Transport and Technical Services Department

Managing Jersey Energy from Waste Plant Residues

Current Position and Outlook

June 12th 2012

---

1. Executive Summary

1.1. The Transport and Technical Service Department (TTS) provides the Island's public waste management services and in recent years has been following a policy of minimising waste generation and recycling as much waste a possible. TTS is now achieving recovery of 92% of the Island's waste it receives; however there is still, inevitably, some residual waste that requires disposal.

1.2. A key part of this residual waste minimisation strategy is the new Energy from Waste Plant at La Collette, which meets European Air Quality Emission Standards. Whilst the plant's very efficient combustion reduces the waste by 75%, and generates up to 8% of the Island's electricity, the rigorous flue gas cleaning process generates Air Pollution Control residues (APCr), which is a new hazardous waste for Jersey to deal with.

1.3. Since 1995 TTS has been safely encapsulating incinerator ash from the old EfW at Bellozanne on the La Collette II reclamation site. With the new plant allowing the Incinerator Bottom Ash (IBA) to be separated and with better exclusion of waste electrical goods, the prospect of IBA recycling for use as construction aggregate can now be investigated. Whilst TTS is identifying the chemistry of the IBA from the new plant so that those stabilisation trials can be commenced, the challenge of utilising a waste with residual chemical inclusions is not to be underestimated, as any use as a product in the Island must not be a pollution risk.

1.4. APCr is a hazardous waste and TTS believe that, whilst disposing of the waste at La Collette in sealed lined cells is possible, it is not a good legacy for the future, as the cells will need to be maintained and, possibly, renewed in the long term. An application to export the APC to the UK for appropriate specialist disposal has been made to the Environment Department who will need to seek permission from the UK authorities.

1.5. Emerging waste treatment technologies are coming onto the market around the world, and TTS is looking at the viability, cost and the potential transferability of these technologies to the small scale requirements of our Island.

1.6. Any option would need to meet the stringent environmental protection standards that TTS adopt and be sustainable in terms of:

- Compliant with the regulatory requirements
- Minimises the risk of pollution
- Viable solution in the long term
- Minimises land take
- Minimises energy consumption for treatment
- Economically Viable in Jersey
- Can be funded within allocated budgets

1.7. TTS has generated a roadmap of the management options for the coming years and are pleased to have the Environment Scrutiny Panel to review the options under consideration, as the decision making process for changes in the future will need to consider all sustainable options within available funding.

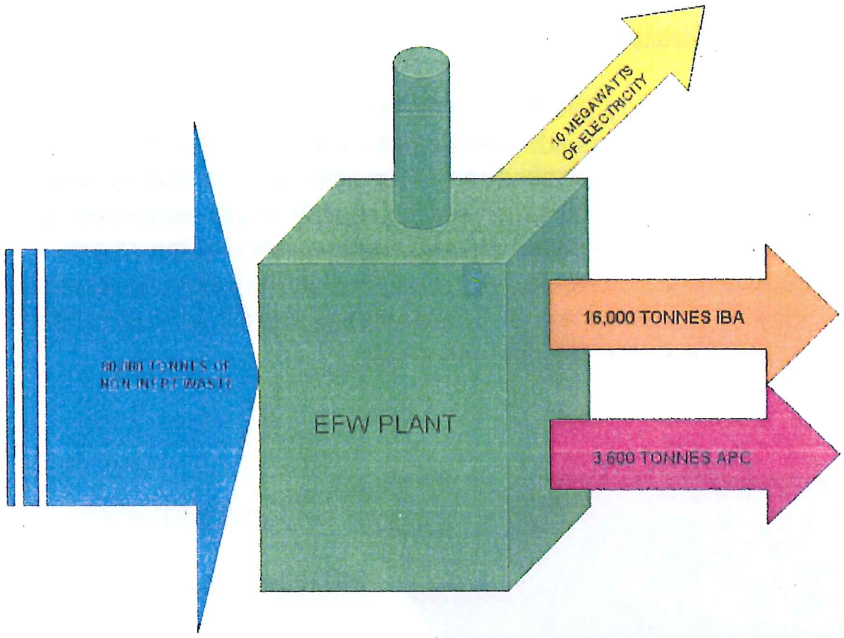
2. Background and Strategic Context

2.1. The Solid Waste Strategy (SWS), approved by the States in 2005, set a policy framework for dealing with the Island's waste into the future with particular emphasis on the application of the *international waste hierarchy*. The aim is reduce waste generation and to recycle waste wherever viable. Successful implementation of the strategy has resulted in improved community awareness, increased recycling and composting standards and rates and delivered a new state-of-the-art energy from waste plant (EFW) which generates 8% of the Island's electricity.

2.2. Residues from the combustion of waste are not new as communities have reduced the volume of unwanted materials and used waste as a fuel throughout history. As waste arisings have grown and the practice of landfilling waste has become less acceptable, industrial scale thermal treatment with energy recovery has become a mainstream activity. Greater attention has more recently been placed on sustainable management of the ash residues from these processes.

2.3. The SWS recognised the need to plan for dealing with ash through the 25 year timeframe. Commitments were made to 'cleaning up' municipal waste as much as possible through the diversion of hazardous elements such as batteries, Waste Electrical and Electronic Equipment (WEEE) waste and scrap vehicle recycling residues. These initiatives have been very successful with almost total diversion of display equipment such as televisions and significant diversion of other WEEE.

2.4. The new EFW plant produces two discrete residue outputs namely bottom ash (IBA) and air pollution control residues (APCr) which are potentially harmful substances captured from the boiler emissions by the environmental control system.



TYPICAL ANNUAL INPUT AND OUTPUTS FROM ENERGY FROM WASTE PLANT

SILO FOR COLLECTING APCr IN BAGS

2.5. IBA, is the majority of the waste and is targeted for recycling in the SWS subject to cleaner input streams and environmental concerns of the use of this material as a recycled aggregate, being overcome.

2.6. APCr is officially classified as 'hazardous' in the European Waste Catalogue primarily due to its very high alkalinity. Some heavy metal and dioxin residues may also be present in low concentrations so this material must currently be treated to remove its hazardous status or it must be appropriately encapsulated on disposal.

3. Published Ash Strategy

3.1. The Planning Permit for the new EFW was conditional on an ash strategy being produced by the Transport and Technical Services Department. This was issued as the document: "*Strategy for the Management of Energy-from-Waste Residues, October 2010*"[1].

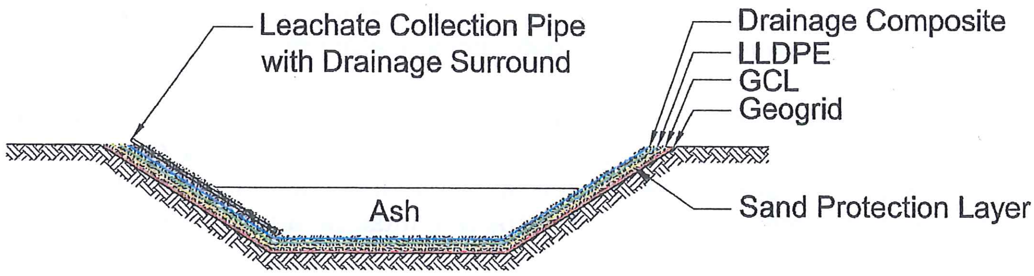
3.2. The document essentially formalised the current management processes for dealing with the two output residues from the plant and set out a commitment to assessing the feasibility of using IBA as an aggregate either within the engineering of La Collette 2 or within the local construction industry.

3.3. The current methods of dealing with EFW residues are encapsulation on the La Collette 2 site with the design of the lined 'cells' being constructed to current good practice standards.

3.4. To progress the work on a long term and more detailed strategy, TTS have set up a multi-disciplinary officer working group comprising engineering and sustainable waste management expertise supported by an external technical advisor. The group is reviewing the available options for managing EFW residues.

4. Current Environmental Position

4.1. The challenge of dealing with EFW residues has historically had a high public profile both locally and nationally. Chemical properties like high alkalinity, potentially leachable metals such as lead and trace materials like dioxin have led to policy on disposal practice requiring the encapsulation of ash and a requirement for the disposal cells to be positioned above Mean High Water Spring Tide Level to ensure discontinuity with the marine environment. All the cells in the La Collette 2 site have been constructed in this way. The risk of airborne transport of dust during the disposal process is also carefully managed with the use of specialist covered vehicles during transportation and daily cover of deposited ash with a layer of inert soils.



Typical ash cell base liner construction

4.2. Once complete, the cells are capped as soon as possible to prevent ingress of rainwater that would then need treatment. Water in the cells from rainfall during filling is monitored and are pumped out, with the leachate being disposed of at the Bellozanne Treatment Works, which has been established as the best practical option as it is not a significant pollutant load.

4.3. In 2011 the department instigated a six month baseline water quality study (output issued with this report) to ascertain whether the inert fill in the site or the ash cell system was contributing to any degradation in water quality in the marine environment adjacent to the La Collette site. The results of this exercise indicated that the cells are doing their job and that there is not a problem with pollutants from the operation. TTS is continuing the surveillance with a quarterly monitoring schedule for the groundwater, lagoon water and sea around the site.

4.4. For the APCr a special cell has been created to the higher engineering standards required for this hazardous waste. The lining is to a higher specification and includes a clay mat sealing layer and an inbuilt electrical leak detection system. This cell was designed to receive a bulk slurry of APCr but is currently receiving the material in flexible bulk containers to allow the material produced so far to be exported should this be the outcome of the review and the funding and regulatory position allow.

APCr Cell 33
La Collette 2

4.5. The overall cell construction process is planned to continue in layers to complete a landscape 'headland' with comfortable capacity for the predicted residue ouputs for the EFW's 25 year design life subject to Environmental Impact Assessment and Planning consent. The final headland would be landscaped to create coastal habitat for native species and form a screen to the La Collette industrial area, when viewed from the east.

4.6. Through robust design and day-to-day site management TTS is confident that the current system provides an acceptable disposal route. Monitoring of the environment in and around the site supports this assertion.

4.7. TTS is committed to ongoing review of recycling treatment and disposal options to see if more sustainable options can be found.

5. Options Review

5.1. The work to review the current ash strategy was initiated in early 2011 starting with the commissioning of a piece of work to review the latest technical position and options available. This work was undertaken by Capita Symonds and culminated in the report: *"La Collette Energy from Waste (EfW) Residues: Technical Options and Disposal Sites."* [2] This report also reviewed the potential locations for ash disposal in the Island and concluded that La Collette continues to be the most appropriate location.

5.2. Early in the review process it became clear that IBA, under controlled circumstances, is being treated and recycled as an aggregate in other jurisdictions. APCr is being successfully encapsulated or chemically stabilised to widen the options for disposal and potentially recycled on an experimental scale. The work to develop a new strategy became more focused on whether these options are viable for Jersey, practically, financially and environmentally.

5.3. Review visits were undertaken to various UK operations by TTS officers including the "Ballast Phoenix" IBA processing site in Sheffield, the Turkeylands IBA site and EFW in the Isle of Man and the "WRG" chemical facility in Leeds, treating APCr to produce a material approved for disposal by normal landfill. The Isle of Man experience has been that it has taken years of trials to produce a recycled IBA aggregate which is yet to be accepted as a product for construction, because of the concerns with potential leaching and water pollution.

Ballast Phoenix IBA processing site in Sheffield

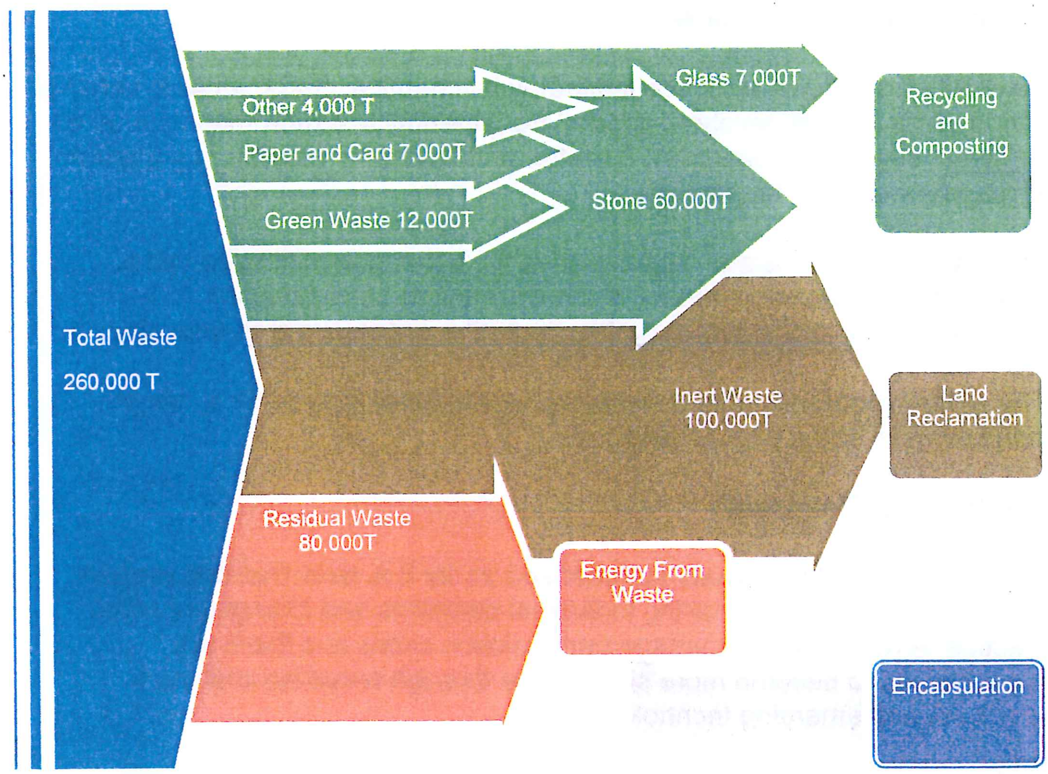
5.4. As well as the more conventional processes, the review team also looked at emerging technology in this field such as high temperature treatment using a plasma arc furnace to render these residues, particularly APCr, fully inert. Whilst cited as in commercial use in Japan, the process is not economic in the UK for APCr.

5.5. Still to assess is a new treatment process for stabilising APCr through carbonation to produce a potentially recyclable aggregate. A company called "Carbon8" is commissioning a plant which the team is due to visit shortly.

6. Waste Hierarchy

6.1. During the review the potential to apply the waste hierarchy to managing ash has been a key objective and the potential to reduce ash output through input control. Similarly, attention to inputs to the EFW in terms of hazardous wastes can improve the quality of ash outputs and benefit the potential for recycling these residues.

6.2. The diagram below shows how through the Islands wider waste strategy the remaining residues remaining after waste prevention, recycling and energy recovery have been applied are already only 8% of waste received.



6.3. With similar principles applied to the residual ash waste stream itself it makes sense to recycle and minimise what needs to be disposed of. As with any recycling process it is only sustainable if a reliable outlet is available. Aggregates recycling in the Island has grown in recent years but continues to be a challenge as end-users need high quality products both in term of physical and chemical quality. IBA can be recycled as an aggregate following weathering and processing – but the acceptance of the industry to use such a material is currently unknown and time is needed to properly characterise the ash and build the confidence of end users.

6.4. Another fundamental issue to address is whether a processed IBA aggregate will be acceptable in Jersey in environmental terms. The current position in other jurisdictions is that aggregates are sanctioned for use subject to a site specific risk assessed process. This accounts for contaminants in the ash, their potential to leach and the sensitivity of the environment where the material is to be placed. The Environment Department, as regulators would expect the highest standards of environmental protection in an Island where all areas are sensitive water catchments. The risks might also be managed through use of processed ash in 'bound' aggregates to reduce mobility such as concrete or asphalt, subject controls on the safe end of life disposal of such products.

6.5. These applications are relatively new and the science is still developing. Such risk assessments would need to be applied to Jersey's water catchments and a decision taken where, in what way, and, if at all, the use of IBA aggregates is acceptable.

6.6. For APCr the options are more limited by its chemical characteristics with the main options debate revolving around the potential to export this material for off-island disposal or treatment. Treatment followed by recycling as a bound aggregate may also be possible.

6.7. The attraction of off-island disposal of APCr is the potential to leave no legacy of this material in Jersey. If the disposal route involves an environmentally acceptable recycling route the option is more attractive.

6.8. The review process is also considering locally stabilising APCr to lessen pollution risks at the point of disposal.

7. Ash Strategy 'Roadmap'

7.1. Considering all of the issues summarised so far it is clear that this process cannot simply be about making individual decisions and changing current practice. A robust waste management solution exists and there are opportunities to become more sustainable through recycling and more specialist and emerging technologies.

7.2. To better understand the feasibility of moving alternative management options there are a number of workstreams that must be initiated, funded and generate outputs or results. Most will take time to report; such as the full analysing the chemical properties of the IBA from the new plant which is clearly needed to assess its potential for recycling. Also the research and development into the potential for IBA aggregates to be used by the industry in terms of market acceptance and engineering performance will be a long process. The acceptance by the Environment Department of the use of the treated waste as a product will depend on their views on allowing a product with restricted location use to be marketed.

7.3. To set out a programme for these workstreams the Department has produced a 'roadmap' (submitted with this report). This shows, for the two types of residue, what needs to happen to inform decision making and the key decision points. Speculative cost estimates have also been attached to each of the activities in the programme.

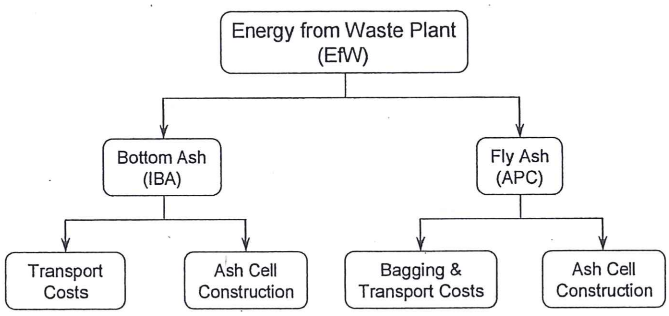
Current Practice	***Interim Practice***	***Medium Term Outlook***
APCr – Storage in double lined cell	APCr - Export for disposal/treatment in UK ?	APCr - Export or stabilise for on Island disposal as non-hazardous ?
IBA – Disposal in mono cells where material can be recovered in the future	IBA – Recycling trials and product market testing ?	IBA – Recovery of metal for recycling, aggregate to construction product use and residual to disposal cells ?

8. Funding

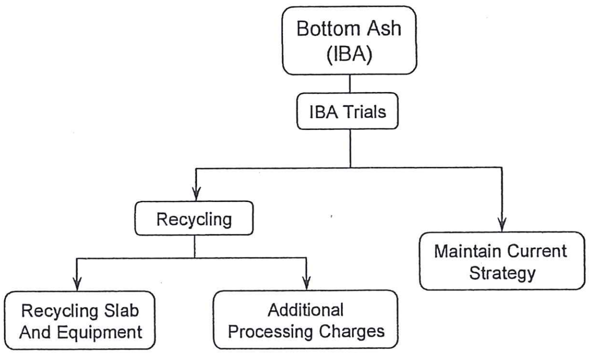
8.1. Whilst TTS has budgets for the current disposal process which involves disposal in sealed cells, other treatment and disposal options are likely to require additional revenue and capital funding.

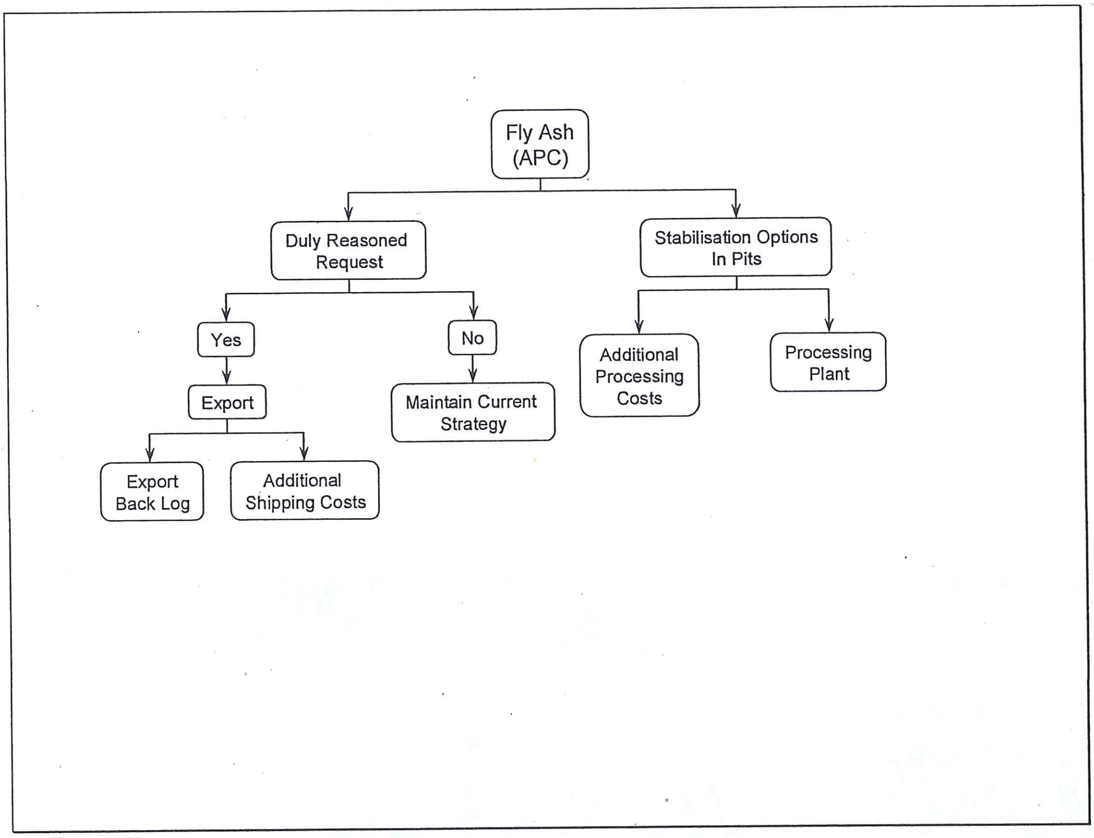
8.2. Options impacting on funding are set out below for IBA and APCr.

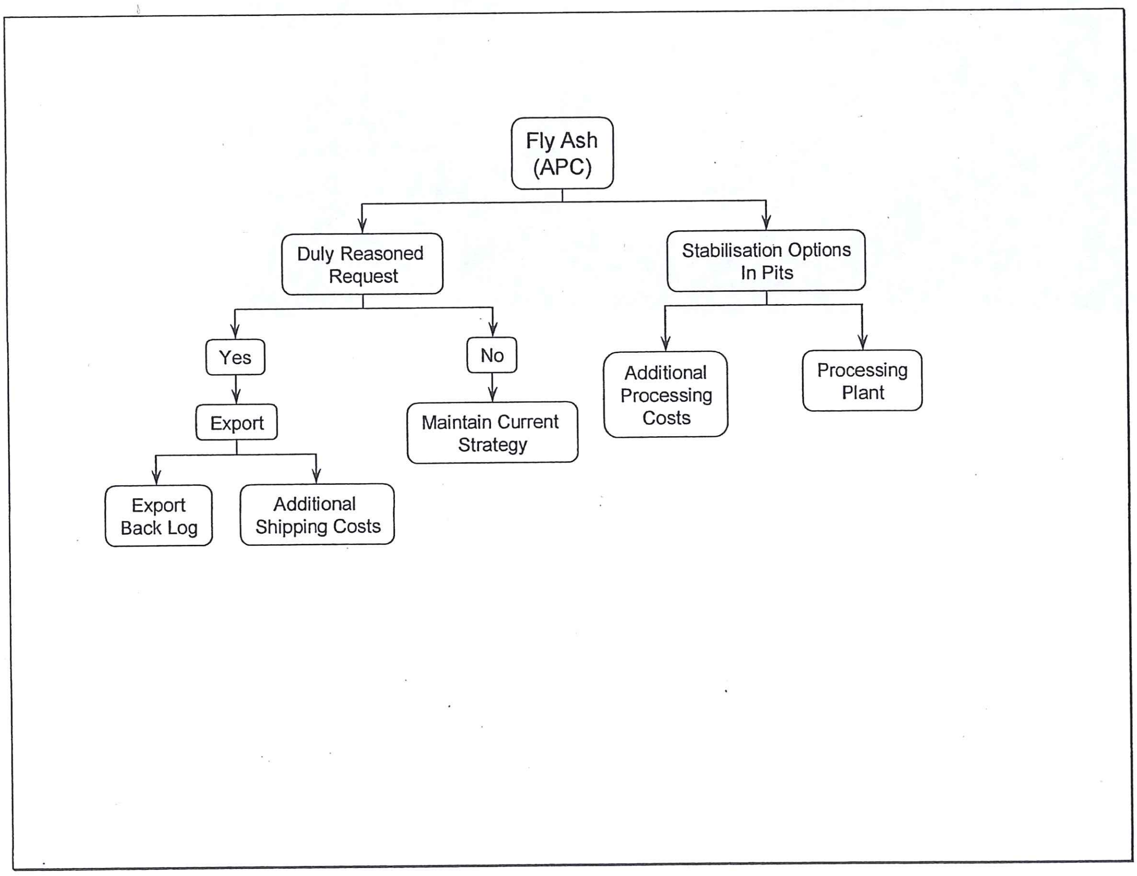
Current



Moving Forward




Fly Ash (APC)
Duly Reasoned Request
Stabilisation Options In Pits
Yes
No
Export
Maintain Current Strategy
Additional Processing Costs
Processing Plant
Export Back Log
Additional Shipping Costs


Fly Ash (APC)
Duly Reasoned Request
Stabilisation Options In Pits
Yes
No
Export
Maintain Current Strategy
Additional Processing Costs
Processing Plant
Export Back Log
Additional Shipping Costs

9. La Collette Headland

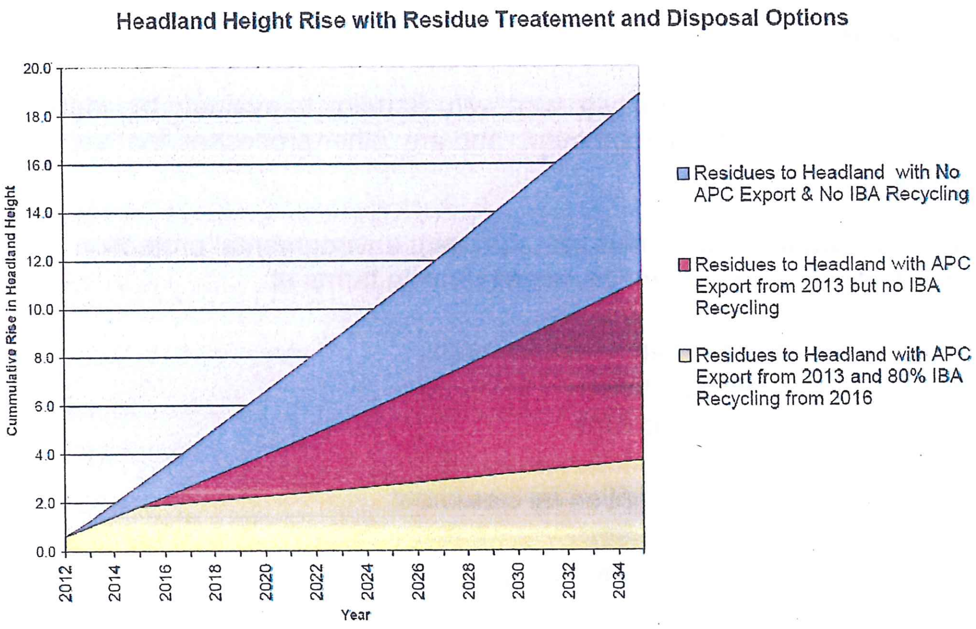
9.1. The States of Jersey approved a land use plan for La Collette which included a headland along the eastern side of the site. This would screen the industrial development on the first reclamation on La Collette from views along the east coast, with the headland designated for the disposal of ash. This was confirmed in the 2002 Island Plan and the new (2011) Island Plan continues to follow this established policy.

9.2. La Collette is designated as a waste management site in the new Island Plan (2011).

La Collette site viewed from the south: Ash cells are the pits on the right hand side of the site

9.3. Concern has been expressed about the legacy of the headland, and whilst the existing ash encapsulation is expected to remain for the foreseeable future, the desirability of limiting the final extent of the headland has been expressed during consultation on the proposal.

9.4. If the most optimistic timescales in the roadmap are achieved for APCr export and IBA recycling the potential residual waste disposal at La Collette could be curtailed. The effect of export of APCr would be significant (up to 40% reduction in height of the headland) as despite the lesser tonnage it is a bulkier material than IBA. The effect of recycling most of the IBA as a product would be very significant. An approximate quantification of the effect on the average height of the headland is shown in the graph below.



9.5. It can be seen that if export of APCr could start in 2013 and 80% of IBA recycled as a product from 2016, the headland would on average increase in height by 4 m rather than 18m; in practice this would be a 'filling out' to a rounded landform of what already has been created.

9.6. To achieve APCr export, additional revenue funding would be needed as well as approval from the Environment Department.

9.7. IBA recycling may be achievable with improved control of EfW waste input and the development of a product which is acceptable to both the Environment Department for use in the Island and the construction industry accepting the product as equivalent to products they currently use.

10. Way Forward

10.1. TTS welcome the opportunity to work with Scrutiny to evaluate the identified options for EfW residue management, and any other processes that are identified.

10.2. Any option would need to meet the stringent environmental protection standards that TTS adopt and be sustainable in terms of:

- Complies with the regulatory requirements
- Minimising the risk of pollution
- Viable solution in the long term
- Minimised land take
- Minimises energy consumption for treatment
- Economically Viable in Jersey
- Can be funded within allocated budgets

10.3. The established La Collette Headland is needed to allow residual, (albeit potential reduced), waste to be disposed of. Planning Approval for a final profile would allow the sides of the headland to be created and landscaped early to end the visual blight of the unfinished earthworks on the site.

Strategy for the Management of Energy-from-Waste Residues

1. OVERALL

1.1 The overall strategy for the management of combustion residues from the new energy-from-waste (EfW) plant at La Collette is to dispose of them safely within a new headland feature on the eastern side of La Collette Phase 2 Reclamation Area. The engineered cells within which the residues will be placed will be created as large as reasonably possible, in order to minimise the quantities of suitable excavated materials (a mixture of soil and rock, hereafter referred to as excavation waste) which are used in shoulder and capping features. The use of incinerator bottom ash (IBA) for engineering purposes (as structural fill) cannot be guaranteed, and further studies based on actual IBA from the new EfW plant will be required to assess its potential for such uses.

1.2 The strategy is to spread the creation of the headland over as long a period as possible, even if this involves using combustion residues from some future EfW plant (or other treatment process) which may be built as a replacement for the new La Collette EfW plant.

1.3 TTS will take note of the provisions and underlying intentions of the EU's Landfill Directive, even though the Directive does not apply to Jersey. This will be done in close consultation with the waste regulatory authorities and within the context of Jersey's status as a relatively small island, with the restrictions and limitations (of technical choice, geological variety etc) that that imposes.

1.4 There are certain key facts which will remain unknown until combustion residues from the new EfW plant are available for testing. Therefore this strategy will be treated as a 'live' document and both reviewed and amended as soon as combustion residues from the new plant have been tested, and then at least once a year thereafter for the first five years, at which point the frequency of subsequent reviews will be determined.

2. GENERAL PRINCIPLES OF GOOD WASTE MANAGEMENT PRACTICE

2.1 The strategy takes into account the following considerations:

- the new EfW plant will generate IBA and air pollution control (APC) residues as distinct waste streams;
- the Waste Framework Directive requires different waste streams to be kept separate, unless their mixing will reduce the hazardousness of the wastes concerned;
- IBA and APC residues have clearly different characteristics, particularly as regards their potential to generate leachate; and
- the most sensitive environmental receptor is the adjacent sea (and Ramsar site), which could potentially be adversely affected by uncontrolled releases of leachate.

2.2 TTS will therefore keep IBA and APC residues from the new EfW plant separate at all times, and will place APC residues within dedicated cells or areas within cells which will be engineered to a higher standard than is required for the disposal of IBA alone. Such technical standards will primarily involve the provision of a basal liner and a final cap (to prevent ingress of rainwater or any other liquids after the cell has been filled with waste).

3. TREATMENT AND USE OF IBA

3.1 TTS will investigate the benefits of treating at least some of the IBA by conditioning and/or grading, to confirm whether it can be used within the headland feature without undue risk (in the context of site-specific source-pathway-receptor linkages) of generating unacceptable levels of leachate or other environmental emissions either alone (e.g. outside engineered cells) or in combination with clean excavation waste for use as an engineering material.

3.2 TTS will also investigate the potential for developing beneficial uses for IBA and IBA-derived aggregate (IBAA) elsewhere within Jersey, since any such diversion will extend the period over which the construction of the proposed headland feature can be spread.

3.3 TTS will explore with others the scope for State intervention to promote or require the use of IBAA, as a means of stimulating the creation of a market. This will include the possibility of encouraging the use on Jersey of a protocol which is currently under development within the UK, and which is expected to define key uses, and to establish quality and environmental protection requirements for such uses.

4. USE AND DISPOSAL OF EXCAVATION WASTE

4.1 At present largely inert soil and other excavation waste is being used to reclaim La Collette peninsula, by backfilling lagoons that have been created behind an artificial rock structure.

4.2 Once this process is complete, TTS will seek alternative uses for excavation waste away from La Collette, and will keep to a minimum the amount of excavation waste which is used within the new headland feature. Excavation waste will not be disposed of (i.e. with no beneficial use) within the new headland feature without a review of this strategy being carried out.

5. SHORT-TERM PRIORITIES

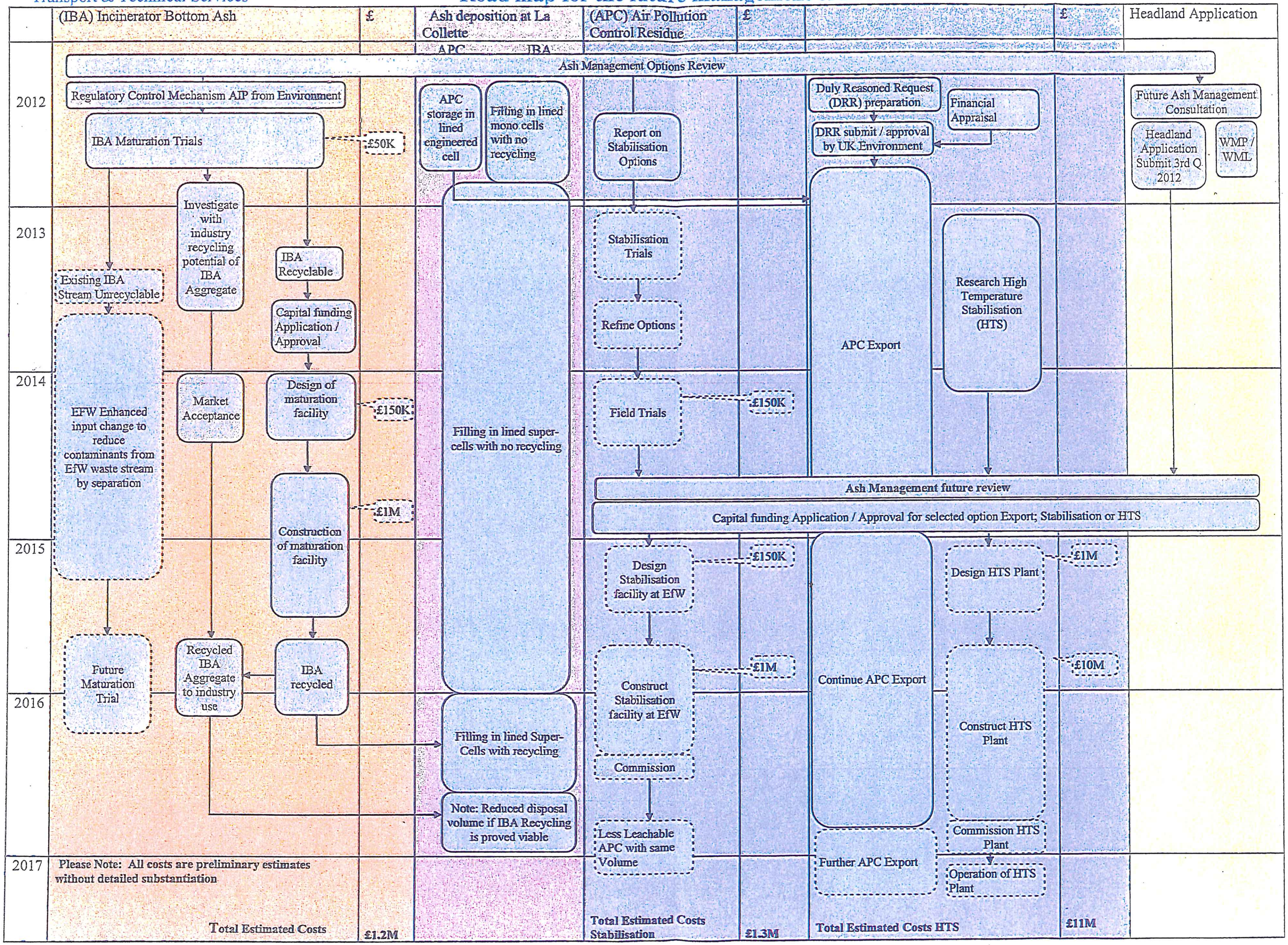
5.1 The potential for creating adverse effects on the water environment from using IBA or IBAA for engineering purposes within the new headland feature needs to be assessed, and the key question to be answered is how conditioned IBA will perform in terms of leachability of metals and nutrients, and whether this is significant in the setting of La Collette headland and its planned engineering measures.

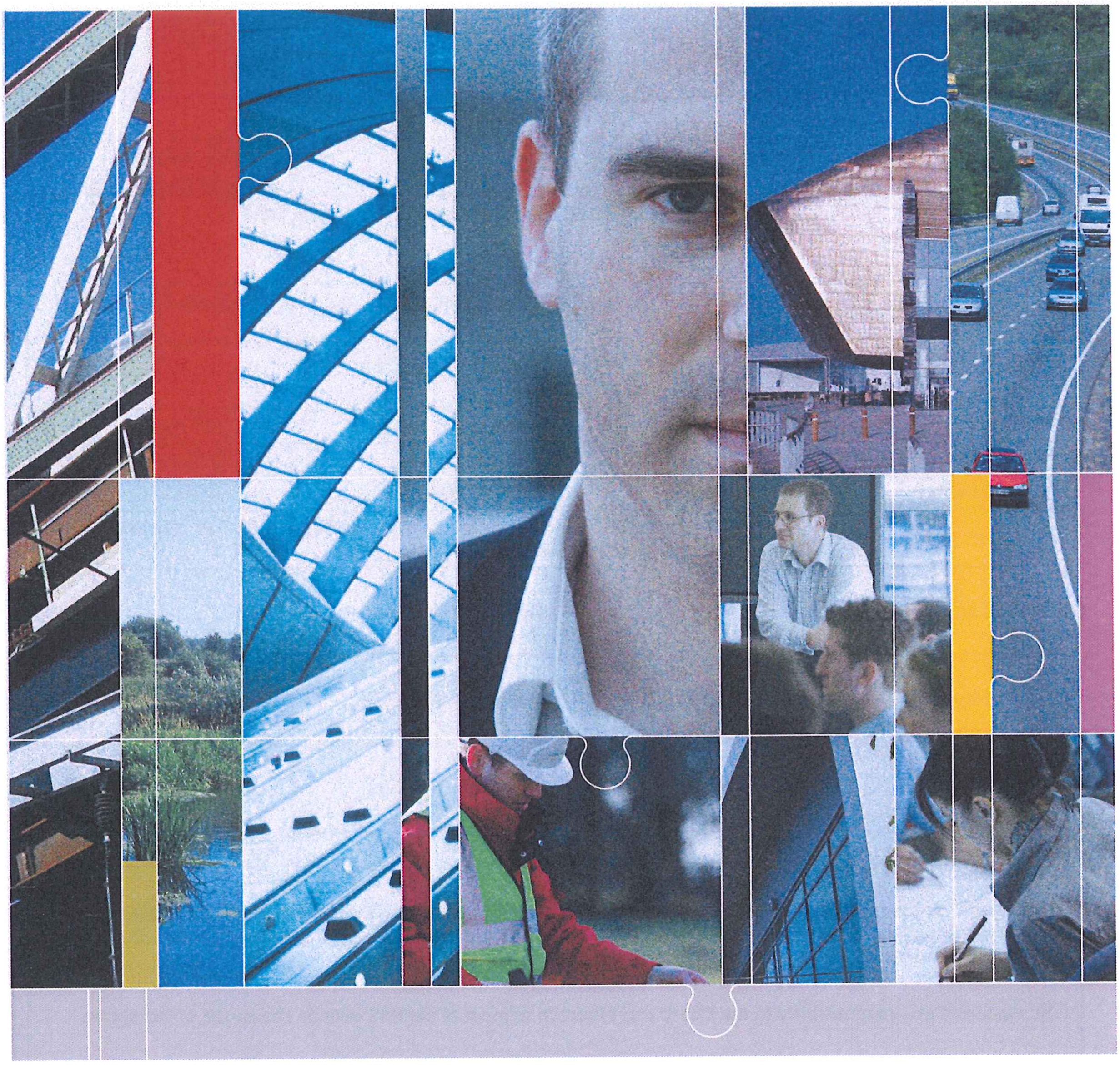
5.2 Any such interpretation of risks will take full account of the best data on the water environment around La Collette that is available at the time of that interpretation, with the objective of assessing the potential cumulative effects of any new emissions in combination with background conditions existing at that time.

TTS
October 2010

Transport & Technical Services

Road map for the future management of EfW Ash





La Collette EfW Residues:
Technical Options & Disposal Sites

A comparison of options for the management of combustion residues from the EfW Plant

States of Jersey Transport and Technical Services

April 2011

CAPITA SYMONDS

Capita Symonds House, Wood Street
EAST GRINSTEAD RH19 1UU
Tel 01342 327161
www.capitasymonds.co.uk

Capita Symonds Management System

Client	States of Jersey, TTS	**Client's Ref**	*Tbc (PO number).* Stage 3b Deliverbable
Report title (in full)	La Collette EfW Residues: Technical Options & Disposal Sites		
Sub-title (if applicable)	A comparison of options for the management of combustion residues from the EfW Plant		
Report version / status	Final. As issued to regulators to inform meeting 12/05/2011.		

Report date	April 2011	**Issue date**	20th April 2011
CSL Job No	CS/049696	**Sub-job No**	CS/049696-02
Project Director	Mark Skelton	**Project Manager**	Gemma Harris
File name / path	F:\ZENV\!Projects\CS049696 La Collette Headland Stage 3\B.Work_Tasks\01 ASSESSMENT\04 Alternative Matrices\working dox		
Prepared by:	David Knapman / Gemma Harris	**Signature (for file)**	
Checked by:	David Knapman	**Signature (for file)**	
Approved by:	Mark Skelton	**Signature (for file)**	

Table of Contents

Annexes

[This page has been left intentionally blank to enable double sided printing]

Executive Summary

1. This report sets out the various options considered for the management of combustion residues which will arise on Jersey from the operation of the new Energy from Waste (EfW) plant at La Collette. These residues comprise incinerator bottom ash (IBA) and air pollution control (APC) residues.

2. The report draws on the 'Strategy for the Management of EfW Residues' adopted by States of Jersey Transport and Technical Services (TTS) department and the viability of each option has been considered against the contents of this Strategy.

3. The following management options have been considered:
   a) TTS to export IBA for conditioning and re-use outside Jersey, by third parties.
   b) TTS to retain IBA on Jersey for conditioning and re-use.
   c) TTS to supply IBA to third parties for them to dispose of it on Jersey, without pre-conditioning.
   d) TTS to dispose of IBA at La Collette, without pre-conditioning.
   e) TTS to export APC residues for recovery treatment and re-use outside Jersey by third parties.
   f) TTS to retain APC residues on Jersey for treatment by TTS and re-use.
   g) TTS to dispose of untreated APC residues in an engineered landfill cell on Jersey.

4. Disposal off Island has not been considered as viable alternatives are available. As such, off Island disposal is unlikely to be permitted due to the requirements of the Basel Convention. The UK extended its ratification of the Basel Convention on the Transboundary Movement of Waste to include Jersey in 2007.

5. The appraisal of management options identified the disposal of unconditioned IBA and untreated APC, either at La Collette or within an alternative site on Jersey, as the preferred management option for EfW residues in the immediate future.

6. Having identified a 'preferred management option' the report then considers in more detail a number of alternative disposal site locations.

7. Disposal sites considered comprised:
   a) Western Quarry.
   b) La Saline (TTS Stone Processing depot).
   c) La Crete Quarry.
   d) Simon Sand Lagoon.
   e) La Gigoulande.
   f) Ronez.
   g) Former mushroom tunnels.
   h) La Collette.

8. Each site was considered against a number of criteria to determine its suitability for the long term disposal of IBA and APC. La Collette was identified as the most viable location.

9. It is noted that the Ash Strategy requires a regular review of the management approach. As this is undertaken, it is recommended that the appraisal tables within this document are revisited and updated, and used to inform future management decisions.

[This page has been left intentionally blank to enable double sided printing]

1. Introduction and Background

1.1 Purpose, Scope and Provenance of this Report

1.1.1 The purpose of this report is to record the outcome of a two-stage process of high level assessment as applied to:

a) the longer term options for managing combustion residues generated by the new Energy-from-Waste (EfW) Plant at La Collette; and
b) the locations in Jersey at which the more feasible of such options might be carried out.

1.1.2 The technical scope of this report is limited to consideration of waste management issues, and the geographical scope is limited to the island of Jersey.

1.1.3 This report has been produced for the States of Jersey Transport and Technical Services department (TTS) by Capita Symonds (CI) Ltd. Previous reports produced by Capita Symonds for TTS which are particularly relevant include:

a) 'EfW Residue High Level Review', 3 September 2010; and
b) 'Background to the Strategy for the Management of EfW Residues', 25 October 2010.

1.1.4 The second of these reports drew heavily on the first, and accompanied a draft 'Strategy for the Management of EfW Residues' which was subsequently adopted by TTS as their preferred pre-operational strategy, and submitted as such to the Minister of Planning and Environment in fulfilment of a condition requiring such a Strategy which had been attached to the original planning consent for the EfW Plant. A copy of that Strategy is attached to this report as Annex 1, and in the interests of brevity is referred to hereafter as 'the Ash Strategy'.

1.1.5 It is noted that the Ash Strategy requires a regular review of the management approach. As this is undertaken, it is recommended that the appraisal tables within this document are revisited and updated, and used to inform future management decisions.

1.2 Background

1.2.1 Combustion residues from the EfW Plant fall under two distinct headings:

a) incinerator bottom ash (IBA); and
b) air pollution control (APC) residues.

1.2.2 IBA is the material left behind on the combustion grate, and is removed in a continuous fashion through the action of the moving grate. IBA is collected in a bunker after first being cooled via a water quench, and passing beneath a magnet to remove a significant proportion of the ferrous metal residues. Although its characteristics require regular monitoring, IBA is generally classified as a non-hazardous waste.

1.2.3 Boiler ash comprises much smaller particles which are entrained within the flow of hot combustion gases. Most of these particles leave the boiler in the column of flue gases, and are subsequently collected by the APC systems (see below). However, a small proportion of boiler ash 'falls out' of the flue gas before it leaves the EfW boiler, and drops down to the bottom of the boiler where it is combined with the IBA. As a result, the term IBA should be understood to include a small proportion of boiler ash.

1.2.4 As a non-hazardous waste, IBA produces a certain amount of leachate when saturated, which requires proper management. In the UK, ash has been treated through conditioning and graded so that it is suitable for use as a substitute for virgin aggregate in certain engineering applications, subject to a site-specific risk assessment.

1.2.5 IBA which has simply been conditioned is referred to as conditioned IBA, whereas material which has gone through a further round of processing to remove oversize items and as much of the remaining ferrous and non-ferrous residues as possible, and to grade it so that it has a known and predictable mixture of particle sizes, is known as IBA aggregate, or IBAA.

1.2.6 APC residues from EfW plants constitute a much smaller mass than IBA. They are formed as a consequence of the treatment of the combustion flue gases, which is required so that emissions standards can be met at the point of release (i.e. at the top of the stack). At La Collette, APC treatment will involve two main stages. In the first stage dry urea will be injected into the boiler furnace chambers, and will act as a source of ammonia, which is central to the Selective Non Catalytic Reduction method by which oxides of Nitrogen (NOx) will be stripped out of the flue gases. After the flue gases pass from the boiler to the gas cleaning equipment, dry hydrated lime and activated carbon will be injected into the duct preceding the bag filter to neutralise acid gases and adsorb (primarily) dioxins, furans, other volatile organic compounds (VOCs) and mercury. The lime injection rate will be controlled by upstream measurement of hydrogen chloride, thus optimising the efficiency of gas scrubbing and lime usage. Bag filters will be used to remove the APC residues, which will consist of fine ash plus excess and spent lime and carbon. The build up of lime and carbon on the filter surface enhances the removal of acid gases, metals and dioxins. Pulses of compressed air will be used to remove the accumulated APC residues from the bags, which will then fall into a collection hopper prior to being conveyed to a sealed storage silo.

1.2.7 Whilst the mass of APC residues is small compared to IBA, due to their hazardous nature APC residues have to be carefully handled. They are generally classified as hazardous waste, which also imposes responsibilities and limits options for its treatment and disposal. When landfilled, APC residues require a higher level of environmental protection than IBA, in the form of a higher-specification impermeable liner and cap (when the cell is closed).

1.2.8 Whereas it is possible to combine APC residues with cement to form a cementitious material in which the hazardous elements are bound, and therefore either non-leachable or leachable at a greatly reduced rate, the technology for doing this is still in the development stage, and is not commercially widespread.

1.2.9 The key elements of TTS' adopted Ash Strategy (which is attached to this report as Annex 1) are that TTS will:

a) use a proportion of the IBA for engineering purposes in the creation of a new headland feature at La Collette, recognising that some clean excavation waste is likely to be used for cell construction;
b) maximise the size of the cells from which the headland is formed in order to minimise the quantities of excavation waste used in shoulder and capping features, and will not use the headland feature simply to dispose of excavation waste;
c) dispose of much or all of the rest of the IBA, and all of the APC residues, within the cells from which the new headland feature is formed, keeping them separate and designing the necessary cells where they are placed to appropriate technical standards;
d) investigate the potential for diverting some IBA for beneficial use elsewhere within Jersey, and if this appears feasible and does not pose unacceptable environmental risks, encourage such use as a way of extending the working life of the new headland feature;
e) prior to implementing any of the above actions, carry out proper risks assessments taking full account of groundwater monitoring data to ensure that risks to the marine environment are minimised, and check the findings of any desk studies against real data from the new EfW plant combustion residues as soon as they are available for testing; and
f) review the strategy regularly to confirm that it remains both valid and helpful.

1.2.10 The final point is important, in that it does not rule out adaptation of the Ash Strategy in response to evolving knowledge and commercial conditions.

2. Technical Appraisal

2.1 The Range of Technical Options

2.1.1 There are two potential management options applicable to both IBA and APC residues:

a) some form of treatment to reduce the material's potential to pollute the environment, and/or to make it more suitable for some form of beneficial use; and
b) safe permanent disposal by landfilling (or land raising).

2.1.2 Under the requirements of the Basel Convention[1], EfW residues could only be sent to Mainland Britain for disposal if no viable option for disposal was available on Jersey. Since alternative options are currently available, off island disposal is not considered within this report. There are no such constraints on sending EfW residues off island for recovery.

2.1.3 The full range of options that were considered were as follows:

	Potential Management Options	
	IBA	***APC Residues***
Treatment	(1) TTS to export IBA for conditioning and re-use outside Jersey, by third parties. (2) TTS to retain IBA on Jersey for conditioning and re-use.	(5) TTS to export APC residues for recovery treatment and re-use outside Jersey by third parties. (6) TTS to retain APC residues on Jersey for treatment and re-use.
Disposal	(3) TTS to supply IBA to third parties for them to dispose* of it on Jersey, without pre-conditioning. (4) TTS to dispose* of IBA at La Collette, without pre-conditioning.	(7) TTS to dispose of untreated APC residues in an engineered landfill cell on Jersey.

*Note: *'disposal' includes the potential for use (without treatment) for example in quarry restoration or creation of a landform*

IBA Management Options

2.1.4 Options 1 to 4 in particular are non-exclusive. It is not beyond the realms of possibility that all four options might be implemented simultaneously. It is more likely that one or both of Options 1 and 2 might be used in combination with one or both of Options 3 and 4.

2.1.5 Option 4 has been made site-specific (to La Collette) for two main reasons, which involve a certain amount of overlap.

a) TTS' current Ash Strategy (which has been accepted by the Minister of Planning and Environment) identifies land raising at La Collette using IBA as the main management option for the EfW residues, subject to the granting of planning permission.
b) There is no viable alternative site to La Collette for disposal in the short term.

APC Management Options

2.1.6 Because the quantities of APC residues are much smaller than those of IBA, the working assumption is that at any one time, only one of the three options (options 5 to 7) will be pursued.

2.2 Appraising the Technical Options

2.2.1 The approach that was adopted to appraisal was to consider whether each option is consistent with TTS' current Ash Strategy (recognising that the Strategy retains sufficient flexibility for new approaches to be phased in over time), and then to consider the strengths, weaknesses, opportunities and threats (SWOT) associated with each option. The appraisal

[1] UK extended its ratification of the Basel Convention on the Transboundary Movement of Waste to include Jersey in 2007.

framework has been used to allow issues of practicality and likely cost to be considered alongside more directly environmental ones.

2.2.2 The strengths and weaknesses of each option are considered to be those features which are inherent to the proposal, whereas opportunities and threats are features which may arise, depending on the specific circumstances of management techniques and site characteristics.

2.2.3 Whilst no third party operator has been identified at this time to deal with either IBA or APC residues, it is possible that in the future a third party may take on some of this work (particularly with regards to IBA, as recognised in the Ash Strategy). On this basis, whilst the majority of management options identified assume that TTS will undertake the preferred management option(s) Option 3 has been included in recognition of the potential for disposal of IBA by third parties, for example for the restoration of quarries.

2.2.4 For the remaining options which assume that TTS will be responsible for undertaking all treatment, where particular differences may arise in the appraisal findings should a third party undertake the works this has been noted in brackets.

2.2.5 The resultant appraisal matrices (one each for IBA and APC residues) are presented as Figures 2.1 and 2.2. The matrixes identify the disposal of unconditioned IBA and untreated APC, either at La Collette or within an alternative site on Jersey, as the current preferred management option for EfW residues.

Figure 2.1: IBA Management Options – Strategy and SWOT Analysis

Management Option	Consistency with Ash Strategy	Strengths	Weaknesses	Opportunities	Threats	Conclusions
(1) TTS to export IBA for conditioning and re-use outside Jersey, by third parties.	Currently inconsistent.	Diversion of part or all of IBA arisings, with minimum investment required by TTS. Wasteis recovered.	Increased level of transport emissions. Not economic based on likely costs assocaited with shipping. UK recycling is substancially driven by landfill tax therefore the option is susceptible to changes in market. It is not considered sustainable to ship waste out of Jersey, when suitable alternatives exist on Island.	Diversion elsewhere will help to extend the life of La Collette Phase 2 for other disposal / reuse of other materials.	Requirement for emergency alternative plan if relationship comes to a sudden end. Increase in shipping or other 3rd party costs.	Currently this option is not an economically viable or sustainable option. *Possible implementation options:* None identified.
(2) TTS to retain IBA on Jersey for conditioning and re-use.	Currently consistent.	Diversion of part or all of IBA arisings, with investment required by TTS. Waste is recovered. Jersey deals with its own waste. Leachate managed under more controlled conditions e.g. concrete pad with drainage.	A willing and competent local partner may not be available. There is currently no established market for IBA in Jersey.	Diversion elsewhere will help to extend the life of La Collette Phase 2 for other disposal / reuse of other materials. Displaces primary aggregate likely to be quarried on Jersey.	No current evidence that a n endproduct suitable for use in the Jersey extensive aquifer context exists, however trials are proposed. Risk of environmental damage through mismanagement remains on Jersey (i.e. avoidable damage is caused). (If TTS undertake this option, as opposed to a 3rd Party, TTS retain threat of long term liability associated with material misuse).	This management option is currently consistent with the Ash Strategy. Nevertheless, testing of the outputs from the EfW plant has not yet commenced, and until this is completed the viability of conditioning is unproven. *Possible implementation options:* Use of conditioned IBA as aggregate subsittute (regonising that no such market currently exists on Jersey).

Management Option	Consistency with Ash Strategy	Strengths	Weaknesses	Opportunities	Threats	Conclusions
(3) TTS to supply IBA to third parties for them to dispose of it on Jersey, without pre-conditioning.	Currently consistent	Diversion of part or all of IBA arisings, with minimum investment required by TTS. Jersey deals with its own waste. Attractive option for material with limited / negative intrinsic value. Not time constrained.	Generates leachate within the new landform which will required management. May be other site specific weaknesses that should be considered (see Figure 3.2). Displaces long term site options for the disapoal of inert waste.	Diversion elsewhere will help to extend the life of La Collette Phase 2 for other disposal / reuse of other materials. Opportunity to create beneficial landscape features (including restoring original landform after quarrying).	Risk of environmental damage through mismanagement remains on Jersey (i.e. avoidable damage is caused).	This management option is currently consistent with the Ash Strategy. As such, it is further considered in Figure 3.2, which considers alternative location for disposal of IBA without conditioning. *Possible implementation options:* Potential for disposal to take place at a number of privately owned quarries in Jersey.
(4) TTS to dispose of IBA at La Collette,without pre-conditioning.	Currently consistent	Viable subject to planning permission. Not time constrained. Minimises transport effects. Creation of landscape feature (notable landscape / biodiversity benefits). Provides a secure long term management solution, subject to planning permission. Entirely under TTS control. Econmic option for material with limited / negative intrinsic value. Site designated as not for development. Established process and technology.	Generates leachate within the new landform which will required management. Liner solutionrequires proper design, installation and managment. Adjacent to a Ramsar site.	Opportunity to create beneficial landscape features. Minimise transport emmissions.	Planning permission is not achieved for the site.	This management option is consistent with the Ash Strategy. As such, it is further considered in Figure 3.2. *Possible implementation options:* Disposal at La Collette

Source: Capita Symonds

Figure 2.2: APC Residues Management Options – Strategy and SWOT Analysis

Management Option	Consistency with Ash Strategy	Strengths	Weaknesses	Opportunities	Threats	Conclusions
(5) TTS export APC residues for recovery treatment and re-use outside Jersey	Currently inconsistent.	None identified.	Likely to be significant transport and processing costs associated with this option. Increased level of transport emissions. Technology not currently fully commercially developed.	*None identified*	Much of this option is outside of TTS' control, but the nature of handling hazardous waste, the need for double handling etc may mean TTS still holds some liability. Requirement for emergency alternative plan if disposal route comes to a sudden end. Transboundary shipment recovery permit required.	Shipping APC residues to Mainland Britain is unlikely to be commercially or economically viable at this time.
(6) TTS retain APC residues treatment and re-use	Currently inconsistent.	None identified.	Technology not currently fully commercially developed. Currently not considered viable in Jersey	None identified.	None identified	Treating APC residues on Jersey is unlikely to be commercially or economically viable at this time.
(7) TTS to dispose of untreated APC residues in an engineered landfill cell on Jersey.	Currently consistent	Well understood. Jersey is seen to be managing its own waste. Entirely under TTS control.	Liner solutionrequires proper design, installation and managment.Generates leachate within an engineered cell, that will require management.	None identified.	Liabilities attached to TTS.	Subject to appropriate design, this is the preferred solution. Further site specific consdieration of this solution is set out in Figure 3.2 *Possible implementation options:* La Collette. (Potential for disposal to take place at a number of TTS / 3rd Partyowned quarries in Jersey.)

Source: Capita Symonds

3. Disposal Sites Appraisal

3.1 The Site Options

3.1.1 Having considered disposal or recovery as options, this section of the appraisal report considers the sites on Jersey where disposal of IBA and/or APC residues might take place. Equivalent consideration has not been given to the recovery options because disposal is currently the only proven technology (see Section 2).

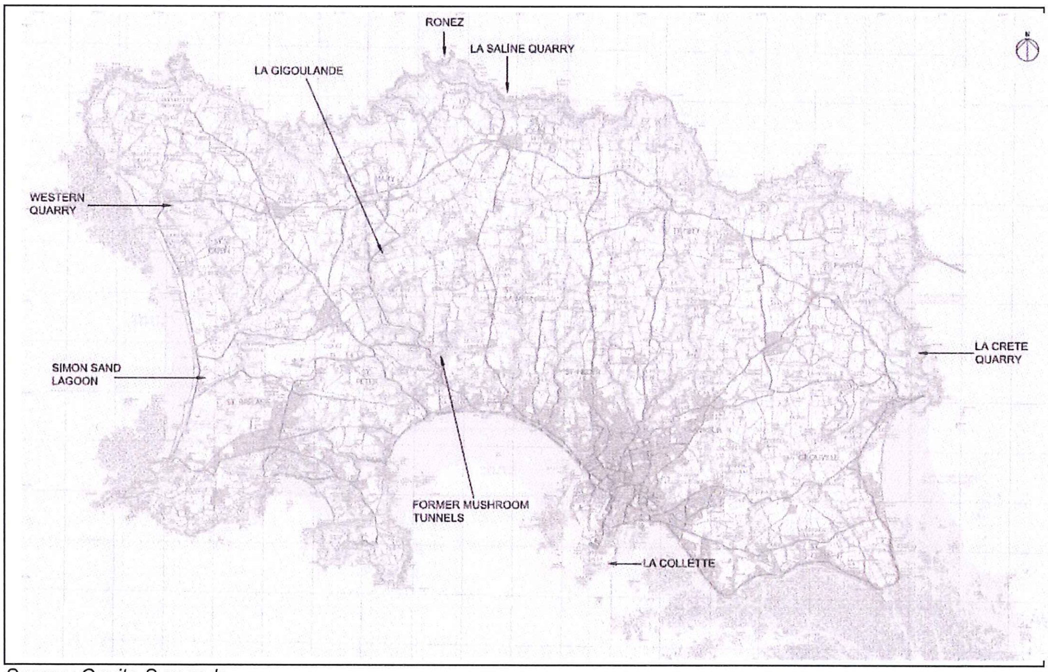
3.1.2 The sites that have been appraised are the same ones as were considered in the context of asbestos disposal (see 'Assessment of Possible Sites for the Disposal of Legacy Asbestos', December 2010,v2).That report recognised that most landfills utilise the void space left behind once quarries have been worked out. The environmental benefits of restoration in accordance with planning policy can include the recovery of the original landform. Other than La Collette, no alternative land raise sites are considered viable in planning policy terms.

3.1.3 Six of the eight sites which have been assessed are former or current quarries on Jersey. The other two sites are the former mushroom tunnels, and La Collette itself. The eight are as follows:

a) Western Quarry;
b) La Saline (TTS Stone Processing depot);
c) La Crete Quarry;
d) Simon Sand Lagoon;
e) La Gigoulande;
f) Ronez;
g) Former mushroom tunnels; and
h) La Collette.

3.1.4 The approximate locations of these eight sites can be found on Figure 3.1.

Figure 3.1: The Eight Sites Under Consideration



Source: Capita Symonds

3.2 Appraisal Criteria

3.2.1 Within the appraisal matrix (Figure 3.2) the colours carry the following meanings:

Probably suitable now and in the future.
Possibly suitable now.
Unsuitable now, but possibly suitable in the future.
Possibly suitable, subject to further work.
Probably unsuitable now or in the future.
Unknown (currently).

3.2.2 The following criteria were used as the basis of the appraisal process. The underlined terms are the ones which provide the column headings in Figure 3.2:

a) Site ownership (with sites currently owned by the States of Jersey being preferred, because of the need to get the work under way).
b) Availability of facility (with preference given to sites where access could reasonably be expected to be granted in the short term, irrespective of ownership).
c) Available void space volume (recognising that any site must be sufficiently large to be able to accommodate a volume of EfW residue such to make the site viable).
d) Consideration of whether it would be possible to disposal of both IBA and APC residues at the same site. At a large site (e.g. La Collette) it is feasible to have specialist disposal cells for materials such as APC residues as well as larger cells for IBA disposal. At some smaller sites considered in the disposal site appraisal this combination may not be feasible, not because there is any over-riding technical reason which mitigates against it, but because of economies of scale (which arise from the fact that there will always be a minimum size of hazardous waste cell below which it makes no sense to go, even if this minimum size is not common to all combinations of circumstances).
e) Access from St Helier and any restrictions on vehicle size, and frequency of vehicle movements.
f) Site access, space and facilities on site (i.e. existing infrastructure provision on site (such as wheel washes, security etc, is the actual entrance safe, is there space for a 'gate' and/or portakabin to hold Personal Protective Equipment and similar, and enough room to unload and handle incoming waste).
g) Underlying geology (with preference given to impermeable hard rock or other formations where impermeability could be reliably engineered).
h) Water resources (taking account of the presence or absence of groundwater resources).
i) Other sensitive receptors (whether environmental, human or cultural, including consideration of their proximity).
j) Environmental / planning designations and policy conflicts (recognising that unconstrained sites are greatly preferable, particularly given the time constraints).
k) Future with consideration of future implications of the site selection e.g. would valuable land be sterilised, and would there be any risk of the capping being breached?

3.2.3 The appraisal matrix can be found at Figure 3.2. The matrix identifies La Collette as the most viable disposal site.

Figure 3.2: EfW Residues Disposal – Alternative Sites Assessment (assumes disposal controlled by site owner)

	Western Quarry	*La Saline*	*La Crete Quarry*	*Simon Sand Lagoon*	*La Gigoulande*	*Ronez*	*Former Mushroom Tunnels*	*La Collette*
Ownership	States of Jersey (TTS).	States of Jersey (TTS).	States of Jersey (TTS).	Private Ownership (potential for future use).	Private Ownership (potential for future use).	Private Ownership (potential for future use).	Tunnel and approach both in private ownership.	States of Jersey (TTS).
Availability	Now (subject to planning permission).	Now (subject to planning permission).	Now (subject to planning permission).	Currently active - date of availability unknown.	Quarry not available (site currently active).	Quarry not available (site currently active).	No longer in use - availability unknown.	Now (subject to planning permission).
Void space	Insufficient: L-shaped cross section makes large-scale disposal very difficult.	Initial review suggests inadequate.	Possibly suitable for APC residue disposal subject to confirmation of depth.	Possibly suitable subject to confirmation of depth. Utilisation of site for residue disposal would displace future inert waste disposal.	Possibly suitable subject to confirmation of depth. Utilisation of site for residue disposal would displace future inert waste disposal.	Probably suitable.	Area of useable tunnel unknown, possibly suitable for APC residue disposal.	Suitable.
IBA and APC	Not likely to have capacity for joint use.	Not likely to have capacity for joint use.	Not likely to have capacity for joint use.	Not likely to have capacity for joint use.	Not likely to have capacity for joint use.	In the long term, likely to have capacity for joint use.	In the long term, may possibly have capacity for joint use.	Has capacity for joint use.
Access	Access via public highways, B64/B35 (main roads).	Access via public highways, through St. Johns.	Access via public highways, B30 (main road) and local road.	Good access via public highways, from B35.	Access via public highways, B36 (main road).	Access through St. Johns, via public highways.	Access via public highways, A11 then local roads.	Good access, no restriction on vehicle size. No public highway requirements
Facilities	Good site access off main road, space for facilities. Some, limited infrastructure in place.	Good site access off minor road, limited space for facilities. Some, limited infrastructure in place.	Good site access off local road, space for facilities. No infrastructure in place currently.	Good site access, plenty of space for facilities. Some infrastructure in place.	Good site access, possible space for facilities. Majority of infrastructure currently in place.	Good site access off local road, space for facilities. Majority of infrastructure currently in place.	Site access possible. No external space for facilities. No infrastructure currently in place.	Very good site access, suitable space available. Majority of infrastructure currently in place.
Geology	Potential for water to flow through cracks and fissures.	Potential for water to flow through joints, cleavages and dislocations. Little known about joint spacing or density.	Potential for water to flow through minor faults and other fractures. Unstable cliff face. Potential for high geodiversity value.	Geology understood to be highly permeable.	Potentially highly permeable, may form superficial aquifers. Also potential for high geodiversity value.	Potential for water to flow through joints, cleavages and dislocations. Little known about joint spacing or density.	Potential for water to flow through cracks and fissures.	Potential for water to flow through minor faults.

	Western Quarry	*La Saline*	*La Crete Quarry*	*Simon Sand Lagoon*	*La Gigoulande*	*Ronez*	*Former Mushroom Tunnels*	*La Collette*
Water Resources	Possible water abstraction catchment.	Possible water abstraction catchment.	Possible water abstraction catchment.	Public water abstraction catchment. Very shallow groundwater.	Public water abstraction catchment. Very shallow groundwater.	Groundwater possibly in continuity with sea.	Unknown. Policy NR1 (draft Island Plan 2009).	Groundwater present beneath Site. No abstraction.
Receptors	Housing nearby but unlikely to be overlooked.	Housing nearby but unlikely to be overlooked.	Housing nearby but unlikely to be overlooked.	Adjacent to the sea. Very little housing nearby. Near to public beach, adjacent to heathland.	Very little housing nearby. Housing along connector road. Nearby waterbodies.	Understood to be adjacent to geological SSI. Adjacent to coastal path. Very close to sea.	Housing nearby. Part of feature of historic interest.	Potentially sensitive receptors (inc. Ramsar site) within 300m.
Policy	Conflict with current & draft Island Plan (landfilling could restore original land form). Currently licensed for extraction only.	Conflict with current & draft Island Plan (landfilling could restore original land form). Currently licensed for extraction only.	Conflict with current & draft Island Plan (landfilling could restore original land form). Currently licensed for extraction only. Site allocated for emergency waste storage.	Conflict with current & draft Island Plan (landfilling could restore original land form). Currently licensed for extraction only.	Conflict with current & draft Island Plan (landfilling could restore original land form). Currently licensed for extraction only.	Conflict with current & draft Island Plan (landfilling could restore original land form). Currently licensed for extraction only.	No specific policy issues for tunnels . Potential heritage loss	Suitable subject to confirmation of draft Island Plan amendments. Currently licensed for disposal.
Future	States of Jersey (TTS).	States of Jersey (TTS).	States of Jersey (TTS).	Private Ownership (potential for future use).	Private Ownership (potential for future use).	Private Ownership (potential for future use).	Tunnel and approach both in private ownership.	States of Jersey (TTS).

Source: Capita Symonds

[This page has been left intentionally blank to enable double sided printing]

A-1. TTS' Adopted 'Strategy for the Management of EfW Residues'

Strategy for the Management of Energy-from-Waste Residues

1. Overall

1.1 The overall strategy for the management of combustion residues from the new energy-from-waste (EfW) plant at La Collette is to dispose of them safely within a new headland feature on the eastern side of La Collette Phase 2 Reclamation Area. The engineered cells within which the residues will be placed will be created as large as reasonably possible, in order to minimise the quantities of suitable excavated materials (a mixture of soil and rock, hereafter referred to as excavation waste) which are used in shoulder and capping features. The use of incinerator bottom ash (IBA) for engineering purposes (as structural fill) cannot be guaranteed, and further studies based on actual IBA from the new EfW plant will be required to assess its potential for such uses.

1.2 The strategy is to spread the creation of the headland over as long a period as possible, even if this involves using combustion residues from some future EfW plant (or other treatment process) which may be built as a replacement for the new La Collette EfW plant.

1.3 TTS will take note of the provisions and underlying intentions of the EU's Landfill Directive, even though the Directive does not apply to Jersey, and will manage the residues from the EfW plant in a way which reduces as far as possible any negative effects on the environment, any pollution of the environment and any risk to human health, for the whole lifecycle of the landfill. This will be done in close consultation with the waste regulatory authorities and within the context of Jersey's status as a relatively small island, with the restrictions and limitations (of technical choice, geological variety etc) that that imposes.

1.4 There are certain key facts which will remain unknown until combustion residues from the new EfW plant are available for testing. Sampling and analysis of these residues will be carried out by the operator of the EfW plant, under the terms of the plant's waste management licence, to a frequency and protocol agreed with the waste regulatory authorities, and in any case before the use of any new disposal or recycling route. Therefore this strategy will be treated as a 'live' document and both reviewed and amended as soon as combustion residues from the new plant have been tested, and then at least once a year thereafter for the first five years, at which point the frequency of subsequent reviews will be determined.

2. General Principles of Good Waste Management Practice

2.1 The strategy takes into account the following considerations:

- the new EfW plant will generate IBA and air pollution control (APC) residues as distinct waste streams;
- the Waste Framework Directive requires different waste streams to be kept separate, unless their mixing will reduce the hazardousness of the wastes concerned (other than simply via dilution, which is not permitted);
- IBA and APC residues have clearly different characteristics, particularly as regards their potential to generate leachate; and

- the most sensitive environmental receptor is the adjacent sea (and Ramsar site), which could potentially be adversely affected by uncontrolled releases of leachate.

2.2 TTS will therefore keep IBA and APC residues from the new EfW plant separate at all times, and will place APC residues within dedicated cells or areas within cells which will be engineered to a higher standard than is required for the disposal of IBA alone. Such technical standards will primarily involve the provision of a basal liner and a final cap (to prevent ingress of rainwater or any other liquids after the cell has been filled with waste).

3. Treatment and Use of IBA

3.1 TTS will investigate the benefits of treating at least some of the IBA by conditioning and/or grading, to confirm whether it can be used within the headland feature without undue risk (in the context of site-specific source-pathway-receptor linkages) of generating unacceptable levels of leachate or other environmental emissions either alone (e.g. outside engineered cells) or in combination with clean excavation waste for use as an engineering material.

3.2 TTS will also investigate the potential for developing beneficial uses for IBA and IBA-derived aggregate (IBAA) elsewhere within Jersey, since any such diversion will extend the period over which the construction of the proposed headland feature can be spread.

3.3 TTS will explore with others the scope for State intervention to promote or require the use of IBAA, as a means of stimulating the creation of a market. This will include the possibility of encouraging the use on Jersey of a protocol which is currently under development within the UK, and which is expected to define key uses, and to establish quality and environmental protection requirements for such uses.

4. Use and Disposal of Excavation Waste

4.1 At present largely inert soil and other excavation waste is being used to reclaim La Collette peninsula, by backfilling lagoons that have been created behind an artificial rock structure.

4.2 Once this process is complete, TTS will seek alternative uses for excavation waste away from La Collette, and will keep to a minimum the amount of excavation waste which is used within the new headland feature. Excavation waste will not be disposed of (i.e. with no beneficial use) within the new headland feature without a review of this strategy being carried out.

5. Short-Term Priorities

5.1 The potential for creating adverse effects on the water environment from using IBA or IBAA for engineering purposes within the new headland feature needs to be assessed, and the key question to be answered is how conditioned IBA will perform in terms of leachability of metals and nutrients, and whether this is significant in the setting of La Collette headland and its planned engineering measures.

5.2 Any such interpretation of risks will take full account of the best data on the water environment around La Collette that is available at the time of that interpretation, with the objective of assessing the potential cumulative effects of any new emissions in combination with background conditions existing at that time.

TTS
November 2010

CAPITA SYMONDS

Capita Symonds' Environment Team forms part of the Infrastructure business unit.

Our largest environmental teams are based in the following offices:

Capita Symonds House, Wood Street
EAST GRINSTEAD RH19 1UU

52 Grosvenor Gardens (Level 7)
LONDON SW1W 0AU

Further details of all our offices, and services, can be obtained from our website, at:
www.capitasymonds.co.uk