APPENDIX A.

BELFAST CITY COUNCIL

CREMATORIUM MERCURY ABATEMENT ECONOMIC APPRAISAL

FINAL REPORT

COMMERCIAL IN CONFIDENCE

May 2008

BELFAST CITY COUNCIL

CREMATORIUM MERCURY ABATEMENT

ECONOMIC APPRAISAL REPORT

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APPENDICES

Abbreviations

Abbreviation	Detail
BAT	Best Available Techniques
BATNEEC	Best Available Technology Not Entailing Excessive Costs
BMAP	Belfast Metropolitan Area Plan
CAMEO	Crematorium Abatement of Mercury Emissions Organisation
CBC	Castlereagh Borough Council
CSR	Comprehensive Spending Review
DDA	Disability Discrimination Act
DEFRA	Department for Environment, Food and Rural Affairs (GB)
DFP	Department of Finance and Personnel
DHSSPS	Department of Health, Social Services & Public Safety
DOE	Department for Environment (NI)
DRD	Department of Regional Development
EHS	Environment and Heritage Service (NI)
EU	European Union
FBCA	Federation of Burial and Cremation Authorities
ICCM	Institute of Cemetery & Crematorium Management
LAPC	Local Air Pollution Control
LAPPC	Local Air Pollution Prevention and Control
LAU	Local Authority Unit
New TSN	New Targeting Social Need
NPC	Net Present Cost
NPV	Net Present Value
OSPAR	Convention for the Protection of the Marine Environment of the North East Atlantic (the "OSPAR convention")
RDS	Regional Development Strategy
RPA	Review of Public Administration
SMART	Specific, Measurable, Achievable, Realistic and Time bound
VAT	Value Added Tax

1 INTRODUCTION AND BACKGROUND

1.1 Terms of Reference

Belfast City Council (henceforth the Council) has commissioned BDO Stoy Hayward to undertake an Economic Appraisal for the proposed implementation mercury abatement equipment to its crematorium at Roselawn.

Whilst the scope of this assignment includes the consideration of the need to expand the facility, it does not extend to include consideration of other sites for expansion and assumes that Roselawn will continue to be the location for the Council's Crematorium.

The Economic Appraisal has been carried out in accordance with "The Green Book of Appraisal and Evaluation in Central Government" issued by Treasury in April 2003 and the Department of Finance and Personnel's Guide to Appraisal, Evaluation, Approval and Management of Policies, Programmes and Projects: "The Northern Ireland Practical Guide to the Green Book" (2003).

1.2 Introduction

1.2.1 Project Promoters – Belfast City Council

Belfast City Council is the largest of the 26 Councils in Northern Ireland, with a resident population of 277,391[1]. Belfast City, and its wider metropolitan area, is the largest settlement in Northern Ireland, and the second largest city on the island of Ireland. It lies at the head of Belfast Lough in the lower reaches of the Lagan valley. The Belfast City Council area sits at the heart of the growing population of the wider Belfast Metropolitan Area, which also comprises the surrounding district council areas of Castlereagh, Lisburn, North Down, Newtownabbey and Carrickfergus.

The Council is responsible for delivering an extensive range of key services which play a key role in improving the quality of life of its citizens by helping to make Belfast a better place to live in, work in, invest in and visit.

The Council's Corporate Plan notes that "it has become more and more evident how the Council has played an increasingly proactive role in developing the city and is involved in various partnerships, which are **working to improve the quality of life for people in Belfast**". The Council's current functions include waste and recycling services, leisure and community services, building control and local economic and cultural development.

Belfast City Council is responsible for providing cemetery and crematorium services to the people of Belfast. The Council aims to ensure an adequate supply and effective management of burial land and to provide appropriate crematorium services that adequately meet the needs of the local catchment area. The crematorium service offered by Belfast City Council is the only one in Northern Ireland, and is therefore providing cremation services to the entire population of the province.

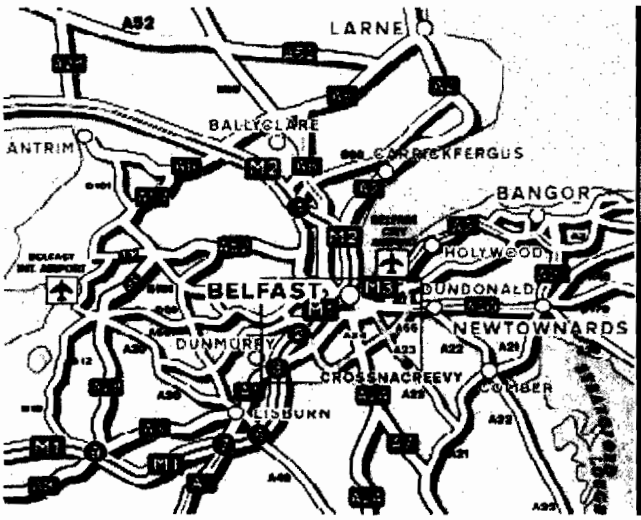
[1] *Belfast Local Government Area Census 2001*

1.2.2 The City of Belfast Crematorium

1.2.2.1 Location & Facilities

The City of Belfast Crematorium is located within the grounds of Roselawn Cemetery, which is situated on the Ballygowan Road, Crossnacreevy, approximately five miles south east of Belfast City Centre. The Crematorium lies within Castlereagh Borough Council area and is therefore regulated under Pollution Prevention and Control Regulations of Castlereagh Borough Council.

Castlereagh Borough Council issues the City of Belfast Crematorium with a permit to operate under the aforementioned regulations and inspects the Crematorium under the conditions of that permit.



The Crematorium was officially opened on 10 May 1961. It is owned and operated by Belfast City Council's Parks and Amenities Section. As previously detailed, the Crematorium is the only such facility in Northern Ireland, and one of only four in Ireland. The current schedule of accommodation at the crematorium is as follows:

Facilities / Schedule of Accommodation		
Waiting room	Entrance hall	Office
Viewing room	Lobby	Cleaners room
Funeral Church (100 seated)	Waiting area	Display hall
Toilets - male, female and disabled	Ladies waiting room	Chancel
Service yard	Sound desk	Café
Wreath display	Vestry	
Cremators (4) on lower level	Store on lower level	Staff canteen

The Crematorium has stated that all cremations at the facility use the accompanying Chapel and it is further noted that all coffins have to be physically delivered through the Chapel to be cremated at the lower level.

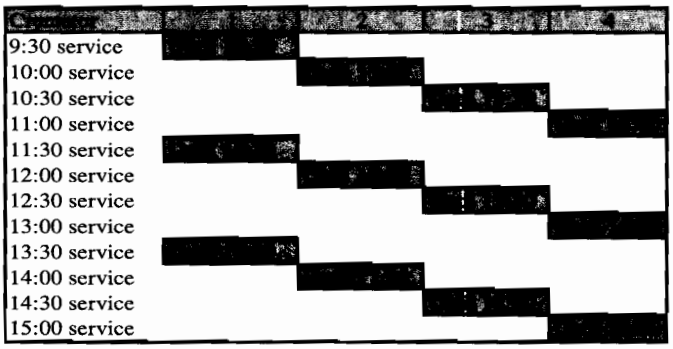
1.2.2.2 Capacity and Operations

The existing four cremators were installed by Furnace Construction in 2003/04. The capacity of four cremators is dependent on the hours of operation, chapel availability and staffing of the facility, with each cremation lasting approximately 90 minutes.

Roselawn currently operates to a schedule of up to 12 cremations per day; however this may be increased during busy periods (winter months), through overtime and extended hours of operation. The crematorium host cremations at the following times[2], at 30 minute intervals:

Day	Operational Hours	No. of possible cremations
Monday to Thursday	9am to 3pm	48
Friday	9am to 2pm	10
Saturday	9am to 11am	4
[redacted]	[redacted]	[redacted]

The above table shows that the crematorium is staffed to host up to 62 cremations a week. Guidance from staff is that a complete cremation cycle is approximately three hours, which allows 90 to 120 minute cremation time, a 30 minute service and time for the cremated remains to be packed for collection.



An analysis of capacity of Roselawn, with its four cremators, shows that there is additional value to be derived from the cremators as they are not working to full capacity – for example, working hours/opening hours could be extended to earlier in the morning and later in the afternoon. This is not reasonable however on the basis that services do not tend to be scheduled for times before 9am or after 3:30pm. Therefore, the limiting factor to extending capacity is the availability of the chapel for services. Based on current operating arrangements and the projected growth of 10% per annum the capacity of 3,100 cremations would be reached by 2010.

All cremations carried out at Roselawn adhere to the following Code of Practice:

Issue	Code of Practice
Conduct	The cremation of a human body is a highly emotional occasion for those taking part in the service. This must never be forgotten by the staff of the crematorium, who must combine to create and maintain an atmosphere of reverence and respect throughout the entire proceedings.
Staff	The greatest care must be taken in the appointment of members of the Crematorium staff, any one of whom may, by conduct or demeanour, detract from the atmosphere

[2] *There are currently no cremations of Sundays*

Issue	Code of Practice
	of reverence which it is endeavoured to create. All staff employed in the operation of cremators must be suitably trained in the technical and ethical procedures and certificated as specified in the Secretary of State's Guidance Notes of the Environmental Protection Act 1990 or any subsequent legislation made thereunder. In addition, it should be realised that the wrong type of person is capable of comment outside the Crematorium which can bring the Crematorium and Cremation into disrepute.
After Committal	(a) A body shall not be removed from the Crematorium after the Service of Committal except for a lawful purpose. (b) Subject to receiving the necessary Authority to Cremate, the coffin and its contents shall be put into the cremator, as soon as practicable, exactly as they have been received on the catafalque. A body not cremated on the same day as the coffin is received at the Crematorium may only retained on the written consent of the Applicant for cremation and in circumstances deemed necessary by the Cremation Authority, including impacts on the environment. All bodies retained at the Crematorium will be accommodated in secure and sanitary conditions within the building. (c) Once a coffin, with its contents, has been placed in the cremator, it shall not be interfered with until the process of cremation is completed. On completion the whole of the Cremated Remains shall be collected and shall be disposed of in accordance with the instructions received.
Correct Identity	(a) No coffin shall be accepted at any crematorium unless it bears adequate particulars of the identity of the deceased person contained therein. If a coffin is encased, the cover and the coffin must bear adequate identity of the deceased person. (b) Every care must be taken to ensure correct identification throughout the whole proceedings from the moment the coffin is received on the catafalque until the final disposal of the Cremated Remains.
Separately Cremated	Each coffin given to the care of the Cremation Authority shall be cremated separately.
Coffin Covers	When a re-usable cover is used to encase a coffin, signed authority must be given by the Applicant for cremation authorising its use and consenting to its subsequent removal from the Crematorium.
Metal Residues	Any metal found amongst the Cremated Remains shall not be salvaged for any purpose, but shall be disposed of in aggregate in accordance with the directions of the Cremation Authority or Higher Authority.
Cremated Remains – Care to be taken	The utmost care shall be taken to ensure that the Cremated Remains, following their removal from the cremator, shall be kept separate and suitably identified. The Cremated Remains shall be placed in a separate container awaiting final disposal. If the cremated remains are to be disposed of in the Garden of Remembrance, this shall be conducted with reverence and respect. Cremated Remains to be conveyed by a carrier service should be placed in a suitably labelled robust container and dealt with according to recommendations laid down by the Federation of British Cremation Authorities. Cremation Authorities shall ensure, by Regulation, that Cremated Remains leaving their Crematorium always do so in a suitable type of container.
Mechanical Apparatus - Cremators And Ancillary Equipment	Cremators and all other ancillary equipment used at the Crematorium shall be kept in good repair, and regularly overhauled and cleaned to ensure their being kept in perfect working order, and to prevent friction noises which will distract or disturb the mourners. Special attention shall be paid to mechanical devices which are particularly prone to develop imperfections.
Statutory Regulations	All cremations shall be carried out according to the provisions of the Cremation Acts and the Regulations made thereunder, or under the appropriate statutory provisions and regulations applicable to the area in which a Crematorium is situated and, in those places where it is applicable, no cremation shall take place except on the written authority of the Medical Referee.

1.2.2.3 *Pricing Policy and Income / Operating Costs*

The following main charges apply to the cremation services:

Cremation charges	Belfast Residents	Non-Belfast residents
Stillborn child or a child aged one or under	£38	£76
A child under the age of 16	£81	£162
A person aged 16 and above	£145	£290
Saturday and bank holiday levy	£115	£115
Hire of Crematorium funeral church for memorial services	£52	£52
Dispersal of cremated remains		
Sent by registered post (UK & Republic of Ireland)	£54	£54
Burial or scattering of cremated remains from other crematoria	£54	£54
Columbarium		
Single urn	£228	£684
Double urn	£456	£1,368
Ecological coffin		
	£150	£150
Memorialisation		
Memorial tree and plaque	£270	£270
Woodland copse and inscription on a granite memorial	£220	£220
Replacement tree plaque (up to 105 letters)	£44	£44
Replacement tree plaque (up to 300 letters)	£88	£88

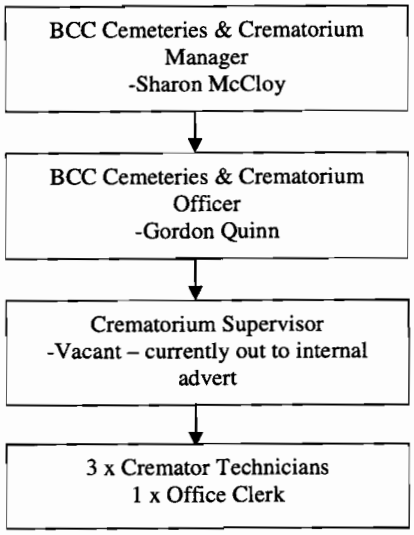
The Crematorium also applies charges for the use of music during a cremation service and to enter detail into the book of remembrance.

Income	£
Fees & Charges	£790,031
Café Franchise	£1,200
Other	£382
[illegible]	[illegible]

Operating Expenses	£
Salaries & Wages	£100,139
Training	£2,440
Operating Expenses	**£**
Gas	£49,242
Electricity	£14,801
Repair & Maintenance	£63,296
Cleaning	£760
Insurances	£1,047
Consumables & Equipment	£56,251
Professional fees	£36,824
Printing and Stationery	£4,546
Recharge	£285,724
Marketing	£1,548
Subscriptions	£845
Depreciation	£105,670
Other	£5,685
[illegible]	[illegible]
Net Expenditure (Income - Expenditure)	462,795

1.2.2.4 Staffing

The current staffing structure at the City of Belfast Crematorium is as follows:



Staffing arrangements are organised around the operational hours detailed in 1.2.2.2. Current health and safety standards require two crematorium staff to be present in the crematory area at all times.

The Crematorium has stated that in general there is one Chapel attendant present at every funeral service. Increasing family demands in terms of additional requirements and the facilitation of large congregations means that (staff permitting) the Crematorium will have to provide a second member of staff to help out with the services.

1.2.2.5 Marketing

The Crematorium has stated that marketing materials are found in:

- Health Centre brochures;
- St. John's Ambulance Catalogues; and
- Newspaper articles dealing with Funeral care.

It is noted that due to the setting and context of the services provided, 'sensitive' marketing activities need to be carried out.

1.2.3 Cremation in Northern Ireland

Since its opening year (1961), when the number of cremations was 81, there has been an increase in the uptake of cremations to the 2007 level of 2,599 cremations. Of these 2,599 cremations, 40% were of Belfast residents and the majority (94%) were private (as opposed to hospital) cremations.

Over the past six years there has been a fluctuation in the level of uptake, with the average being 2,415 in that period. There would appear to be a marked increase in uptake in the past year (2006 to 2007) with a 10% uplift in that time period.

The table below shows that in Northern Ireland in 2006 only 16% of deaths were cremated, compared to 72% in the whole of the UK[3].

Country	No. of Crematoria	No. of Deaths	No. of Cremations[4]	% of deaths
Northern Ireland – City of Belfast	1	14,532	2,361	16%
United Kingdom	250	575,974	416,881	72%

Upon comparison of Northern Ireland to other countries where there is a small uptake of cremation services, it would appear that Northern Ireland outperforms similar comparators.

Country	No. of Crematoria	No. of Deaths	No. of Cremations[5]	% of deaths
Bulgaria	1	113,438	5,423	5%
Iceland	1	1,901	350	18%
Northern Ireland – City of Belfast	1	14,532	2,361	16%
United Kingdom	250	575,974	416,881	72%

It is noted that cremation costs in Northern Ireland are second lowest in the UK (to Jersey). The crematorium staff suggests that the choice to cremate is not driven by cost considerations and notably it is lower in cost than burial. The experience of staff is that the family of the deceased who choose cremation do so as a personal preference and not one that is price-driven. Therefore, in the opinion of cremation staff an increase in costs to cover increased capital and operating costs will not cause a reduction in cremations.

1.2.4 Availability of burial plots within Belfast City Council Cemeteries

Belfast City Council currently manages and maintains nine cemeteries in Belfast. It is noted that six of the nine cemeteries are closed for burials, with City Cemetery, Dundonald and Roselawn being deemed "open".

Of these three, only Roselawn has grave lots available for purchase, with 1,200 new graves marked out ready for burial and available for purchase. A further 3,000 graves are subject to planning permission.

It is noted that the average number of burials over the past six years is 850, with almost 30% representing non-resident burials in that time period. Roselawn Cemetery currently sells approximately 210 graves per annum.

A recent report undertaken by Council estimates that these additional 4,200 graves are expected to provide burial capacity until 2026.

[3] *Source: Cremation Society of Great Britain*
[4] *Provisional figures as at 6th March 2007*
[5] *Provisional figures as at 6th March 2007*

1.2.5 Background to the Project

Both governments and the public generally have become increasingly aware of the negative impact that manufacturing and industrial processes has on the environment. In a drive to address emissions of mercury, the UK government has identified the cremation process as one of the major contributors of mercury pollution in the UK. Indeed, it is estimated that in the absence of intervention, emissions of mercury from UK crematoria would rise by two-thirds from 2000 to 2020.

The impact of mercury pollution has been studied a great deal, but it would appear to be associated with nerve and blood defects at even low levels of pollution, with the poison entering the food chain through polluted fish eaten by humans. It is reported that the effects of mercury pollution are global in nature and permeate areas where there is no industrial activity. Mercury pollution even at very low levels produces subtle defects.

In recognition of both the scale and impact of the pollution, there is now revised statutory guidance[6] that aims to reduce the levels of mercury production by the crematoria sector in the UK by 2012. This guidance advocates the introduction of gas cleaning equipment to cremators to essentially remove mercury emissions. The target for 2012 is that the sector will reduce emissions levels of mercury by 50%, either through the installation of the necessary equipment or by entering into a burden sharing scheme within the sector, so that the sector as a whole achieves this target.

The burden sharing scheme, known as Crematorium Abatement of Mercury Emissions Organisation (CAMEO), would see the Council continue to emit mercury from its cremators at no capital cost and incurring an annual cost of mercury certificates through CAMEO. It is estimated that the cost of such a certificate will be £35 per cremation or £91,000 per annum at current cremation levels.

The Lord Mayor of Belfast Jim Rodgers has commented on the installation of mercury abatement equipment, *"Such equipment could well add considerably to the cost of funerals. But the only alternative would be to ask undertakers to extract filled teeth before bodies are cremated."*

The decision facing the Council is which option to implement to adhere to the new statutory guidance, with due cognisance to the environment and value for money considerations. To this end, the Council have commissioned an options appraisal to provide the best way forward for the City of Belfast Crematorium in order to comply with legislative requirements.

[6] *Issued by DEFRA, and locally adopted by DOE*

2 STRATEGIC CONTEXT

In order to carry out an appraisal of the proposed project, it is necessary to take account of the particular aims and objectives of the various strategic interest groups in order to identify the context within which the project fits. For this project we have identified the following stakeholders, as having strategic importance with respect to this project:

National & International

Stakeholder	Strategy / Policy	Commentary
European Union – European Commission	EU Mercury Strategy (2005)	In January 2005, the Commission adopted a mercury strategy that envisages a number of actions to protect citizens' health and the environment. The Commission presents *"a coherent strategy ... with measures to protect human health and the environment from the release of mercury based on a life-cycle approach, taking into account production, use, waste treatment and emissions"*. **Member States identified dental amalgam as a significant source of mercury releases, including via dental surgeries and cremation.** A key aim is to reduce mercury levels in the environment and human exposure, especially from methylmercury in fish. The strategy has the following objectives that are of particular importance to the proposed project: • Reducing mercury emissions; • Reducing the entry into circulation of mercury in society by cutting supply and demand; • Resolving the long-term fate of mercury surpluses and societal reservoirs (in products still in use or in storage); • Protecting against mercury exposure; • Improving understanding of the mercury problem and its solutions; and • Supporting and promoting international action on mercury.
	Marketing and Use Directive (76/769/EEC) - - The Controls on Dangerous Substances and Preparations Regulations (2006)	These regulations came into force on 7 January 2007, following a consultation held in 2006. The Marketing and Use Directive which is used for placing **restrictions on the marketing and use of specific hazardous chemicals including mercury** has led to a large number of separate transposition instruments. These address a number of substances with various restriction requirements and derogations which businesses find cumbersome to comply with. The proposed project i.e. the installation of mercury abatement equipment fits strategically with this EU Directive.
Department for Environment, Food and Rural Affairs (DEFRA)	Departmental Report (2007)	The report stresses the importance of the following issues: • Sustainable consumption and production; • Protecting the natural environment; • Sustainable rural communities; and • Better regulation and our corporate services.

Stakeholder	Strategy / Policy	Commentary
	National Environment – Public Service Agreement 28 (2007)	On the 9 October 2007, the UK Government published the results of the Comprehensive Spending Review 2007 (CSR 2007) which contained a new set of cross-government priorities or **Public Service Agreements** (PSAs). **DEFRA will lead on PSA28 'Secure a healthy natural environment for today and the future'** with Department of Communities and Local Government and Department for Transport as formal delivery partners. The proposed project fits with the targets that the CSR (2007) Policy Statement and Defra as the leading department have set out to achieve: • **The air that people breathe free from harmful levels of pollutants;** • **Sustainable water use which balances water quality, environment, supply and demand;** • **Land and soils managed sustainably;** • **Biodiversity valued, safeguarded and enhanced;** • **Clean, healthy, safe, productive and biologically diverse oceans and seas; and** • **People enjoying, understanding and caring for the natural environment.**
	Mercury Emissions from Crematoria (2002)	The consultation paper comprises a paper produced for Defra by the Environment Agency's Local Authority Unit (LAU) with their technical assessment of the case for tackling mercury emissions from crematoria. The LAU paper reaches the following conclusions: • It is predicted that, without intervention, mercury emissions from crematoria in the UK will increase by two thirds from 2000 to 2020; • By 2020 crematoria would emit between 11 and 31% of the UK mercury emissions to air; • The mass of mercury emitted is more important than the species of mercury emitted; • Denmark, France and Great Britain do not have standards that require gas cleaning; • The cost of abating mercury by gas cleaning crematoria exhausts in the UK is higher than other abatement costs that industry bears; and • If crematoria close rather than upgrade then some co-ordination of closure and any new provision would be necessary to maintain a service to the nearby communities

Northern Ireland

Stakeholder	Strategy / Policy	Commentary
Northern Ireland Executive	Draft Programme for Government (2008 – 2011) – Building a Better Future	The Draft Programme for Government sets out an overview of priority areas and the key goals to take forward in pursuit of the over-arching aim. The priorities relevant to the proposed project include: **Promote Tolerance, Inclusion and Health and Well-Being:** The proposed project is aligned to the following goals under this priority: **Invest To Build Our Infrastructure:** The proposed project will provide a modern, efficient facility which is an essential requirement in order to adhere to legislation. It provides a platform to help protect and improve that state of the environment in the area. **Deliver Modern High Quality and Efficient Public Services:** The government is currently taking forward the most wide ranging reform of public services for a generation. At the heart of this reform programme is a commitment to world class public services which meet the needs of the economy and wider society.
Department of Finance and Personnel (DFP)	Comprehensive Spending Review (CSR) (2007)	The Comprehensive Spending Review 2007 (CSR) is a zero based review of all Departmental objectives, policies and spending plans and fixes spending plans for the three years 2008-09 to 2010-11. In October 2007, the Chancellor announced a series of measures to invest in key priorities for the long-term, transform public services, deliver sustainable growth and prosperity, provide fairness and opportunity for all, build sustainable communities and **protect the environment in Northern Ireland**. The project fits strategically in that the CSR states that measures will be taken to promote stronger communities and **provide a better quality of life and a sustainable environment.**
Department of Regional Development (DRD)	The Regional Development Strategy for NI 2025 (RDS) "Shaping our future"	The RDS is the national strategy framework tasked with ensuring a better quality of life for current and future generations. The future development of Northern Ireland, as envisaged by this Strategy, takes account of key driving forces such as population, transportation needs and economic changes. The RDS provides an overarching strategic framework to help achieve a strong spatially balanced economy, **a healthy environment** and an inclusive society. Specifically RDS provides the context for: • Protecting and enhancing the physical, natural and man-made assets of the Region; • Housing, transport, **air and water quality**, energy and waste strategies and infrastructure providers and public service promoters; and • Development plans for guiding public and private investment **decisions relating to land use**. The proposed works at Roselawn Cemetery fits strategically with the above priorities set out by the RDS.
Department of Environment (DOE)-Planning Service	Draft Belfast Metropolitan Area Plan 2015	The purpose of the Plan is to inform the general public, statutory authorities, developers, and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the BMA over the Plan period. BMAP provides an essential framework for guiding investment by public, private and community sectors. BMAP provides a planning framework which is in general conformity with the RDS in facilitating sustainable growth and a high quality of development in

Stakeholder	Strategy / Policy	Commentary
		the Belfast Metropolitan Area throughout the Plan period, **whilst protecting and where appropriate, enhancing the natural and man-made environment of the Plan Area.** Within BMAP, Crossnacreevy / Ryan Park are identified as Local Landscape Policy Area's i.e. CSY03 and CSY 04.
Department of Environment (DOE) - Environment and Heritage Service (EHS)	Corporate Plan (2006-2009)	The aim set out in the Corporate Plan is *"to protect, conserve and promote our natural environment and built heritage for the benefit of present and future generations."* The proposed project fits strategically with the vision of the EHS which is 'to have a healthy and well-protected environment and heritage in Northern Ireland which is highly valued by the whole community'. The objectives outlined in the Corporate Plan are to achieve: • **significant improvement in the state of the environment**; • clear improvement in public attitudes and behaviours towards the environment; and • more sustainable way of living.
Belfast City Council (BCC)	Corporate Plan (2007-2008)	BCC have a vision of ***'Belfast as a modern and welcoming city with a quality of life to rival the best in the world'***. The Corporate Plan highlights that the role of the council is to improve the quality of life across Belfast, by providing strong representative leadership and direction and by providing the most efficient and effective customer focused services. The activities in the Plan are therefore focused around three key areas and the proposed project fits with these themes in the following way: • **Improving quality of life, now and for future generations** - The project aims to do this by ensuring that the services provided are the best by working with relevant stakeholder organisations and communities in the city to address the things that matter most to people in their day-to-day lives. • **Providing leadership and strategic direction for shaping, developing and managing the city** - As the elected body for Belfast, the Council provides leadership and strategic direction to shape, develop and manage the city. The proposed project fits strategically with the Councils' aims of *protecting the environment* and continuing to improve how they deliver their services. • **Meeting the needs of local people through the effective delivery of quality, customer-focused services** - The proposed project aims to provide the highest quality services to the bereaved families of Northern Ireland. The aim is to make the best use of all available resources to meet local and national needs and improve the bereavement process. All services will be accessible and designed for the convenience of the people that use them. Within the Corporate Plan the Council states that a priority is to *'manage and maintain the City of Belfast Crematorium'*.
	Parks & Leisure Department – Parks and Cemeteries Section - 'Your City, Your Space – A Strategy for Open Spaces' (2005)	The vision of the Strategy is *"to make good-quality open space part of living in, working in and visiting Belfast."* The Strategy comprises of four themes (Healthier places, safer space, people and community and our heritage) supported by the following three principles: Partnerships, Marketing & Communication and **Quality & Standards.** Within the Strategy document the current Belfast Lord Mayor Jim Rodgers (Chair of Parks and Cemeteries Sub-committee) highlights that Belfast's parks, cemeteries and other open spaces

Stakeholder	Strategy / Policy	Commentary
		are essential facilities for everyone who lives in and visits Belfast to use. The strategy is strongly linked to major council schemes such as the Capital City Agenda, the Belfast Masterplan and the Arterial Routes Programme. The Strategy sets out the following Policy Statement: *"We will manage in an efficient and cost effective way, facilities related to burying and cremating the dead. We will also work with our partners to preserve and promote these facilities as resources for recreation, historical education, and improving local biodiversity."*
	Environmental Policy Statement (2006)	The Policy Statement outlines how the Council is committed to protecting the environment. In doing so, the Council aims to improve the quality of life of all citizens, both now and for future generations, through working with others to protect and improve the environment.
Castlereagh Borough Council (CBC)	Corporate Strategy 2006-2009	The vision statement within the corporate strategy states *"Castlereagh Borough Council is committed to Building on the Boroughs Strengths to create and **conserve for your future**."* The Council aims to promote the following the core value of 'sustainability' i.e. ensuring that actions and activities seek **to improve the quality of life in the Borough now and for future generations.** Within the Strategic aims laid out in the Strategy the Council aims to: • Ensure that all those who live work and play in the Borough do so in a safe environment; and • Ensure that buildings within the Borough are environmentally suitable for current and future needs and so maintain the health, safety and welfare of people in and around buildings. The proposed project fits strategically with the vision, values and strategic aims of the Council.
Northern Ireland Executive	Section 75 Northern Ireland Act (1998)	Belfast City Council has a dedicated Equality Officer who ensures that policies and facilities are developed in line with Section 75 requirements. Furthermore, their policy is set out in their Equality Scheme and this has been communicated to all staff and key volunteers. With reference to the proposed project will not specifically exclude any groups within Section 75.
UK Government	New Targeting Social Need (New TSN)	New Targeting Social Need (TSN) is the key policy for tackling social need and social exclusion and is aimed at tackling disadvantage by directing efforts and resources towards individuals, groups and areas objectively defined as being in greatest need, irrespective of community background. New TSN also aims to promote social inclusion. The proposed project fits strategically with the Government's policy for tackling social need and social exclusion in that it: • Addresses employment: the proposed project will continue to provide employment • Targets other social need: the crematorium aims to provide services for all Northern Ireland residents • Promotes social inclusion: the crematorium provides religious, non-religious and ethnic minority services.

3 ASSESSMENT OF NEED

3.1 Introduction

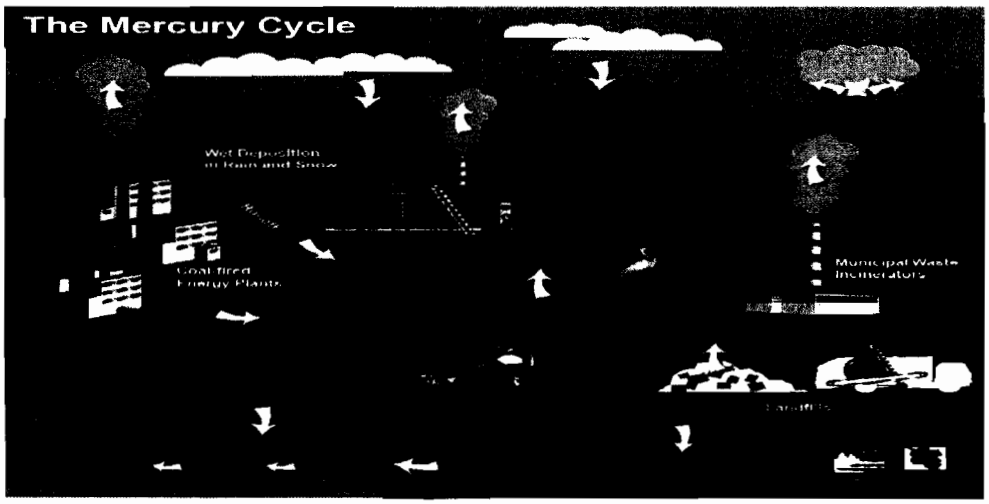
In this section of the report we assess the need for the proposed project by considering the following:

Reference	Sub Section
3.2	Mercury & its effects
3.3	Legislative Drivers for Change
3.4	Market Analysis
3.5	Benchmark Comparators to Roselawn Crematorium
3.6	Consultations
3.7	Additionality
3.8	Conclusion

3.2 Mercury and its effects

Mercury (Hg) is toxic, accumulates in the air and water, and can harm the brain, kidneys, nervous system and unborn children. Exposure to mercury is largely diet or occupationally dependent, however, many are exposed to mercury from their amalgam fillings. **Exposure of the general population to mercury can occur via inhalation of mercury vapour from dental amalgam fillings** (elemental), or through the diet (Methylmercury and inorganic mercury). Methylmercury in fish makes the most significant contribution to dietary exposure to mercury[7].

The diagram below shows the mercury cycle; how it is released into the atmosphere and then returned and enters the food chain[8]:



When mercury enters the environment from emissions in the air, water or soil, it oxidises into other compounds of mercury. These other forms of mercury form methyl mercury, through either chemical or biological (bacterial) processes. Methyl mercury builds up in the tissues of

[7] *Food Standards Agency, Committee on Toxicity of chemical in food, consumer products and the environment, 2004*
[8] *Northeast Waste Management Officials' Association*

fish and shellfish. In areas of mercury contamination, larger and older fish tend to have higher levels of mercury. Mercury will remain in the environment for years.

Both mercury and its compounds have high toxicity to aquatic life in the short and long terms. **Eating fish contaminated with mercury can cause poisoning in humans; birds and land animals that eat contaminated mercury could also be poisoned**. Mercury and its compounds are highly persistent in water and the environment. Mercury and its compounds will bio-accumulate[9] or concentrate in the tissues of fish[10]. Mercury is transferred and accumulated through several food web levels[11].

Up to 16% of all mercury emitted in the UK comes from crematoria because of the fillings in teeth and this percentage is expected to increase to 25% by 2020 without action. DEFRA aims to cut these emissions of mercury from crematoria by half by the end of 2012. The increase in crematoria emissions is said to be caused by a generation which is more likely to have retained all its teeth, but has more fillings because it did not benefit from advances in oral hygiene.

DEFRA have set national, rather than local, targets that apply to the reduction of mercury. This is due to the fact that emissions from specific crematoria do not impact on the immediate vicinity, but affect health via the food chain, particularly when they are then deposited in water and taken up by fish (as shown above).

3.3 Legislative Drivers

3.3.1 Legislative Overview

As a crematorium in the UK, the City of Belfast Crematorium is regulated under Part I of the Environmental Protection Act 1990 (effective since 1991). In addition to this they are required to use BATNEEC (Best Available Technology Not Entailing Excessive Costs) and the statutory government guidance, known as process guidance note PG5/2. Recently it has become apparent that existing controls failed to address emissions of mercury. It is estimated that in the absence of intervention, emissions of mercury from UK crematoria would rise by two-thirds from 2000 to 2020.

The UK is a signatory to the OSPAR Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic), and Recommendation 2003/4 under this Convention calls for the application of Best Available Techniques (BAT) to prevent the dispersal into the environment of mercury from human remains. OSPAR recognises that cultural and social impacts can be taken into account in controlling emissions of mercury from crematoria.

At the UK level, DEFRA first introduced Process Guidance Note 5/2 (04), followed by the AQ1 (05) note on the "Control of Mercury Emissions from Crematoria", AQ13 (05) and AQ24 (05). This guidance indicates that 50% of existing cremations at existing crematoria are to be subject to mercury abatement by 2012.

At the Northern Ireland level, it is the Department for Environment (DOE) that issue Process Guidance Notes in line with guidance from DEFRA. Process Guidance Notes issued by the

[9] *Refers to the net accumulation over time of metals within an organism from both biotic (other organisms) and abiotic (soil, air, and water) sources*
[10] *Australian Government, Department of the Environment, Water, Heritage and the Arts, State of Knowledge Report 2001*
[11] *US EPA, 1997*

DOE i.e. PG5/2-Version 2, are issued in line with DEFRA recommendations set out in Process Guidance Note 5/2 (04) and the subsequent additional guidance i.e. AQ1 (05), AQ13 (05) and AQ24 (05). All relevant legislation is detailed below.

3.3.2 *PG5/2 (Version 2)*

The DOE released the Process Guidance Note PG5/2 Version 2 in September 2005. The Note gives guidance on the conditions appropriate for the control of emissions into the air from crematoria processes / installations, and is one of a series of notes giving guidance on BATNEEC.

The note was issued for use under both Local Air Pollution Control (LAPC) established by the Industrial Pollution Control (NI) Order 1997, and Local Air Pollution Prevention and Control (LAPPC) established by the Environment (NI) Order 2002. The provisions of the note and the dates by which compliance with these provisions was expected are listed in the table below:

Processes affected	Provision	Compliance Date
Existing Crematoria	Notification of option	31 December 2005
Existing crematoria where abatement is to be fitted	Install mercury abatement	31 December 2012
New crematoria and new or existing cremators fitted with mercury abatement	Install mercury abatement	New crematoria - from 1 October 2006
All processes	Instrument reliability guideline	12 months from notice

In relation to mercury abatement the guidance notes that *"Existing crematoria should by 31 December 2005 notify their district council regulator of an undertaking to either:*

- *Install abatement such that 50% of cremations are subject to mercury abatement by 31 December 2012; or:*
- *Participate in a burden sharing scheme with other UK based crematoria such that they share in the cost of installing abatement that will ensure that at least 50% of the cremations carried out by the crematoria within the scheme are subject to mercury abatement by 31 December 2012."*

The summary of the main changes highlighted in the Process Guidance Note PG5/2 are shown in the table below:

Change	Reason	Commentary
Mercury and dioxin arrestment for new crematoria and new or existing cremators fitted with abatement	To reduce the mercury and dioxin emitted	Arrestment plant is being considered separately for existing and substantially changed processes
Criteria for reliability of monitoring plant	To increase consistency of monitoring	-
Provisions for temperature and retention time differently expressed	Increased understanding of process	-
Monitoring methods updated and results expressed using 95% confidence limits	The published methods have been revised	For each pollutant, three samples needed instead of two, but revised methods are quicker to use than old methods
Primary monitoring methods changed from US to current British / European methods	Monitoring houses are using BS / EN methods, which have been recently revised	
Additional advice on coffin construction and content	To reduce pollutants emitted	Reflects new and improved cremation practices

3.3.2.1 AQ 24(05)

The latest Air Quality Note, AQ 24(05) was the direct result of representations made by the FBCA (Federation of Burial and Cremation Authorities) on behalf of its membership to DEFRA. The guidance has provided further information on burden sharing and a number of points intended to clarify for regulators and operators the considerations likely to be material in deciding whether to fit abatement equipment or contribute to the cost through burden sharing.

The key points contained in the note are summarised as follows:

- The focus for mercury abatement should not be on local environmental protection, because the problem arising from mercury emissions is from long range transportation. It is for this reason that a national abatement target for mercury has been set;

- The reduction in mercury emissions has been set at 50% to reflect an appropriate balance between costs to the cremator operators, and the bereaved, and benefits to the environment. DEFRA are not seeking levels above 50% abatement i.e. **there is no requirement for the UK to achieve 100% abatement in 2020**;

- Sharing the burden of achieving 50% abatement across the industry, if properly managed, will minimise increases in cremation fees. If this approach fails to achieve the required 50% DEFRA will require the larger crematoria to abate in order to achieve the required reduction;

- A good many operators have concluded that the best way is to join the CAMEO (Crematoria Abatement of Mercury Emissions Organisation) scheme, which is arranging burden sharing at the national level and provides an umbrella organisation for both running the system and reporting to DEFRA;

- CAMEO will levy and administer an environmental surcharge from members from January 2007, which is considered by the scheme to be the most economical and effective way to collect and redistribute to authorities fitting abatement equipment in line with the phasing programme.

- The indicative phasing timetable was issued to cremation organisations because cremator and abatement equipment manufacturers are unlikely to be able to meet demand if it is concentrated in the last two or three years before the 2012 deadline.

3.3.3 CAMEO (Crematoria Abatement of Mercury Emissions Organisation)

The FBCA, representing 94% of UK Cremation Authorities, proposed the Burden Sharing Agreement to minimise the impact of compliance with the emission reduction targets, named CAMEO. The proposed burden sharing arrangement will provide a means of simultaneously achieving several different and potentially competing objectives relating to emissions of mercury from crematoria. The scheme's objectives are environmental and social, with fairness and economics playing a key role.

For the purpose of illustrating how abatement trading would operate all calculations are based on the following; the environmental target of the scheme will be defined as achieving the prevention of emissions of mercury from 50% of cremations, the cost of abatement quoted by

DEFRA as £55 per cremation is used to identify costs. The total number of cremations carried out in the UK is estimated to be 440,000 per annum.

The cost to the industry of achieving the DEFRA target of 50% abatement can be calculated as follows:

- Total UK 440,000 cremations
- 50% abatement = 220,000 cremations
- 220,000 cremations x £55(DEFRA) abatement cost = results in an industry wide burden of £12,100,000 per annum.

So the cost to the industry of achieving 50% abatement is £12,100,000 per annum. The cost has to be shared across the industry as a whole and each cremation authority will contribute the following amounts to CAMEO on an annual basis:

- £12,100,000 / 440,000 cremations = £27.50 per cremation
- Crematorium cremations x £27.50 = Crematorium contribution to the industry wide burden. For example 2,000 cremations would equate to £55,000.

It is anticipated that CAMEO receipts will be distributed amongst those cremation authorities that installed abatement equipment. The amount each cremation authority receives will be based on the number of abated cremations it carries out. In addition those crematoria that install abatement plant will receive financial contributions from those that do not, a contribution they would not receive from a command control solution implemented by DEFRA. The amount they receive will decline as the amount abating increases, but if a single cremation authority does not abate members will receive a financial contribution.

At the CAMEO Steering Group Meeting 27th September 2007 it was agreed that the mercury abatement surcharge should be increased from £25 to £35 per cremation from 1st January 2008.

It is also noted that the cost of annual emission testing is likely to double when abatement equipment is installed as it is necessary to carry out tests both with and without filtration.

CAMEO is to collate statistical data on the number of cremation authorities abating in the UK and provide this information to DEFRA to demonstrate that the 50% level of abatement is being met.

Monitoring Date	Indicative Benchmark (proportion of cremations subject to upgrading in order to achieve overall 50% mercury reduction)[12]
31 December 2007	10%
31 December 2008	20%
31 December 2009	40%
31 December 2010	60%
31 December 2011	80%
31 December 2012	100%

DEFRA has stated that as well as monitoring the percentage of upgrades completed, they will also be asking for data on what is committed (i.e. contracts signed and work programmed or begun) as a pointer towards future compliance.

[12] *DEFRA has stated that for avoidance of doubt, a figure of e.g. 20% means that 20% of the cremations needed to be subject to upgrading in order to reach the 50% reduction target, not 20% of all cremations.*

In the event that the burden sharing scheme does not prove to be viable, DEFRA has stated that it will revert to the more conventional approach of securing the 50% reduction by requiring all crematoria above a certain size to fit mercury abatement, with exceptions where installation is demonstrably impossible because of space constraints or heritage considerations.

3.3.4 Institute of Cemetery & Crematorium Management (ICCM) Mercury Abatement Survey 2005

In June 2005, the ICCM contacted all UK crematoria to conduct a Mercury Abatement Survey following the noted legislation. 47 crematoria responded to the survey and the results were as follows:

- 15 crematoria intend to upgrade to achieve 100% abatement;
- 7 intend to upgrade to achieve 50% abatement;
- 1 intend to achieve 75% abatement; and
- 23 had made no firm decision at the time of the survey.

The ICCM concluded, that based on the above study, the abatement percentage within the sector is likely to be 65.8%

3.4 Market Analysis

3.4.1 UK Market Overview

The Cremation Society of Great Britain provides the following National Cremation Statistics for the UK:

Year	Operating Crematoria	New Crematoria	Deaths[13]	Cremations	%
1960	148	17	588,032	204,019	34.70
1970	206	2	638,834	353,957	55.41
1980	220	1	644,684	420,717	65.26
1990	225	0	629,629	438,066	69.58
2000	243	2	611,960	437,609	71.50
2006[14]	251	2	575,974+	416,881	72.38+

The figures above show a significant increase in the number of cremations over the last half century. It must also be noted that there has been a continual increase in cremations as a percentage of recorded deaths, with the most recent information suggesting that approximately 72% of deaths are cremated. There are 251 crematoria in the UK, with the following table showing the regions in the UK that carried out the highest number of cremations in 2006[15]:

[13] *Source: Office for National Statistics*
[14] *+ Provisional figures as at 6th March 2007*
[15] *Source: Cremation Society of Great Britain*

Region	No. of Crematoria	No. of Cremations[16]	Average no. cremations per crematorium
London	24	36,323	1,513
Scotland	25	33,946	1,358
West Midlands	12	21,792	1,816
Wales	13	19,880	1,529
Greater Manchester	13	19,485	1,499
Essex	8	15,924	1,991
Yorkshire West	11	15,574	1,416
Kent	8	12,901	1,613
Merseyside	6	12,317	2,053
Hampshire	4	10,600	2,650
[illegible]	[illegible]	[illegible]	[illegible]

In terms of a regional analysis, the table above shows that the City of Belfast Crematorium performed, on average, the 2nd highest average number of cremations per crematorium in the UK in 2006. The table illustrate the high performance of the City of Belfast Crematorium in comparison with crematoriums UK wide. In terms of the individual crematoria carrying out the highest number of cremations in 2006, the top ten in the UK carry out between 3,133 (Glasgow) and 3,933 (Portchester).

The main manufacturers and suppliers of crematoria abatement equipment to the UK are as follows:

Manufacturer	Country/Region
Facultatieve Technologies	England, Leeds
Furnace Constructions	England, Cheshire
J.G Shelton, Cremator Manufacturers	England, West Midlands
Cremation Technology International	England, Cheshire
DFW Group	Netherlands

3.4.2 Ireland Market Overview

At present there are four Crematoriums operating in the Republic of Ireland. These include:

- Glasnevin Cemetery & Crematorium;
- Newlands Cross Cemetery and Crematorium;
- Mount Jerome Crematorium; and
- The Island Crematorium.

All of the crematoria are privately operated and owned, with Cork indicating that they have an 80-seater chapel and carried out 500 cremations in its first full year of operation (2007).

3.4.3 Northern Ireland Market Overview

Whilst Roselawn is the only existing crematorium in Northern Ireland, there are plans for a privately operated crematorium to be located in a new 9,000 plot cemetery at the Woodlands Village site, on the Lisburn Road in Moira[17]. The proposed development is to feature two interdenominational chapels in a scheme featuring the following:

[16] *Provisional figures as at 6th March 2007*
[17] *Belfast Telegraph – Tuesday 12 February 2008*

- 30 acres of parkland;
- An ornamental lake;
- Wildflower meadows;
- Memorial garden; and
- 300 parking spaces.

The catchment area for the cemetery is largely encompassed by the Lisburn City Council area, where cemetery facilities are expected to close by 2014.

In their report and presentation to Lisburn City Council's Planning Committee, the consultants stated Roselawn Cemetery and Crematorium was 'massively overburdened' and suggested future difficulty in locating burial plots will lead to a rise in demand for cremation services.

In terms of the level of Northern Ireland population and death rate projections published by NISRA, it is expected that the death rate Northern Ireland from 2007 to 2030 will show fluctuation, with an overall estimated increase of 22.23% between 2008 and 2030.

Year	Population	No. of Deaths	Percentage Change	Death Rate[18]
2008	1,773,619	13,958	-	7.9
2010	1,799,483	13,925	-0.24%	7.7
2030	1,993,270	17,021	22.23%	8.5

Source: NISRA

This steady rise suggests there will be an increasing demand on Northern Ireland's burial and cremation facilities. The scope of this assignment precluded a detailed analysis of available burial facilities vis-à-vis cremation uptake. For the purposes of this assignment we have assumed an annual growth of 10%.

3.5 Benchmark Comparators to Roselawn Crematorium

Key suppliers of cremation equipment (Furnace Construction and Facultatieve Technologies) were asked to provide two examples of best practice crematoriums in the UK. The following table provides a comparison of the main attributes of the following four crematoriums:

	Owners	No. of cremator	Abatement equipment fitted	% abate	Signed to CAMECO	No. of chapels	Chapel Seats	2007 Level
Manchester	Private	4	√ - 4 single units	100%	√	2	160	2,000
Blakely	Council	3	√ - 1 single unit	50%	√	3	460	1,183
Haycombe	Council	2	√ - 1 double unit	100%	X	2	275	1,854
Coventry	Council	4	√ - 2 double units	100%	X	2	200	1,300
Belfast	**Council**	**4**	**X**	**TBC**	**TBC**	**1**	**100**	**2,599**

[18] *Death rate is defined as the number of deaths to total population in a specified community or area over a specified period of time. The death rate is expressed as the number of deaths per 1,000 of the population per year.*

Key points to note from the table include:

- In 2007, the City of Belfast Crematorium performed more cremations than any of the other crematoriums last year with a fewer number of chapels than all of the comparators;
- This lower level of chapel is reflected in the seating capacity - with the majority of crematorium offering chapels with varying capacity to accommodate more than one cremation and varying number of mourners. The crematorium operators felt that this provided them with flexibility and time to ensure that families are not too close together in the process;
- Three of the four crematoriums consulted with have opted for 100% abatement;
- Those crematoriums supplied by Facultatieve Technologies have double abatement units installed on their cremators allowing for 100% abatement, whilst Furnace Construction prefer to fit cremators with single abatement units; and
- Two crematoriums have signed up to the CAMEO burden sharing scheme, whilst the other two have decided not to sign up to the scheme as yet.

Further detail on key findings from consultations with the above crematoriums is provided in Section 3.8.

3.6 Consultations

3.6.1 Key Stakeholder Consultations

As part of the Economic Appraisal process, BDO Stoy Hayward conducted a series of in-depth consultations with the following key stakeholders.

Key Stakeholder	Commentary
Castlereagh Borough Council (CBC) – Environmental Health Service	• CBC regulates Roselawn Cemetery and Crematorium under Pollution Prevention and Control Regulations; • CBC issues Roselawn with a permit to operate under the regulations and inspects the Crematorium under the conditions of the permit; • The conditions of the permit are currently being reviewed for amendment to account for mercury abatement; • CBC has indicated that 50% abatement is expected as a minimum to comply with legislation but their preference would be 100% abatement. However, they do understand the huge cost implications to the Council; • CBC are not favourable of CAMEO (and no local abatement) as this fails to address the direct contribution of the crematorium to mercury pollution in Northern Ireland and the UK; • CBC stressed that mercury abatement compliance will be a condition within the new permit offered.
DOE - Environmental Policy Group	• It was agreed by the department that crematoria are regulated by the associated District Councils; • The crematorium has an obligation to meet the requirements stipulated in the permit issued by Castlereagh Borough Council. This permit should reflect the Process Guidance notes i.e. PG 5/2 (Version 2) issued by the DOE; • Supportive of local abatement; • 100% abatement is a positive step forward but the legal requirement is 50% abatement.
Planning Service	• Within BMAP, Crossnacreevy / Ryan Park are identified as Local Landscape Policy Area's i.e. CSY03 and CSY 04. Those features, or the combination of features, that contribute to the environmental quality, integrity or character of this area are listed below: - **Area of local amenity importance** – Roselawn Cemetery and its associated landscape contributes to the setting of the settlement, and includes significant vegetation and watercourses, making it an important local nature area; and

Key Stakeholder	Commentary
	- **Locally significant buildings and their surroundings** – Chapel and Crematorium. • Within this context the Crematorium makes a contribution the quality of the area; • Cannot identify any outstanding statutory burdens/hurdles that will prevent the development of the crematorium and associated buildings. The buildings are not listed by the EHS; • The Crematorium is located in a 'Greenbelt' area. There is a presumption against building in Greenbelt locations. This would be the overarching constraint. However, no real issues that would prevent the building of a second chapel; • **The Crematorium must demonstrate the need for redeveloping the existing facility. A case must be put forward to the Planning Service on the basis of anticipated demand;** • Issues may need to be addressed in terms of existing and anticipated future levels of pollutants. The level of pollutants may attract the need for an environmental assessment. All environmental issues will need addressed with all relevant stakeholders being consulted; • Given the location and context no major planning problems are envisaged. However like any proposal the Planning Service will require information around the associated impacts of any such development; and • Belfast City Council has submitted a planning application for the extension of Roselawn Cemetery. The application is currently being processed and reviewed by the Planning Service. Given the location and context no major planning problems are envisaged. The Planning Service will consult with all relevant stakeholders i.e. EHS, Roads Service, Water Service, etc.
DHSSPS - Chief Environmental Health Officer	• Remit to advise on policy and legislative issues with regards to environmental health; • Support local abatement as opposed to burden sharing. Would want to see all mercury abatement falling within legal limits i.e. 50%; • Ideally would support zero emissions i.e. 100% mercury abatement. However could not advise on what level of abatement equipment should be introduced without seeing cost – benefit analysis; and • Fully supportive of local abatement that complies with stipulated emission standards.
EHS – Pollution Prevention (Water)	• Remit as pollution prevention practitioners is to prevent poisonous chemicals such as mercury being discharged into water; • Driven by Environmental Quality Standards to manage and control pollution issues around water; • Fully supportive of local abatement. If mercury is being discharged then the issue should be addressed immediately; and • If the abatement equipment is being installed then it would be in the best interests of pollution prevention to go for 100% abatement.
EHS – Industrial Pollution	• Fully supportive of local abatement; • Supportive of 100% mercury abatement although only 50% will be required by legislation; • Crematorium is obliged to meet the requirements of the permit issued by CBC. This permit must reflect the process guidance notes issued by Defra; and • Defra will await the outcomes of 2012 deadline and CAMEO scheme. If these fail to work it may be a legal requirement for all crematoria to abate.
Manchester Crematorium	• Privately owned crematorium. Currently operate four Furnace cremators. All cremators are fitted with individual abatement units i.e. 100% abatement – financed through a bank loan; • One of the first crematoriums to go ahead with the installation of mercury abatement equipment; • Rationale for installation – as mercury abatement will be a requirement they wanted to be one of the first crematoriums to have the equipment installed before there is a major rush to meet the deadline i.e. There will be high demand coming up to the deadline but there are limited suppliers available; • Have signed up to CAMEO scheme and will expect returns due to their 100% abatement; • During downtime of mercury abated cremators (i.e. 0.01%) will operate one non-

Key Stakeholder	Commentary
	abated cremator –very rare; • Used Furnace Construction for installation of mercury abatement equipment as they had originally fitted the cremators at Manchester Crematorium. All crematoriums will fit mercury abatement equipment from the firm that supplied their cremators – industry trend; • Two Chapels available – Larger older Chapel (100 seats) and smaller new chapel (60 seats); • Carried out circa 2,000 cremations in 2007. The number of cremations has halved in the last ten years; • Only capacity issues are around car parking – limited car parking space available.
Blakely Crematorium	• Council owned crematorium. Currently operate 3 Furnace cremators. Currently installing one mercury abatement unit to cremator number one. Intention is to carry out 80% of cremations on the abated cremator that will satisfy the 50% requirement. Informed that abatement equipment can be switched to cremator number 2 if needed; • Opted for 50% mercury abatement due to legislative requirements and financial restrictions, with view of moving to 100% in the future; • Carried out 1,183 cremations in 2007. Not that busy in comparison to other crematoriums in the area. Steep competition in the Greater Manchester Area; • Rationale for installation – Manchester wanted to lead the way in terms of installation of the equipment; • Three Chapels available (all constructed 1957) – Larger Chapel (300 seats) and two smaller chapels (circa 80 seats each) i.e. full capacity 460 seats. Allows greater flexibility i.e. can work between different Chapels when required; • Used Furnace Construction for installation of mercury abatement equipment as they had originally fitted the cremators. Very good service offered; • Only capacity issues are around car parking – limited car parking space available; • Have signed up to CAMEO scheme; and • Operate a flexible working team – Maintenance, Crematorium staff and Gravediggers are all part of a flexible working team. Offered 6.7% flexibility pay to do 13 weekends or late nights to cope with busy times. Allows them to operate 8am – 7pm when required. Currently do not operate at the weekends.
Haycombe Crematorium, Bath	• Council owned crematorium. Currently operate two Facultatieve cremators. Have one double abatement unit that serves the two cremators. i.e. 100% abatement; • First local authority to have 100% abatement and associated equipment installed; • Previously had two Furnace cremators. One cremator broke down continuously. Decided to opt for Facultatieve. Very happy with quality and service; • Two Chapels available – Larger Burial Chapel (200 seats) and smaller cremation associated chapel (circa 75 seats). Allows greater flexibility i.e. can work between different Chapels when required. Offer discounts for larger cremation congregations to use the larger chapel – caters for larger congregations, prevents need for overflow rooms; • 1,854 cremations carried out in 2007; • Have not signed up to CAMEO i.e. burden sharing. Do not see the benefit in signing up as yet as they will not reap financial returns until closer to 2012, when all crematoriums are obliged to have processes set in place i.e. 50% abatement or burden share.
Coventry Crematorium	• Council owned crematorium. Currently installing four Facultatieve cremators. Have two double abatement unit that serves the four cremators. i.e. 100% abatement; • Previously had two Furnace cremators. One cremator broke down continuously. Decided to opt for Facultatieve. Very happy with quality and service; • Two Chapels available – Larger Chapel (120 seats) and smaller chapel (circa 80 seats). Allows greater flexibility i.e. can work between different Chapels when required and suit preferences; • 1,300 cremations carried out in 2007; • Installed mercury abatement equipment to adhere to upcoming legislation. Old cremators had come to end of useful life. So when the decision came to replace them it was decided that it was in the best interests of the crematorium to opt for 100% abatement as it would be a requirement sometime down the line – "made sense." • Have not signed up to CAMEO i.e. burden sharing. Do not see the benefit in

Key Stakeholder	Commentary
	signing up as yet but will be open to suggestions in the future when the scheme is finalised and financial rewards are apparent.
The Island Crematorium, Cork	• Crematorium opened December 2006. Only one cremator in operation at present; • The building which houses the crematorium was constructed in 1808 i.e. 200 years old; • Circa 500 cremations carried out during 14 months of operation; • No abatement equipment installed on cremator. Advised by manufacturers (Facultatieve Technologies) that it would be cost effective to have the abatement equipment fitted along with the installation of a second cremator i.e. install a double abatement unit onto the two cremators; • Provision for second cremator should occur within the next five years depending on demand; • Proposed new crematorium in Limerick (80 miles away) will increase competition and may curb demand; • One Chapel on site (now referred to as 'spiritual space'. Accommodates 80 people (seating) • Crematorium still on learning curve in relation to the requirement of abatement equipment. Aware that OSPAR will may require 100% abatement by 2020. The installation of abatement equipment with the proposed second cremator will satisfy these requirements;

3.6.2 Site Visit Consultation

As part of the appraisal process BDO Stoy Hayward carried out a site visit at the City of Belfast Crematorium and conducted an in-depth consultation with the following key stakeholders:

- Belfast City Council Cemeteries and Crematorium Manager;
- City of Belfast Crematorium Chapel Attendant; and
- Furnace Construction Representative.

The consultation centred on building usage & constraints; operational considerations; and future requirements. The key findings from the site visit and consultation are presented in the table below:

Issue	Consultation findings
Building Usage & Constraints	• Average attendance at chapel service and cremation is in excess of 100 persons, with the current capacity being 100 seated; • Normal burial attendances are approximately 30-40 persons; • Noted instances of people in chapel having to stand in outside hall, corridor and overflow into coffee room to create capacity; • Chapel usage consists of approximately 50% committal service (10 mins) and 50% full service (30 mins) – as evidenced by organ use; • The main limiting factor in the crematorium is the lack of chapel space – with the current facility being too small and often being used in back to back sessions. This is not ideal for families who have to see people ahead of them and after them in what is almost like a "conveyor belt"; and • Approximately 65% of cremated remains are taken away from Crematorium for personal burial and 35% remain within Roselawn Cemetery.
Operational Considerations	• The option of a larger Chapel for full service with ancillary spaces was proposed; • Cultural considerations - Expectations in Northern Ireland for three-day turnaround from time of death to burial, compared to 7-10 days in rest of UK – cultural issue puts pressure on Crematorium; • Currently using makeshift storage/holding area for bodies in insufficient storage room – not as intended; • Current Chapel and Crematorium was rewired, and new PVC windows fitted 3-4 years ago. Council spent circa £250k;

Issue	Consultation findings
	• Any new build option must take into consideration an underground linkage from Chapel to cremators. Any new linkage to cremators will result in a decrease in existing storage; and • Outdoor capacity needed for mercury abatement equipment as well an internal modifications (abatement equipment will be approximately the same size as the cremator i.e. 100% increase in space required for abatement equipment for each cremator).
Future Requirements	• Implementation issues – a good method was previously deployed whereby two cremators were operational at all times; and • Door frame of existing Chapel will need heightened and steps removed to comply with DDA requirements. Will also need to apply to any new build.

3.7 Additionality

A project should not receive assistance if the project objectives would be achieved without the public expenditure. In general assisted projects should receive only the minimum assistance required to bring them about, with any excess over the amount referred to as 'dead-weight'.

Additionality is not solely a matter of a project being pursued or not but often partial in the sense that without assistance:

- The project may have been carried out in another location of some lower priority;
- The same project may be carried out later; and
- A different project may be carried out or the same project on a smaller scale or to a lower standard of quality.

In consideration of these points additionality is not considered to be an issue for this project.

3.8 Conclusion to Assessment of Need

The Assessment of Need has shown that there is a need to remove mercury from the crematorium's output from the cremation of bodies. Whilst it is acknowledged that the level of mercury emissions will naturally fall away following the removal of mercury infused fillings, there is a short to medium term need to remove mercury before it is released into the environment.

Whilst the decision to abate or follow CAMEO is discussed further in the report, it is noted that many local stakeholders expect abatement to at least 50% in order to reduce the impact of cremation on the local environment. The decision as whether to abate further than the 50% is based on a consideration of costs and benefits, which is discussed in the remaining sections of the report.

The site visit and benchmarking exercise indicated support for the implementation of a second chapel of a different size to the existing 100-seater chapel. The second chapel (and ancillary facilities) would improve scheduling and enable greater numbers of cremations to be held in the future. The analysis of the current and predicted levels of cremations (assuming 10% growth per annum) shows that the current capacity of Roselawn (3,100 cremations per annum) will be exceeded in 2010. In order to address the capacity issues the limiting factors, staffing and chapel availability, should be addressed by the Council.

4 OBJECTIVES AND CONSTRAINTS

4.1 Introduction

An important part of the Economic Appraisal process is the determination of the objectives of the project. This section considers the assessment of need and the strategic policies of Belfast City Council to derive specific project objectives. The section will also consider the potential project constraints that could impact upon the project.

4.2 Belfast City Council Aims and Objectives

The Council, in its Corporate Plan 2007 – 2008, outlines its overall vision for the period. The Council sees Belfast as:

> *"A modern and welcoming city with a quality of life to rival the best in the world."*

The activities in the Plan are focused around three key areas:

- Improving quality of life, now and for future generations
- Providing leadership and strategic direction for shaping, developing and managing the city
- Meeting the needs of local people through the effective delivery of quality, customer-focused services

Within the Corporate Plan the Council states that a priority of the Council is to 'manage and maintain the City of Belfast Crematorium'.

4.3 Project Specific Objectives

The overall project objective is to "continue to offer freedom of choice for families of bereaved persons in Northern Ireland through the operation of a crematorium at Roselawn Cemetery."

4.4 SMART Objectives

The project objectives should, as far as possible be SMART (specific, measurable, achievable, realistic and time bound).

	SMART Objectives
1	To meet the minimum mercury abatement requirements by 2012
2	To pay cognisance to OSPAR guidance and future requirements i.e. 100% abatement by 2020
3	To optimise the ability of Council to meet the expected cremation needs of Belfast and Northern Ireland through the requisite building requirements
4	To provide a value for money service offering, with a pricing policy that reflects the cost of cremation to the end user by 2009

4.5 Project Constraints

This section of the report aims to identify any key issues or constraints that have the potential to impact on the proposed project. The main issues or potential constraints identified with the project are as follows:

4.5.1 Legislative Changes

The decision making power as to the imposition of legislation relating to crematoriums rests with the central UK government and the DOE in Northern Ireland. As a crematorium operating within the UK, the Council-operated facility must adhere to any such legislation and best practice guidance.

4.5.2 Private Sector Investment

As detailed in Section 3, there has been an interest expressed by the private sector to provide crematorium facilities and services in Northern Ireland i.e. Moira. This appraisal is constrained by the lack of information available on the impact of any such offering on the throughput of the crematorium at Roselawn.

4.5.3 Capacity / Projected Uptake of Cremations

Regardless of trends in mainland UK, where cremations account for a significantly higher proportions of disposals, the experience in Northern Ireland appears to be specific to the region, with uptake much lower. There is no information available from Council to explain this difference and as such, although growth is expected, the level of growth and drivers for change have not been stipulated.

The four cremators installed at Roselawn have the potential additional capacity, if working hours/opening hours are extended, to accommodate expected future growth. However the limiting factor / constraint in attaining increased capacity / throughput is the availability of the chapel, ancillary areas and resourcing.

4.5.4 Funding

As with any project, funding is a constraint. Without secured funding, this project will move forward in the proposed format or timeframe.

4.5.5 Review of Public Administration

If the RPA outcomes are implemented as recently reported, Belfast City Council will continue to be in existence post 2011. Therefore, whilst there is likely to be limited impact directly on the Council, there may well be a knock-on effect from the proposed reduction in the number of Councils.

Discussion with Belfast City Council Parks and Cemeteries Staff suggested that the impact could be that other Northern Ireland Councils take the decision to implement a crematorium in their Council area, which will benefit from larger catchment areas and populations, as well as offering a local facility to the ratepayers therein.

This would have a negative impact on the payback period for any major investment decisions to be undertaken by Council, reducing the viability of an enlarged facility at Roselawn.

5 IDENTIFICATION OF OPTIONS

5.1 Introduction

Based on the strategic fit, aims and objectives of the proposed investment, BDO Stoy Hayward has identified a number of 'Do Something' options. A 'Status Quo' option has also been included in line with current appraisal guidance, as this provides an auditable base case against which other options may be evaluated. This section therefore considers options around the following parameters:

- Benchmark Option i.e.' Status Quo' option;
- Variation in the infrastructure of the Crematorium;
- Variation in the equipment of the Crematorium; and
- Variation in mercury abatement at the Crematorium.

A combination of the above is then drawn together to develop a comprehensive long-list of options. Each option is preliminarily scored against the objectives outlined in Section Four in order to compile a short-list of options which are then subjected to in-depth appraisal.

5.2 Potential Options

5.2.1 Benchmark Option

"Green Book" guidance requires that options selected for in-depth appraisal should include an option which may be used as a benchmark against which to appraise other options. This usually takes the form of a "Do Nothing" or "Do Minimum" option. In this case the "Do Nothing" option, which would maintain the status quo, whereby there is no abatement of mercury or any involvement in an abatement scheme such as CAMEO. This option involves the crematorium continuing to operate four cremators with the one existing associated chapel.

Notably this option will not meet legislative requirements, nor does it recognise the adverse impact of releasing mercury into the atmosphere. The likely consequence of this option is the closure of the Crematorium following the loss of its operating license.

5.2.2 Infrastructure Options

Variations under this option are as follows:

- Continue to operate the facility with one chapel; and
- Introduction of an additional chapel.

The Assessment of need concluded that, for the level of equipment available (i.e. four cremators), the crematorium is underrepresented in the level of ancillary facilities, as evidenced through stakeholder consultations, benchmarking of comparable facilities and the site visit findings. For the purpose of value for money, both options are taken forward.

5.2.3 Equipment Options

Options open to the Council under this option are as follows:

- Operate the facility with a reduced number of cremators;
- Continue to operate the facility with four cremators; and

- Purchase and operate additional cremators in addition to the existing four cremators (with the additional cremators having mercury abatement equipment within their specification).

5.2.4 Mercury Abatement Options

Options open to the Council under this option are as follows:

- Dispose of existing cremators and purchase and operate four new cremators with mercury abatement equipment within their specification;
- Disregard the installation of abatement equipment and take part in CAMEO Scheme i.e. burden sharing;
- Install abatement equipment to two of the four cremators to facilitate 50% abatement; and
- Install abatement equipment to all four cremators to facilitate 100% abatement.

5.3 Identification of Options

Each option is assessed in the context of whether its anticipated effect will satisfy the principal objectives or violate important constraints, and the extent to which same will satisfy/violate the screening criteria, to determine which options will be short-listed for in depth appraisal.

5.3.1 Rejected Options

With a multitude of options available, it has been decided that the following options be rejected and will not be carried forward:

- *Operate the facility with a reduced number of cremators* - This option has not been taken forward for in-depth appraisal as it prohibits the Crematorium from satisfying public demand for cremation services, and facilitating the expected future growth in the number of cremations in Northern Ireland. A reduced number of cremators will also prevent flexible working practices at the Crematorium i.e. switching between cremators during busy periods;

- *Purchase and operate additional cremators in addition to the existing four cremators (with the additional cremators having mercury abatement equipment within their specification)* - This option has not been carried forward as the four existing cremators in operation are suffice to satisfy public demand for cremation services, and to facilitate the expected future growth in the number of cremations in Northern Ireland. There are also major cost implications associated with the installation of new cremators, as well as capacity issues within the grounds of the existing crematorium; and

- *Dispose of existing cremators and purchase and operate four new cremators with mercury abatement equipment within their specification* - This option has not been taken forward for in-depth appraisal as the Crematorium had four new cremators installed only four years ago. The existing cremators have an expected useful life of 15 years with only four years lapsed so far. The Crematorium staff indicate that there are no issues with the existing equipment or support provided by the current suppliers. The current suppliers have also indicated that there are no additional costs associated with a retrofit i.e. Furnace abatement equipment installed onto Furnace cremator.

5.3.2 Shortlisted Options

In cognisance of the above sifting and short-listing of options, the following combined options have been developed to satisfy the principal project objectives. The proposed options have now been allocated numbers are detailed below:

Option 1 – Status Quo – Benchmark Option

This option involves the Crematorium maintaining the status quo i.e. continuing to operate with one chapel facility and the existing four cremators, with no abatement of mercury taking place, and no involvement in an abatement burden sharing scheme such as CAMEO.

Notably this option will not meet legislative requirements, nor does it recognise the adverse impact of releasing mercury into the atmosphere. The likely consequence of this option is the foreclosure of the Crematorium following the loss of its operating license.

Option 2 – One chapel facility, four cremators, with no mercury abatement i.e. participation in burden sharing scheme

This option involves the Crematorium continuing to operate with one chapel facility and the existing four cremators. Within this option no mercury abatement will be fitted, however, the Crematorium will participate in a burden sharing scheme with other UK based crematoria.

Option 3 – One chapel facility, four cremators with 50% mercury abatement

This option involves the Crematorium continuing to operate with one chapel facility and the existing four cremators. Mercury abatement equipment will be fitted to two of the four cremators.

Option 4 - One chapel facility, four cremators with 100% mercury abatement

This option involves the Crematorium continuing to operate with one chapel facility and the existing four cremators. Mercury abatement equipment will be fitted to four cremators.

Option 5 - Two chapel facilities, four cremators, with no mercury abatement i.e. participation in burden sharing scheme

This option involves the Crematorium operating with two chapel facilities and the existing four cremators. Within this option no mercury abatement will be fitted, however, the Crematorium will participate in a burden sharing scheme with other UK based crematoria.

Option 6 - Two chapel facilities, four cremators with 50% mercury abatement

This option involves the Crematorium operating with two chapel facilities and the existing four cremators. Mercury abatement equipment will be fitted to two of the four cremators.

Option 7 - Two chapel facilities, four cremators with 100% mercury abatement

This option involves the Crematorium operating with two chapel facilities and the existing four cremators. Mercury abatement equipment will be fitted to four cremators.

5.4 Conclusion

As a result of the appraisal process so far and in light of HM Treasury Guidance the following options will be carried forward:

Option	Description
One	Status Quo – Benchmark Option
Two	One chapel facility, four cremators in operation, with no mercury abatement i.e. participation in burden sharing scheme
Three	One chapel facility, four cremators with 50% mercury abatement
Four	One chapel facility, four cremators with 100% mercury abatement
Five	Two chapel facilities, four cremators in operation, with no mercury abatement i.e. participation in burden sharing scheme
Six	Two chapel facilities, four cremators with 50% mercury abatement
Seven	Two chapel facilities, four cremators with 100% mercury abatement

6 MONETARY ASSESSMENT

6.1 Introduction

Each option being considered must be assessed from a monetary prospective to ascertain the impact on the economy as a whole. Costs and Revenues will be evaluated as to accuracy, timeliness and reasonableness, and ranked according to the most beneficial monetarily.

While we are primarily concerned with the costs and benefits that affect the economy as a whole, some of these may be difficult to measure in monetary terms. The financial cost of something may not reflect its true cost to the economy. While the economic projections consider the true economic cost of each option, they do not include a monetary assessment of the non-monetary impacts. These are considered separately in Section Eight below.

At present a design team is not in place and consequently potential designs are not available. Any capital build and fit out costs have been provided by Council staff, whilst equipment costs are based on indicative costs provided by two suppliers (Furnace Construction and Facultatieve Technologies).

6.2 Assumptions

The following table, provided by ICCM, provides the basis for the cost section.

Description	Facultatieve	DEW	Shelton	Furnace
Approx. Space Requirements (air blast units - external)	Order Time – approx 3mths Installation – 2 to 6 wks	Order Time – approx 3mths Installation – 2 to 6 wks	Order Time – approx 3mths Installation – 2 to 6 wks	Order Time – approx 3mths Installation – 2 to 6 wks
Single Unit (length x width x height)	8550x5000x3700	6500x5000x4500	8550x5000x3700	4500x4500x3500
Double Unit (length x width x height)	Double single size or where roof space is 5m+ 9300x5000x5000	Double single size or where roof space is 5m+ 9300x5000x5000	Double single size or where roof space is 5m+ 9300x5000x5000	Prefer to install one unit per cremator. Will discuss other requirements
Triple Unit (length x width x height)	Treble single size or where roof space is 4.5m+ 11700x6000x4500	Treble single size or where roof space is 4.5m+ 11700x6000x4500	Treble single size or where roof space is 4.5m+ 11700x6000x4500	Prefer to install one unit per cremator. Will discuss other requirements
Single Unit	£250k	£250k	£250k	**£250k**
Double Unit	£380k	£380k	£380k	**£380k**
Triple Unit	£425k	£425k	£425k	**£425k**

We have assumed that the cost of abatement equipment for two and four machines is £500,000 and £1m respectively. Infrastructure and preparatory costs are estimated by Council staff at £500,000. It is also assumed that an additional chapel will cost £2,000,000[19], to be implemented in Year 3.

Additional costs above the current operating costs of the facility (as set out in Section 1.2.2.3) are as follows:

- Increased utility costs by £2,000 per abatement equipped cremator per annum;
- Mercury testing cost of £1,000 per annum;

[19] *Based on quotation supplied by Council Staff*

- Burden sharing certificates will have a market value of £35 each, with all excess or requisite certificate being traded fairly through CAMEO;
- The pricing policy for the services provided will be increased by £35 per cremation across the various categories;
- The level of cremations will increase by 10% per annum for the next two years to full capacity of 3,100 cremations per annum (see Para 3.4.3);
- There will be an additional maintenance charge of £15 per cremation per abated cremator, assuming that the level of cremations is evenly spread over the four cremators[20];
- There is no opportunity cost associated with the various options.
- The level of increase in cremation costs varies by option with the premise being that an additional chapel will add an additional £20 and abatement equipment (regardless of the percentage abatement) will add an additional £17.50 per cremation.
- Additional staff will be required for the operation of a second chapel. The Crematorium manager advises that this should include one additional chapel attendant and one additional crematorium technician. Additional staff costs of £50,000 per annum have been assumed, to begin in Year 4.

6.3 Option One - Status Quo – Benchmark Option

There are no costs associated with this option except replacement of the existing cremators in ten years time (2018/19) at a cost of £550,000. However, owing to the fact that the facility would not attain accreditation, the capital costs, operating costs and income would be nil.

6.4 Option Two – One chapel facility, four cremators with no mercury abatement

6.4.1 Capital Costs

These are no capital costs associated with this option except the replacement costs of the cremators and capital works on the building as follows:

Cost Category	Cost £	Timing
Chapel Overhaul	250,000	Year 15
Replacement Cremators	550,000	Year 10

6.4.2 Annual Operating Costs

Operating Expenses	Year 0	Year 1	Year 2	Year 3 onwards
Salaries & Wages	£100,139	£100,139	£100,139	£100,139
Training	£2,440	£2,440	£2,440	£2,440
Utilities	£64,043	£64,043	£64,043	£64,043
Repair & Maintenance	£63,296	£63,296	£63,296	£63,296
Cleaning	£760	£760	£760	£760
Insurances	£1,047	£1,047	£1,047	£1,047
Consumables & Equipment	£56,251	£56,251	£56,251	£56,251
Professional fees	£36,824	£36,824	£36,824	£36,824
Printing and Stationery	£4,546	£4,546	£4,546	£4,546
Recharge	£285,724	£285,724	£285,724	£285,724
Marketing	£1,548	£1,548	£1,548	£1,548

[20] *In practice, the abated cremators would be used in preference over non-abated cremators, thereby increasing the percentage of abated cremations above the 50% target.*

Operating Expenses	Year 0	Year 1	Year 2	Year 3 onwards
Subscriptions	£845	£845	£845	£845
Depreciation	£105,670	£105,670	£105,670	£105,670
CAMEO Cremation Certificates	-	-	£54,250	£54,250
Other	£5,685	£5,685	£5,685	£5,685

6.4.3 *Income*

Income	Year 1	Year 2	Year 3 onwards
Fees & Charges	£915,504	£1,007,055	£1,091,563
Café Franchise	£1,200	£1,200	£1,200
Other	£382	£382	£382

6.5 Option Three – One chapel facility, four cremators with 50% mercury abatement

6.5.1 *Capital Costs*

Cost Category	Cost £	Timing
Chapel Overhaul	250,000	Year 15
Replacement Cremators	550,000	Year 10
50% Abatement[21] (includes professional fees, utility upgrades, contingency & disruption costs)	1,000,000	Immediate & Year 15

6.5.2 *Annual Operating Costs*

Operating Expenses	Year 0	Year 1	Year 2	Year 3 onwards
Salaries & Wages	£100,139	£100,139	£100,139	£100,139
Training	£2,440	£2,440	£2,440	£2,440
Utilities	£68,043	£68,043	£68,043	£68,043
Repair & Maintenance	£82,796	£84,746	£86,546	£86,546
Cleaning	£760	£760	£760	£760
Insurances	£1,047	£1,047	£1,047	£1,047
Consumables & Equipment	£56,251	£56,251	£56,251	£56,251
Professional fees	£36,824	£36,824	£36,824	£36,824
Printing and Stationery	£4,546	£4,546	£4,546	£4,546
Recharge	£285,724	£285,724	£285,724	£285,724
Marketing	£1,548	£1,548	£1,548	£1,548
Subscriptions	£845	£845	£845	£845
Depreciation	£172,337	£172,337	£172,337	£172,337
Mercury Testing	£1,000	£1,000	£1,000	£1,000
Other	£5,685	£5,685	£5,685	£5,685

[21] *Based on quotation supplied by Council Staff*

6.5.3 Income

As Option Two.

6.6 Option Four – One chapel facility, four cremators with 100% mercury abatement

6.6.1 Capital Costs

Cost Category	Cost £	Timing
Chapel Overhaul	250,000	Year 15
Replacement Cremators	550,000	Year 10
100% Abatement[22] (includes professional fees, utility upgrades, contingency & disruption costs)	1,500,000	Immediate & Year 15

6.6.2 Annual Operating Costs

Operating Expenses	Year 0	Year 1	Year 2	Year 3 onwards
Salaries & Wages	£100,139	£100,139	£100,139	£100,139
Training	£2,440	£2,440	£2,440	£2,440
Utilities	£72,043	£72,043	£72,043	£72,043
Repair & Maintenance	£102,296	£106,196	£109,796	£109,796
Cleaning	£760	£760	£760	£760
Insurances	£1,047	£1,047	£1,047	£1,047
Consumables & Equipment	£56,251	£56,251	£56,251	£56,251
Professional fees	£36,824	£36,824	£36,824	£36,824
Printing and Stationery	£4,546	£4,546	£4,546	£4,546
Recharge	£285,724	£285,724	£285,724	£285,724
Marketing	£1,548	£1,548	£1,548	£1,548
Subscriptions	£845	£845	£845	£845
Depreciation	£205,670	£205,670	£205,670	£205,670
Mercury Testing	£1,000	£1,000	£1,000	£1,000
CAMEO Certificates	£Nil	£Nil	(£54,250)	(£54,250)
Other	£5,685	£5,685	£5,685	£5,685

6.6.3 Income

As Option Two.

6.7 Option Five – Two chapel facilities, four cremators with no mercury abatement

6.7.1 Capital Costs

Cost Category	Cost £	Timing
Chapel Overhaul	250,000	Year 15
Replacement Cremators	550,000	Year 10
Second chapel[23] (includes infrastructure adjustments, wreath display, waiting area & ancillary rooms)	2,000,000	Year 3

[22] *Based on quotation supplied by Council Staff*
[23] *Based on quotation supplied by Council Staff*

6.7.2 *Annual Operating Costs*

Operating Expenses	Year 0	Year 1	Year 2	Year 3	Year 4 onwards
Salaries & Wages	£100,139	£100,139	£100,139	£100,139	£150,139
Training	£2,440	£2,440	£2,440	£2,440	£2,440
Utilities	£64,043	£64,043	£64,043	£64,043	£64,043
Repair & Maintenance	£63,296	£63,296	£63,296	£63,296	£63,296
Cleaning	£2,760	£2,760	£2,760	£2,760	£2,760
Insurances	£1,047	£1,047	£1,047	£1,047	£1,047
Consumables & Equipment	£56,251	£56,251	£56,251	£56,251	£56,251
Professional fees	£36,824	£36,824	£36,824	£36,824	£36,824
Printing and Stationery	£4,546	£4,546	£4,546	£4,546	£4,546
Recharge	£285,724	£285,724	£285,724	£285,724	£285,724
Marketing	£1,548	£1,548	£1,548	£1,548	£1,548
Subscriptions	£845	£845	£845	£845	£845
Depreciation	£185,670	£185,670	£185,670	£185,670	£185,670
CAMEO Certificates	£Nil	£Nil	£54,250	£54,250	£54,250
Other	£5,685	£5,685	£5,685	£5,685	£5,685

6.7.3 *Income*

Income	Year 1	Year 2	Year 3 onwards
Fees & Charges	£922,004	£1,014,205	£1,099,313
Café Franchise	£1,200	£1,200	£1,200
Other	£382	£382	£382

6.8 Option Six – Two chapel facilities, four cremators in operation, with 50% mercury abatement

6.8.1 *Capital Costs*

Cost Category	Cost £	Timing
Chapel Overhaul	250,000	Year 15
Replacement Cremators	550,000	Year 10
50% Abatement[24] (includes professional fees, utility upgrades, contingency & disruption costs)	1,000,000	Immediate & Year 15
Second chapel[25] (includes infrastructure adjustments, wreath display, waiting area & ancillary rooms)	2,000,000	Year 3

[24] *Based on quotation supplied by Council Staff*
[25] *Based on quotation supplied by Council Staff*

6.8.2 *Annual Operating Costs*

Operating Expenses	Year 0	Year 1	Year 2	Year 3	Year 4 onwards
Salaries & Wages	£100,139	£100,139	£100,139	£100,139	£150,139
Training	£2,440	£2,440	£2,440	£2,440	£2,440
Utilities	£68,043	£68,043	£68,043	£68,043	£68,043
Repair & Maintenance	£82,796	£84,746	£86,546	£86,546	£86,546
Cleaning	£2,760	£2,760	£2,760	£2,760	£2,760
Insurances	£1,047	£1,047	£1,047	£1,047	£1,047
Consumables & Equipment	£56,251	£56,251	£56,251	£56,251	£56,251
Professional fees	£36,824	£36,824	£36,824	£36,824	£36,824
Printing and Stationery	£4,546	£4,546	£4,546	£4,546	£4,546
Recharge	£285,724	£285,724	£285,724	£285,724	£285,724
Marketing	£1,548	£1,548	£1,548	£1,548	£1,548
Subscriptions	£845	£845	£845	£845	£845
Depreciation	£252,337	£252,337	£252,337	£252,337	£252,337
Mercury Testing	£1,000	£1,000	£1,000	£1,000	£1,000
Other	£5,685	£5,685	£5,685	£5,685	£5,685

6.8.3 *Income*

Income	Year 1	Year 2	Year 3 onwards
Fees & Charges	£967,504	£1,064,255	£1,153,563
Café Franchise	£1,200	£1,200	£1,200
Other	£382	£382	£382

6.9 Option Seven – Two chapel facilities, four cremators with 100% mercury abatement

6.9.1 *Capital Costs*

Cost Category	Cost £	Timing
Chapel Overhaul	250,000	Year 15
Replacement Cremators	550,000	Year 10
100% Abatement[26] (includes professional fees, utility upgrades, contingency & disruption costs)	1,500,000	Immediate & Year 15
Second chapel[27] (includes infrastructure adjustments, wreath display, waiting area & ancillary rooms)	2,000,000	Year 3

[26] *Based on quotation supplied by Council Staff*
[27] *Based on quotation supplied by Council Staff*

6.9.2 *Annual Operating Costs*

Operating Expenses	Year 0	Year 1	Year 2	Year 3	Year 4 onwards
Salaries & Wages	£100,139	£100,139	£100,139	£100,139	£150,139
Training	£2,440	£2,440	£2,440	£2,440	£2,440
Utilities	£72,043	£72,043	£72,043	£72,043	£72,043
Repair & Maintenance	£102,296	£106,196	£109,796	£109,796	£109,796
Cleaning	£2,760	£2,760	£2,760	£2,760	£2,760
Insurances	£1,047	£1,047	£1,047	£1,047	£1,047
Consumables & Equipment	£56,251	£56,251	£56,251	£56,251	£56,251
Professional fees	£36,824	£36,824	£36,824	£36,824	£36,824
Printing and Stationery	£4,546	£4,546	£4,546	£4,546	£4,546
Recharge	£285,724	£285,724	£285,724	£285,724	£285,724
Marketing	£1,548	£1,548	£1,548	£1,548	£1,548
Subscriptions	£845	£845	£845	£845	£845
Depreciation	£285,670	£285,670	£285,670	£285,670	£285,670
Mercury Testing	£1,000	£1,000	£1,000	£1,000	£1,000
CAMEO Certificates	£Nil	£Nil	(£54,250)	(£54,250)	(£54,250)
Other	£5,685	£5,685	£5,685	£5,685	£5,685

6.9.3 *Income*

As Option Six.

7 RISK APPRAISAL & OPTIMISM BIAS ADJUSTMENT

7.1 Introduction

Risks associated with any project are a combination of project specific risks and those on a wider macro-economic scale. Project specific risks are those that directly affect the project and which the project promoters should have a high level of knowledge and associated level of control over (e.g. recurrent/running costs). Wider macro-economic/local risks are those that are beyond the control of project promoters yet can significantly influence the success of the project (e.g. economic climate). The following risks (including Optimism Bias) have been identified and outlined below as to their possible effect on the various options.

7.2 Potential Risks and Uncertainties

The following table provides details of any potential risks and whether the level of risk is low, medium or high for each option.

Risk	Level of Risk (high, medium or low)						
	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Changes in Legislation	High	Medium	Medium	Low	Medium	Medium	Low
Time Slippage	High	High	Medium	Low	High	Medium	Low
Robustness of Costs	Low	Low	Medium	Medium	High	High	High
Insufficient Funding	Low	Low	Low	Medium	High	High	High
Increased Competition	Low	Low	Medium	Medium	High	High	High
Environmental Impact – S/T	Low	Low	Medium	Medium	High	High	High
Environmental Impact – L/T	High	High	Medium	Low	High	Medium	Low

7.2.1 Changes in legislation

Although the Crematorium is obliged to meet the 2012 '50% abatement target' set out in the Process Guidance notes, through the installation of abatement equipment or participation on a burden sharing scheme, there is a risk of OSPAR changing legislative requirements and calling for 100% abatement by 2020. In this instance decisions made now run the risk of becoming outdated.

7.2.2 Time Slippage

Without guidance from a technical design team, there is the potential for time slippage, as engineering studies and detailed costings have not been considered.

Further to this, if no dedicated design and construction team have been put in place there is a danger of the Crematorium not meeting the legislative timetable. In order to sustain future use of the Crematorium, the Council-operated facility must adhere to specific legislation timetable and best practice guidance.

7.2.3 *Robustness of Costs*

Whilst indicating a cost in region of £2m, it is acknowledged that the costs outlined in Section 6 are built upon a number of assumptions. Following on from above, without the benefit of a design team's expertise or an investigation of the sub surface, it is difficult to achieve robust costs.

7.2.4 *Insufficient Funding*

If funding is not secured purchase of the abatement equipment and the development of the second chapel, will be significantly curtailed in terms of both scale and timing.

7.2.5 *Increased Competition*

As identified in the Assessment of Need section, there is an expected growth in the level of cremations in Northern Ireland, in line with the increase in the projected death rate. These assumptions are not robust and the level of growth has not been stipulated. Increased competition from council owned or private sector crematoriums may slow demand at Roselawn and negate the need for an additional chapel.

7.2.6 *Environmental Impact – Short-term*

During the construction period there are likely to be negative environmental impacts such as noise pollution, dust, etc. However, construction management practices such as noise attenuation and dust reduction should be undertaken in order to minimise any adverse effects. Working outside operational hours should also be encouraged given the sensitive nature of the assignment.

7.2.7 *Environmental Impact – Long-term*

Mercury emissions from the Crematoria enter the mercury cycle i.e. they are released into the atmosphere and then return and enter the food chain[28].

If the Crematorium fails to address the mercury abatement issue there may be long-term environmental health risks for the people of the area. Mercury will accumulate in the air and water, and can harm the brain, kidneys, nervous system and unborn children.

7.2.8 *Mitigation factors*

The following table outlines the potential risks discussed, mitigation measures and the responsibility to mitigate the risk:

Risk	Mitigation Measure	Responsibility
Changes in Legislation	Future proof existing equipment and infrastructure that will allow the Crematorium to meet potential changes in legislation.	Belfast City Council and Furnace Construction
Time slippage	Seek technical advice.	Belfast City Council
Robustness of costs	Seek technical advice and invest in engineering studies where appropriate.	Belfast City Council
Insufficient	Seek advice from Council regarding the availability of	Belfast City Council

[28] Northeast Waste Management Officials' Association

Risk	Mitigation Measure	Responsibility
Funding	funding	
Increased Competition	Monitor competition and continued growth in cremations via appropriate market research	Belfast City Council
Environmental Impact	Stipulations within any construction contracts to undertake practices such as noise attenuation, dust reduction, and traffic and pedestrian management systems.	Belfast City Council and Furnace Construction

7.3 Optimism Bias

The Green Book (2003) states that there is a demonstrated, systematic tendency for project appraisers to be overly optimistic, referred to as an "optimism bias" and to redress the tendency, the Green Book requires appraisals of a capital expenditure basis to make explicit, empirically based adjustments to the estimates of a projects cost, benefits and duration.

In the absence of more robust information from Northern Ireland government departments on similar projects from the past, the adjustment percentages used below are based on the results of a study by Mott McDonald (2002) into the cause of cost and time overruns. Given that the proposed costs have been based on Council experience (for the capital build aspect) and quotations (for the mercury abatement aspect) there is no need to adjust the costs for optimism bias.

7.4 Displacement

Displacement refers to the extent to which the proposed project displaces activity from similar provision from elsewhere. Given that the existing Crematorium is the only facility within Northern Ireland, the issue of displacement is not an issue. However, it is noted that the private sector is making soundings of investing in this area and so any future investment decisions will need to pay cognisance to any new private sector provision.

8 NON-MONETARY ASSESSMENT

8.1 Introduction

It is the case that not all costs and benefits can be measured in monetary terms, as no market value exists for them. In this section, we consider the non-monetary costs and benefits associated with each of the short listed options.

A weighting and scoring exercise has been adopted to illustrate in quantitative terms how each option performs against identified non-monetary criteria.

8.2 Qualitative Assessment

In order to critically assess the case for investing rate payers monies in the betterment and expansion of the Crematorium, we have developed the evaluation criteria outlined below and highlighted each criterion. In order to allow the comparison of options each criterion has been allocated a weight. The weight allocated to the criteria total 100%. Each option has been given a score between 1 and 10 against the criteria with an option scoring 10 having maximum positive impact.

The criteria employed to assess the non-monetary costs and benefits take cognisance of the overall project objectives identified in Section 4 of the report. The criteria, and associated weighting, applied to assess the benefits of the short-listed options and the rationale for each individual criterion is:

8.2.1 Criterion 1 – Ability to meet minimum mercury abatement requirement by 2012 (40%)

The Council has undertaken this Economic Appraisal in light of UK legislative requirements for the abatement of 50% of all cremations or participation in a burden sharing scheme. The ability of the preferred option to meet minimum legislative requirements is imperative to the outcome of the assignment.

8.2.2 Criterion 2 – Ability to pay cognisance to the expected OSPAR guidance of 100% abatement by 2020 (40%)

Research and consultation exercises have informed BDO Stoy Hayward of the likeliness that OSPAR convention guidance will opt to impose legislation requiring 100% mercury abatement by 2020. The ability of the abatement equipment installed to perform 100% abatement is key to meeting expected OSPAR requirements.

8.2.3 Criterion 3 – Ability to optimise the Council's capability of meeting the expected cremation needs of Belfast and Northern Ireland through requisite building requirements (20%)

As part of the appraisal process it is in the interests of the Council and Crematorium to identify the future cremation needs of Belfast and Northern Ireland. The ability of the Chapel, ancillary rooms and equipment at the Crematorium to facilitate projected cremation needs is crucial for the efficient and effective operation of the Crematorium.

8.3 Results of Qualitative Assessment

The following table reflects the scores of the options in light of the relevant non-monetary criteria.

Criterion	Weight	Option 1		Option 2		Option 3		Option 4		Option 5		Option 6		Option 7	
		S	WS	S	WS	S	WS	S	WS	S	WS	S	WS	S	WS
1	40	0	0	7	280	10	400	10	400	7	280	10	400	10	400
2	40	0	0	4	160	5	200	10	400	4	160	5	200	10	400
3	20	4	80	4	80	4	80	4	80	8	160	8	160	8	160
		Total	80		520		680		880		600		760		960
Rank			7		6		4		2		5		3		1

8.4 Analysis

8.4.1 Criterion1 - Ability to meet minimum mercury abatement requirement by 2012 (40%)

Under Criterion One, Option One scores nil as it fails to meet the minimum mercury abatement requirements by 2012. Options Two and Five score relatively high as the meet the minimum requirements set out for 2012, however these options carry the risks associated with participation on a burden sharing scheme that has yet to be finalised. Options Three, Four, Six and Seven score full marks as they all entail the installation of mercury abatement equipment that will result in the abatement o at least 50% of all cremations at the Crematorium by 2012.

8.4.2 Criterion 2 - Ability to pay cognisance to the expected OSPAR guidance of 100% abatement by 2020 (40%)

Under Criterion Two, Option One scores nil as it fails to pay cognisance to expected OSPAR requirements of 100% abatement by 2020. Options Two and Five score low as they do not involve the installation of any abatement equipment although it is noted that these two options involve participation on a burden sharing scheme. Options Three and Six score half marks as the include 50% abatement i.e. half of the potential 100% OSPAR requirement. Options Four and Seven score full marks as they involve 100% abatement that will satisfy any potential OSPAR requirements for 100% abatement by 2020.

8.4.3 Criterion 3- Ability to optimise the Council's capability of meeting the expected cremation needs of Belfast and Northern Ireland through requisite building requirements (20%)

Under Criterion Three, Options One, Two, Three and Four score the lowest as only one chapel will continue to operate (as present facility) and perform cremations, although these options will still go some way in helping to meet the cremation needs of Belfast and Northern Ireland. Options Five, Six and Seven score double the marks of the other options as the provision of a second chapel optimises the Council's ability of meeting the expected cremation needs of Belfast and Northern Ireland.

8.5 Conclusions

Option Seven is the highest ranking option from a purely qualitative perspective. The provision of two chapels, along with the 100% abatement of all cremations, allows the Crematorium to adhere to any potential legislative requirements, whilst facilitating the expected growth in cremation needs of Belfast and Northern Ireland.

Conversely, and as would be expected, the Status Quo / "Do Nothing" Option scores the least, failing to recognise the need to meet legislative requirements and facilitate future growth in the market.

9 NET PRESENT VALUE / NET PRESENT COST

9.1 Net Present Value / Net Present Costs

Discounting is a technique used to compare costs and benefits that occur in different time periods. It is a separate concept from inflation, and is based on the principle that, generally, people prefer to receive goods and services now rather than later. This is known as 'time preference'.

The discount rate is used to convert all costs and benefits to 'present values', so that they can be compared. The recommended discount rate is 8.0%, as this is a revenue generating project. Calculating the present value of the differences between the streams of costs and benefits provides the Net Present Value (NPV) of an option. NPV is the primary criterion for deciding whether government action can be justified.

When a discounted rate produces a negative NPV this is referred to as a Net Present Cost (NPC). Usually with this scale of public funding were there are no revenue streams, the options will present an NPC. The option with lowest NPC is the best monetarily.

Inflation has not been included in the analysis. VAT has also been excluded.

The Net Present Value Analysis (NPV) has been undertaken over a 25-year period. Inflation has not been included in the analysis. VAT has also been excluded.

Option	Option Description	NPC	Rank
1	Status Quo – Benchmark Option	(2,091,750)	5
2	One chapel facility, four cremators with no mercury abatement	1,115,513	1
3	One chapel facility, four cremators with 50% mercury abatement	(773,568)	2
4	One chapel facility, four cremators with 100% mercury abatement	(1,604,193)	3
5	Two chapel facilities, four cremators with no mercury abatement	(1,794,366)	4
6	Two chapel facilities, four cremators with 50% mercury abatement	(3,038,392)	6
7	Two chapel facilities, four cremators with 100% mercury abatement	(3,844,682)	7

Detailed NPC calculations are included in Appendix I.

9.2 Sensitivity Analysis

The treatment of any potential uncertainty is generally best dealt with using sensitivity analysis which involves varying the value/number of key project indicators which are likely to be subject to the greatest degree of uncertainty, i.e. revenue costs.

In order to determine the impact of potential increases in the total cost of the project as a result of uncertainties, NPC calculations have been performed using the optimism bias costs calculated above and subject to the following sensitivities:

With respect to this project, the following sensitivities were applied to reflect the monetary risks associated with the project:

- Inability for the Council to pass on 100% of the costs – with a 50% reduction in the price increase per cremation (Sensitivity A); and
- Inability for the Council to attain 100% sales of its excess certificates through CAMEO – with a 50% reduction in the income per cremation (from £35 to £17.50 per cremation) (Sensitivity B).

Sensitivity A

Option	NPC	Sensitivity	Rank
1	(2,091,750)	(2,091,750)	4
2	1,115,513	805,154	1
3	(773,568)	(1,083,926)	2
4	(1,604,193)	(1,914,552)	3
5	(1,794,366)	(2,149,061)	5
6	(3,038,392)	(3,703,447)	6
7	(3,844,682)	(4,509,737)	7

Sensitivity B

Option	NPC	Sensitivity	Rank
1	(2,091,750)	(2,091,750)	5
2	1,115,513	1,115,513	1
3	(773,568)	(773,568)	2
4	(1,604,193)	(1,868,631)	4
5	(1,794,366)	(1,529,928)	3
6	(3,038,392)	(3,038,392)	6
7	(3,844,682)	(4,109,119)	7

Even with all the sensitivity analysis, Option 2 remains the top ranked option, as it requires no immediate outlay for capital equipment, and the annual 50% abatement charge does not set in until 2012. The second placed option remains Option 3. Options 6 and 7 remain the bottom two from an NPV viewpoint throughout the sensitivities.

Detailed sensitivity calculations are included in Appendix II.

10 IDENTIFICATION OF PREFERRED OPTION/RECOMMENDATIONS

10.1 Summary of Monetary/Non Monetary Assessment

The options have been appraised with reference to both monetary and non-monetary indicators, the results are summarised below. Costs exclude VAT.

Option	Description	Initial Capital Cost (£)	NPC (£)	NMS
1	Status Quo – Benchmark Option	Nil	(2,091,750)	80
2	One chapel facility, four cremators in operation with no mercury abatement	Nil	1,115,513	520
3	One chapel facility, four cremators with 50% mercury abatement	£1m	(773,568)	680
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	Two chapel facilities, four cremators with no mercury abatement	£2m	(1,794,366)	600
6	Two chapel facilities, four cremators with 50% mercury abatement	£3m	(3,038,392)	760
7	Two chapel facilities, four cremators with 100% mercury abatement	£3.5m	(3,844,682)	960

10.2 Preferred Option

Option Two – the Do Minimum, rates first in quantitative terms as it costs the least amount in capital outlay of the do something options. This option, however, fails to address the underlying issue of mercury emissions into the atmosphere and therefore conversely scores the lowest from a qualitative perspective.

The preferred option from a qualitative perspective, based on the Assessment of Need and specific project objectives, is Option Seven, which offers complete removal of mercury and operationally provides for a better service provision through a second chapel. This Option, which provides enhanced and fit for purpose facilities enables better service provision and future proofs the crematorium for increased future usage (in line with expected growth trends). However it is noted that in order to substantiate the business case for this investment further analysis is required by Council, as follows:

- User feedback – a questionnaire could be administered to family members on payment of the service. Questions about scheduling, satisfaction with facilities, suggested improvements, etc could be asked;
- Capacity Review – A more detailed understanding of the future growth and capacity constraints of the facility is required through analysis of Northern Ireland wide burial plot availability vis-à-vis death rate; and
- Cost determination – Detailed designs and costs should be ascertained.

The preferred option needs to be driven by the striking of a balance between value for money and fit for purpose considerations. Whilst the implementation of 100% does not offer as easily measurable returns, the non-quantifiable benefit of reducing mercury in the immediate environment cannot be understated. Therefore, the preferred option is 100% abatement and further consideration should be given to the affordability of a second chapel. Therefore, given the lack of visibility on future growth in cremation use, the preferred option is Option Four.

11 PROJECT FINANCE, MANAGEMENT, MONITORING & EVALUATION

Economic appraisal requires the provision of post project monitoring and evaluation. This section provides an overview of the funding, management, monitoring and evaluation of the project.

11.1 Project Financing and Funding

The capital expenditure associated with the preferred option is £1.5m for 100% mercury abatement equipment and infrastructure. The ability of the organisation to raise this finance will be dependent upon Council approval. The proposed funding will be through DOE loan sanction.

11.2 Project Management

The project will be managed by Belfast City Council. The Council has designated an experienced Project Management Team to oversee the developments to the Crematorium. There is considered to be a strong and experienced management team in place, who have experiences in large capital projects.

Nick Brennan as Project Manager will have responsibility for ensuring that the project is delivered in accordance with the approved plan and will direct the work of the Project Team. The team will be lead by Fiona Holdsworth (Principal Parks and Cemeteries Services Manager), John McFarlane (Bereavement Services Manager) and Sharon McCloy (Cemeteries and Crematorium Manager). Any further technical or administrative support will be brought on board as required.

Once the preferred option has been agreed the Council will need to appoint the appropriate persons to deliver the project specifications. Procurement will be carried out to source contractors that are seen to provide the best value for money in delivering the project. The procurement process will require sufficient competency and robust management procedures among contractors and professionals involved in delivering the project.

The project will improve the resources and facilities available to the Crematorium by increasing capacity and establishing environmentally friendly working practices. The establishment of the project management team by Belfast City Council allows for the efficient and effective planning, implementation, programming, monitor and evaluation of the project.

11.3 Project Marketing

Marketing will be necessary to attract both Belfast and non-Belfast residents to use the Cremation facilities.

At present the Crematorium has stated that marketing materials will be found in:

- Health Centre brochures;
- St. John's Ambulance Catalogues; and
- Newspaper articles dealing with Funeral care.

In order for the proposed project to be a success and to recover costs, the marketing activities of the Crematorium will need to be enhanced. The thrust of the marketing activities should be concentrated on attracting both Belfast and non-Belfast residents:

- Advertising on relevant Belfast City Council brochures;
- Adverts in parish bulletins detailing specifically the new improved crematorium facilities;
- Advert in local media i.e. in relation to environmentally friendly operations;
- Upgrade current webpage on Council website; and
- Notices at main local hospitals and health centres.

It is noted that due to the setting and context of the services provided, 'sensitive' marketing activities need to be carried out.

11.4 Project Monitoring

Monitoring of the project is fundamental to the appraisal process as it allows actual progress to be compared with what was originally planned. Monitoring is essentially a management function designed to check if a project is implemented on time and within budget.

Monitoring of the project should be the responsibility of the project management team.

Monitoring of the project should take place on a fortnightly basis until the construction elements of the project are completed and monthly thereafter. Specific monitoring indicators are:

- Works duration;
- Construction quality;
- Cost of construction;
- Number of cremations;
- Location of users of crematorium;
- Percentage of abated cremations; and
- Level of mercury emissions from Crematorium.

Monitoring information should be disseminated during monthly meetings (and before if an issue arises) and fed through to Belfast City Council where appropriate. It is the responsibility of the project sub-committee and Project management team to ensure that prior to commencement of the project, the information required for regular monitoring and control is agreed and appropriate systems put in place to enable such information to be collected.

Any variances from what was originally planned should be discussed and corrective action put in place in order to achieve the objectives as set out.

11.5 Project Evaluation

Responsibility for carrying out an appraisal and evaluation needs to be clearly defined. It is important that it is made clear who is entitled to demand an appraisal and evaluation, and when; who is to carry it out; and who is to check that procedures have been applied correctly. Conditions specified in the "Green Book" for effective appraisal and evaluation includes:

- A prevailing attitude that value for money is important;
- Clear support for project promoters;
- Clear definition of responsibilities; and
- Clear and up to date procedural and technical guidance.

The timing, content and persons responsible for carrying out the evaluation needs to be clearly defined. Belfast City Council intends to commission a post evaluation, which should address the following:

- A detailed analysis of the completed project;
- Ongoing monitoring of the project;
- Perceptions of stakeholders;
- Analysis of the social impact;
- Analysis of the environmental impact;
- Post – project analysis of all funding sources and expenditure; and
- A concluding analysis of the extent to which the crematorium's aims and objectives were met.

The SMART objectives, description of options and key assumptions made are described in sufficient detail to support post-project evaluation.

We would recommend that an interim evaluation be undertaken one year after project completion. A full evaluation of the impact of the project should be undertaken 2 years after the works have finished.

An independent evaluator should be appointed by the project's main funders to undertake the ex-post interim and final evaluation in line with the timescales outlined above. It is the responsibility of Belfast City Council to ensure the usefulness of all information collated to facilitate the evaluation.

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