



Environmental justice action

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groundWork appeal: Environmental Authorisation for the use of alternative fuels and resources at NPC's Simuma Works near Port Shepstone, KwaZulu-Natal.

WML Ref: DC21/WML/0018/2013

EIA Ref: DC21/0024/2013

26th January 2016

A. General summary of the appeal:

1. This is an application for an expansion of existing activities, for which NPC has existing Environmental Authorisations and Atmospheric Emission Licences;
2. New input waste materials are been proposed for authorisation. The materials proposed to be used have never been clearly stated in the DEIR, or the basic assessment report, or NPC's Atmospheric Emission Licence application.
3. This EIA is a new development proposing to employ new waste streams as AFR and raw materials.
4. Before a new fuel or raw material is implemented it must be extensively tested to check that it is suitable for the kiln. Any such any new waste material input would require an amendment of the site's Atmospheric Emission Licence and Waste Management Licence and would thus be subject to a separate basic assessment process; and EIA process
5. NPC by their own admission have not undertaken nor presented in their FEIR (upon which this authorisation is based) any analysis of the dioxins and furans (listed in Table 10-1 of the FEIR) as per the requirements of their: Minimum Emission Standards for AFR used in cement manufacturing processes using AFR (Sub-Category 5.5). In fact NPC at their Environmental Liaison Meeting held on the 22nd May 2015 presented only limited data on PM10, NOx, and SO2. This is hardly reassuring considering their AEL requires them to continuously monitor for a variety of complex and toxic gases listed in their AEL. In fact up to date emissions monitoring is missing from this FEIA and the assumptions within their FEIA are based on data from 2009 - 2010. This is in our opinion a major oversight and fatal flaw of this application and should be rejected by the KZN EDTEA on these grounds alone.
6. This authorisation makes no provision for or mandatory requirement for a legally constituted monitoring committee made up of interested and affected parties that will provide an independent and objective oversight to compliance with the WML, EMPr and AEL for this activity which is the norm for this kind of activity.

General comments

This authorisation as it exists is essentially a licence to operate a hazardous waste incinerator that can burn any industrial hazardous waste at the discretion of the licence holder. It effectively puts the fox in charge of the henhouse!

At the outset we have to be absolutely clear that the global scientific literature unequivocally demonstrates that all hazardous waste incinerators produce the most toxic compound known to science, namely, 2,3,7,8-tetrachloro-dibenzo-p-dioxin and other similar compounds which I will simply call "dioxins."

Dioxins are toxic at very low levels and are known to cause cancers (specifically chronic lymphocytic leukaemia, soft tissue sarcoma, non-Hodgkin's lymphoma, prostate cancer, as well as cancers of the lungs, larynx and trachea). They also cause birth defects, alter the reproductive systems of fetuses, impact the IQ of children, suppress the immune system, decrease fertility, cause ovarian dysfunction, and reduce the sizes of male genitalia. They are highly persistent in the environment, so any dioxins produced today will remain for up to 150 years if on top of the soil, more than 500 years if in bodies of water, and up to 1000 years if the dioxins are covered by a few centimeters of soil surface.

South Africa is a party to the Stockholm Convention on Persistent Organic Pollutants. Under this treaty, South Africa is obligated to reduce and, where feasible, eliminate releases of dioxins to the environment. This authorisation as it currently exists does not take into account that no dioxins testing has been undertaken at this facility and makes no provision to meeting the objective of our obligation to reduce and, where feasible, eliminate releases of dioxins to the environment.

I should add that there is no such thing as "clean incineration." All incinerators release toxic particulates, carbon monoxide, hydrogen chloride, toxic metals, etc. in addition to dioxins and greenhouse gas CO₂. Air pollution control devices are needed to limit the releases to the air, but most of these pollution control devices such as filters and electrostatic precipitators merely move the pollutants from one environmental medium (the air) into another (solid filters or wastewater). The toxic pollutants do not disappear; they are concentrated into other media that have to be treated as hazardous waste. Importantly, ash from incinerators is toxic, heavily contaminated with dioxins and leachable metals, and under the Stockholm Convention BAT/BEP guidelines, ash requires special land disposal as hazardous waste. Often, these added costs are not included in economic and human health analyses but they should be.

The dioxin limits continue to be revised as new data come out. The current South African limit is 0.1 ng I-TEQ/Nm³ which remains the international standard, but a few years ago the US EPA lowered its dioxin limits even further to 0.0099 to 0.027 ng TEQ/m³. This suggests that in coming years, the internationally acceptable dioxin limit will go down further as new data compel us to promulgate more stringent limits to protect public health from a pollutant that will remain in our environment for hundreds of years.

Furthermore the KwaZulu-Natal Department for Economic Development, Tourism & Environmental Affairs will not be able to enforce the current dioxin limit, much less a more stringent dioxin limit to protect public health currently, nor in the foreseeable future.

South Africa does not have the technical in-country capacity to analyze for dioxins from incinerators. In the 1990s, the US limited the number of approved US laboratories capable of testing for dioxins under the Contracts Lab Program since it is a very difficult test to conduct. There are currently no labs in South Africa that can analyze for dioxins. Samples have to be sent to the EU, the US, Japan or other countries to undergo these expensive tests. Most industrialized countries require testing for dioxin emissions every 6 months or every year. Some countries conduct frequent spot checks of dioxin emissions, since high levels of dioxins are formed during transient conditions in incinerators waste-to-energy plants and many manufacturers submit dioxin results under ideal conditions. Spot tests are how many incinerator facilities in the US and elsewhere have been shut down or heavily penalized for violations.

Given that South Africa does not have the in-country capability to conduct regular testing for dioxins of incinerators, much less frequent independent spot checks by regulatory bodies, these dioxin limits may just be limits in paper and not in reality thereby threatening public health.

Additionally this authorisation is effectively a move away from environmentally sound best practices of segregation, waste minimization, and environmental protection for the following reasons:

By their very nature, hazardous waste incinerators are technologies that need waste as an input to operate. Therefore, they encourage generation of more waste in order for the operators to make a profit. There are case studies worldwide that have shown that when industries and communities decide to reduce waste, increase recycling, improve composting, etc., incinerators and waste-to-energy plants end up losing money and have to shut down.

Relying on hazardous incinerators will do the opposite – discourage less segregation and produce more waste so that incinerator operators can make more profits. Moreover, investing in incineration and waste-to-energy plants commit communities to these dirtier technologies for the long term, commitments that require communities to generate more waste for incinerators to operate profitably. We should be moving in the opposite direction: encouraging less consumption of materials, greater demand side management, minimization of waste, and more protection of the environment and public health.

Good waste management begins with preventing waste being generated in the first place — after all, what is not produced does not have to be disposed of. Hence, waste prevention and minimisation should have top priority in any waste management plan. Where waste material is produced, planners and managers must always choose the optimal treatment option with the lowest possible risks to human health and the environment. Each treatment option brings with it different impacts to different parts of the environment.

There is no blueprint which can be applied in every situation but there are firm principles upon which an approach to waste management is based, namely:

- Prevention principle — waste production must be minimised and avoided where possible.
- Producer responsibility and polluter pays principle — those who produce the waste or contaminate the environment should pay the full costs of their actions.
- Precautionary principle — we should anticipate potential problems.
- Proximity principle — waste should be disposed of as closely as possible to where it is produced through reduced waste movements and improved waste transport regulation.

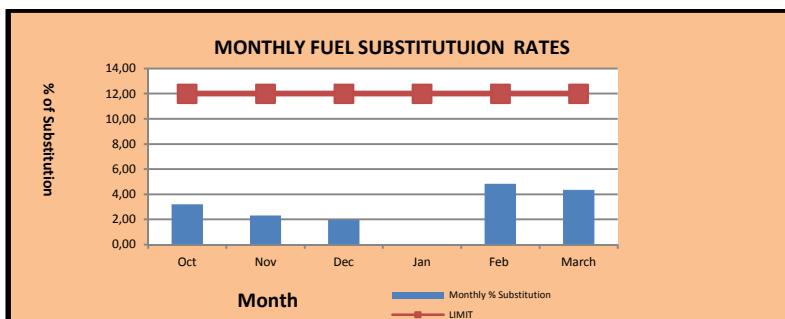
This authorisation flies in the face of implementing these principles in KZN. Furthermore the NPC cement kilns are neither properly designed for the purpose for incinerating hazardous waste, nor will they be held to the same regulatory standard as other purpose built hazardous waste incinerators in similar jurisdictions. While it is claimed in the FEIA that the very high temperatures and long residency times within NPC's cement kilns result in high incineration efficiency and low emissions, the NPC cement kilns are simply not designed for burning heterogeneous waste streams in the first place. And because they are not regarded as hazardous waste incinerators, they will generally avoid having to meet stringent emissions regulations.

One of the biggest problems with using cement kilns as makeshift incinerators is periodic operating upsets, where the temperature can be reduced and emissions of dioxins dramatically increase.

Studies have shown that emissions of some substances are reduced but that others increase substantially. It should also be noted that the toxic residue of the fuel is incorporated into the cement, along with any heavy metals and other contaminants.

B. Specific comments on the groundWork appeal: Environmental Authorisation for the use of alternative fuels and resources at NPC's Simuma Works near Port Shepstone, KwaZulu-Natal.

1. We submit that waste cannot be considered a non-renewable resource. groundwork has serious objections to the burning of alternative fuels – such as waste tyres – and maintains that this is contrary to the waste management hierarchy as stipulated in the Waste Act.¹
2. Section 2d (iii) of the authorisation (Key factors considered in making this decision) states that “replacing a percentage of the coal and raw materials with AFR will reduce greenhouse gases”. This is an inherently incorrect statement. As a recent European study shows, when the full extent of carbon emissions coming out of the stack of incinerators are considered, incinerators emit significantly more greenhouse gas emissions for each kWh of electricity generated than coal-fired power plants.²
3. We submit that NPC has in fact only superficially researched the use of AFR in their kilns. From their own data presented below at their Environmental Liaison Meeting held on the 22nd May 2015 they disclosed that the substitution rate for tyres has never in fact exceeded 5% of the total fuel requirement of the kilns (see figure 1 below). Without having a clear sense of what impact to air quality of the full substitution allowance of 12% this EIA process cannot make any reasonable predictions of whether this will impact and exceed the South African ambient air quality standards for PM10, PM2.5, SOx and NOx let alone toxic heavy metals and persistent organic pollutants.



4. Furthermore we submit that even with these low percentages of substitution NPC is still failing to meet the limits of its stack emissions for PM10 (see figure 2 below). Ambient air quality data for Particulate Matter (PM10), Sulfur Dioxide (SO₂) and Oxides of nitrogen (NO_x) were only available for the period 2010 to 2012. Again this is another example of a major limitation of this FEIA upon which this authorisation is based. In fact considering the paltry substitution rate and the kiln 1 emissions exceedances - the current South African Ambient Air quality standard of 75ug/m³ for 24 hours and 40ug/m³ annual standard is bound to be exceeded in the vicinity of this kiln!

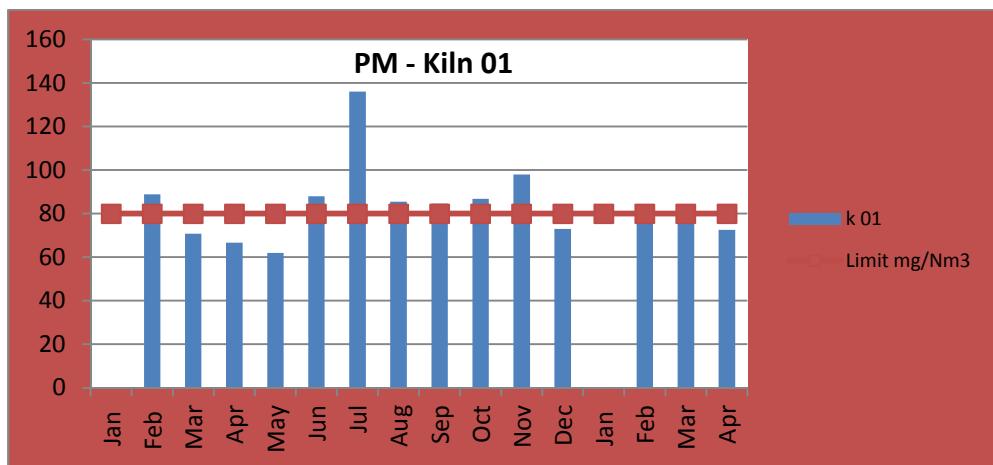
From the figure below (from NPC themselves) kiln 1 is clearly borderline with a paltry 2-4% substitution rate of a homogenous alternative fuel (waste tyres). Who can predict how additional undisclosed fuels to this scenario.

5. We submit before any authorisation for undisclosed fuels can be made that each one of these “possible” fuels is tested separately (with emissions measured continuously) and then in combination with waste tyres etc. so that we can be reasonably certain that heterogeneous

¹ The hierarchy of waste management is identified in the Waste Act as waste avoidance and reduction; re-use; recycling; recovery and, as a last resort, treatment and safe disposal.

² Hogg, Dominic “A Changing Climate for Energy from Waste?” Friends of the Earth UK, March 5, 2006

fuels will not significantly impact emission rates and emission limits set out in our national legislation.



If this authorisation stands as it is it will effectively put the fox in charge of the henhouse allowing NPC free licence to incinerate any types of hazardous waste based on what NPC refer to as

"the effectiveness of a protocol for selection of suitable AFR material and exclusion of materials based on unfavourable characteristics / composition, i.e. the responsible use of AFR"....."At present NPC is investigating the use of various alternative fuels, including but not limited to refinery tank bottoms, solvents, hydrocarbon waste, general industrial waste, spent resins etc. NPC is currently targeting to replace more than 50% of the fossil fuel used and 10% of the traditional raw materials by co-processing approximately 200 000 tons per annum alternative fuels and alternative raw materials".

We submit that this level of EIA investigation is not sufficient to issue a licence for what is effectively hazardous waste incineration that has the potential to adversely impact public health and the environment.

Furthermore Section 2 of the Environmental Management Programme Report (EMPr) deals with legislative requirements. However this section does not consider the requirements of the National DEA's 2008 Guidelines for Treatment of Hazardous Waste and Co-Processing of Alternative Fuels and Raw Materials (AFRs) in Cement Kilns (the Guidelines)³. We submit that before any waste stream can be authorised for co-processing the Guidelines should be applied strictly.

The 2008 Guidelines establish various conditions that should be put in place to prevent risks to the greatest extent possible prior to commencement of treatment of hazardous wastes in cement kilns on a routine basis. One such pre-requisite is the demonstration of hazardous wastes destruction performance through test burns. Test burns are recommended for the verification of the destruction and removal efficiency (DRE) and the destruction efficiency (DE) of certain principal organic hazardous compounds (POHC) in cement kilns.

These test burns have to be authorised by means of a waste management licence (WML) in terms of the List of Waste Management Activities – published under the National Environmental Management: Waste Act 59 of 2008 (Waste Act) - that have, or are likely to have, a detrimental effect on the environment, since the burning of hazardous waste (H:H) and waste tyres in cement kilns is such a listed waste management activity. A WML is required to undertake any waste management activity.

A person who wishes to commence, undertake or conduct such listed activity must conduct a basic assessment process or an EIA process (depending on the type of activity), as stipulated in the NEMA EIA Regulations made under section 24(5) of NEMA as part of a WML application.

³ National DEA's 2008 Guidelines for Treatment of Hazardous Waste and Co-Processing of Alternative Fuels and Raw Materials (AFRs) in Cement Kilns (the Guidelines)

We submit that no such trial test burns have been undertaken nor have the waste streams been properly defined and classified as per the Waste Classification and Management Regulations and guidelines.

Furthermore the 2008 Guidelines define the co-processing of only “selected wastes” and exclude e.g. health care risk waste and other hazardous wastes. The Licence as it is currently written does not exclude any “H:H hazardous waste” and this was never the intention of the guidelines. Specifically the guidelines in “Section 6 – Policy Implementation” support this.

C. The undefined list of permissible waste streams is too extensive and will pose an unacceptable threat to public health

We submit that the undefined list of permissible waste streams is an oversight by the KZN EDTEA and will result in an unacceptable threat to health. We submit that this approach does not even meet the guidance provided by the International industry guidelines for cement kilns (see Holcim-GTZ Public Private Partnership: Guidelines on Coprocessing Waste Materials in Cement Production” Final Draft March 2005. (“Holcim-GTZ Guidelines”⁴).

For example the Holcim-GTZ Guidelines set out typical air emissions from cement production and co-processing as well as appropriate reduction techniques. In respect of dioxins, furans, benzene and mercury the guidelines state: “No reasonable abatement technique. Input limitation with raw materials is the option.”

This statement highlights the importance of ensuring that there are proper regulatory controls over the waste stream proposed for use in cement production. The Holcim-GTZ guideline states that certain wastes are not suited for co-processing and by implication should be prohibited from being used in co-processing as well as suggesting that general permits for waste groups should not be allowed.

The GTZ Holcim guidelines state:

“The main objective of the permission and controlling process is to ensure that only suitable waste will be used and the AFR operations run properly. Regulators and kiln operators should be able to track the progress of the waste through the waste treatment path either directly from the waste generator or through collecting/pre-treatment companies. The quality of the material designated for co-processing is crucial. Quality data and emissions monitoring data form the basis of scientific discussions with external stake-holders. They will also be helpful tools for reducing local concern and the notion that cement plants are misused as trash bins for uncontrolled disposal of waste.”

“The product (clinker, cement, concrete) shall not be abused as a sink for heavy metals and the concentration of trace elements in the final cement product shall statistically not be higher than that of cement produced with primary energy and virgin raw material”.

“General permits for waste groups (plastics, sorted household waste, high heating value liquid waste and mineral waste as AFR) should not be issued. They are too generic and it is hard to track these wastes from generator to kiln. It is important to know the origin of each type of waste and its composition in order to ensure safe co-processing.”

It is submitted that the EIA process should also follow this approach and limit the use of waste that can be incinerated in the NPC cement kilns to such waste which does not contain precursors to dioxin formation. It should also give proper guidance to limit the inappropriate proliferation of waste streams which may give rise to the increased emission of heavy metals, for example the proper tracking of waste. Also for example sewage sludge contains a wide range of chemicals and heavy metals. We also submit that the incineration of POP’s and pesticides should not be permissible.

D. Monitoring (including provisions for monitoring performance of air pollution control devices):

⁴ Holcim-GTZ Public Private Partnership : Guidelines on Coprocessing Waste Materials in Cement Production” Final Draft March 2005, Annex 12. <http://www.cement.ca/images/stories/Holcim-GTZ%20Guidelines%20on%20Co-processing%20Waste%20Materials.pdf>

It is submitted that the data presented in *S13.1 Air Quality Impacts* of the FEIR (upon which this authorisation is based) are inadequate to make a reasonable assessment for the proper monitoring and protection of health - in particular to detect the variations in emissions under current and WML stipulated (12% substitution rates) and also for the measured emissions of highly toxic emissions such as dioxins and heavy metals.

This FEIA upon which this authorisation is based does not report any measured emissions data for dioxins and furans as is required by their current AEL. Unless these data are available for the maximum waste tyre substitution rate how can a reasonable assessment be made on the efficiency of the waste tyre AFR project let alone, making a reasonable assessment for substituting coal with the percentages of hazardous waste that NPC aspire to...."At present NPC is investigating the use of various alternative fuels, including but not limited to refinery tank bottoms, solvents, hydrocarbon waste, general industrial waste, spent resins etc. NPC is currently targeting to replace more than 50% of the fossil fuel used and 10% of the traditional raw materials by co-processing approximately 200 000 tons per annum alternative fuels and alternative raw materials".

Furthermore the FEIR (upon which this authorisation is based) fails to address provisions for monitoring performance of air pollution control devices. The minimum emission standards for cement production using alternative fuels set in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (AQA) requires continuous monitoring of several important pollutants (PM, CO, NOx, SO2, HCl, HF) and also mentions the need to monitor the optimum performance of air pollution control equipment. However this requirement is insufficiently detailed in this FEIA and should be reassessed in order to enable the authorisation to be an effective regulatory tool.

It is often assumed that monitoring the performance of a polluting facility means monitoring pollutant emissions as frequently as possible (if not continuously). However it is submitted that this approach fails to address the problem comprehensively, and in order to do so it is just as important to monitor, directly and continuously, the performance of the facility's air pollution control devices. For many pollutants, such as dioxin, it is impossible to monitor emissions continuously.

Therefore, an important way of establishing whether a facility is controlling emissions of these pollutants is to obtain real-time information about the performance of relevant air pollution control devices. For example, if a fabric filter is functioning properly, then air pressure upstream of the filter is much higher than the air pressure downstream of the filter. However, if there is a tear or rupture of the fabric filter, then this can be detected by a sudden drop in the difference between air pressures on both sides of the fabric filter. It is relatively straight forward to obtain real-time information about air pressures on both sides of the fabric filter and if these indicate a sudden drop in the difference between the air pressures, then it can be inferred that there is a breach in the integrity of the fabric filter and that excessive emissions are occurring – without the need to measure these emissions.

Similarly, if a facility is relying on rapid cooling of exhaust as a means to control dioxin emissions, then measuring the temperature of the exhaust prior to the air pollution control device becomes the most reliable means of telling whether the facility is adequately controlling dioxin emissions. For an example of this approach from another jurisdiction we refer to the US EPA regulation (see Annexure A), which is applicable to cement kilns burning hazardous waste and which has numerous monitoring requirements that focus not only on pollutant emissions, but on the performance of a facility's air pollution control devices.

It is therefore submitted that the FEIA should be amended to include provisions that encompass parameters that would continuously inform the company, the authorities and even the general public that a hazardous waste cement kiln's pollution abatement technology (e.g. ESP, bag filter, scrubber, etc.) is functioning optimally.

Furthermore NPC's authorisation and ROD issued by the then DAEA stipulates the requirements for monitoring under S5.2.17. However no presentation of these quarterly audit reports on the use of

waste tyres and emissions monitoring, nor compliance with the conditions of the ROD are presented in the FEIA. This again represents a failure of the FEIA.

Fundamentally groundwork has serious objections to the burning of alternative fuels – such as waste tyres – and maintains that this is contrary to the waste management hierarchy as stipulated in the Waste Act.⁵ The current NPC cement kilns were designed and built some time ago, to make cement, not to burn H:H waste, waste tyres, plastics, solvents nor sewage sludge. Their design is unable to guarantee the same level of complete combustion that would be achieved in a purpose built hazardous waste incinerator.

There is evidence that high temperatures cannot be maintained throughout an entire cement kiln, that turbulence in the kiln may give rise to pockets of incomplete combustion, and that the level of excess oxygen is inadequate. In fact the need to have sufficient oxygen for efficient combustion is at odds with the atmospheric requirements for good quality cement.⁶ Significantly, the new EU Directive (see section 11) which will affect the burning of hazardous wastes in kilns exempts kilns burning wastes at 40% or less contribution to heat value from the need to have a minimum 6% oxygen atmosphere. This seems to recognise that low oxygen and thus poor combustion is a feature of cement kilns.⁷ The absence of systems in cement kilns for rapid quenching of emissions also provides an environment that encourages formation of dioxins.

Sewage sludge can contain a wide range of chemicals and heavy metals and should be excluded from the list of permissible waste streams.

Studies show an increase in dangerous emissions when tyres are burned in cement kilns. A Friends of the Earth report, *Gone to Blazes*⁸, reports that tests of tyre burning at four California kilns showed the following emission increases when compared to coal:

Emission	% Increase	Number of tests
Dioxins	53% - 100%	4 / 4
PAHs	296% - 2230%	3 / 4
Lead	59% - 475%	3 / 4
Chromium	727%	1 / 3

PCDD/PCDF emissions to air increased have consistently been shown when tires were fed to the main burner (Conesa et al., 2008),⁹ and PCDD/PCDF levels in cement were found to increase during co-combustion of tires (Hsu and Ling 2000).¹⁰

Furthermore a significant increase of zinc and lead input to the kiln, and between a two to five times increase in dioxin emissions, were found in a German study of a Belgian kiln burning tyres¹¹

⁵ The hierarchy of waste management is identified in the Waste Act as waste avoidance and reduction; re-use; recycling; recovery and, as a last resort, treatment and safe disposal.

⁶ David B Kopel, *Environmental Law Reporter*, 4, 1993. 2. EW Kleppinger, *Folly or Redemption? Can cement kilns really do the job?*, Air & Waste Management Association, Clearwater, Florida 2.3.1993; *Letter to Director of EPA from coalition of US citizen groups* 16.1.1995; *Citizens Briefing Book on Cement Kiln Incineration of Hazardous Wastes in Texas*; prepared for Texas Air Control Board Policy Task Force, 20.11.1992. ; Paul Connett, Professor of Chemistry, St Lawrence University New York , Air Watch public meeting ,Clitheroe, March 23 1997

⁷ EU Hazardous Waste Incineration Directive 94/67, Article 3, Article 6.2.

⁸ <http://www.foe.co.uk/pubsinfo/briefings/html/19971215145335.html>

⁹ Conesa, J., Galvez, A., Mateos, F., Martin-Gullon, I., Font, R., 2008. Organic and inorganic pollutants from cement kiln stack feeding alternative fuels. *Journal of Hazardous Materials* 158: 585-592.

¹⁰ Hsu, M., Ling, Y., 2000. Experimental evaluation of PCDD/DFs in cement samples from kilns using waste tyres. *Organohalogen Compounds* 46:366-368.

¹¹ L Lhose, Critique on the Environmental Assessment on the Lische Dry Cement Kiln, Wallony, Belgium, Oekopol Institute, Hamburg, 1996.

E. Atmospheric emissions and selection of AFR

In S10.1 of this FEIA upon which this authorisation is based NPC state that "*The availability of suitable AFR over the life of the facility will change and different types of AFR will have to be obtained from different sources. The type and composition of the AFR selected will result in emissions to atmosphere, which will be variable depending on the AFR used. NPC has appointed a reputable waste management contractor to identify and source AFR*".

We submit that this assertion at face value is unacceptable and disrespectful to the public who will ultimately bear the burden of the impacts of this proposed activity. NPC expect us to "trust" them to appoint an undefined "reputable waste management contractor" to responsibly provide them with an undefined endless hazardous waste stream (that WILL result in variable atmospheric emissions) but it will all be fine because they have a good reputation.

We submit that in South Africa you would be hard pressed to find any "reputable" waste management contractor by their own admission and even more hard pressed to find a waste contractor who has experience in sourcing suitable waste for incineration in a cement kiln! This is simply unacceptable and again represents a failure of the FEIA to demonstrate that what is proposed has a basis of expertise or previous experience. The environmentally sound management of hazardous waste along its full lifecycle requires demonstrated experience and public trust. From this application it seems that all NPC are interested in is to substitute as much coal as they think possible to save money and to make as much money as possible incinerating hazardous waste, whilst externalising the associated lifecycle public health costs.

This authorisation makes no provision for or mandatory requirement for a legally constituted monitoring committee made up of interested and affected parties that will provide an independent and objective oversight to compliance with the WML, EMPr and AEL for this activity which is the norm for this kind of activity.

We submit that this authorisation should be set aside because it does not make provision for a monitoring committee made up of interested and affected stakeholders for the following reasons and with the following functions:

- To enable the community, government stakeholders and industry to participate effectively in and monitor the operation, and ongoing monitoring of the NPC AFR project.
- To monitor the objectives of the National Integrated Waste Management Strategy and the Provincial Waste Management Plan in reference to waste prevention, minimisation and recycling are effected.
- To monitor compliance and/or non- compliance of the permit conditions and inimum requirements.
- To discuss and address the concerns of the community (in the immediate vicinity) regarding the NPC AFR project.
- To act as the representatives of the community.
- To observe and monitor the impacts of the site on the receiving environment.

Concluding remarks: Why is burning hazardous waste a bad idea?

In summary, this authorisation is a grave step backwards, from the standpoint of environmental protection, public health, and cost. Hazardous waste incinerators generate highly toxic pollutants that will remain in our environment for hundreds of years and cause cancers, developmental and reproductive disorders. The country (let alone the Province) does not have in-house technical capacity and hence lacks the ability to monitor and enforce existing dioxin limits. The capital and operating costs of non-incineration technologies are lower and do not commit communities to long-term generation of waste to feed the treatment systems. Instead, more effort is needed by the KZN Provincial Authority (EDTEA) to go to improving segregation, recycling, source reduction, reuse, composting, and waste minimization, and the promotion of truly cleaner technologies.

Hazardous waste incineration in cement kilns is on the balance of the global evidence base a polluting, expensive and unsustainable technology that undermines zero waste strategies (such as recycling and composting) and stifles innovation in the waste management and energy sectors. Burning resources and creating toxic pollution, whether for energy generation or waste management disposal, makes no sense if we are serious about recycling, reducing greenhouse gas emissions and addressing climate change.

Releases toxic air pollutants

Hazardous waste cement incinerators are known to produce large amounts of toxic air pollution that impact on the environment and human health. These emissions include highly toxic and carcinogenic persistent organic pollutants such as dioxins and furans (PCDD and PCDF), hexachlorobenzene (HCB), PCBs and brominated persistent organic pollutants¹².

Incinerators also emit nanoparticles, toxic heavy metals such as lead, mercury and arsenic and acid gases that have serious impacts on human health¹³. Many of these pollutants are carried on the wind impacting communities and ecosystems long distances from the point of origin¹⁴. South Africa is a signatory to the Stockholm Convention, which obliges us to reduce, and where feasible, eliminate sources of dioxins and furans. Permitting cement incinerators to establish in South Africa contravenes the intent of this obligation.

Hazardous waste incineration in cement kilns destroys embedded energy

Waste incinerators destroy the resources entrained in waste including the embedded energy. The embedded energy in any given product includes the energy expended in extracting resources, refining, manufacturing and transporting the product to the point of sale. This energy is lost when a discarded product is burned in an incinerator and the whole cycle must begin again. Most of this energy is retained when the discarded product is recycled or reused. The only energy 'recovered' from burning a product in an incinerator is the 'calorific' energy of that item – in other words - the small amount of heat energy it contains. For example burning a PET plastic water bottle yields 3.22 gigajoule per tonne whereas recycling it saves 85.16 gigajoule per tonne. That means recycling a PET plastic bottle saves 26.4 times the energy that burning yields demonstrating that incinerating waste is an enormous waste of energy¹⁵.

Undermines recycling efforts

Waste incinerators seek the highest calorific value fuels available to burn as this increases the efficiency of their energy. Unfortunately those high calorific value wastes are also highly valued for recycling. These include plastics, paper, woodwaste and cardboard. By competing for the same materials as recycling operations incinerators undermine the recycling sector and destroy valuable resources and their embedded energy.

Stifles innovation

Waste incinerators require waste supply contracts that typically last for 25-30 years. This means that local governments must supply the incinerators with a steady flow of waste at an agreed volume for that period of time. If the waste stream is locked for decades, alternative waste treatment technologies including recycling, re-use, composting and anaerobic digestion are effectively stymied. This is a significant barrier to achieving sustainability as new developments in environmentally friendly technology are prevented from accessing the resources.

Entrenches a linear economy

Waste incineration entrenches a linear economy in our society that relies on the extraction of virgin materials and rewards consumptive and wasteful lifestyle choices. Our society needs to transition as soon as possible to a circular economy where resources are not destroyed through landfills or

¹² USEPA (2005) The Inventory of Sources and Environmental Releases of Dioxin-Like compounds in the United States: The Year 2000 Update. March 2005 External Review Draft.

¹³ British Society for Ecological Medicine (2008) The Health Effects of Waste Incinerators. 4th Report of the British Society for Ecological Medicine.

¹⁴ For example see Stockholm Convention on Persistent Organic Pollutants 2001, www.pops.int

¹⁵ Energy Comparison: Recycling versus Incineration (ICF Consulting, 2005)

incineration but rather are conserved through reuse, recycling and composting schemes generally known as Zero Waste Solutions.

[END]

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