Minutes of a Meeting of the Environmental Authority
Held on Wednesday 26 August 2020
At the Department of Environment and Natural Resources, Botanical Gardens, Paget and Remotely using Zoom Teleconference

PRESENT: Ms. Tinee Furbert, Chair
Mrs. Susan Armstrong, Member, remote access
Mr. Andrew Barnes, Member, remote access
Mr. Willie Furguson, Member
Mr. James Morrison, Member
Mr. Eugene Saunders, Member
Mr. Jonathan Starling, Member, remote access

ADVISORS: Dr. Geoff Smith, Environmental Engineer, DENR
Dr. Shaun Lavis, Hydrogeologist, DENR
Mr. Tom Crossan, Chief Environmental Health Officer, remote access
Mr. Kirk Outerbridge, Chief Engineer, Public Works, remote access
Mr. Tarik Christopher, Principal Engineer (Water & Sewage), Public Works, remote access
Ms. Patricia Hollis, Environmental Officer, DENR, Recording Secretary

IN ATTENDANCE:
Ms. Taylor Hines, Student Intern, DENR

ABSENT:
Mr. Armell Thomas, Senior Environmental Health Officer

1. **Welcome to New Members**
With this being the first "in person" meeting of the Authority able to be held this year due to the social distancing restrictions required by the Covid-19 pandemic, the Chairman met and welcomed all Members and Advisors.

2. **Confirmation of Minutes**
The minutes of the meetings held on 19 February 2020, 13 May 2020, 22 June 2020, and 13 July 2020 were approved and signed by Eugene Saunders, who was present for those meetings. The Authority noted that the meetings of 13 May, 22 June and 13 July were held electronically and for the avoidance of doubt, ratified all decisions made.

3. **Medical Waste Incinerator and Pet Crematorium--Construction Permit Application Medi-Waste (BDA) Ltd (CP-677)**
The Members were reminded that Medi-Waste (BDA) had submitted a construction permit application for a facility containing two medical waste incinerators and one pet crematorium unit that is proposed to be located at Lot 28, Waller's Point Road, Southside, and St. George's. The batch loading systems will incorporate two-chamber incineration of the materials with the injection of hydrated lime to neutralise acid gases, and a 5-micron ceramic filter to capture particulate matter greater than 5μm (i.e. >0.005mm) in diameter in the exhaust. The exhaust would terminate at an elevation of 9.6m above grade and will be approximately 250m (820 ft) from the nearest residential units, Harbour View Apartments.

It was noted that the Pet Cremation unit meets the UK DEFRA standards. However it was also noted that the medical waste incinerator does not meet the UK/EU Industrial Emissions Directive (IED) with respect to the prescriptive operating conditions of ensuring the waste is exposed to 1100 °C for more than 2 seconds if the waste contains more than 1% halogenated organic substances. The UK manufacturer, Inciner8 Ltd, stated that their packaged units would reach 1100°C temperature for only 0.5 second. As it would not be appropriate to assess each red bag for its contents with respect to halogenated organics it is acknowledged that these units therefore technically do not meet the prescriptive operating requirements of the UK IED.

Analysis by the MCERTS-accredited monitoring company, Exova Ltd, of the exhaust emissions from this equipment when burning medical waste, has been compared to emission standards of the UK IED and US Code of Federal Regulations (CFR Parts 60 and 62 for 'Medium' sized incinerators) by DENR. The data showed that the emission rates from the medical waste unit met all of the UK IED emission limit values. The exhaust data showed that it met all standards for air pollutants in the US CFR regulations with the exception of lead (Pb). It is noted that lead can be present in a vapour form once heated and could therefore pass through the abatement systems described. Activated carbon injection would be required to help address metal vapours which are present on the much larger medical waste incineration systems. Prevention of lead being deposited in medical red bag waste may therefore be necessary. Bermuda's Clean Air Regulations do not include specific emission limits for medical waste incinerators, hence the need for comparison to appropriate developed jurisdictions (i.e. UK/EU, USA).

It was noted that in the UK, there are only 17 medical waste incinerators that meet the IED standard as regulated by the UK Environment Agency, and these are all significantly larger (i.e. 4,270 to 100,000 Tonnes per year) than the proposed facility for Bermuda's medical waste (i.e. <200 Tonnes per year). It was further noted that Inciner8 Ltd medical waste incinerators, similar to the proposed ones for Bermuda, are in use around the world in countries including: Zimbabwe, Egypt, Pakistan, Tonga, Papua New Guinea and other places via contracts with the UK Ministry of Defence. These units are not expected to be operated in the UK as a result of the IED operational requirements and presence of 17 existing facilities around the country.

This application was initially considered by the Authority at their email meeting of the 22nd June 2020, where a range of questions were raised for the applicant. The following includes the answers to those questions posed:

Q1. Will the Plume be visible from the stack during operation?
Medi-Waste (BDA) Ltd: No.

Q2. How much lime will be used?
Medi-Waste (BDA) Ltd: 4kg per Tonne of medical waste. Medical waste will not be treated if lime is not available.

Q3. How will spent lime be disposed of?
DENR: Tynes Bay Waste to Energy Facility have confirmed acceptance of such waste (i.e. spent lime and ash). This will be added to the existing ash used for making ash/concrete blocks.

Q4. What size fraction of particulates will be ceramic filter capture/allow to pass?
Medi-Waste (BDA) Ltd: Pore size 5µm (i.e. 0.005mm) will filter out the particles greater than 5µm in size and smaller as the filtered particles build up before backpulsing.

Q5. Is there any mercury and dioxin/furan data for this medical waste incineration unit?
Medi-Waste (BDA) Ltd: Yes. This was presented at the meeting and the emissions were shown to be compliant to UK and US legislation for these pollutants.

Q6. How are pets disposed of now by veterinary clinics?
Medi-Waste (BDA) Ltd: Pets and other animals are currently disposed at a reserved area of the Marsh Folly Compost Facility. Some pets are also buried locally or sent overseas for cremation with the ashes being returned to Bermuda.

Q7. What disposal criteria is in place now for pets?
DENR: There are not any specific regulations for pet disposal.

Q8. What sort of medical waste is this proposed facility planning on treating?
Medi-Waste (BDA) Ltd: Infectious, pathological, sharps, chemicals, pharmaceuticals, genotoxic wastes.

Q9. What is the temperature range of the first chamber?
Medi-Waste (BDA) Ltd: 0 to 1320 °C or 32 to 2408°F.

Q10. As there is no standard currently adopted for Bermuda for such a facility will one be adopted from another jurisdiction?
DENR: Yes, as there are no local regulations for medical waste the Construction Permit process of the Clean Air Act 1991 can be used to adopt best practice legislative requirements of other developed jurisdiction. It is noted that this facility

meets a wide range of EU manufacturing standards, specifically: EU Safety Standard (ILNAS EN 746-2), EU Low Voltage Directive (72/23/EEC), EU EMC Compatibility Regulation (89/336/EEC) and the EU Machinery Directive (2006/42/EC).

Q11. What is the lifespan of such a medical facility?
Medi-Waste (BDA) Ltd: 15-20 years for the incineration and filtration equipment.

Q12. What is the maintenance and cleaning schedule?
Medi-Waste (BDA) Ltd: Dependent of type of component and detailed schedule of replacement checks. Staff would be fully trained by the manufacturer to maintain and clean the incinerators. Aim to employ an engineer specifically trained in incineration technology to oversee the operation of the units.

Q13. Is it DENR's plan to research other case studies as it relates to small medical waste incinerators?
DENR: DENR has investigated the case studies of similar incinerators supplied by Inciner8 Ltd to other countries outside of the UK. DENR considers that this proposed small medical incinerator with both lime injection and ceramic micro-screen filtration would be appropriate for consideration for use on a small island such as Bermuda. See answers to Question 15 for current disposal practises for medical waste in Bermuda.

Q14. What sort of standard have been adopted in other countries for small medical waste incinerators?
DENR: No additional information is available from the applicant on this question that is over what was already provided above.

Q15. How many Tonnes of waste is BHB currently sending overseas each year?
DENR: Discussion with Bermuda Hospitals Board (BHB) revealed the following for the calendar year of 2019:

- Amount of bio-hazard waste, including potential chemical waste, shipped overseas in refrigerated 20ft containers under contract with Stericycle Inc.: **96,047 lbs per year (43.6 Tonnes per year).**
- Amount of bio-hazard waste (not including any chemical waste) that was processed locally in the licenced BHB Steam Sterilized macerators (SSM's): **276,647 lbs per year (125 Tonnes per year).**
- **Total medical waste (Bio- and Chemo- Hazard) generated/treated for 2019: 372,694 lbs per year (168.6 Tonnes/year)**

During the meeting some further questions were raised by the members to be addressed or the next meeting. These included the following:

Q16. What is the largest size animal that the pet crematorium will accept?
Q17. Will there be a smell from the facility, including the storage and handling areas?

With there being no further questions, the Authority **AGREED:**
that DENR will circulate draft conditions for the construction permit for the Authority's consideration. The construction permit shall include the requirement that the facility will be required to operate so it does not cause a nuisance under the Dept. of Health legislation (dust, noise, odours), and that the construction and operation shall be compliant to OSHA standards, or stated equivalent. The construction permit conditions shall include the requirement for the applicant to submit statements confirming agreements with the Bermuda Hospitals Board and Ministry of Public Works to accept the wastes/waste products before an operating licence application will be considered in addition to permission from the Department of Planning and the land-owner, BLDC.

4. BELCO Air Quality Complaints

Since the construction of BELCO's North Power Station, there have been numerous reports of poor air quality in the Ocean Lane, Pembroke area, north east of the BELCO plant, and of episodes of soot deposition in neighbourhoods around the plant.

a. Poor Air Quality

Earlier investigations and reports to the Authority have highlighted the apparent downdrafting of emissions form the BELCO stack(s), which could be causing very poor air quality in the Ocean Lane area, located down the back of (i.e. on northern side of) Langton Hill. Recent air dispersion modelling data (March 2020) has confirmed the apparent downdrafting

phenomenon in addition to both DENR and BELCO personnel witnessing the strong odours at Ocean Lane when the wind is from the SSW direction. In line with the Authority's written requirements, BELCO have attempted to determine which stack is the cause of these emissions. A 10-day shutdown of the new North Power Station (NPS) engines in June highlighted that the older East Power Station (EPS) engine stack (E5-E8) was the probable source of these emissions. The reason as to why these existing engines appear to be causing poor air quality issues via downdrafting over Langton Hill is not known. One potential theory relates to the reduced number of baseload engines operating in the E5-E8 stack resulting in the exhaust not getting as lofted as when all 4 engines used to operate.

The additional requirement of the Authority for BELCO to procure and install a trailer-mounted mobile air quality monitoring station on Ocean Lane is well underway. This is due to arrive in Bermuda by the end of August, after a 1 month delay due to Covid-19, and is due to be operational by the third week in September. [*The trailer mounted sensor system was placed on the ship to Bermuda on Friday 28th August*]. It is anticipated that this equipment will determine whether the air quality at Ocean Lane is compliant with the requirements of the Clean Air Regulations 1993, thereby determining if the air quality is safe to breathe.

The Authority also required that BELCO monitor the quality of water tanks in the affected area to World Health Organization (WHO) and UK standards. The Authority required that BELCO use a third party (i.e. Dr. Andrew Peters of BIOS) to collect the samples and manage their chain of custody. The list of parameters to be determined was created by DENR and reviewed by the Department of Health. This sampling is due to also complete before the end of August [*Completed Thurs 27th August*] with results expected from 1 to 3 weeks, depending on the parameter in question. Analysis of sediments in the water tanks will commence in September when the company collecting the sediment has availability.

b. Emissions of Soot Particles

Since the last meeting of the Authority BELCO and nearby residents have reported several events of large and small ash particles from the North Power Station stack falling on their properties, fouling their roofs, vehicles and other items. The largest event occurred after the four NPS engines were re-started after a 10-day down period described in item 4.a. above. BELCO is working with the manufacturers to address the soot problem. BELCO is required by DENR to analyse the leachability of the ejected ash which will give an indication of the worst case potential impact to residents' fresh water supplies. DENR had instructed BELCO to extend the water tank analyses described in agenda item 4.a. above to properties in the BELCO and Mount Hill areas. A total of 10 water tanks will be sampled from the BELCO area including Mount Hill, Langton Hill and two sites located near busy roads but away from BELCO.

The Authority **AGREED:**
to send a letter to BELCO expressing their further concern about the more recent poor air quality, soot complaints and potential impact to drinking water quality to the Mount Hill area. DENR will provide a draft for the Chair's consideration.

5. Applications for Construction Permits and Operating Licences (New)

5.1 CP-654, OL-1044 OneComm, 39 Headquarter's Hill, Prospect

The Authority **APPROVED:**
the application for construction permit and operating licence submitted by OneComm for a 60 kW diesel genset at 39 Headquarter's Hill, Prospect, subject to standard conditions and providing the existing barrier wall around the compound remains.

5.2 CP-648, OL-1038 OneComm, 18 Pompano Close, Southampton

The Authority **APPROVED:**
the application for a construction permit and operating licence submitted by OneComm for a 60 kW diesel generator at 18 Pompano Close, Southampton, subject to standard conditions..

5.3 CP-647, OL-1037 OneComm, 107 Somerset Road, Sandys

The Authority **APPROVED:**
the application for a construction permit and operating licence submitted by OneComm for a 60 kW diesel generator at 107 Somerset Road, Sandys, subject to standard conditions.

5.4 CP-682, OL-1086 Aecon, LF Wade Airport, St. George's
The Authority **APPROVED:**
the application for a construction permit and operating licence submitted by Aecon for a 200 kW diesel generator at the LF Wade Airport, St. George's, subject to standard conditions.

5.5 CP-683, OL-1087 Susan Spruce, 19 Tucker's Town Road, St. George's
The Authority **APPROVED:**
the application for a construction permit and operating licence submitted by Susan Spruce for a 50 kW diesel generator at 19 Tucker's Town Road, St. George's, subject to standard conditions and providing the generator is operated in the 5 foot deep recess with 6 foot high timber enclosure.

5.6. OL-1082 BAC Universal Electric 125 kW mobile genset
The Authority approved subject to standard conditions.

5.7 OL-1048, 1049, 1050 OneComm mobile generators (2 x 15 kW, 1 x 20 kW). The Authority approved these three applications subject to standard conditions.

5.8 Deferred Applications
It was noted that the applications listed below were deferred or withdrawn:
5.8.1 CP-684, OL-1088 A Budge, 2 Warwickshire Drive, Warwick, genset deferred pending submission of more information on sound attenuation.
5.8.2 CP-680, OL-1084 M. Grandisson, Arch Capital Group, 2 Hastings Road, Pembroke, genset deferred pending location information
5.8.3 CP-679, OL-1083 D. Pacheco, 17 Seagull Lane, Pembroke, 20 kW genset deferred pending submission of sound attenuation measures.
5.8.4 CP-681, OL-1085 A. Gaade, 5 Moorings Cove, Pembroke, 20 kW genset, withdrawn.

6. Applications for Operating Licences (Reissue)
6.1 The Authority **APPROVED:**
the reissue of operating licences on the three-page printout, subject to standard conditions, with the exception of five applications:
OL-142 Corporation of Hamilton Front Street waste water treatment plant. This was deferred pending update of negotiations between the Corporation and Government.
OL-521 WEDCo waste water treatment plant. This was deferred pending submission of the annual report.
OL-992 Graybar Holdings waste water treatment plant. This was deferred pending submission of the annual report.
OL-813 F & C Scrap Metal facility. This was deferred pending submission of the annual report.
OL-114 BELCO generators. This was deferred pending presentation of annual report by BELCO to the Authority at their next meeting.

7. Applications for Import Permits
The Authority **APPROVED:**
the application for an import permit submitted by AirCare Ltd for 40 x 24 lb cylinders of R-404A and 40 x 30 lb cylinders of R-134A, subject to standard conditions.

8. Applications for Water Rights (New)
The Authority **APPROVED** the applications listed below:
8.1 WR 5670 Karen Bean, domestic supply well at 3 Southbend Lane, Sandys, subject to standard conditions

8.2 WR 5671 M Rodrigues, domestic sewage disposal borehole at 41 Stokes Point Road, St. George's, subject to standard conditions and providing the borehole is sealed 40 feet below sea level.

8.3 WR 5672 Cartref Trust, domestic sewage disposal borehole at 75 Harbour Road, Warwick, subject to standard conditions and providing the borehole is sealed 40 feet below sea level.

8.4 WR 5673 Skyport Corp, domestic rainwater disposal borehole at 16 Kindley Field Road, St. George's, subject to standard conditions.

9. Applications for Water Rights (Reissue)

The Authority **APPROVED:**

the issue of water rights as listed on the six-page printout, subject to standard conditions, with the exception of four indicated as withdrawn.

10. Request for Advisor from Dept of Planning

The Authority requested that an Advisor from the Department of Planning attend the Authority's meetings.

11. Any Other Business

11.1. Referring to the recent explosion in Lebanon caused by ignition of stored ammonium nitrate, the question was raised as to how much and where explosive or hazardous materials, such as fertilizer, bulk propane, chlorine are being stored in Bermuda.

DENR commented that under the Fire Safety Act 2014 that all commercial buildings, institutions, etc. require a Fire Certificate that should include details of chemicals/dangerous commodities stored in that facility. Applications for Fire Certificates for these buildings are required from the building's owner / company employer to the Fire Safety Officer.

11.2 It was noted that the warning light on top of the BELCO North Power Station stack is overly bright and seems much brighter than other similar lights.

12. Date of the Next Meeting

The date of the next meeting will be set later.

CHAIRMAN

Sept 30th 2020

DATE