The Glencorse Water Project

Kenny Naylor - Scottish Water, John Marshall, Black & Veatch Ltd

CIRIA Presentation - September 2013

Glencorse Project

Presentation Summary

1. No surprises
2. Deliver a blueprint for handling large scale projects
3. No surprises
4. Maintain delivery programme
5. Enhance reputation of Scottish Water & partners
6. No surprises

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Presentation Overview

1. Review of location of WTW and pipelines
2. Assessment of main issues
3. Partnership of Scottish Water and Black & Veatch
4. Communication Methods
5. Customer DVD

3

History of Water - 1912

4

History of Water – 2007

5

Why is Glencorse WTW required?

1. Existing water treatment works reaching the end of their working life
2. To allow Edinburgh to grow

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Strategic Objectives of Glencorse Project

1. Improvements to Water Quality
2. Long term strategic solution for supply of Edinburgh's water
3. Release of development constraints
4. Replace ageing assets
5. Provide a 21st Century asset

Securing Edinburgh's Water Supply
For Future Generations

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The Need for Change

- Alnwickhill WTW and Fairmilehead WTW cannot provide drinking water to the required high standards
- This investment is necessary to improve the quality of Edinburgh's water and to meet the needs of future development in the city

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Figure 1: Water supply areas of Edinburgh

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The Options

- To build a new WTW at Fairmilehead incorporating the treatment capacity of Alnwickhill WTW
- To build a new WTW at new site location in Midlothian incorporating the treatment capacity of Fairmilehead WTW & Alnwickhill WTW

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Fairmilehead WTW

Fairmilehead Option

- The new WTW would be built within the boundary of the existing site
- The area available is very small
- The new WTW would be very large and proximity to existing neighbours would be an issue
- Excavation work would be carried out and spoil would have to be taken off site via hundreds of lorry movements
- Existing WTW would need to be maintained without interruption whilst new WTW is constructed

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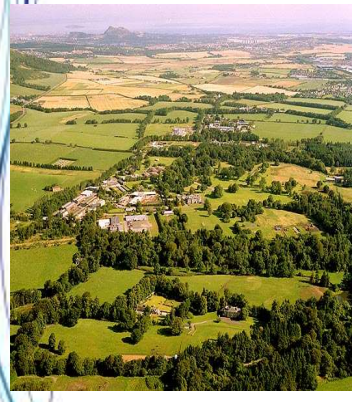
New Site Option



- We would use raw water from the existing aquaduct mains and deliver treated water back into the existing distribution network by gravity
- The search area was determined by the proximity of infrastructure and hydraulics
- Land availability, the slope & elevation of the site and road access were key factors

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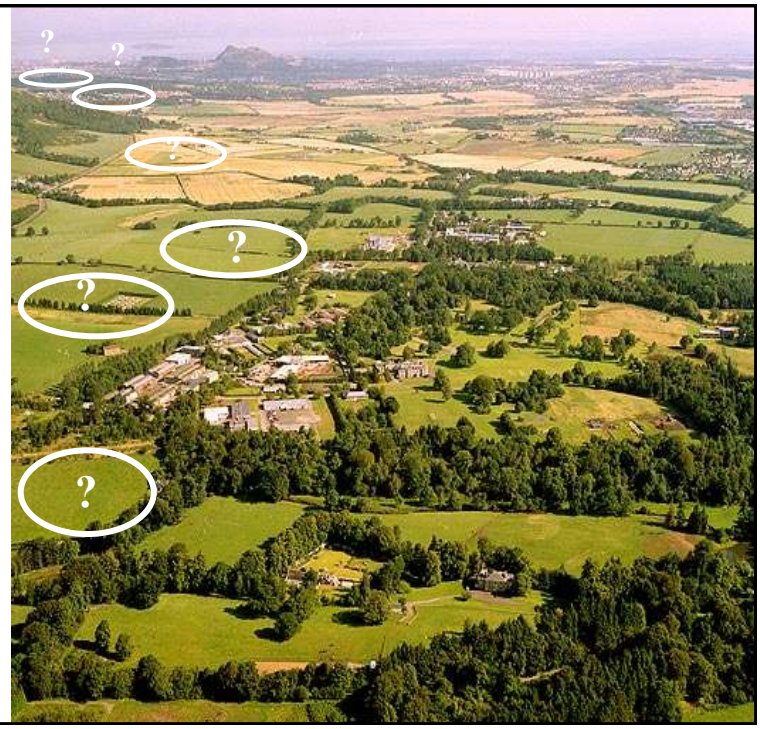
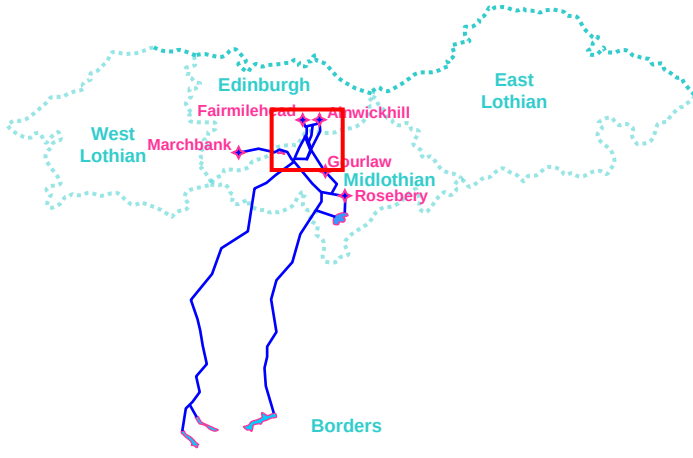
You want to put it *where*?



SCOTTISH WATER

Search Area



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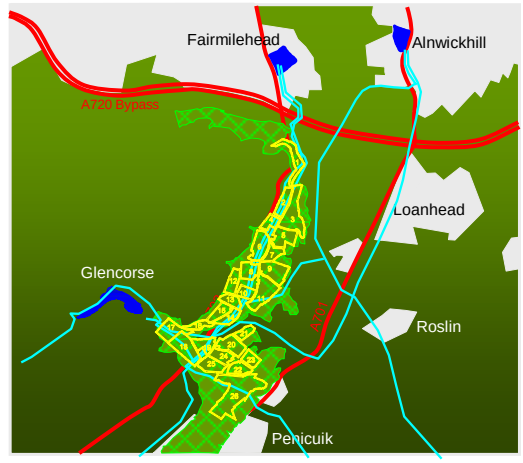
Search Area



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Five new sites in Midlothian identified

Pentland Business Park

Glencorse

Penicuik

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Overall Site Selection

SCOTTISH WATER

- Scope
- Optioneering
- Feasibility
- Initial Consultation & Site Selection
- Formal Consultation & Detailed Site Selection
- Site Selection Workshop
- GAP Analysis
- Further Analysis
- Site Selection - Decision

- Six separate sites subject to identical study & evaluation
- Engineering, Environmental & Economic factors considered

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Detailed Site Selection

SCOTTISH WATER

- Consultation
- Land Ownership
- Cost Estimates & Report
- Environmental Screening
- Architectural Considerations
- Buildability
- Site Selection Workshop

- Wide consultation process carried out
- Utilised a combination of inhouse engineering teams and external experts

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Further Analysis

- Site Selection subject to rigorous review and verification
- All material made available following announcement
- Recommendation reviewed by Independent Consultants
- Recommendation made to Board in April 2007

Scottish Water's Preferred Site

- Glencorse
- New Development Area E
- Located north of Belwood Road & Mauricewood Road near Penicuik and close to the A702
- Site Selection approved by Board in May 2007
- Decision announced in June 2007

SCOTTISH WATER

B&V up to this point

1. Involvement, D&B, commitment, investment, previous experience, partnership.
2. Benefits, knowledge for design and construction and delivery

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Benefits of Glencorse

1. Engineering: Proximity to existing infrastructure. Water quality can be improved without compromising existing assets or levels of service.
2. Sustainability: New site requires less vehicle movements, less CO2, less pumping power. Accommodates need for more recycling of materials & less waste.
3. Environment: New site allows best opportunity for screening and environmental enhancement.

Benefits of Glencorse

4. Flexibility: The new site solution will give Scottish Water the flexibility to provide more water and wastewater services to more places in future.
5. Economics: The whole life cost of the new site option is significantly less than FMH option.

A More Sustainable Solution.

Glencorse - Announcement

- Public announcement June 12th 2007
- 1150 letters & leaflets sent out
- www.scottishwater.co.uk/edinburghwater
- Press Coverage

Evening News

Want to get the best out of Edinburgh?
GET EDINBURGH'S BEST ENTERTAINMENT MAGAZINE

Evening News
Tue 12 Jun 2007

Work could begin next spring on the new plant at Glencorse Reservoir. Picture: Rob McDougall

Printer friendly | Send to friend | Comments (11)

Glencorse to be source of city's £60m waterworks

ADAM MORRIS
(amorris@edinburghnews.com)

A NEW multi-million pound water treatment works for Edinburgh is to be built in Midlothian.

Scottish Water announced today that it would close treatment facilities at Fairmilehead and Alnwickhill in favour of moving wholesale to Glencorse. Subject to planning permission, it is hoped work on the £60 million project will start next spring and be complete by 2010.

Water bosses, who look set for a windfall through the sale of prime land at the two current sites in the south of the city, said today that the new plant would result in a drastic improvement in the quality of drinking water in the city.

EDWP: Press

Tues 12th June 2007
SW Announcement
Edinburgh Evening News

COMPETITION: NINTENDO Wii - TWO TO BE WON!

Evening News
THE EDINBURGH PAPER

BESLIJA BACK WITH HEALTH WARNING

HIBS TRACK FRENCH DEFENDER

WATER WAR

Objections set to flood in against new city treatment plant

SCOTTISH WATER

EDWP: Press

Wed 13th June 2007
Edinburgh Evening News

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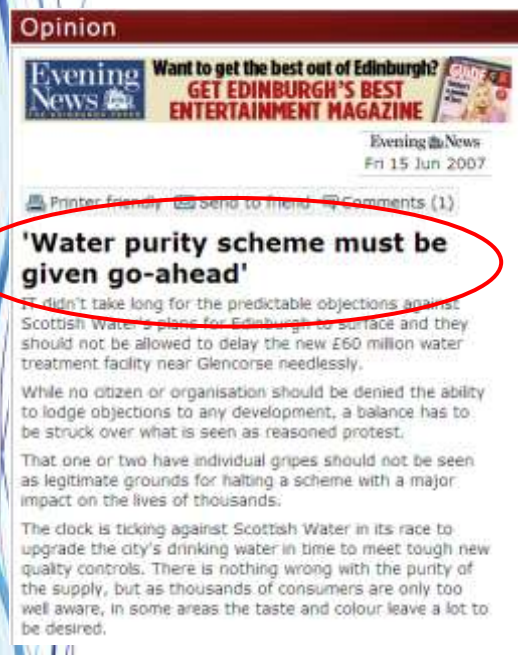
Opinion

Evening News

Want to get the best out of Edinburgh?
GET EDINBURGH'S BEST ENTERTAINMENT MAGAZINE

Evening News
Fri 15 Jun 2007

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'Water purity scheme must be given go-ahead'

It didn't take long for the predictable objections against Scottish Water's plans for Edinburgh to surface and they should not be allowed to delay the new £60 million water treatment facility near Glencorse needlessly.

While no citizen or organisation should be denied the ability to lodge objections to any development, a balance has to be struck over what is seen as reasoned protest.

That one or two have individual gripes should not be seen as legitimate grounds for halting a scheme with a major impact on the lives of thousands.

The clock is ticking against Scottish Water in its race to upgrade the city's drinking water in time to meet tough new quality controls. There is nothing wrong with the purity of the supply, but as thousands of consumers are only too well aware, in some areas the taste and colour leave a lot to be desired.

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EDWP: Press

Fri 15th June 2007
Edinburgh Evening News

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Sustainability

- Stakeholder Management
- Community Involvement
- Environmental Awareness
- Landscape Design
- Carbon Footprint
- Innovations
- Renewable Energy
- Education

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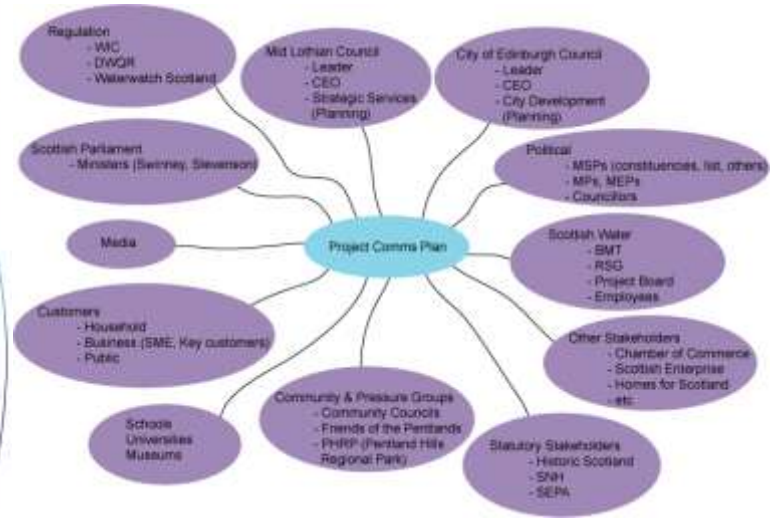
Stakeholder Map



The Plan

Comms Plan

- Stakeholder mapping
- Relationship Managers accountable for all stakeholders
- Key messages
- Internal Communication Plan
- Media management
- Intelligence & drivers for stakeholders & groups
- Customer Project Champions for Call Centre
- Calendar of events/briefings
- Partnership approach throughout

Project Website

- Will be open with content & sharing information
- Will be used to ease burden on Councils, Stakeholders & Scottish Water
- Will establish dedicated 'mini-site', linked from Scottish Water website
- Will be used for web-based consultation

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Stakeholder Contact

Jeremy Purvis MSP
Rhona Brankin MSP
David Hamilton MP
Midlothian Council Planning Department
Midlothian Councillors, Wards 1 & 4
City of Edinburgh Council, City Development
Pentland Hills Regional Park
Friends of the Pentlands
Penicuik Schools
Scottish Natural Heritage (SNH)
Scottish Environmental Protection Agency (SEPA)
Historic Scotland
Community Councils (Damhead, Penicuik & District, Liberton and Fairmilehead)
Penicuik Community Development Trust
Waterwatch Scotland
Local Residents, landowners & tenants
Various landowners along pipeline route
Newspapers & Local Radio
Midlothian Enterprise Trust
Edinburgh & Midlothian Chamber of Commerce

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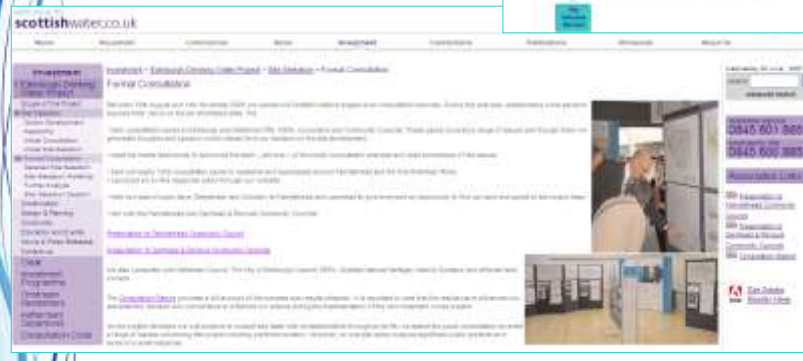
Project Website



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Clear Communication

- Over 1150 copies sent out
- Available to download on website

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Vision Statement / Brief

'…Scottish Water wishes to promote
the new works as an innovative,
intelligent and low impact development.'

'The siting of the new works... will be sympathetic to the local environment and community.'

'… architectural and landscape design
… to the highest standard.'

'The project will be informed by and
establish water industry best-practice in sustainability…'

'…ensure that the works are cost-efficient and
environmentally and socially responsible over their whole life…'

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B&V up to this point

1. Involvement, D&B, commitment, investment, previous experience, partnership.
2. Benefits, knowledge for design and construction and delivery
3. Next steps involved speaking with stakeholders to share aspirations of all …..
4. Important to optimise design progress
5. Clear stance of Client & Contractor

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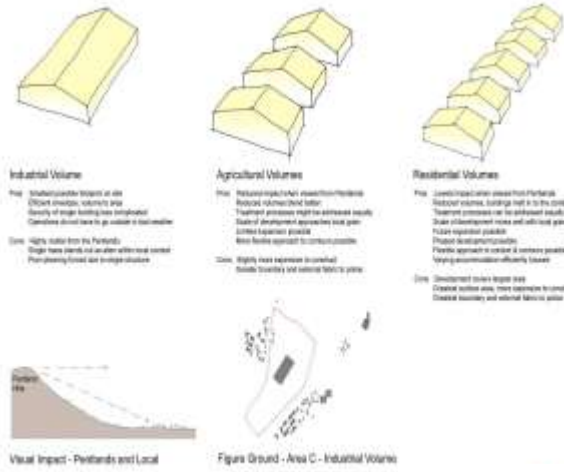
Volume & massing



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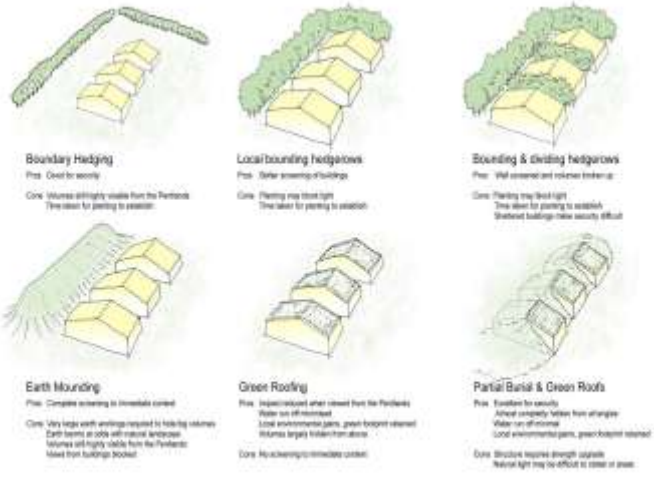
Landscape's role



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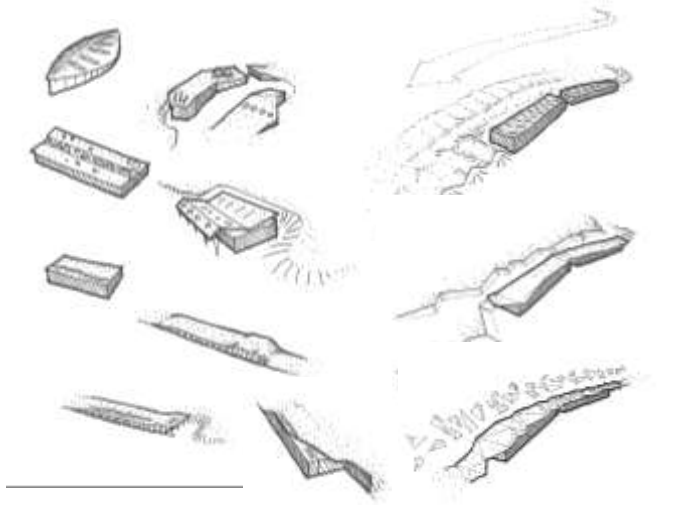
Landscape as-art



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Mecanoo – Delft Library
Tadao Ando – Nariwa Museum
Future Systems – Pod life

West 8 – Interpolis Gardens
Patricia Leighton – M8 Saw Tooth Ramps

Landscape Principles

- Visual integration and a good landscape fit
- Improve biodiversity with new habitats
- Sustainable use of materials

Green Roof | Wetland | Raw Timber Logs

Hard Landscaping

Grasscrete

Geogrid – recycled plastic

Charles Jencks - GOMA Edinburgh

Netlon

Murrayfield training pitches

Soft Landscaping

Jakob Inox– tensioned wire greening systems

Boundary Landscaping

Hedgerow – 6 Months Old

Vernacular Turf Walling

Temporary Artwork – Welsh Botanic Gardens

Porsche HQ – Ha Ha

Community Involvement

50

- Result - Planning Consent was achieved in 10 weeks.

- Similar project in Glasgow took 2.5 years

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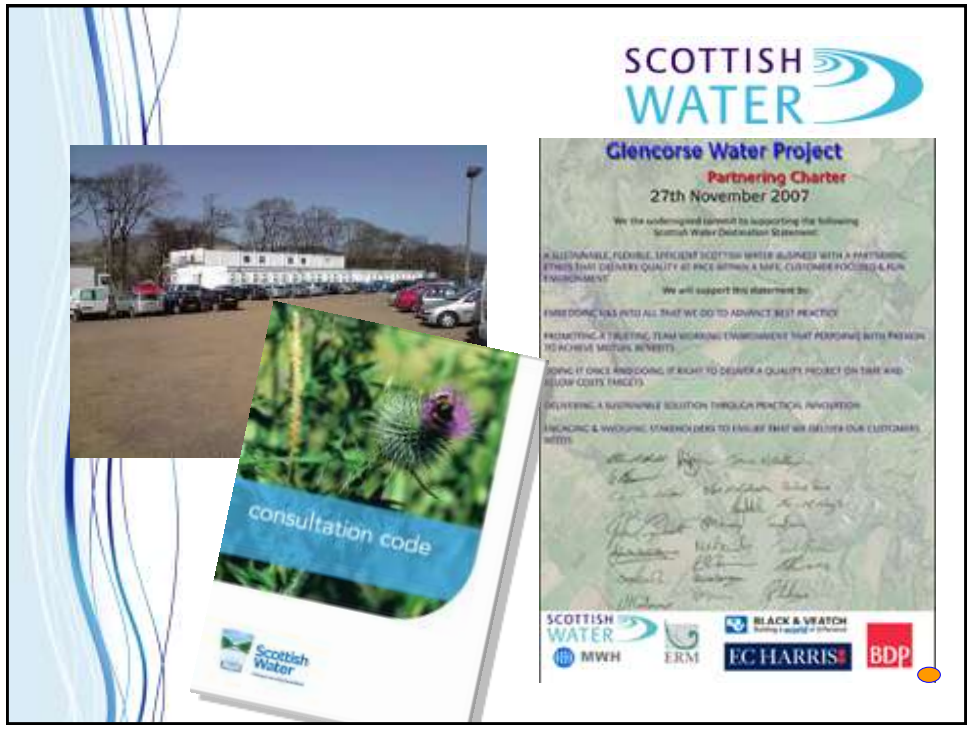

Stakeholder Management

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- Dedicated Communications Plan with regular review
- Tailoured Web pages within Scottish Water website
- Meet the Team Events
- Quarterly e-newsletters to VIP list
- Community Forum with site visits
- Project Champions within Call Centre
- Community involvement with Charities & Groups
- Education Programme

Meet The Team Sessions

- Local residents invited to meet the people involved in the project.
- Actions recorded and summary distributed to locals.

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Making Contact Easy

- All correspondence contains our contact details.
- Contractor carries calling cards.
- Project Champions in Scottish Water's Contact Centre.

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Recording and Acting on Feedback

- Register to record all enquiries about the project.
- Details logged and outcomes recorded.
- Provides intelligence on customer contacts.

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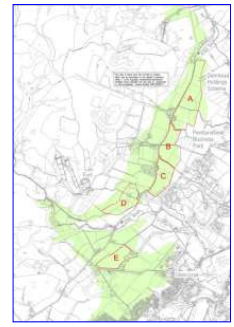
Location, Location, Location

Glencorse WTW location was chosen to allow it to be gravity fed from reservoirs 30km away in the Scottish Borders. In turn, the WTW feeds Edinburgh by gravity with no need for energy-intensive pumping.



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Key Project Facts

- New water treatment works for Edinburgh
- Scottish Water's largest ever Capital Project
- £130m budget
- Will provide drinking water for up to 450,000 people
- Maximum Capacity of 175MLD (175,000,000 litres per day)

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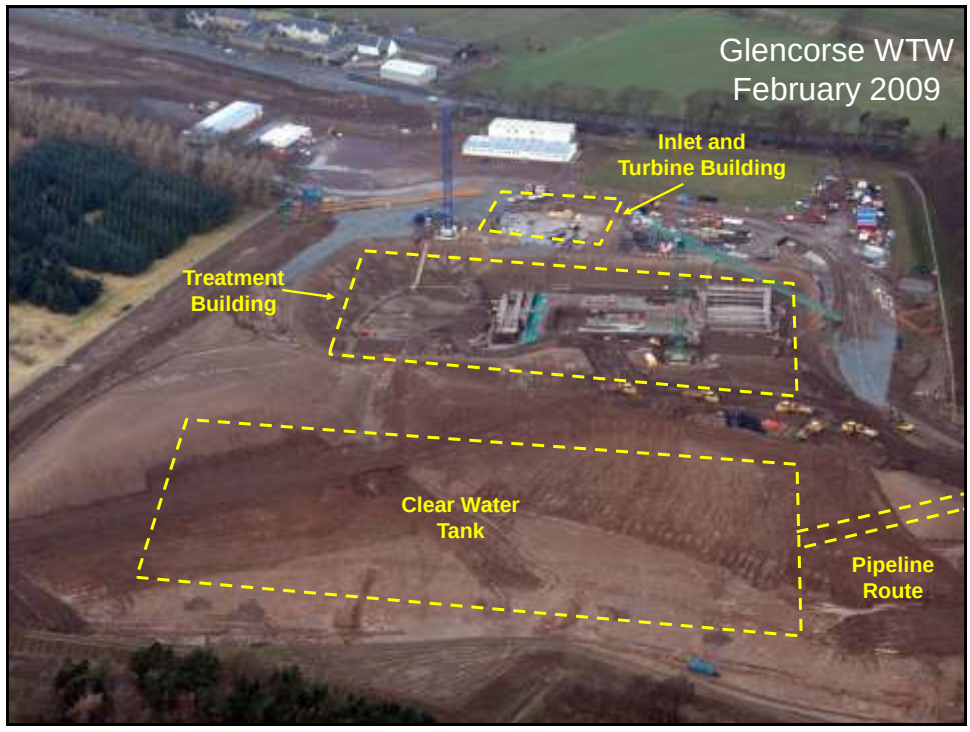
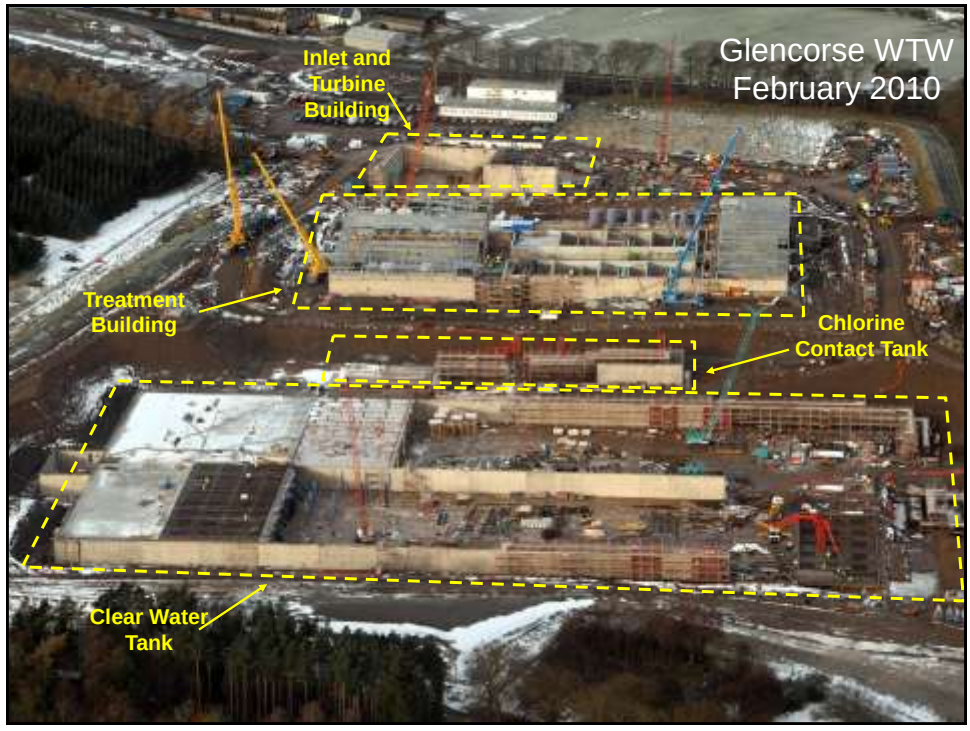
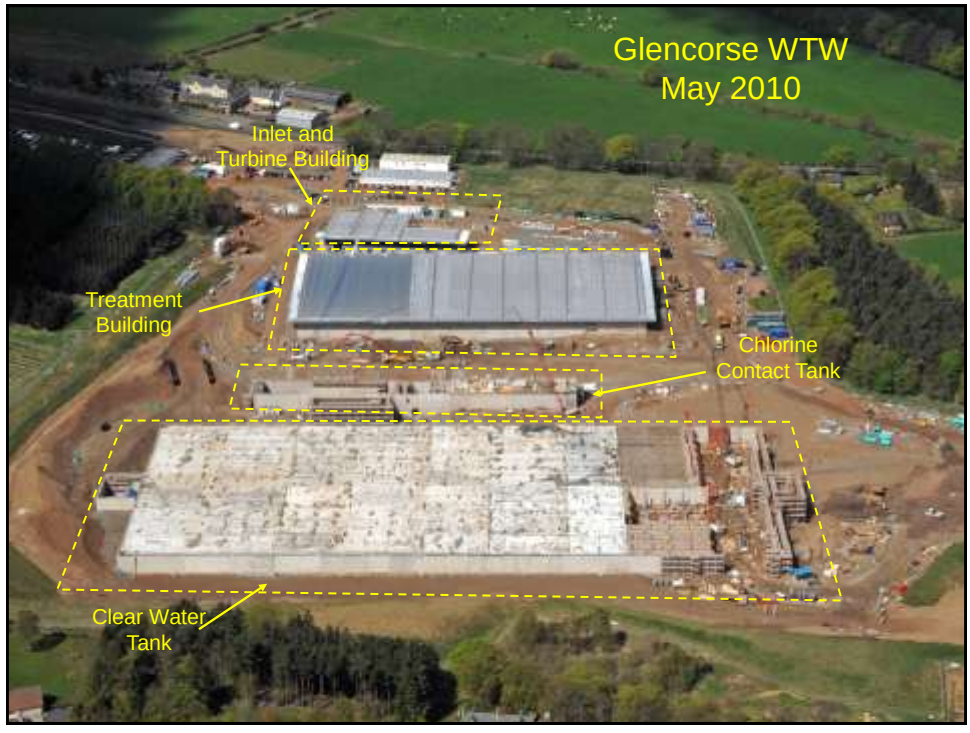
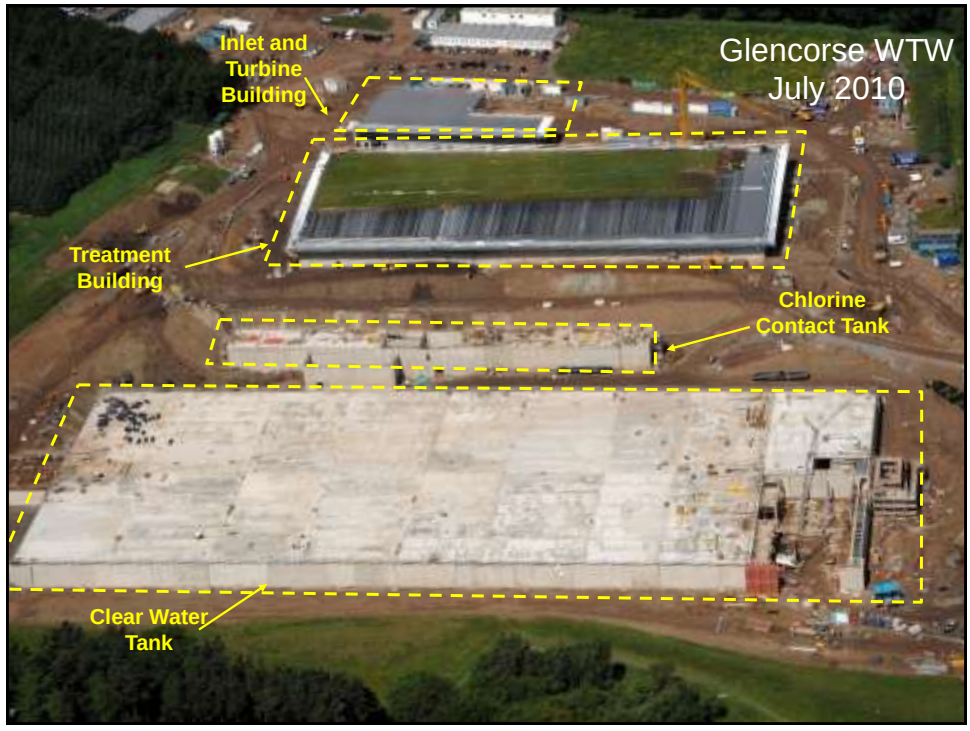



Glencorse WTW
February 2010
Inlet and
Turbine
Building
Treatment
Building
Chlorine
Contact Tank
Clear Water
Tank


Glencorse WTW
May 2010
Inlet and
Turbine Building
Treatment
Building
Chlorine
Contact Tank
Clear Water
Tank


Glencorse WTW
July 2010
Inlet and
Turbine
Building
Treatment
Building
Chlorine
Contact Tank
Clear Water
Tank

Glencorse WTW
April 2011
Inlet and
Turbine Building
Treatment
Building
Chlorine
Contact Tank
Clear Water
Tank

Stakeholder Management Opportunities

- CocoDaff
- Roman Marching Camp & Archaeological finds
- Grass Roof, wetlands
- Hydroturbine
- Plastic Pipe production
- Pipejacking under City By-pass
- Community involvement - volunteering
- Educational visits
- Awards

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SCOTTISH WATER

Local Investment

Roof was harvested at Turf Farm near Loch Leven

Glencorse in the news…..

Garden Design Journal (Oct 2010)

GREEN ROOF PRESERVES BEAUTY SPOT

A huge new

Horticulture Week (Aug 2010)

Green roof takes size record

Garden News (Aug 2010)

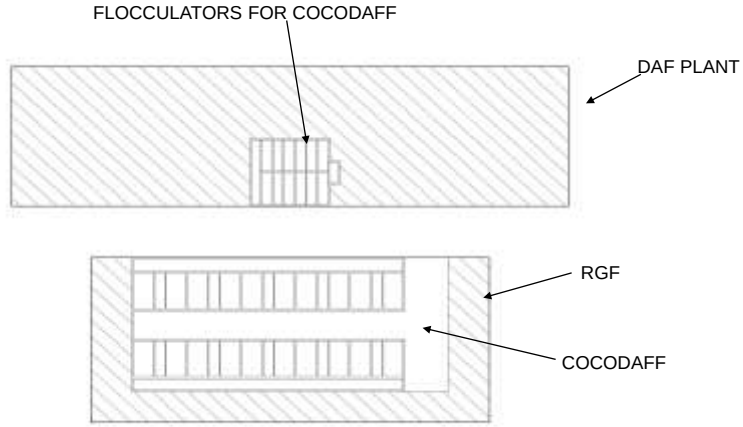
Green roof makes plant disappear!

Keeping it Local

- Scottish Larch from a sustainable source used for wood cladding
- Concrete batching plant within 2 miles
- Local subcontractors and labour used

Technical Innovations

COCODAFF – Comparison Of Footprint



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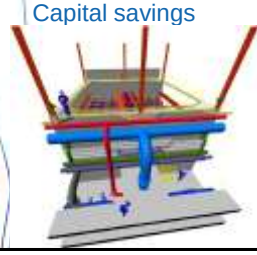
Innovative Water Treatment Process

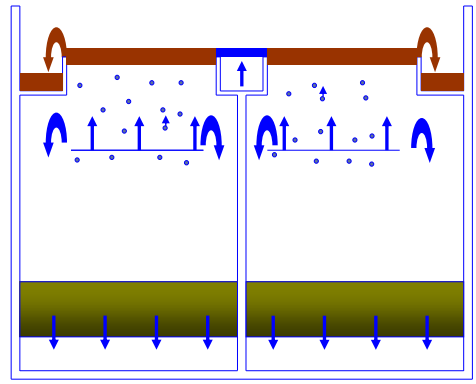
CoCoDAFF: Counter Current Dissolved Air Flotation & Filtration

Rapid Gravity Filter and Dissolved Air Flotation combined into one unit.

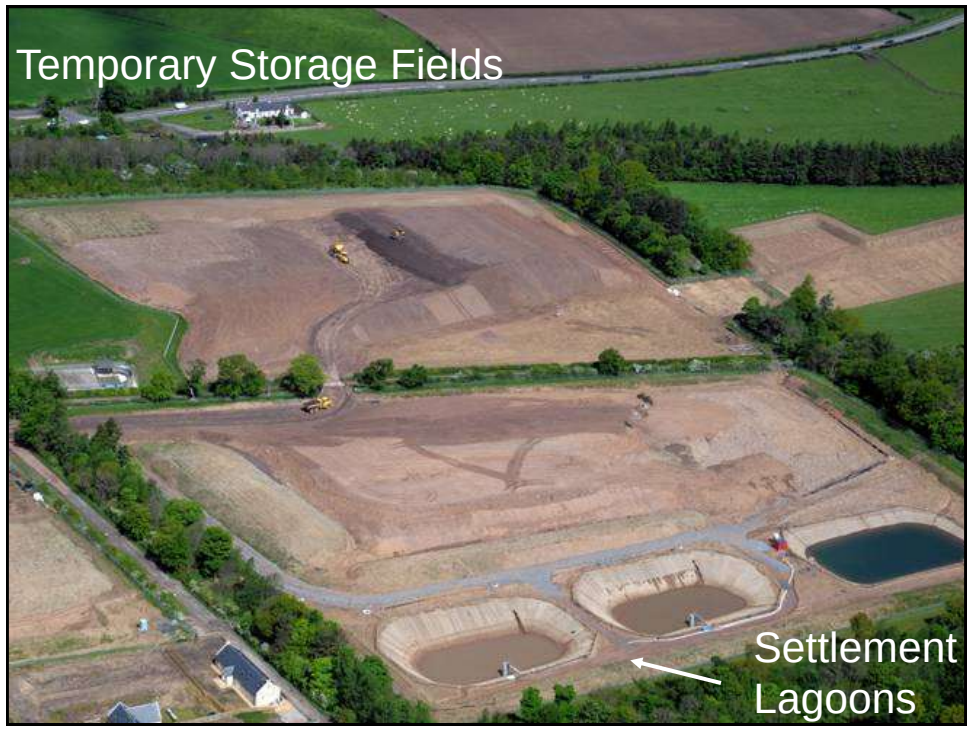
Benefits:

- Efficient use of space
- Reduces building footprint
- Capital savings





Excavation


Temporary Storage Fields
Settlement Lagoons

Summary of Sustainability - Economic

During Construction:

- Local sub-contractors and labour
- Locally sourced materials where possible

Long Term:

- Project reduces development constraints by providing increased capacity to supply water
- Adding to the tourism experience by providing a high quality drinking product

Summary of Sustainability - Environmental

During Construction:

- 75% of excavated soil retained on site.
- Mobile pipe production plant.
- Locally sourced materials and labour used where possible.

Long Term:

- Site selection allowed Edinburgh to be gravity fed.
- Inclusion of Scotland's largest green roof and additional habitat areas.
- Hydro-electric turbine to generate electricity.

Summary of Sustainability – Social

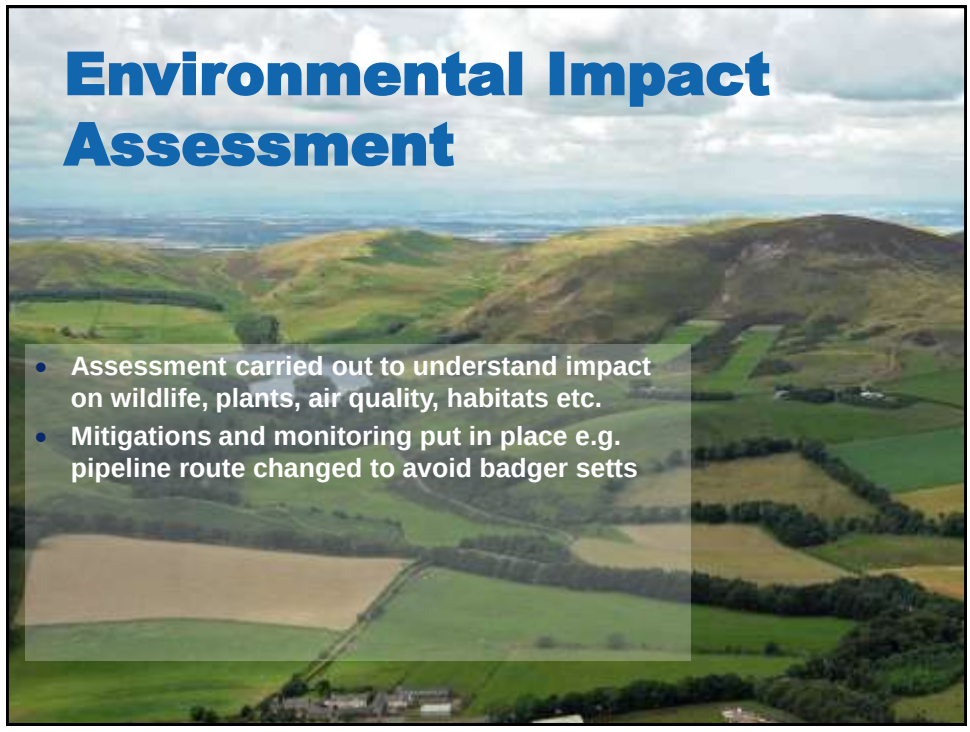
During Construction:

- Education Programme
- Community Work

Long Term:

- Minimal impact on neighbours and users of Pentlands Park

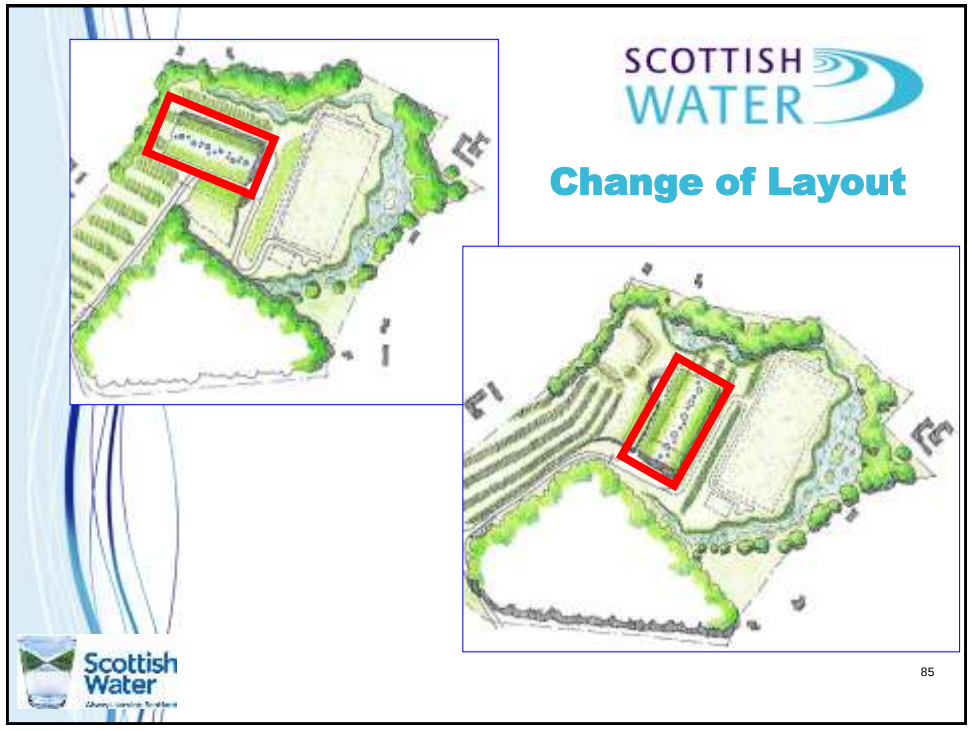
Environmental Impact Assessment



- **Assessment carried out to understand impact on wildlife, plants, air quality, habitats etc.**
- **Mitigations and monitoring put in place e.g. pipeline route changed to avoid badger setts**

Spoil
• 430,000 m3 of spoil generated
• 2 fields approx 5ha for interim storage.
• Resulted in minimum HGV movements and restrictions.

Roman Marching Camp


SCOTTISH
WATER
Change of Layout
Scottish
Water
85

SCOTTISH
WATER
The 16th Battalion
of the Durham Light Infantry
OPEN DAY
Archaeological Investigation
of WWI Army Camp
Scottish
Water
BLACK & VEATCH

Archaeology Open Day

170 locals came along to see WWII camp discovered on pipeline route

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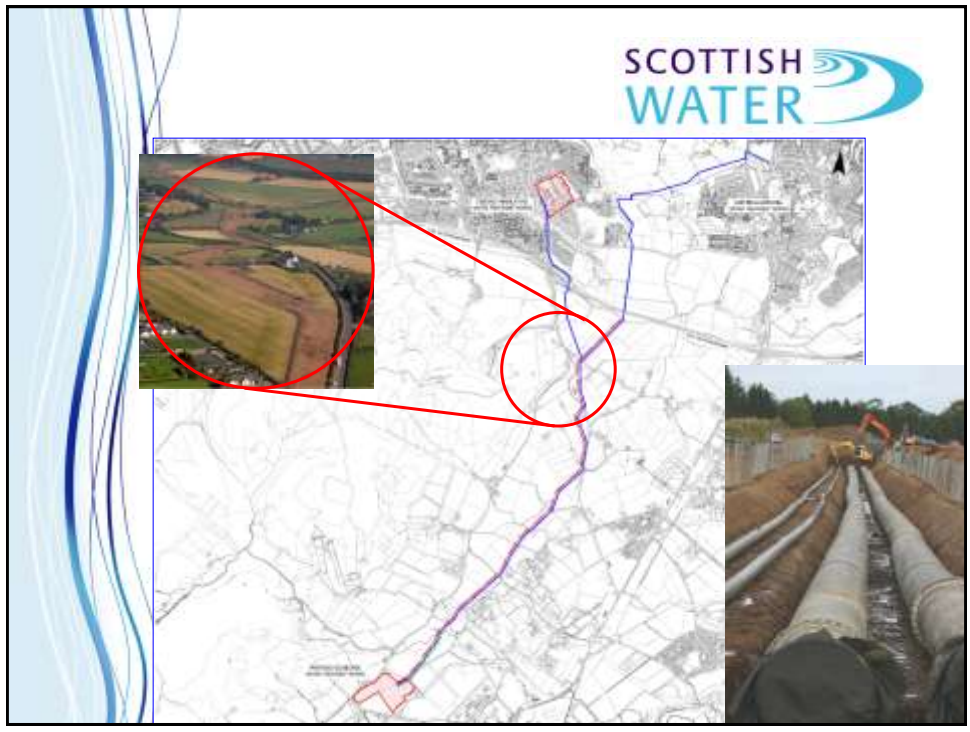

Technical Innovations

Mobile Pipe Production concept

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WORLD FIRST: Mobile Pipe Production at Glencorse

- Site based pipe factory manufactured 15km of pipe
- Allowed extra long pipe sections to be made
- Massive reduction in vehicle movements, carbon footprint as well as time & cost savings

(Above)
The Mobile Pipe Production Kit

(Below)
Inside the Tent where all the pipes were produced. The plastic pellets are stored in white bags on the right the pipe making machinery on the left hand side.

Scottish Water

Pipeline Route to
Damhead

Tunnelling Operation at Bypass

Digging Arm

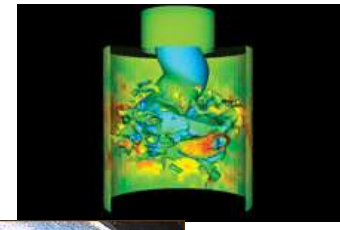
Concrete Pipes

Hydraulic Ram

94

Technical Innovations

Hydroturbines



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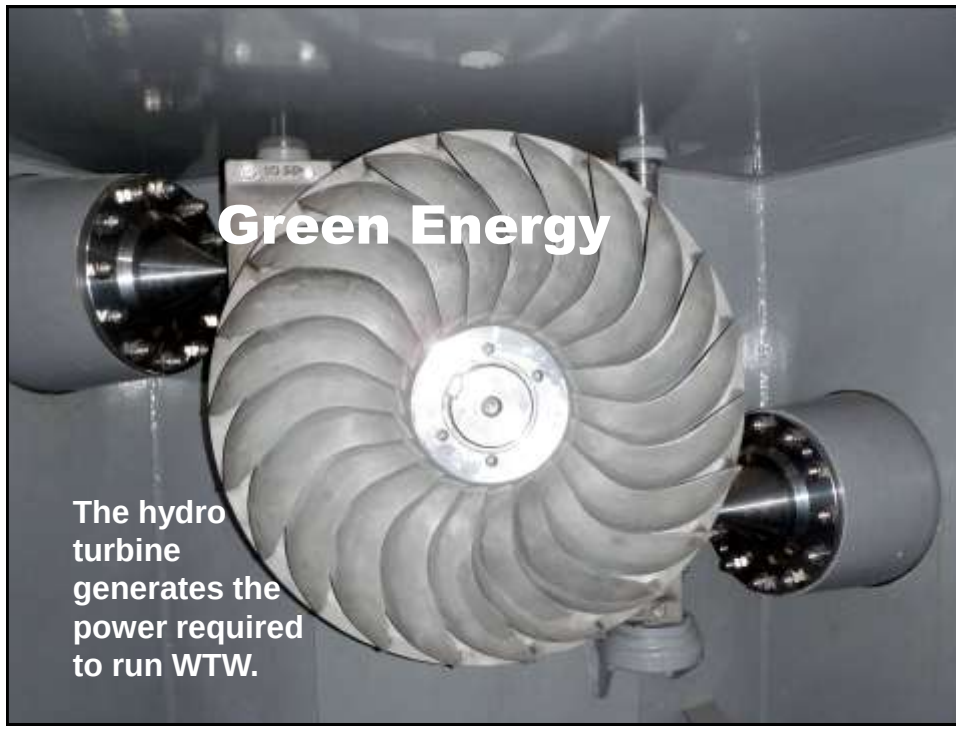
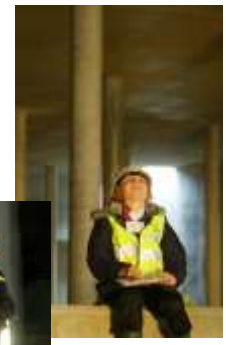


Education

- Primary
- Secondary
- Graduate/Post Graduate



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Education Programme

Over 500 young people visited the site over three years:
4 Primary Schools
2 High Schools
3 Universities

1000 student visits

Heath & Safety & Schools

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Education Programme

- Primary school programme has covered various topics including Health & Safety in construction, water treatment, water pollution and the environment.

Water works makes splash with pupils

PUPILS at three schools neighbouring a new £200 million water treatment works have started the project as part of an educational initiative.

The youngsters are being taught lessons in construction, health and safety and the environment, which developer Scottish Water said would stand them in good stead for future careers.

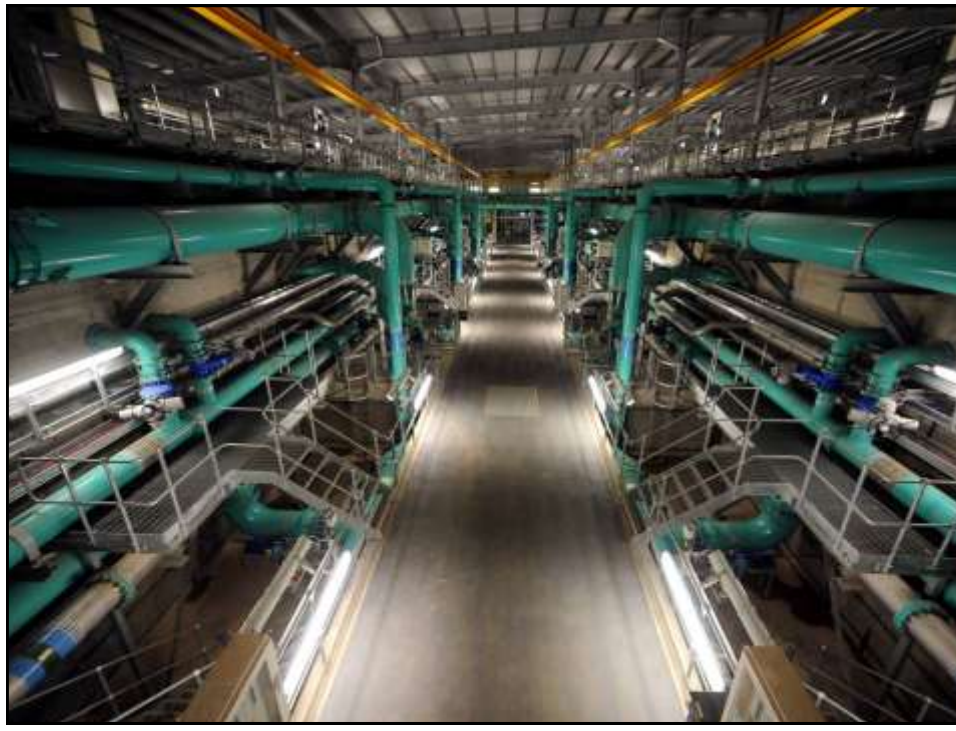
The company is building the new treatment works on the edge of the Pentland Hills Regional Park, which will provide almost half a million people with fresh drinking water.

It will replace the ageing Fairmilehead and Alnwickhill works when it opens in 2011, providing more than 175 million litres each day – enough to fill the Commonwealth Pool 70 times.

Scottish Water's Lynsey Tweedie said: "This is a fantastic opportunity for these children to learn some of the basic lessons which may benefit them should they consider careers in civil engineering, construction or environmental management.

"It's proven to be an inspiring initiative for the children."

STEM CENTRAL
Engineering through sciences, technologies and maths
Water - Water treatment
Learning in context
Electric transport
Water
About water
Learning journeys
Videos
Water treatment video
Flooding video
Interactives
Engineering challenges
Resources
Energy-saving house
Related videos
Lynsey Tweedie
Project Manager - Scottish Water
About this video
Excelle
nce

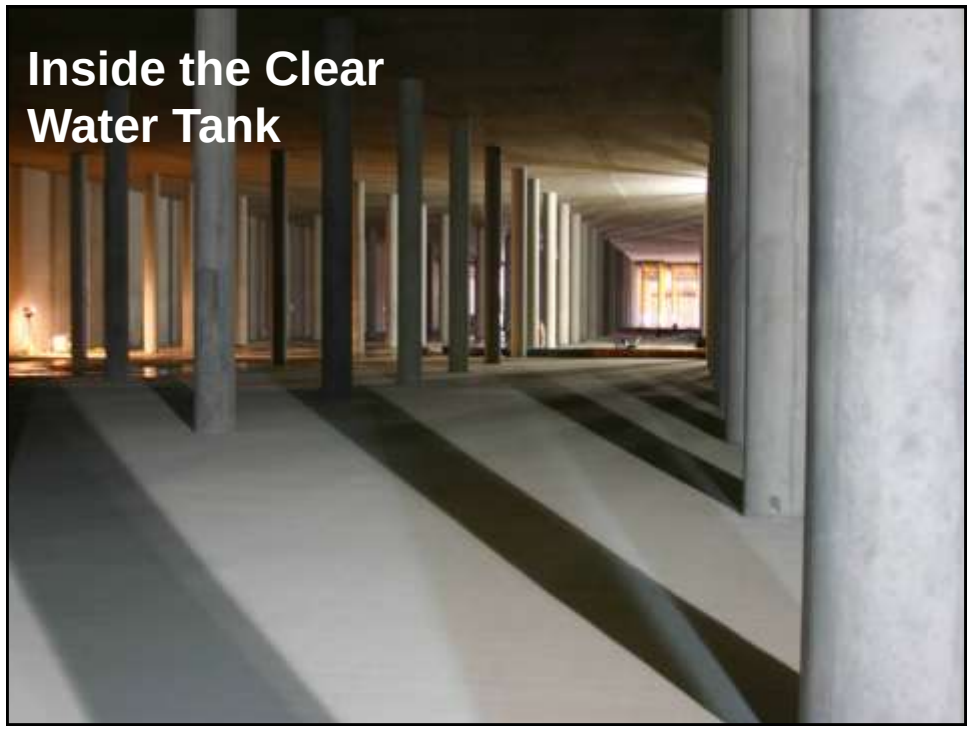


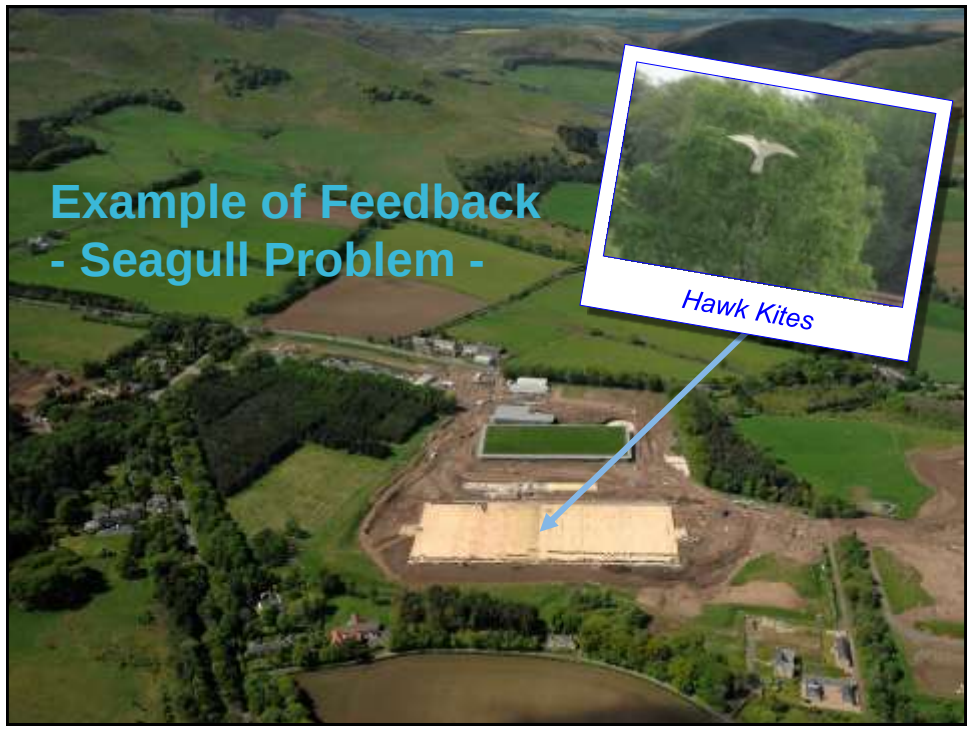
Legacy

"It is rare for school children to take part in a project of this scale and importance, on their own doorstep from its beginning to its completion.

"Such inspiration will leave a living legacy for Glencorse, here in Midlothian."

Moira Brady, Head Teacher, Cornbank Primary School


Inside the Clear
Water Tank


Example of Feedback
- Seagull Problem -
Hawk Kites

Internal Communications

- 50 people within Scottish Water who contribute to success of project.
- Without excellent internal consultation results could be 50,000 – 200,000 people experiencing interruptions to supply.

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When staff are customers too…..

- Work carried out in proximity of Scottish Water's Edinburgh Office.
- Traffic management on Biggar Road for 12 months.
- Temporary carpark provided

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The Big Freeze!

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Volunteering in the Community

SCOTTISH WATER

Before

After

Refurbishment of picnic area in Pentland's Park

Fundraising for local charity

Creation of Community Garden at Dick Vet School

Success

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SCOTTISH WATER

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Glencorse Video

Thank You
Scottish
Water