Cyfoeth Naturiol Cymru Natural Resources Wales

Compliance Assessment Report

Report ID: CAR_NRW0035559

This form will report compliance with your permit as determined by an NRW officer					
Site	Barry Thermosets Plant EA/EPR/PP3238LX/V002	Permit Ref	PP3238LX		
Operator/Permit holder	Hexion UK Limited				
Regime	Installations				
Date of assessment	30/07/2019	Time in	10:00	Out	16:00
Assessment type	Report/Data Review				
Parts of the permit assessed	Rountine submissions and audit actions				
Lead officer's name	Kemp, Andi				
Accompanied by	Nick Sharp				
Recipient's name/position	Ian Beatty/ EHS Manager	Date issued	09/08/2019		

Section 1 – Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations or the licence under the Water Resources Act 1991 as amended by the Water Act 2003. A detailed explanation is captured in "Compliance Assessment Report Detail" (Section 2) and any actions you may need to take are given in the "Action(s)" (section 4). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS Scores can be consolidated or suspended where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit conditions and compliance summary	CCS Category	Condition(s) breached
A1 - Specified by permit	A	
B3 - Infrastructure - Site drainage engineering (clean and foul)	A	
B4 - Infrastructure - Containment of stored materials	A	
C2 - General Management - Management system and operating procedures	A	
E3 - Emissions - Surface water	A	
G1 - Monitoring and Records, Maintenance and Reporting - Monitoring of emissions and environment	A	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	A	

KEY: See Section 5 for breach categories, suspended scores will be indicated as such.
A = Assessed or assessed in part (no evidence of non-compliance), **X** = Action only,
O = Ongoing non-compliance, not scored.

Number of breaches recorded	0	Total compliance score (see section 5 for scoring scheme)	0

If the Number of breaches recorded is greater than zero, please see Section 3 for our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- The part(s) of the permit that were assessed (eg. Maintenance, training, combustion plant, etc)
- Where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- Any non-compliances identified
- Any non-compliances with directly applicable legislation
- Details of any multiple non-compliances
- Information on the compliance score accrued inc.
- Details of advice given
- Any other areas of concern
- Any actions requested
- Any examples of good practice
- A reference to photos taken

Compliance Assessment: Hexion Speciality Chemicals, Sully – PP3238LX

Purpose of Compliance Assessment

This CAR1 form covers the following aspects:

- Previous Actions from CAR1 MARCH 2019
- Inspection of certain site infrastructure
- Routine data submissions: Jan – Mar 2019 and Apr – Jun 2019
- Latest Aquacheck results
- Introduction to Hazardous Waste Audit
- Latest phase of ETP audit work

Previous Actions

The last CAR1 was issued on 14th March 2019 and contained 5 actions due 30th April 2019 and one ongoing action, Action 6 from May 2016. The operator submitted a written response on 30th April 2019.

Action 1 Hexion 11th Mar. 2019 – concerned 6 bullet points with regard to the effluent pipeline. The response is accepted and confirms:

- the whole of the effluent pipeline benefits from a cyclic inspection;

- an engineering firm is on contract for repairing any damage to river banks – this is mainly from the point of view of preventing collapsing banks and loss of pipe rack support and possible pipe shear;

Recommendation 1 Hexion 30th July 2019: *If any repairs are required to the banks or channel of any main river, the NRW Development Flood Risk team needs to be consulted for the authorisation of any works using a Flood Risk Activity Permit. For Ordinary watercourses, the Local Authority is usually consulted.*

- improvements to pipe support legs, replacement and descale / painting is ongoing and building on previous ABB recommendations, along with carbon spool replacement;

- a section of pipeline that missed the 2017 NDT testing due to overgrowth, is scheduled to be completed during ABBs Sep. 2019 inspection. Based on results of the other lengths of NDT tested lines and factoring in the same pipe installation age (2010) and no significant reduction noticed on the tested lengths, it is reasonable to conclude that the condition of the untested stretch is in broadly the same condition;

- the line supports were inspected in 2018 as recommended in the 2017 ABB inspection report.

Action 1 Hexion 11th Mar. 2019 closed.

Action 2 Hexion 11th Mar. 2019 – concerns accident management provision for a number of (typically) sub COMAH scenarios. The operator explains that as an Upper COMAH site and a regulated installation under EPR, plans and procedures are in place for major and minor incidents. The operator uses trained staff and incident flow charts to plan response, depending on the actual size and nature of the spill / incident. These flow charts for minor suspected spills, dovetail into the internal emergency plan under COMAH, if the incident escalates beyond predefined points, e.g. if a spill of >1000 lts then implement internal emergency plan. In terms of an off specification effluent incident, the operator has a Site Work Instruction for acting on detection of high levels of phenol i.e. 20 ppm or greater in bio out sample, this is the outlet from the BAFF plant to clean lagoon. Phenol is a critical parameter and component of the effluent. The permit ELV for phenol being discharged from the clean lagoon is 10 mg/l (at these lower concentrations the units of ppm and mg/l can be considered interchangeable), so the operator using 20 ppm limit before the effluent gets into the clean lagoon should be protective of the ELV at 10 ppm and receiving environment – W1 data bears this out. Other actions under this SWI the operator can take are: dilution using Biglis Well water and recirculation of clean lagoon back into dirty lagoon. When Ineos and Zeon were also operating, Hexion's permit ELVs were based on receiving dilute effluent from the independent ETPs on each of these two sites – essentially dilution. The operator knows that dilution in itself is not a BAT technique. Work in this area

will be taken forward in the full, separate write up of the ETP audit. This SWI and information and the KPIs for bio plant operation, will be used in the ETP audit write up. **Action 2 Hexion 11th Mar. 2019 closed.**

Action 1 Hexion 30th Jul. 2019: *Over the last year can the operator confirm how many times the high phenol SWI and dilution / recirculation have been deployed and how / where this is recorded.* **Due: 30th Sep. 2019**

Action 3 Hexion 11th Mar. 2019 – required the operator to evaluate the colourmetric chemistry method it uses on site for analysis of formaldehyde to the SCA Blue Book method 135 – due to the withdrawal of BS 2942. SCA 135 is a HPLC method and the site state that an investment of at least £35000 would be needed to develop a new in house method. Currently the operator participates in a proficiency scheme between laboratories, in this case in house laboratories on process industry sites, that are not independently accredited to ISO 17025 laboratory standard. In addition to this the operator sends a sample off once a month (from an aliquot where part is used on site) to an independent lab that uses SCA 135, for comparison to the results of their own in house analysis. The operator has provided analytical data for both of these testing regimes. Using the last two quarters sample results submitted to NRW (Jan. – Mar., Apr. Jun. 2019), the average free formaldehyde result can be effectively zero up to 0.3 mg/l. A sample sent to ALS labs on 15th July and independently tested gave a result of 0.029 mg/l – it can be reasonably concluded on this simple spot check basis (because there will be other data sets to show a broader relationship), that the in house method using colourmetric methods does not produce a result significantly different to SCA 135 HPLC. **Action 3 Hexion 11th Mar. 2019 closed.**

Recommendation 2 Hexion 30th July 2019: *The operator should define the variance between their in-house results and the independent lab results that illustrates acceptable or unacceptable results.*

Action 4 Hexion 11th Mar. 2019 – required the shortening of a diesel delivery pump to within the bund walls – a photograph was submitted in evidence and this area was physically inspected on 30th July 2019. **Action 4 Hexion 11th Mar. 2019 closed.**

Action 5 Hexion 11th Mar. 2019 – a small interceptor has been fitted that can capture surface water contaminated by diesel from the diesel storage / dispense area. **Action 5 Hexion 11th Mar. 2019 closed.**

Action 6 Hexion 19th May. 2016 – the Borax trail is no longer going ahead. **Action 6 Hexion 19th May. 2016**

All previous actions are now closed.

Inspection of certain site infrastructure

A brief site inspection took place – most of the inspection time was spent running through the next phase of the ETP audit, which will be written up separately. The effluent sumps serving the production area, some of the tertiary containment, the diesel off load / storage and dispense area, transformer incident area and the main control room were inspected.

As usual the sumps and concrete surfacing appeared in good condition (there is a drop test regime for the metal lined sumps) and there was no evidence of gross spillage. Roll over bunds containing the whole production and tanker unloading and loading areas are still in good condition and engineered up to the adjacent kerbing structures, i.e. no gaps.

The diesel off load connection pipe has been shortened by approximately 12 inches, thus now able to contain spigot flow and sprays within the bund. The small interceptor will be examined in terms of specification and mode of operation in due course, but it can be confirmed that the chamber is fitted into the surface water drains around this area.

Although outside the permitted area and being dealt with by NRW Natural Resources Management team, the operator showed that the whole equipment associated with the switchgear room and adjacent vanadalised, redundant transformers, has now been removed. Ongoing liaison with Ambipur is progressing on any medium or long term remediation actions deemed necessary. NRW NRM have confirmed they are satisfied thus far. The Sully Brook and Cadoxton at the confluence, appeared free from visible hydrocarbon contamination.

At the moment the site does not have a full back-up energy supply. The control room system benefits from a battery driven UPS. To remedy the back up supply for wider site operations, on the back of a recent COMAH Process Safety inspection, a diesel back up generator has been sourced from the power station next to the site. The operator is securing a double skinned diesel storage tank and the following points were reinforced:

- ensure such tanks are UV protected
- ensure the double skin provides protection around the whole primary containment
- protect the tank from collision, e.g. bollards etc.
- ensure the connection from the tank to the generator and the offloading point from supply into tank, and any associated pumps are all secure connections – this whole area may need additional bunding

This new back-up generator is scheduled for operation by Feb. 2020 – so the operator is expected to manage operations adequately during this time. The operator confirms that the batch process effectively fails safe, so loss of power to the mechanical aspects of the production process, should not lead to loss of control.

Some time was spent in the control room where discussions were had with the technicians, during the current activities in their shift, with regard to the reactors. The purpose of this assessment was for the regulator to gain some insight into typical daily batch production processes. The timing was not pre-planned so what was demonstrated to NRW represented the actual process stages at the specific time of the inspection. At this time three reactors (R1, R6 and R10) were at different stages of the batch process. One reactor was building up to the specified temperature, before additional charging; a second reactor was entering the washing phase; and the third reactor was holding a complete batch, waiting for the recipe time to complete. Although this is normally a COMAH CA Process Safety aspect, today's assessment was not detailed but nonetheless is relevant under EPR as it demonstrates the level of control exercised by the operator, which should prevent or minimise loss of control, pressure relief incidents, loss of containment and wastes batches. The Supervisory Control and Data Acquisition (SCADA) system, with multiple screens and layers, shows a variety of live information. Such information includes: temperature, pressure, level, mass, which valves are open closed, what feed or drain lines are open / closed, feed rates, what rate the agitator is operating at, heating and cooling systems. The system will also show alarms for deviation, pressure relief, exotherms , low or high feed etc. Each batch process has a Standard Operating Procedure (SOP), which can be accessed by the technician via the computerised system – which benefits from battery powered UPS. The SOPs are developed from Hexion's knowledge of the process conditions and behaviour of the reaction components, degrees of freedom etc. The operative follows the flow chart and instructions, communicating where relevant to operatives out on plant and supervisors. Additional procedures are invoked, including emergency plans, if the reaction parameters deviate from what is programmed, such as dumping reactor contents into quench tank. Additional surveillance is provided by a communications system and CCTV, which also includes cameras in the reactor overhead condensers – as the operation (judged to be occurring if fluid flow is seen) is critical in maintaining batch temperature. Overall for NRW purposes, the technicians, SOPs, SCADA and general operation is clearly performed by trained and competent people.

Recommendation 3 Hexion 30th July 2019: *The operator is expected that competence will be maintained through a combination of experience, academic / technical qualifications / knowledge and ongoing training. This would be supported by general working conditions.*

The operator discussed installing an LEV system to the packing shed, where IBCs are fed by finished product pipes. During the IED review it will be worth noting this emission point. However, it is unlikely to warrant consideration of ELVs and associated monitoring, although the operator should consider dispensing activities in their overall fugitive emissions management plan.

The operator commented on and the regulator saw, the TOC analyser that is not functioning properly due to pipe blockage. TOC is not required to be monitored in the permit, it is a useful and quick analysis to perform, which can aid fine control of ETP performance. As discussed on site the three main individual effluent parameters are phenol, methanol and formaldehyde. These have very low ELVs, between 10 – 50 mg/l. The COD limit is 1000 mg/l and the phenol, methanol and formaldehyde results are all below the ELVs, so therefore there is a chemical oxygen demand that accounts for a considerable concentration of the COD ELV. The operator suggests recalcitrant COD components, such as the resins in the effluent. The

operator will need to investigate treating this COD loading to ensure they meet the CWWT BRef BAT AELs.

Routine Monitoring Submissions

The site is required to take composite samples, produce average results and report quarterly. Here Jan. – Mar. 2019 and Apr. – Jun. 2019 W1 and E1 results are reported. E1 reports monitoring of the bio plant into the clean lagoon and has no ELVs. A direct comparison of E1 data to W1 (downstream of clean lagoon) cannot be accurately made, even if the samples are taken on the same day (as indicated on the monitoring returns), because E1 samples are taken, then this concentration enters the clean lagoon, with its current contents. Then W1 is sampled and represents the current clean lagoon concentration, which includes the E1 emissions. W1 does have a variety of ELVs.

Examining at face value the submitted results, all W1 results are complaint and it can be seen that there is a reduction from E1 to W1. It can also be seen that all E1 data is also compliant with W1 ELVs, which illustrates (although direct influent concentrations are not known at the time) that the DAF, BAFF bio plant is biodegrading to a degree the effluent, at least formaldehyde, phenol and methanol. Data that is ideally needed is influent concentration as it enters the dirty lagoon.

Hazardous waste Audit

This will be scheduled for later in the regulatory year and will be a mixture of desk based, documentation required, a site based visit and final write up of conclusions. There are several aspects to be considered and the operator will be sent directions on what evidence should be available on the day. Essentially across the whole audit, these aspects will be assessed:

- spot check of several hazardous waste consignment notes
- assess classification of any wastes describes as Mirror entry non hazardous – a selection of waste streams will be looked at
- examine waste totals from annual submissions, E-PRTR, and hazardous waste database
- look at hazardous waste storage areas
- HP14 -if relevant

- Industry packaging guidance

- Application of the waste Framework Directive waste hierarchy

Effluent Treatment Plant Audit

This has progressed from the initial overview and introduction stage (Nov. 2018) and now the ETP audit proforma is starting to be filled in. To aid in this most of the relevant aspects on the pro forma were discussed while going around the ETP.

From the 31st July, the following information and data was formally requested from the operator (email sent by AK 1ST Aug. 2019):

I will be reviewing responses to Improvement Conditions -

IC1 – correlation of COD and BOD

IC4 – ETP optimisation studies

IC10 – Direct Toxicity Assessment

I will skim any relevant compliance assessment reports and non compliances / notifications / enforcement – related to ETP operation and performance – if still relevant today.

I already have the schematics and process flow diagrams, biomass augmentation SWI, controlling high phenol SWI, anti foam and coagulant MSDSs and bio results spreadsheet. I have notes from the 1st Nov initial inspection.

Working through the ETP proforma and based on what I already have and know about the operation, below is a list of information (in whatever convenient form) still required / questions to be asked:

- Inhibitory effects of phenol, formaldehyde and methanol – if their influent concentrations are high enough

to cause inhibition of biodegradation.

- If phenol, formaldehyde and methanol are the main target pollutants and will be contributing to the overall COD loading, but based on their ELVs of 10 mg/l, what is making up the bulk of the COD, which can be between 600 – 1000 mg/l – understanding this is the key to efficient treatment.
- Deriving % efficiency and overall efficiency – so we'll take each stream influent concentration and compare to final effluent concentration and use the combined concentration in the dirty lagoon compared to the final effluent concentration. Reduction at source and process integrated techniques are not included in the BAT efficiency demonstration:

	Technique	Description
a	Process-integrated techniques ([1])	Techniques that prevent or reduce the generation of water pollutants.
b	Recovery of pollutants at source ([1])	Techniques to recover pollutants prior to their discharge to the waste water collection system.
c	Waste water pretreatment ([1]) ([2])	Techniques to abate pollutants before the final waste water treatment. Pretreatment can be carried out at the source or in combined streams.
d	Final waste water treatment ([3])	Final waste water treatment by, for example, preliminary and primary treatment, biological treatment, nitrogen removal, phosphorous removal and/or final solids removal techniques before discharge to a receiving water body.

([1]) These techniques are further described and defined in other BAT conclusions for the chemical industry.

([2]) Covered by BAT 11.

([3]) Covered by BAT 12.

- Composition and moisture content of final sludge.
- Identification of all streams into the effluent.
- What continuous process parameters are monitored and influence daily operation.
- Identification of KPIs for effluent treatment process.
- Identification of critical kit associated with ETP.
- Some data on sizing of unit operations, based on flow rate and concentration and retention time, settling.
- Details of training given to Keiran, his own relevant experience, what he trains other operators on – so copies of training SWI or schedules.
- SWI for procedure of production notifying ETP of spills, reactor dumps etc.
- Records of when dilution used and high phenol SWI invoked – over the last year.
- Brief description of where data can be seen either on the ETP itself (pH, DO etc?) and what is seen and controlled from the main control room.
- Main parameter values for optimum operation: DO, pH, temp., influent concentration, biomass data.

I won’t set a strict time limit on this, but as and when you can. If you don’t have data on a particular aspect – just say so.

END

Cyfoeth Naturiol Cymru Natural Resources Wales	**EPR Compliance Assessment Report**	**Report ID: CAR_NRW0035559**

This form will report compliance with your permit as determined by an NRW officer

Site	Barry Thermosets Plant EA/EPR/PP3238LX/V002	Permit Ref	PP3238LX
Operator/Permit holder	Hexion UK Limited	Date	30/07/2019

Section 3 – Enforcement Response

You must take immediate action to rectify any non-compliance and prevent repetition.
Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

Other than the provision of advice and guidance, at present we do not intend to take further enforcement action in respect of the non-compliance identified above. This does not preclude us from taking enforcement action if further relevant information comes to light or advice isn't followed.

Section 4 – Action(s)

This section summarises the actions identified during the assessment along with the timescales for when they will need to be completed.

Criteria Ref.	**CCS Category**	**Action required/advised**	**Due Date**
See Section 1 above			

Section 5 – Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- Advise on corrective actions verbally or in writing
- Require you to take specific actions verbally or in writing
- Issue a notice
- Require you to review your procedures or management system
- Change some of the conditions of your permit
- Decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and/or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- Ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- Ensure you comply with other legislative provisions which may apply

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance that could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General information

Data protection notice

The information on this form will be processed by the Natural Resources Wales (NRW) to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s). The NRW may also use and/or disclose it in connection with:

- Offering/providing you with its literature/services relating to environmental matters
- Consulting with the public, public bodies and other organisations (eg. Health and Safety Executive, local authorities) on environmental issues
- Carrying out statistical analysis, research and development on environmental issues
- Providing public register information to enquirers
- Investigating possible breaches of environmental law
- Assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Regulations request

The NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within fifteen working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with officer's line managers using the informal appeals procedure. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 0300 065 3000 (Mon to Fri 08.00 – 18.00) and ask for the Customer Contact team or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on 0845 607 0987.

Welsh Language
If you would like this form in Welsh please contact your Regulatory Officer.