



New Incinerator Project



Office of the Auditor General
Government of the Virgin Islands
2 March 2011

Background

1. The population growth experienced in the territory over the past 15 years has been matched by an increase in its generation of solid waste. The volume is such that it has outgrown the capacity of existing incinerator (purchased in 1994) and the Solid Waste Department has at times resorted to open burning of garbage in the Pockwood Pond area where the incinerator is located. The practice of open burning has led to numerous complaints from citizens who are concerned about the health implications for those living and working in the general area and threatens environmental discord with the neighbouring USVI which is being affected by the resulting smoke.
2. In peak periods the present incinerator facility accommodates a waste stream of some 93 tons a day and burns 36,500 tons of waste each year. This is more than twice its recommended burning capacity of 40 tons per day.
3. In order to meet the growing needs of the populace the Government undertook to purchase a larger incinerator that would accommodate the island's waste problem.
4. The objective of this audit is to review the progress of the new incinerator project from the time of commissioning in 2004 to its arrival in the territory in 2009 and the position at 31 December 2010. The audit will seek to identify the issues that attributed to the delays in getting the system to an operational state and anticipated issues associated with its complete use.

Limitation in Scope

5. A number of the earlier documents and files relating to commencement of the project were not forwarded for review as these were unavailable.

Commissioning the Incinerator

6. *Delivery on the contract to design and build the 100 ton incinerator was delayed by almost three years after the initial contractual delivery date. This was due in part by the Government's inability to have the site prepared in time to accommodate the equipment.*
7. On 12 October 2004, the Government signed an agreement in the amount of \$4,516,973.10 with Texas Equipment System Inc. for the supply and commissioning of a 100 ton incinerator. The agreement also included the provision of an air pollution control system (wet scrubber), a waste oil burning system, an auxiliary diesel generator set with a seawater pump skid system and other miscellaneous recommended equipment.

8. The agreement stipulated a commencement period within 30 days of signing, after which the contractor would have 180 days to complete the project. This would put completion in May 2005. In their discussions with the Ministry, the contractor advised that the government’s delay in placing the order would likely push back the manufacturing schedule from six months to more than 18 months because of the contractor’s other pending major projects. The records indicate that the incinerator unit was completed in December 2006, and stored by the manufacturer (at no additional costs) until the Government made arrangements to have it shipped in December 2008. No explanation was provided for the two year delay between the completion date and the date of shipment, but it is notable that the government, at that time, had not yet begun construction of the building which was to house the incinerator.

9. Four years after signing the contract, in October 2008, officials from the Ministry of Health and Social Development traveled to Virginia where they inspected the incinerator. The finished product was accepted by the Government and arrangements begun to have it shipped. At that time a total of \$4,291,124.46 had been paid to Texas Equipment Systems Inc. for the equipment and its commissioning as shown in the schedule below.

Payments for Incinerator		
		\$
3 - Dec-2004	Texas Equipment Systems	903,394.62
4 - Nov-2005	Texas Equipment Systems	1,129,243.28
24-Mar-2006	Texas Equipment Systems	1,129,243.28
4 - Sep -2008	Texas Equipment Systems	<u>1,129,243.28</u>
		<u><u>4,291,124.46</u></u>

Housing the Incinerator

10. Prior to the arrival of the new incinerator, a number of facilities had to be put in place. The first was the commissioning of the steel building to house the incinerator.

11. In March 2005 after a two year protracted period that commenced in February 2003 involving discussions and tendering and vetting of documents, an agreement was signed with Conestoga – Rovers and Associates, Inc. (CRA) in the amount of \$219,000.00 for consultancy services to design and supervise the construction of the expanded incinerator facility which included engineering and design of the steel building that would accommodate the new incinerator.

12. After an informal selected tendering process, the Government on 29 August 2006 contracted to purchase the prefabricated steel building from Watson Exports for \$260,750 via contract 2M/2006. A second agreement was executed with Watson Exports to provide additional doors for the building housing the existing incinerator

in the amount of \$38,830.00. The prefabricated steel building arrived in the territory in July 2007. It was subsequently found to have some slight defects which caused minor delays in construction but were remedied by the installing contractor.

13. On 5 July 2007, six months after the incinerator was completed, major contract, (5M/2007), in the amount of \$2,014,938.88 was issued to A.N. Davis Plumbing & Electrical for construction of the steel building in which it would be housed. The contractor was selected after the tendering process had been waived and estimates solicited from qualifying contractors.

14. The contract provided for construction of the building to be completed in two parts. The first part, which had to be done before the incinerator was installed, consisted of constructing the incinerator foundation and pads, the generator pad, diesel tank pad and the storage for waste oil. This was completed in June 2008. The second part, which was to assemble the frame of the steel building, was completed after the incinerator was received and reassembled. Commencement was delayed for two months when the contractors had to spend time clearing the designated site of garbage and charging the government an additional \$21,279.00 for the time and effort.

15. It was subsequently discovered that the initial contract sum, of \$2,014,938.88, erroneously included the cost of the building itself (in the amount of \$350,330.84) which was supplied by the Government. Adjustments were made for this inclusion and in the end a total of \$1,846,618.34 was paid to this company indicating a net variation/increase of \$171,083.47 on this contract.

Transportation & Assembly

16. *The local costs for transporting the incinerator from Port Purcell to Pockwood Pond appears disproportionately high when compared to the international transportation costs from Virginia. The Government was required to pay additional sums for the contractor's partial failure to perform under the local transportation contract.*

17. In March 2008, with completion of phase one of the steel building imminent, arrangements commenced for shipping of the incinerator from Virginia to the Virgin Islands.

18. The formal tendering process was waived and estimates were solicited from five available shippers. An agreement was signed in December 2008 with Crowley Caribbean Services to have it shipped from Mechanicsville, Virginia via Jacksonville, Florida to Port Purcell, Tortola for a total of \$227,296.00.

19. The components of the disassembled incinerator arrived in the Virgin Islands on 17 January 2009 at Port Purcell. A contract to have it transported to Pockwood Pond by land and sea had been executed the previous day with Sandwise Limited in the amount of \$108,375.00. The contract also included crane, trucking, hauling and spotting services for the erection of the incinerator and the total costs was based on an anticipated five days' work.

20. After it was landed the incinerator had to be lifted from the barges and transferred to other barges and trucks to be taken to Pockwood Pond. Information received from the Solid Waste Department indicated that the option of having the equipment shipped directly to Pockwood Pond could not be accommodated because the barges used by the shippers would not be able dock in the shallow waters at that site.

21. Notwithstanding the substantial sum contracted for local transportation costs it was discovered that the equipment owned by the contractor, Sandwise, was incapable of lifting the heavier parts of the incinerator. As a result a variation increasing the contract sum by \$36,000.00 was issued so that the contractor might hire another provider to do the works and to cover the related costs for additional days needed to complete the project.

22. No adjustment was made because of the contractor's failure to perform. In fact the contract document under which Sandwise was engaged is conspicuous for its failure to provide a liquidated damages remedy and for its inclusion of a clause which

allows the contractor to charge more in the event that he needs to use more equipment for a job that his company had been contracted to do.

23. Newton Construction Company Ltd. was contracted on 15 January 2009 in the amount of \$21,626.40 to reassemble the new incinerator. A variation was sought by this contractor after the works which were slated to take 5-7 days lasted for 10 days. In the end the total costs for transportation and assembly were as indicated below.

Name of Contractor	Amount	Detail
Crowley Caribbean Services	227,296.00	Shipping - Contract Issued
Sandwise Limited	144,375.00	Transportation - Contract Issued
Newton Construction Company Ltd	28,964.00	Assembly -Contract Issued
	<u>400,635.00</u>	

24. After the incinerator was put in place and assembled, A.N. Davis Plumbing & Electrical revisited the project in early March 2009 and completed the frame work for the building.

Electrical and Plumbing

25. *Nonacceptance of the Public Tender Board's recommendations for the electrical and plumbing contractor cost the project an additional \$101,480.98 and resulted in a time delay of more than a year and a half.*

26. The electrical and plumbing installations were the next major works required before the incinerator could to be tested for use. Public Tender Notice No. 2 of 2009 was issued in February 2009 for the incinerator's electrical and plumbing works. Three bids were received and evaluated as follows.

Name of Contractor	Amount	PTB Assessment
<i>ADC Construction Company Ltd.</i>	814,810.60	<i>Responsive –Recommended</i>
<i>Skelton Electrics Ltd.</i>	524,275.00	<i>Partially Responsive – Security Missing</i>
<i>Romeo Equipment</i>	830,954.25	<i>Non Responsive – Documents Missing</i>

27. ADC Construction Company Ltd. submitted a bid in the amount of \$814,810.60. The Central Tender Board deemed this company responsive as the company fulfilled the tender requirements.

28. Skelton Electrics tender of \$524,275.00 was deemed partially responsive. The company did not provide a Tender Security in the form of a letter of intent from a Bank or Insurance Company in the amount equivalent to 10% of the contract sum. The company was given an extension to submit the missing documents but failed to do so and as a result was deemed non-responsive.

29. Romeo Equipment with a bid of \$830,954.25 was also deemed non-responsive due to failure to provide Certificates of Good Standing and other forms in accordance with the tender notice and instruction to contractors.

30. In May 2009, a decision was reached to award the contract for the electrical and mechanical installation to ADC Construction Company Ltd. for the amount of \$814,810.60. This decision was reversed in September 2009 before the contract was issued and steps were initiated to re-tender the project. There was no explanation on file for this retraction, but other information suggested a concern that additional cost would be incurred in the form of variations. Each of the three companies received a letter from the Central Tender Board informing them that only one tender was responsive and that the project would be re-advertised.

31. The project was re-tendered in September 2009 in a notice that requested submissions for two separate contracts. One for Electrical Installation and the other for Mechanical Installation.

32. On 3 November, 2009 the tender documents were opened. The bids were as indicated below.

Name of Contractor	Electrical Installation	Mechanical Installation	PTB Assessment
ADC Construction Company Ltd.	509,471.41	276,588.08	<i>Responsive –Recommended</i>
Burhym Electric	615,572.50	-	<i>Non Responsive</i>
Skelton Electrics Ltd.	639,703.50	-	<i>Non Responsive</i>
Romeo Equipment	-	307,531.38	<i>Non Responsive</i>

33. The submissions from Skelton Electrics Ltd, Burhym Electric and Romeo Equipment were again deemed non-responsive. The Public Tender Board again recommended that the contracts for both the Electrical and Mechanical Installation be awarded to ADC Construction Company Ltd.

34. This recommendation was initially accepted and would have resulted in contracts to ADC Construction Company Ltd. for the Electrical and Mechanical Installation in the amounts of \$509,471.41 and \$276,588.08 respectively. The combined total of \$786,059.49 would be \$28,751.11 less than the original bid.

35. However, on July 21, 2010, the decision to award both contracts to ADC Construction Company Ltd. was reversed because there were again concerns that this would lead to a number of contract variations.

36. Instead, Skelton Electric Limited was awarded the contract for the electrical works for a sum of \$639,703.50 and ADC Construction Company Ltd. was awarded the contract for the mechanical and plumbing works for \$276,588.08. The combined amount of both contracts would be \$916,291.58 representing an increase of

\$101,480.98 over the original bid of \$814,810.60 submitted by ADC Construction Company Ltd and a time lapse of a year and a half since the first tender was issued.

37. The contracts were signed on October 20, 2010 and stipulated that the mechanical and electrical installation works would be completed in 174 and 274 days respectively. The commencement date was later determined to be 20 December 2010.

38. In the end, the process of tendering and re-tendering of the works played a major role in delaying the project and resulted in an increased contractual commitment for the government.

Pollution Control System

39. *The Government does not currently own the property to facilitate installation of the pollution control system. The land negotiation process has resulted in some exorbitant amounts which need to be revisited.*

Scrubber

40. An important phase in completing the incinerator project is the installation of the scrubber. The scrubber is a pollution control unit that is attached to the incinerator to reduce the toxins which would otherwise be emitted into the atmosphere. The scrubber is included in the incinerator commissioning contract with Texas Equipment, but it was not delivered with the incinerator because the required facilities (wet well etc.) to operate it are not in place. The contract provides a guarantee of one year from startup or 15 months from shipment (whichever occurs first) for the scrubber unit, therefore having it on site before it can be installed and used could result in expiration of the guarantee before it could be tested.

Wet Well

41. Essential to the operation of the scrubber is the availability of a wet well, pump house and pipe line to the seafront to bring in salt water to cool down the equipment/generators. Presently the Solid Waste Department has access to a pump house and wet well owned by BVI Electricity Corporation (the Corporation). The Corporation has however advised that they will no longer be able to facilitate this arrangement because the water requirements of the new incinerator plant would burden the system and could cause disruption to the Corporation's operations and plans for expansion.

42. This aspect of the project was not anticipated. The Ministry must now seek a location to accommodate a pump, wet well and pipes (the sea water intake system) for feeding water to the plant to cool the incinerator and scrubber unit. This process requires land agreements, pipe laying works, and construction of the pump house.

Land Negotiations

43. The Government has begun negotiations to gain rights/access to a strip of land from the incinerator site to the seafront to lay the required pipes. It was determined that the area required would be less than half an acre and was computed to .451 acre.

44. The initial proposal received from the owners of the property stipulated a ten year 5 foot easement on the following terms:

- a. One time payment of \$250,000.00 which would guarantee the easement providing all payments are made;
- b. Easement payments of \$1,000.00 per month payable quarterly
- c. Any architectural, survey and construction related works to be done on the property be contracted to Smith's Architectural Engineering & Surveying Services.

45. The Ministry of Health and Social Development then sought the assistance of the Ministry of Natural Resources and Labour to negotiate a reasonable arrangement with the owners. The latter ministry procured the services of a private firm to determine the value of the property. The resultant report stated the value for the parcel in question at \$438,000.00 for the 12.9 acres of land. This computes to a value of \$15,313.02 for the required .451 acres.

46. The Ministry of Natural Resources and Labour has however recommended purchasing the required .451 acres for \$250,000.00. This is significantly more than the actual value of the property required. Compounding this is the owners revised request for \$450,000.00 and their insistence on being given the rights for all architectural works required on this aspect of the project.

47. At the time of writing negotiations were not concluded. There is a need for further intervention to prevent the Government from being taken advantage of on this matter.

Costs

48. The New Incinerator project was first introduced into the budget in 2000 with a preliminary amount of \$1,000,000.00 and description which stated "Provision for consultant and initial preparation for new incinerator." By 2010 the Project Estimate had increased to \$13,507,898.00 and the total expenditure incurred at 31 December 2010 was \$12,227,282.84.

Year	Project Budget	Expenditure Incurred
2000	1,000,000.00	57,144.00
2001	1,300,000.00	307,023.31
2002	2,988,500.00	108,600.00
2003	2,729,500.00	359,849.00
2004	6,334,500.00	920,551.00
2005	10,334,500.00	2,178,404.00
2006	16,834,500.00	2,460,880.00
2007	11,142,500.00	2,434,867.00
2008	11,142,500.00	2,063,628.00
2009	13,507,898.00	1,070,464.00
2010	13,507,898.00	265,872.53
		<u>12,227,282.84</u>

49. The cost associated with the key companies that played a significant role in the new incinerator project are as indicated below. These amounts are incomplete as the project is still ongoing.

Vendor/Contractor	Description	Amount
Texas Equipment System	Purchase of the New Incinerator	4,291,124.66
A.N. Davis Plumbing	Construction of steel building	1,846,618.34
Watson Exports	Design and supply Steel Building	305,511.00
Crowley Caribbean	Shipping of the incinerator	247,948.00
Sandwise	Transport of the incinerator	144,375.00
Conestoga- Rovers	Engineering design services	225,590.00
Skelton Electric Limited	Electrical Installation	*63,970.35
ADC Construction Co. Ltd	Mechanical & Plumbing Installation	*27,658.81
Contract works currently ongoing. Payments incomplete.		

50. Other significant costs associated with the project include:

Vendor/Contractor	Description	Amount
Enelle C. Smith, I	Land Acquisition	3,250,000.00
Sandwise	Purchase a heavy duty truck	116,532.00
Tortola Concrete	Equipment Rental	127,570.00
Kane Caribbean	Purchase 2 Komatsu Front End Loader	220,000.00

51. The land acquired at \$3,250,000 was not used for the new incinerator project and it is unclear as to the Government's intention in purchasing this property.

Other Considerations

45. *For successful implementation and operation of the project there are a number of considerations that must be addressed by the relevant agencies. These include provisions for hazard control, handling and disposal of incineration waste, reduction of population generated solid waste and provisions for the existing 40 ton incinerator.*

Waste Byproducts

52. The ash generated by the incinerator would likely be sizable and have to be disposed of properly.

53. Use of the scrubber unit would also result in additional waste for disposal. The scrubber removes the hazardous substances and transfers them into a liquid solution, solid paste or powder. Provisions will also have to be made to ensure that this is disposed of properly.

Green Application

54. With the continuous increase in solid waste and the costly need to address this, there is a need for the Ministry to look into alternatives which would reduce the territory's waste output through recycling and reusing. This would require a massive public campaign and introduction of facilities and activities that encourage waste reduction such as recycling centers, household sorting of waste and separate collection arrangements.

55. Additionally efforts should be engaged to assess whether the incineration process can be used to generate energy. Initial information from the incinerator manufacturer indicates that it may be possible to incorporate a waste heat boiler to the system for energy recovery. Such a system would capture the excess heat that would normally be discharged and convert it into electricity and steam. Some conference may be required with the Electricity Corporation and other specialists to determine the feasibility of the waste-to-energy option.

Incinerator Capacity

56. When the new 100 ton incinerator was commissioned in 2004 it was felt that this equipment, which would more than double the current capacity of the existing incinerator, would be adequate to meet the needs of the island. However as the current peak production of waste is estimated to be 93 tons per day it is apparent that the new incinerator within the short term will reach maximum capacity.

57. The existing 40 ton incinerator is still in use but requires extensive refurbishing in order for it to remain operational for the longer term. Consideration must be given to the possibility of investing resources to keep this incinerator viable

for future use. If this is not an option then steps should commence to sell, relocate or otherwise dispose of this equipment.

Other

58. An intangible of the entire incinerator matter is the negative effect that the open burning has had on relations with the neighbouring US Virgin Islands. This has led to involvement of the US Environmental Protection Agency which has been asked to intervene in what could become an unpleasant affair. In addition, the negative media exposure and our continued inability to adequately deal with the increasing waste disposal issues can pose a threat to the territory's image as an environmental friendly destination.

Conclusion & Recommendations

Conclusion:

59. This project would have benefitted from better coordination and foresight. It is the job of the project manager to establish and maintain a master work schedule ensuring that each aspect of the project is brought on line and completed in time to accommodate other areas as necessary. Instead there were long delays and large gaps between the various phases and assignments. Some of these (like the re-tendering of the electrical and plumbing components) were beyond the project manager's control.

60. It has taken almost six years to acquire the new 100 ton incinerator. During that time the waste stream has grown to 93 tons at its peak and increasing annually. In essence government may have invested in an incinerator that country has outgrown before it has been put to use.

Recommendations:

1. Steps should immediately be employed to get a second value on the less than half an acre (.451 acres) of property required to complete the project and to negotiate, or otherwise compulsorily acquire, this at the reasonable/market value.
2. The incinerator is located in a residential and commercial area. It is therefore important that steps are taken to have the scrubber installed so as to ensure that the health of the populace is not endangered unnecessarily.

3. The territory needs to develop or adopt guidelines for emission control and air quality standards and ways of measuring this to ensure that a healthy environment is maintained.
4. An assessment should be performed to determine whether the waste to energy option is viable for the project.
5. Waste reduction programmes must be stepped up to encourage (or require by legislation) the populace to engage in recycling and reusing activities. This is currently being done in larger communities and is possible achieve in the BVI with the right facilities and public education.
6. The tendering process should be used with more regularity large projects. Only a small percentage of the works on this multi-million dollar project were put to open/public tender.
7. Where the tendering process is engaged greater consideration should be given to the results and recommendations of the Public Tender's Board. This Board is made up of experts appointed/assigned to assess submissions with a view to ensuring that the Government achieves both value and performance on the proposed project.
8. Large projects require project management with proven ability to get results within a stipulated timeframe. An open arrangement, such as the one entered into with the initial project manager allows for a drawn out project without adequate provision for remedy.

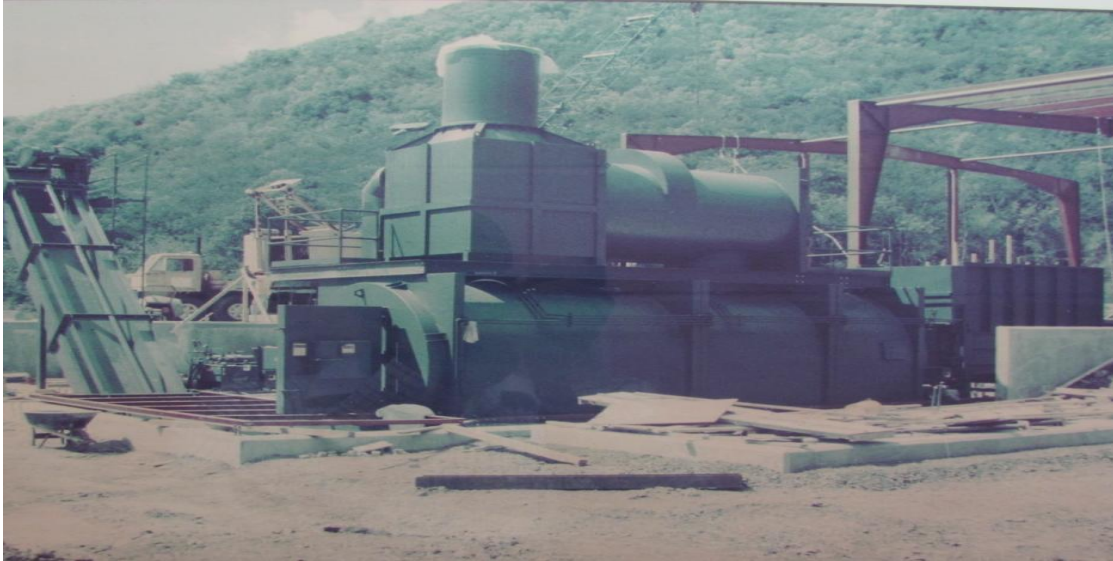
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The new 100 Ton Incinerator



Inside the 100 Ton Incinerator.



The 40 Ton Incinerator.



The 40 Ton incinerator.



Burning area outside



Waste material stored in the building until burnt.

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