ATTACHMENT 14 – Concrete Supplier Location Information

APACHE CONCRETE
Cement Plant : 34 miles from batch plant.
Batch Plant: 2 miles from project.
This company gets their cement from a 25 year old, long wet kiln cement manufacturing plant that emits 1.2 tons of CO2 per 1 ton of cement.

BLACKFOOT READYMIX
Cement plant 32 miles from batch plant.
Batch Plant: 10 miles from project.
This company has a 6 yr old, long dry kiln cement manufacturing facility that emits 1 ton of CO2 per 1 ton of cement.

CHINOOK CEMENT
The third batch plant is 7 miles from the site by road, but their cement travels 5200 nautical miles from a company in Shanghai China that uses a brand new, cyclone preheater dry kiln cement plant that recycles its exhaust heat, resulting in .8 tons of CO2 per 1 ton of cement. It is brought over on a brand new self loading/unloading Panamax ship in 72,000 metric ton shipments. The ship takes 24 hrs to load and leave port. During this time it burns .25 metric tons of Intermediate Fuel Oil (IFO 380) every hour. The fuel is also known as Bunker Fuel, Heavy Fuel, or Diesel #6. While at sea, the ship travels at 14 kts and burns 34 metric tons of IFO per day. The ship takes 24 hrs to enter port and unload at the batch plant. During this time it must burn only diesel #2 to comply with Environmental Control Area regulations, and it uses .2 metric tons of diesel #2 per hour.

All of the companies get their aggregates from the same company. The source is on an island off the coast of British Columbia. The aggregates are shipped to a yard on 17,000 metric tonne barges. The tugs that pull these barges have 3500 HP engines. The voyage takes 26 hrs and they burn 220 grams of diesel per kwh.

Apache Concrete batch plant is 41 miles away from the aggregate yard
Blackfoot Readymix batch plant is 33 miles away from the aggregate yard
Chinook Cement batch plant is 50 miles away from the aggregate yard

Fly Ash is trucked to each batch plant from a coal power plant:
Apache Concrete batch plant is 39 miles away from the power plant
Blackfoot Readymix batch plant is 47 miles away from the power plant
Chinook Cement batch plant is 30 miles away from the power plant

There is a total of 15,614 cubic yards of concrete on the project.
Mix A: 3000psi. 3302CY
Mix B: 4000psi. 9307CY
Mix C: 5000psi. 3005CY

All companies use 10 CY concrete trucks.
The aggregate, cement, and fly ash are carried by tractor-trailers that haul 19.30 tons at a time.

Assume the tractor-trailers average 5.3 miles per gallon

22.384 lbs CO_2/gallon of Diesel #2

26.033 lbs CO_2/gallon of IFO 380

Average weight of Diesel is 7.09 lbs/gal

IFO 380 weighs 950kg/cubic meter

1 metric tonne = 1000kg = 2204 lbs = 1.10231131 short tons

1 hp = .745 kw

Fly ash is a byproduct of coal power plants, so the carbon footprint of its *production* is counted as that of electrical generation. Therefore assume the carbon footprint of the fly ash *material* is 0 lbs CO_2/lb admixture.

1 cubic meter = 264.172052 US Gallons

Use the specific gravities shown on the mix designs to determine density of cement, fly ash, sand, and 1" aggregate.

Water: 62.4 lbs/cu. Ft.

Kg/cu. m divided by 16.02 = lbs/cu.ft

1 cubic yard = 764554.858 cubic centimeters

1 cubic meter = 1.30795062 cubic yards

1 pound = 453.59237 grams

1 kg = 2.20462262lbs

Assume the water acquisition has no carbon footprint.

Assume concrete admixtures other than fly ash have no weight or volume.

Do not include production or handling of the aggregate, other than that noted above, as part of this calculation

Do not include production or handling of the raw materials for cement, other than that noted above, as part of this calculation

The Price of CO_2 is: $10/ton of CO_2 based on Carbonfund.org current rates