



Cumbria Waste Recycling

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# SEAL SANDS HAZARDOUS WASTE TRANSFER STATION

Surface Water Pollution Risk Assessment





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## Surface Water Pollution Risk Assessment

**SURFACE WATER POLLUTION RISK ASSESSMENT PUBLIC**

**PROJECT NO. UK0042157.9205**

**OUR REF. NO. SWPRA001**

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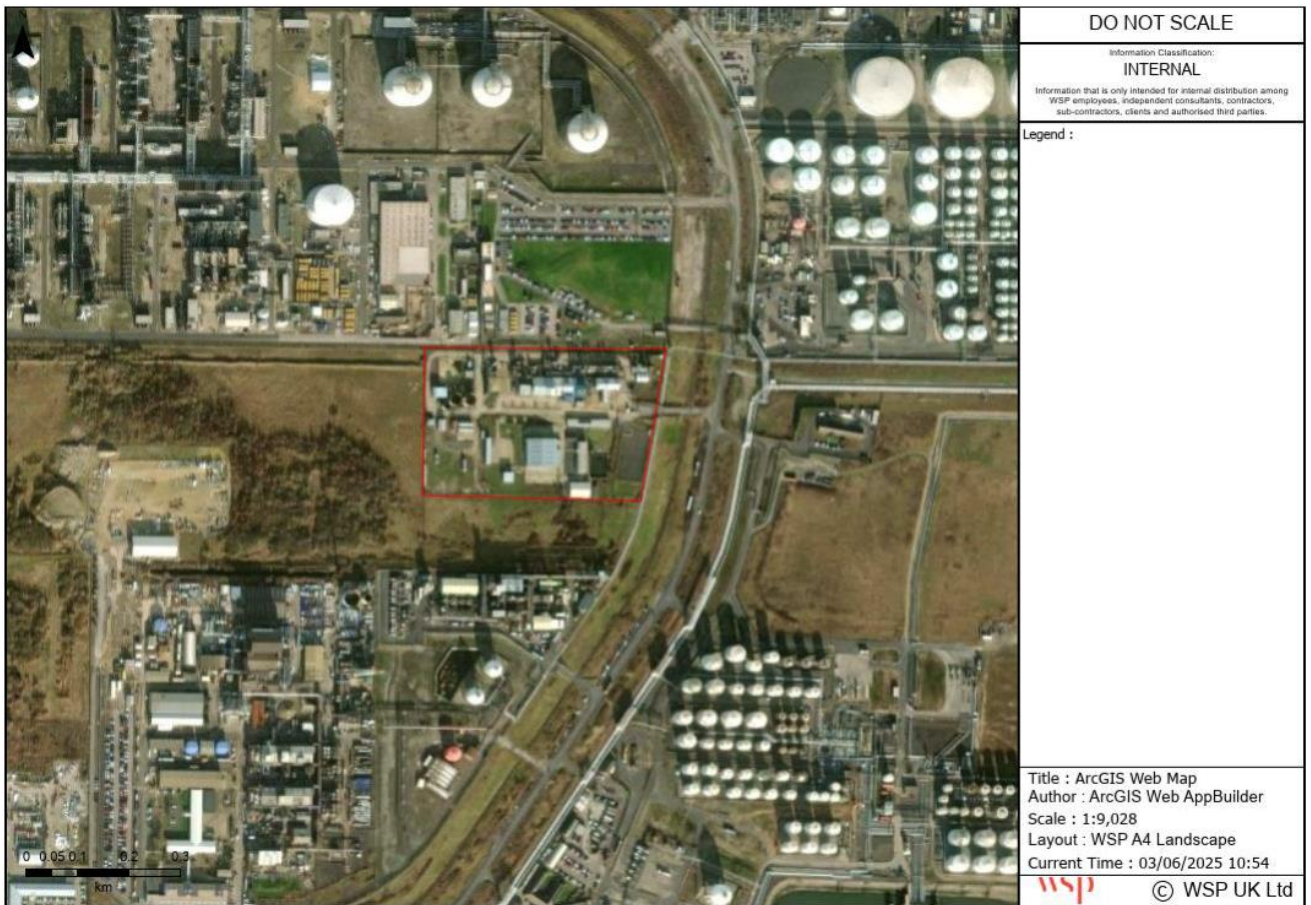
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# 1 INTRODUCTION

WSP UK Limited (WSP) has been commissioned by Cumbria Waste Recycling (CWR) to undertake a Surface Water Pollution Risk Assessment (SWPRA) relating to the indirect release to surface water from the Seal Sands Hazardous Waste Transfer Station (HWTS), located within the Seal Sands Industrial Estate, Teesside. The location of the wider site which occupies approximately 12 acres, is shown below in Figure 1-1, with the whole site boundary shown in red.

**Figure 1-1 - Site Location**



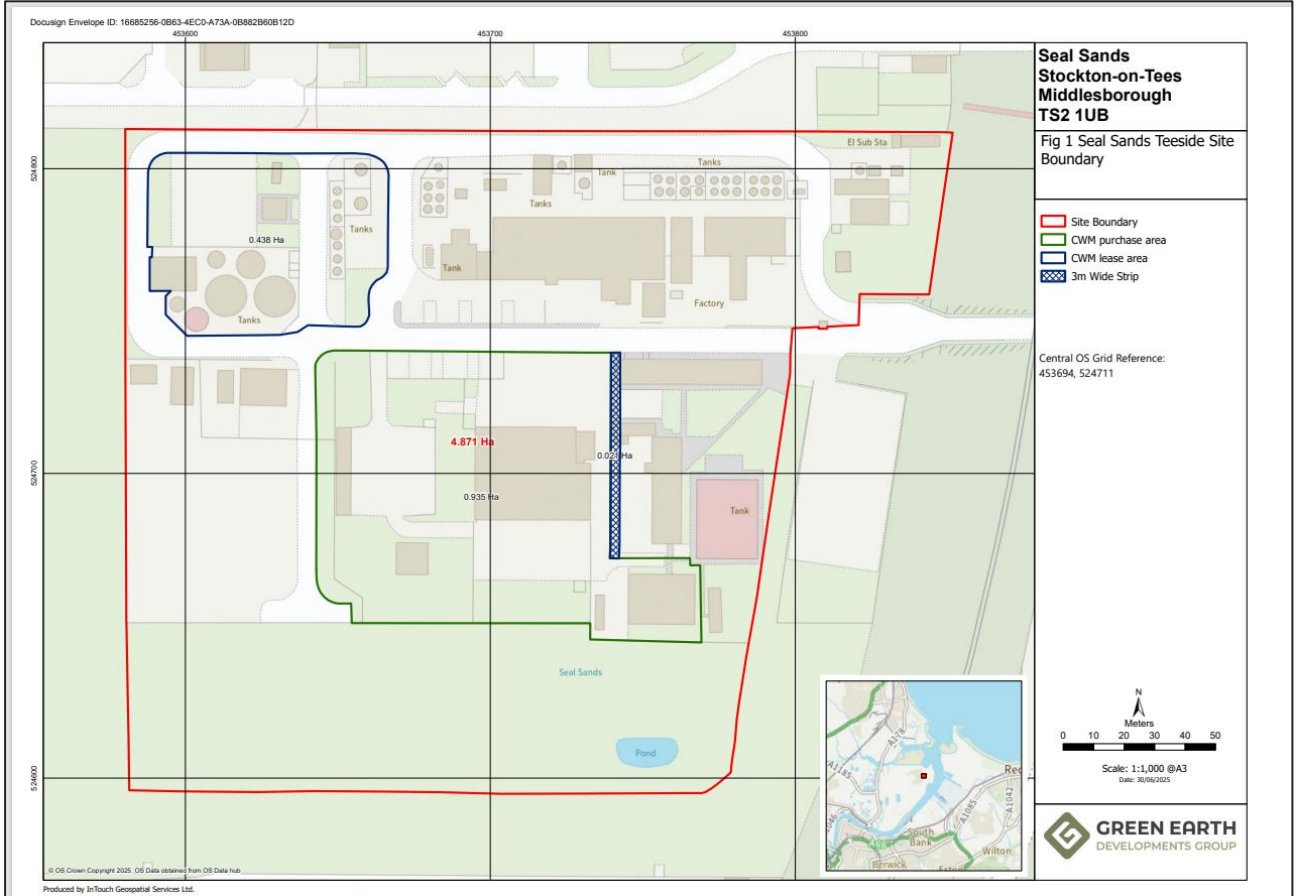
CWR intends to purchase part of the wider site on a freehold basis from Green Earth Developments Limited and lease a second area of the wider site. The previous use of the site was as a chemical plant producing organic compounds containing oxygen, sulphur, nitrogen, phosphorus and halogens.

CWR intend to operate a HWTS on the site and will be required to apply for and subsequently operate in accordance with the conditions of an Environmental Permit, issued by the Environment Agency. This SWPRA forms part of that Environmental Permit application.

The effluent discharged from the HWTS is received by the Bran Sands Industrial Effluent Treatment Works. This Treatment Works is operated by Northumbrian Water Limited and discharges to the Dabholm Gut at National Grid Reference NZ 54895 24741, a small tidal tributary of the Tees

Estuary. The Industrial Effluent Treatment Works is regulated under Environmental Permit EPR/LP3439LK.

**Figure 1-2 - Seal Sands HWTS Site Plan**



## 2 METHODOLOGY

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This SWPRA has been undertaken in accordance with the Environment Agency’s “Surface water pollution risk assessment for your environmental permit” guidance<sup>1</sup>.

The referenced guidance is targeted at applicants for bespoke environmental permits that include the discharge of hazardous chemicals and elements to surface water. It describes a series of Screening Tests designed to assess the risk from hazardous chemicals and elements to the environment, along with an additional test for priority hazardous pollutants to assess whether the annual load limit of pollutants discharged is greater than a defined significant load limit.

The equations described within the Screening Tests compare the nature of the effluent to be discharged, and the resultant quality within the receiving water course, with appropriate environmental quality standards (EQS). As the Dabholme Gut is a tidal tributary of the Tees Estuary, Screening Tests for estuaries and coastal waters have been used for this risk assessment.

No data relating to the quality of the discharge from the HWTS, or a proxy site (a similar sized site and process which is likely to have a similar discharge) was available. Therefore, in order to undertake this assessment, WSP have rearranged the Screening Test equations to calculate the maximum allowable release concentration ( $RC_{max}$ ) for each parameter.

The  $RC_{max}$  values determined are subsequently compared to the best available technique associated emissions levels (BAT-AELs)<sup>2</sup> for indirect emissions to surface water from water-based liquid waste treatment installations to identify whether any emissions limit values (ELVs) lower than the BAT-AELs need to be implemented.

As the effluent from the HWTS is being discharged to Bran Sands Industrial Effluent Treatment Works, a Sewage Treatment Reduction Factor (STRF) has been included in the calculations.

The equations used for each of the Screening Tests and for the Significant Load Assessment are presented below.

### 2.1 SCREENING TEST 1

The first Screening Test compares the concentration of the determinand in the discharge (Release Concentration or “RC”) to the relevant EQS. If the RC is less than the EQS, the determinand is considered not to pose an environmental risk and does not require further assessment. Equation 2-1 is used to determine the maximum allowable RC ( $RC_{max}$ ) when accounting for the STRF.

#### Equation 2-1 - Calculation of $RC_{max}$ using Screening Test 1

$$RC_{Max} = EQS/STRF$$

In which:

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<sup>1</sup> [Surface water pollution risk assessment for your environmental permit - GOV.UK](#)

<sup>2</sup> [Waste Treatment | EU-BRITE](#)

$RC_{max}$  = Maximum allowable Release Concentration ( $\mu\text{g/l}$ ); and  
 EQS = Environmental quality standard ( $\mu\text{g/l}$ );  
 STRF = Sewage Treatment Reduction Factor.

## 2.2 SCREENING TEST 2

The second Screening Test is dependent on whether the site is discharging to the low water channel (if the water does not flow across the estuary bed at any stage of the tide) in the upper parts of the estuary where the water is mainly fresh. As Dabholme Gut is a tributary which discharges to the upper part of the estuary, as shown in Figure 3-1, the Screening Tests for Freshwater, starting at Test 2 are required. In these Freshwater Tests, the freshwater flowrate and upstream quality are used, but the EQSs for estuaries and coastal waters are used.

### 2.2.1 FRESHWATER TEST 2

Screening Test 2 introduces dilution within the receiving water body to calculate the Process Contribution (PC). In the event that the PC of a determinand is less than 4 % of the EQS, the determinand is considered not to pose an environmental risk and is screened out from further risk assessment. If the Process Contribution (PC) of the determinand is greater than 4 % of the EQS, the determinand is assessed further under Freshwater Screening Tests 3 and 4. The  $RC_{Max}$  based on Screening Test 2 was calculated using Equation 2-2.

#### Equation 2-2 - Calculation of $RC_{Max}$ Using Screening Test 2

$$RC_{Max} = \frac{0.04 \times EQS \times (EFR + RFR)}{EFR \times STRF}$$

In which:

$RC_{Max}$  = Maximum allowable release concentration ( $\mu\text{g/l}$ );  
 EQS = Environmental quality standard ( $\mu\text{g/l}$ );  
 EFR = Effluent Flow Rate ( $\text{m}^3/\text{s}$ );  
 RFR = River Flow Rate ( $\text{m}^3/\text{s}$ );  
 STRF = Sewage Treatment Reduction factor.

### 2.2.2 FRESHWATER TESTS 3 AND 4

A determinand must pass both Screening Tests 3 and 4 simultaneously in order to be screened out from further risk assessment. Therefore, when calculating the maximum allowable release concentration based on Screening Tests 3 and 4, the lower value for  $RC_{Max}$  calculated using Equation 2-3 and Equation 2-4 is used.

Screening Test 3 considers whether the discharge will increase the concentration of the determinand within the receiving water course by more than 10 % of the relevant EQS. The  $RC_{Max}$  based on Screening Test 3 was calculated using Equation 2-3.

### Equation 2-3 - Calculation of $RC_{Max}$ Using Screening Test 3

$$RC_{Max} = \frac{0.1 \times EQS \times (EFR + RFR)}{EFR \times STRF}$$

In which:

- $RC_{Max}$  = Maximum allowable release concentration ( $\mu\text{g/l}$ );
- EQS = Environmental quality standard ( $\mu\text{g/l}$ );
- EFR = Effluent Flow Rate ( $\text{m}^3/\text{s}$ );
- RFR = River Flow Rate ( $\text{m}^3/\text{s}$ ); and
- STRF = Sewage Treatment Reduction Factor.

Screening Test 4 considers whether the predicted environmental concentration (PEC) is higher than the relevant EQS. The PEC is calculated as the sum of the PC and the background concentration (BC) and the maximum allowable release concentration based on Screening Test 4 was therefore calculated according to Equation 2-4.

### Equation 2-4 - Calculation of $RC_{Max}$ Using Screening Test 4

$$RC_{Max} = \frac{(EQS - BC) \times (EFR + RFR)}{EFR \times STRF}$$

In which:

- $RC_{Max}$  = Maximum allowable release concentration ( $\mu\text{g/l}$ )
- EQS = Environmental quality standard ( $\mu\text{g/l}$ )
- BC = Background concentration ( $\mu\text{g/l}$ )
- EFR = Effluent Flow Rate ( $\text{m}^3/\text{s}$ )
- RFR = River Flow Rate ( $\text{m}^3/\text{s}$ )
- STRF = Sewage Treatment Reduction Factor

If the limits obtained by these Screening Tests cannot be achieved, modelling is required.

## 2.3 SIGNIFICANT LOAD ASSESSMENT

The maximum allowable release concentration based on the Significant Load Assessment was calculated according to Equation 2-5 below.

### Equation 2-5 - Calculation of $RC_{max}$ based on the Significant Load Assessment

$$RC_{Max} = \frac{SL \times 10^6}{EFR \times 365 \times 24 \times 60 \times 60 \times STRF}$$

In which:

- $RC_{Max}$  = Maximum allowable release concentration ( $\mu\text{g/l}$ )
- EFR= Effluent Flow Fate ( $\mu\text{g/l}$ )
- SL = Significant Load Limit (kg/year)
- STRF = Sewage Treatment Reduction Factor

## 2.4 DETERMINANDS CONSIDERED

Although an extensive suite of hazardous chemicals and elements are referenced within the guidance<sup>1</sup>, this assessment has been undertaken with focus given to:

- Substances which are anticipated to be discharged, as informed by CWR; and
- Substances for which Best Available Techniques associated Emission Levels (BAT-AELs) for indirect discharges to a receiving water body for water-based liquid waste are available<sup>2</sup>.

It is proposed that the discharge compliance limits are based on these parameters and set at the BAT-AELs, when applicable, unless the SWPRA indicates that a lower compliance limit is required. The assessment therefore focuses on:

- Cyanide;
- Arsenic;
- Cadmium;
- chromium;
- Chromium(VI);
- Copper;
- Lead;
- Nickel;
- Mercury;
- Zinc;
- Ammonia;
- Chlorine;
- Phenol; and
- Sulphate.

Although BAT-AELs are also available for hydrocarbon oil index (HOI) and adsorbable organically bound halogens (AOX), no EQS values are defined for these parameters, and they were therefore excluded from the scope of this assessment.

In line with BAT 3, a complete inventory of waste water streams should be identified once operational, and this risk assessment may be revised once a suitably robust inventory and data set has been established.

## 2.5 SEWAGE TREATMENT REDUCTION FACTORS

The discharge from the HWTS is an indirect discharge which will pass through the Industrial Effluent Treatment Works prior to discharge. Consequently, the Sewage Treatment Reduction Factors (STRFs) have been implemented to determine the maximum allowable release concentrations using the STRFs defined within the guidance<sup>1</sup>.



The treatment at Bran Sands, as described in their Environmental Permit (EPR/LP3439LK), is “activated sludge processes” and therefore the STRFs for activated sludge plants have been used as in this SWPRA.

### 3 SCREENING TEST INPUTS

The following sections describe the input data used within the Screening Tests.

#### 3.1 ENVIRONMENTAL QUALITY STANDARDS

The Screening Tests compare the measurements of pollutants to be discharged to Environmental Quality Standards (EQS). There are two types of EQS:

- EQS Annual Average (AA) – to evaluate the long-term environmental impacts that could be caused; and
- EQS Maximum Allowable Concentrations (MAC) – to evaluate the short-term environmental impacts that could be caused.

These Screening Tests have been undertaken using the ‘Estuaries and coastal waters specific pollutants and operational environmental quality standards’ and the ‘Estuaries and coastal waters priority hazardous substances, priority substances and other pollutants environmental quality standards’ presented within the Environment Agency’s guidance<sup>1</sup>.

##### Copper

The EQS concentration for Copper – Dissolved is determined from the amount of Dissolved Organic Carbon (DOC) in the estuary and is determined from Equation 3-1 below. The level of DOC has been from the Environment Agency Water Quality Explorer<sup>3</sup> and Table 3-1 presents the input and EQS value used for the SWPRA.

##### Equation 3-1 - EQS Copper - Dissolved

$$\text{Annual Average EQS for CU} = 3.76 + (2.677 \times ((\text{DOC}/2) - 0.5)) \mu\text{g/l}$$

**Table 3-1 – EQS Copper - Dissolved**

| DOC (mg/l) | Annual average environmental quality standard (µg/l) |
|------------|--|
| 3.8        | 7.51   |

<sup>3</sup> <https://environment.data.gov.uk/water-quality>

### 3.2 SEWAGE TREATMENT REDUCTION FACTORS

The STRFs used within the assessment are presented in Table 3-2.

**Table 3-2 – Sewage Treatment Reduction Factors for an Activated Sludge Plant<sup>4</sup>**

| Substance     | Percentage removal rate of a substance by activated sludge plant (%) | STRF (Proportion remaining in effluent) |
|---------------|--|---|
| Cyanide       | 68   | 0.32                                    |
| Arsenic       | 11   | 0.89                                    |
| Cadmium       | 63   | 0.37                                    |
| Chromium      | 84   | 0.16                                    |
| Chromium (VI) | 84   | 0.16                                    |
| Copper        | 79   | 0.21                                    |
| Lead          | 83   | 0.27                                    |
| Nickel        | 24   | 0.76                                    |
| Mercury       | 33   | 0.67                                    |
| Zinc          | 67   | 0.33                                    |
| Ammonia       | 92   | 0.08                                    |
| Chlorine      | 0  | 1                                       |
| Phenol        | 83   | 0.17                                    |
| Sulphate      | -  | 1                                       |

### 3.3 EFFLUENT FLOW RATE

This SWPRA has been conducted using the maximum flow rate of discharge of 5m<sup>3</sup>/hr or 120m<sup>3</sup>/day to Bran Sands ETP. This is the maximum flow rate consented by Northumbrian Water Limited as per the current sites operation. If CWR agree a different maximum flow rate, the SWPRA can be refined to account for this.

<sup>4</sup> <https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit>

### 3.4 RIVER FLOW RATE

The Environment Agency’s guidance recommends that a Q95 river flow is used as the river flow rate for the receiving water course. The Q95 is the flow in the watercourse which is exceeded by 95 % of the recorded flows which comprises a conservative low flow representing a low degree of dilution.

For this SWPRA, the flow rate has been reported by the Estuary Guide<sup>5</sup> at Grid Reference NZ535265, with a measured Q95 of 2.64 m<sup>3</sup>/s.

### 3.5 BACKGROUND DATA

As per the Regulators guidance<sup>1</sup>, the substances considered in this SWPRA have not discharged before, so a sample of data from the planned discharge point shall be used, with River Tees at Dabholme Gut Confluence being the closest reference point. This sampling point is detailed below in Table 3-3 and Figure 3-1.

**Table 3-3 – River Tees at Dabholme Gut Confluence**

| Description       | RIVER TEES AT DABHOLME GUT CONFLUENCE                            |
|-------------------|--|
| Sampling Point ID | NE-45401356  |
| Type              | Saline Water – Estuarine Sites – Non Bathing/Shellfish           |
| Location          | easting northing: 454822 524858<br>lat lon: 54.615892, -1.152599 |
| Area              | Northumberland Durham And Tees                                   |
| Sub-Area          | Ecmas Sampling (North East Area)                                 |
| Summary           | 162 samples taken between 2006 and 2025                          |

[https://environment.data.gov.uk/water-quality/view/sampling-point/NE-45400569?\\_all=true](https://environment.data.gov.uk/water-quality/view/sampling-point/NE-45400569?_all=true)

<sup>5</sup> [The UK Estuaries Guide - ABPmer](#)



**Figure 3-1 - River Tees at Dabholme Gut Confluence**

A summary of the background data used is shown below in Table 3-4.

Results within the data set that are below the detection limit, have been treated as equal to the detection limit as per the guidance.

Substances that do not have background data available, an assumed background concentration has been set to 0.5 EQS as per the guidance<sup>1</sup>.

**Table 3-4 – Background Data<sup>6</sup>**

| Parameter                                  | Number of Data Points | Number sample above LOD | Mean (µg/l)           |
|--|-----------------------|-------------------------|-----------------------|
| Benzene                                    | 9                     | 0                       | 5.00x10 <sup>-2</sup> |
| Cadmium                                    | 9                     | 1                       | 1.69x10 <sup>-2</sup> |
| Lead                                       | 9                     | 9                       | 3.98x10 <sup>-1</sup> |
| Mercury                                    | 9                     | 0                       | 5.00x10 <sup>-3</sup> |
| Tributyltin compounds (tributyltin-cation) | 8                     | 4                       | 8.63x10 <sup>-5</sup> |
| Chloroform                                 | 9                     | 4                       | 4.03x10 <sup>-1</sup> |

<sup>6</sup> <https://environment.data.gov.uk/water-quality/view/explore>

## 4 RESULTS

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### 4.1 SCREENING TESTS RESULTS

Table 4-1 summarises the results of Screening Tests undertaken as described in Section 2 for the substances anticipated to be in the discharge, as well as those listed in the Waste Treatment BAT Conclusions. This includes the:

- $RC_{Max}$  calculated based on the AA EQS; and
- $RC_{Max}$  calculated based on the MAC EQS.

The BAT-AELs for indirect emissions to surface water are also presented within Table 4-1, (as per Table 6.2 BAT-associated emission levels (BAT-AELs) for indirect discharges to a receiving water body of the Waste Treatment BATc, for Treatment of Water-Based Liquid Waste). Where the  $RC_{max}$  to pass a screening test is calculated to be higher than the corresponding BAT-AEL, the determinand has been removed from further risk assessment on the understanding that a compliance limit would be set at the BAT-AEL.

The results indicate that the indirect discharge of:

- Lead, Mercury, Nickel, Arsenic, Chromium (VI) and Zinc in concentrations greater than the BAT-AEL would be screened out from a surface water pollution risk assessment with freshwater Screening Test 2;
- Cadmium and Cyanide in concentrations greater than the BAT-AEL would be screened out from a surface water pollution risk assessment with freshwater Screening Tests 3 and 4; and
- Substances without an associated BAT-AEL would be able to discharge at the limits specified in Table 4-1 below.



**Table 4-1 – Screening Test Results**

| Substance                  | BAT-AEL        | Significant Load | AA EQS (ug/l)  | MAC EQS (ug/l) | Test 1                          |                                  | Test 2                          |                                  |                                 |                                  |                                 |                                  | Recommended limit from the SWPRA (ug/l) |
|----------------------------|----------------|------------------|----------------|----------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|---|
|                            |                |                  |                |                | AA EQS RC <sub>Max</sub> (ug/l) | MAC EQS RC <sub>Max</sub> (ug/l) | Freshwater Test 2               |                                  | Freshwater Test 3               |                                  | Freshwater Test 4               |                                  |   |
|                            |                |                  |                |                |                                 |                                  | AA EQS RC <sub>Max</sub> (ug/l) | MAC EQS RC <sub>Max</sub> (ug/l) | AA EQS RC <sub>Max</sub> (ug/l) | MAC EQS RC <sub>Max</sub> (ug/l) | AA EQS RC <sub>Max</sub> (ug/l) | MAC EQS RC <sub>Max</sub> (ug/l) |   |
| Cadmium                    | 100            | 5                | 0.2            | Not applicable | 0.540540541                     | Not applicable                   | 41.12                           | Not applicable                   | 102.8                           | Not applicable                   | 872.6577778                     | Not applicable                   | 100                                     |
| Lead                       | 300            | Not applicable   | 1.3            | 14             | 7.647058824                     | 82.35294118                      | 581.7270588                     | 6264.752941                      | 1454.317647                     | 15661.88235                      | 10093.21307                     | 152168.8601                      | 300                                     |
| Mercury                    | 10             | 1                | Not applicable | 0.07           | Not applicable                  | 0.104477612                      | Not applicable                  | 7.947820896                      | Not applicable                  | 19.86955224                      | Not applicable                  | 170.3104478                      | 10                                      |
| Nickel                     | 1000           | Not applicable   | 8.6            | 34             | 11.31578947                     | 44.73684211                      | 860.8147368                     | 3403.221053                      | 2152.036842                     | 8508.052632                      | 10760.18421                     | 42540.26316                      | 1000                                    |
| Ammonia - un-ionised       | Not applicable | Not applicable   | 21             | Not applicable | 262.5                           | Not applicable                   | 19968.9                         | Not applicable                   | 49922.25                        | Not applicable                   | 249611.25                       | Not applicable                   | 49922.25                                |
| Arsenic                    | 100            | Not applicable   | 25             | Not applicable | 28.08988764                     | Not applicable                   | 2136.853933                     | Not applicable                   | 5342.134831                     | Not applicable                   | 26710.67416                     | Not applicable                   | 100                                     |
| Chlorine                   | Not applicable | Not applicable   | Not applicable | 10             | Not applicable                  | 10                               | Not applicable                  | 760.72                           | Not applicable                  | 1901.8                           | Not applicable                  | 9509                             | 1901.8                                  |
| Chromium (III) - dissolved | 300            | Not applicable   | Not applicable | Not applicable | Not applicable                  | Not applicable                   | Not applicable                  | Not applicable                   | Not applicable                  | Not applicable                   | Not applicable                  | Not applicable                   | 300                                     |
| Chromium (VI) - dissolved  | 100            | Not applicable   | 0.6            | 32             | 3.75                            | 200                              | 285.27                          | 15214.4                          | 713.175                         | 38036                            | 3565.875                        | 190180                           | 100                                     |
| Copper                     | 500            | Not applicable   | 7.5078         | Not applicable | 35.75142857                     | Not applicable                   | 2719.682674                     | Not applicable                   | 6799.206686                     | Not applicable                   | 33996.03343                     | Not applicable                   | 500                                     |
| Cyanide                    | 100            | Not applicable   | 1              | 5              | 3.125                           | 15.625                           | 237.725                         | 1188.625                         | 594.3125                        | 2971.5625                        | 2971.5625                       | 14857.8125                       | 100                                     |
| Phenol                     | Not applicable | Not applicable   | 7.7            | 46             | 45.29411765                     | 270.5882353                      | 3445.614118                     | 20584.18824                      | 8614.035294                     | 51460.47059                      | 43070.17647                     | 257302.3529                      | 20584.18824                             |
| Sulphate                   | Not applicable | Not applicable   | Not applicable | Not applicable | Not applicable                  | Not applicable                   | Not applicable                  | Not applicable                   | Not applicable                  | Not applicable                   | Not applicable                  | Not applicable                   | 0                                       |
| Zinc                       | 2000           | Not applicable   | 6.8            | Not applicable | 20.60606061                     | Not applicable                   | 1567.544242                     | Not applicable                   | 3918.860606                     | Not applicable                   | 19594.30303                     | Not applicable                   | 2000                                    |

RCMax values greater than the corresponding BAT-AEL are highlighted in green, indicating that discharge concentrations greater than the BAT-AEL would be screened out from further risk assessment.

## 4.2 SIGNIFICANT LOAD ASSESSMENT

Of the priority hazardous pollutants with significant load limits defined within the guidance<sup>1</sup>, only cadmium and mercury have associated significant load limits.

Table 4-2 presents the results of the Significant Load Assessment undertaken as described above in Section 2. The maximum allowable release concentration for both cadmium and mercury is greater than the corresponding BAT-AEL, indicating that discharge equal to the BAT-AELs would not result in a breach of the annual significant load limits.

**Table 4-2 – Summary of Significant Load Assessment**

| Parameter | Annual Significant Load Limit (kg) | RC <sub>max</sub> (ug/l) from the Significant Load Assessment | RC <sub>max</sub> (ug/l) from Screening Tests | BAT-AEL (ug/l) |
|-----------|------------------------------------|---|---|----------------|
| Cadmium   | 5                                  | 308   | 103   | 100            |
| Mercury   | 1                                  | 34  | 19  | 10             |

## 5 CONCLUSIONS AND RECOMMENDATIONS

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### 5.1 CONCLUSIONS

This SWPRA has been undertaken in accordance with the Environment Agency's guidance<sup>1</sup> to consider the risk presented by the indirect emissions to surface water from the Seal Sands HWTW.

CWR intend to operate a HWTS at the site and will be required to apply for an Environmental Permit, issued by the Environment Agency.

The HWTS is expected to discharge a maximum of 5 m<sup>3</sup> per hour or 120 m<sup>3</sup> per day to the Bran Sands Industrial Effluent Treatment Works. This Treatment Works is operated by Northumbrian Water Limited and discharges to the Dabholm Gut at National Grid Reference NZ 54895 24741, before connecting to the River Tees. The Industrial Effluent Treatment Works is regulated under EPR/LP3439LK.

No data relating to the HWTS or a proxy site was available. Therefore, this SWPRA has been undertaken to consider:

- Substances which CWR have indicated may be contained in the effluent;
- Substances which have corresponding BAT-AELs for indirect emissions to surface water from water based liquid waste treatment installation<sup>2</sup>.

This assessment has shown that discharge concentrations aligned to BAT-AEL would not cause an exceedance of the associated EQS values.

### RECOMMENDATIONS

It is recommended that the emissions limit within the Environmental Permit for the Seal Sands HWTS are aligned to the BAT-AELs.

With the exception of lead, the substances listed above in the substances which are anticipated to be found in the discharge do not have an associated BAT-AEL, the limits for these should be set based on this SWPRA.

Modelling would be required if the HWTS requires a higher emission limit than calculated using Screening Tests described above in Section 2<sup>1</sup>.

It is also recommended that a monitoring regime is developed in line with the Waste Treatment BAT Conclusions<sup>2</sup>, in particular:

- BAT 3 to establish and to maintain an inventory of waste water as part of the environmental management system;
- BAT 6 and BAT 7 regarding the monitoring regime.

Once the HWTS is operational, a wastewater inventory of hazardous chemicals and elements that are likely to be discharged from the site should be produced, and this list used to refine the results of the SWPRA. The EA Guidance<sup>1</sup> considers pollutants likely be found in the discharge if:

- They're allowed to be added to the discharge;
- You've added them to the discharge;

- You've detected them using chemical analysis.

Following collection of a suitable robust data set (at least twelve sample results for each parameter, ideally 36 for each parameter as per Environment Agency Guidance<sup>1</sup>) this risk assessment and the monitoring regime should be revisited to align with the wastewater inventory determined.

**Table 5-1 – Proposed Monitoring Parameters for Discharge from Site**

| Parameter   | Monitoring Standard  |
|---|--|
| Daily discharge volume  | Calibrated, MCERTs certified volumetric flow meter   |
| pH  | Calibrated pH meter  |
| Temperature   | Calibrated temperature probe   |
| Electrical Conductivity (EC)  | Calibrated EC meter  |
| Total Suspended Solids  | BS EN 872  |
| Total Nitrogen  | BS EN ISO 11905-1 or BS EN 12260   |
| Total Phosphorus  | EN ISO 15681-1 and -2 or EN ISO 6878 or EN ISO 11885   |
| BOD   | BS EN ISO 5815-1 or BS EN 1899-2<br>Five day test  |
| COD   | BS EN ISO 15705  |
| Hydrocarbon Oil Index   | BS EN ISO 9377-2   |
| Free Cyanide  | EN ISO 14403-1 or -2   |
| Adsorbable organically bound halogens                                   | EN ISO 9562  |
| Arsenic   | BS EN ISO 11885 or BS EN ISO 17294-2 or BS EN ISO 15586  |
| Cadmium   |  |
| Chromium  |  |
| Copper  |  |
| Lead  |  |
| Nickel  |  |
| Zinc  |  |
| Mercury   | BS EN ISO 17852 or BS EN ISO 12846   |
| Hexavalent Chromium   | BS EN ISO 11885, BS EN ISO 17294-2 or BS EN ISO 15586  |
| Priority Substances (including Priority Hazardous Substances), specific | Testing to be completed by a UKAS accredited laboratory using the method defined within the guidance: Monitoring |

| <b>Parameter</b>   | <b>Monitoring Standard</b>   |
|--|--|
| Pollutants and Other Pollutants with EQS values defined for freshwater | discharges to water: CEN and ISO monitoring methods where available.<br>The targeted LOD should be less than 10% of the EQS. |

<https://www.gov.uk/government/publications/monitoring-discharges-to-water-cen-and-iso-monitoring-methods>



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