

Blue Ridge Environmental Defense League

www.BREDL.org PO Box 88 Glendale Springs, North Carolina 28629 BREDL@skybest.com (336) 982-2691

July 7, 2009

Lawrence E. (Eddie) Nanney, Director
3rd Floor, L&C Annex 401 Church Street
Nashville, TN 37243-1532
Division.Radiological.Health@state.tn.gov

**Re: Tennessee Radioactive Material License Number R-73024-E17
IMPACT Services, Inc., Oak Ridge, TN 37830-8131**

Mr. Nanney:

On behalf of the Blue Ridge Environmental Defense League and our members in Tennessee, I write to provide comments on the proposed license amendment to the IMPACT Services incinerator. I hereby request that the public comment period be extended at least 30 days and that a public hearing be held on this matter near the licensed site before the Division approves the requested licensing action.

Procedural Matters

I have today submitted a request to the Division for the following documents:

1. License amendment request and correspondence for pyrolysis process—42 pages,
2. Current license document (R-73024-E17)—17 pages,
3. Existing license application, amendment requests and related correspondence (license process)—431 pages and
4. Volumetric Clearance for Disposal to landfill authorization (part of current license)—690 pages.

I was informed by the Division of Radiological Health's Charlie Arnot that these are the pertinent documents in this decision. On June 30th and July 2nd I attempted to gain access to some of these documents: the current permit and the proposed amendment. I was told by Mr. Arnot that I must come to Nashville to obtain any copies whatsoever. Direct appeals to the DRH for an alternative means of accessing public records were unproductive. Subsequently, I called Commissioner Fyke's office which kindly referred me to the Office of General Counsel. There, Ms. Freda Crutchfield attended to my request and her efforts apparently did get the DRH to relent. The Division has now agreed to provide pertinent documents via postal mail after the receipt of payment of copying and postage costs. I understand this method of providing public documents was communicated to DRH only today.

Mr. Nanney, I relate this to you only because it has taken an inordinate amount of effort to access public documents in an efficient and timely way. The public comment period is 15 days after notice. My initial request to DRH was meant to facilitate the matter by the provision of documents either electronically or via facsimile. During the last 23 years I have worked with many local, state and federal agencies and the provision of documents

Esse quam videre

has generally gotten easier with the advent of electronic communications. Today, most permits, draft permits and preparatory documents are initially produced on computers and are, therefore, easily posted to websites and/or e-mailed. I regret that this is apparently not within the capability of the Tennessee Department of Environment and Conservation at this time.

Background

On June 22, 2009 the Division of Radiological Health issued a notice that it was prepared to approve a request from IMPACT Services, Inc. to amend their Tennessee Radioactive Material License to “authorize a pyrolytic volume reduction process for wastes contaminated with radioactive materials at the licensee’s facility at the U.S. Department of Energy ETTP Complex on the Oak Ridge Reservation.”

Applicable Rules

The Division of Solid Waste Management regulates certain radiological waste processing facilities licensed by the Division of Radiological Health by use of the *special waste* approval process.¹ All special wastes sent to solid waste landfills must meet DSWM conditions including the use of well-maintained radiological sensing equipment.

Rule 1200-1-7-.01 “Special Wastes” are solid wastes that are either difficult or dangerous to manage and may include sludges, bulky wastes, pesticide wastes, medical wastes, industrial wastes, hazardous wastes which are not subject to regulations under Department rules 1200-1-11-.03 through 1200-1-11-.07, liquid wastes, friable asbestos wastes, and combustion wastes.

Pursuant to TCA 68-211-103, “Solid waste processing means any process that modifies the characteristics or properties of solid waste, including, but not limited to, treatment, incineration, composting, separation, grinding, shredding, and volume reduction...”

Rule 1200-1-7-.01 “Incinerator” means an enclosed device using controlled flame combustion, the primary purpose of which is to thermally break down solid waste. Examples of incinerators are rotary kiln, fluidized bed, and liquid injection incinerators.

Rule 1200-1-7-.01 (3) Classification of Disposal Facilities

(a) Class I Disposal Facility refers to a sanitary landfill which serves a municipal, institutional, and/or rural population and is used or to be used for disposal of domestic wastes, commercial wastes, institutional wastes, municipal solid wastes, bulky wastes, landscaping and land clearing wastes, industrial wastes, construction/demolition wastes, farming wastes, shredded automotive tires, dead animals, and special wastes.

Incinerator ash is subject to hazardous waste determination requirements under federal regulations Subtitle C, 40 CFR Part 261. Ash generated at TDEC-permitted facilities are

¹ TDEC DSWM Policy and Guidance Manual, Memorandum of Agreement, 09/12/06, pn 126, p. 61

subject to Tennessee Hazardous Waste Management Rules and Regulation which include the TCLP test for determination of hazardous characteristics.

Discussion

Incineration perpetuates pollution of the environment. Older incinerators have been joined by new burners claiming zero emissions and so-called "green" energy from garbage, tires, sewage sludge and biomass from farms and forests. However, even the newer incinerator technologies—gasification, plasma arc, and pyrolysis—have smokestacks that emit pollution to the environment. These emissions include dioxins and furans, heavy metals including cadmium, chromium and arsenic. Burning materials contaminated with radioactive substances does not eliminate the radiation; it merely puts it into the atmosphere. And incineration presents multiple problems of ash management and disposal. An overview:²

Incineration is the controlled burning of waste and has become the most favored option because it provides a cost-effective manner of disposal. Incinerators are expensive, but once on-line can produce lucrative profits for the builders and operators of the facility. They burn the waste and, to the average person, it appears to have disappeared. In addition, resource recovery incinerators produce electricity from the incineration process and provide another financial incentive for waste disposal firms to use such technology.

As with landfills, there is more than meets the eye with the "incineration solution." Incinerators are designed to burn hazardous or municipal solid waste at extremely high temperatures to destroy, or at least reduce, the toxic components. The reality is that burning does not destroy the waste, but merely changes its form.

In addition, the process creates new toxic by-products. Incineration of even relatively benign household garbage creates dangerous toxins. These new toxins and waste products, which never are burned completely - despite even the most effective pollution control devices - escape up the smokestacks in the form of air emissions and fly ash, settling on land and surface water or remain in the machine as ash residue, which then must be landfilled.

Radioactive ash presents a waste handling problem which TDEC and DRH must account for in the proposed licensing action. Between the incinerator and the landfill is the time when ash may become dispersed into the environment. Research has detailed this problem:

In Japan, low-level radioactive wastes discarded by research institutions and hospitals are packed into containers and stored. Volume reduction by incineration and compression processing are sometimes attempted; alternatively,

² Christy Law, *Up in smoke: setting fire to the waste problem*, USA Today (Society for the Advancement of Education), copyright 1993 and 2004, FindArticles.com

the wastes are left in an unprocessed state because neither landfill sites nor disposal methods have been established. Especially, low-level radioactive waste incineration ash presents great problems of security, safety, and stability in inventory location. A safe and appropriate disposal processing method is desired because the bulk density of ash is low; the ash is also easily dispersed.³

Radioactive ash and incinerator emissions are a source of internal irradiation, a more harmful form of exposure than external radiation dose. Dr. J. Thompson explains the physiological process as follows:⁴

The radioactive waste will be incinerated, transforming it into radioactive particulates. These microscopic particles will then be breathed in by the local population. Incinerators typically produce the very tiny PM2.5 particulates. These are highly chemically reactive and will attach to radioactive matter and are so small they will be breathed deeply into the lungs, by-passing the lungs defences and then be taken into the blood stream and into the cells.

Dr. Thompson continues:

Here the body mistakes the radioactive matter for a natural substance and it is then incorporated into the body. For instance radioactive iodine is stored in the thyroid instead of normal iodine. So it becomes attached to body structures and concentrated where it will act as a source of radiation and it will continue to emit this radiation over time. This is highly dangerous because these continuing radioactive emissions will target the nearby cells and their genetic material where they can induce cancer. In fact we already know that radioactive isotopes can become attached to the chromosomes^{5, 6} and there can be no more dangerous place to harbour radioactive isotopes.

Morbidity data for prostate cancer,⁷ childhood leukemia,⁸ and female breast cancer⁹ confirm the damaging effects of internal radiation exposure. Thomson points further to studies which show that airborne radiation is the most damaging route of exposure.¹⁰

Comparisons of radiation dosage caused by man-made industrial facilities with naturally occurring background radiation exposure (NBR) fail to account for the harmful nature of the artificial radioactivity. Again, Dr. Thompson presents epidemiological evidence which should cause the DRH to readjust its health impact assessment for incineration

³ Hidemi KOYAMA, Masayuki KOBAYASHI and Masayuki HORIO: Resources Processing, Vol. **54**, No. 2, pp.63-70 (2007)

⁴ Low-level Radioactive Waste at Colnbrook Incinerator, J. Thompson, Downloaded July 7, 2009 at <http://slough.info/sain/sain02/sain02thompson01.html>

⁵ Luning Nature 1963; 197:304-5

⁶ Mazia Proceedings of National Academy of Sciences 1954;40:52

⁷ Beral BMJ 1990;307:139-7

⁸ Roman BPJ 1993;306:615-21

⁹ Sternglass & Gould International J of Health Services 1993;23/4:783-804

¹⁰ Coughtry in Uptake of Radionucleotides in Domestic Animals 1993

before taking further licensing action:¹¹

The most obvious illustration of this is the clusters of leukaemia and cancers that are found around nearly all of the worlds nuclear facilities.^{12 13} Sellafield has a tenfold increase in childrens leukaemia and a threefold increase in cancers. The authorities unsurprisingly maintain that it cannot be due to the radioactivity because the amount of external irradiation is much less than NBR. At Dounreay there is a 6 fold increase in childrens leukaemia and again we are told there is no risk from the radiation as it is less than NBR.¹⁴ They fail to mention that Aberdeen has double the level of NBR but no increase in cancers and leukaemias. This, itself, should tell us that natural background radiation is irrelevant. To say that internal irradiation is safe because it is less than background radiation is like saying a cobra must be far less dangerous than a cow because it is so much smaller. The truth is that they are very different animals and size does not equate with danger.

Dr. Rosalie Bertell's research into biometrics and environmental epidemiology indicates the critical danger to public health caused by internal radiation exposure:¹⁵

The severity of health effects caused by internal exposures will depend on the biological characteristic of the radioactive chemical and the length of time it may be expected to reside in the body. Radioactive cesium, for example, lodges in muscles and is probably completely eliminated from the body in two years. Radioactive strontium lodges in bone and remains there for a lifetime, constantly irradiating the surrounding cells. The usual time required by the body to rid itself of half the radioactive chemical is called the 'biological half-life' of that chemical. Some radiation health effects are observable in the persons exposed; some effects are only seen in their children or grandchildren because the damage was to sperm or ovum.

Ionising radiations emitted from within the body by radioactive chemicals taken in by inhalation, ingestion or absorption are even more damaging because they are so close to delicate cell structures. The body is not able to distinguish between radioactive and nonradioactive chemicals and will as readily incorporate the one as the other into tissue, bone, muscle or organs, identifying them as ordinary nutrients.

The chaotic state induced within a living cell when it is exposed to ionising radiation has been graphically described by Dr Karl Z. Morgan as a 'madman

¹¹ *Id*

¹² Sternglass *Secret Fallout* 1981 (New York, McGraw Hill)

¹³ Cook-Mazzaffari *Br J of cancer* 1989;59:476-85

¹⁴ Heasman *Lancet* 1986;1i:266

¹⁵ Dr Rosalie Bertell, *No Immediate Danger, Prognosis for a Radioactive Earth*, The Book Publishing Company -- Summertown, Tennessee 38483, ISBN 0-913990-25-2

loose in a library'.¹⁶ The result of cell exposure to these microscopic explosions with the resultant sudden influx of random energy and ionisation may be either cell death or cell alteration. The change or alteration can be temporary or permanent. It can leave the cell unable to reproduce (or replace) itself. Radiation damage can cause the cell to produce a slightly different hormone or enzyme than it was originally designed to produce, still leaving it able to reproduce other cells capable of generating this same altered hormone or enzyme. In time there may be millions of such altered cells. This latter mechanism, called biological magnification, can cause some of the chronic diseases and changes we usually associate with old age. One very specific mutation which can occur within the cell is the destruction of the cell's mechanism for resting which normally causes it to cease reproductive activities after cell division. This inability to rest results in a runaway proliferation of cells in one place, which, if not destroyed, will form a tumour, either benign or malignant. The abnormal proliferation of white blood cells is characteristic of leukaemia; red blood cell proliferation results in what is called polycythemia vera.

If the radiation damage occurs in germ cells, the sperm or ovum, it can cause defective offspring. The defective offspring will in turn produce defective sperm or ova, and the genetic 'mistake' will be passed on to succeeding generations, reducing their quality of life until the family line terminates in sterilisation and/or death.¹⁷

Simply stated, radioactive substances such as uranium cannot be destroyed by incineration. The International Institute of Concern for Public Health presented the most straightforward indictment of the incineration of radioactive waste:¹⁸

Uranium is pyrophoric, which means that when it is in fine particles, it can catch fire even at normal temperatures. By incinerating it, it will burn at 3,000 to 6,000 degrees centigrade. This will cause the uranium particles to turn into ceramic uranium.

Ceramic uranium is not soluble in body fluids after being breathed into the lungs. This metal vapour will solidify in the cooling air and form respirable particles. Some particles will be nanometre in size (a nanometre is 1 billionth of a metre), so small that they can pass through the lung-blood barrier, escape from the blood vessels and enter into the cells. They can also pass through the blood-brain barrier and enter into the brain itself. These particles have been found in seminal fluid and in the female where they can cross the placenta and cause havoc to the developing embryo or fetus. These metal fumes pose an immediate danger for the residents of downwind communities.

¹⁶ Karl Z. Morgan, 'Reducing Medical Exposure to Ionizing Radiation', *American Industrial Hygiene Association Journal*, May 1975, pp. 361-2

¹⁷ H. Müller, 'Radiation and Heredity', *American Journal of Public Health*, vol 54, no. 1, 1964, pp. 42-50

¹⁸ Burning Radioactive Waste: Blind River and the CNSC Decision, International Institute of Concern for Public Health, Toronto, Canada, March 16, 2007

Finally, can the U.S. Department of Energy's East Tennessee Technology Park (ETTP), formerly known as K-25, be trusted to comply with the law? Revelations of the most egregious officially-sanctioned behavior surfaced during the 1990's. The following report was published by the Environmental Research Foundation ¹⁹

Leo P. Duffy, a DOE assistant secretary, testified February 20 [1992] that between 1984 and 1991 some 113,000 cubic yards of radioactive wastes (about 200 boxcar-loads weighing 7000 tons) were shipped illegally to eleven chemical waste disposal facilities (incinerators and dumps)...Martin Marietta Energy Systems--the company that operates the Oak Ridge National Laboratory (Oak Ridge, Tennessee), the Paducah Gaseous Diffusion Plant (Paducah, Kentucky), and the Portsmouth Gaseous Diffusion Plant (Portsmouth, Ohio)--sent its president, Clyde Hopkins, to testify that his employees had been illegally shipping radioactive wastes to waste disposers like Rollins and Chem Waste for years. He said his employees used white-out illegally to delete information from shipping manifests indicating that the wastes were radioactive because they believed "national security considerations" required them to. He said enemies of the United States might glean valuable information about U.S. atomic weapons by studying the wastes his staff had been shipping illegally to Chem Waste and Rollins and the others. He testified that his staff had been shipping uranium-238, uranium-235 and technetium-99 mixed in with chemical wastes. Additional information attached to his testimony indicated Martin Marietta had reason to believe iodine-129, neptunium-237, and thorium-232 were also being shipped off-site to various incinerators and landfills.

Although the above events occurred years ago, recent history indicates that agency oversight and accountability remain susceptible to human foibles. In January 2009 a former employee of Bechtel Jacobs at ETTP pled guilty to attempting to sell classified data and materials. The US Department of Justice said:

Oakley stated that he had taken certain parts of uranium enrichment fuel rods or tubes and other associated hardware items from the ETTP work site and that he wanted to sell these materials for \$200,000 to the foreign government.

How has the DRH and TDEC improved policies, procedures, monitoring and record-keeping during the last decade to eliminate such behavior, whether done for profit or in the interest of "national security"?

Conclusion

In view of the above, the inescapable problem presented by the proposed licensing action, "pyrolytic volume reduction process for wastes contaminated with radioactive materials," is that, if approved by the Division of Radiological Health, the agency's action would be

¹⁹ RACHEL'S HAZARDOUS WASTE NEWS #282, April 22, 1992

out of compliance with the law, would be violating the principles of medical ethics and would be undermining its fundamental mission; i.e., “protecting Tennesseans and the environment from the hazards associated with ionizing radiation.”²⁰ We recommend that the Division not authorize pyrolytic processing of radioactive materials.

I plan to submit additional comments.

Respectfully,

A handwritten signature in black ink that reads "Louis A. Zeller". The signature is written in a cursive style and is followed by a horizontal line.

Louis A Zeller
Science Director
Blue Ridge Environmental Defense League

Attachments

Law, *Up in smoke: setting fire to the waste problem*, USA Today (Society for the Advancement of Education), copyright 1993 and 2004, FindArticles.com

Hidemi KOYAMA, Masayuki KOBAYASHI and Masayuki HORIO: Resources Processing, Vol. **54**, No. 2, pp.63-70 (2007)

Low-level Radioactive Waste at Colnbrook Incinerator, J. Thompson, Downloaded July 7, 2009 at <http://slough.info/sain/sain02/sain02thompson01.html>

Dr Rosalie Bertell, *No Immediate Danger, Prognosis for a Radioactive Earth*, The Book Publishing Company -- Summertown, Tennessee 38483, ISBN 0-913990-25-2 (excerpt)

Burning Radioactive Waste: Blind River and the CNSC Decision, International Institute of Concern for Public Health, Toronto, Canada, March 16, 2007

RACHEL'S HAZARDOUS WASTE NEWS #282, April 22, 1992

²⁰ TDEC DRH website: <http://tn.gov/environment/rad/index.shtml>, downloaded July 7, 2009