To whom it may concern

12 March 2021

Dear Sir/Madam

Proposal to list "Chlorinated paraffins with carbon chain lengths in the range C14-17 and chlorination levels ≥45% chlorine by weight" in Annex A, B or C to the Stockholm Convention on Persistent Organic Pollutants

Defra published the above document on 18 January 2021, inviting interested parties to provide information to support or critique the proposal for listing. It was stated that information can relate to anything, for example:

- the substance identity
- the manufacturing
- placing on the market and use of the substance
- hazards to human health or the environment
- monitoring data
- exposure scenarios
- environmental emissions.

Defra indicated that it would also be interested in any information on risk management measures, alternatives, costs and benefits related to the use of the substance and well justified requests for exemptions if no alternatives are available.

Special Metals Wiggin is a user of the substances that are the subject of this proposal. In Annex A we present information regarding our use of the substance and the end uses of the products manufactured with it. We also include details of our usage in terms of quantity and product types, and details of relevant environmental pathways.

If you require further information please contact me on [redacted]

Yours faithfully

[redacted]

[redacted]

Annex A

Special Metals Wiggin wishes to provide evidence as a user of the Medium Chain Chlorinated Paraffins (MCCPs)(CAS name *Alkanes, C14-17, chloro*, CAS number 85535-85-9), to inform Defra's proposal to list these substances to the Stockholm Convention as a Persistent Organic Pollutant (POP).

We use the substances as a component of the lubricant required for the cold rolling ("pilgering") of nickel alloy tube and the cold drawing of nickel alloy tube and round.

Alternative sulphur-containing lubricants are highly corrosive to nickel alloys and could severely limit our ability to supply material used in critical and highly demanding aerospace applications, energy and power generation, chemical processing and pharmaceutical production. Special care is always taken in nickel alloy manufacture to prevent sulphur contamination.

The substances comprise 25-50% of the lubricants used; the balance being a highly refined base oil of viscosity >125 cSt @ 40°C. Our cold rolled tube and round is employed in various applications where corrosion and creep resistance are critical to the user, including:

- deep sea oil and gas extraction
- power generation: heat exchangers in conventional and renewable energy production including the world's largest solar farm and the most modern ultrasupercritical boilers developed for low emissions technology
- the refining of basic chemicals: we are one of only three approved suppliers globally for wrought radiant tubes in both licensed designs of steam cracking furnaces for the pyrolysis of ethylene
- the majority of basic chemicals depend on the use of commercially pure nickel tubes to manufacture sodium hydroxide used in soaps, detergents, chemical and pharmaceutical production
- Aerospace engines: Precision nickel alloys tubes are used in aero engines and in the airframes of a variety of aircraft. NIMONIC alloys were developed by us for use in Sir Frank Whittle's jet engine
- the nuclear power industry; at least one product line is classed as "critical national infrastructure"
- precision nickel superalloy tubes used in newly developed hydrogen fuel cell vehicles for heavy vehicles as a clean technology alterative to less efficient electric batteries
- nickel tubes are used in high efficiency steam reformers for hydrogen production critical for developing the hydrogen economy.

At any one time we have approximately 40 tonnes of the substance in active use within our five tube reducers. These machines have closed loop recirculating lubrication systems with the substance being filtered following use before being returned to each machine's individual storage tank. We also keep around one tonne in storage during routine operation inside our bunded oil store. We may store larger amounts (up to 10 tonnes) in IBCs in advance of performing oil changes.

The usable life of the substance in our application tends to be around 12 months, though this can be extended in times of low demand for certain products when certain machines may not be

utilised at full capacity. We have been actively pursuing environmental improvements to our processes aimed at extending the usable life of the substance.

On-site environmental release scenarios for the substance are:

- Release to water or land as a result of accidental spillage during storage or material handling.
- Evaporative losses to air during use, though this is very limited.

Off-site release scenarios occur at the point of disposal, with:

- Release to water during waste oil disposal; oil recycling sites generally blend the substance with non-chlorinated oils to reach a chlorine concentration in their own effluent that is compliant for discharge within their environmental permit or trade effluent consents.
- Releases to air during the incineration of solid wastes contaminated with the substance (for example oily rags, PPE, machine consumables).

Over the past five years we have disposed of an average of 120 tonnes per annum of MCCP-contaminated waste (both neat waste oil and waters that are potentially contaminated with MCCPs). The excess waste tends to be generated during machine “flushing”, when we use recycled hydraulic oil to flush old chlorinated oil (containing entrained solids) out of our lubrication system prior to new oil being added. This recycled hydraulic oil then picks up residues of MCCPs that require it to be disposed of as a chlorinated oil (EWC 12 01 06).

We are unable to quantify solid waste losses as these are mixed with other oily waste that does not contain the substance, as the disposal route is the same (energy recovery via incineration outside the United Kingdom), but we estimate around 3-5 tonnes of the substance to be disposed of via this route annually.

Special Metals Wiggin has over fifty years of experience manufacturing high quality alloys at our site in Hereford, UK. Due to the high product quality requirements of our customers Special Metals Wiggin has not conducted any trials into alternative lubrication. Whilst we are aware that some lubrication suppliers do advertise alternative substances that can deliver equivalent performance, we have not trialled these within the extremely demanding processes we carry out at our site. We manufacture a large number of alloy types and the current MCCP-based lubricants have been found to offer the most versatile solution that allows us to pilger all of our relevant alloys on our various tube reducing machines.

If compelled to change lubricants we would need to complete phased trials of alternatives in parallel to production, without risking damage to our machinery, compromising sales commitments or cross-contaminating process fluids. If we do not find a solution we will be at commercial disadvantage to competitors still using chlorinated oils overseas.

A critical stage of our process is degreasing (i.e. removal of MCCP products and greases from our alloys after pilgering). Our degreasing process is tailored to the current lubricants we use and served by an EPR Part A1 solvent recovery process. If we were to trial new products on individual machines we will be required to install new, parallel degreasing systems to support the trial. This will add significant cost and complexity to the work and may require a variation to our environmental permit.

MCCPs are considered to be the best product for lubrication of nickel-based alloys in high pressure, cold metalworking manufacturing applications. The nickel alloys we manufacture are some of the hardest alloys available on the market and require extreme forces in order to work them into the required forms. MCCPs have always been found to offer the best compromise across a wide range of alloys, from pure nickel up to Inconel 718, a nickel-iron-chrome alloy used in rocketry, cryogenic tankage and aviation applications.

Alternative substances could work in a different manner, particularly with regard to tool/surface interaction. Our business model is to sell capacity on our machinery. A less capable lubricant/coolants could require more process cycles to achieve the same as chlorinated lubricants meaning less capacity, increased costs and longer lead times.

Long chain chlorinated paraffins are not as effective as medium chain chlorinated paraffins for our alloys and in our lines of business we are only aware of non-chlorinated alternatives being implemented for LCCPs, not for MCCPs. Where non-chlorinated alternatives have been deployed, suppliers with whom we have spoken are currently unable to give extensive technical detail on long term performance as their deployment is relatively new.

The products we use that contain the substance are Houghton's Houghto-Draw CR45, TD51 and INEOS Cerechlor E Series lubricants.

Should the use of MCCPs be restricted, we would request that the timeline toward restriction be at least five to seven years, so that we can conduct a proper evaluation of alternative lubricant performance across our whole range of alloys. If no alternatives can be identified that deliver the necessary performance, we would request the ability to seek exemption from any restriction due to the vital roles our products play in the development of sustainable technologies.

Our alloys are not compatible with a number of proposed alternatives to chlorinated oils, for example sulphonated lubricants, as our alloys are vulnerable to sulphidation from residue during heat treatment. The combined list of detrimental and prohibited contact materials from our many customers in different sectors is extensive, limiting our options.

The potential impacts should alternatives not prove as effective or as resilient could include:

- additional carbon dioxide, NOx and SOx emissions resulting from increased energy use when we are required to re-melt and re-work product that fails quality standards, with corresponding lower process yield
- poorer environmental performance of our products over their lifecycle
- increased raw material requirements due to more frequent oil changes
- increased tooling costs due to decreased tool life and increased the frequency of tool changes. This will increase the cost of the alloys we produce and product supply lead times due to an associated reduction in manufacturing capacity
- reduced corrosion inhibition due to different additives in alternative lubricant that do not contain MCCPs
- increased maintenance requirements or equipment modifications requiring capital expenditure
- inability to supply certain grades of product to critical applications due to poorer surface quality

- requirement for revisions to our associated solvent degreasing and solvent recycling process (with an associated environmental permit variation) to accommodate changed lubricant characteristics.
- Lead times for any capital investment in alternative specialist plant or modification to existing machinery (seals, bearings etc.) could be pushed out beyond the date for listing because of the demand exceeding supply. The market cost of such plant would increase accordingly.

Working through these impacts will require extensive trialling, hence the need for an extended timeframe to undertake any necessary changes and verify their viability. Certain drawn products will require their quality plans to be rewritten and reappraised and new contact materials would require approvals from customers which will involve time for additional engagement with our customers so that they can undertake downstream testing of products.