be investigated should reflect both the ground conditions at the site and the migration characteristics of the substances of interest as described by stage 6 e.g. there is no point stopping at the groundwater surface if the substances are heavier than water (DNAPLs (Dense Non-Aqueous Phase Liquids)) and the strata very sandy.

To ensure the investigation delivers the information required it is good practice to develop of schedule of investigation requirements and have a copy on site during the works to ensure the objectives are being met. An example of the type of information which might be included in this schedule is shown in table 6.4 below. Note from this table a large number of samples are being taken whilst the excavation is open but not all will be tested.

Typical exploratory hole locations may be: at known potential emission points, especially where these coincide with potential historic emissions; down gradient of historic emission points to check for migration and; confirmatory samples in suspected “clean” areas to confirm assumptions.

It is not always necessary to investigate every potential emission point. Where appropriate, the site could be zoned into areas of like characteristics and an investigation undertaken to represent the conditions of the zone. For example, at a chemical plant there may be a number of bunded compounds containing sulphuric acid tanks, if there is no reason to believe the conditions at each of these bunded compounds should differ it may be sufficient to investigate one or two thoroughly and use this data as indicative of the conditions at the others. If however it was known that one of the compounds had previously had an incident which may have resulted in emissions to ground or groundwater this should be investigated separately to the rest of the compounds to determine the specific conditions present.

Where investigation is not practical at a particular emission point consideration should be given to obtaining samples in the general vicinity to provide an indication of the condition near the emission point or down gradient of the emission point to assess migration. Examples of such instances may be where investigation would: breach the integrity of containment measures, damage underground services, be a health and safety risk, cause unnecessary disruption to the safe operation of the installation/mobile plant. Consideration should also be given to obtaining additional data during plant maintenance, shut down periods etc, further guidance on this is provided in section 7.0.

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Effects of emissions to drains, water courses, ponds etc should also be considered, however before sampling is undertaken the value of this information in terms of establishing the initial site condition should be assessed.

In the case of drains consideration should be given to the need for a CCTV survey, as the integrity is particularly important where the drains are stated to be a defence against substances entering the ground or groundwater. If breaches in the drains are found intrusive investigation should be considered in the vicinity of the breach alternatively samples of surrounding soil could be taken during repair of the system.

For water courses a single water sample up and down stream of an emission point is fairly meaningless in terms of determining the initial site condition, however if regular monitoring is to be undertaken throughout the life of the installation it is more appropriate. If regular water monitoring is not to be undertaken then a better measure of the potential for emissions to have occurred may be obtained from sampling bed sediment or sediment within discharge pipes. The value of this information will however depend on a number of factors including the substance of interest, how regularly the discharge pipe is cleaned, whether bed sediment is excavated periodically to maintain flow, the flow rate and energy of the water course etc.

Ponds being more static are likely to give more reliable data both in terms of water quality and sediment quality however these too can be very variable depending on where and how the substance may have entered, careful consideration should therefore be given to the type of samples required and the interpretation of the data produced.

### 6.7.3 Chemical Analysis

In terms of chemical analysis, the only substances of interest are those which may be emitted by the installation/mobile plant during its operation under the PPC permit and, where appropriate, any daughter products. Other substances which may be present as a result of historic activities but will not be used at the installation/mobile plant are not relevant to the site report, even though they may be of interest to the applicant. By restricting analysis to only those substances of interest rather than the usual generic "land contamination" suites only relevant information is provided therefore saving unnecessary cost. In addition, the substances of interest may vary from sampling point to sampling point, therefore it may be more cost effective to vary the analytical suite accordingly rather than applying a single analytical suite to all samples.

Where a large number of similar substances are used, screening analysis for specific chemical groups or marker substances may be more appropriate than analysis for every individual substance. Where screening identifies positive results, substance specific testing may then be appropriate. Similarly for complex mixtures, marker substances may be more appropriate than analysing all individual components.

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However careful consideration should be given to the selection of screening techniques or marker substances and in particular, the value of the results produced in terms of establishing the initial site condition e.g. a solvent extractable matter result is unlikely to be specific enough to adequately quantify the site condition in terms of organic contamination but may be useful to indicate where more specific analysis should be undertaken.

Where these approaches are adopted the site report should clearly state the logic for the choice of chemical group or marker substance, justify that selection and provide an interpretation of the results in the context of the site.

Guidance on the selection of appropriate investigation techniques, single or multiphase investigations, sampling and chemical analysis and the level of confidence achieved by these is beyond the scope of this guidance however appropriate references are included in the reference section at the end of this document.

#### 6.7.4 Sources of Information

- Stages 1 – 6
- See also references

#### 6.7.5 Example Data Presentation

**Table 6.4 Planning the Investigation**

<b>EH No</b>	<b>Reason</b>	<b>Depth</b>	<b>Samples</b>	<b>Analysis</b>
BH 1	Historically unbunded diesel tank with known leak. Investigating to see if residual contamination present. hexane tank 20 m upgradient no recorded emissions, but check for hexane. Also use to obtain background for other substances, e.g, methanol	Approx 3m (boulder clay should be encountered at approx 2.5m – if not extend BH accordingly).	0.2m (below concrete), 0.5, 1.0, 1.5, 2.0 and 3.0m Or as dictated by soils, visual evidence of contamination or odours. Water if present. Note: - determine samples to be analysed once logs for this and adjacent exploratory holes reviewed.	3 soil samples 1 water sample Petroleum hydrocarbons,, VOCs (volatile organic compounds)...
Notes: EH = Exploratory hole BH = Borehole				

Investigation and sampling methodologies, exploratory hole logs, results of chemical analyses, laboratory methods and detection limits should all be included as appendices

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so that comparable methods can be employed at permit surrender to ensure consistency between data sets.

Examples of presentation of the results of the investigation are included under Stage 8 below.

## 6.8 Stage 8: Statement of Site Condition

The purpose of this stage is to draw together (not reproduce) all of the information collected in stages 1 – 7 to produce a **simple** statement or statements of the site condition which identifies substances in, or on the land” (Sch 4, Part 1, paragraph 1(2)). Where potentially polluting substances are likely to be present the statement of site conditions should identify which strata or groundwater body they are associated with and describes their concentration, nature and extent. Providing a clear statement of which substances are not present is just as important as identifying those which are.

In general, measured data will provide the best indication of actual site conditions, however it is recognised that full characterisation of sites may be impractical due to physical constraints and even where there are no constraints full characterisation may be prohibitively expensive. The statement of site condition is therefore more likely to represent a combination of measured data and inferred/extrapolated data. Where the site is not fully characterised by chemical analysis it is important to explain what the test results mean in terms of the site i.e. do they represent a hot spot level at an emission point, the general ground condition in the vicinity of emissions or background levels on the site. In addition, interpretive and extrapolated text should expand on the data to indicate, for example, whether more elevated conditions may be anticipated closer to the source, whether a plume would be expected to extend downgradient of a specific result etc. Any such interpretation should be justified and should always be site specific.

To convey the data in it's simplest form it is likely that the “statement of site condition” will comprise a mixture of annotated site plans, tables and relevant supporting text.

In all cases the statement of site condition should be clear, any assumptions made should be justified and the degree of confidence in the statement should be expressed.

Statistical interpretation of the data set should only be undertaken where the data set is sufficiently large and was collected in a manner which is suitable to interpretation in this manner. Targeted “hotspot” investigations should not be interpreted statistically.

**Note it is a statement of site condition which is required and not a risk assessment or an assessment of whether the site is “suitable for use”, these are not of concern in respect of the requirements of the initial site condition report.**

### 6.8.1 Sources of Information

Stages 1 – 7

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### 6.8.2 Example Data Presentation

Figure 4 together with supporting text.

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## 7.0 AFTER INITIAL SITE REPORT/DURING OPERATION

Once the application has been accepted and a permit issued it is easy to forget about the site condition until surrender. However a considerable amount of useful information could be collected during the operation of the installation which could be used to:

- i. further refine or enhance the description of the initial site condition, especially where data is obtained in the first few years following granting of the PPC permit.
- ii. provide the details required for the final site condition report, thereby reducing uncertainty regarding the site condition and the scale of the works required at surrender
- iii. gain additional information which demonstrates on an on-going basis that the installation is in a satisfactory state

The following section provides an indication of the type of information which could be collected during the life of the site and how it may be used at surrender (see also section 8.0 below for information likely to be included in the final site condition report). Note some of the data suggested below may be required by the Regulations or the permit, others will be purely voluntary.

The types of activities which may provide useful information/data are:

- During any works which require the ground to be excavated and/or exposed e.g. construction of new buildings or extensions, replacing drains, repairing hardstanding, repairing machine pits etc, take the opportunity to obtain samples of the ground below the structures and have them analysed for the relevant substances to determine chemical content.
- If there are spills, leaks, drips, incidents etc keep a record of what was spilled, how much, where the spill extended to on the site surface, whether the substance entered the drains or is likely to have entered the ground, what immediate containment measures were put in place, what subsequent remediation was undertaken, how much was recovered and an indication of residual risk. If necessary long term monitoring should be undertaken to demonstrate the conditions present.
- Where materials are excavated to remove spills etc take samples of the sides and base of the excavation prior to backfilling to demonstrate the residual concentrations of the substances present or confirm that it has all been removed.
- Where on site treatment of materials is undertaken the remediated material should be proof tested upon completion of remedial works to demonstrate the residual concentrations.
- Where a change in raw materials etc. is planned undertake a risk assessment of the new material to determine the likely pollution potential and also assess the likelihood of the substance already being present on the site. If it is likely to already be present



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consideration should be given to determining the current condition prior to introduction to avoid ambiguity at the surrender stage.

- Keep records of any changes to the process, materials handled, incidents etc
- Keep records of adjacent land uses which may handle the same substances especially where they may migrate onto the installation. This is especially important where a land use comes and goes within the life of the permit since there would be no recollection of it at surrender and no mention of it at the original application.

With the exception of incident/accident investigation, samples taken early on in the life of the PPC permit are likely to represent initial conditions. Successive samples taken later may be used along with site records to confirm no emissions have occurred, or may demonstrate emissions are occurring from the installation. In the latter case the applicant may wish to review the site practices to ensure continued pollution does not arise and may consider remediation if appropriate.

Operators may find it useful to build up copies of such records, drawings, reports in a separate file during the lifetime of the permit, and summarise them periodically, so that they are then readily available for production of the final site report (See Sections 8 and 9).

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## 8.0 OUTLINE OF FINAL SITE REPORT

The purpose of the final site condition report is to describe the condition of the site at the time of application for surrender of the permit and in particular it should demonstrate that there is no pollution risk attributable to the permitted activity and that the site is in a satisfactory state. The final site condition report should be produced after any remedial works have been completed. It should be noted that the purpose of the final site report is not to provide detailed information on any such remedial works, but should include the outcome of the works in respect of the final site condition.

Table 8.1 provides a summary of the main stages to be undertaken to produce a final site condition report. Further details of the information required by each stage are included in section 9 together with suggested sources for the information and examples of how it may be presented.

Following consideration of this guidance, applicants may wish to contact SEPA to discuss the site and the requirements for the site condition report prior to commencing any works (end of stage 2), and to discuss the nature and extent of any remedial works proposed. Discussion may also be helpful at the end of stage 4 to ensure there are no issues omitted which SEPA would require to be addressed.

**Table 8.1 Main Stages of the Final Site Condition Report**

Stage	Activity	Objectives and Relevant Section of Legislation
1.	Identify changes to the site since the initial site condition report which may have resulted in a change in the pollution risk e.g. changes to the process, substances handled etc	Determine whether there are additional potential pollution risks to those identified in the initial site condition report  <i>(Reg 12 and 13 and relevant permit conditions)</i>
2.	Review site records etc and undertake site inspection to demonstrate integrity of containment systems and identify locations where emissions have/may have occurred  <i>Undertake remedial works (if required)</i>	Identify potential emission points  <i>(Reg 15 (3)(c))</i>
3.	For each emission identify what investigation and remedial action has been undertaken	Demonstrate emissions have been remediated  <i>(Reg 15 (3)(d))</i>
4.	Identify the current (post remediation) condition of the site. Demonstrate there is no pollution risk attributable to the permitted activity and that the site is in a satisfactory state.	Statement of site condition  <i>(Reg 15 (3)(c) and)(d))</i>

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## 9.0 DETAILED CONTENT OF FINAL SITE CONDITION REPORT

Some pointers for a good site condition report:

- Keep it simple
- Make it relevant
- Focus on the substances associated with the installation
- Provided justification for your assumptions, decisions etc
- Undertake remediation PRIOR to applying to surrender permit
- Provide a clear statement of site condition

The following section provides an indication of the type of detail required in each of the above stages, indicates possible sources for that information and suggests methods of presenting the data.

### 9.1 Stage 1: Identify Changes to the Process, Substances Handled etc Under PPC, and Confirm Emission Points Statement of Site Condition

#### 9.1.1 Information required

The initial site condition report will have identified potential pollution risks at the installation (see Section 6, Stage 3). The first stage of the final site condition report is to determine whether these are still correct or whether changes to the process, substances handled, their storage, use, disposal, etc, may have introduced new pollution risks or removed previously identified risks.

To identify any changes:

- compare a list of substances handled at surrender with those handled at the time of application to operate under PPC, this should include: substances handled, volume, storage, containment, usage and abatement methods etc.
- compare the current process to the initial process to determine whether there have been any changes to it or to the operational practices and
- consider general changes to the installation such as replacement of drains, installation of hardstandings, bunds, etc. In each case consider why the change was made (i.e. following an incident or to prevent an incident) and the potential effect of it in terms of pollution risk.
- Consideration should also be given to any changes (substances, processes, etc) which may have been made since granting of the permit but are no longer present at the time of surrender.

It is likely that any changes will already have been notified to the regulator under Reg 12 or 13 or as a result of site specific permit conditions.

Examples of the types of things which should be considered are:

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- Changes in substances handled
- Significant changes in the quantity of substances handled
- Changes in the method or location of substance storage, containment, handling or use
- Changes to the process, addition of new processes or extension to the plant
- Changes to drainage system, effluent treatment plant etc
- Changes to ground surfacing

Note: as described in section 7.0 it is easier to collect and collate this information as an on going exercise during the operation of the site rather than trying to recall the details at the time of permit surrender.

### 9.1.2 Sources of Information

- Initial site condition report
- Site records
- Visual site inspection

### 9.1.3 Example Data Presentation

**Table 9.1 Changes and potential risks**

Note: PPR = Potential Pollution Risk; ISCR = Initial Site Condition Report

<b>Substance / Process</b>	<b>Changes During Operation</b>	<b>Comments</b>	<b>PPR ISCR</b>	<b>PPR Prior to surrender</b>
Heavy Fuel Oil	<p><b>Change:</b> Bund constructed around fuel oil tank and fill point in January 2004</p> <p><b>Reason:</b> Required by improvement notice to comply with BAT</p> <p><b>Risk:</b> Potential drips prior to bund installation particularly at fill point, but should not differ from initial site condition since bund constructed within 4 months.</p> <p><b>Change:</b> Sealed inside of bund March 2013</p> <p><b>Reason:</b> Reduce the risk of seepages through bund walls and floor.</p> <p><b>Risk:</b> Low as no visible emissions were identified during inspections.</p>	<p>Used throughout Permit period.</p> <p>Some minor drips may have occurred prior to Jan 2004, insufficient to represent pollution risk.</p> <p>Bund constructed to current BS and annual maintenance check undertaken, records inspected, no reason to suspect emissions.</p> <p>No known spills, incidents, accidents during operation under PPC</p>	Yes	No

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Methanol	<b>Change:</b> Doubled quantity of methanol handled, May 2010 <b>Reason:</b> Increase in production <b>Risk:</b> No change to pollution risk since materials stored, handled and contained in same manner.	Used throughout Permit period, Quantity doubled, Risk unchanged from initial site condition report. One small incident in 2018, when a burst pipe resulted in a release to the bund, some overspraying of methanol may have occurred, but should have evaporated. Area investigated to confirm current condition (see results to SI)	Yes	Yes
Effluent (various substances)	<b>Change:</b> Replace section of drain between manhole s7 and s10, February 2006. <b>Reason:</b> General maintenance following blockage and discovery of crack in pipe	Potential for effluent to have entered ground in 3 months since previous inspection. Once repairs effected no further pollution risk. Area investigated to confirm current condition (see results to SI)	No	Yes

## 9.2 Stage 2: Demonstrate Integrity of Containment and Identify Emissions

### 9.2.1 Information Required

For each substance which has a potential pollution risk produce a list of the potential emission points and determine the likelihood of emissions having occurred during operation under PPC.

Emissions may have occurred in a number of ways:

- Major incidents, accidents or events which cause a large release of substances e.g rupture of a tank or pipeline
- Smaller incidents accidents or events releasing small amounts or substances e.g. a burst drum
- Regular, seemingly insignificant, emissions which accumulate over time to form a significant pollution event e.g a few drips of oil at a fuel filling point during each delivery.

In determining whether or not an emission has occurred reference should be made to the site records e.g. maintenance documents, records of plant and equipment testing, etc, undertaken to demonstrate the integrity of the systems in place to prevent emissions during the operational life of the site. Where the records demonstrate maintenance was required a description of what was undertaken, when and what potential there was for an emission to occur both during maintenance and prior to the defect being identified should be provided.

In addition, the general operational practices at the site should be considered to determine whether other emissions may have occurred at points not previously identified e.g. a drum falling off a fork lift truck during transportation around the site.

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Anecdotal information from employees on potential for routine emissions or incidents and accidents can also be valuable in determining the potential for emissions to have occurred during the life of the permit.

### 9.2.2 Sources of Information

- Site walk over
- Site records – accident book, integrity testing, pressure tests, maintenance records etc
- Anecdotal information
- Long term monitoring data

### 9.2.3 Example Data Presentation

This information can be included in the comments section of Table 9.1 in stage 1 or a separate table, columns added to record specific details such as volume spilled, amount recovered etc. In addition, the location of any spills, etc could be recorded on a site plan.

Before proceeding to Stage 3 the applicant may wish to speak to SEPA to discuss the findings and the proposed further works and to check there are no specific issues not identified which SEPA would wish to see covered.

## 9.3 Stage 3: Site Investigation and Remedial Actions Undertaken

### 9.3.1 Information Required

Any remediation necessary to remove pollution risk and return the site to a satisfactory state must be undertaken prior to submission of the application to surrender.

The final site condition report should include a brief resume of any site investigation works undertaken, of the areas where pollution was identified and the remedial measures undertaken. Full details should be provided of the proof testing undertaken and final site condition following remediation. However, it is recognised that in practice operators are likely to consult the guidance at the time they are preparing their application to surrender a permit and therefore, some general guidance on the requirements for site investigation are provided below. It is stressed however that this investigation and any remedial works must be complete before the application for surrender is submitted.

Where an emission is known to have, or is likely to have, occurred it is likely that a site investigation will usually be necessary to determine the nature and extent of the emission and to establish whether it represents a pollution risk or would result in the site not being in a satisfactory state. If a change in condition is confirmed then remediation and confirmatory testing will need to be undertaken to demonstrate that any pollution risk

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has been removed and the site is in a satisfactory state prior to submitting the final site condition report.

If an emission occurred during operation and was remediated at that time documentary evidence of the remedial work undertaken and confirmation of the residual levels of the substance will be required to demonstrate that any pollution risk has been removed and the site is in a satisfactory state.

Any site investigation should be properly planned prior to implementation, it is unlikely to be simply a repeat of the works undertaken for the initial site condition report. The investigation should seek to identify pollution, determine its nature and extent and provide sufficient information to allow any remediation necessary to be designed. It may also be prudent to investigate areas expected to be "clean" to confirm these expectations. The site investigation design should be prescriptive in that it should specify where exploratory holes should be located, which horizons need to be sampled and what testing needs to be undertaken, but at the same time it should be flexible in that if actual condition encountered on site differ from those anticipated the investigation can be amended.

As described in section 6, stage 7 where a number of similar operations have been undertaken and the same conditions are anticipated for each it may not be necessary to investigate every potential emission point. The site could be zoned according to like characteristics and one or two of the operations investigated thoroughly and the conditions applied to the remainder of the zone. If however it was known that one of the operations had previously had an incident making it different to the rest of the zone this should be investigated separately to determine the specific conditions present.

On sites where the drains are identified as being one of the mechanisms preventing effluents, spillages etc entering the ground the integrity of the drains should be confirmed to demonstrate they have provided adequate containment.

In all cases chemical analysis should concentrate only on substances and possible daughter products associated with the operation of the installation under the permit. Where a large number of similar substances are used screening analysis for chemical groups or marker substances may be more appropriate than analysis for every individual substance. Where positive results are identified substance specific testing may then be appropriate. Similarly for complex mixtures marker substances may be more appropriate than analysing all individual components. Where these approaches are adopted the site condition report should clearly state the logic for the choice of chemical group or marker substance and justify that selection.

Remediation technology is beyond the scope of this guidance however references are provided at the end of this document. You should also be aware that remediation may itself be subject to control under other legislation and may require licensing prior to being undertaken. Further guidance can be found in the SEPA publication Licensing the Remediation of Contaminated Land.

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### 9.3.2 Sources of Information

- Site Investigation and Remediation reports
- Site records
- Waste transfer notes/duty of care records
- Anecdotal information

### 9.3.3 Example of Data Presentation

Data will be presented on a site specific basis and may comprise a mixture of tables, diagrams and text.

## 9.4 Stage 4: Statement of Site Condition

### 9.4.1 Information required

This stage should draw together the information collated for stages 1–3 and should provide a clear statement that demonstrates that there is no pollution risk resulting from the operation of the permitted installation, or that any such risk has been remediated and that the site is in a satisfactory state.

If a change in condition is identified which is not remediated then justification for leaving the pollution in situ must be provided. An example of where this may arise is where pollution can be clearly demonstrated to have entered the site from an off site source and has not resulted from the operation of the installation.

Regulation 15(4) states that SEPA must be "...satisfied, in relation to the site report, that such steps (if any) as are appropriate to avoid any pollution risk resulting from the operation of the Part A Installation or Part A mobile plant and to return the site to a satisfactory state have been taken" If the site condition report does not allow SEPA to be satisfied in this respect then it must reject the application for surrender stating the reasons.

### 9.4.2 Sources of Information

Stages 1 – 3

### 9.4.3 Example Data Presentation

Data presentation is likely to comprise a combination of:

A written statement of final site condition;  
Plan(s) showing final site condition in terms of chemical test data etc  
and relevant information to support or justify the statement that there is no pollution risk and the site is in a satisfactory state.



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## 10.0 GLOSSARY

### Acronyms and Abbreviations

BGS	British Geological Survey
BH	Borehole
CCTV	Closed Circuit Television
DNAPLs	Dense Non Aqueous Phase Liquids
PPC	Pollution Prevention and Control
PPR	Potential Pollution Risk
Reg(s)	Regulation(s)
SEPA	Scottish Environment Protection Agency
Sch	Schedule

### Terms

Listed Activity	Activities as described in Sch 1 to the PPC Regs
Directly associated activity	See definition for installation below.

### Regulation

Emission	<p>“emission” means</p> <p>(a) in relation to Part A installations, the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in an installation into the air, water or land;</p> <p>(b) in relation to Part B installations, the direct release of substances or heat from individual or diffuse sources in an installation into the air;</p> <p>(c) in relation to Part A mobile plant, the direct or indirect release of substances, vibrations, heat or noise from the mobile plant into the air, water or land;</p>
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installation	<p>(d) in relation to Part B mobile plant, the direct release of substances or heat from the mobile plant into the air,</p> <p>and references to emissions in the definitions of “emission limit value”, “pollution” and “pollutant” shall be construed accordingly for the purpose of the application of those definitions in relation to Part A and Part B installations and Part A and B mobile plant; “installation” means</p> <p>(a) a stationary technical unit where one or more activities listed in Part 1 of Schedule 1 are carried out; and</p> <p>(b) any other location on the same site where any other directly associated activities are carried out which have a technical connection with the activities carried out in the stationary technical unit and which could have an effect on pollution,</p>
pollution	<p>and, other than in Schedule 3, references to an installation include references to part of an installation;</p> <p>“pollution” means emissions as a result of human activity which may be harmful to human health or the quality of the environment, cause offence to any human senses, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment; and</p>
Pollutant	<p>“pollutant” means any substance, vibration, heat or noise released as a result of such an emission which may have such an effect;</p>
Specified waste management activity	<p>“specified waste management activity” means any one of the following activities:-</p> <p>(a) the disposal of waste in a landfill, whether or not the disposal falls within Section 5.2 of Part 1 of Schedule 1;</p> <p>(b) the disposal of waste falling within Section 5.3 of that Part of that Schedule;</p> <p>(c) the recovery of waste falling within paragraphs (c)(i), (v), (vi) or (vii) of Part A of Section 5.4 of that Part of that Schedule.</p>

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Substance

“substance” includes any chemical element and its compounds and any biological entity or micro-organism, with the exception of radioactive substances within the meaning of Council Directive 80/836/Euratom[3], genetically modified micro-organisms within the meaning of Council Directive 90/219/EEC[4] and genetically modified organisms within the meaning of Council Directive 90/220/EEC[5];

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## 11.0 LIST OF REFERENCES

TECHNICAL REFERENCE	REFERENCE SUBJECT
<b>Desk Study:</b>	
Environment Agency Technical Guidance Note IPPC H7: Application Site Report & Site Protection and Monitoring programme	Useful technical guidance, but note that not all sections applicable to installations in Scotland: SEPA expect all information to be included in the application, not a phased SI after application submission
DETR: Trade Industry Profiles (set of 47, various dates)	Provides useful information on the typical range of contaminants which could be anticipated from a range of past industrial uses.
DETR: Guidance on Preliminary Site Inspection of Contaminated Land (CLR No.2, 1994)	Provides information on a range of features indicative of contamination which should be considered during a walkover survey.
BGS Hydrogeology of Scotland (1990) and associated Hydrogeology of Scotland map (1988)	Provides a useful guide to aquifers and general hydrogeological conditions in Scotland.
BGS Groundwater Vulnerability, Drift Deposit and Solid Geology maps	Provides an indication of geological conditions.
DETR: Documentary Research on Industrial Sites (CLR. No. 3, 1994)	Provides guidance on desk study research of industrial sites.
Croner Substances Hazardous to the Environment	Provides details of chemical characteristics and toxicology.
Croner Substances Hazardous to Health	Provides details of chemical characteristics and toxicology.
The CRC Handbook of Chemical and Physics (CRC Press)	Provides details of chemical characteristics and toxicology.
Merck Research Labs: The Merck Index – An Encyclopedia of Chemicals, Drugs, and Biologicals 12 <sup>th</sup> Ed (1996)	Provides details of chemical characteristics and toxicology.
NEY R.E. Fate and Transport of Organic Chemicals in the Environment: A Practical Guide. (Gov Institutes, Maryland 3 <sup>rd</sup> Ed 1998)	
<b>Site Investigation:</b>	
DETR: Sampling Strategies for Contaminated Land	Discusses the strengths and limitations of a number of sampling strategies.
Environment Agency: Development of Appropriate Soil Sampling Strategies for Land Contamination (2001)	Provides guidance on soil sampling strategies
Scottish Enterprise: How to Investigate Contaminated Land (1994, 1998 reprint)	Provides a good general guide to the assessment of contaminated land.
CIRIA: A Guide to Safe Working on	Provides useful background to key health

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<b>TECHNICAL REFERENCE</b>	<b>REFERENCE SUBJECT</b>
Contaminated Sites (1996)	and safety issues.
BS 5930 (1999), Code of Practice for Site Investigations	Guidance on intrusive site investigation work including standard soil descriptions.
BS 10175 (2001), Code of Practice for the Investigation of Potentially Contaminated Sites	A useful guide to the selection of appropriate sampling techniques.
<b>Analytical Work:</b>	
Scottish Enterprise: How to Investigate Contaminated Land (1994, 1998 reprint)	Includes guidance on laboratory sample handling and quality assurance procedures.
<b>Appointment of Contractors:</b>	
Scottish Enterprise: How to Approach Contaminated Land (1988)	Provides guidance on the appointment and management of contractors/consultants.
DETR: A Quality Approach to Contaminated Land Consultancy (1997)	Guidance on quality issues and procurement of consultants.
<b>Site Closure:</b>	
Environment Agency Technical Guidance Note IPPC H8: Surrender Site Report	Useful technical guidance, but note that not all sections applicable to installations in Scotland
Department of the Environment Waste Management Papers	Guidance on landfill completion and monitoring.
Remedial Treatment for Contaminated Land, Volume II: Decommissioning, decontamination and demolition. CIRIA SP102, 1995	Guidance on pollution risk on closure, decommissioning and decontamination, post closure site survey procedures
Environment Agency: Remedial Treatment Datasheets (2002)	Technical information on remedial options and techniques
Licensing the Remediation of Contaminated Land – SEPA	Regulatory controls applicable to remediation activities

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## APPENDIX 1: LEGISLATIVE ISSUES AND INTERACTION BETWEEN LEGISLATION

### A1.1 Relevant Clauses of the PPC Regulations

#### Regulation 2

2. - (1) In these Regulations-

"the 2003 Regulations" means the Landfill (Scotland) Regulations 2003;

"change in operation" means, in relation to an installation or mobile plant, a change in the nature or functioning or an extension of the installation or mobile plant which may have consequences for the environment; and

"substantial change in operation" means, in relation to an installation or mobile plant, a change in operation which, in the opinion of SEPA, may have significant negative effects on human beings or the environment or which in itself constitutes the carrying out of an activity falling within Schedule 1 exceeding any threshold capacity therein, and shall include (except in relation to Part 1 of Schedule 3)-

- (i) in relation to a small SED installation which does not fall wholly within the scope of the IPPC Directive, a change of the nominal capacity leading to an increase of emissions of volatile organic compounds of more than 25 percent;
- (ii) in relation to all other SED installations which do not fall wholly within the scope of the IPPC Directive, a change of the nominal capacity leading to an increase of emissions of volatile organic compounds of more than 10 percent;

"directly associated activity" means-

- (i) in relation to an activity carried out in a stationary technical unit and falling within any description in any section of Chapters 1 to 6 of Part 1 of Schedule 1, any directly associated activity which has a technical connection with the activity carried out in the stationary technical unit and which could have an effect on pollution, and
- (ii) in relation to an SED activity, any directly associated activity which has a technical connection with the SED activity carried out on the same site and which could have an effect on any discharge of volatile organic compounds into the environment;

"emission" means-

- (a) in relation to Part A installations, the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in an installation into the air, water or land;
- (b) in relation to Part B installations, the direct release of substances or heat from individual or diffuse sources in an installation into the air;

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(c) in relation to Part A mobile plant, the direct or indirect release of substances, vibrations, heat or noise from the mobile plant into the air, water or land;

(d) in relation to Part B mobile plant, the direct release of substances or heat from the mobile plant into the air,  
and references to emissions in the definitions of "emission limit value", "pollution" and "pollutant" shall  
be construed accordingly for the purpose of the application of those definitions in relation to Part A and Part B installations and Part A and B mobile plant;

"emission limit value" means the mass, expressed in terms of specific parameters, concentration or level  
of an emission, which may not be exceeded during one or more periods of time;

"enforcement notice" has the meaning given by regulation 19(1);

"general binding rules" has the meaning given by regulation 10(1);

"hazardous waste", unless the context otherwise requires, means any waste which is special waste to  
which the Special Waste Regulations 1996 apply;

"installation" means (except where used in the term SED installation)-

(a) a stationary technical unit where one or more activities listed in Part 1 of Schedule 1 are carried out; and

(b) any other location on the same site where any other directly associated activities are carried out;

and, other than in Schedule 3, references to an installation include references to part of an installation;

"the IPPC Directive" means Council Directive 96/61/EC concerning integrated pollution prevention and control"

"landfill" means a landfill to which the Landfill (Scotland) Regulations 2003 apply;

"mobile plant" means plant which is designed to move or to be moved whether on roads or otherwise  
and which is used to carry out one or more activities listed in any section of Chapters 1 to 6 of Part 1 of Schedule 1;

"new SED installation" and "existing SED installation" shall be interpreted in accordance with Schedule 3;

"off-site condition" has the meaning given by regulation 9(13);

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"organic compound" means any compound containing at least the element carbon and one or more of hydrogen, halogens, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates;

"operator", subject to paragraph (2), means, in relation to an installation or mobile plant, the person who has control over its operation;

"Part A installation", "Part B installation", "Part A mobile plant" and "Part B mobile plant" shall be interpreted in accordance with Part 3 of Schedule 1;

"permit" means a permit granted under regulation 7;

"pollution" means emissions as a result of human activity which may be harmful to human health or the quality of the environment, cause offence to any human senses, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment; and "pollutant" means any substance, vibration, heat or noise released as a result of such an emission which may have such an effect;

"reduction scheme" means a reduction scheme which complies with Annex IIB of the Solvent Emissions Directive;

"the relevant date" has the meaning given by regulation 1(1) of the 2003 Regulations;

"revocation notice" has the meaning given by regulation 17;

"SED activity" means any activity falling within the section in Chapter 7 of Part 1 of Schedule 1 where operated above the solvent consumption thresholds specified for that activity as set out in that section of that Chapter;

"SED installation" means-

- (i) a stationary technical unit where one or more SED activities are carried out; and
- (ii) any other location on the same site where any other directly associated activities are carried out;

"small SED installation" means an SED installation which falls within the lower threshold band of items 1, 3, 4, 5, 8, 10, 13, 16 or 17 of Annex IIA to the Solvent Emissions Directive or, for the other activities of Annex IIA, which have a solvent consumption of less than 10 tonnes/year;

"the Solvent Emissions Directive" means Council Directive 1999/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations;

"SEPA" means the Scottish Environment Protection Agency;

"specified waste management activity" means any one of the following activities:-

- (a) the disposal of waste in a landfill, whether or not the disposal falls within Section 5.2 of Part 1 of Schedule 1;



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(b) the disposal of waste falling within Section 5.3 of that Part of that Schedule;

(c) the recovery of waste falling within paragraphs (c)(i), (v), (vi) or (vii) of Part A of Section 5.4 of that Part of that Schedule;

"substance" includes any chemical element and its compounds and any biological entity or micro-organism, with the exception of radioactive substances within the meaning of Council Directive 80/836/Euratom[3], genetically modified micro-organisms within the meaning of Council Directive 90/219/EEC[4] and genetically modified organisms within the meaning of Council Directive 90/220/EEC[5];

"suspension notice" has the meaning given by regulation 20;

"the Waste Directive" means Council Directive 75/442/EEC on waste;

"variation notice" has the meaning given by regulation 13

"volatile organic compound" means-

- (i) any organic compound having a vapour pressure of 0.01 kPa or more at 293.15K or having a corresponding volatility under the particular conditions of use, or
- (ii) the fraction of creosote which exceeds a vapour pressure of 0.01 kPa at 293.15K;

"waste" means, unless the context otherwise requires, anything that-

- (i) is waste for the purposes of the Waste Directive; and
- (ii) is not excluded from the scope of that Directive by Article 2 of that Directive;

"waste incineration installation" means that part of an installation or mobile plant which includes any of the following activities:-

- (a) the incineration or co-incineration of waste in an incineration or co-incineration plant falling within paragraphs (a), (b), (c), (d) or (e) of Part A of Section 5.1 of Part 1 of Schedule 1; or
- (b) any activity falling within any Section of that Part of that Schedule which is carried out in a co-incineration plant as defined in Section 5.1 of that Part of that Schedule..

(2) For the purposes of these Regulations-

(a) where an installation or mobile plant has not been put into operation, the person who will have control over the operation of the installation or mobile plant when it is put into operation shall be treated as the operator of the installation or mobile plant;

(b) where an installation or mobile plant has ceased to be in operation, the person who holds the permit which applies to the installation or mobile plant shall be treated as the operator of the installation or mobile plant.

(c) where-

- (i) an installation includes a combustion plant as defined in Article 2(7) of Council Directive 2001/80/EC and to which that Directive applies; and

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(ii) the rated thermal input of the combustion plant is extended by 50 megawatts or more,  
the extension shall be treated as a substantial change in operation.

(2A) For the purposes of these Regulations a change in the operation of a waste incineration installation which involves the incineration or co-incineration for the first time of hazardous waste shall be treated as a substantial change in operation, and for the purposes of this paragraph, "co-incineration" and "hazardous waste" shall have the meanings given in Section 5.1 of Part I of Schedule 1.

(3) In these Regulations, a reference to a release into water includes a release into a sewer and a reference to a Council Directive is a reference to that Directive as amended on the date on which these Regulations are made.

(4) Schedule 1 shall have effect and Part 1 of that Schedule shall be interpreted in accordance with the provisions as to interpretation in Part 2 and 3 of that Schedule.

(5) Parts 1 and 2 of Schedule 3 shall have effect and shall be interpreted in accordance with the definition sections in those Parts of that Schedule.

(6) Any reference in these Regulations to a numbered regulation or Schedule is a reference to the regulation or Schedule so numbered in these Regulations and any reference to a numbered paragraph is a reference to the paragraph so numbered in the regulation or the Schedule (or Section or part of the Schedule) of which that paragraph forms part.

## **Regulation 5**

**5.** - (1) SEPA may require any application or type of application made to it under any provision of these Regulations to be made on an application form made available by it, in writing or in an electronic form acceptable to SEPA.

(2) An application form made available by SEPA under paragraph (1) shall specify the information required by it to determine the application, which shall include any information required to be contained in the application by the provision of these Regulations under which the application is made.

(3) Where SEPA makes available an application form under paragraph (1) in relation to the making of applications to it under a provision of these Regulations, any application made to it under that provision shall be made on that form.

(4) Where an application which is required to be accompanied by a fee, map or plan is sent electronically, the fee, map or plan may be sent to SEPA separately from the application but the application shall not be treated as having being received by SEPA until the fee, map or plan has also been received.

(5) An application made under these Regulations may be withdrawn at any time before it is determined.

(6) It shall be the duty of SEPA to follow developments in best available techniques.

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### Regulation 7

7. - (1) 'An application for a permit to operate an installation or mobile plant shall be made to SEPA in accordance with paragraphs 1 to 3 of Part I of Schedule 4 and shall be accompanied by any fee prescribed in respect of the application under section 41 of the Environment Act 1995[7] and paragraphs 4 to 8 of Part I of Schedule 4 shall apply with respect to such applications.

### Regulation 8

8. - (1) When determining the conditions of a permit, SEPA shall take account of the general principles set out in paragraph (2) and, in the case of permits for the operation of a Part A installation or a Part A mobile plant, the additional general principles set out in paragraph (3).

(2) The general principles referred to in paragraph (1) are that installations and mobile plant should be operated in such a way that-

- (a) all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques;
- (b) no significant pollution is caused.

(3) The additional general principles referred to in paragraph (1) in relation to permits for the operation of Part A installations or a Part A mobile plant are that these installations should be operated in such a way that-

- (a) waste production is avoided in accordance with Council Directive 75/442/EEC on waste[9], but where waste is produced, it is recovered or, where that is technically and economically impossible, it is disposed of while avoiding or reducing any impact on the environment;
- (b) energy is used efficiently;
- (c) the necessary measures are taken to prevent accidents and limit their consequences,

and that, upon final cessation of activities, the necessary measures should be taken to avoid any pollution risk and to return the site of the installation or mobile plant to a satisfactory state.

### Regulation 15

15. - (1) Subject to paragraph (1A), this regulation applies where an operator of a Part A installation or Part A mobile plant ceases or intends to cease operating the installation (in whole or in part) or the mobile plant.

(1A) This regulation does not apply in relation to that part of any installation or mobile plant where an activity falling within paragraphs (d) or (e) of Part A of Section 5.1 of Part 1 of Schedule 1 is carried out.

(2) Where this regulation applies, the operator may-

- (a) if that operator has ceased or intends to cease operating all of the installations and mobile plant covered by the permit, apply to SEPA to surrender the whole permit;
- (b) in any other case, apply to SEPA to surrender the permit in so far as it authorises the operation of the installation or mobile plant ("the surrender unit") which that operator has ceased or intends to cease operating (a "partial surrender").

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(3) An application under paragraph (2) shall be accompanied by the permit and any fee prescribed in respect of the application under section 41 of the Environment Act 1995, and shall contain the following information:-

- (a) the operator's telephone number, address and e-mail address (if any) and, if different, any address or e-mail address to which correspondence relating to the application should be sent;
- (b) in the case of a partial surrender, a description of the surrender unit and a map or plan identifying the part of the site used for the operation of the surrender unit (the "identified part of the site");
- (c) a site report describing the condition of the site or the identified part of the site, as the case may be ("the report site"), identifying, in particular, any changes in the condition of the site as described in the site report contained in the application for the permit; and
- (d) a description of any steps that have been taken to avoid any pollution risk on the report site resulting from the operation of the Part A installation or Part A mobile plant or to return it to a satisfactory state.

(4) If SEPA is satisfied, in relation to the report site, that such steps (if any) as are appropriate to avoid any pollution risk resulting from the operation of the Part A installation or Part A mobile plant and to return the site to a satisfactory state have been taken, it shall accept the surrender and give the operator notice of its determination and the permit shall cease to have effect or, in the case of partial surrender, shall cease to have effect to the extent surrendered, on the date specified in the notice of determination.

(5) If, in the case of a partial surrender, SEPA is of the opinion that it is necessary to vary the conditions included in the permit to take account of the surrender, it shall specify the necessary variations in the notice of determination given under paragraph (4) and the variations specified in the notice shall take effect on the date specified in the notice.

(6) If SEPA is not satisfied as mentioned in paragraph (4), it shall give to the operator a notice of its determination stating that the application has been refused.

(7) SEPA shall give notice of its determination of an application under this regulation within the period of 3 months beginning with the date on which it receives the application or within such longer period as it and the operator may agree in writing (or in electronic form).

(8) If SEPA fails to give notice of its determination accepting the surrender or refusing the application within the period allowed by or agreed under paragraph (7), the application shall, if the operator notifies SEPA in writing (or in electronic form acceptable to it) that the operator treats the failure as such, be deemed to have been refused at the end of that period.

(9) SEPA may, by notice to the applicant, require that applicant to furnish such further information specified in the notice, within the period so specified, as it may require for the purpose of determining an application under this regulation;

(10) Where a notice is served on an operator under paragraph (9)-

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(a) for the purpose of calculating the 3 month period mentioned in paragraph (7), no account shall be taken of the period beginning with the date on which notice is served and ending on the date on which the information specified in the notice is furnished; and

(b) where the specified information is not furnished within the period specified, the application shall, if SEPA gives notice to the operator that it treats the failure as such, be deemed to have been withdrawn at the end of that period.

(11) For the purpose of deciding whether a pollution risk results from the operation of a Part A installation or Part A mobile plant for the purpose of this regulation-

(a) where the operation of the installation or plant involved the carrying out of a specified waste management activity, only risks resulting from carrying out that activity after the relevant date for that activity shall be treated as resulting from the operation of the installation or plant;

(b) where the operation of the installation or mobile plant involved the carrying out of other activities, only risks resulting from the carrying out of those other activities after the date on which the permit applying to the installation or mobile plant was granted shall be treated as resulting from the operation of the installation or mobile plant.

(12) The relevant date for a specified waste management activity for the purpose of paragraph (11)(a) is-

(a) where the activity was carried out on the site of the installation or mobile plant under a waste management licence which, by virtue of section 35(11A) of the Environmental Protection Act 1990[10], ceased to have effect in relation to the carrying out of that activity on that site on the granting of the permit applying to the installation or mobile plant, the date on which that waste management licence was granted;

(b) in any other case, the date on which the permit applying to the installation or mobile plant was granted.

(13) In paragraph (12), "waste management licence" has the same meaning as in section 35(12) of the Environmental Protection Act 1990 (and includes a disposal licence which is treated as a site licence by virtue of section 77(2) of that Act).

## **Schedule I, Part I, Chapter 5: Waste Management**

### Section 5.1 Incineration & Co-incineration of waste

Part A (d) The incineration of non-hazardous waste in an incineration plant with a capacity of less than 1 tonne per hour

Part A (e) Unless carried out as part of any other Part A activity, the incineration of hazardous waste in a co-incineration plant.

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## Schedule 4, Part I

1. - (1) An application to SEPA for a permit under regulation 7 shall be in writing (or in electronic form acceptable to it) and, subject to paragraphs 2 and 3, shall contain the following information:-

(a) the name of the applicant, his telephone number, address (including post code) and e-mail address (if any) and, if different, any address or e-mail address to which correspondence relating to the application should be sent and, if the applicant is a body corporate, its registered number, the address of its registered or principal office and, if that body corporate is a subsidiary of a holding company (within the meaning of section 736 of the Companies Act 1985[28]), the name of the ultimate holding company and the address of its registered or principal office;

(b) in the case of an application for a permit to operate an installation or Part A mobile plant, the address of the site of the installation or mobile plant and its national grid reference, a map or plan showing that site and, in the case of an installation, the location of the installation on that site, and the name of any local authority in whose area the site is situated;

(c) in the case of an application for a permit to operate a Part B mobile plant, the name of the local authority in whose area the applicant has his principal place of business and the address of that place of business or, where the operator of the mobile plant has his principal place of business outside of Scotland, the name of the local authority in whose area the plant was first operated or, where the plant has not been operated in Scotland, the local authority in whose area it is intended by the operator that the plant will first be operated;

(d) in the case of an application for a permit to operate a Part A installation or a Part A mobile plant (except for an installation or mobile plant falling within paragraph (d) and (e) of Part A of Section 5.1 of Part 1 of Schedule 1 or an SED activity or part of an SED activity (and any directly associated activities) which does not also fall within any description in any section of Chapters 1 to 6 of Part 1 of Schedule 1 (and any directly associated activities)), a site report containing the information required by sub-paragraph (2);

(e) a description of the installation or mobile plant, the activities listed in Part 1 of Schedule 1 to be carried out in the installation or by means of the mobile plant, and, in the case of an installation, any other directly associated activities to be carried out on the same site as the installation;

(f) the raw and auxiliary materials and other substances and the energy to be used in or generated by the carrying out of the activities referred to in paragraph (e);

(g) the nature, quantities and sources of foreseeable emissions from the installation or mobile plant into each environmental medium, and a description of any foreseeable significant effects of the emissions on the environment and on human health;

(h) the proposed technology and other techniques for preventing or, where that is not practicable, reducing and rendering harmless emissions from the installation or mobile plant;

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(ha) how the best available techniques are applied to the operation of the installation or mobile plant;

(i) the proposed measures to be taken to monitor the emissions;

(j) a description of the measures to be taken for the prevention and recovery of waste generated by the operation of the installation or mobile plant;

(k) a description of any proposed additional measures to be taken to comply with the general principles set out in regulation 8(2);

(l) (i) in the case of an application for a permit to operate a Part A installation, any relevant information obtained or conclusion arrived at in relation to the installation pursuant to articles 5, 6 and 7 of Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment[29]; or

(ii) a safety report within the meaning of Regulation 7 (safety report) of the Control of Major Accident Hazards Regulations 1999;

(m) in the case of an application for a permit to operate an installation or mobile plant covered by general binding rules, a statement as to whether the applicant wishes the aspects of the operation of the installation or mobile plant covered by the requirements in the rules to be subject to those requirements instead of conditions included in the permit pursuant to regulation 9 and 9C;

(n) in the case of an application for a permit that will authorise the carrying out of a specified waste management activity at an installation or by means of mobile plant, any information which the applicant wishes SEPA to take into account when considering whether the applicant is a fit and proper person to carry out that activity;

(na) in the case of an application for a permit for an installation or mobile plant which is the subject of a Climate Change Agreement within the meaning of paragraph 46 of Schedule 6 to the Finance Act 2000, written confirmation that the installation is covered by a Climate Change Agreement and the terms of that agreement in so far as they relate to the installation;

(o) any additional information which the applicant wishes SEPA to take into account in considering the application;

(p) a non-technical summary of the information referred to in the previous sub-paragraphs.

(2) The site report required by paragraph 1(d) shall describe the condition of the site of the installation or Part A mobile plant and shall, in particular, identify any substance in, or on the land .  
”

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## **A1.2 Relationship Between PPC and Part IIA of EPA 1990**

The relationship between the PPC regime and the Contaminated Land regime (Section 78YB of Part IIA of the Environmental Protection Act 1990 as amended by Schedule 10, paragraph 3 of the PPC Regulations) should be noted. If contamination is due to a breach of permit conditions and SEPA can take enforcement action under the permit, then a remediation notice under Part IIA could not be served.

However, if, upon application for surrender, it appeared that there was contamination which was not attributable to breach of conditions, or that there was contamination which was not as a result of the PPC activity, contaminated land remediation notice could be served if the contamination fits the definition of Contaminated land prescribed in s.78 YB of Part IIA of the Environmental Protection Act 1990 (As Amended).

It should be noted that where the PPC activity is the deposit of controlled waste in or on land, Part IIA will not apply at all where the contamination is attributable to that activity and enforcement action may be taken. The difference between waste disposal activities and other activities is therefore that in respect of the latter, the land could potentially be designated as contaminated, but a remediation notice could not be served, whereas in the former, the land could not even be designated as contaminated. In practice it is likely that this difference is unlikely to have great significance.



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### **A1.3 Relationship Between PPC and The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (“CAR”)**

The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) came into force on 1<sup>st</sup> April 2006, and require authorisations for all discharges to groundwater and, surface waters (replacing the Control of Pollution Act 1974), and disposals to land (replacing the Groundwater Regulations 1998). The requirements of the Groundwater Directive (80/68/EEC), which were previously enacted by the Groundwater Regulations, are now fulfilled by CAR.

Under paragraph 21(c)(iii) of Schedule 10 of CAR a permit issued under PPC is deemed to be a CAR authorization , i.e. if discharges and disposals to land are covered by a PPC permit, then there is no requirement for a separate authorisation under CAR.

New PPC permits must include such conditions as are necessary to ensure compliance with the Groundwater Directive. Existing PPC permits will be reviewed, and if necessary, revised to incorporate such conditions.

If however, other activities such as water abstractions, impoundments (dams and weirs) or engineering works in inland waters and wetlands are associated with a PPC installation, then a separate CAR authorisation will be needed. The Water Environment (Controlled Activities) (Scotland) Regulations 2005 came into force on 1<sup>st</sup> April 2006, and require authorisations for all discharges to wetlands, surface waters and groundwaters (replacing the Control of Pollution Act 1974), and disposals to land (replacing the Groundwater Regulations 1998). The requirements of the Groundwater Directive (80/68/EEC), which were previously enacted by the Groundwater Regulations, are now covered by CAR.

Paragraph 21(c)(iii) of Schedule 10 of CAR allow for a permit issued under PPC to be equivalent to an authorization issued under CAR, i.e. if discharges and disposals to land are covered by a PPC permit, then there is no requirement for a separate authorisation under CAR.

New PPC permits must include such conditions which are necessary to ensure compliance with the Groundwater Directive. Existing PPC permits will be reviewed, and if necessary, revised to incorporate such conditions.

If however, other activities such as water abstractions, impoundments (dams and weirs) or engineering works in inland waters and wetlands are associated with a PPC installation, then a separate CAR authorisation will be needed.

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#### **A1.4 Relationship Between PPC and The Landfill Regulations**

The Landfill (Scotland) Regulations 2003 implement the requirements of the Landfill Directive in Scotland.

Certain landfilling activities (as defined in the Landfill Regulations) also fall within the scope of the PPC Regulations (Schedule 1, Chapter 5, Section 5.2, Part A). These installations are required to produce a hydrogeological risk assessment. This hydrogeological assessment is required to demonstrate compliance with the Landfill Directive and the Groundwater Directive, and it effectively includes all of the information required in a site report. It must include a conceptual site model and a hydrogeological risk assessment, and propose control and trigger levels for groundwater quality. There is separate guidance available for operators undertaking this assessment.

[\(\[http://www.sepa.org.uk/pdf/guidance/landfill\\\_directive/hydrogeological\\\_risk\\\_assessments.pdf\]\(http://www.sepa.org.uk/pdf/guidance/landfill\_directive/hydrogeological\_risk\_assessments.pdf\)\)](http://www.sepa.org.uk/pdf/guidance/landfill_directive/hydrogeological_risk_assessments.pdf),

There is also a different PPC application form for landfill activities.

All other waste management activities listed in Chapter 5 of the PPC Regulations (except for an installation or mobile plant falling within paragraph (d) and (e) of Part A of Section 5.1 of Part 1 of Schedule 1) are required to produce a site report as per this guidance.

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## APPENDIX 2: DIRECTIVE 80/68/EEC (THE GROUNDWATER DIRECTIVE) LIST I AND LIST II SUBSTANCES

*Note: These List I and II substances should not be confused with the List I and II substances of the Dangerous Substances Directive (76/464/EEC)*

### 1. LIST I SUBSTANCES

- (1) Subject to sub-paragraph (2) below, a substance is in List I if it belongs to one of the following families or groups of substances :
- (a) organohalogen compounds and substances which may form such compounds in the aquatic environment;
  - (b) organophosphorus compounds;
  - (c) organotin compounds;
  - (d) substances which possess carcinogenic, mutagenic or teratogenic properties in or via the aquatic environment (Approved Substances Supply List categories used);
  - (e) mercury and its compounds;
  - (f) cadmium and its compounds;
  - (g) mineral oils and hydrocarbons;
  - (h) cyanides.
- (2) A substance is not in List I if it has been determined by the Agency to be inappropriate to List I on the basis of a low risk of toxicity, persistence and bioaccumulation.

### 2. LIST II SUBSTANCES

A substance is in List II if it could have a harmful effect on groundwater and it belongs to one the following families or groups of substances:

- (a) the following metalloids and metals and their compounds:

Zinc	Tin
Copper	Barium
Nickel	Beryllium
Chromium	Boron
Lead	Uranium

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Selenium	Vanadium
Arsenic	Cobalt
Antimony	Thallium
Molybdenum	Tellurium
Titanium	Silver

- (b) biocides and their derivatives not appearing in List I (considered to be those defined by the Biocides Directive);
- (c) substances which have a deleterious effect on the taste or odour of groundwater, and compounds liable to cause the formation of such substances in such water and to render it unfit for human consumption;
- (d) toxic or persistent organic compounds of silicon, and substances which may cause the formation of such compounds in water, excluding those which are biologically harmless or are rapidly converted in water into harmless substances;
- (e) inorganic compounds of phosphorus and elemental phosphorus;
- (f) fluorides;
- (g) ammonia and nitrites.

A substance is also in List II if-

- (a) it belongs to the families and groups of substances set out in paragraph 1(1) ;
- (b) it has been determined by the Agency to be inappropriate to List I under paragraph 1(2); and
- (c) it has been determined by the Agency to be appropriate to be classed in List II having regard to toxicity, persistence and bioaccumulation.

It should be noted that the Joint Agency Groundwater Directive Advisory Group ('JAGDAG') periodically considers classifications of List I and II substances. The latest list of substances (2002) can be found on the SEPA website:

[http://www.sepa.org.uk/pdf/groundwater/substance\\_list.pdf](http://www.sepa.org.uk/pdf/groundwater/substance_list.pdf)

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### **APPENDIX 3: ADDITIONAL REQUIREMENTS FOR SITES WITH A DIRECT DISCHARGE TO GROUND AND GROUNDWATER, INCLUDING LANDFILL OPERATORS**

Where emissions at a Part A installation constitute a discharge, disposal or tipping for the purposes of disposal, of matter containing listed substances which might lead to a direct or indirect discharge into the groundwater the requirements of the EC Groundwater Directive (80/68/EEC) (the Groundwater Directive), as implemented by the Controlled Activities Regulations 1998 and Regulation 15 of the Waste Management Licensing Regulations 1994, apply.

A permit including point source discharges issued under PPC for the operation of a Part A installation or the Waste Management Licensing Regulations is deemed to be an authorisation for discharges under the Controlled Activities Regulations.

The requirements of the Groundwater Directive apply to all landfill sites and any Part A installation where the discharge, disposal or tipping for the purposes of disposal, of matter containing listed substances takes place which might lead to a direct or indirect discharge into groundwater. These are additional requirements to those arising from PPC. One of the requirements of the Groundwater Directive is that a prior investigation must be undertaken to demonstrate that there will be no entry of List I substances into groundwater and no pollution of groundwater by List II substances. The prior investigation is the responsibility of the applicant and must be carried out before an application for a permit is made.

In terms of PPC requirements, all applications to operate a Part A installations must include a site report but must also provide additional information necessary to demonstrate that all appropriate preventative measures are taken against pollution of land and any associated waters.

(Note: Part A installations include landfill and disposal to land as described by Sch 1 Part 1 section 5.2 of the Regs.)

The Landfill (Scotland) Regulations 2003 require the operator to demonstrate that the landfill is sited and designed so as to provide conditions for the prevention of pollution of the soil, groundwater and surface water. This usually entails a risk assessment which examines:

- the type and quantity of waste deposited;
- the volume and composition of any leachate generated;
- the management of leachate levels;
- the geological and hydrogeological conditions in the area;
- the construction of the landfill liner;
- the leaching potential of the liner system;
- possible effects on groundwater and surface water receptors

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Where possible measured data, rather than default values or inferred data, should be used for modeling predicted flow – all data used should be fully justified.

The Operator should consider the initial site condition for any identified substances and conduct testing up-stream and down-stream of site at appropriate locations. It is also necessary to consider other potential sources for these materials such as adjacent closed landfills or industrial sites.

Consideration should be given to rising groundwater levels, particularly where current groundwater levels are depressed due to dewatering activities in the general vicinity

Tables of leachate composition from different types of landfill can be found in Appendix 1 of WMP 26B “Landfill Design, Construction and Operational Practice”

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## APPENDIX 4: CHECKLIST

### A5.1 Checklist for Initial Site Report

Item	Y/N	Comment
Stage 1: Identification of Substances Used at the Installation		
1		Has a list of substances at the installation been produced? (raw materials, products, by-products, intermediaries, wastes, auxiliaries)
2		Are there any substances which have obviously been omitted?
Stage 2: Identification of Substances which have a theoretical pollution potential		
3		Has the theoretical pollution potential of each substance been determined based on chemical and physical data? e.g. toxicity, mobility, persistence, state etc
Stage 3: Assessment of site specific pollution potential		
4		Has the site specific pollution potential been determined based on an assessment of the quantity used, adequacy and integrity of containment mechanisms for delivery, handing, storage, use and disposal of substances etc?
5		Have the substances of concern been identified and their selection justified?
6		Have the likely areas/points of emission been identified?
Stage 4: Site History		
7		Has the potential for these substances to be present as a result of activities prior to operation under PPC been considered through review of site history?
8		Do areas of historic contamination overlap with potential future emission points?

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Item		Y/N	Comment
Stage 5: Site Environmental Setting			
9	Has the environmental setting of the site been considered to determine which strata and groundwater bodies could be affected by emissions and the extent and depth to which the site should be characterised? e.g. by consideration of topography, geology, hydrogeology and hydrology.		
10	Have potential flow paths through the sub surface been considered? e.g. drains, services, faults, mines.		
Stage 6: Conceptual Site Models			
11	Has a cross section or conceptual site model been developed identifying emission points and the extent to which these may impact on the surface, sub-surface and groundwaters?		
Stage 7: Site Investigation			
12	Can the site be adequately characterised without a site investigation? (if yes go to item 18)		
13	Has a site investigation been undertaken? (either specifically for PPC or has old data been used)		
14	Were samples obtained at appropriate depths in strata and groundwaters likely to be impacted by potential emissions / historic contamination?		
15	Has analysis been undertaken for appropriate substances?		
16	Where screening or marker substances have been used are these considered appropriate?		
17	Were the samples taken and analysed using appropriate quality assured methods, acceptable limits of detection, accuracy and precision?		
Stage 8: Statement of Site Condition			
18	Is a clear statement on site condition presented?		
19	Does it cover all substances which have a		

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	<b>Issue Date:</b> 21/06/06
	<b>Originator:</b> Irene Anders/ Fiona Weir
	<b>Issued by:</b> PPC/ Air Central
	<b>Authorised by:</b> Dougie Johnstone

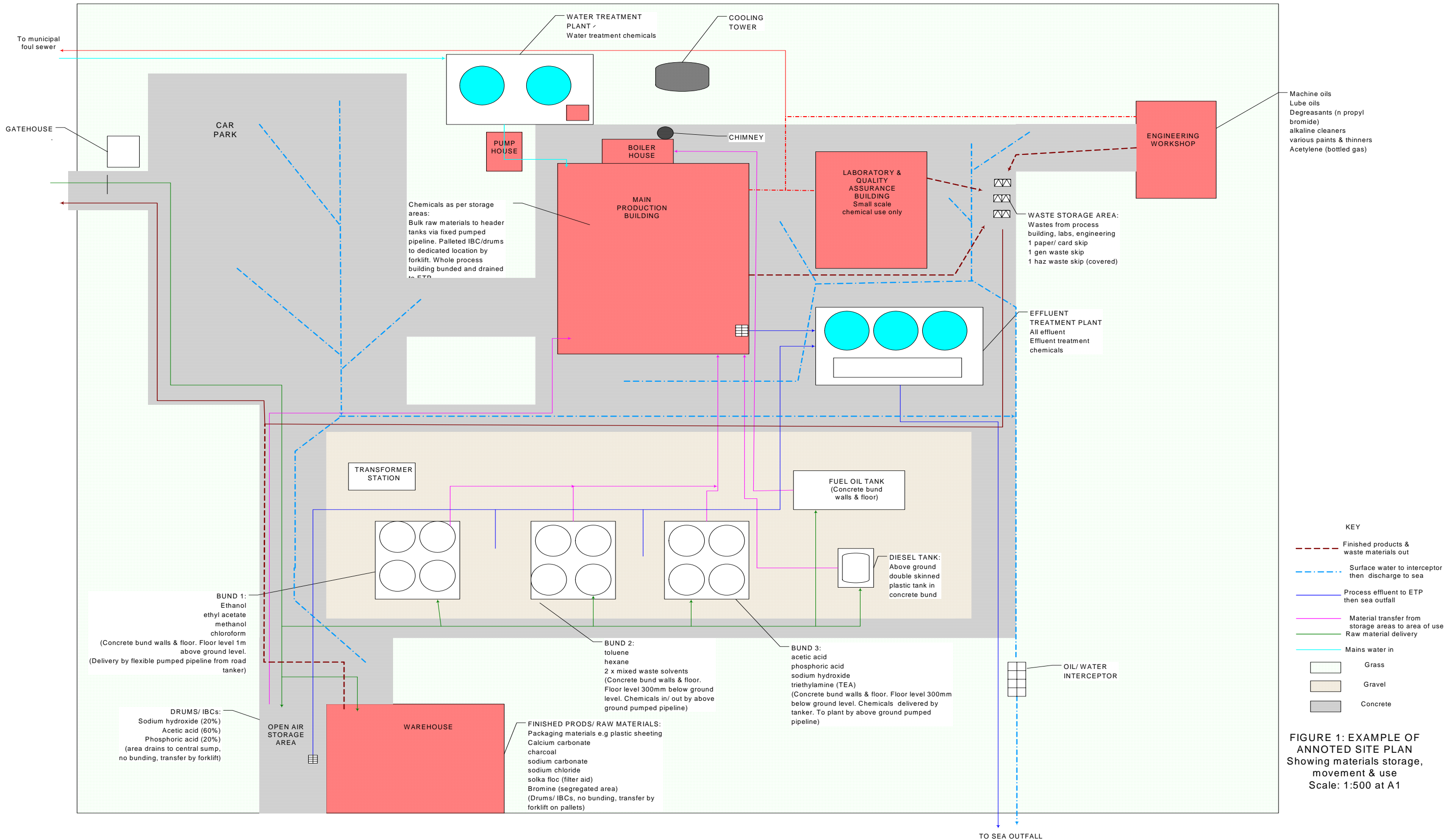
Item		Y/N	Comment
	pollution potential?		
20	Has groundwater quality been used as an indicator of ground / soil quality and is it an appropriate indicator?		
21	Has the statement on site condition been fully justified?		
22	Is it considered to be representative of the actual site condition?		

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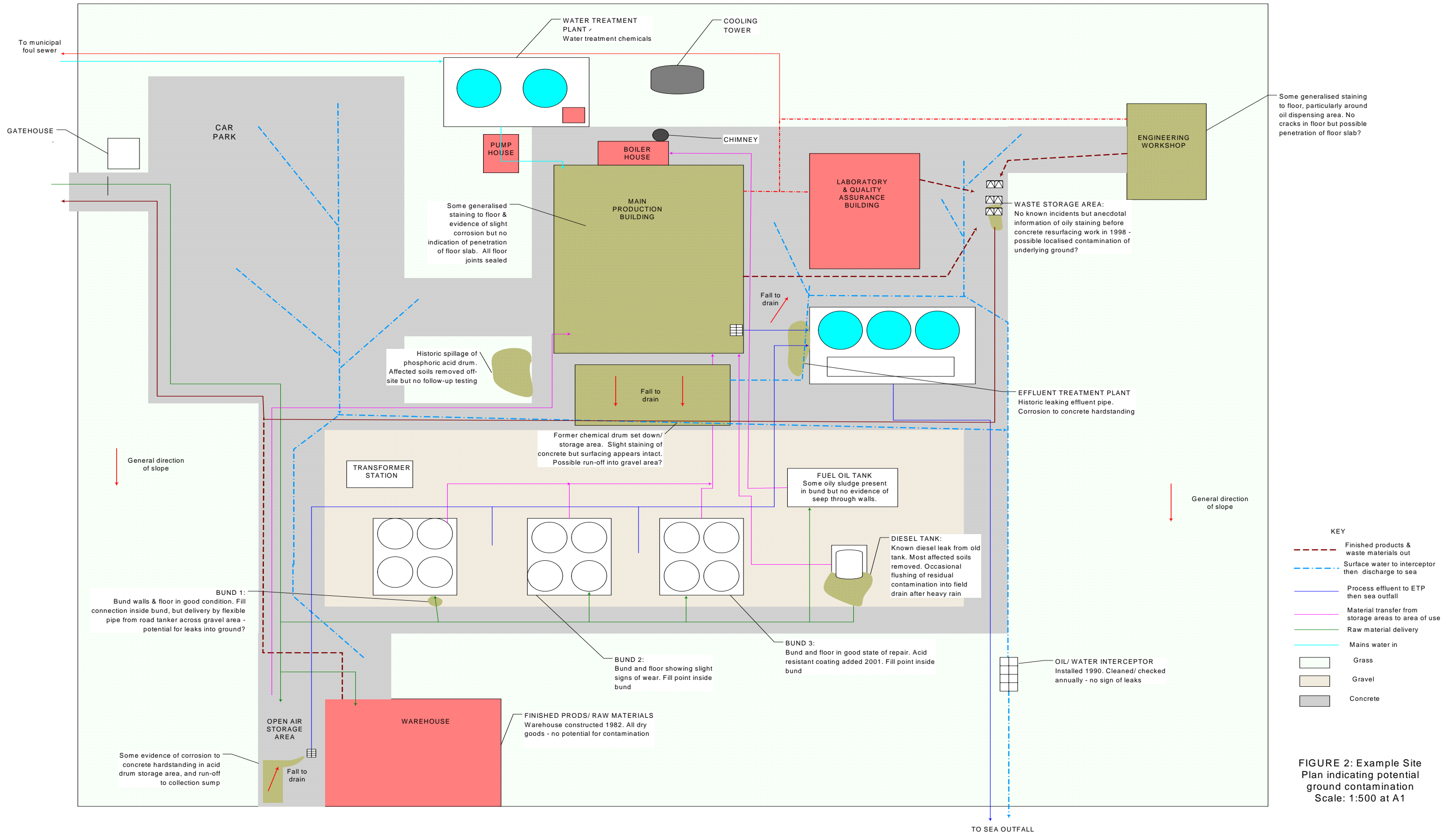
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## A5.2 Checklist for Final Site Condition Report

Item	Y/N	Comment
Stage 1: Identification of Changes under PPC and Confirmation of Emission Points		
2		Have potential emission points during operation under PPC been confirmed?
1		Have changes to the process, substances handled, site layout, etc been identified and the pollution risk assessed?
Stage 2: Demonstrate Integrity of Containment and Identify Emissions		
3		Is adequate information available to demonstrate containment of substances with the potential to cause pollution?
4		Have accidents, incidents or routine operations which may give rise to pollution been identified?
5		Are SEPA aware of accidents, incidents or routine operations which may give rise to pollution but are not considered by the applicant.
Stage 3: Investigation and Remediation		
6		Have areas where emissions may have occurred been investigated?
7		Where pollution during operation under PPC has been identified has it been remediated?
8		Has proof testing been undertaken to demonstrate that the pollution has been remediated.
Stage 4: Statement of Site Condition		
9		Is a clear statement on site condition presented?
10		Does it cover all substances which have a pollution potential?
11		Has groundwater quality been used as an indicator of ground/soil quality and is it an appropriate indicator?
12		Has the statement on site condition been fully justified?
13		Is it considered to be representative of the actual site condition?
14		Are additional works required to remove pollution risk and return the site to a satisfactory state or to demonstrate that this has been achieved (specify)?



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**FIGURE 2: Example Site Plan indicating potential ground contamination**  
Scale: 1:500 at A1

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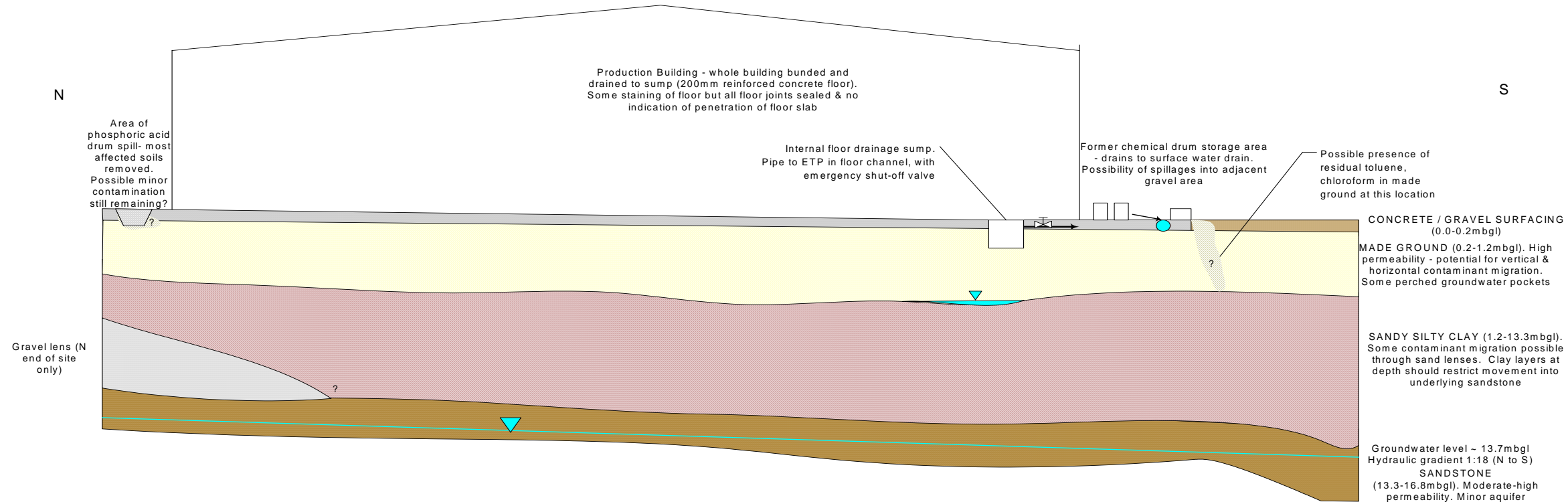


FIGURE 3(a)  
CROSS SECTION & CONCEPTUAL SITE MODEL  
FOR PRODUCTION BUILDING AREA  
(Not to Scale)

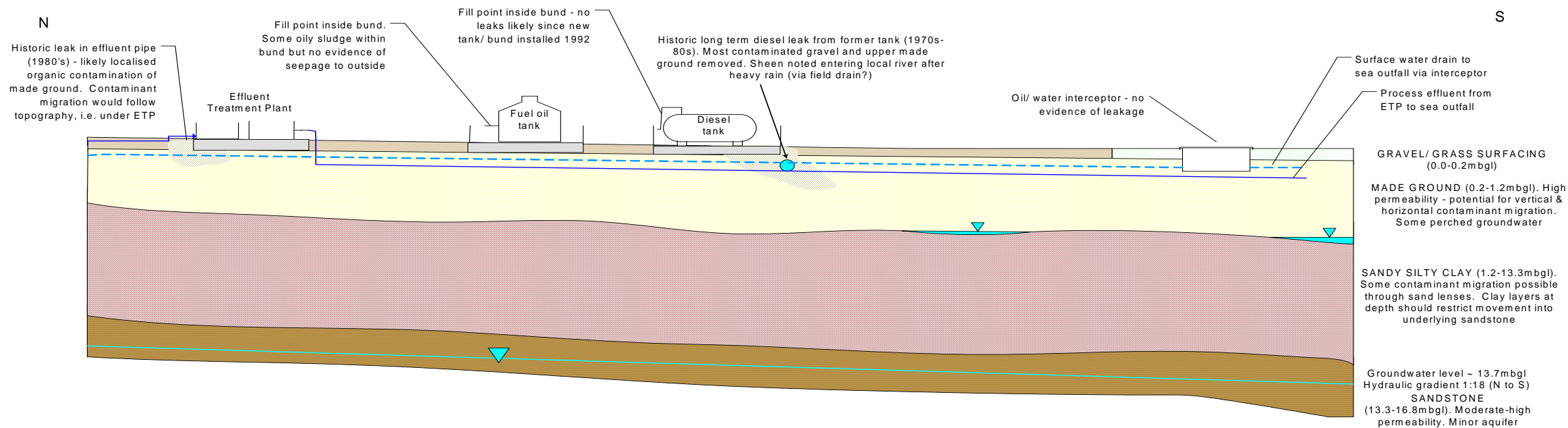


FIGURE 3(b)  
CROSS SECTION & CONCEPTUAL SITE MODEL  
FOR ETP & FUEL TANKS AREA  
(Not to Scale)

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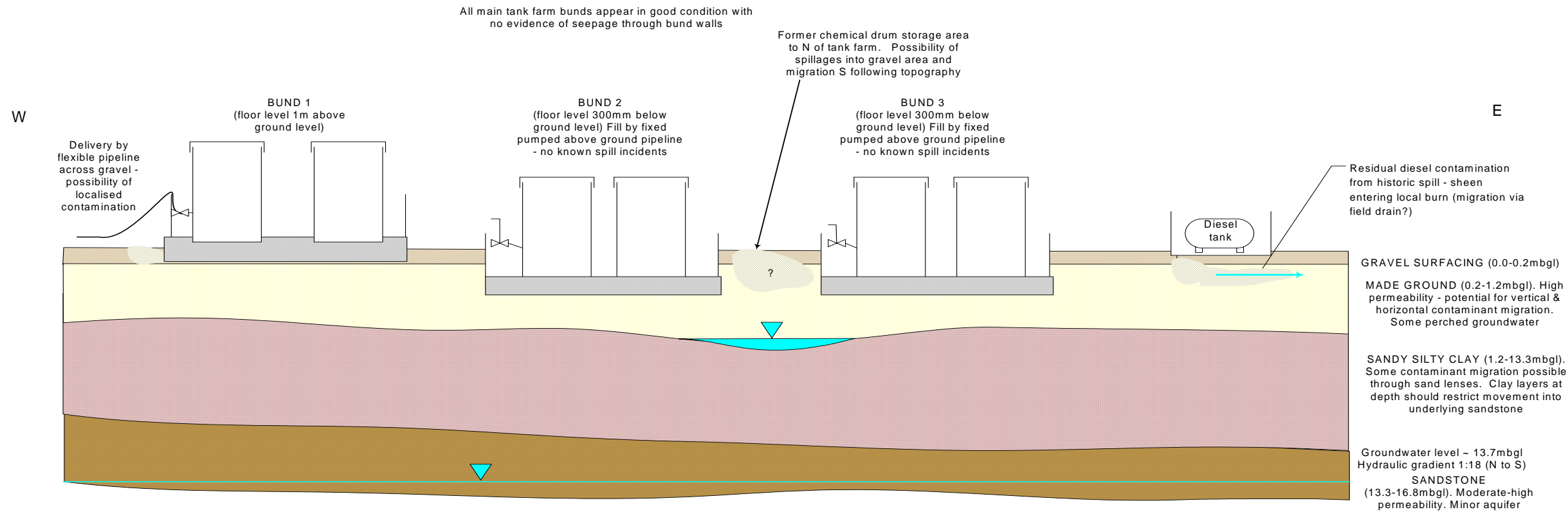
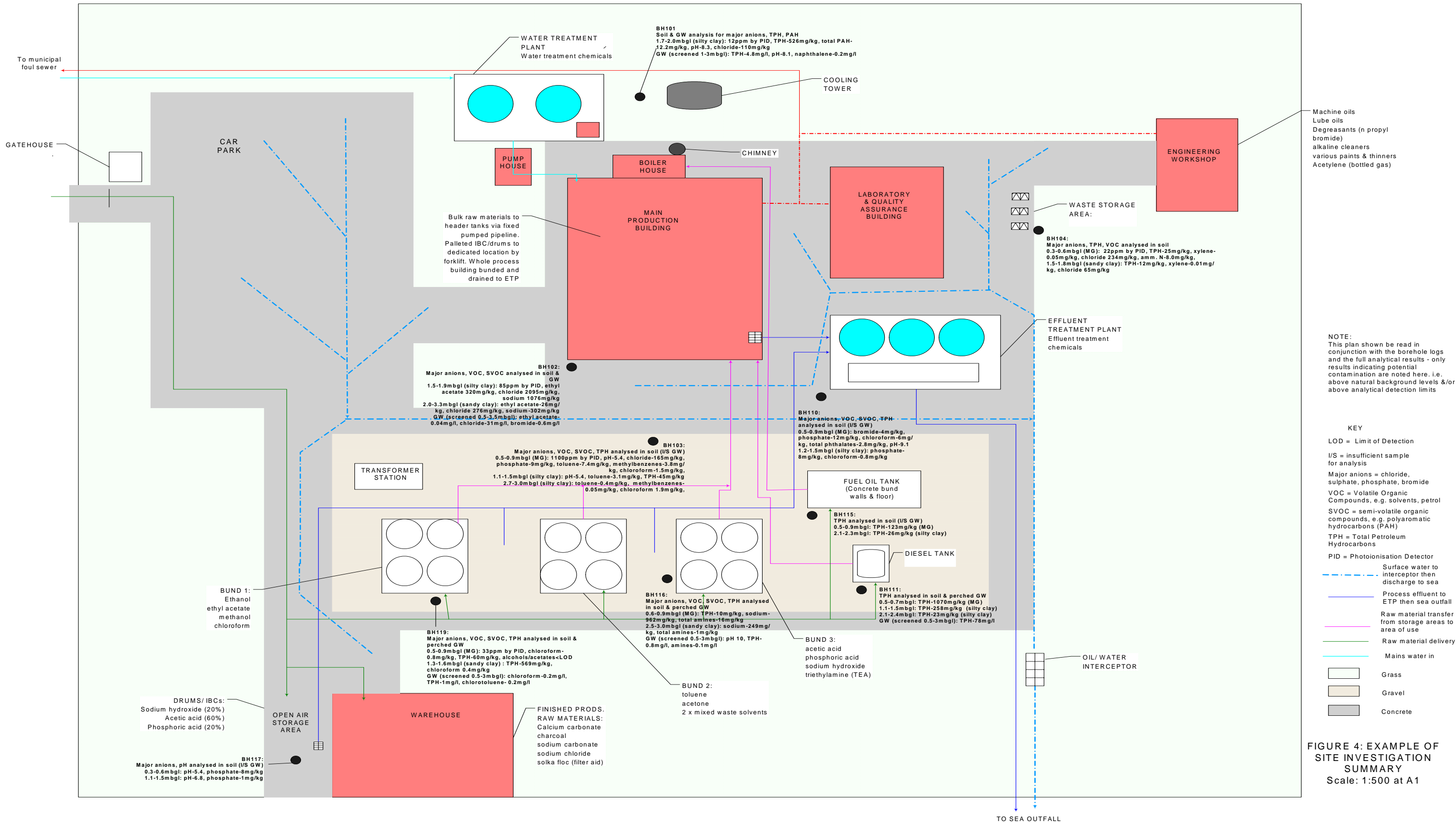


FIGURE 3(c)  
CROSS SECTION & CONCEPTUAL SITE MODEL  
W-E ACROSS TANK FARM AREA  
(Not to Scale)



**NOTE:**  
This plan shown be read in conjunction with the borehole logs and the full analytical results - only results indicating potential contamination are noted here. i.e. above natural background levels &/or above analytical detection limits

- KEY**
- LOD = Limit of Detection
  - I/S = insufficient sample for analysis
  - Major anions = chloride, sulphate, phosphate, bromide
  - VOC = Volatile Organic Compounds, e.g. solvents, petrol
  - SVOC = semi-volatile organic compounds, e.g. polycyclic aromatic hydrocarbons (PAH)
  - TPH = Total Petroleum Hydrocarbons
  - PID = Photoionisation Detector
  - Surface water to interceptor then discharge to sea
  - Process effluent to ETP then sea outfall
  - Raw material transfer from storage areas to area of use
  - Raw material delivery
  - Mains water in
  - Grass
  - Gravel
  - Concrete

**FIGURE 4: EXAMPLE OF SITE INVESTIGATION SUMMARY**  
Scale: 1:500 at A1