





## Environmental Risk Assessment

Hazards	Type of risk and controlling measures	Severity (1-5)	Probability (1-5)	Significance (1-5)	Controllable (1-5)	Total Score	Significant (Score >50) (Y/N)
Emissions to air – Hydrogen chloride gas	The process does not produce Hydrogen Chloride gas. Any Hydrogen Chloride in the Ferrous Chloride feed liquor is used to dissolve Iron in the dissolver or passes through the process and ends up in the Ferric Chloride product.	5	1	1	1	5	N
Emissions to air – Chlorine gas	Potential of chlorine gas escaping is low. The process is located in a top-tier COMAH site. ICL have an up-to-date safety report dealing with chlorine emissions and ICL will be supplying the chlorine. The Ferric Chloride plant is a replica of a plant which was installed and operated for 8 years by Industrial in runcorn , Cheshire. For the proposed plant at West Thurrock, an additional tail gas scrubber will be included. This adds another layer of protection to mitigate potential Chlorine emissions.	5	2	5	2	100	Y
Emissions to air – Mill scale dust	Mill scale when delivered has a coating of grease on it, which enables the scale to stick together and prevent any dust, from being produced.	1	2	1	1	2	N
Emissions to air – Aluminium hydrate powder	Aluminium hydrate powder, is delivered damp, but does have the potential to dry out. Dust is non-hazardous, but due to particle size it can be classed as an irritant. However, as it will only be on site if there are issues at the Grays site, it is doubtful it will be an issue.	1	3	1	2	6	N

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Originator	Title	Date	Approvals	Title	Date
 Claire Harling	Environmental Manager	20 <sup>th</sup> March 2018	 Tony Clark	Plant Manager	20 <sup>th</sup> March 2018
Issue: 1	Effective Date: 20/03/2018		ICL-EMS-WT-DOC5130	Form 1046	Page 1 of 4

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Emissions to water – Reactor overflow (ferrous/ferric chloride)	The nature of the process, mean that the reaction isn't a vigorous one. The likelihood of reactor over flowing is small as the process is automated and it would only be due to systems failure that an overflow would take place. However the whole plant is in its own bund. Note that all spillages will report to a bund sump. All spillages are normally returned to the process via filters. The processs allows for a generous water balance which accommodates wash down water,	5	2	5	1	50	Y
Emissions to water – Reactor overflow (Poly-Aluminium chloride)	Slightly more vigorous reaction than with the mill scale, however as the system is automated, the likelihood of reactor overflowing and reacting either the site drains or the land is slight as the whole plant is bunded.	5	2	5	1	50	Y
Leaks from final product storage tanks	As the whole plant is in a bunded area, leaks will be contained and with the use of the sump, if one of the storage tanks leaks, the product will be analysed and then re-blend with the suitable product. However, if this is not possible it will be taken away for off site disposal.	4	1	5	1	20	N
Hydrogen	Hydrogen is present in the Chlorine feed gas to the Ferric Chloride Plant. The maximum concentration is 4.5% v/v. The gas is diluted with air prior to Chlorine	5	1	5	1	25	N

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	absorption so that the emitted gas from the process contains less than 2% Hydrogen which is half of the LEL.						
Risk of Accident	The plant is located in the middle of Ineos Chemicals at Runcorn. The site as a whole is a top-tier COMAH site and as such anything made on the Industrial Chemicals plant will be included in the site safety report and any accident plans. There have been no known significant incidents or accident on the Industrial Chemicals plant at Runcorn during the time owned by both Ineos, ICL & High Chemicals, hence why the process & design has been/will have been copied. The same applies to Process 8, 9 10 & 11.	5	1	5	1	25	N
Fugitive emissions	The process will be vented through scrubbers, so any fugitive emissions will be scrubbed and neutralized before emission takes place. The scrubber medium will be tested daily and replaced when required. The spent medium will then be used in the dilution phase of the manufacturing process for all of the products, thus reducing potential waste being produced.	5	1	5	1	25	N
Odour	The process of manufacturing ferrous chloride creates no known odour; however the process scrubber is designed to prevent any emissions of an odorous nature.	4	2	1	1	8	N


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Noise from plant equipment	The original site survey and noise survey indicates that noise from the process is not an issue. This is due to the plant being surrounded by other chemical manufacturing processes which have greater noise levels	2	1	2	5	20	N

Fire There are two possible scenarios. Chlorine in iron fire, and Hydrogen fire. The potential for Chlorine in iron fires is mitigated by the fact that there is no direct contact between chlorine gas and steel. Hydrogen fires are rendered unlikely due to the low concentration thereof by use of dilution air.

H1 has not been completed, as none of the plants have been designed, information on flows cannot be determined and in no way should the emissions be guessed. However, copies of emission reports for the same processes on other sites are available to illustrate what the emissions are and could be.

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