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Planning Department

Final Report  
Inert Waste Arisings and Landfill Capacity

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## **1. Management Summary and Recommendations**

This report reviews the numerous issues impacting on the remaining life of La Collette II and offers predictions on the eventual date that the site will close to receipt of inert waste.

This report should be read in conjunction with the model that attempts to identify these variables and enable the user to undertake "what if" scenarios and assess the impact on the remaining life of La Collette II particularly with regard to completion to the 14m AAD level. The results of the model are both tabulated and graphically represented.

This model has two main outcomes.

1. To determine the time taken to create new land for the relocation of the Tank Farm and gas vapourisation facility.
2. To determine the remaining life of La Collette II to the 14m AAD level

This report separately reviews the information obtained from Transport and Technical Services and reports on the predicted closure of the site on completion of limited super filling activities.

At the current rates of infill and without the impact of the major projects in the waterfront area the time taken to create the same area of land that is currently occupied by the fuel farm operators and the gas works (33,100m<sup>2</sup>) would be three years. This figure is based on the recent data available from the weighbridge.

There are however two major projects namely, the Esplanade Quarter and Castle Quays that will have the most significant short term impact on rates of infill and if both schemes progress as planned then the area of land required will be created in approximately 16 months.

Transport and Technical Services currently charge a gate fee for the disposal of inert waste at La Collette II. There are two bands "clean loads" attracting a fee of £3.60 per tonne and "mixed loads" attracting a fee of £11.50 per tonne. These two fees are likely to inhibit the amount of waste that will be taken from these two major projects to La Collette II due to the commercial implications on project costs. It is likely that the developers will look to reduce costs by recycling on site and either reusing the material on site or selling excess product from site into the local market. It is also likely that the privately operated recycling market will prove a successful route for the disposal of some of the mixed loads of excavated material.

Since the privately owned waste recycling contractors are unregulated there is no information available to indicate how successful they would be in diverting inert waste from the limited capacity of La Collette II. As a result of this the model assumes that all waste is placed in the landfill at La Collette II arising from these two projects.

At the current rates of infill to December 2007 data and with the impact of the two major schemes, La Collette II will be filled to the design limit of 14m AAD (Above Admiralty Datum) in approximately 9 years or 2017. By this time approximately 3.4million m<sup>3</sup> of inert waste, MSWI ash, asbestos and glass will have been deposited in the site. The original lifespan of the site was anticipated to be 20 years and filled to the 14 m AAD level by approximately 2016.

Super filling is planned in specific areas of La Collette II although the area identified in the Jersey Mineral Strategy 2000 has reduced due to the allocation of the land for other uses.

The super fill area running in a North South orientation on the Eastern edge of the site will be complete by 2011. The area on the Western edge of the site will be super filled by 2018 and there are no plans to use this location for ash storage pits.

The Southern area around the curve of the site will be required for the storage of ash in specially constructed ash pits.

The Energy from Waste plant will be commissioned in 2011 and it is predicted that the ash produced requiring landfill disposal will be approximately 50% of the amount produced presently.

At current rates of ash production Transport and Technical Services estimate that this Southern area will provide 13 years capacity. At future production rates this area could be expected to provide almost double that capacity.

La Collette II will be closed to the receipt of inert waste in 2018 at the rates recorded up to December 2007 and including the known large Waterfront construction projects planned over the next few years.

This date is too close to the potential dates when La Gigoulande and Simon Sands quarries could become available for the receipt of inert wastes and offers little or no flexibility to plan future waste disposal routes without some form of potential interruption. To overcome this interim inert waste storage should be planned for at La Collette II in the form of additional super filling on a strictly temporary basis until any new facility is able to receive wastes.

#### Recommendations

1. The Southern area of land identified for super fill should be reserved for ash deposit only. Predictions suggest that this site will provide approximately 25 years ash storage based on ash figures predicted from the new Energy from Waste plant.
2. Approvals should be sought to continue using this area of site for ash deposit after the closure of La Collette II in 2018 to inert waste.
3. Permission should be obtained to enable temporary super filling of inert waste at La Collette II until either La Gigoulande or Simon Sands becomes available.
4. The States should retain an option to utilise both La Gigoulande and Simon Sands to secure Jersey's waste disposal needs for the long-term benefit of the Island.

## **2. Introduction**

It is well documented that the site was constructed in the period up to 1995 and commenced operation for the receipt of inert waste sometime in 1996. Since that time the rate of infill has been largely in line with original expectations but peaks in construction activity in recent years have involved much larger quantities of material being delivered to La Collette II for placing in the landfill site. This in turn has caused concern on the remaining life of the site as plans for a future landfill site are yet to be realised. This report aims to address these concerns in the context of ongoing construction and reclamation activities and another planned peak of deposits as a result of the redevelopment of significant areas of the waterfront as the States attempts to reconnect the vibrant life of St Helier with the unique foreshore environment.

### **3. The European View**

Construction and Demolition waste constitutes a highly significant proportion of all wastes. Those wastes also have a very high recovery potential, as shown by pilot studies in member states, which have achieved recycling levels of more than 80%. However the sad fact is that only a small proportion of this waste stream is actually recovered in the EU as a whole.

At more than 450 million tonnes per year<sup>1</sup> the Construction and Demolition waste stream, which includes excavation waste etc. constitutes the largest waste stream within the EU measured in quantitative terms.

Excluding earth and excavated road material the amount of Core Construction and Demolition waste generated is estimated at 180m tonnes per year. When compared to the annual consumption of approximately 2,000 m tonnes of aggregate in the EU the amount available for recycling represents only 9%. Current management of that waste stream results in less than optimal utilisation of this resource.

Roughly 75% of construction and demolition waste is land filled despite its major recycling potential, whereas only 25% of waste is recycled. The technical and economic feasibility of recycling has been proven, where Denmark, The Netherlands and Belgium achieved recycling rates of more than 80%.

The cost of transport of this waste prohibits utilisation of Construction and Demolition waste beyond a distance of approximately 25 kilometres.

The hierarchical principle of applying waste management methods (Prevention, Minimisation, Reuse, Recycling, Energy Extraction and finally, Disposal) is not applied by most member states, which results in sub optimal utilisation of natural resources.

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<sup>1</sup> Management of construction and demolition waste - working document No1. DGX1 ENV.E.3 - Waste Management April 2000.

#### **4. Recycling rates in the United Kingdom.**

In a recent report<sup>2</sup> figures for 2005 (the latest year for which figures are available) showed that 89 million tonnes of Construction, Demolition and Excavation Waste (CD+EW) was produced in the United Kingdom.

This material was processed as follows:

42 million tonnes of Recycled Aggregate was produced  
28 million tonnes was classed as waste and was disposed of in landfill sites  
15 million tonnes was disposed of in Registered Exempt Sites  
4 million tonnes was recycled as soil (excluding top soil).

Of the 42 million tonnes that was recycled 17 million tonnes was recycled on site at the point of production. Overall 24 million tonnes was recycled as graded recycled aggregate and 18 million tonnes was recycled as un-graded aggregate.

The overall recycling rate for CD+EW is approximately 47% with recycling at landfill sites being approximately 28%.

These figures would be a useful benchmark for use in Jersey but it should be noted that a direct comparison could not be made until the efforts of the private recycling contractors are known. Inclusion of this information would no doubt improve the already successful results achieved at La Collette II.

A report by the Minerals and Waste Planning division of the Office of the Deputy Prime Minister (OPDM) titled Survey of Arisings and Use of Construction and Demolition waste concluded that the key to increasing the proportion of hard Construction and Demolition waste recycled as aggregate is to improve the on site separation of these materials such as concrete, bricks and tiles from soil and other vegetable materials in order to make them more accessible to the recycling industry.

The report also concludes that if more Construction and Demolition waste is diverted from landfill sites and registered exempt sites, some material that is currently used for landfill engineering or for engineering purposes on landfill and registered exempt sites may have to be replaced with low grade primary aggregates or mineral waste.

A significant barrier to the reuse of aggregates is the definition by the EU, of recovered C&D and EW as "waste" until such time as it is "fully recovered". Fully recovered waste is currently deemed to mean incorporated into some final product or used in construction.

Classification of recycled and secondary aggregates as waste will create a commercial impediment to their use. Major issues are: -

- Increased cost and administration of waste regulation requirements.
- The potential liabilities of storing and using waste by purchasers.
- The perception of waste as an inferior and unsuitable material.

The UK recycling industry is currently lobbying for the reclassification of recycled materials as product and not waste.

In its report<sup>3</sup> WRAP has stated that in recent years opportunities for and developments in the reuse of Construction and Demolition Waste have encouraged an increasing number of local authorities to use recycled content in highways maintenance.

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<sup>2</sup> Department for Communities and Local Government – Capita Symonds Report February 2007.

<sup>3</sup> Specifying recycled in local authority contracts for highway maintenance: good practice.

The principal drivers for these changes in attitude and acceptance have been: -

- Landfill Tax and the Aggregates Levy provide a direct financial incentive.
- New recycling techniques have demonstrated cost and performance advantages.
- Authorities have greater power to pursue Community Benefits – such as reduced disruption through in-situ recycling.
- Technical specifications and standards now encompass a range of recovered materials.

In the UK, recent Government guidance on public procurement highlights contract specification as the key stage to set policy based requirements. Action through the procurement process will enable purchasing organizations to realise cost savings and policy benefits.

Recovered and recycled materials can now be used in a range of highways applications. There are clear financial benefits to be gained from using recycled products in highways maintenance, as well as economic, environmental and social contributions to sustainable development. Specifying requirements for recycled content in a highways' contracts helps to meet policy targets – such as sustainability, procurement good practice, Best Value and waste management. A wide range of recycled products is available, and their quality and performance are at least comparable with primary aggregate equivalents.

Procuring recycled materials to replace primary aggregates and soil makes financial sense. Using recycled materials for highways maintenance is often cost neutral at least, and in many cases can deliver good financial returns. Specific cost savings include:

- The avoidance of waste disposal charges and Landfill Tax through the re-use of for example, road plannings.
- The avoidance of Aggregates Levy payments, from which recycled and secondary aggregates are exempt.
- Reduced costs of transporting aggregates when recovered materials are available locally.



### **5. La Collette II Landfill**

The landfill at La Collette commenced operations for the receipt of inert waste in 1996 following the completion of the new rock armour in 1995. The original life expectancy of the landfill site was approximately 20 years resulting in a planned completion date, excluding super filling, of 2016.

The original area of the landfill site was 275,000m<sup>2</sup> with an estimated average depth of 12.36 m, giving an estimated capacity of 3,400,000m<sup>3</sup>. Since the start of operations at La Collette 158,833m<sup>2</sup> of the original area has been filled in 12 years, which equates to an average annual rate of 13,250 m<sup>2</sup>. This gives a remaining available area of 116,767m<sup>2</sup> according to records available at December 2007, which when divided by the average historical figures gives a remaining life of 8.8 years. This figure is in accordance with current TTS projections. Put another way there is 42% of the surface area remaining with 40% of the original timescale remaining.

When the site began operation the original depth that was available was approximately 8m. As the tip head proceeds towards the outer sea walls the available depth appears from records to be increasing and it is estimated that the depth of fill may increase towards 15m.

One of the challenges that arise in attempting to gain a more accurate determination of the life of La Collette is that the depth of the remaining unutilised site is not known, since a survey has not been undertaken. As more of the site becomes filled with inert waste a layer of fine sediment is forming which makes it more difficult to determine the true depth of the available void.

According to records held by TTS the infill rate is slowing. Historical figures show that the rate at which land was being created was an average of 600-650m<sup>2</sup> per month. Current rates for 2007 show that this figure is now;

Q1 447 m<sup>2</sup> per month  
Q2 483 m<sup>2</sup> per month  
Q3 929 m<sup>2</sup> per month  
Q4 366 m<sup>2</sup> per month

The anomaly for Q3 is reported to be that the depth of fill at this location was 12m instead of the now more usual 14m.

Figures in Appendix 2 show the tonnages of material disposed of at La Collette II. Figures used in the model showing data from when La Collette II commenced operation include volumetric data since prior to the year 2000 there was no weighbridge at La Collette. The weighbridges were added in 2000, from which point on records of waste is reported in tonnes.

The conversion rate from tonnes to a volumetric measure is an average figure of 1.75tonne/m<sup>3</sup>. The normal range of densities would be expected to be in the range of 1.70 – 1.80 with this figure increasing to 2.0 – 2.2 when fine crushed concrete is the material. However, it is assumed that all fine concrete has already been removed for on site recycling and so this higher figure is not used.

Although recent experience shows that the amount of material being deposited in the landfill site is slowing it is a useful exercise to project the long-term rates of infill from when the site opened to project the life of the remaining void.

In 2004 a report<sup>4</sup> indicated that the remaining life of La Collette was 10 years based on the historical rates of infill. Since that report was produced a number of factors have changed that

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<sup>4</sup> Solid Waste Strategy Report – Carl Bro Group

are affecting the date when the site will be closed to more inert waste deposits. This will always be the case since many factors affect the rate of production of CD+EW.

Some of the principal factors that are affecting the remaining life of La Collette are:

- Changes in the level construction activity
- Implementation of Waste Management Plans requiring on site recycling
- Activity of private contractors acting as recycling operators and bypassing La Collette
- Impact of the gate fee at La Collette imposing a financial disincentive to use this facility
- Improved rates of recycling being achieved at the Reclamation Centre

As can be seen from the Transport and Technical Services figures in Appendix2 construction activity in Jersey has been lower in recent years and this has had an impact on the rates of production of CD+EW. The redevelopment of the waterfront area as proposed in the Hopkins Master Plan will stimulate the production of a short-term rise in the production of inert waste.

Waste Management Policy require the reuse of CD+EW material on site wherever possible. For example, in discussions with Jersey Airport regarding their future plans for apron works and runway modifications they expressed the aim of having as near as possible a nil earth works balance from these projects with all concrete being reused on site and shale being recycled by AAL Recycling Ltd.

During recent years a few companies have established additional services offering recycling of inert waste. These companies have been involved in the Construction and Demolition industry for some time and the opportunity for them to enter the market was created by the previous recycling contractor who did not produce sufficient quality recycled material at La Collette II to meet the market demand. This demand was created by commercial opportunity and the desire to reuse demolition waste to improve the sustainability credentials of new projects.

The gate fee charged at the weighbridge at La Collette is £3.60 per tonne for clean loads or loads where significant content can be recovered and recycled or £11.50 per tonne where too much contamination exists to make recycling an option. This revenue is not charged by AAL Recycling Ltd whose income is derived from the sale of recycled material. Other private recycling contractors who operate in a similar business in Jersey are also generating their revenue from the sale of product only. This lower fee whilst acknowledged as being operationally necessary creates a cost penalty for companies needing to dispose of CD+EW which assists in extending the life of La Collette II.

## **6. Waste Arisings**

In addition to the receipt of inert waste for disposal at La Collette there are a small number of very significant projects that will create additional quantities of material that needs to be disposed of at La Collette.

As far as the normal waste arisings are concerned it has been assumed that these will continue at the levels experienced recently. Of course, there can be no guarantee of these figures, which are dependent on the continuity of the thriving environment in Jersey and better on and off site recycling.

### **Esplanade Quarter**

The Hopkins Master Plan<sup>5</sup> for the redevelopment of the Esplanade Quarter (including the Jardins de la Mer and Weighbridge Square) has created a proposal for a project to reconnect the vibrant centre of St Helier with the foreshore. This ambitious project plans to lower the level of the existing road, la Route de la Liberation, and to create a new commercial, recreational and residential sector with significant underground parking spaces. The net result of this project is estimated to produce some 410,000 m<sup>3</sup> or approximately 717,500 tonnes of excavation material sometime in a 12-18 months period commencing in 2009 subject to planning permission for the project. Section 4.2 of the Master Plan relating to Waste Management is included in Appendix 6.

The Masterplan states:

“Initial calculations indicate that about 410,000 cubic metres of material will be excavated. Much of the excavated material will be recycled during the construction work, either on site or elsewhere in the island. The States of Jersey will insist on the highest achievable levels of recycling of excavated material, with the remainder being taken to the current Jersey reclamation site, east of La Collette. Based on current recycling rates from the incoming material to the La Collette II site, it is estimated that between 20% and 40% of the material could be recycled. Much will depend on the nature of the original fill material and the opportunity for resale into the marketplace at the time of excavation. The overall volume equates to about 3.85 years of space in the current La Collette II reclamation site with no recycling. If 20% recycling were achieved, this volume equates to about 3 years. If 40% recycling were achieved, this volume equates to about 2.3 years.”

### **Castle Quays**

Further, a scheme at Castle Quays has also been identified that will create another short-term peak of material to be disposed of at La Collette. This project is expected to produce approximately 61,200 m<sup>3</sup> or 107,000 tonnes of waste excavated material in a 12-month period in 2008 again subject to receipt of the necessary approvals.

One of the known challenges with the land for the two schemes identified above is that they are to be built on previously reclaimed land. This area was once a landfill site called West of Albert and it is known to contain Municipal Incinerator Solid Waste (MSWI) ash and asbestos. These materials are distributed throughout the site but are expected to be contained in loosely identified pockets, which at the time was deemed to be an appropriate technique for dealing with these materials. These pockets containing contaminated waste are formed as a direct result of the depositing of these contaminated materials as they arise on site and not as a result of the construction of dedicated areas of the site to receive such waste. It is important that the excavation of these materials is closely supervised to ensure that contaminated materials are identified and separated from other material. This contaminated material must be isolated and treated separately. Specific measures should be introduced to ensure that these materials are not mixed with recyclable material or material that will be placed in the inert sections of the La Collette II landfill as the impact of doing so will be far reaching.

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<sup>5</sup> Masterplan for The Esplanade Quarter, St Helier, 2007– Hopkins Architects

Once these materials are exposed they will need to be removed safely to La Collette and disposed of in a safe manner. La Collette is classed as an inert waste disposal site and therefore can only accept hazardous waste such as MSWI ash and asbestos by placing them in specially engineered pits dedicated to that purpose. At present asbestos is being stored in suitable containers and a contract is in place with a specialist asbestos contractor to deal with the waste in a safe and auditable manner.

MSWI ash is currently placed in engineered pits, which comply with national standards for the receipt of these materials.

### **7. Super Filling at La Collette II**

Super filling of the site has been proposed for a number of years. The original area of land available for super filling was proposed in the Jersey Mineral Strategy and described on a drawing produced at the time. This drawing is reproduced here as Figure 1.

In 2001 Michael Felton Ltd – Landscape Architects, produced a series of drawings showing detailed arrangements for the proposed super fill first outlined in the Jersey Mineral Strategy. These drawings were based on the land area identified in figure 1 of that strategy and it is understood from discussions with Transport and Technical Services that the plans are still deemed largely relevant for the planned landscaping of the super filled areas.

Discussions with Transport and Technical Services staff has identified that a significant volume of the planned super fill volume has been utilised for the storage of MSWI co-mingled bottom and fly ash. The rate of fill of this area is increasing following the implementation of new procedures to cover each day's ash deposit with inert waste to prevent dispersion by the elements. Ash pits are being created, filled and capped simultaneously in a series of layers within the boundary of the super fill volume and will eventually reach a height of approximately 22m AAD. This will allow sufficient capping and restoration material to complete the reinstatement of the site to the 24 m AAD level.

Transport and Technical Services has maintained comprehensive records of the rates of ash deposits since the inception of La Collette II and has used this data in conjunction with detailed drawings of ash pit locations to estimate when the current super fill volume will be completed. This area, which runs in a North South orientation on the Eastern side of the site, is projected to be filled to the 22m AAD level by 2011.

Furthermore, Transport and Technical Services staff has assumed that the area identified for super filling around the curve at the Southern tip of the site will also be reserved for the construction of ash pits. It is not clear that this is accepted Transport and Technical Services policy but the extension of time this provides for the deposition of ash in a location already authorised for the receipt of such materials is a distinct advantage and worthy of consideration as policy.

Transport and Technical Services staff has, using detailed drawings, estimated that the construction of ash pits in this location with a total of three distinct layers will provide an additional ash disposal route of approximately 13 years based on the current placement techniques and historic ash production figures.

This would give a location for non-inert ash disposal until 2024 assuming that disposition of this material is still possible long after the site has closed for the receipt of inert waste. However, as noted in Section 16 of this report the new Energy from Waste plant will significantly reduce the amount of ash to be stored in dedicated ash pits. The Energy from Waste plant will not be commissioned until 2011, which is when the Eastern super fill area is due for completion. This would indicate that all the ash from the Energy from Waste plant would be deposited in the southern area of the site. Since this area is anticipated to provide 13 years capacity at existing rates of infill; the life span of this area with significantly reduced ash production could double to approximately 25 years.

The adoption of this location for the long term disposal of ash could enable infill to commence in new landfill facilities using inert waste only until such time as these deposits are above natural water tables enabling non-inert wastes to be received and stored in specially engineered pits, subject to the necessary studies, assessments and approvals.

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As a result of the use of the super fill volumes for the storage of non-inert MSWI fly and bottom ash the remaining volume suitable for the receipt of inert waste is significantly reduced and hence the life of La Collette II is unlikely to be significantly extended.

However, there will be limited opportunities for the deposit of inert waste in these locations as a result of the following activities:

- Construction of bund walls for the containment of ash (ash pits)
- Daily covering of deposited ash to prevent dispersal (capping)
- Restoration layer of inert material to approximately 1 metre depth on completion of final ash pit
- Restoration layer of inert material mixed with possibly composted material to form a manufactured topsoil layer of approximately 1 metre depth.

Had the super fill areas been used solely for the receipt of inert waste it is likely based on historic figures of infill that 4-5 years additional life would have been provided at La Collette II. This would have given an extension of life from the presently predicted 2017 at the 14m AAD level to 2021-2022. With the use of these areas for principally ash deposition it is likely that a limited extension of the sites' life is achievable in the order of 18 months to 2018 as described in Appendix 3.

### **8. The future of inert waste disposal in Jersey.**

It is clear from the Island Plan 2002 Town Proposals map that the RAMSAR zone extends to the rock armour at La Collette II and ends at the point where the phase II rock armour joins the phase I rock armour which is the entrance to the tanker unloading berth.

The proximity of the RAMSAR zone effectively prohibits the extension of La Collette beyond its current boundary described by the rock armour. There is no possibility of extending the site without abandoning the States commitment to RAMSAR, which because of the implications of renegotiating an international agreement is unlikely to occur.

An extract of the Jersey Island Plan 2002 Town Proposals Map is contained in Appendix 5 and shows the RAMSAR zoning.

The Jersey Mineral Strategy 2000 states that the preferred strategy is to extend the life of La Gigoulande quarry by opening up adjacent land for the extraction of various minerals. This expansion would extend the life of the quarry by 13-20 years depending on the rates of extraction of between 100,000 tonnes per annum and 150,000 tonnes per annum. Hence the estimated closure of the quarry would be between 2013 and 2020.

The estimated date that La Collette II will be filled to the 14m AAD level is 2017 and the date when super filling is complete and forces the closure of the site is 2018 dependent on the amount of inert material can be used for site restoration.

If limited super filling proceeds at La Collette II and La Gigoulande only extracts minerals at the lower limit used in the calculations there will be a 1-2 year period where there is likely to be a shortage of capacity for the disposal of inert waste from La Gigoulande closing and landfill operations ceasing at La Collette II. If La Gigoulande operates at the average predicted output or above then there may be an overlap between La Collette II closing and La Gigoulande becoming available. However, as the timing of these events is close it does not leave Transport and Technical Services with sufficient flexibility to ensure the Islands waste disposal routes are not put in jeopardy.

Simon Sands quarry extracts various grades of sands and gravels from the site in St. Ouens bay on the West side of the Island. Simon Sands is the second possible site that has been identified for the disposal of inert waste. This site has planning permission to operate until 2018 when the sites license will expire and current operations must cease. There is a significant void being created that will have capacity to secure disposal of inert waste in Jersey for a considerable amount of time. Simon Sands has estimated that the total void available on expiry of the license in 2018 will be in the order of 4,000,000 tonnes. This is equivalent to 2,285,714 m<sup>3</sup>, which in turn relates to approximately 67% of the original capacity of La Collette II.

It is possible that some areas of the Simon Sands quarry will be exhausted prior to the closure date of 2018 and that permission could be obtained to utilise this site for the receipt of inert waste. Significant planning and engineering would need to be undertaken in advance to ensure full consultation has been achieved and engineering issues addressed to prevent sand and gravel product contamination.

It has become clear that there is capacity for the future disposal of inert and hazardous waste within Jersey at La Collette II until 2018 and beyond this time at La Gigoulande and Simon Sands. It is not clear when La Gigoulande will be exhausted and available for receipt of waste since this date will be determined by the success of the sites' owner in exceeding extraction rates in excess of the stated minimum. Simon Sands will cease quarrying in 2018 irrespective of the extraction rates and will be available for the receipt of inert waste after this date. It

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may be possible subject to the necessary approvals and contracts being in place to commence waste operations in advance of this date.

The timing of these events is very close and leaves Transport and Technical Services with limited flexibility. It is therefore recommended that Transport and Technical Services ensure that it has the necessary approvals in place to undertake additional deposits of inert waste as temporary super filling for an interim period to ensure storage is available until either of the two options is operational. This additional super filling would probably have to be on the condition that this material is removed from La Collette II at some stage in the future to the new land fill site.



### **9. La Collette Tank Farm**

One of the principal drivers behind this report is a need to know how long it will take to create land at the landfill site for the possible relocation of the tank farm.

The proposed redevelopment of the Waterfront and the extraordinary incident at Buncefield has forced a review of the safety measures and location of bulk fuel storage, in particular the proximity of low flash point petroleum products, to other facilities. The potential development of the reclaimed land at La Collette for commercial business and other uses could be hindered by the present location of the tank farm.

The relocation site for the tank farm was proposed in 2002 as a result of submissions by the then Waterfront Board to develop the completed La Collette site for commercial and domestic accommodation. Subsequently, a separate hazard review of this location has been instructed to identify the risks involved following the outcomes of the Buncefield investigations. The outcomes of this review will not be known for some time to come but as a result of that report there may be an impact on the eventual land requirement. It is understood that the review is working on the assumption that the same area of land will be required as is currently allocated under the existing lease.

TTS advised that for monitoring purposes they work on the basis that the existing tank farm including the gas storage facility occupies an area of land of some 33,100 m<sup>2</sup>. This includes an area of land used by Harbours and not occupied by the tank farm operators. It also includes the land around the gas site in which the oil pipelines are laid and the access road that runs between the gas site and tank farm

Land occupation has also been calculated from information obtained from Jersey Gas and from the Tank Farm operators by reference to the recently renewed lease.

Jersey Gas stated that they occupy 100,000 sq feet of land, which equates to 9,290 m<sup>2</sup>. However, this figure is for land within their site boundary and excludes the land around the site used to carry the oil pipelines from the unloading berth to the tank farm and the common access road between the two sites.

The Tank Farm operators lease is for an area of land of 203,500 sq feet, which equates to 18,906 m<sup>2</sup>. However, earlier proposals<sup>6</sup> described the land to be leased to the tank farm operators as 195,195 sq feet (18,103 m<sup>2</sup>) as shown on drawing 648/1 in the Appendix 1. The area of land leased by the tank farm operators also includes an area for future expansion currently used by Harbours.

This gives a total land area occupation of 28,196 m<sup>2</sup> compared with the figure given by TTS of 33,100 m<sup>2</sup>. In discussions with TTS it has been stated that to ensure the stability of the new tank farm on the reclaimed land they would expect a safety margin of land between the edge of the new installation and the edge of the new land. Their current thinking on this margin is between 4m-5m on the exposed edge of the site. It has been assumed that with the other two sides of the land being contained by the rock armour on the one side and the old La Collette I wall on the other further land stabilisation zones are not required.

The TTS figure has been used in the calculation for the time taken to create the land for the new tank farm since this figure allows room for manoeuvre in the unusual shape of land earmarked for the tank farm and an area for land stabilisation.

It should be noted that in discussions with Jersey Gas it was pointed out that they could require some 30%-40% more land to incorporate the recommendations from the Buncefield

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<sup>6</sup> La Collette fuel farm, St. Helier: Lease to Shell UK Ltd and Esso Petroleum Company Ltd. Lodged au Greffe 13/05/03

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investigation. To date this figure has not been used in any calculations nor has this statement been verified against the recommendations from the reports. Should this figure be applied to the whole of the site then the land requirement would increase to approximately 45,000 m<sup>2</sup>. The exact land requirement will not be known until the results of the current investigation are complete.

In addition, a recent report<sup>7</sup> identified that Jersey did not operate with the same Strategic Fuel Reserves that are in force in the United Kingdom. The implementation of this recommendation would see the reserves in Jersey increasing substantially from the present levels to an average 67.5 days. Should this recommendation be implemented there would be a significant impact on the land requirement. At the time of writing this report no decision has been made regarding this recommendation.

As requested, no contact has been made with the oil companies in connection with these proposals.

The land on which the existing fuel farm is located is under the control of the States of Jersey. The Minister for Treasury and Resources has negotiated a new ten-year lease<sup>8</sup> with the operators of the fuel farm that commenced in 2006 and will expire on 31<sup>st</sup> January 2016.

The projects identified in the Hopkins Master Plan will enable the creation of the land for the relocation of the tank farm in approximately 16 months as described earlier. The land will be available well before the expiry of the lease to the occupiers of the tank farm, which will allow sufficient time for a new facility to be constructed and commissioned.

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<sup>7</sup> Review of the Current Arrangements for the Importation, Storage and Supply of Petroleum Products to the Distribution and Retail System in Jersey – Consultancy Services to the Oil Industry.

<sup>8</sup> LC3 Fuel Storage Site. Decision Ref MD-PH-2006-0021

### **10. Modelling**

A model to predict the time taken to create the area of land required for the relocation of the tank farm and the Jersey Gas vapourisation plant has been developed to enable its use and further development as required. An electronic copy of the model is available.

Using this model it is possible to estimate the impact of numerous variables on;

- The date when the new tank farm land would be available
- The date when La Collette II will be filled to the 14m AAD level

The model includes the following variables that can be altered to assess potential outcomes;

Input of waste and the timescales for general waste receipts, specific projects and Utility companies

- Effective recycling rates
- Estimated depth of landfill
- Land area required for the new tank farm
- Available land area remaining at La Collette II
- Potential for possible increases/decreases of landfill deposits

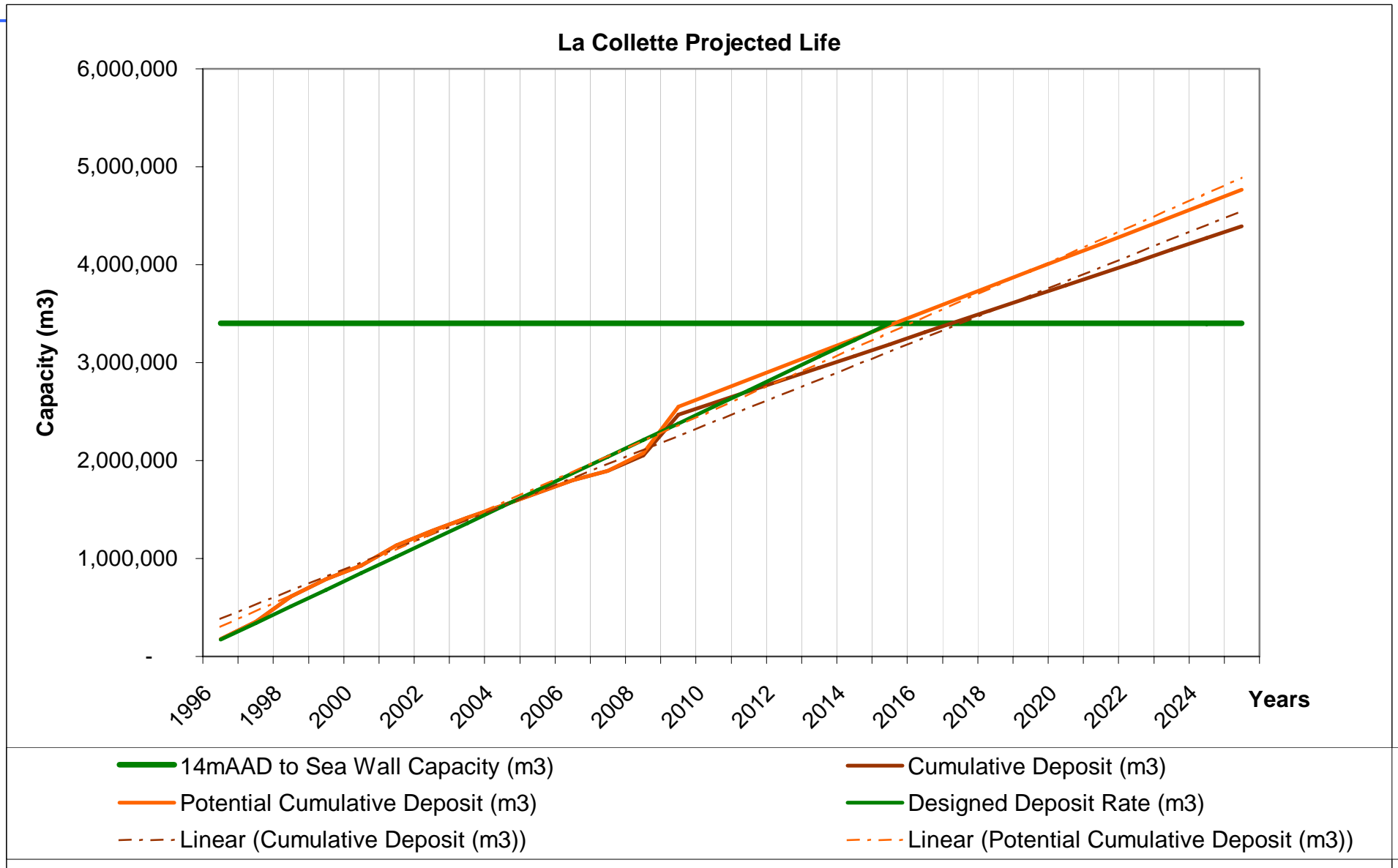
Based on the information obtained during the preparation of this report the following estimates have been derived from the model.

1. The time taken to complete the creation of 33,100 m<sup>2</sup> of land for the new tank farm location is approximately 16 months. The major assumptions are that the Esplanade Quarter excavations are completed in 12 months with an effective recycling rate of 30%.
2. The remaining life of La Collette II to the 14mAAD level is 8.9 years based on the assumption in 1 above and that the average depth of the remaining void is 12.36m and the effective recovery rate on TTS general receipts is 25% with no increase or decrease in tonnages.

The following graph shows the Projected Life of La Collette II based on the various inputs from the tables included in Appendix 9.

Due to the complex and detailed nature of the work undertaken in construction and filling of the ash pits it has not been possible to develop a model to predict when this void would be exhausted. Instead data has been collected from Transport and Technical Services including empirical estimates of the operating life span extension provided by super filling in the Eastern and Southern super fill areas.

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**11. Access to the proposed tank farm site**

The proposed location of the new tank farm is to the southwestern edge of the reclamation site opposite the present fuel un-loading terminal. This is an odd shaped area of land and the ultimate land required may increase above the existing land usage due to the potential difficulty of the integration of a new facility in an inefficient area.

The Jersey Mineral Strategy<sup>9</sup> identified two potential access points at La Collette where inert waste could be taken onto site. Consideration needs to be given to these locations for the ease of access to the reclamation centre for those loads of material that can be reprocessed in this facility. A reworking of some of the internal site routes within the site may be necessary.

It is understood that there is an enabling works budget of some £200,000 established for these works.



Figure 1.

Appendix 4 contains photographs of the general area of La Collette II where it is proposed to locate the new tank farm.

Photo 1 shows the old La Collette I sea wall boundary although the cobs have since been removed for recycling. It is through this wall that the access would be created to the area for the creation of the new land for the tank farm.

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<sup>9</sup> Jersey Mineral Strategy 2000-2020

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Photo 2 views the La Collette I sea wall and shows the extent of the landfill to the east to the 14m AAD level.

Photo 3 is taken from the landfill area of La Collette II looking west and shows the sea wall with a section of the cobs removed for recycling.

Photo 4 shows the construction of the temporary access road to enable the removal of the cobs.

Construction of the land for the new tank farm could continue from this access road working west and south to create the land required.

Access from the north would be possible by breaking through the old sea wall boundary of La Collette I.

The drawing of the Gas Vapourisation Plant in Appendix 7 also shows the more easterly pipe crossing where again the pipes are lowered to pass under the access road.

**12. Commercial Issues.**

The waste material to be excavated and placed in La Collette requires transport to move it from the point of extraction to the point of deposit. The total amount of material to be recycled from the two major schemes that have been identified is

Esplanade Quarter 717,500 tonnes

Castle Quays 107,000 tonnes

This gives a total figure of 824,500 tonnes. Not all of this material will be moved to La Collette since it is anticipated that a percentage will be recycled on site and therefore will be either used on site or sold from the site to other contractors. It is unlikely that the contractor developing these schemes will be prepared to pay the gate fee charged by TTS at La Collette since the cost of doing so will be hugely restrictive and not make commercial sense.

For example, TTS decide at the weighbridge if a lorry load of material should be classed as recycled content (defined by TTS as 80% recycled content and 20% landfill content). To achieve an average 30% recycling of the excavated waste, which is the mid point of the figures quoted in the Hopkins Master Plan, would require 40% of the excavated material to be assessed as having an 80% recycled content at the weighbridge. This would result in approximately 329,800 tonnes of excavated material taken to La Collette which would be charged at £3.60 per tonne with a contract on-cost to the sites developers of £1,187,280.

It would seem that from a purely commercial basis that off site recycling is unlikely to occur unless TTS reconsider the issue of gate fee charging or the introduction of a landfill tax applicable to anyone disposing of waste in landfill whether in the public or private domain.

If we now assume that all recycling takes place at the point of extraction then considering the portion of waste not suitable for recycling the net figure will be in the order of 494,700 tonnes (removal of 40% recycled content) to 659,600 tonnes (removal of 20% recycled content). The cost to the projects developers for placing the waste in the landfill site at £11.50 per tonne will be between £5,689,050 and £7,585,400. This potential charge may also see the developers attempt to reduce this amount by looking to place the non-recyclable waste with the thriving private waste contractors.

The point to be made here is that if the developer cannot recover or avoid these costs the amount of material delivered to La Collette II may be less than predicted in the model and the time taken to create the land for the new tank farm will be extended.

### **13. Transport Issues**

The largest vehicles currently approved for use on the roads in Jersey are 16 tonne vehicles. AAL Recycling gained approval for using 35 tonne trailers for a specific project but they believe this is unlikely to be granted again. It is understood that the developer of the two sites is seeking to obtain permission for 20-23 tonne vehicles. Until the authorities have decided which is the maximum size of vehicle that can be used on the roads there will continue to be uncertainty regarding the number of vehicle journeys that will be needed to move the waste from the old West of Albert site to La Collette II.

If we assume that the Driver and Vehicle Standards authorities give approval to the vehicles that the developer is seeking to use then 20-23 tonne vehicles would be the vehicle of choice.

In assessing the movement of waste from the developers sites to La Collette the normal working hours operated by TTS have been used. That is to say Monday to Thursday full days and Friday operating to 2pm only with no operations at weekends. Of course specific projects such as this may require alterations to these times and these calculations should reflect this if these change.

Moving the waste over a 12-18 month period (including both projects) would require the transport of between 1,409 tonnes per day and 2,819 tonnes per day. With a working day of 7.25 hours per day this gives an hourly rate of 194 tonnes per hour to 389 tonnes per hour. Utilising say 20 tonne capacity lorries this gives the number of lorry journeys of between 10 and 20 journeys per hour.

Assuming average journey times and conditions apply then the time taken to load a lorry, travel to La Collette, which is a distance of approximately 2,000 metres, off load excavated waste and return to the developers' site takes on average 45 minutes then the number of lorries required to complete the required journeys is between 8 and 15 vehicles depending on the throughput.



#### **14. AAL Recycling**

AAL Recycling advised that if the waste is delivered to the reclamation centre at La Collette for recycling they have the capacity to process between 1,500 tonnes per day and 2,000 tonnes per day. This would indicate that if the timescales for the excavation of the material were 18 months they would be able to process the material on arrival, if all machinery is working. If the timescales were shorter than this (at say 12 months) then some material would need to be stockpiled prior to processing.

What is less certain is the market demand for this recycled material and there is no way of assessing this until the excavated material has been inspected and recycled product is available. It is also uncertain if the excavated material will be suitable for the production of the material that is demanded by market forces.

AAL Recycling also advised that if they were to recycle the excavated material from the West of Albert site they would expect to be able to recover approximately 30% of the content for recycling, which ties in with the general statement in the Hopkins Master Plan of achieving between 20% and 40% recycling.

Looking at the infrastructure available to AAL Recycling it is clear that they have made a substantial investment in plant and equipment for the production of quality recycled aggregates and other materials. The five-year contract was awarded in 2006 and the site opened for the sale of materials in January 2007. The total investment is believed to be in the order of £1m and the company has purchased some of the most modern processing plant available on the market. The facility they have established is capable of processing some 350,000 tonnes of waste per year and with an average recycling rate of 25% would produce approximately 85,000 tonnes of recycled aggregates per year. This figure compares favourably with the contract target of producing 70,000 tonnes per year in the fifth year of the contract.

### **15. Jersey Airport**

Jersey Airport identified approximately 20,000 tonnes of material that could be produced as a result of planned works but they stressed they are looking to achieve a nil earth works balance.

### **16. Energy from Waste plant**

The new Energy from Waste Plant has two impacts on the remaining life of La Collette II. Firstly the waste material arising from the construction of the plant needs to be ultimately disposed of in the landfill site and secondly the land earmarked for the location of the site was previously identified as suitable for super filling.

The new Energy from Waste plant is expected to be commissioned and placed into service in 2011. This new plant will produce segregated fly and bottom ash streams enabling better recovery and recycling of the bottom ash.

The fly ash will be treated as a hazardous waste and will be disposed of in lined pits in La Collette II as is presently undertaken with the existing MSWI ash streams.

The amount of fly that will be produced by the plant has been stated as rising from 4,272 tonnes per annum in 2011 to 7,849 tonnes per annum in 2035.

Bottom ash produced by the plant will be recycled dependent on its constituents. Transport and Technical Services anticipate that ultimately 90% of the ash will be recycled with 10% being land filled at La Collette II in lined pits with fly ash.

Based on the above it is anticipated that the amount of waste to be disposed of at La Collette II from the new plant will rise from 5,531 tonnes per annum in 2011 to 8,098 tonnes per annum in 2017 when La Collette II is expected to close to inert waste deposits. The figure continues to rise to 10,161 tonnes per annum in 2035.

However, the amount of recycling of bottom ash that can be achieved is dependent on the successful removal of certain materials prior to incineration. For example, electronic items and batteries etc. If these items are not successfully removed then it may not be possible to recycle 90% of the bottom ash as proposed due to the presence of heavy metals.

### **17. Jersey Electricity**

Despite the fact that Jersey Electricity plans to build two primary substations and extend the 11kv network and probably install a 4<sup>th</sup> interconnect with France there is no significant CD+EW expected that would merit being recorded separately from the normal receipts at the weighbridge. Wherever possible Jersey Electricity aim to have neutral waste arisings except on trench works where graded backfill is required to replace excavated spoil.

### **18. Jersey Water**

Despite numerous telephone calls and email correspondence no response has been received from Jersey Water regarding likely production levels of CD+EW from its ongoing activities.

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<sup>10</sup> Jersey Waste Strategy – Final version issue 5.

<sup>11</sup> Appendix 2 – TTS recorded figures for material received at La Collette weighbridge

**19. Jersey Telecomm**

Initial conversations with Jersey Telecomm did not identify any major construction projects that would impact on the infill rates at La Collette.

**20. Transport and Technical Services**

There are no new major capital projects identified from the capital programme that would likely impact on the waste arisings over and above La Collette II normal weighbridge receipts.

