Green Port Hull

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ABP Overview

- Largest Port company in the UK - 92 million tonnes of cargo handled in 2015
- 21 ports handling every conceivable type of cargo and generating 25% of UK’s rail freight
- In 2015 ABP’s statutory harbour authority (SHA) areas handled around a quarter of UK major ports’ seaborne trade
- Full range of facilities accommodating needs of major sectors - energy, cruise, containers, agri-bulks, automotive, forest products and steel
- Supports 84,000 jobs
- Dedicated, committed industry experts providing world-leading solutions and managing operations
Offshore Wind

The Humber is strategically positioned to be the centre of UK offshore wind revolution.
What is Green Port Hull?

- Facility for the manufacture, assembly, testing shipment and on-going maintenance of wind turbines for the offshore wind power industry
- A factory for manufacture of blades together with office space and welfare facilities;
- 54ha site (comparable to 130 football pitches)
- 7.5 ha reclaim of land from estuary
- Partial infill of Alexandra Dock
- Dredging
- Initial £310m investment by ABP and Siemens
Alexandra Dock 2014
Alexandra Dock Today
Alexandra Dock Early 2017
TSHD ‘Eke Möbius’ – Alexandra Dock
Beneficial Use Material at GPH

- 845,000 m³ from Chequer Shoal
- 296 round trips to Chequer
- 140,000 m³ from Eastern Approaches
- 31 trip round trips to Eastern Approaches
- Average 4,615 m³ of sand collected on each trip
- 3 – 4 round trips per day
- Direct pumping into Alex Dock and stock piled for use behind main quay wall
Win Material Sites
# Dredge Quantities

<table>
<thead>
<tr>
<th>Dredging</th>
<th>Dredge material</th>
<th>Specific gravity</th>
<th>Dredge quantity</th>
<th>Holme Channel Deep</th>
<th>Middle Shoal</th>
<th>Hull Middle</th>
<th>Window A</th>
<th>Window B</th>
<th>Bull Sand Fort</th>
<th>GPH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stallingborough north</strong></td>
<td>Silt &amp; sand</td>
<td>1.8</td>
<td>55250</td>
<td>18685</td>
<td>36565</td>
<td></td>
<td></td>
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<tr>
<td><strong>Stallingborough south</strong></td>
<td>Silt &amp; sand</td>
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<td>9750</td>
<td>3315</td>
<td>6435</td>
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<td><strong>SDC north</strong></td>
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<td>970,000</td>
<td>311000</td>
<td>659000</td>
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<tr>
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<tr>
<td><strong>SDC all areas</strong></td>
<td>Glacial clay</td>
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<td>120000</td>
<td>60000</td>
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<tr>
<td><strong>Hawke</strong></td>
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<td>865,000</td>
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<tr>
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<td><strong>Eastern 2</strong></td>
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<td>50000</td>
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<td>100000</td>
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<td><strong>Eastern 3</strong></td>
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<td>13750</td>
<td>27500</td>
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</table>
# Potential for Further Beneficial Use

<table>
<thead>
<tr>
<th>Material type</th>
<th>Description (from SI work)</th>
<th>Beneficial use options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>The sand to be dredged from outside Spurn will have a median particle size of 200 microns up to 2 mm. The majority of the remaining sand from the Sunk Dredged Channel area will be less than 100 microns with possibly 10% silt material</td>
<td>Suitable for infill in construction (as evidenced by GPH.) Load bearing capabilities are good. Equally the coarser dredged sand is of a type that has been used by east coast beaches for sand recharge.</td>
</tr>
<tr>
<td>Silt</td>
<td>The median particle size of the silt identified in the table above will be between 10 – 50 microns depending on the specific location and in some cases comprise 20% clay size material</td>
<td>Difficult to de-water so has limited use in construction as infill. If used its load bearing capabilities are low as it would create ‘soft-spots.’</td>
</tr>
<tr>
<td>Glacial clay</td>
<td>The individual particle size of the glacial clay is similar to the silt material but is more consolidated in situ hence, most likely needing a backhoe or cutter section dredger to remove.</td>
<td>Can be used in construction but if dredged by backhoe it would be presented in the form of large lumps. If used in construction infill, therefore, this has the possibility of creating voids underground. As the lumps gradually erode over time due to groundwater penetration the material would settle again creating undulations in the infilled area’s surface. If a CSD is used then the resulting material will have a character at the point of use similar to the silts above.</td>
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</tbody>
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Dredging of Berth Pockets

- Disposal of 275,000 m$^3$ of clay and silt across four different licenced disposal sites in the Humber Estuary
- Marine Licence Variation
- Extensive Environmental Monitoring
- Restrictions due to location of residential properties
Dredging of Berth Pockets

- **Magnor**
  - The largest and most efficient backhoe dredger in the world.
  - With the spuds of 40 m length, she will be able to dredge to depths of 32 m.
  - Biggest bucket will have a capacity of 45 m³, nearly 1½ times the volume of a 20’ ISO container.
  - The total installed power on the excavator is 4,100 kW.
  - Use of water cooling for the engines and hydraulics. It delivers huge improvements in terms of fuel consumption and, above all, noise reduction.
Any Questions?

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