D5 Justifiable Demand for a Class 2 Landfill

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Dellara Pty Ltd

Orchard Hills waste and resource management facility

Justifiable demand for a Class 2 landfill in Sydney

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INTRODUCTION

The former Erskine Park Quarry (Lot 40, DP 738126 in Patons Lane, Orchard Hills, Sydney see Map 1) is proposed by Dellara Pty Ltd ("the Proponent") as a suitable site to establish and operate a waste and resource management facility. The proposed Orchard Hills waste and resource management facility would be accepting general (non-putrescible) waste predominantly comprised of construction and demolition (C&D) and commercial and industrial (C&I) waste. Restricted, liquid or dangerous waste would not be accepted in the facility. The facility would primarily focus on maximising resource recovery. Any no recoverable residual waste would be emplaced in the site's proposed Class 2 solid waste landfill.

Recycling and reprocessing, clay/shale extraction and residual waste emplacement would be the main activities on the site, rendering the facility financially viable and providing a holistic waste management solution. Upon project completion, the land would be returned to rural grazing fully rehabilitated.

Mike Ritchie and Associates were engaged by the Proponent to investigate the landfill space requirements of the greater Sydney area and assess the potential contribution of the proposed Orchard Hills waste and resource management facility to the demand for Class 2 landfill space in the future.

THE JUSTIFIABLE DEMAND POLICY

The Justifiable Demand Policy forms a provision of the 2007 State Environmental Planning Policy[i]. On 7th July 2010 the Government amended the Infrastructure State Environmental Planning Policy (SEPP) for Landfill Applications (2007) relating to mandatory considerations for determining applications for landfill facilities under Part 3A and Part 4 of the Environmental Planning and Assessment Act 1979. In particular, clause 123 was amended to reflect changes in market conditions for landfill disposal[ii]. The new criteria shift the emphasis from "justifiable demand" towards increased waste recovery and other improved environmental outcomes.

Therefore, when determining a development application for any landfill facility the consent authority must consider:

1. Whether there is a suitable level of recovery of waste, such as by using AWT or the composting of food and garden waste, so that the amount of that waste is minimised before it is placed in the landfill; and

2. Whether the development:
    a. Adopts best practice landfill design and operation; and
    b. Reduces the long term impacts of the disposal of waste, such as greenhouse gas emissions or the offsite impact of odours, by maximising landfill gas capture and energy recovery; and
3. If the proposal relates to a new or expanded landfill;
    a. Wether the land on which the development is located in degraded land such as a disuses mine site, and
    b. Whether the development is located so as to avoids land use conflicts, including whether it is consistent with any regional planning strategies or locational principles included in the publication EIS Guideline: Landfilling (DOP 1996) as in force from time to time, and
4. Whether transport links to the landfill are optimised to reduce the environmental and social impacts associated with transporting waste to the landfill.

In addition the following definition has been added:

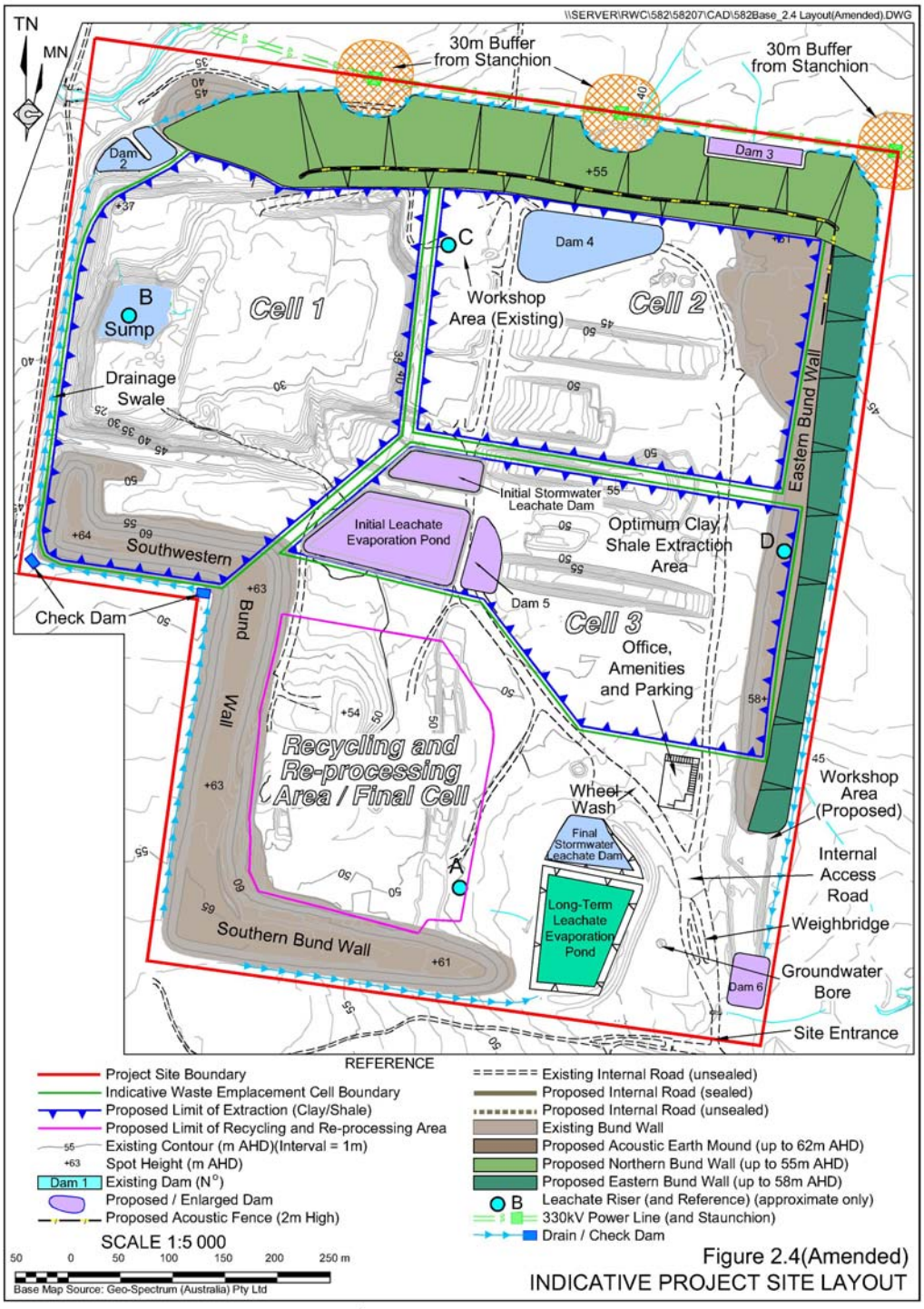
Putrescible waste means general solid waste (putrescible) within the meaning of clause 49 of Schedule 1 to the Protection of the Environment Operations Act 1997.

Prior to the amendment of clause 123, Wright Corporate Strategy Pty Ltd prepared a Strategic Review on the *Putrescible Landfill Demand and Capacity for the Sydney Region*[iii]. The review, considered that the Justifiable Demand Policy as it stood at the time provided an "objective basis on which to judge project need and a basis for considering the implications of future resource recovery targets, technologies and practices". According to the review, both WSN Environmental Solutions and the Total Environment Centre NGO viewed the policy as a useful tool for constraining unnecessary landfill growth in the Sydney region.

Similarly, the recent Director-General's assessment on the Eastern Creek Waste Project (Light Horse) stipulated that the Justifiable Demand Policy aims at keeping "landfill capacity scarce to encourage people to divert all waste streams away from landfills". Nevertheless, as demonstrated by the granted project approval, the aim at this stage is not to eliminate landfill altogether. Independent advice to the NSW Department of Planning by Tony Wright (author of the Putrescible landfill demand report) stipulates that contingency landfill capacity is required and should be allowed for 10 years. In order to avoid excess capacity, a maximum of 20 to 30 years of demand should be applied. This was calculated at current disposal rates and therefore should be considered a conservative estimate as waste generation in the Sydney region is increasing both per capita and as total waste due to increasing population.

According to the Minister for Planning, Hon Tony Kelly MLC, despite the recent amendments to Clause 123 the overall principle of justifying demand for new landfill space is retained[iv]. Therefore this report endeavours to assess current and future demand for, and availability of, landfill space in the Sydney region.

Map 1: Indicative Orchard Hills project layout.



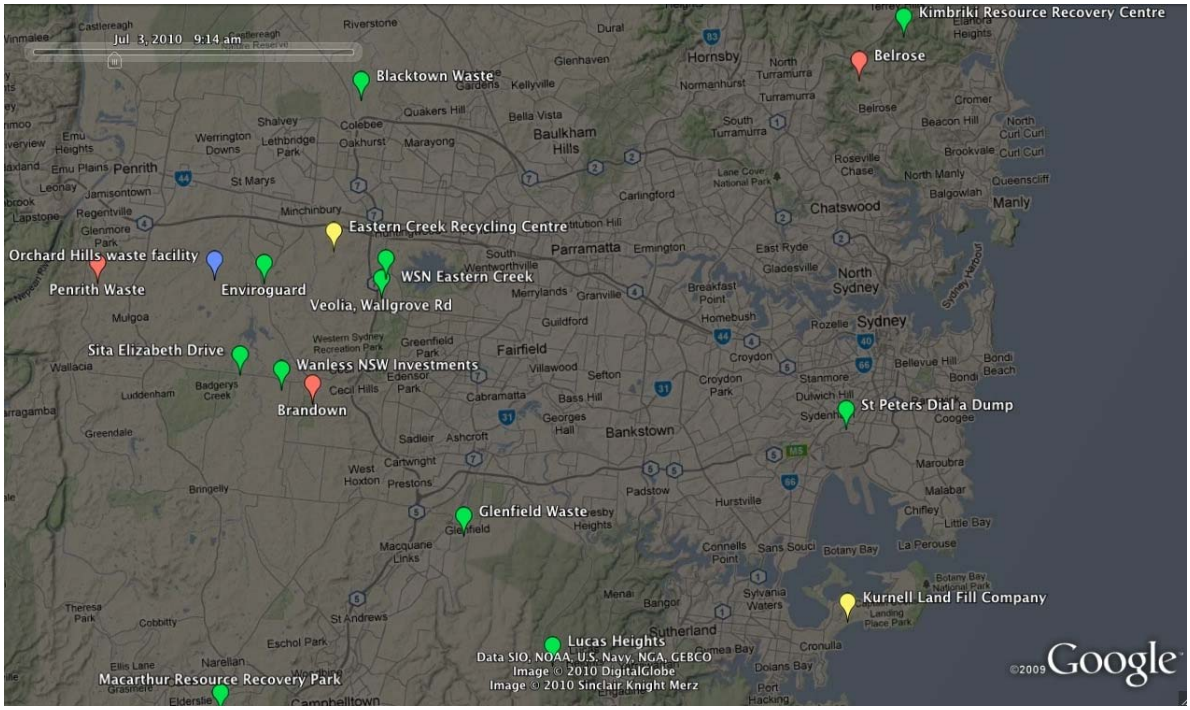
Capacity

At the moment there are 11 DECCW approved facilities in the Western Sydney region that can accept Class 2 General Solid Waste. However, landfill capacity should be assessed Sydney wide as landfill closures in other regions are likely to impact the whole of Sydney's Metropolitan Area (SMA) due to the fact that waste is likely to move within regions due to the limited landfill space available. As an example, the TPI Enviroguard facility is expected to cease operations within 3 years. Moreover, the Macarthur Resource Recovery Park (formerly Jacks Gully landfill) that is not allowed to accept putrescible waste anymore could also face a cap on dry waste in the near future as houses move closer to the facility.

This reduction in Class 2 disposal sites could be partially balanced by the recently approved Light Horse facility that was recently (22 November 2009) granted project approval by the NSW Planning Assessment Commission. The locality of a number of key facilities in Sydney Metropolitan Area, including Light Horse and all those located in the vicinity of Western Sydney is illustrated in Map 2. The proposed Orchard Hills Waste and resource management facility is marked as a blue bubble.

Overall, there is uncertainty with regards to remaining total capacity of existing Class 2 landfills. Access to individual facility tonnage data is extremely limited while disclosure of data that might be held by government agencies is forbidden under the Protection of the Environment Operations Act, 1997 S.319(1)(a) and requires consent.

Map 2: Key Class 2 solid waste facilities.



Hyder report

At the lower end, Hyder reported an estimated 4.7 million tonnes of remaining solid waste capacity projected to be depleted by 2012[v]. The *Australian landfill capacities into the future* report was commissioned by the Federal Department of the Environment, Water, Heritage and the Arts commissioned part of a suite of research reports used to inform the *National Waste Policy - Less waste, more resources*. Estimates on landfill airspace were based on a WMAA survey. WMAA provided Hyder with aggregated data in order to maintain commercial confidentiality of landfill operators. However, 21% of the known facilities contacted by WMAA did not respond to the questionnaire and therefore the data gaps were significant, especially since there was no information on the relative size of the non-responders. Hyder summarised the issue of data availability as follows: *"None of the jurisdictional regulators appear to routinely collect and collate landfill capacity data. In general, landfill data was more difficult to obtain for private landfills and particularly private inert landfills."*

Wright Corporate Strategy report

A report prepared by Wright Corporate Strategy Pty Ltd for the State Government of New South Wales reached a significantly different estimate [vi]. As evident from the title, The *Strategic Review- Putrescible Landfill Demand and Capacity for the Sydney Region* did not focus on Class 2 landfills. However, it made reference to Sydney's Metropolitan Area Class 2 landfill capacity, which was estimated at 35 million tonnes. The report is dated March 2009 but was only released a year later therefore neither Hyder nor WMAA would have had access to it. In any case, this report does not include a break down of landfill capacity per facility or a methodology as to how the 35 million tonnes figure was derived. A likely reason could be the issue of confidentiality as explained above. As a result, the accuracy of this estimate cannot be assessed. However, since the NSW government endorsed this report, it could be regarded as an "official" estimate. Wright Corporate Strategy assumed that annual disposal of Class 2 waste is 2.5 million tonnes, equating to 14 years of available Class 2 landfill space (taking into account expected future disposal trends). Now, over a year later, remaining capacity would be 32.5 million tonnes or 13 years.

In assessing Justifiable Demand for the Light Horse facility Tony Wright estimated that the site's 14 million tonnes of Class 2 capacity would raise Sydney's contingency landfill space by 6 years to a total of 20 years[vi]. The assessment does not appear to account for the fact that the 14 years capacity was calculated a year earlier. If this is taken into account total capacity would now be 46.5 million tonnes or 18.6 years. It should be noted that at the time of writing of the Hyder report the Light Horse project had not been granted approval, therefore the 4.7 million tonnes estimate does not include that site's capacity.

Current assessment

In order to independently assess Sydney's remaining Class 2 landfill capacity, Table 2 was compiled based on estimates provided by industry sources and publicly available information.

This research confirmed that the publicly available data on Sydney's landfill capacity is very limited, not consolidated and in general sources are not referenced. The data collected is not sufficiently accurate to provide an undisputable estimate of total remaining capacity. However a range and best estimate can be deducted. The three landfills for which we could not obtain reliable estimates on remaining capacity are quite small and believed to be nearing their capacity. Nevertheless a generous 1 to 2 million tones capacity was allowed in order to model a best-case scenario. Total current Class 2 landfill capacity for Sydney was estimated at 34.3 to 36.3 million tonnes. That figure includes the Light Horse facility and is considerably lower than Wright's 46.5 million tonnes. When including Orchard Hills, expected capacity is between 40.6 and 42.6 million tonnes (Table 2).

Summarising the three data sources, Table 1 presents landfill capacity as estimated by each researcher. The Wright Report estimates have been corrected to account for the year elapsed and the 6.3 million tonnes of capacity added by Orchard Hills. In order to update the Hyder estimate, the capacities of Light Horse and Orchard Hills were added. The estimate was not corrected for the elapse of a year to crudely account for the exclusion of 21% of the known landfills that did not return the questionnaire.

Table 1: Projected capacity of Class 2 landfills in Sydney including Orchard Hills.

Source	Remaining Capacity (million t)
Hyder 2009	25
Wright Corporate Strategy	52.8
Current research	40.6-42.6

Capacity in terms of tonnes is a different matter to capacity in terms of years. The former is absolute while the later is inextricably linked to the demand side of the equation. Moreover, the Justifiable Demand Policy requires contingency landfill capacity of 20-30 **years**. To find out whether there is Justifiable Demand for more Class 2 landfills volumetric capacity needs to be expressed in years. For this it is important to examine the quantities of C&I and C&D waste landfilled annually.

Table 2: Indicative annual waste intake and remaining capacity for key SMA landfills accepting Class 2 solid waste based on estimates provided by industry sources

Site	Status	Resource recovery	Remaining Capacity (t)	License approved/ actual tonnage to landfill (t per year)	Comments
Orchard Hills waste and resource management facility	Seeking approval	Yes	6.3 million subject to excavation	n/a	Will only accept Class 2 solid waste. Will offer clay/shale extraction.
Sita Elizabeth Drive	Active	No	3 million	120,000	Annual input depending on market conditions
Brandown	Active	Yes	3.2 million	100,000	More emphasis on recycling than landfilling
Enviroguard	Active		800,000	1 million	Expected to close in 3 years
Veolia, Wallgrove Rd	Active	No	3 million	430,000	
Wanless NSW Investments	Active		2 million	100,000	Predominately own use
Penrith Waste	Inactive	No	Site is full		
Blacktown Waste	Active		4-5 million subject to excavation	360,000	Due to start site works for new cell
Kurnell Land Fill company	In transition	Yes	Unknown*	-	Site to be redeveloped with Australand/Breen Holdings
St Peters Dial a Dump	Active	Yes	1 million	240,000	Full in 5 years
Kimbriki Resource Recovery Centre	Active	Yes	3.3million	55,550	Major resource recovery push. Owned by 4 North Shore Councils
Glenfield Waste	Active	Yes	Unknown*	200,000	
Eastern Creek Recycling Centre	Granted approval	Yes	14 million	700,000	Also known as Light Horse
WSN Eastern Creek	Active	Yes	Unknown*	100,000	
Belrose	Inactive	minor	No longer accepts Class 2 Solid		

Subtotals		
Landfills with unknown remaining capacity	1-2 million	*Marked TBC These are relatively small landfills
Landfills with known remaining capacity	39.6-40.6 million	Incorporating minimum and maximum estimates
Total capacity	**40.6-42.6 million**	***Including Orchard Hills***

Demand

Hyder report

The Hyder report assumed 3.38 million tonnes of C&I and C&D waste deposited in Class 2 landfills for 2006-07. At 25 million tonnes capacity (including Orchard Hills), Sydney's contingency landfill space would suffice for just over 7 years.

Wright Corporate Strategy report

Although it has been stated that throughout their analysis the authors assumed landfilling of 2.5 million tonnes annually, the source of this estimate was not mentioned. At 52.8 million tones of landfill space (including Orchard Hills), Sydney is calculated to have a little over 21 years of contingency landfill space remaining.

Current assessment

In order to evaluate whether a capacity of 40.6-42.6 million tonnes of landfill space for Sydney Metropolitan Area is justified the following information on Sydney C&I and C&D waste (Table 3) was extracted from the NSW DECCW Waste Avoidance and Resource Recovery Progress Report 2008.

Table 3: C&I and C&D waste management in Sydney.

	Disposed (t)	Recycled (t)	Generated (t)	% Recycled
C&I				
2002-2003	*2,029,500*	*1,022,000*	*3,051,500*	*33%*
2004-2005	*2,246,500*	*1,214,500*	*3,461,000*	*35%*
2006-2007	2,086,876	1,527,958	3,614,834	42%
2007-2008	2,223,856*	n/a	n/a	n/a
C&D				
2002-2003	*1,177,000*	*2,505,000*	*3,682,000*	*68%*
2004-2005	*1,306,500*	*2,508,000*	*3,814,500*	*66%*
2006-2007	*1,286,000*	*2,978,500*	*4,264,500*	*70%*
Total				
2002-2003	*3,206,500*	*3,527,000*	*6,733,500*	*52%*
2004-2005	*3,553,000*	*3,722,500*	*7,275,500*	*51%*
2006-2007	*3,372,876*	*4,506,458*	*7,879,334*	*57%*

Source: NSW DECCW, 2009[vii]
*NSW DECCW,2010[viii]

The table reveals a pattern of annual increases in C&I and C&D waste generation in Sydney. However, the increase in recycling efficiency results to annual landfill disposal increasing at a relatively steady rate in absolute tonnages. Nevertheless, the dry fraction of waste disposed of in landfills is growing. The nationwide rate of increase is believed to be twice that of CPI and is projected in the National Waste Report (2010) to be growing at between 4.5 and 7% per

year. Assuming that waste disposal stabilises at 3.37 million tonnes per year and remaining capacity is 40.6 to 42.6 million tonnes (Table 1), Sydney's remaining capacity is calculated to be 12 and ½ years or less.

To verify this estimate, additional data sources were researched. The 2009 Hyder report on *Waste and Recycling in Australia*[ix], and the *National Waste Report 2010*[x] based on Hyder data, agree on 4.98 million tonnes of waste being landfilled annually in NSW. Sydney's population is 65% of the state's total therefore it was assumed that it landfills 65% of all landfilled waste (3.23 million tonnes annually, see Table 4). At this rate of disposal the 40.6 to 42.6 million tonnes of remaining capacity would last for 12 and ½ to 13 years.

Table 4: C&I and C&D waste disposal in NSW and Sydney.

2006-2007	C&I (million tonnes)	C&D (million tonnes)	Source
NSW	2.92	2.04	Waste & Recycling in Australia[ix]
Sydney	1.9	1.33	National Waste Report 2010[x]

Capacity and demand analysis

On the basis of three research projects, remaining landfill capacity in the Sydney region has been estimated at between 25 and 52.8 million tonnes, which translates to 7-21 years of available landfill. This equation is heavily dependent on the amount of waste landfilled annually. Table 5 summarises the different estimates produced on the basis of these reports.

Table 5: Estimates of remaining and projected capacity of Class 2 solid waste landfill space in Sydney.

Source	Remaining Capacity (million t)	Annual waste to landfill (million t)	Remaining Capacity (years)		Justifiable demand
			With Orchard Hills	Without Orchard Hills	
Hyder 2009	25	3.38	7.4	5.5	Yes
Wright Corporate Strategy	52.8	2.5	21.1	18.6	Yes
Current research	40.6-42.6	3.37[vii]	12-12.6	10.2-10.8	Yes
		3.23[x]	12.6-13.2	10.6-11.2	Yes
Combination	***52.8***	***3.37***	***15.7***	***13.8***	***Yes***

The Wright report provides the most optimistic scenario in terms of remaining volumetric capacity. However the annual waste to landfill quantities assumed are considerably lower than the latest NSW DECCW figures that were also backed up

by a recent C&I audit[viii]. The waste data presented in Table 3 is considered the most reliable set as:

- it is the most recent one,
- is compiled and published by the NSW DECCW,
- is used in guiding NSW waste policy and
- although there is a percentage of C&I and C&D waste that is disposed of in putrescible landfills, it is expected to be in the range of a couple of thousand tonnes rather than a million tonnes. Besides the regulatory constrains, this is also enforced by landfill operators that strive to preserve valuable MSW landfill capacity.

The combination of the most optimistic remaining capacity (54.3 million tonnes) data with the most realistic waste disposal data (3.37 million tonnes per year) yields a remaining Class 2 landfill capacity for Sydney of under 16 years. This is considered as the most accurate estimate that can be obtained with the available literature.

Tony Wright and the Department of Planning have stipulated that the maximum capacity limit for Class 2 landfill space should be between 20 and 30 years[vi]. This would indicate that the additional reserve capacity offered by Orchard Hills could be considered since the currently approved capacity, as estimated by Tony Wright, at 18.6 years does not even cover the lower end of this period (Table 5). Given the fact that Light Horse landfill is not yet operational and the difficult (from an engineering perspective) task ahead for bringing that facility online, the proposed Orchard Hills waste and resource management facility is well placed to provide the required Class 2 landfill capacity.

Assuming that both the Orchard Hill and the Light Horse facilities become operational, Sydney's Metropolitan Area landfill capacity for Class 2 waste would amount to 21.1 years at the most, well within the specified upper limits. Based on more realistic scenarios, the operation of these facilities will not suffice to secure a minimum of 20 years contingency in which case planning for the siting of new Class 2 landfills needs to begin immediately.

This report uncovered data suggesting that Class 2 landfill space in Sydney could run out in as few as 5 years from now. Moreover, all calculations assume a best-case scenario where the quantity of waste to landfill per year stabilises at a given rate. This is very unlikely and not supported by officially reported waste trends (Table 1, Figure 1 and Figure 2). Should landfilling rates increase, landfill capacity will be depleted even sooner.

Demand for recycling

The NSW government has set ambitious recycling goals of 63% for C&I waste and 76% for C&D waste by 2014. As shown in Figures 1 and 2, if the current trends persist, the targets for C&I and C&D will not be met. For C&I waste, recycling needs to increase by 2 million tonnes on today's figures while C&D recycling also needs to grow to 4.3 million tonnes from today's 3 million. The recycling of such huge quantities of waste cannot be achieved by the existing recycling facilities that largely operate on their capacity limits.

The addition of recycling facilities such as Orchard Hills waste and resource management is a necessity that will assist in achieving the 2014 diversion targets. The Orchard Hills facility is designed for a maximum annual capacity of 450,000 tonnes. However, at full operation, the annual average quantity of waste input is expected to be 300,000 tonnes. Of this amount it is projected that at least 200,000 tonnes or 67% of all waste will be recycled. When taking into account that a significant proportion of the incoming waste would be unrecoverable contaminated soil, the actual rate of resource recovery would be even higher. However, even the minimum expected recovery rate of 67% would be an improvement of 10% on the 2007/2008 average recycling rate of C&I and C&D in Sydney (Table 3).

Figure 1: C&I landfill trend in Sydney Metropolitan Area (utilizing data presented in Table 3).

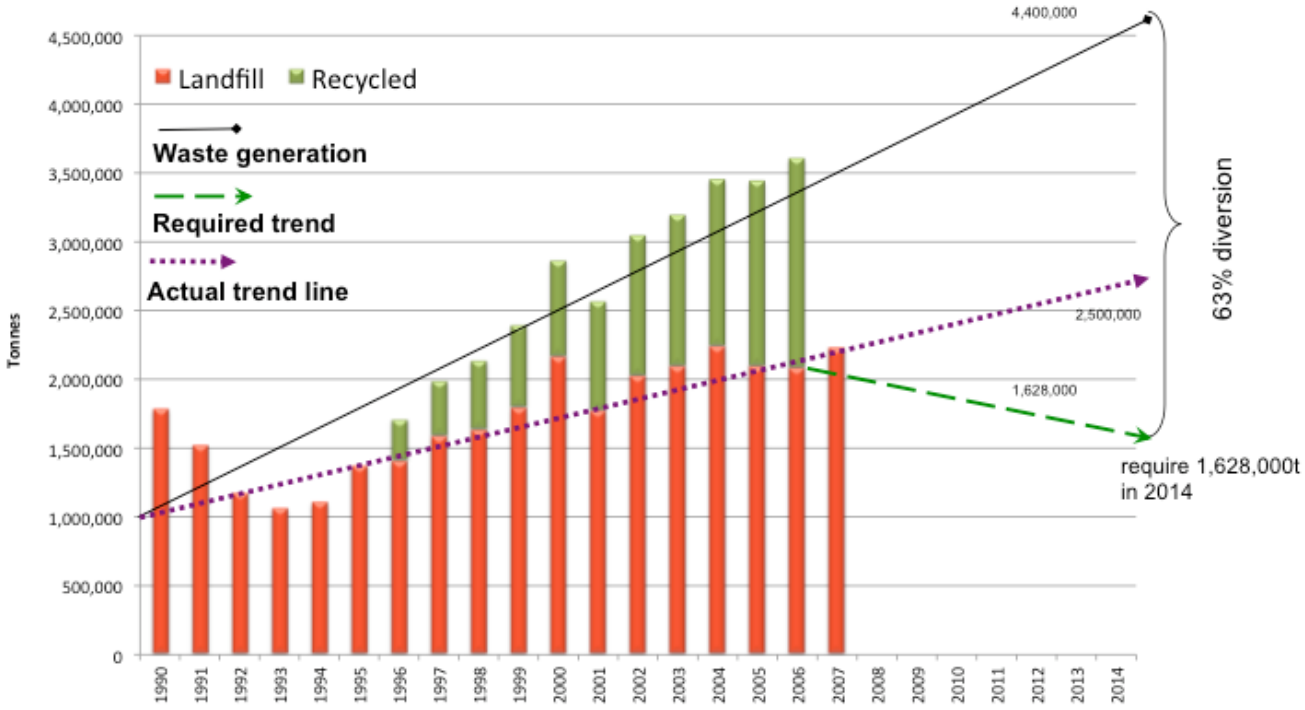
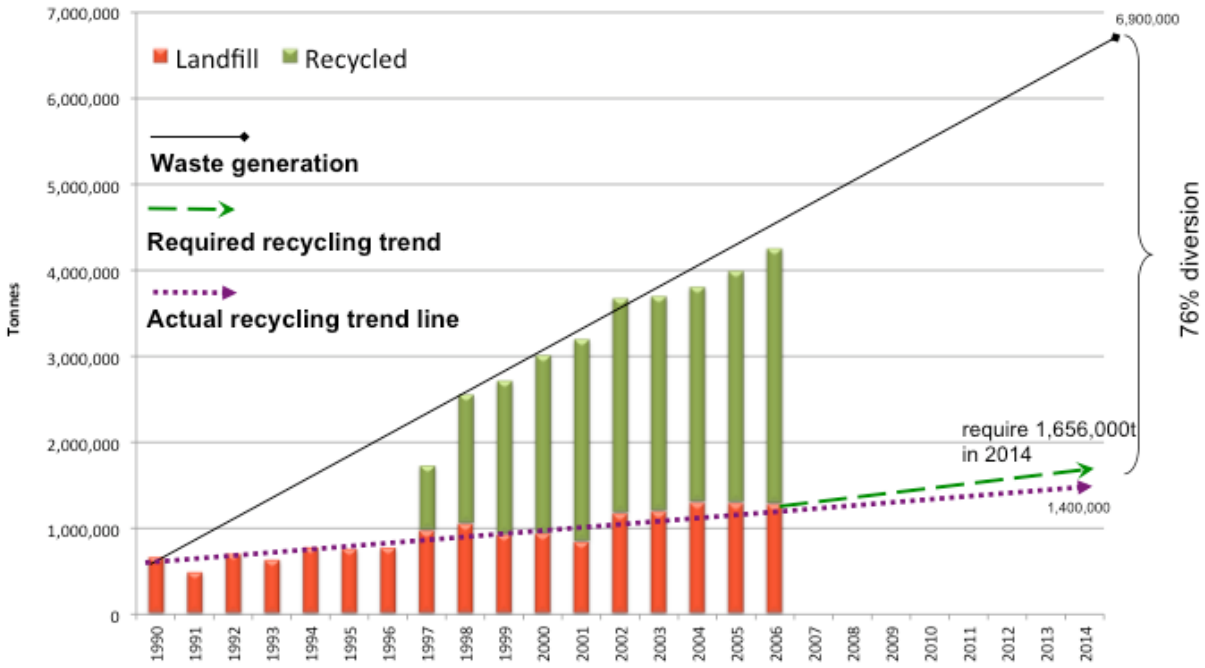
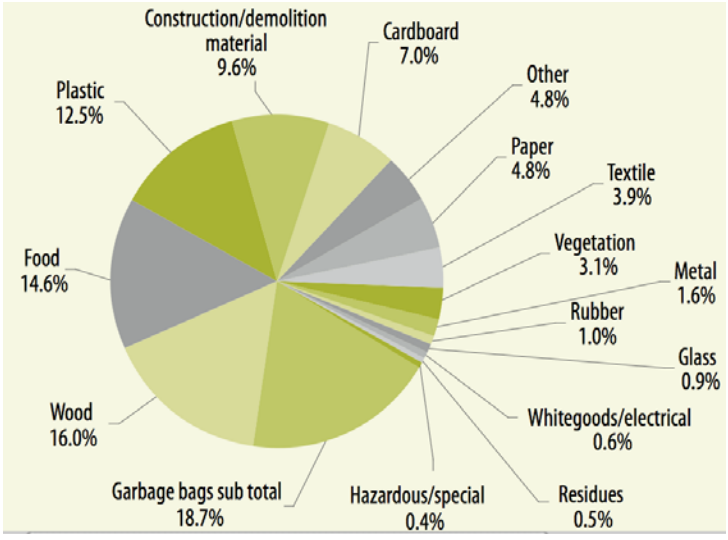


Figure 2: C&D landfill trend in Sydney Metropolitan Area (utilizing data presented in Table 3).



Furthermore, the results of the C&I survey performed by DECCW in 2008 suggest that there is scope for significant resource recovery from mixed C&I loads (amounting to 1,737,594 tonnes in 2007-2008)[viii]. As a non hazardous waste landfill, Orchard Hills would predominantly receive mixed loads of waste containing amongst others, recyclable quantities of wood, plastic, paper and cardboard as well as C&D material. Figure 3 presents the findings of the 2008 C&I survey.

Figure 3: Composition of mixed C&I loads as identified in the DECCW 2008 survey.



The composition of C&I waste received in Orchard Hills would be similar to that presented in the figure. By recycling a significant proportion of this waste, Orchard Hills aims to contribute to the diversion of C&I waste that is currently landfilled at an increasing rate (by almost 150,000 tonnes between 2006-2007 and 2007-2008, see Table 3).

Given this analysis it can be argued that, along with the necessary reserve landfill capacity provided by Orchard Hills, there is also justifiable demand for this project in the form of additional recycling capacity.

Additional project benefits

Although Orchard Hills would be a Class 2 landfill, the issue of Sydney landfill capacity should be considered holistically. As pointed out in the Wright Strategy report, there is a shortage of putrescible landfills in Sydney. One way of dealing with the problem is to redirect non-putrescible waste to Class 2 landfills in order to conserve Class 1 landfill capacity. Class 1 landfill capacity will reach a crisis point in 2014 when the Eastern Creek landfill reaches capacity.

The recent termination of a range of AWT tender processes further exacerbates the rate of Class 1 void consumption. Orchard Hills provides dry waste landfill capacity that will permit the redirection of dry waste from putrescible landfills especially Eastern Creek. As the Class 1 void space is extinguished, the price for disposal at Eastern Creek will drive waste generators to explore commercially viable disposal points. Orchard Hills provides that opportunity, combined with a 67% recycling rate, in and of itself.

The site of the development in Sydney's west is centrally located within the Northwest and Southwest regions that form part of the NSW Government's Sydney Metropolitan Strategy zone. These areas are identified for significant increases in the provision of housing and employment. With good access to the M4, M7 and M5 Motorways the Orchard Hills waste facility can provide raw materials for the expected housing and commercial development in these regions as well as accommodate the C&D waste generated by this activity.

The integrated waste management solution offered by Dellara is focused on achieving high resource recovery at a time when the landfill levy growth is seen as too low for driving alternative waste management. Moreover, it's relatively close proximity to the Light Horse facility would also increase competition in the local waste sector and therefore benefit councils, businesses and the community.

Finally, the Orchard Hills waste and resource management facility is also a "means to an end" as it forms a realistic proposal for the ultimate rehabilitation of a highly disturbed site.

CONCLUSION

At the moment, without the future capacity provided by the Orchard Hills facility, Sydney's Class 2 capacity is lower than the contingency capacity of 20 to 30 years specified by Tony Wright and endorsed by the NSW government. Even the most optimistic estimates predict a current remaining capacity of 18.6 years.

By providing an integrated management solution for C&I and C&D waste, the Orchard Hills waste and resource management facility would assist in the management of Sydney's waste, maximising the recycling and reprocessing of resources in keeping with the Policy of Justifiable Demand. Adding up to 2.5 years to the overall capacity of General Solid Waste (non-putrescible) licensed landfills in the Sydney Metropolitan Area would result to a total Class 2 landfill capacity of 15.7 years (or 21.1 under the most optimistic scenario), well within the limits of the 20 to 30 years contingency capacity rule. Taking into account Dellara plans to recycle at least 67% of the incoming waste stream and the Wright estimate for the desirable amount of reserve landfill capacity, we conclude that there is justifiable demand for this project.

REFERENCES

[i] NSW Legislation, 2010. State Environmental Planning Policy (Infrastructure) 2007 [2007-641]. *Current version for 16 July 2010 to date (accessed 24 July 2010 at 05:02).* http://www.legislation.nsw.gov.au/fullhtml/inforce/epi+641+2007+cd+0+N

[ii] NSW Government, Department of Planning, 2010. Changes to Infrastructure SEPP – Determination of Landfill Applications. Planning Circular PS 10-016, Issued 12 July 2010.

[iii] Wright Corporate Strategy Pty Ltd, 2009. Strategic Review- Putrescible Landfill Demand and Capacity for the Sydney Region. Prepared by Wright Corporate Strategy Pty Ltd for the State Government of New South Wales

[iv] NSW Government, 2010. Media Release: *New Criteria Strengthens Waste Recovery and Minimises Landfill*. Release date: 13 July, 2010.

[v] Hyder, 2009. Australian landfill capacities into the future. Final report - amended and revised. Prepared for the Department of the Environment, Water, Heritage and the Arts, Australian Government. www.environment.gov.au/settlements/waste/publications/landfill-capacities.html

[vi] NSW Department of Planning, 2009. Major Project Assessment: Eastern Creek Waste Project. Director General's Environmental Assessment Report.

[vii] NSW DECCW, 2009. Waste Avoidance and Resource Recovery Progress Report 2008. www.environment.nsw.gov.au/resources/warr/09155WARRreport08.pdf

[viii] NSW DECCW, 2010. Disposal based survey of the commercial and industrial waste stream in Sydney. http://environmentaltrust.nsw.gov.au/resources/warr/105WasteSurveypt1.pdf

[ix] Hyder, 2009. Waste and Recycling in Australia. Amended report, November 2009. A report prepared for the Department of the Environment, Water, Heritage and the Arts.

[x] EPHC, 2010. National Waste Report 2010. Environment Protection and Heritage Council, Department of the Environment, Water, Heritage and the Arts, Australian Government.