

## Cilfor Water Management Plan Summary 24-05-23

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### **1.0 Proposed discharge**

Ref. Water Management Plan (WMP) Section 5.

The Cilfor surface water discharge will be derived from two main sources

- Abstracted groundwater 40 – 220 m<sup>3</sup>/day;
- Contaminated rainfall runoff 114 m<sup>3</sup>/day;

The Cilfor surface water discharge volume will vary during the construction works from 40m<sup>3</sup>/day potentially up to 300 m<sup>3</sup> /day. The maximum daily discharge rate is expected during a seven month period between July 2024 and February 2025 when the shaft is being excavated.

The average (non-rainfall) daily discharge rate at Cilfor site during shaft excavation is expected to be approximately 120 m<sup>3</sup>/day.

The water discharged will be treated on site to remove sediment and to balance the pH to achieve a neutral pH between 6 – 10. The water treatment plant will be designed and operated to achieve a suspended solids concentration of less than 60mg/l.



## **2.0 Lagoon capacity**

Cilfor will have a water balancing lagoon on site upstream of the water treatment plant. The lagoon size is still to be confirmed but it is expected to have a minimum storage capacity of 300m<sup>3</sup>.

## **3.0 Treatment Process stages including chemicals used**

Ref. WMP Section 6.3

Water to be discharged off site will be temporarily stored in a flow balancing lagoon. The water in the balancing lagoon will be pumped to a three stage treatment process to remove oil, suspended solids and adjust the pH.

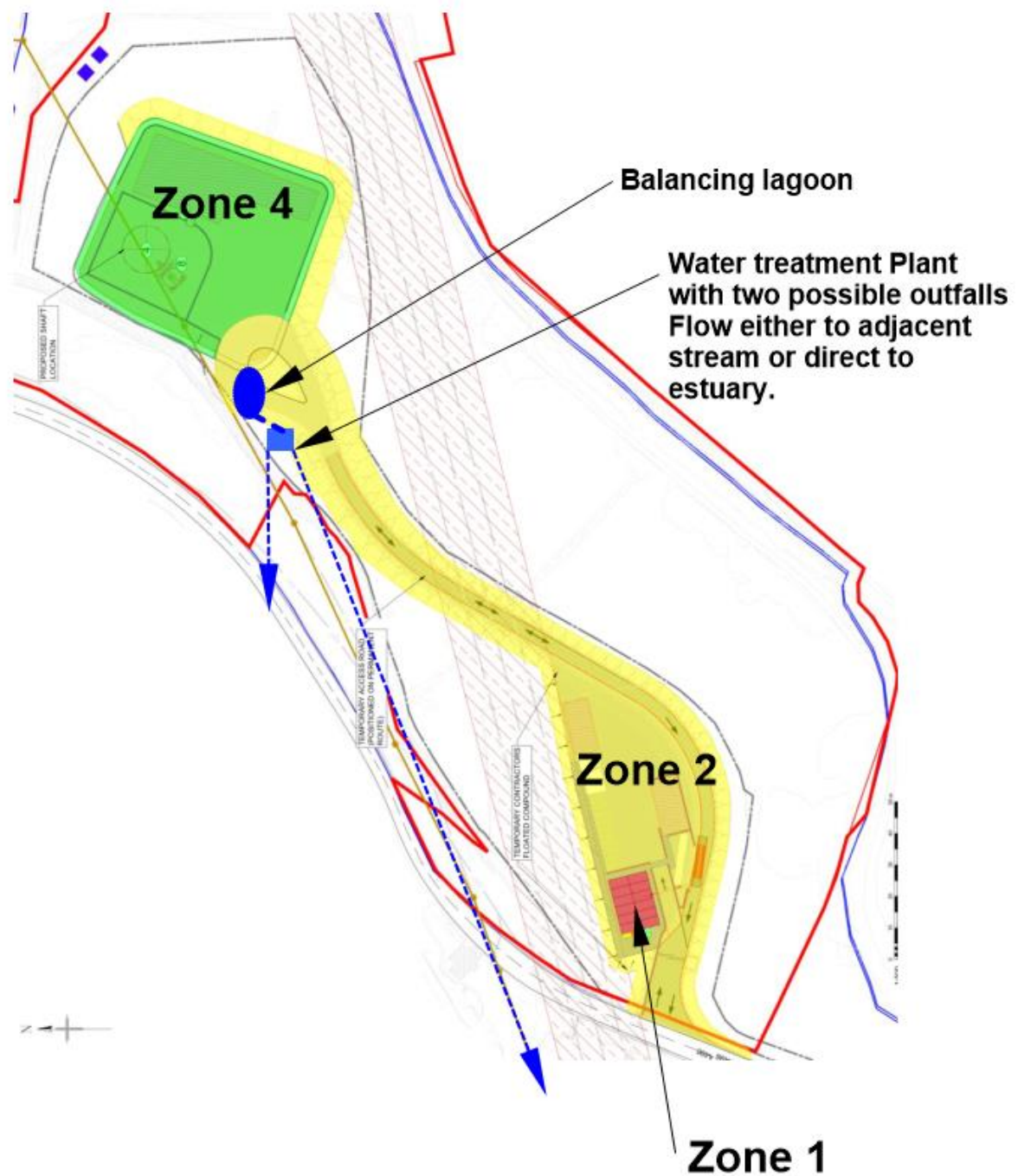
The Garth water discharge treatment process will comprise:

- Siltbuster HB50 (or similar) tilted plate oil water separator which will remove free floating oil and light non-aqueous phase liquids (LNAPLs);
- Suspended solids reduction units using Siltbuster HB50 units (or similar) with the following chemical pre-treatment:
  - Coagulant (poly Aluminum Chloride). This will cause the fine particles to aggregate together into larger particles;
  - Flocculant (Anionic Polymer) will be added to bind the particles together and increase the particle size to enhance the settlement rate;
- pH adjustment unit using Carbon Dioxide.

The Cilfor water discharge treatment process will include the same elements as the Garth site but will also have an additional process using Caustic Soda to neutralise acidic waters should these be encountered. This will maintain neutral pH and minimise the risk of acidic conditions that may be encountered in peatlands.

The water treatment plant will be operated in accordance with an environmental permit. The treated water will be discharged to either an ordinary water course or a main river.

#### 4.0 Site Plan showing water flow paths



Ref. WMP Fig 5.2.2 Cilfor Rainfall Runoff Zones and proposed water treatment schematic

#### 5.0 Chemical Data sheets

See Attached.

#### 6.0 Details monitoring programme

Ref. WMP Section 9.

“Water sampling will be undertaken prior to construction to ascertain baseline conditions for water courses within the Scheme boundary.

All discharge outfalls shall be tagged and monitored. Corrective and preventative measure will be implemented as required. During the construction phase to ensure the adherence to water quality standards HUK will undertake visual daily checks, weekly inspections and monthly audits of nearby watercourses.

In addition HUK will install water monitoring equipment at the eastern and western construction compounds downstream of construction and discharge activities. The water quality monitoring equipment will provide 24hr monitoring of surface water discharge quality with a live alarm system. The parameters to be monitored will include:

- dissolved oxygen,
- conductivity,
- pH,
- salinity,
- oxidation-reduction potential (ORP),
- temperature, and
- turbidity.

The NRW water discharge consent conditions will inform the water discharge quality testing specification and sampling frequency.

Each surface water discharge will be sampled at least monthly and analysed for the following parameters:

- Chemical Oxygen Demand (mg O<sub>2</sub>/l)
- Biochemical Oxygen Demand (mg O<sub>2</sub>/l)
- Suspended Solids (mg/l)
- Settleable Solids (mg/l)
- Total Solids (mg/l)
- Fats / Oil / Grease (mg/l)
- pH
- Ammoniacal Nitrogen (mg/l)
- Nitrogen (mg/l)
- Phosphates (mg/l)
- Salinity (mg/l)
- Conductivity (uS/cm)
- Redox Potential (mV)
- Turbidity (NTU)
- Iron (ug/l)

Water samples will be collected by the HTUK environmental manager or a person trained and delegated by them to collect suitable water samples. Water samples will be temporarily stored under refrigerated conditions pending collection by the analytical laboratory tasked with undertaking the chemical analysis of the water samples. Initially the chemical analysis laboratory will be:

ALS Laboratories (UK) Ltd, Torrington Avenue, Coventry, CV4 9GU  
[www.alsenvironmental.co.uk](http://www.alsenvironmental.co.uk) T: +44 (0)24 7642 1213

A stock of water sample bottles will be stored on site to enable adhoc water samples to be collected. In the event of a water pollution incident additional water samples will be taken to both assess the impact of the incident and demonstrate the effectiveness of the resulting clean up and or mitigation works.

All SUDS features in addition to outfalls will be monitored by works staff to ensure blockages do not occur during construction. A suitable monitoring programme will be implemented by HUK with records kept of any maintenance requirements to be undertaken on a reasonable timescale by a suitably qualified person. A monitoring checklist would include:

- Water quality monitoring at discharge points to local drains;
- Visual inspection of ditches;
- Visual inspection of above ground drainage and water supply infrastructure.

Silt fencing locations will be marked drawings (see Appendix F) included in appropriate RAMs such as Garth site establishment RAMs to be developed by the sub-contractor Jennings Ltd. The location of silt fencing will be informed by the location of sensitive receptors which will be described in pre-start briefings.

The silt fencing will be inspected on a weekly basis by the environmental manager or engineer in their absence. All engineers completing checks will complete a full inspection of water courses and environmental mitigation measures on site with the environmental manager prior to carrying out an unsupervised inspection.

Silt fencing location drawings to be included in the temporary works register.

During dewatering operations the mitigation measures will be inspected at regular intervals and maintained as required. All such dewatering operations will be subject to HTUK's Permit to Pump procedures. “

## **7.0 Emergency contacts should incident occur**

Ref. WMP Section 10.3

### **“10.3 Emergency contacts should incidents occur**

A Pollution Incident is an occurrence that requires an immediate response to prevent and control damage to the environment.

A suitable number of Incident Controllers (minimum of one per site per shift) shall be appointed in accordance with 00000-HUK-GHS-XX-PC-Z-0048 Appointment of Key Personnel with SHE Responsibilities, with responsibilities for liaison, supervision, and control in the event of an emergency.

Contact details for HTUK supervisors will be maintained on the SHE Notice Board(s) and identified during start of shift briefings.

The Project Manager is the SVIP project's principal Incident Controller. Hochtief staff that deputise for the principal Incident Controller include the SVIP project's Site Agents and the Works Manager.

Project Manager	David Murray	david.murray@hochtief.co.uk
Site Agent	Rhys Davis	rhys.davis@hochtief.co.uk
Site Agent	Iwan Rowlands	iwan.rowlands@hochtief.co.uk
Site Agent	Charles Enston	charles.enston@hochtief.co.uk
Works Manager	Kevin O'Brian	kevin.obrian@hochtief.co.uk”

## 8.0 Responsibilities

Ref. WMP section 10.4

### “10.4 Responsibilities

The Pollution Incident Response Plan is described in the following document:  
Pollution Incident Control Plan doc ref. C0233-ATM-GES-XX-PL-X-0008.

The document is updated at least six monthly and reviewed and accepted by a project director prior to re-issue.

In summary the procedure is Stop, Contain and Report. The HTUK staff responsible for the various aspects of the Pollution Incident Response Plan is outlined in Table 10.4 below.

**Table 10.4 Pollution Incident Response Plan Responsibilities**

	Action	Responsibility
1	<b>Stop</b> the Spill if you can by standing up the drum, stopping the flow, turning off the tap etc. as appropriate, decant any remaining liquid into a secure vessel and label. Try not to stand in the spill	All site staff/ site supervisor
2	<b>Contain</b> the spillage using an appropriate spill kit, so preventing the spillage from spreading and/or entering a drainage system or water course	All site staff/ site supervisor
3	<b>Inform</b> the site supervisor (Incident Controller for major if major pollution incident) who will take charge of the process and ensure the spill has been effectively stopped and contained.	All site staff
4	Escalation the site supervisor/ Incident Controller will inform: <ul style="list-style-type: none"><li>• Environmental Manager</li><li>• Ecological Clerk of Works</li><li>• HTUK Project Director</li><li>• NG Project Manager (within 1 hour)</li></ul>	Site supervisor / incident controller
5	Assess the risk that the spillage poses to: the health and safety of people on site and in the surrounding vicinity; and the environment	All site staff/ site supervisor
6	Assess whether the spillage can be cleaned up by site staff or if a major pollution incident requires specialist contractor (e.g. DARCY GROUP 01732 441019)	Site supervisor / incident controller
7	As appropriate inform the Emergency Services, local police, NRW, water supplier. NRW must be informed in the event of a spillage entering a live drainage system or watercourse (use 24hour Incident Hotline Number: 0300 065 3000). Assistance to be provided to the authorities should they attend site. HTUK must be notified immediately of any such event	Site supervisor / incident controller
8	Obtain the appropriate PPE (in accordance with the material COSHH sheet and the nature of the clean-up works to be undertaken).	All site staff/ site supervisor
9	Clean up the spill using the appropriate spill kit. Treat all material in contact with the spill as contaminated	All site staff/ site supervisor/ specialist contractor
10	Re-assess the situation. Do you have the appropriate PPE? Have all of the relevant parties been informed	All site staff/ site supervisor/ specialist contractor
11	Decontaminate the site and all personnel that have come into contact with the spill. Dispose of PPE, all contaminated materials and the used spill kits as hazardous waste	All site staff/ site supervisor/ specialist contractor
12	Replace spill kits used and remove all contaminated material	Site supervisor
13	Project Director and SHESQ Manager will instigate an investigation into the incident's cause. An action plan will be prepared to determine why the incident occurred and whether any modifications to working practices are required to prevent a recurrence. If necessary the CE&SMP, PICP and Construction Phase Plan will be updated (and any other plans as appropriate) and all workers will be notified.	Project Director/ HSQE Manager

## 9.0 Environmental incident reporting

Ref. WMP Section 10.5

### “10.5 Environmental incident reporting

Incident reporting shall be carried out in accordance with HTUK procedure 0000-HUK-GHS-XX-PC-Z-0021 Incident and Accident Reporting Investigation and NG INV01.”

## 10.0 Concrete wash treatment and disposal

Ref. WMP Appendix B4

### “B4 Concrete and grout wash out water treatment and disposal

A variety of concrete and grouts mixes will be used on site to construct the shaft and tunnel linings. Some of these materials will be delivered to site as a readymix material ready to be poured straight away and some will be mixed on site and pumped to where needed.



**Figure B4 Concrete wash out skip at Garth site 10-05-23**

Readymix delivery vehicles may need to be washed before leaving site. A concrete wash out skip will be used for this purpose. These will retain the solids and allow drained water to be collected and reintroduced back into water treatment systems. An example of concrete wash skip in use at Garth site in May 2023 is shown in Figure B4 above

Larger volumes of concrete and grout wash water generated from the washing of grout mixing and pumping equipment used by piling rigs and TBM equipment will be treated on site to neutralise the wash water and remove gross solids prior to reusing the water in later grout and concrete mixes. The STP and water discharge treatment plant will both have sedimentation and pH neutralisation equipment. Early works undertaken before the installation of the STP and water discharge treatment plant may require supplementary treatment equipment. Suppliers of suitable proprietary concrete and grout wash out equipment with pH neutralisation include:

- [www.kellytanks.co.uk](http://www.kellytanks.co.uk)
- [www.siltbuster.co.uk](http://www.siltbuster.co.uk)”



SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

Version 9.0

Print Date 2019/04/24

Revision date / valid from 2019/04/24

MSDS code: MPAC100

**SECTION 1: Identification of the substance/mixture and of the company/undertaking**

**1.1. Product identifier**

Trade name : POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)

**1.2. Relevant identified uses of the substance or mixture and uses advised against**

Use of the Substance/Mixture : Water treatment chemical

Uses advised against : At this moment we have not identified any uses advised against

**1.3. Details of the supplier of the safety data sheet**

Company : Brenntag UK Limited  
Alpha House, Lawnswood Business Park  
GB LS16 6QY Leeds  
Telephone : +44 (0) 113 3879 200  
Telefax : +44 (0) 113 3879 280  
E-mail address : msds@brenntag.co.uk

**1.4. Emergency telephone number**

Emergency telephone number : Emergency only telephone number (open 24 hours):  
+44 (0) 1865 407333 (N.C.E.C. Culham)

**SECTION 2: Hazards identification**

**2.1. Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008


REGULATION (EC) No 1272/2008			
Hazard class	Hazard category	Target Organs	Hazard statements
Serious eye damage	Category 1	---	H318
Corrosive to metals	Category 1	---	H290

For the full text of the H-Statements mentioned in this Section, see Section 16.

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****Most important adverse effects**

Human Health	:	See section 11 for toxicological information.
Physical and chemical hazards	:	Small amounts of hydrogen chloride may be release at temperatures above the boiling point., May lower the pH of the water and thus be harmful to aquatic organisms.
Potential environmental effects	:	See section 12 for environmental information.

**2.2. Label elements****Labelling according to Regulation (EC) No 1272/2008**

Hazard symbols	:	
Signal word	:	Danger
Hazard statements	:	H290 May be corrosive to metals. H318 Causes serious eye damage.
Precautionary statements	:	
Prevention	:	P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P261 Avoid breathing spray. P234 Keep only in original packaging.
Response	:	P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 Immediately call a POISON CENTER/doctor. P390 Absorb spillage to prevent material damage.
Storage	:	P406 Store in a corrosion resistant container with a resistant inner liner.
Disposal	:	P501 Dispose of contents/ container in accordance with the local/regional/international regulations.

**Hazardous components which must be listed on the label:**

- Aluminum chloride hydroxide sulfate

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****2.3. Other hazards**

For Results of PBT and vPvB assessment see section 12.5.

**SECTION 3: Composition/information on ingredients****3.2. Mixtures**

		Classification (REGULATION (EC) No 1272/2008)	
Hazardous components	Amount [%]	Hazard class / Hazard category	Hazard statements
<b>Aluminum chloride hydroxide sulfate</b>			
CAS-No. : 39290-78-3	>= 15 - <= 25	Eye Dam.1 Met. Corr.1	H318 H290
EC-No. : 254-400-7			
EU REACH- : 01-2119531540-51-xxxx			
Reg. No.			

For the full text of the H-Statements mentioned in this Section, see Section 16.

**SECTION 4: First aid measures****4.1. Description of first aid measures**

General advice	: Show this safety data sheet to the doctor in attendance.
If inhaled	: Move to fresh air. If symptoms persist, call a physician. If unconscious, place in recovery position and seek medical advice.
In case of skin contact	: Wash off with plenty of water. If skin irritation persists, call a physician.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Rinse mouth with water. Do NOT induce vomiting. If a person vomits when lying on his back, place him in the recovery position. If symptoms persist, call a physician.

**4.2. Most important symptoms and effects, both acute and delayed**

Symptoms	: corrosive effects, Serious eye damage, See Section 11 for more detailed information on health effects and symptoms.
Effects	: See Section 11 for more detailed information on health effects

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

and symptoms.

**4.3. Indication of any immediate medical attention and special treatment needed**

Treatment : Treat symptomatically.

**SECTION 5: Firefighting measures****5.1. Extinguishing media**

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Not combustible.

Unsuitable extinguishing media : High volume water jet

**5.2. Special hazards arising from the substance or mixture**

Specific hazards during firefighting : Heating or fire can release toxic gas.

Hazardous combustion products : Hydrogen chloride, Sulphur oxides, Carbon oxides

**5.3. Advice for firefighters**

Special protective equipment for firefighters : Wear self-contained breathing apparatus and full protective suit when necessary.

Further advice : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

**SECTION 6: Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

Personal precautions : Use personal protective equipment. Avoid contact with skin, eyes and clothing. Provide adequate ventilation.

**6.2. Environmental precautions**

Environmental precautions : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

**6.3. Methods and materials for containment and cleaning up**

Methods and materials for containment and cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Further information : Treat recovered material as described in the section "Disposal considerations".

**6.4. Reference to other sections**

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

See Section 1 for emergency contact information.  
See Section 8 for information on personal protective equipment.  
See Section 13 for waste treatment information.

**SECTION 7: Handling and storage****7.1. Precautions for safe handling**

- Advice on safe handling : Keep container tightly closed. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.
- Hygiene measures : Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Small amounts of hydrogen chloride may be release at temperatures above the boiling point.

**7.2. Conditions for safe storage, including any incompatibilities**

- Requirements for storage areas and containers : Keep containers tightly closed.
- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Further information on storage conditions : Keep tightly closed in a dry and cool place. Keep in a well-ventilated place. Protect from frost, heat and sunlight.
- Advice on common storage : Keep away from food, drink and animal feedingstuffs. Materials to avoid: Chlorite Sulphite Iron Galvanised surfaces Hypochlorites Metals
- Storage temperature : > 0 - < 30 °C

**7.3. Specific end use(s)**

- Specific use(s) : No information available.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters**

<b>Component:</b>	<b>Aluminum chloride hydroxide sulfate</b>	<b>CAS-No. 39290-78-3</b>
<b>Other Occupational Exposure Limit Values</b>		

UK. EH40 Workplace Exposure Limits (WELs), Time Weighted Average (TWA):  
2 mg/m<sup>3</sup>

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

ELV (IE), Time Weighted Average (TWA):  
2 mg/m<sup>3</sup>

**8.2. Exposure controls****Appropriate engineering controls**

Refer to protective measures listed in sections 7 and 8.

Provide sufficient air exchange and/or exhaust in work rooms.

**Personal protective equipment***Respiratory protection*

Advice : Breathing apparatus needed only when aerosol or mist is formed.  
In case of intensive or longer exposure use self-contained breathing apparatus.  
In case of brief exposure or low pollution use breathing filter apparatus.  
Combination filter: A-P2

*Hand protection*

Advice : Protective gloves should be replaced at first signs of wear.

Material : PVC  
Break through time : > 480 min  
Guideline : DIN EN 374

Material : Neoprene  
Break through time : > 480 min  
Guideline : DIN EN 374

*Eye protection*

Advice : Tightly fitting safety goggles  
Ensure that eyewash stations and safety showers are close to the workstation location.

*Skin and body protection*

Advice : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific workplace.  
Wear appropriate chemical resistant clothing and boots.

*Protective measures*

Advice : Handle in accordance with good industrial hygiene and safety practice.  
Ensure that eye flushing systems and safety showers are located close to the working place.

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****Environmental exposure controls**

General advice : Do not flush into surface water or sanitary sewer system.  
Avoid subsoil penetration.

**SECTION 9: Physical and chemical properties****9.1. Information on basic physical and chemical properties**

Form	: liquid
Colour	: clear yellowish
Odour	: not significant
Odour Threshold	: no data available
pH	: 1.5 - 2.5
Crystallization point	: -11 °C
Boiling point/boiling range	: 100 - 120 °C
Flash point	: Not applicable
Evaporation rate	: no data available
Flammability (solid, gas)	: The product is not flammable.
Upper explosion limit	: Not applicable
Lower explosion limit	: Not applicable
Vapour pressure	: no data available
Relative vapour density	: no data available
Density	: 1.19 - 1.23 g/cm <sup>3</sup>
Water solubility	: (20 °C) completely soluble
Partition coefficient: n-octanol/water	: Not applicable
Auto-ignition temperature	: no data available
Thermal decomposition	: > 200 °C Do not allow evaporation to dryness.
Viscosity, dynamic	: ca. 10 - 20 mPa.s (20 °C)
Explosivity	: Not applicable
Oxidizing properties	: not oxidising

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****9.2. Other information**

Surface tension : not determined

**SECTION 10: Stability and reactivity****10.1. Reactivity**

Advice : No decomposition if stored and applied as directed.  
Is corrosive to metals.

**10.2. Chemical stability**

Advice : Stable under recommended storage conditions.

**10.3. Possibility of hazardous reactions**

Hazardous reactions : In contact with metals generates hydrogen gas, which together with air can form explosive mixtures. Strong bases cause violent reaction by neutralisation.

**10.4. Conditions to avoid**

Conditions to avoid : Extremes of temperature and direct sunlight. Keep from freezing.  
Thermal decomposition : >200 °C  
Do not allow evaporation to dryness.

**10.5. Incompatible materials**

Materials to avoid : Galvanised metals, Metals, Bases, Aluminium, Copper, Iron, Leather

**10.6. Hazardous decomposition products**

Hazardous decomposition products : Small amounts of hydrogen chloride may be release at temperatures above the boiling point.

**SECTION 11: Toxicological information****11.1. Information on toxicological effects****Data for the product****Acute toxicity****Oral**

Please find this information in the listing of the component/components below in this section.

**Inhalation**

no data available



**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****Dermal**

no data available

**Irritation****Skin**

Result : Prolonged or repeated contact may dry skin and cause irritation.

**Eyes**

Result : Causes serious eye damage.

**Sensitisation**

Result : not sensitizing

**CMR effects****CMR Properties**

Carcinogenicity : Contains no ingredient listed as a carcinogen  
 Mutagenicity : Contains no ingredient listed as a mutagen  
 Teratogenicity : It is not considered teratogenic.  
 Reproductive toxicity : Contains no ingredient listed as toxic to reproduction

**Specific Target Organ Toxicity****Single exposure**

Remarks : The substance or mixture is not classified as specific target organ toxicant, single exposure.

**Repeated exposure**

Remarks : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

**Other toxic properties****Repeated dose toxicity**

Repeated or prolonged skin contact may cause skin irritation and/or dry skin.

**Aspiration hazard**

No aspiration toxicity classification,

<b>Component:</b>	<b>Aluminum chloride hydroxide sulfate</b>	<b>CAS-No. 39290-78-3</b>
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**Acute toxicity****Oral**

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

LD50 : 2360 mg/kg (Rat)

**Inhalation**

LC50 : > 5 mg/l (Rat, male and female; 4 h; dust/mist) (OECD Test Guideline 403)

**Dermal**

LD50 : > 2000 mg/kg (Rat, male and female) (OECD Test Guideline 402)

**Irritation****Skin**

Result : No skin irritation (Rabbit) (OECD Test Guideline 404)

**Eyes**

Result : No valid data available.

**Sensitisation**

Result : not sensitizing (Maximisation Test; Dermal; Guinea pig) (OECD Test Guideline 406) Read-across (Analogy)

**CMR effects****CMR Properties**

Carcinogenicity : No known significant effects or critical hazards.  
Mutagenicity : In vitro tests did not show mutagenic effects  
Read-across (Analogy)  
Teratogenicity : Did not show mutagenic or teratogenic effects in animal experiments.  
Reproductive toxicity : Animal testing did not show any effects on fertility.  
Read-across (Analogy)

**SECTION 12: Ecological information****12.1. Toxicity****Data for the product****Acute toxicity****Short-term (acute) aquatic hazard**

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

Result : The product is not classified as dangerous for the environment.

<b>Component:</b>	<b>Aluminum chloride hydroxide sulfate</b>	<b>CAS-No. 39290-78-3</b>
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**Acute toxicity****Fish**

EC50 :  $\geq 0.156$  mg/l (Danio rerio (zebra fish); 96 h; Test substance: dissolved Al) (semi-static test; OECD Test Guideline 203)Read-across (Analogy)

NOEC  $\geq 1000$  mg/l (Danio rerio (zebra fish); 96 h) (semi-static test; OECD Test Guideline 203)Read-across (Analogy)

**Toxicity to daphnia and other aquatic invertebrates**

EC50 : 98 mg/l (Daphnia magna (Water flea); 48 h) (semi-static test; OECD Test Guideline 202)Read-across (Analogy)

**algae**

NOEC : 1 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Growth rate; OECD Test Guideline 201)Read-across (Analogy)

EC10 3.1 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Growth rate; OECD Test Guideline 201)Read-across (Analogy)

EC50 14 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Growth rate; OECD Test Guideline 201)Read-across (Analogy)

**Bacteria**

EC50 :  $> 100$  mg/l (activated sludge; 3 h) (static test; End point: Respiration inhibition; OECD Test Guideline 209)Read-across (Analogy)

EC50  $> 4.4$  mg/l (activated sludge; 3 h; Test substance: dissolved Al) (static test; End point: Respiration inhibition; OECD Test Guideline 209)Read-across (Analogy)

**12.2. Persistence and degradability****Data for the product****Persistence and degradability****Biodegradability**

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

Result : The methods for determining the biological degradability are not applicable to inorganic substances.

**Component:** Aluminum chloride hydroxide sulfate **CAS-No.** 39290-78-3

**Persistence and degradability****Persistence**

Result : no data available

**Biodegradability**

Result : The methods for determining the biological degradability are not applicable to inorganic substances.

**12.3. Bioaccumulative potential****Data for the product****Bioaccumulation**

Result : Bioaccumulation is unlikely.

**Component:** Aluminum chloride hydroxide sulfate **CAS-No.** 39290-78-3

**Bioaccumulation**

Result : Does not bioaccumulate.

**12.4. Mobility in soil****Data for the product****Mobility**

Result : The product is water soluble., Known distribution to environmental compartments

**Surface tension**

Result : not determined

**Component:** Aluminum chloride hydroxide sulfate **CAS-No.** 39290-78-3

**Mobility**

Water : The product is water soluble.

**12.5. Results of PBT and vPvB assessment****Data for the product**

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****Results of PBT and vPvB assessment**

Result : This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).

**Component:** Aluminum chloride hydroxide sulfate **CAS-No. 39290-78-3**

**Results of PBT and vPvB assessment**

Result : The PBT or vPvB criteria of Annex XIII to the REACH Regulation does not apply to inorganic substances.

**12.6. Other adverse effects****Data for the product****Additional ecological information**

Result : Solutions with low pH-value must be neutralized before discharge. Ecological injuries are not known or expected under normal use.

**SECTION 13: Disposal considerations****13.1. Waste treatment methods**

- Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.
- Contaminated packaging : Dispose of contaminated packaging in the same way as the product. In accordance with local and national regulations.
- European Waste Catalogue Number : No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

**SECTION 14: Transport information****14.1. UN number**

3264

**14.2. UN proper shipping name**

- ADR** : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
(Aluminum chloride hydroxide sulfate)
- RID** : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
(Aluminum chloride hydroxide sulfate)
- IMDG** : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.  
(Aluminum chloride hydroxide sulfate)

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)****14.3. Transport hazard class(es)**

ADR-Class	: 8
(Labels; Classification Code; Hazard identification No; Tunnel restriction code)	8; C1; 80; (E)
RID-Class	: 8
(Labels; Classification Code; Hazard identification No)	8; C1; 80
IMDG-Class	: 8
(Labels; EmS)	8; F-A, S-B

**14.4. Packaging group**

ADR	: III
RID	: III
IMDG	: III

**14.5. Environmental hazards**

Environmentally hazardous according to ADR	: no
Environmentally hazardous according to RID	: no
Marine Pollutant according to IMDG-Code	: no

**14.6. Special precautions for user**

Not applicable.

**14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

IMDG : Not applicable.

**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****15.2. Chemical safety assessment**

There is no data available for this product.

**SECTION 16: Other information****Full text of H-Statements referred to under sections 2 and 3.**

H290	May be corrosive to metals.
H318	Causes serious eye damage.

**Abbreviations and Acronyms**

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

<b>BCF</b>	bioconcentration factor
<b>BOD</b>	biochemical oxygen demand
<b>CAS</b>	Chemical Abstracts Service
<b>CLP</b>	Classification, Labelling and Packaging
<b>CMR</b>	carcinogenic, mutagenic or toxic to reproduction
<b>COD</b>	chemical oxygen demand
<b>DNEL</b>	derived no-effect level
<b>EINECS</b>	European Inventory of Existing Commercial Chemical Substances
<b>ELINCS</b>	European List of Notified Chemical Substances
<b>GHS</b>	Globally Harmonized System of Classification and Labelling of Chemicals
<b>LC50</b>	median lethal concentration
<b>LOAEC</b>	lowest observed adverse effect concentration
<b>LOAEL</b>	lowest observed adverse effect level
<b>LOEL</b>	lowest observed effect level
<b>NLP</b>	no-longer polymer
<b>NOAEC</b>	no observed adverse effect concentration
<b>NOAEL</b>	no observed adverse effect level
<b>NOEC</b>	no observed effect concentration
<b>NOEL</b>	no observed effect level
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>OEL</b>	occupational exposure limit
<b>PBT</b>	persistent, bioaccumulative and toxic
<b>REACH Auth. No.:</b>	REACH Authorisation Number
<b>REACH AuthAppC. No.</b>	REACH Authorisation Application Consultation Number
<b>PNEC</b>	predicted no-effect concentration
<b>STOT</b>	specific target organ toxicity
<b>SVHC</b>	substance of very high concern
<b>UVCB</b>	substance of unknown or variable composition, complex reaction products or biological materials
<b>vPvB</b>	very persistent and very bioaccumulative

**Further information**

Key literature references and sources for data	:	Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.
Methods used for product classification	:	The classification for human health, physical and chemical hazards and environmental hazards were derived from a combination of calculation methods and if available test data.
Hints for trainings	:	The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safety Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.

**POLYALUMINIUM CHLORIDE HYDROXIDE SULPHATE (PAC)**

Other information :

The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

|| Indicates updated section.



# Carbon dioxide (Food Fresh)

PRODUCT : CARBON DIOXIDE (FOOD FRESH) MSDS NR : 300-00-0036 BOC VERSION : 1.03 DATE : 29/01/2004 PAGE : 1/2

## 1 IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY

<b>Product name</b>	Carbon dioxide
<b>Chemical formula</b>	CO <sub>2</sub>
<b>Company identification</b>	see footer
<b>Emergency phone Nos</b>	see footer

## 2 COMPOSITION/INFORMATION ON INGREDIENTS

<b>Substance/Preparation</b>	Substance
<b>Components/Impurities</b>	Contains no other components or impurities which will influence the classification of the product.
<b>CAS Nr</b>	124-38-9
<b>EEC Nr (from EINECS)</b>	204-696-9
<b>Specifications</b>	99.8% Conforms to BS4105 part 1 I and E290

## 3 HAZARDS IDENTIFICATION

### Hazards identification

Liquefied gas under pressure. In high concentrations may cause asphyxiation. When liquid carbon dioxide under pressure is released to atmosphere, the discharge consists of gaseous and solid carbon dioxide only. Slightly corrosive in the presence of moisture. Solid carbon dioxide is white and when in direct contact with the skin will cause acute cold damage to skin – "cold burn". One volume of liquid or solid will give about 500 or 900 volumes of gas, respectively, at ambient conditions. Not classified as a dangerous substance.

## 4 FIRST AID MEASURES

### Inhalation

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Low concentrations of CO<sub>2</sub> cause increased respiration and headache. Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

### Skin/eye contact

Immediately flush eyes thoroughly with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

### Ingestion

Ingestion is not considered a potential route of exposure.

## 5 FIRE FIGHTING MEASURES

### Specific hazards

Exposure to fire may cause containers to rupture/explode. Non flammable. Inform Fire Brigade.

### Hazardous combustion products

None.

### Suitable extinguishing media

All known extinguishants can be used.

### Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position. Inform emergency services of the nature of the product and the possibility of bursting disc rupture (the cylinder is fitted with a bursting disc which will rupture and allow the contents to completely discharge if heat causes the carbon dioxide pressure to exceed the maximum permissible service level). Notify BOC to collect any cylinder(s) involved in a fire. Ensure such cylinders are clearly labelled.

### Special protective equipment for fire fighters

In confined space use self-contained breathing apparatus.

## 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions

Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe: check using a carbon dioxide measuring device. Ensure adequate air ventilation. Post warning notices.

### Environmental precautions

Try to stop release if safe to do so. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

**Clean up methods** Ventilate area.

## 7 HANDLING AND STORAGE

### Handling and storage

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Normal materials of construction are suitable for dry gas of ambient temperature. Below –30°C only use low temperature carbon steel, austenitic stainless steels, aluminium, copper and their alloys. If carbon dioxide is dissolved in water, particularly at elevated pressures and in the presence of oxygen, use materials resistant to carbonic acid, eg. stainless steel or Monel. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact BOC if in doubt. Refer to BOC container handling instructions. Keep container below 50°C in a well ventilated place. Do not heat cylinder.

## 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure limits

Carbon dioxide Occupation Exposure Standard (OES):  
Long Term Exposure Limit (LTCL) 5000ppm  
Short Term Exposure Limit (STEL) 15000ppm

### Personal protection

Ensure adequate ventilation. Carbon dioxide monitoring is recommended if used or stored in a confined space.

## 9 PHYSICAL AND CHEMICAL PROPERTIES

<b>Molecular weight</b>	44
<b>Melting point</b>	–56.6°C
<b>Sublimation point</b>	–78.5°C
<b>Critical temperature</b>	30°C
<b>Relative density, gas</b>	1.52 (air = 1)
<b>Relative density, liquid</b>	0.82 (water = 1)
<b>Vapour Pressure 20°C</b>	57.3 bar
<b>Solubility mg/l water</b>	2000 mg/l
<b>Appearance/Colour</b>	Colourless gas
<b>Odour</b>	In high concentrations, a sharp smell may become apparent.
<b>Other data</b>	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## 10 STABILITY AND REACTIVITY

<b>Stability and reactivity</b>	Stable under normal conditions
---------------------------------	--------------------------------

## 11 TOXICOLOGICAL INFORMATION

### General

High concentrations cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness. Carbon dioxide is mildly toxic, with no cumulative effects.

**12 ECOLOGICAL INFORMATION**

<b>General</b>	When discharged in large quantities may contribute to the greenhouse effect.
<b>Global warming factor</b>	1

**13 DISPOSAL CONSIDERATIONS****General**

Do not discharge into any place where its accumulation could be dangerous. Discharge to atmosphere in large quantities should be avoided. Contact BOC if guidance is required.

**14 TRANSPORT INFORMATION**

<b>Proper Shipping Name</b>	Carbon dioxide
<b>UN Nr</b>	1013
<b>Class/Div</b>	2.2
<b>ADR/RID Classification Code</b>	2A
<b>ADR/RID Hazard Nr</b>	20
<b>Labelling ADR</b>	Label 2.2: non flammable non toxic gas

**Other transport information**

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and:

- cylinder valve is closed and not leaking.
- valve outlet cap nut or plug (where provided) is correctly fitted.
- valve protection device (where provided) is correctly fitted.
- adequate ventilation.
- compliance with applicable regulations.

**15 REGULATORY INFORMATION**

<b>Number in Annex I of Dir 67/548</b>	Not included in Annex I.
<b>Designation in Dir 95/2/EC</b>	E290
<b>EC Classification</b>	Not classified as dangerous substance.
<b>Labelling of cylinders – Symbols</b>	Label 2.2: non flammable non toxic gas.

**16 OTHER INFORMATION**

Ensure all national/local regulations are observed.

Do not breathe the gas.

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Contact with liquid may cause cold burns and/or frostbite. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Do not use any other gas as a substitute for carbon dioxide. Always leak check cylinders when first collected, delivered or used, using an approved leak detection fluid.

Keep container in well ventilated place

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

For further safety information please refer to "Safe Under Pressure" and "Safe handling, storage and transport of industrial gas cylinders", both of which are available from your local BOC outlet.

**CYLINDER CHARACTERISTICS**

Cylinder Size	Maximum Filled Pressure at 15°C (bar)	Approx. Dimensions incl. valve and guard where supplied (mm)	Approx. Full Cylinder weight (kg)	Manifolded Cylinder Pallets (MCPs)	Maximum Filled Pressure at 15°C (bar)	Approx. Dimensions incl. cylinders (mm)	Max. Gross Weight (kg)
VB/LB	50	140 x 940	17.4	TKL	50	840 x 1280 x 1839	1368
VK/LK	50	230 x 1496	99	TKV	50	840 x 1280 x 1839	1368
				WL	50	1280 x 1705 x 830	1368
				WV	50	1280 x 1705 x 830	1368



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**For product and safety enquiries please phone**

**In the United Kingdom:**

**0800 111 333**

**BOC**

**Customer Service Centre  
Priestley Road, Worsley  
Manchester M28 2UT  
Fax: 0800 111 555**

**In Ireland:**

**Dublin (01) 409 1800**

**BOC**

**P.O. Box 201  
Bluebell, Dublin 12  
Fax: 01 409 1805**

SFT/007296/APUK/0204/1M

## Material Safety Data Sheet

Page 1 of 5

### Section 1: Identification of Substance/mixture and of the company undertaking

#### 1.1: Product Identifier

Product Name    AQUATREAT 2084

#### 1.2: Relevant Identified use of substance/mixture and uses advised against

#### 1.3: Details of the Supplier of the safety data sheet

Company Name: Aquatreat

Albany House  
North Dock  
Llanelli  
Carmarthenshire  
SA15 2LF

Telephone: 01554 775236

Fax: 01554 772253

E-mail: [enquiries@aquatreat.co.uk](mailto:enquiries@aquatreat.co.uk)

Website: [www.aquatreat.co.uk](http://www.aquatreat.co.uk)

#### 1.4: Emergency Telephone Numbers:

Emergency Telephone: 0333 333 9499

### Section 2: Hazards Identification

#### 2.1: Classification of substance/mixture according to Regulation (EC) No 1272/2008

Classification under CLP:        NC            Not Classified

Additional Information:

#### 2.2: Label Elements: Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Label elements under CLP:        NC            Not Classified as Hazardous

Signal Words:

Hazard Pictograms:

Precautionary Statements

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

#### 2.3: Other Hazards

**Section 3: Composition information on hazardous ingredients**

Hydrocarbons, C12 - C15, isoalkanes, cyclics &lt;2% aromatics

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
920-107-4		H302; ASP Tox.1	20 - 45

Isotridecanol, ethoxylated

EINECS	CAS No	Classification according to Regulation (EC) 1272:2008	Percent
Polymer		H318; Eye Dam.1, H302; Acute Tox.4	<5

**Section 4: First Aid Measures****4.1: Description of First Aid measures**

- Skin Contact:** Wash off immediately with soap and plenty of water and remove any contaminated clothing. If persistent irritation occurs, seek medical advice
- Eye Contact:** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Alternatively, rinse immediately with Diphoterine. Get prompt medical attention
- Ingestion:** Rinse mouth with water. DO NOT induce vomiting. Seek medical attention immediately
- Inhalation:** Move to fresh air. No special first aid measures required.

**4.2: Most important symptoms and effects both acute and delayed**

- Skin Contact:** None under normal use
- Eye Contact:** None under normal use
- Ingestion:** None under normal use
- Inhalation:** None under normal use

**4.3: Indication of any immediate medical treatment and special treatment required**

None reasonably foreseeable.

**Section 5: Fire fighting measures****5.1: Extinguishing media**

Use fire extinguishers appropriate to the surrounding fire

**Unsuitable Media**

None

**5.2: Special hazards arising from the substance/mixture**

Oxides of Carbon and Nitrogen. Hydrogen cyanide may be produced as a result of combustion in an oxygen deficient atmosphere.

**5.3: Advice for firefighters**

Wear self contained breathing apparatus and protective clothing. Spills become extremely slippery when wet

**Section 6: Accidental Release Measures****6.1: Personal precautions, protective equipment and emergency procedures**

Wear appropriate PPE - See section 8

**6.2: Environmental precautions**

Do not allow spills to enter surface water drains and watercourses

**6.3: Methods and Materials for containment and clean up**

Soak up with inert material. Sweep and shovel into suitable closed containers and arrange disposal

**6.4: References to other sections****Section 7.0: Handling and Storage****7.1: Precautions for safe handling**

Avoid contact with skin and eyes. Renders surfaces extremely slippery when spilled. Do not eat, drink or smoke when using this product

**7.2: Conditions for safe storage.**

Keep away from heat and sources of ignition. Do not allow the product to freeze. Incompatible with oxidising agents

**7.4: Specific End Use(s)****Section 8: Exposure controls/Personal Protection****8.1: Control Parameters**

None known

**8 Hour TWA:**

**15MinSTEL:**

**8.2: Exposure Controls**

Engineering Measures Use local exhaust ventilation if misting occurs

Respiratory Protection respiratory protective equipment is not normally required under normal conditions of use

Hand Protection PVC or other plastic material gloves

Eye Protection Safety glasses with side shields

Skin Protection Coveralls or chemical apron

**Section 9.0: Physical and Chemical Properties****9.1: Information on basic physical and chemical properties**

State: Liquid

Colour: Milky

Odour: Aliphatic

Specific Gravity: 1.05

pH: 5 - 8 @5g/l

**9.2: Other Information**

**Section 10: Stability and Reactivity****10.1: Reactivity**

Stable under recommended conditions of storage and use

**10.2: Chemical Stability**

Stable under recommended conditions of storage and use

**10.3: Possibility of Hazardous Reactions**

None known

**10.4: Conditions to Avoid**

Heat, Sunlight and frost

**10.5: Incompatible Materials**

Oxidising Agents

**10.6: Hazardous Decomposition Products**

Oxides of Carbon and Nitrogen

**Section 11: Toxicological Information**

Aquatreat 2084

Dermal	Rat	LD50	>5000 mg/kg (estimated)
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Aquatreat 2084

Oral	Rat	LD50	>5000 mg/kg (estimated)
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**Section 12: Ecological Information****12.1: Toxicity**

LC50/Oncorhynchus mykiss/ 96hours>100mg/l (estimated), EC50/Daphnia Magna/48 hours>100mg/l (estimated), IC50/Algae/72 hours>100mg/l(estimated)

**12.2: Persistence and Biodegradable**

Not readily biodegradable

**12.3: Bioaccumulative Potential**

This product is not expected to bioaccumulate

**12.4: Mobility in Soil**

No data available

**12.5: Results of PBT and vPvB Assessment**

Not according to the criteria of Annex XIII of REACH

**12.6: Other adverse effects**

None

**Section 13: Disposal Information**

Dispose of waste in accordance with local or national regulations

**Section 14: Transport Information**

UN Number	<input type="text"/>		
Shipping Name	<input type="text" value="Not classified as hazardous for transport"/>		
Transport Class	<input type="text"/>		
Packing Group	<input type="text"/>		
Environment Hazard	<input type="text"/>		
Special Precautions	<input type="text"/>		
Tunnel Code	<input type="text"/>	Transport Category	<input type="text"/>

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

**Section 15: Regulatory Information**

15.1: Safety, Health and Environmental regulations/legislation specific for the substance/mixture

15.2: Chemical safety assessment

**Section 16: Other information**

The above information is based on our present knowledge of the product at the time of publication. It is given in good faith, no warranty is implied as to the quality or specification of the product. Information contained in this data does not constitute an assessment of workplace risks. The user must satisfy himself that the product is entirely suitable for their purpose



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SE30755-JB-02  
27 January 2023

Aled Williams  
Water Co.

By Email: [Aled.Williams@waterco.co.uk](mailto:Aled.Williams@waterco.co.uk)

Dear Aled,

### **Liquid reagent dosing rates and 'carry-over'**

In situations where high total suspended solids (TSS) and extreme pH can only be treated using chemicals, Siltbuster will carry out a series of in-house laboratory tests to determine the chemical characteristics of the source water, the choice of chemicals to be supplied and the effective dose rate required to achieve the target TSS and pH value for compliant discharge.

At this stage, a representative sample of water from the Eryri Visual Impact Provision project is not yet available for in-house testing.

We have worked with various contractors on the Head of the Valleys (HOV) road construction project, South Wales, for a number of years. Each system uses poly aluminium chloride (PAC) and anionic flocculant, sometimes with carbon dioxide (CO<sub>2</sub>), followed by gravity settlement to achieve visually clear pH near-neutral water.

Siltbuster propose to use the same reagent combination for the Eryri Visual Impact Provision project.

Regulators' concerns over the use of chemicals typically focus on the potential 'carry-over' of chemical that can occur if a water treatment system is overdosing. Siltbuster chemical dosing systems are flow proportional and so only introduce chemicals whilst the system is receiving flow, but it is important therefore that once the treatment plant has been installed and the chemical dose rates correctly set up, that maintenance schedules are adhered to and the system operated as per the operators guide and any training given.

As good practice, it is recommended that inlet samples are taken periodically, and jar tests conducted to check the water chemistry and chemical dose rates. In conjunction with this, discharge samples should also be taken and analysed. This will allow the treatment systems to be adapted to any changes in the system that may have occurred and reduce the possibility of carry-over.

Presented below (Table 1) are results from two separate HOV sites, both dosing PAC and flocculant followed by gravity settlement. Testing was completed at a UKAS accredited laboratory (Socotec) in March 2022.

***Hire, Sales & Technical Support***



Results demonstrate systems are continuing to operate in compliance with environmental permits and agreements set by the regulator (NRW).

The reagent dosing rates within the Siltbuster systems were:

- PAC coagulant 10-15mg/l - dose rate as Aluminium (mg/L)
- AQ2084 flocculant: 2-3mg/l - dose as active (mg/L)

*Table 1 results for Al and acrylamide carry over testing*

			Inlet Dowlais East	Outlet Dowlais East	Inlet Mostyn	Outlet Mostyn
			WATER	WATER	WATER	WATER
	MDL	Units	04/03/2022	04/03/2022	04/03/2022	04/03/2022
pH	1	pH units	8.0	7.1	7.8	7.4
Total suspended solids	5	mg/l	2,500	13	3,640	8
Aluminium as Al (dissolved)	0.01	mg/l	0.01	0.06	0.03	0.04
Iron as Fe (dissolved)	0.01	mg/l	<0.01	<0.01	0.01	<0.01
Aluminium as Al	0.01	mg/l	0.30	0.31	0.13	0.11
Iron as Fe	0.01	mg/l	0.18	0.02	0.16	0.01
Acrylamide	0.1	µg/l	<0.1	<0.1	<0.1	<0.1

We trust that the above information is sufficient for your current needs. However, should you have any queries please do not hesitate to get in contact.

Yours sincerely,

**James Baylis**  
**Area Sale Manager – Construction (North)**

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