Appendix 1

Fens Reservoir Project (FRP): Transport of Construction Materials

Material Requirements

The primary materials required by volume for construction are rock (rip-rap) for bank protection and aggregates for access roads, estimated to exceed 1.5 million tonnes in total.

The main sources for these materials include the Peak District, Scotland, and Norway, with shipping to Hull as the most likely route for materials from Scotland or Norway. After extensive consideration of several routes and modes of transport, the Traffic & Transport Technical Working (TWG) has selected two principal options involving initial delivery by rail to Whitemoor Sidings, north of March.

Current Delivery Plans

As outlined in the Design Refinement Report (DRR) in the Phase 3 Consultation Report. The TWG examined various routes using waterways for delivery to the Reservoir site. However, these were not felt to be feasible and have been discounted. Thus, the Fens Reservoir Project is now currently evaluating two primary options, for delivering aggregate from rail to site for the reservoir's construction:

- Option A: Transportation from Whitemoor Rail Sidings, located north of March, to the site entrance at Doddington via an adjacent retail / industrial estate and the A141.
- Option B: The construction of new sidings at Stonea/Manea, followed by transport of materials via a temporary road across fields to the project site.

Should Option B be adopted, the prospect of transporting materials by waterways becomes redundant. However, Option A offers the potential for a hybrid rail/waterway transport solution, the benefits of which are outlined later in this paper.

Delivery Options from Whitemoor Sidings

- Option 1 – the proposed route in the latest consultation documents (Con3) : Off-load materials from rail at Whitemoor Sidings and transport them to the site via HGVs, covering a distance of six miles.
- Option 2 – an alternative suggested hybrid Rail / Waterways delivery, using an unused rail line from Whitemoor Sidings to move rail wagons to near the 20 Foot River and tranship via barge to the reservoir site via local waterways.

Impact of HGVs from Option 1 on Local Roads

Peak delivery is projected at 5,800 tonnes per day, equating to four trainloads. According to the DRR (p78, section 7.3.27), this would result in 350–450 HGV movements per day between Whitemoor Sidings and the Reservoir site. However, data on p81 (section 7.3.46) suggests peak

HGV movements could reach approximately 900 per day on the A141 during the March to October period in year three of the project.

Traffic surveys (p90 of the DRR) indicate the A141 experiences 1,000–1,500 vehicle movements per hour. Even with the significant increase in HGVs, Department for Transport guidelines (p85) consider an impact of less than 30% as "slight", with the projected 900 additional HGVs per day representing a 7% increase over a 10-hour working period.

These figures are averages and do not fully account for specific impacts, such as:

- Congestion at new and existing roundabouts and traffic lights along the route
- Impact at the western end of the of the retail / industrial estate, particularly at the junction with the A141
- Disproportionate wear on road surfaces from HGVs compared to cars
- Seasonal variations from farming and other slow-moving traffic
- Disruptions from accidents, roadworks, or weather
- Increased emissions and poorer air quality

Waterways Alternative

To mitigate the impact on local roads, an alternative route using local waterways has been identified. This proposal, discussed with the TWG in August 2025, remains under consideration pending a robust case demonstrating its advantages over preferred routes.

Proposed Hybrid Rail / Waterways Route

Freight trains would deliver materials to Whitemoor Sidings, where rail wagons could be transferred via the Bramley Line (an unused railway between March and Wisbech) to the Twenty Foot River. The Bramley Line Heritage Trust is collaborating with Network Rail to preserve and potentially reinstate this line for future use.

The proposed section of railway is approximately one 1.5 miles in length. Wagons would be unloaded onto a conveyor system leading to a barge loading facility on the riverbank. Barges would then carry materials along the Twenty Foot River, Old Nene, Popham’s Eau, and Sixteen Foot Drain – a journey of about 12 miles to the reservoir's boundary.

Waterway Dimensions and Suitability

A depth survey conducted on 10th October 2025 found minimum water depths of 2.1m and an average of 2.8m, providing suitable draught for most UK inland barges (carrying 80–130 tonnes). Channel widths are sufficient to allow navigation and passing of multiple barges. Air draft under bridges is estimated at a minimum of 2.1m, based on both published figures and practical experience. The route is largely free from residential properties, minimising potential disturbance.

The Sixteen Foot River is even deeper due to recent dredging for flood prevention, and photographs show the waterway is considerably wider and the banks higher than typical canals.

Loading and Unloading Operations

Loading would occur at the 20 Foot River, with options for unloading directly from the Bramley Line or via a purpose-built siding. The preferred method involves transferring materials from wagons to barges using bucket unloaders and a conveyor system alongside the existing railway

track. If reinstatement of the Bramley Line is not possible, an alternative is to build a conveyor from Whitemoor Sidings across fields to a suitable loading point.

Materials would be unloaded from the barges by long reach bucket unloaders and loaded onto tipper trucks for distribution to points of use or stockpiles. Hard standing / docks would not be required as unloaders would operate from the banks of the 16 & 40 Foot Rivers .

Unloading at the reservoir site would depend on barge and unloading configurations, with a target throughput of 2,500 tonnes per day, although this can be scaled up and down as required.

Barge Transport Scenarios

The viability of barge transport was modelled using several scenarios, each based on different barge sizes and trip frequencies, with the aim of delivering approximately 2,500 tonnes per day. These scenarios assumed a loading wharf with sufficient capacity, two 360-degree excavators unloading at the destination, a loaded journey time of 4 hours, and an empty return journey of 3 hours. Crew and tug requirements were also considered.

1. Option 1: 3 x 80 tonne barges per trip. Eleven loaded trips per day, requiring 27 barges and seven journey tugs. Double shifts would be needed for some tugs.
2. Option 2: 4 x 80 tonne barges per trip. Eight loaded trips per day, using 36 barges and seven tugs. The first tug would need to complete a second trip, likely necessitating double shifts.
3. Option 3: 3 x 100 tonne barges per trip. Nine loaded trips per day, involving 27 barges and seven tugs. Double shifts would be required for two tugs.
4. Option 4: 4 x 100 tonne barges per trip. Seven loaded trips per day, using 32 barges and seven tugs. No double shifts anticipated, with the final arrival around 17:00.
5. Option 5: 3 x 120 tonne barges per trip. Seven loaded trips per day, requiring 24 barges and seven tugs. Final arrival at approximately 17:00, with no need for double shifts.
6. Option 6: 4 x 120 tonne barges per trip. Six loaded trips per day, using 28 barges and six tugs. The last journey tug would arrive at roughly 18:30, departing at 14:30.

A suitable mooring location at the halfway point between loading and unloading wharves would be advantageous, allowing loaded barges to pause mid-journey and continue the following morning. The same arrangement could benefit tugs returning with empty barges.

Road Freight Cost Estimate

An estimate provided by a member of the Freight Group with a background in road haulage suggests that a 44-tonne lorry, carrying around 26 tonnes per trip (depending on the material), would cost approximately £950 per eight-hour shift. The proposed working pattern would be day shifts from Monday to Friday and night shifts from Monday to Thursday.

Barge Cost Estimate

(Gerry Heward – IWA Freight Group, Oct 25) tug and hopper rates:

80 tonne hopper barges (ex-BW mud hoppers 21.5m x 4.2m) at £500.00/week/barge + VAT
Tug (Bantam Pusher Tug) and Skipper, day rate, 8hrs shift at £550.00/day + VAT
Second Skipper for double shift work, 8hr shift, at £350.00/skipper/shift + VAT
For longer contracts it would be normal to work on weekly rates for tug & skipper which are discounted from the day rates.

Cost Comparison

1st pass rough estimate based on delivery of 2,500 tonnes per day & above rates

Delivery by road

Basis is a 2 hour return journey per 44t HGV carrying 26t per trip on an 8 hour shift

= 96 trips /4

=24 lorries

@£950 per shift = £22,800

= £9.12 per tonne

Delivery by barge

Basis is Option 2 above (4X 80t barges trips; 8 trips per day; requiring 36 barges & 7 tugs)

=36 x (500 / 5) + (7 x (£550 + £350))

=3600 + 6300 = £9900

=£3.96 per tonne

Difference = £5.15 per tonne

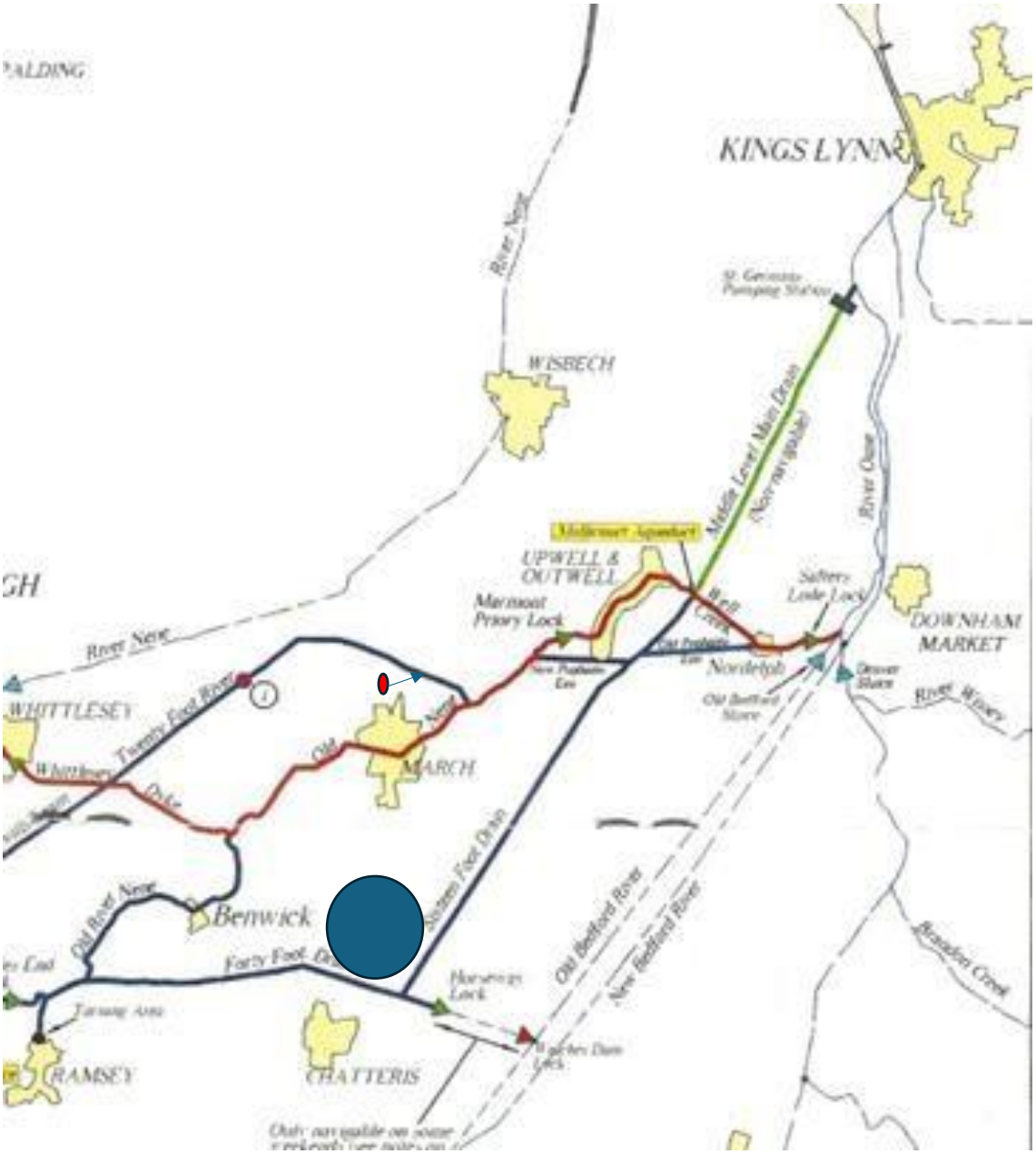
Notes

- Fuel costs not included, but expected to be less for barge transport
- Additional costs for loading / unloading not included
- Difference over 1m tonnes of material = £5.2m

Benefits of a Waterways Option

- Reduces risk to the project by providing an alternative means of delivery
- Meets the National Policy Statement for Water Resources Infrastructure which encourages a shift from road to more sustainable modes such as rail and inland waterways (section 3.2.7 of the DRP)
- Reduces impact on local residents and traffic
- Reduces carbon emissions per tonne of material delivered.
- Cost effective

Fens Reservoir Waterways



Map extract from Imray Laurie Norie & Wilson – St Ives

Fens Reservoir site at junction of Forty & Sixteen Foot Rivers

Whitemoor Sidings (red dot) north of March – approx. 1.5 km from 20 Foot Drain

Bramley Line

Whitemoor Sidings

Bramley Line connection

Bramley Line north of Whitemoor Sidings

Track between Road Crossing & Chain Bridge

Track between Road Crossing & Chain Bridge

Rail crossing of Whitemoor road

Railway track at Chain Bridge

View down 20ft