

Remediation of the East Tip, Haulbowline Island

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Remediation of the East Tip, Haulbowline Island

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Cork County Council



Why are we here?

- Commitment made at meetings of 11th October 2012 (Cobh) and 19th November 2012 (Ringaskiddy).
- Planning, waste licence and foreshore applications nearing completion
- Update the public on progress to date.
- Obtain additional feedback, through public consultation, that can be integrated in design and EIS processes (4 wks).



Presentation Outline:

Regularisation of the East Tip

1. Project objectives
2. ECJ 494/01 & the consent process
3. Recommendations and conclusions of the Detailed Quantitative Risk Assessment
4. Update on the statutory consent processes
5. Quality control & peer review



1. Objectives

1. Identify and quantify the risks to human health and the environment.
2. Identify and specify the mitigation measures necessary to minimise those risks.
3. Leave a positive legacy for residents of the Lower Harbour.





1D2O8501 Photo: Peter Barrow, 28th November 2012. Tel: 087-2559638



East Tip, Haulbowline Island, Remediation Project

PÁIRC ÁINEASA INIS SIONNACH LANDSCAPE MASTERPLAN

Table 1: Existing Site

| Area | Area (sqm) | Notes |
|-------------------------|---------------|--|
| Existing Buildings | 15,000 | Existing buildings to be demolished |
| Existing Roads | 5,000 | Existing roads to be retained |
| Existing Green Space | 10,000 | Existing green space to be retained |
| Existing Water Features | 2,000 | Existing water features to be retained |
| Existing Other | 5,000 | Existing other features to be retained |
| Total | 37,000 | |

Table 2: Proposed Development and Public Open Space

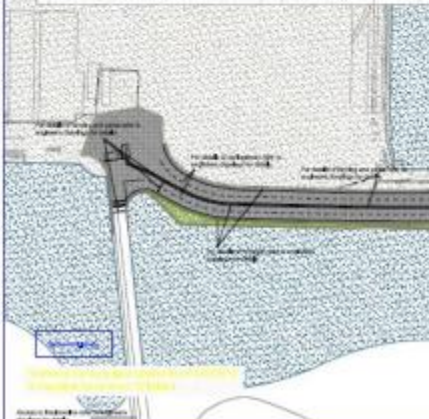
| Category | Item | Area (sqm) | Notes | |
|-----------------------|------------------------|---------------|----------|----------|
| Proposed Development | Football Pitch | 1,000 | Proposed | |
| | GAA Pitch | 1,000 | Proposed | |
| | Wetland Area | 5,000 | Proposed | |
| | Event/Car Parking Area | 2,000 | Proposed | |
| | Car Parking | 1,000 | Proposed | |
| | Cycle rack | 500 | Proposed | |
| | Viewpoint | 100 | Proposed | |
| | Other | 1,000 | Proposed | |
| | Public Open Space | Grass | 10,000 | Proposed |
| | | Shrub | 5,000 | Proposed |
| Tree | | 5,000 | Proposed | |
| Water | | 2,000 | Proposed | |
| Other | | 5,000 | Proposed | |
| Total Proposed | | 37,000 | | |

Table 3: Proposed Trees

| Species | Quantity | Notes |
|----------------|----------|--------|
| Plantain | 100 | Native |
| Blackthorn | 100 | Native |
| Blackberry | 100 | Native |
| Black Hawthorn | 100 | Native |
| Black Currant | 100 | Native |
| Black Elder | 100 | Native |
| Black Dogwood | 100 | Native |
| Black Dogwood | 100 | Native |
| Black Dogwood | 100 | Native |
| Black Dogwood | 100 | Native |

Table 4: Proposed Planting

| Planting Area | Planting Type | Quantity | Notes |
|---------------|---------------|---------------|----------|
| Grass | Grass | 10,000 | Proposed |
| Shrub | Shrub | 5,000 | Proposed |
| Tree | Tree | 5,000 | Proposed |
| Water | Water | 2,000 | Proposed |
| Other | Other | 5,000 | Proposed |
| Total | Total | 37,000 | |



KEY: GENERAL

- Proposed Development
- Proposed Public Open Space
- Proposed Roads
- Proposed Water Features
- Proposed Other
- Existing Buildings
- Existing Roads
- Existing Green Space
- Existing Water Features
- Existing Other
- Proposed Palisade Gate
- Proposed Viewpoint
- Proposed Cycle Rack
- Proposed Vehicular Access Road
- Proposed Wetland Area
- Proposed Football Pitch
- Proposed GAA Pitch
- Proposed Grass
- Proposed Shrub
- Proposed Tree
- Proposed Water
- Proposed Other

KEY: TREE SPECIES

- Plantain
- Blackthorn
- Blackberry
- Black Hawthorn
- Black Currant
- Black Elder
- Black Dogwood
- Black Dogwood
- Black Dogwood
- Black Dogwood

THE

Páirc Áineasa Inis Sionnach
Landscape Masterplan
1:1,000@A1
Figure X.XXX

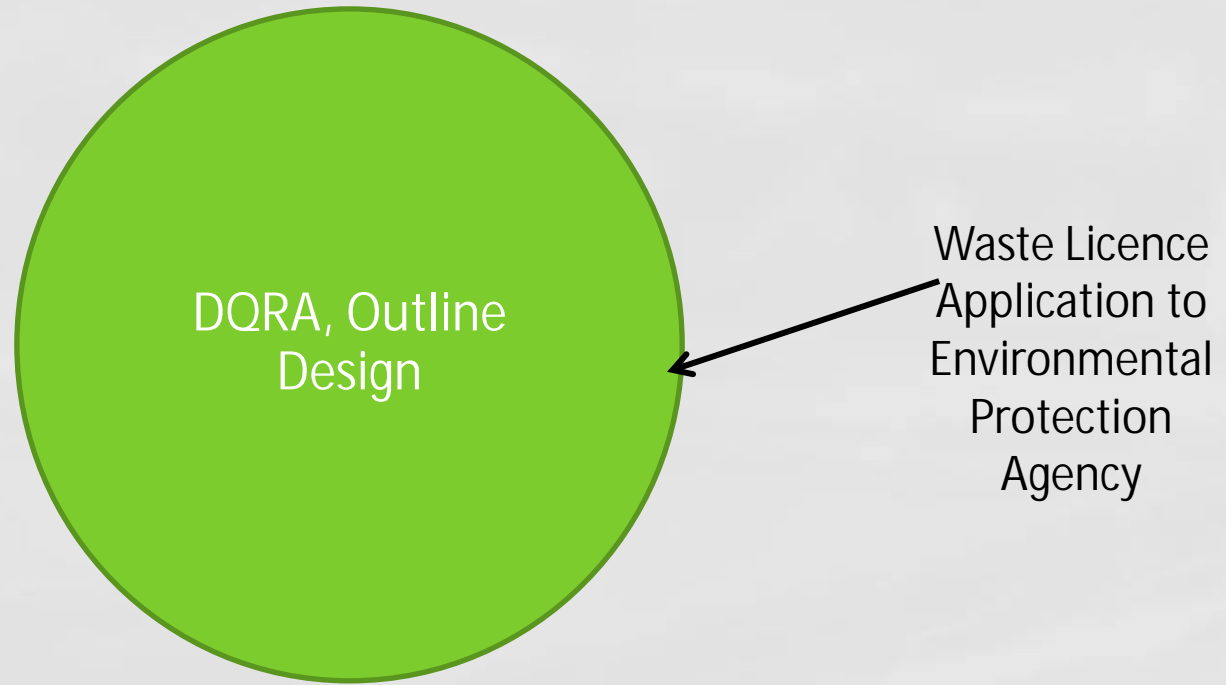
EAST TIP REMEDIATION PROJECT

EAST TIP REMEDIATION PROJECT

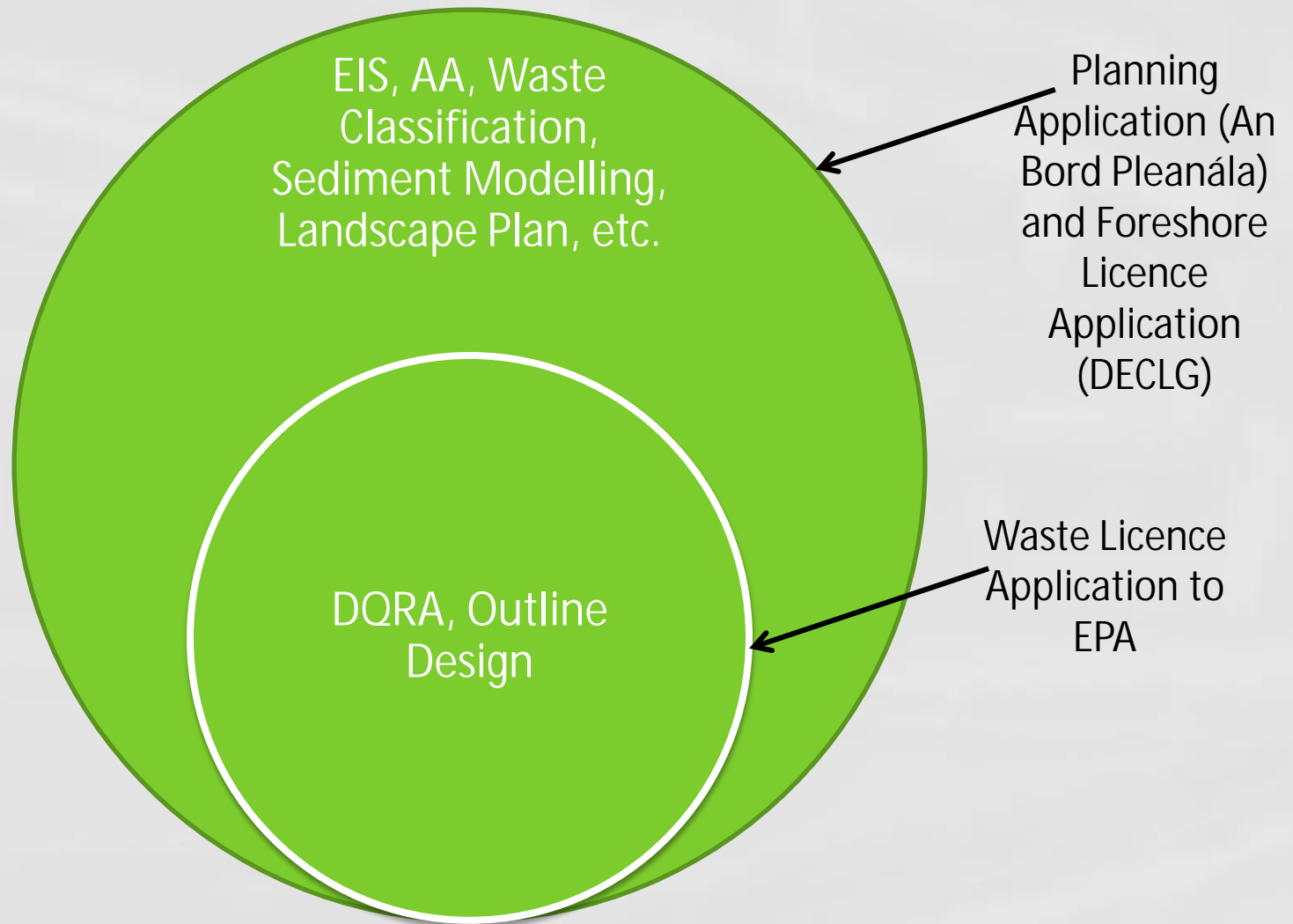
RPS



2. ECJ 494/01 & the Consent Process



2. ECJ 494/01 & the Consent Process



Remediation of the East Tip, Haulbowline Island

Results of Detailed Quantitative Risk Assessment

Dr. Cecilia MacLeod
Regional Director, WYG



Objectives

- The overall objective of the project was to quantify the risk to human health and the environment from the chemical constituents of the waste contained within the East Tip at Haulbowline.
 - Determine risk based upon current site use;
 - Determine risk based upon potential future public amenity future use;
 - Determine risk to controlled waters;
 - Make recommendations for mitigation.

Contaminants of Concern

- Metals associated with steel works: Arsenic, Copper, Cadmium, Chromium, Lead, Manganese Mercury, Nickel
- Polyaromatic Hydrocarbons, PCBs, Dioxins and Furans
- Petroleum Hydrocarbons
- Asbestos

Geo-Environmental Investigations

2005 – 2012

A series of investigations undertaken which included:

- Site Investigation;
- Generic and Quantitative Risk Assessment.

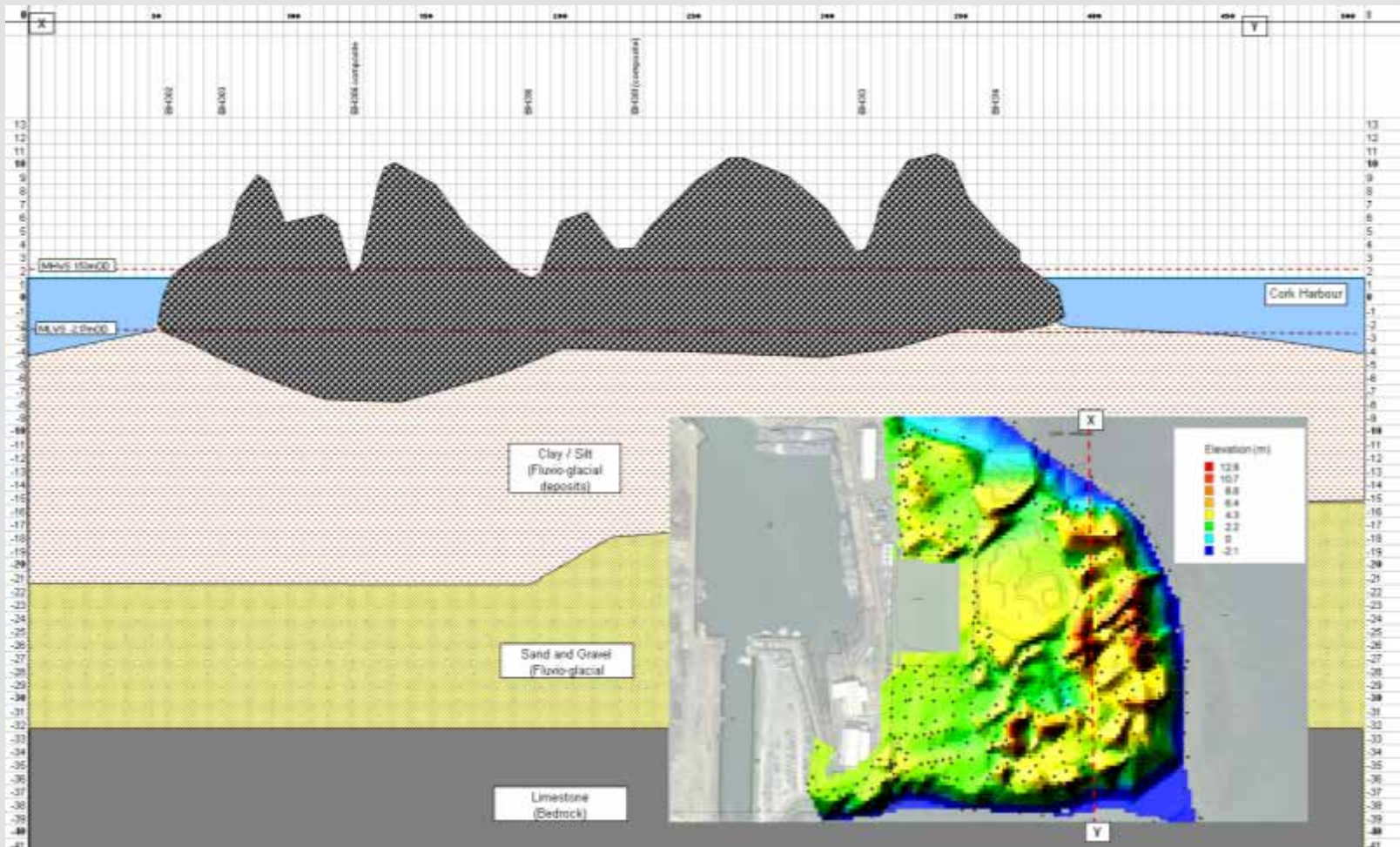


Geo-Environmental Investigations

Investigation included:

- Installation of 35 boreholes, excavation of 31 trial pits and 2 trenches;
- Collection and analysis of 108 waste samples, 34 natural strata and 23 leachability testing samples;
- Collection and analysis of 20 offshore marine samples, 23 harbour water samples, 8 shell fish samples;
- 136 groundwater samples, 5 surface water samples (from excavations), 9 foreshore seepage samples;
- 11 Ground gas samples and 17 rounds of gas monitoring.

Schematic Conceptual Site Model (Groundwater)



Investigation Findings

- Solid, leachability and water analysis results compared to Generic Assessment Criteria (human health commercial and park land use, Water Framework Directive Standards)
- Waste contains various heavy metal compounds at concentrations that would necessitate Human Health pathway management for any future land use scenario (capping layer)
- Very low quantities of asbestos identified

Key Source-Pathway-Receptor Linkages (Groundwater)

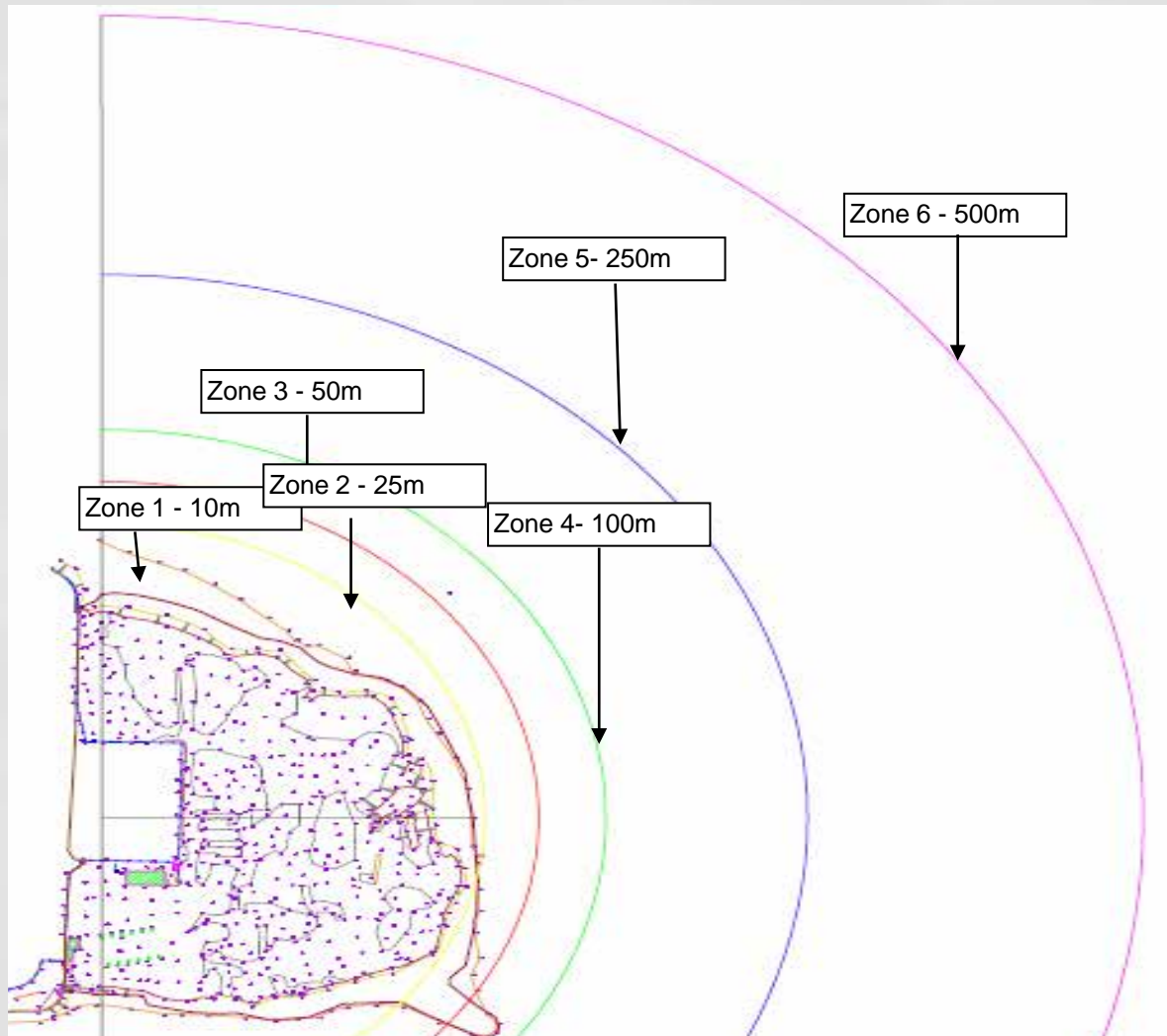
| Source | Pathway | Receptor |
|---|--|------------------------------------|
| Unsaturated Waste (containing various leachable contaminants including heavy metal and hydrocarbon compounds) | Leaching and vertical migration | Groundwater / Cork Harbour (Tidal) |
| Saturated Waste (containing various leachable contaminants including heavy metal and hydrocarbon compounds) | Lateral migration of dissolved phase contaminants | |
| | Vertical migration of dissolved phase contaminants | |
| | Direct erosion / transport of sediments, bearing sorbed contaminants | |

Tiered Risk Assessment Process

- Generic QRA -
 - Basic comparison of soil and leachate data to Water Quality Standards (WQS)
- Detailed QRA
 - Considering contaminant flux and from the site and dilution model in the receptor



DQRA Modelling Output



Conclusions from Risk Assessment based upon Current Site Use

- Potential human health risk for site users in it's current state.
- Potentially leachable contaminants remain in the waste.
- Groundwater impacted with heavy metals and hydrocarbons, and in direct hydraulic continuity with Cork Harbour.
- Model predicts limited impact to near shore waters (<25m) although no measurable impact to water was observed.
- Contaminant contribution from erosion and sediment transport is likely to be more important than dissolved contaminant transport.



Recommendations

- Control risk to human health by capping and landscaping.
- Limit further leachate generation by minimising infiltration (i.e. low permeability capping).
- Control dissolved phase contaminant loading into Cork Harbour by decreasing lateral permeability around the shoreline perimeter of the site in conjunction with low permeability capping.
- Address future sediment loading into Cork Harbour by creating erosion protection around the shoreline perimeter.



Conclusions

- Additional investigations completed.
- Site is now sufficiently well understood to design a robust solution.
- Studies (risk assessment, EIS) well progressed.
- No risks identified for community. Now, and during remediation or in long term.
- Effective remediation will be based on containment of materials within the East Tip.
- Outline remedial design well underway.
- A positive legacy will be created.



Remediation of East Tip – Update on EIS, Statutory Consents, Appropriate Assessment & Outline Design

Larry O'Toole
Director
RPS



Statutory Processes – ‘recap’

- Objective of project is to remediate site to amenity use
- Site has to be regularised
- Statutory processes to be followed

| | | |
|------------------------------|---|------------------------|
| 1. Planning Application | → | An Bord Pleanála |
| 2. Waste Licence Application | → | EPA |
| 3. Foreshore Application | → | Foreshore Unit - DECLG |

- EIS to accompany the 3 applications
- Assessment of the Project with regard to nearby Natura Sites (Special Areas of Conservation & Special Protection Areas)



Basis of Design

- Design developed for the proposed remediation of the site
- Design informed by results of Detailed Quantitative Risk Assessment
 - Capping or cover system across the top of the landfill
 - Installation of a perimeter engineered structure (to decrease lateral permeability along the shoreline)

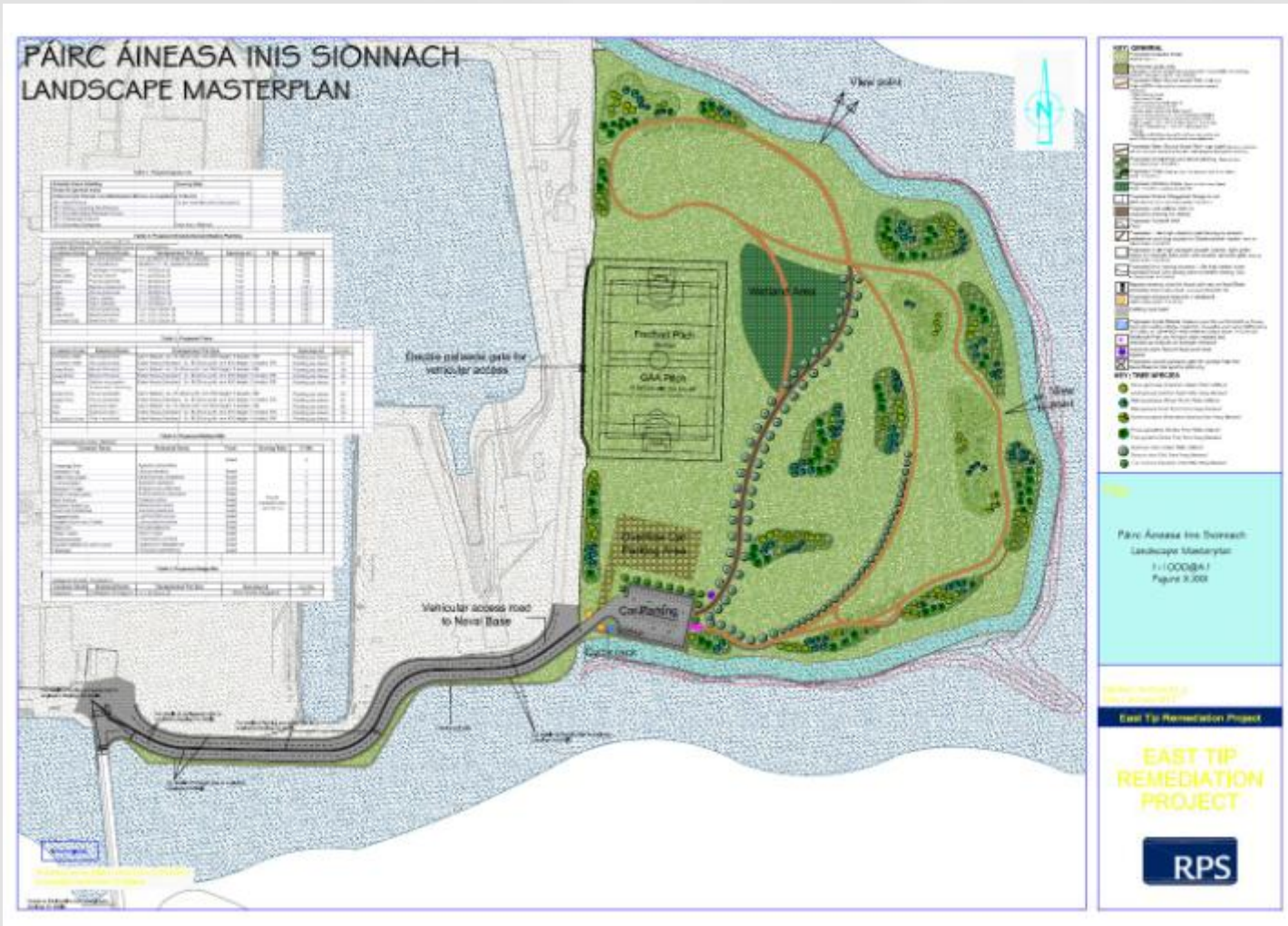


Design Elements

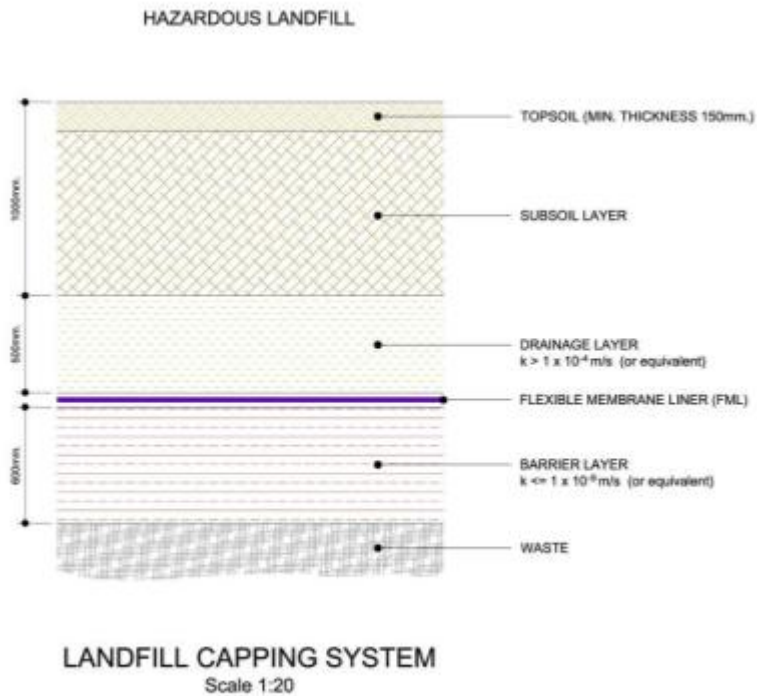
- Main elements
 - Reprofilng and shaping of site
 - Construction of Engineered Capping System
 - Construction of Perimeter Engineered Structure (PES)
- Other related elements
 - Road upgrade
 - Security and interface with Navy
 - Development of site as amenity – Landscape Masterplan
- Design still evolving - based on outcome of various studies



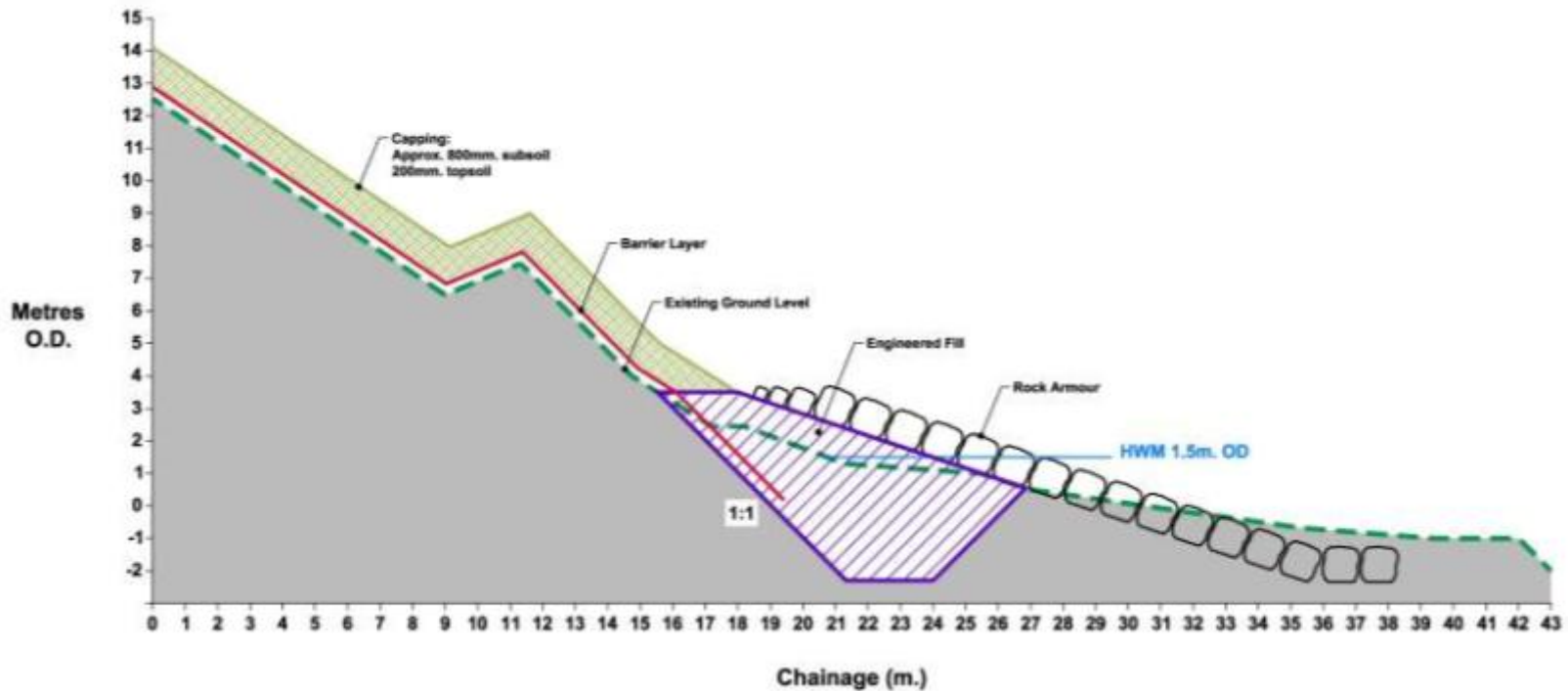
Design Outline



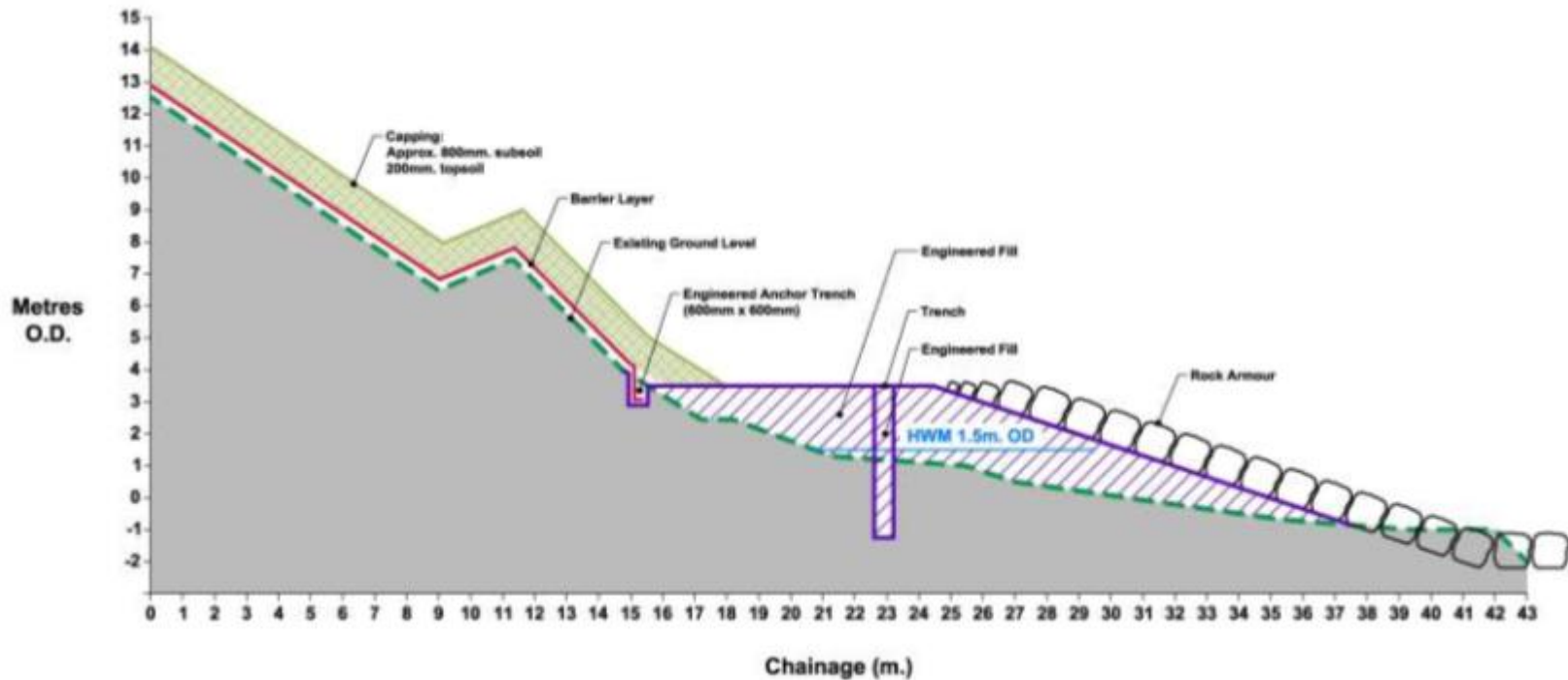
Design – Engineered Capping System



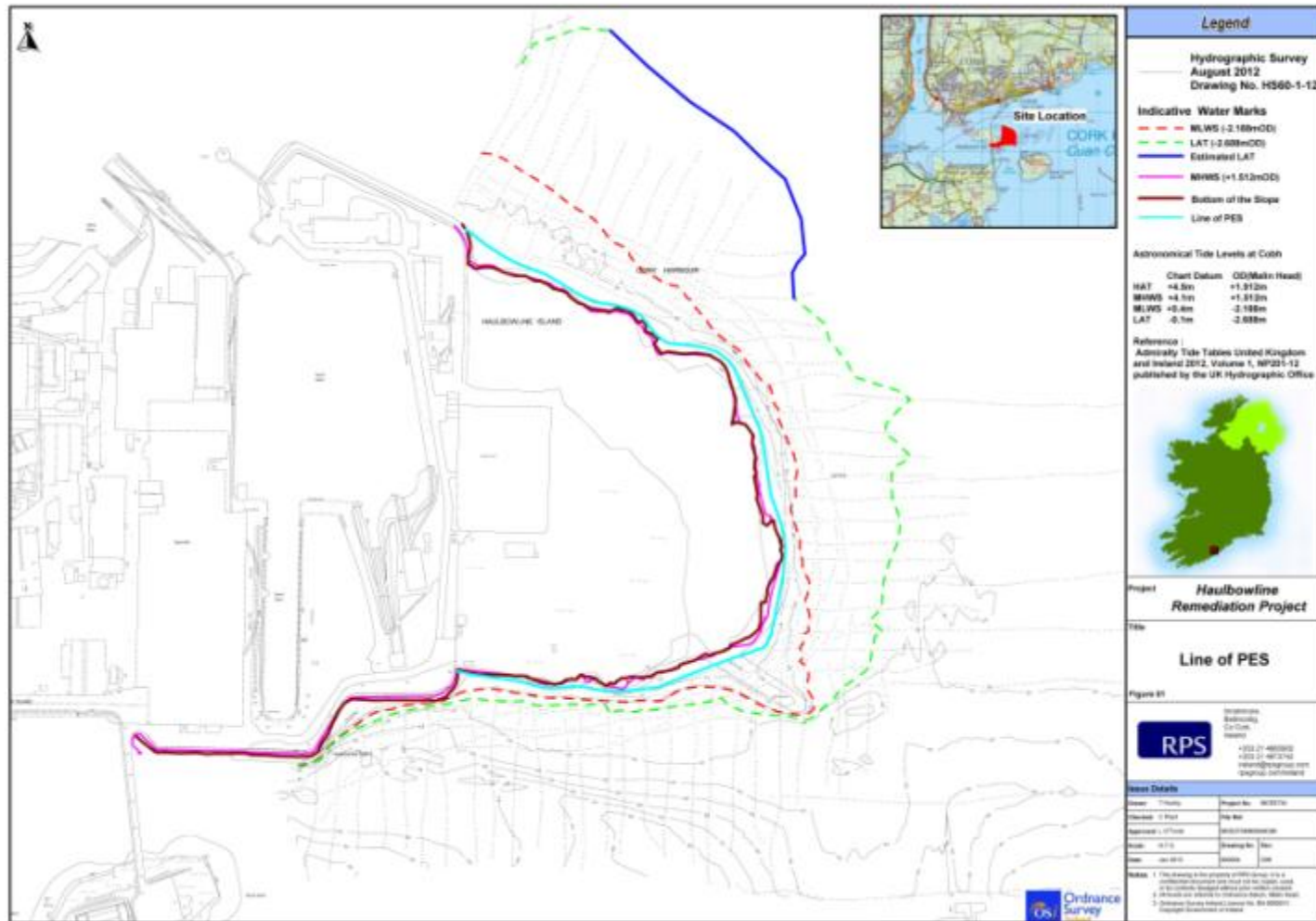
Design – Indicative Perimeter Engineered Structure (PES) – Option 1



Design – Indicative Perimeter Engineered Structure (PES) – Option 2



Design-Perimeter Engineered Structure (PES)



Design – construction impacts

- Design has to be 'buildable'
- Potential construction impacts particularly in marine environment
- Issues of regrading and handling of materials, material reuse and importation, (capping/subsoil/topsoil etc) to be considered
- Water management within site
- Excavation in foreshore - tidal constraints
- Details of construction impacts and mitigation to be included in EIS



Technical Dialogue

- Primary purpose was to determine what solutions exist in marketplace to achieve an effective remediation of the site
- Included discussion of possible design solutions and associated construction issues
- Prior Information Notice (PIN) was published on e-Tenders & the Official Journal of European Union on 10th August 2012.



Technical Dialogue

- 3 Site visits conducted in October and November 2012
- 16 interested parties attended the site visits - total 22 companies from 5 different countries including several consortia
- Included specialist earthworks, dredging, foundation and remediation contractors and other parties with relevant expertise
- Contractors were asked to make detailed submissions following site visits with suggested remediation solutions and construction methods proposed
- A summary report has been prepared following the Technical Dialogue process



Environmental Impact Statement (EIS)

- Key document to support the various applications
- Describes the proposed development
- Outlines the potential impacts on:
 - The Local Community
 - Local Road Network & Traffic
 - Air Quality & Climate
 - Noise & Vibration
 - Visual Impact
 - Use of Natural Resources
 - Ecology (Terrestrial & marine)
 - Hydrogeology & Hydrology
 - Archaeology & Cultural Heritage
- Consultation with statutory bodies and other stakeholders



Environmental Impact Statement (EIS)

- Key Potential Issues Identified and Addressed
 - Health impacts during the construction stage and operation stage – based on findings of DQRA
 - Increased Traffic during the Construction Stage
 - Dust and noise to local community and employees during the Construction Stage
 - Landscape – End use/Operational Stage
 - Marine Environment – Construction Stage



Traffic and Transport

- Key Potential Impacts
 - Increased traffic movement on local road network during construction resulting in potential disruption to road users, cyclists and pedestrians
 - Noise and dust emissions associated with construction traffic
- Proposed Mitigation Measures
 - Traffic Management Plan for Construction Stage;
 - Phasing of works;
 - Local measures - pedestrian crossings in Ringaskiddy, speed restrictions on Island;
 - Reuse of materials where possible; and
 - Reinstatement of roads post construction



Noise and Dust

- Key Potential Impacts
 - Dispersion of construction dusts/pollutants during the proposed works (removal of stockpiles, re-profiling, crushing, etc.) and increased noise;
 - Noise and dust emissions associated with construction traffic; and
 - Greenhouse gas emissions from construction operations (traffic, materials and plant)
- Proposed Mitigation Measures
 - Dust and noise monitoring during the construction stage;
 - Dust suppression measures, wheel washing, clean roads; and
 - Limiting construction hours (subject to seasonal/tidal constraints)

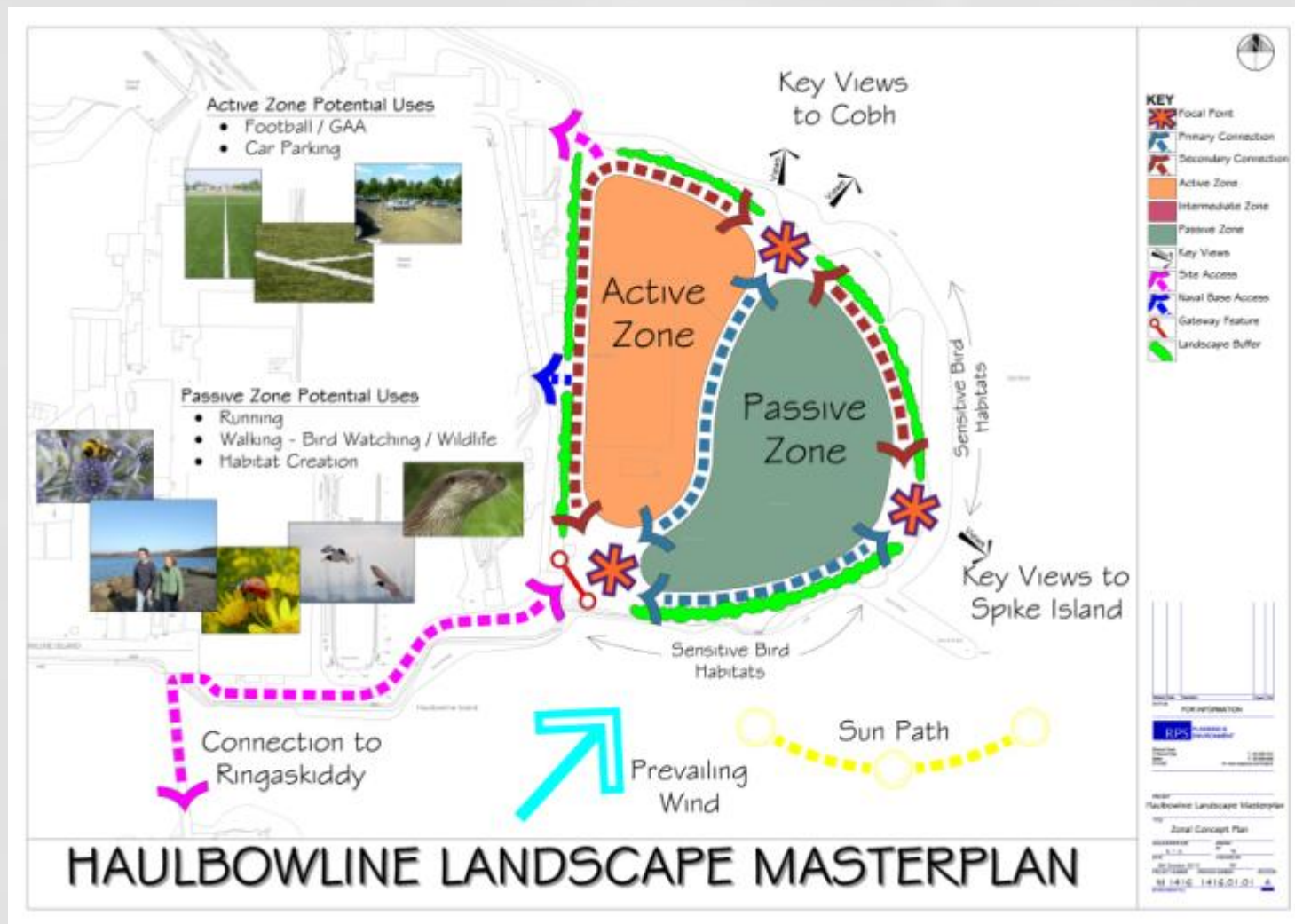


Landscape and Visual

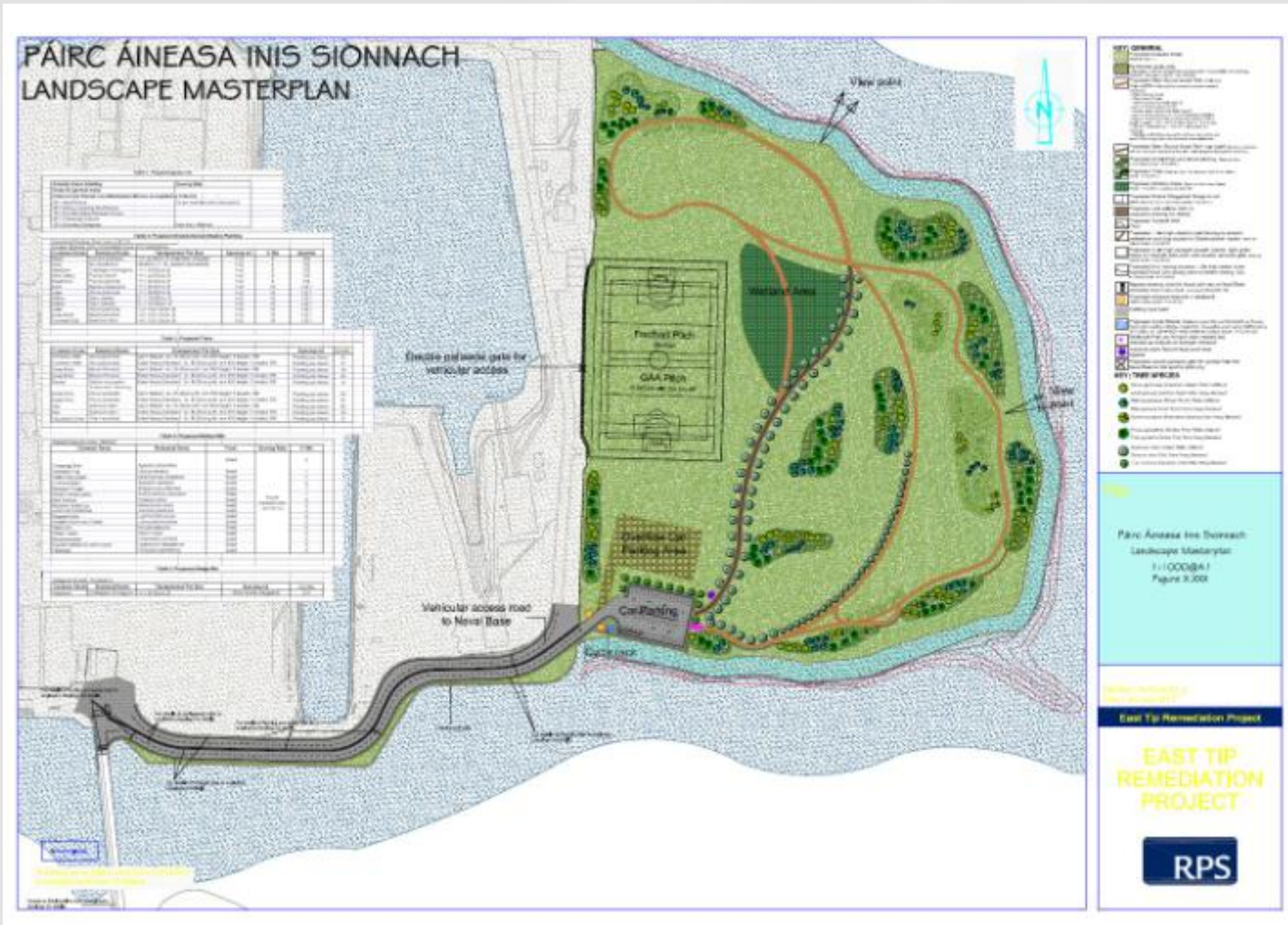
- Key Potential Impacts
 - Temporary visual impacts during site preparation/enabling works; and operations during the construction phase; and
 - Potential visual impacts of End use proposals.
- Proposed Mitigation Measures
 - Landscape Planting and Management Plan
 - Creation of wetland habitats, viewing points and amenity areas.



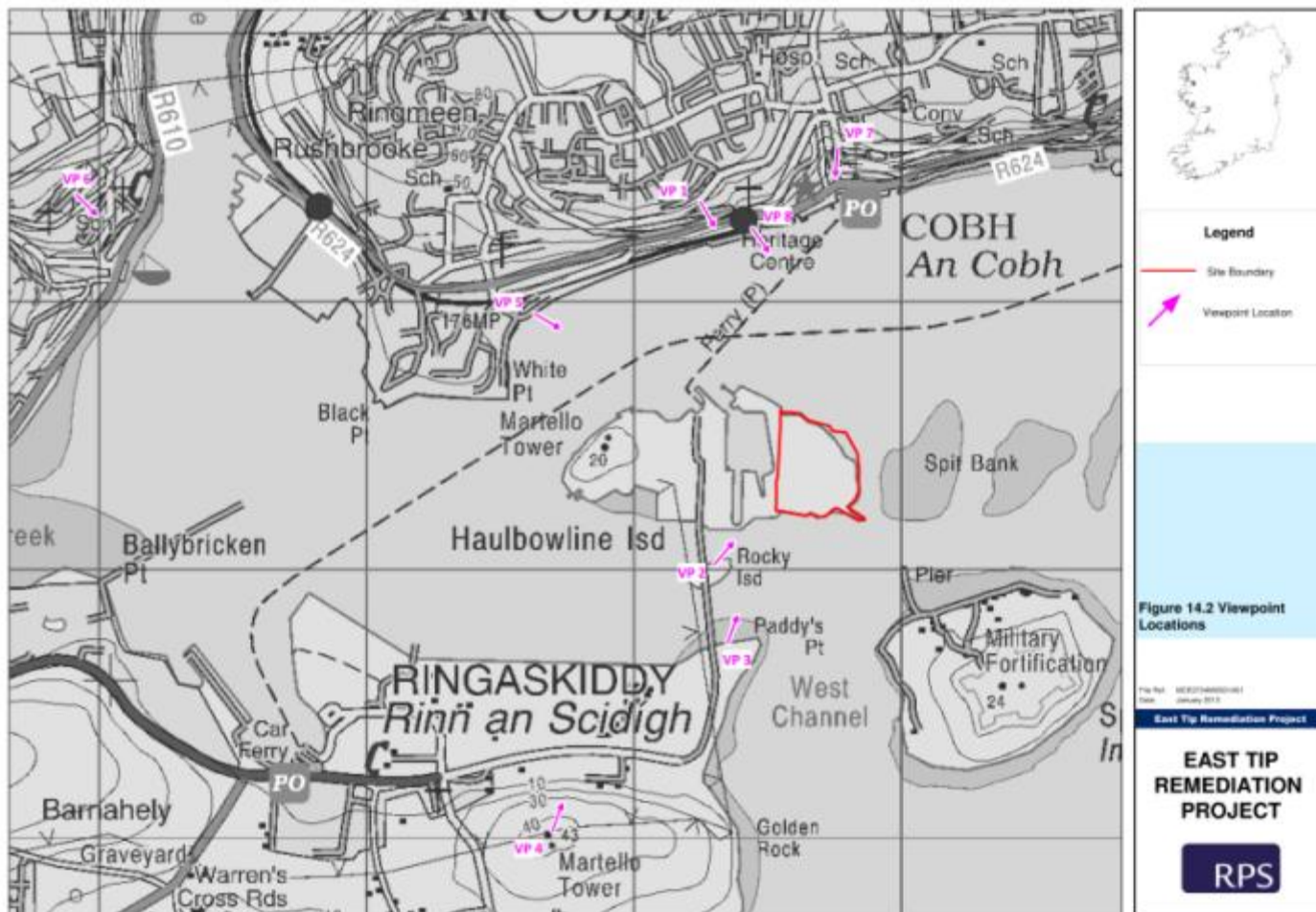
Landscape Masterplan



Landscape Masterplan



Landscape and Visual – Sensitive Receptors



Landscape and Visual – Existing



Landscape and Visual – Proposed



Landscape and Visual – Existing



Landscape and Visual – Proposed



Appropriate Assessment (AA)

- EU Habitats Directive
- AA & Article 12 Screening Report (Stage 1)
- Article 12 – potential impacts on Annex IV species (e.g. Otter, Bat, Grey Seal, Bottle-nosed Dolphin) - no significant effects
- Article 6 – effects on conservation of natural habitats (SPA/cSAC) and of wild fauna and flora
 - Possibility, albeit unlikely, of adverse effects on SPA
 - Therefore carry out Stage 2 - Natura Impact Statement (NIS)



Marine Environment

- Key Potential Impacts
 - Release of contaminants from waste and sediments in intertidal and sub tidal areas during construction; and
 - Their potential direct and indirect impacts
- How Addressed during the EIA Process?
 - Sediment Sampling and modelling;
 - Hydrodynamic Assessment
 - Habitat Assessment (terrestrial and marine)
 - Ongoing consultation with IFI, NPWS, PoC;
 - AA Screening and Natura Impact Statement



Marine Environment – Proposed Mitigation

- Works where possible to be constructed above sub-tidal zone and/or from land
- Temporary works to allow construction during tidal cycles
- Appropriate construction methods being explored to assist in development of appropriate sediment control options
- Possible specialist plant to be used to minimise sediment re-suspension
- Ongoing monitoring during the construction stage

Planning and Waste Licence Applications

- An application for Planning Approval directly to An Bord Pleanála (ABP)
- First application in a series of consent processes
- Waste Licence Application to EPA to follow (>2 weeks after)
- Applications will include Design Details, EIS and NIS
- Opportunity for public submissions to both bodies
- ABP to consider environmental effects of any works on the foreshore
- Consent still required from Minister – application to the Foreshore Unit of DECLG



Statutory approvals

- Objective is to remediate site and convert to amenity use
- Statutory bodies will need to be satisfied that proposed remediation measures do indeed protect public and surrounding environment
- Long-term monitoring and aftercare requirements to be defined in Waste Licence (if granted)



East Tip – Overview & Update of Site Assessment Works

Peter Young
Strategy Director
SKM Enviros



Summary of SKM Role

- Acting as Cork CC's independent peer reviewer
- Applies throughout scoping, site investigations and assessments done by Lot 2 consultants.
- Providing independent quality review / international experience / feedback & continuity at all stages including investigations and supporting studies (draft EIS) completed since last (October) meeting.
- Verify approach meets Irish and international best practice



Summary of Investigation Findings



- Additional targeted investigation has led to more evidence to support understanding of site.
- Standards applied during work are in line with Irish (& international) norms.
- Level of testing is now commensurate or better than many similar sites we have encountered.
- The tip is now well characterised from a contamination & risk perspective.
- Conditions encountered remain as anticipated based on known history of East Tip.



Environmental Risk Assessment

- Tip contains expected range of contaminants - principally metallic contaminants.
- Key receptors are site visitors/users and ecosystems in harbour waters.
- Detailed Risk Assessment has verified that impact on environment from materials on tip is very localised.
- Practical remedial options identified to address risks.
- Optimum approach gives enough certainty for EIS and planning, but also enough flexibility.



Approach to Site Remediation



- Current & long term risks can be dealt with through on-site containment using a combination of site capping and re-engineering of site perimeter to reduce migration and erosion.
- While remediation may involve limited removal of some contamination “hotspots” do not anticipate need for wide-scale removal of material from site. Soils will be needed though.
- Remediation will leave a positive green space legacy.



Conclusions

- Additional investigations completed.
- Site is now sufficiently well understood to design a robust solution.
- Studies (risk assessment, EIS) well progressed.
- No risks identified for community. Now, and during remediation or in long term.
- Effective remediation will be based on containment of materials within the tip.
- Outline remedial design well underway.
- Leaving a site which is an asset for the community



Follow the progress of the project in the
Latest News section at:

www.corkcoco.ie/haulbowline

You can also contact the Project Team by emailing:

haulbowline@rpsgroup.com





1D2O8501 Photo: Peter Barrow, 28th November 2012. Tel: 087-2559638



East Tip, Haulbowline Island, Remediation Project