



EuDA 2018 Annual Conference

Th 15/11/2018, Brussels



European Dredgers adding Value to Society Worldwide

Adding Value to Global Logistics: *the Expansion of the Suez Canal*

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European Dredging Association



EUROPEAN DREDGING ASSOCIATION

Presentation's Objectives



Demonstrate:

- ⇒ the importance of the Suez Canal in Global Logistics
- ⇒ the importance of the New Suez Canal Project
- ⇒ Dredging is a problem-solving and solution-oriented sector !

Provide food for thought on the role of dredging and its contribution to global logistics infrastructures.



Suez Canal Expansion



Suez Canal

Historical overview



1798: Napoleon Bonaparte discovers ancient waterway passage.

North – South canal deemed impossible to an alleged water level difference (10m)

1854: Ferdinand de Lesseps obtains a concession to construct a canal open to ships of all nations

1859: Construction begins on the shore of future Port Said

1869: Opening of Canal under French control

1875: British buy minority shareholding in the canal for just under £4.0 million

1882: Britain invades Egypt and seizes control of the canal

1956: Nasser, second president of Egypt, nationalises the canal

1967 - 75: Suez canal is closed due to Arab-Israeli war

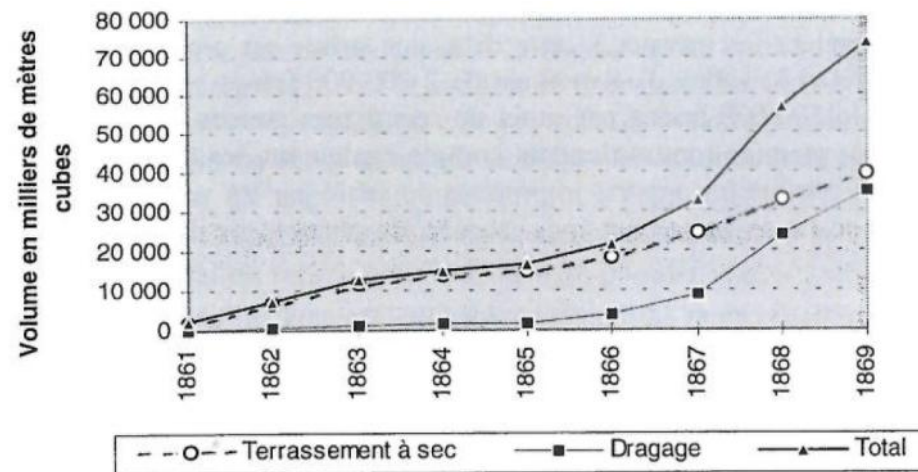
2014: President el-Sisi launches New Suez Canal project



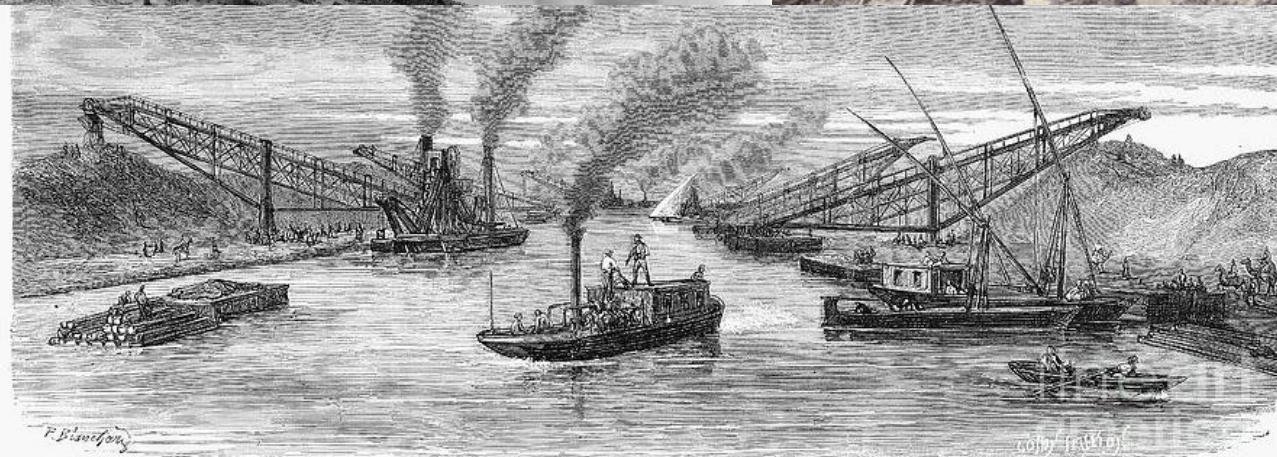
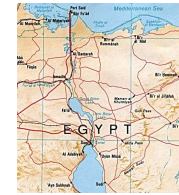
First Canal Project 1859-1869



- Designed for steam powered vessels (only 5% of traffic at that time)
- Considered “crazy and utopic” by the British
- 70.000.000 m³ – 10 years
- Methodology:
 - Started with forced laborers, shovels and camels
 - Shifted to steam powered dredgers, introduction of budget control (François Voisin)



First Canal Project 1859-1869



CANAL DE SUEZ. — Le canal maritime à Kantara; vue prise pendant le travail des dragues et des éévateurs. — D'après une photographie de M. Déziré.



Strategic Location For Global Trade



1869:

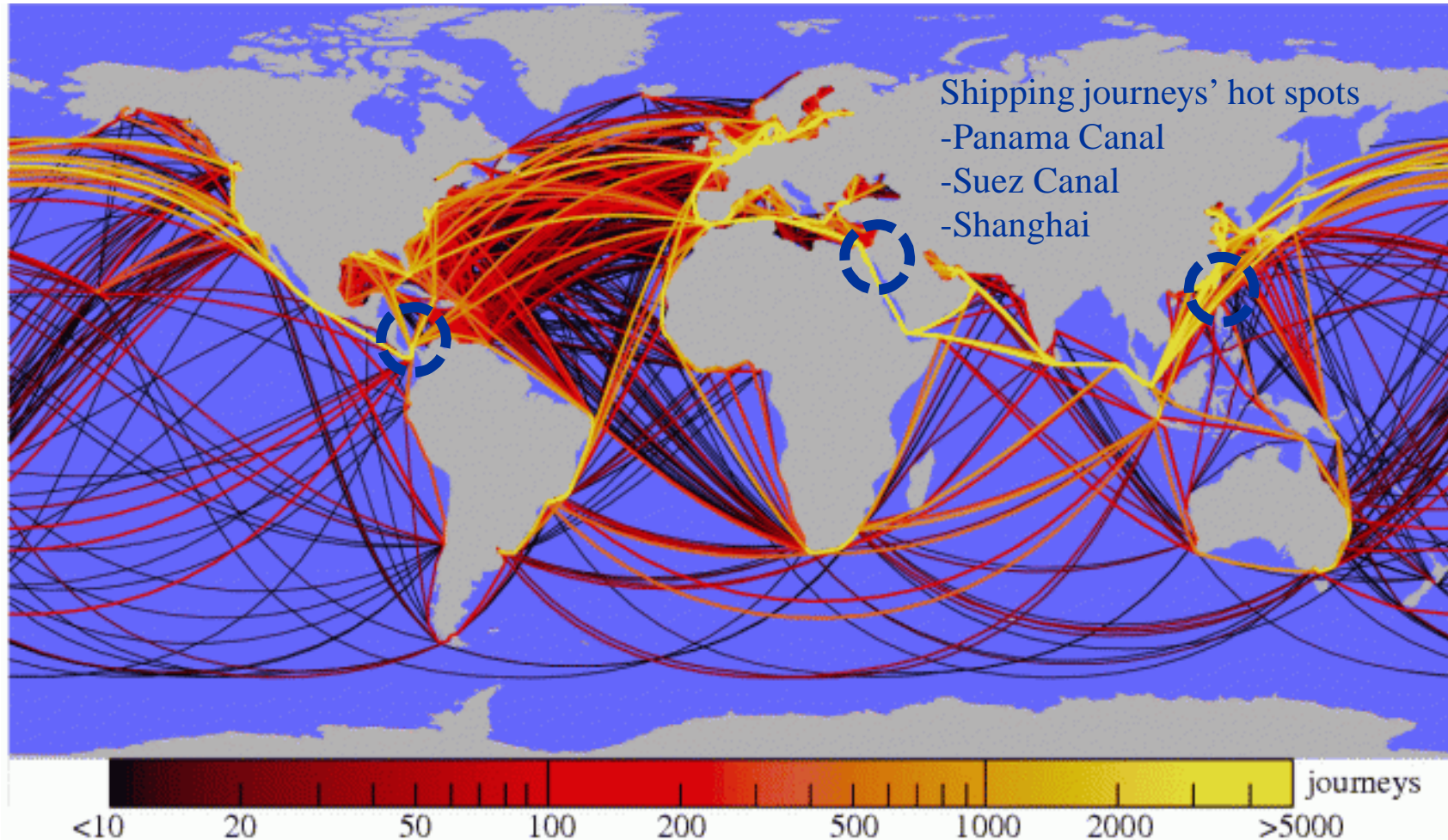
- ✓ 1st Canal completed
- ✓ Sailing time reduced
from 3 months to 3 weeks

12.000km -
14 days sailing

20.000km -
24 days sailing



Suez Canal in 2014: A major Shipping route



Shipping journeys' hot spots
-Panama Canal
-Suez Canal
-Shanghai



Suez Canal in 2014: A major Shipping route



- Owned and maintained by Suez Canal Authority
- 5.5 billion USD revenue in tolls – 17.000 ships passed (2014)
- 193 km long and 24m deep

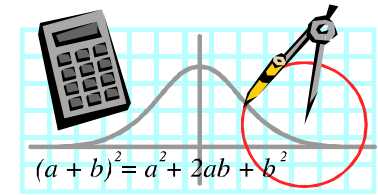


- Single lane traffic with passing places in « Ballah » and the « Great Bitter Lake » ; no locks
 - Between 12 – 16 hours to transit the canal
 - 24 hours capacity: 76 standard ships



2015: Suez Canal Expansion

Facts and Figures



- Public project funding: \$8,6 billion in 10 days from Egyptian population only
- Total estimated cost (SCA):
 - Dry excavation \$ 0,55 billion
 - Dredging works: \$ 2,10 billion
 - Ferry boats and navigational aids \$ 1,30 billion
 - Tunnels: \$ 4,00 billion
 - Armed forces utilities: \$ 0,29 billion

TOTAL \$ 8,20 billion



2015: Suez Canal Expansion

Rationale and Objectives



- Minimise the cost for transiting vessels
 - attract a bigger number of ships (from 49 ships/day to 97 ships/day by 2023)
 - reduce southbound transit from 18 hours to 11 hours
 - increase passage fee.
- Boost foreign currency income
(projected annual revenue by 2023 \$13,2 billion from \$5,3 billion before 2015)
- Government takes into account general increase of Global World Trade
- Encourage foreign capital investments
- Turn Egypt into an important economic and logistics center through industrial and commercial centers

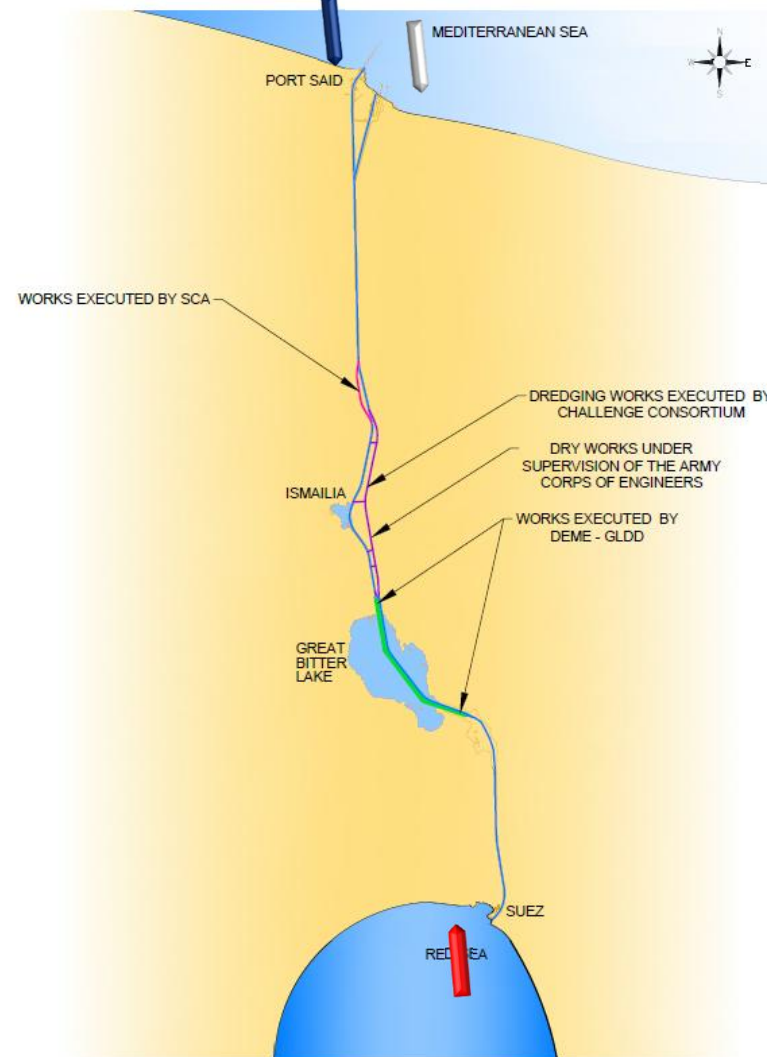


2015: Suez Canal Expansion



Rationale

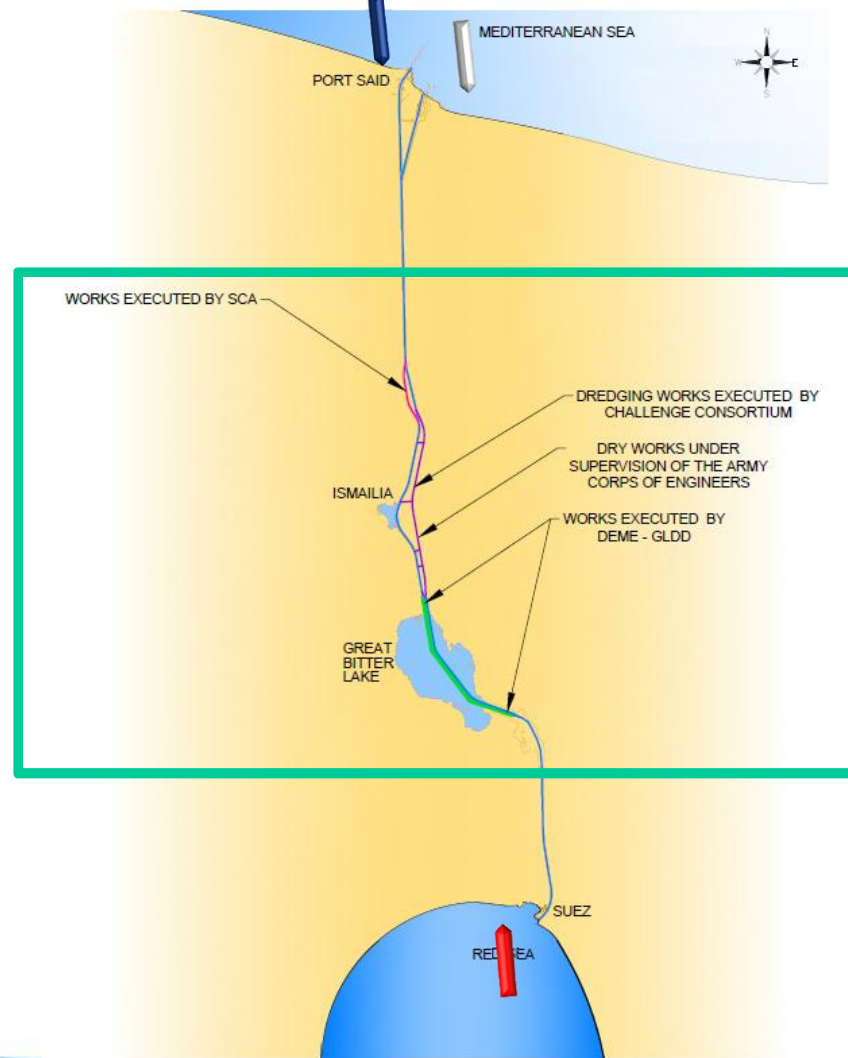
PRE-2015



2015: Suez Canal Expansion



Rationale

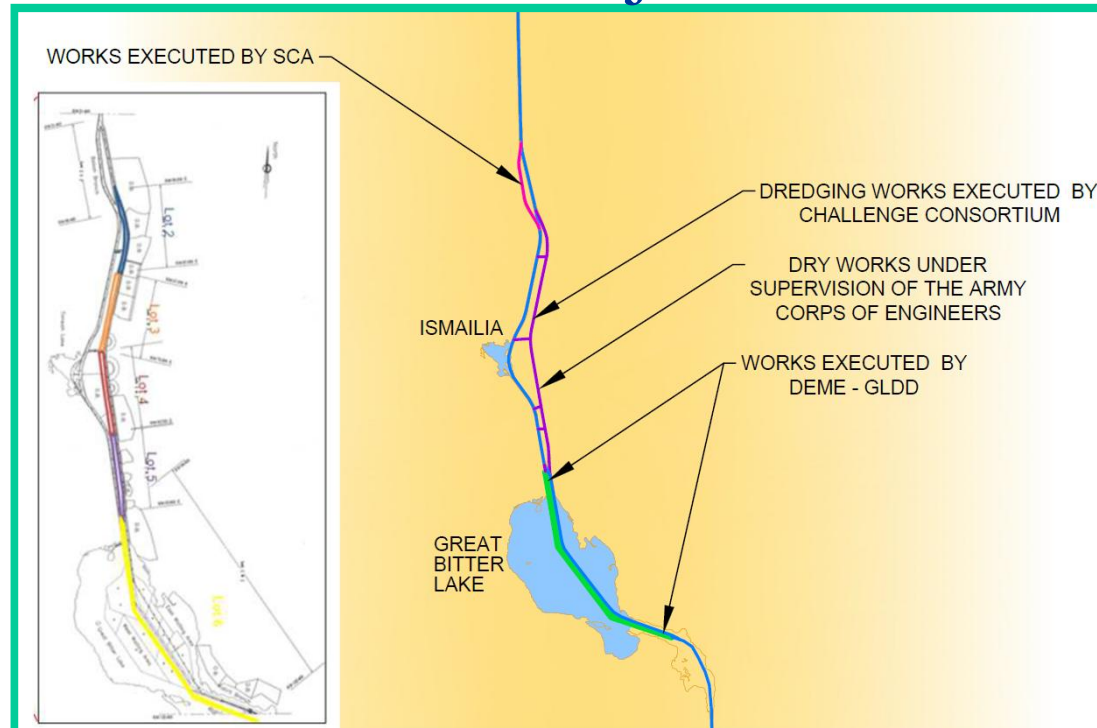


**AFTER DOUBLING
Post-2015**



2015: Suez Canal Expansion

The Project



Facts and Figures about the new Suez Canal

Source: Suez Canal Authority

Total length	72 km
Dredging works	258 mn m³
Duration of execution	10 months (11/2014–08/2015, excl. mobilisation 2 months)
Estimated cost	EGP 15 billion (~2.1 billionUS\$, ~ 1.9 billion€)
Equipment	45 dredgers (incl. 27 CSDs and 13 TSHDs)

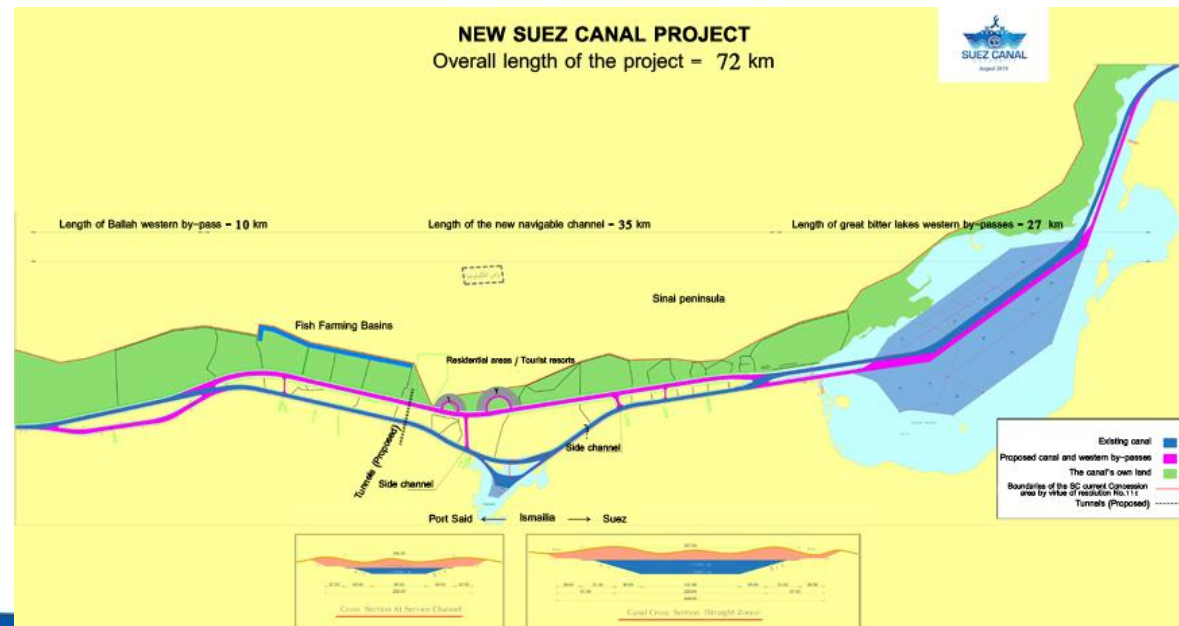
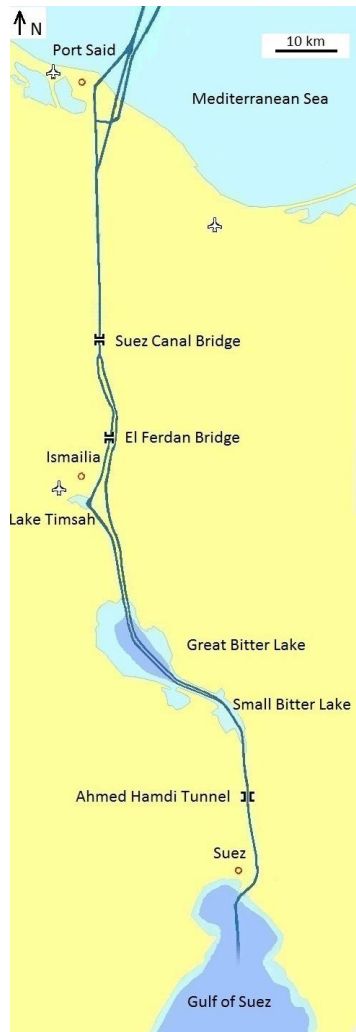


2015: Suez Canal Expansion

The Project



- Overall cost: 8.4 billion USD (incl. tunnels and bridges)
- Construction of second canal over part of the route
- Expected to double the capacity of the canal
- Reducing waiting times from 14 hours to 3 hours
- Construction period: 1 year (from announcement in August 2014)



2015: Suez Canal Expansion

The Project



- Execution time reduced from 5 years to 1 year:
 - Huge logistic challenge
 - Highest concentration Cutter Suction Dredgers ever in the world
- 508.000.000 m³ in 9 months (3 months for tender negotiation and mobilisation)
 - ↔ 19th century: 10 years for 70.000.000 m³ (±factor 100!)



2015: Suez Canal Expansion

The Project's technical challenges



Soil investigation revealed

- 60,000,000m³ loose sand
- 100,000,000m³ dense to very dense sand
- 3,000,000m³ stiff clay
- 20,000m³ sandstone

With this soil info and all available CSD's a matrix was made to allocate the most appropriate vessel to a certain area

e.g. CSD with high cutterpower (J.F.J De Nul) in stiff clay area

And thus making a best cost calculation



Suez Canal Expansion - Challenges

Lot 2-5: technical and time requirements

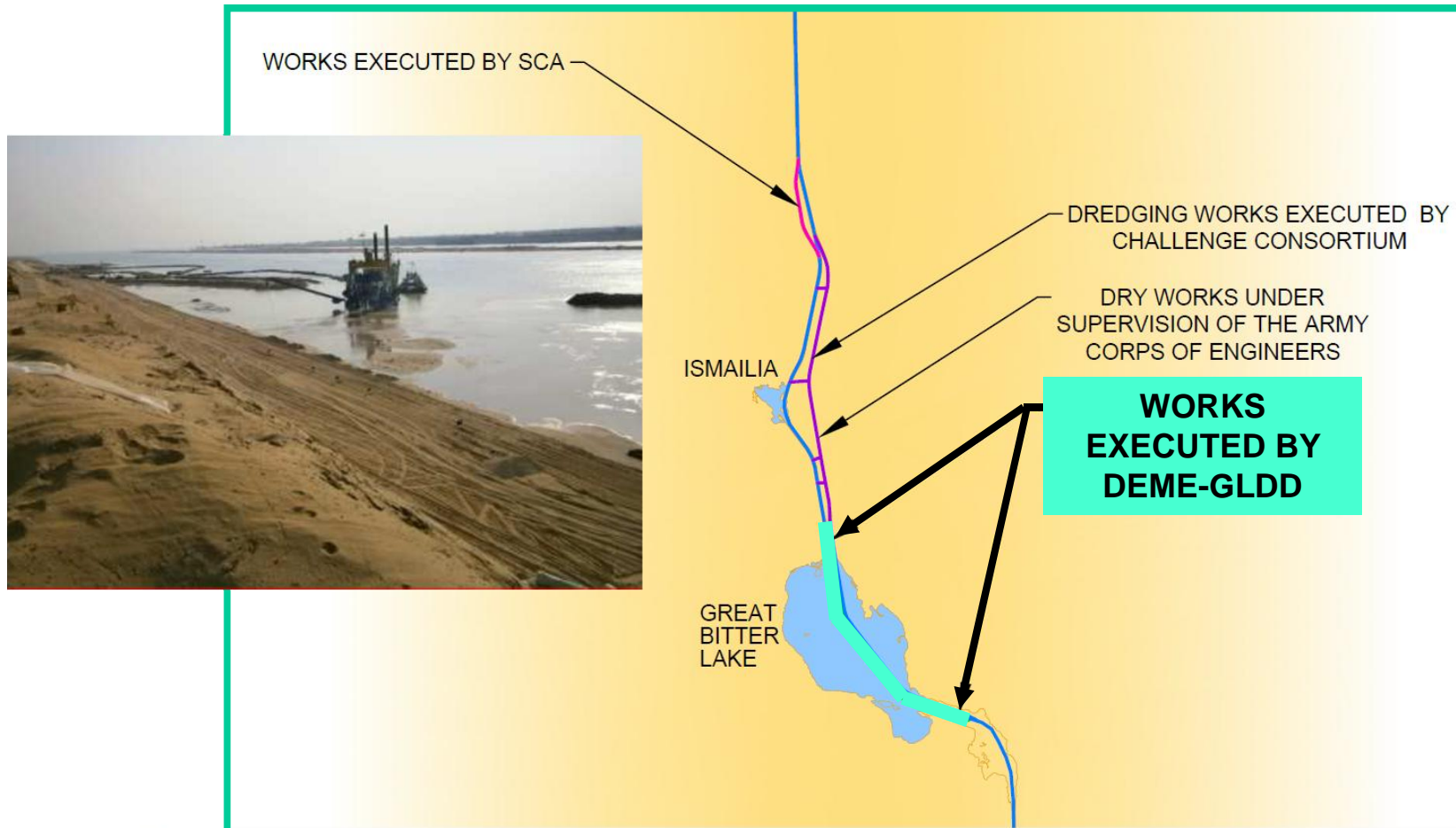


- Deepening of existing channel to **-24 m**
- Width : **147 m**
- Length - approx. **35 km**
- Quantity dredged
 - Lot 2 Jan De Nul approx. **51,069,219 m³**
 - Lot 3 Boskalis approx. **46,329,189 m³**
 - Lot 4 Van Oord approx. **47,168,546 m³**
 - Lot 5 NMDC approx. **48,117,413 m³**
- Execution period - **10 months** (August 2014 – 01 July 2015)



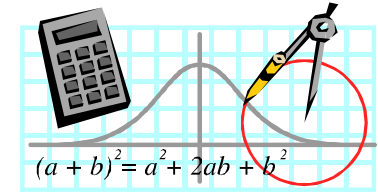
Suez Canal Expansion

Example of Challenges (Lot 6 DEME-GLDD)



Suez Canal Expansion - Challenges

Lot 6: Key facts and figures

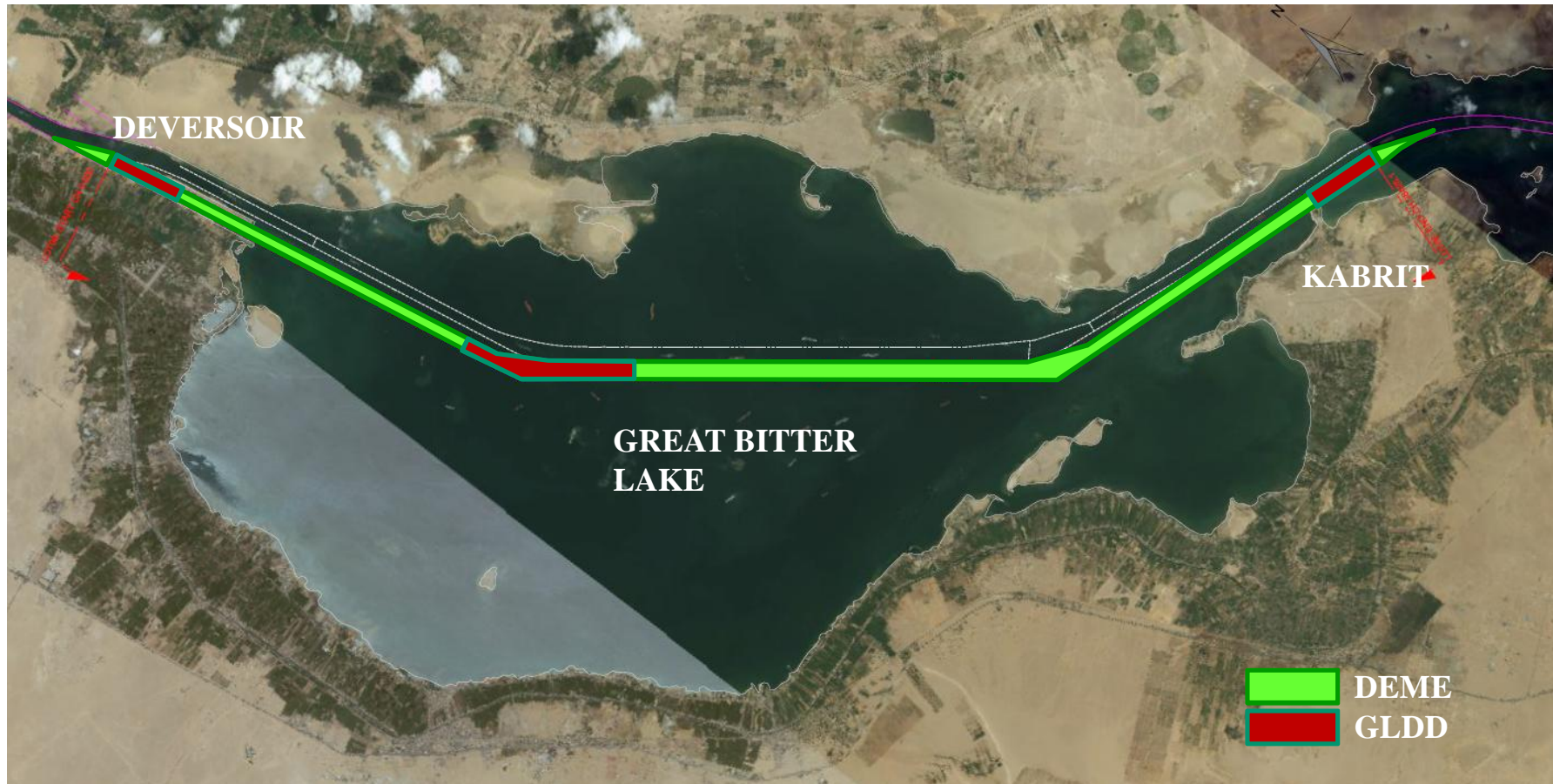


- Scope: New Suez Canal (Lot 6)
- Contract price: 540,000,000 USD
- JV Dredging International (75%) – Great Lakes Dredge & Dock (25%)
- Bid submission date: 20 September 2014
- Contract award: 18 October 2014
- First dredging vessel on site: 18 November 2014
- Completion date: 18 July 2015



Suez Canal Expansion - Challenges

Lot 6: Non-integrated Joint venture



Suez Canal Expansion - Challenges

Lot 6: technical and time requirements



- Deepening of existing channel from -14 m to **-24 m**
- Width between toe lines:
 - Deversoir (10 km) - **127 m**
 - Great Bitter Lake (12 km) - **250 m**
 - Kabrit (8 km) - **127 m**
- Length - approx. **30 km**
- Quantity dredged – approx. **40.000.000 m³**
- Execution period - **8 months** (December 2014 – July 2015)

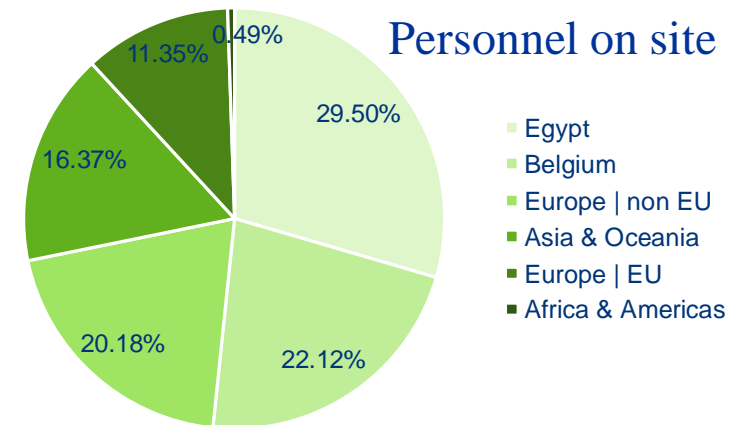


Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology

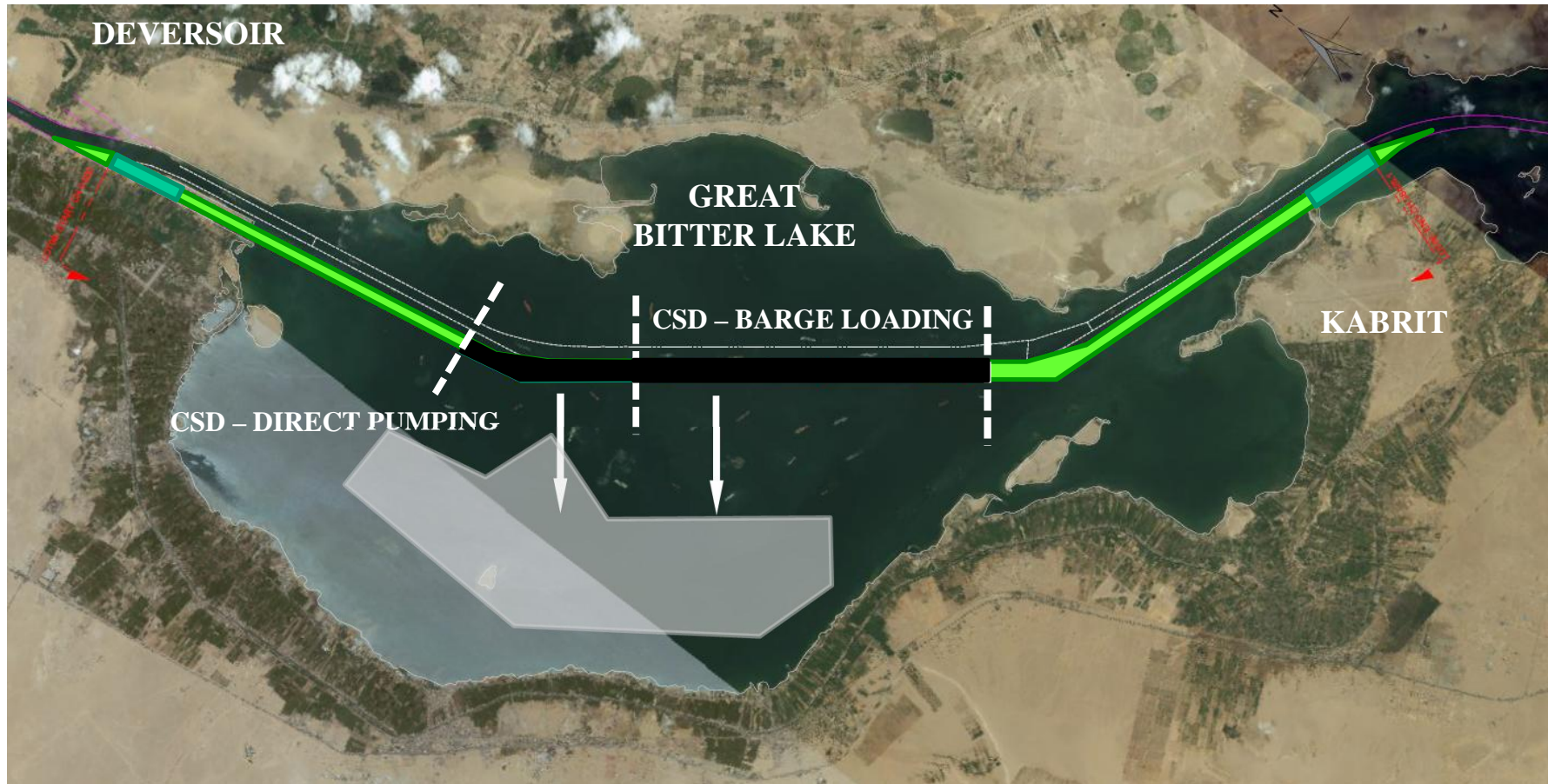


- People: project team of approx. **950 persons**
- Technology: fleet of **13 state-of-the-art dredgers** and **40 support craft**
- **World wide mobilisation** in record time
- Full support of the Belgian Head Quarters in Zwijndrecht
- Fully committed to deliver in time



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology



Great Bitter Lake



Barge loading by Cutter Suction Dredger



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology



Great Bitter Lake



Barge loading by CSD via spider pontoon



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology



Great Bitter Lake

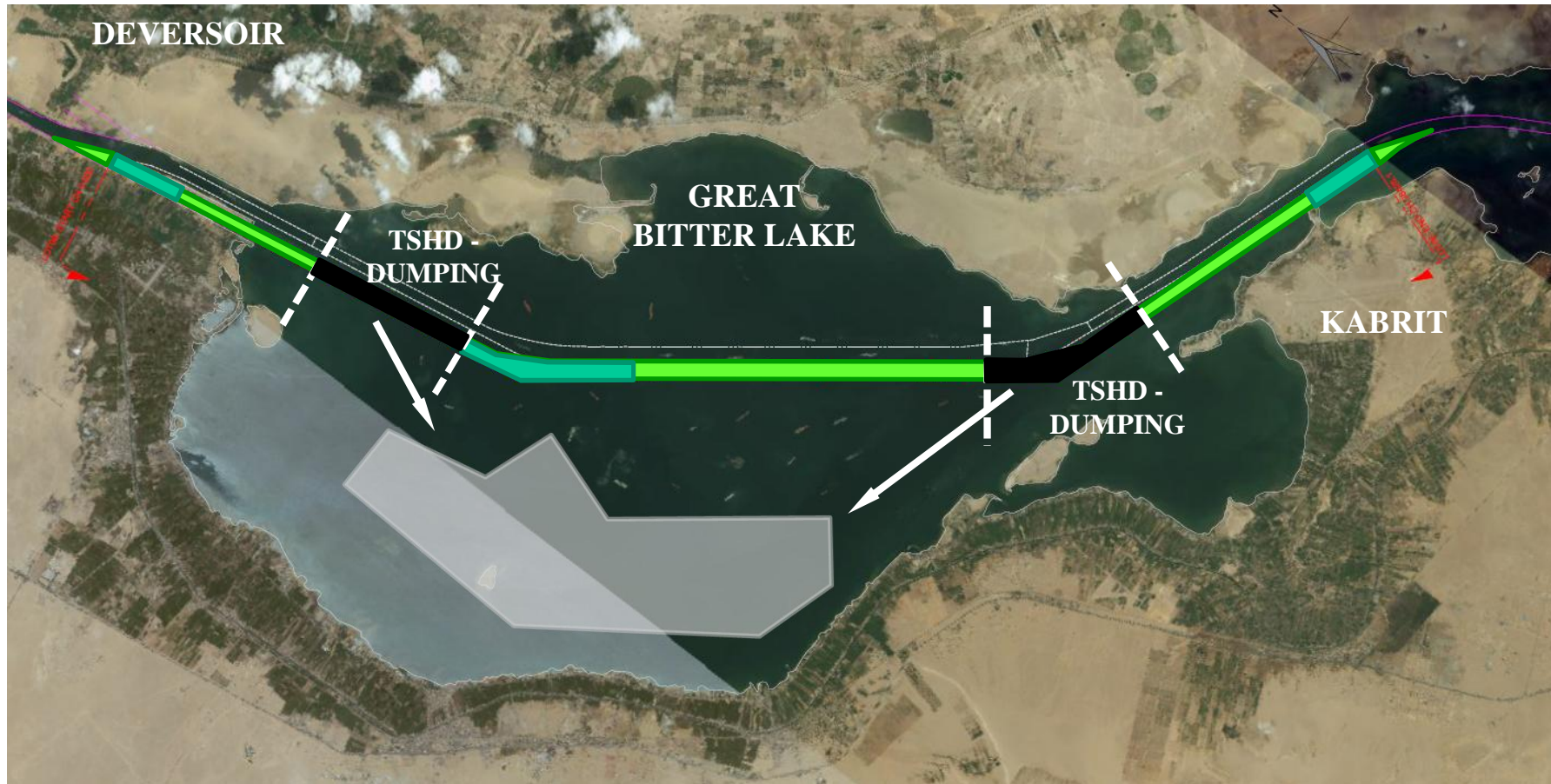


Hopper loading by CSD



Suez Canal Expansion - Approach

Lot 6: Know How – the Methodology



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology *Transitions*

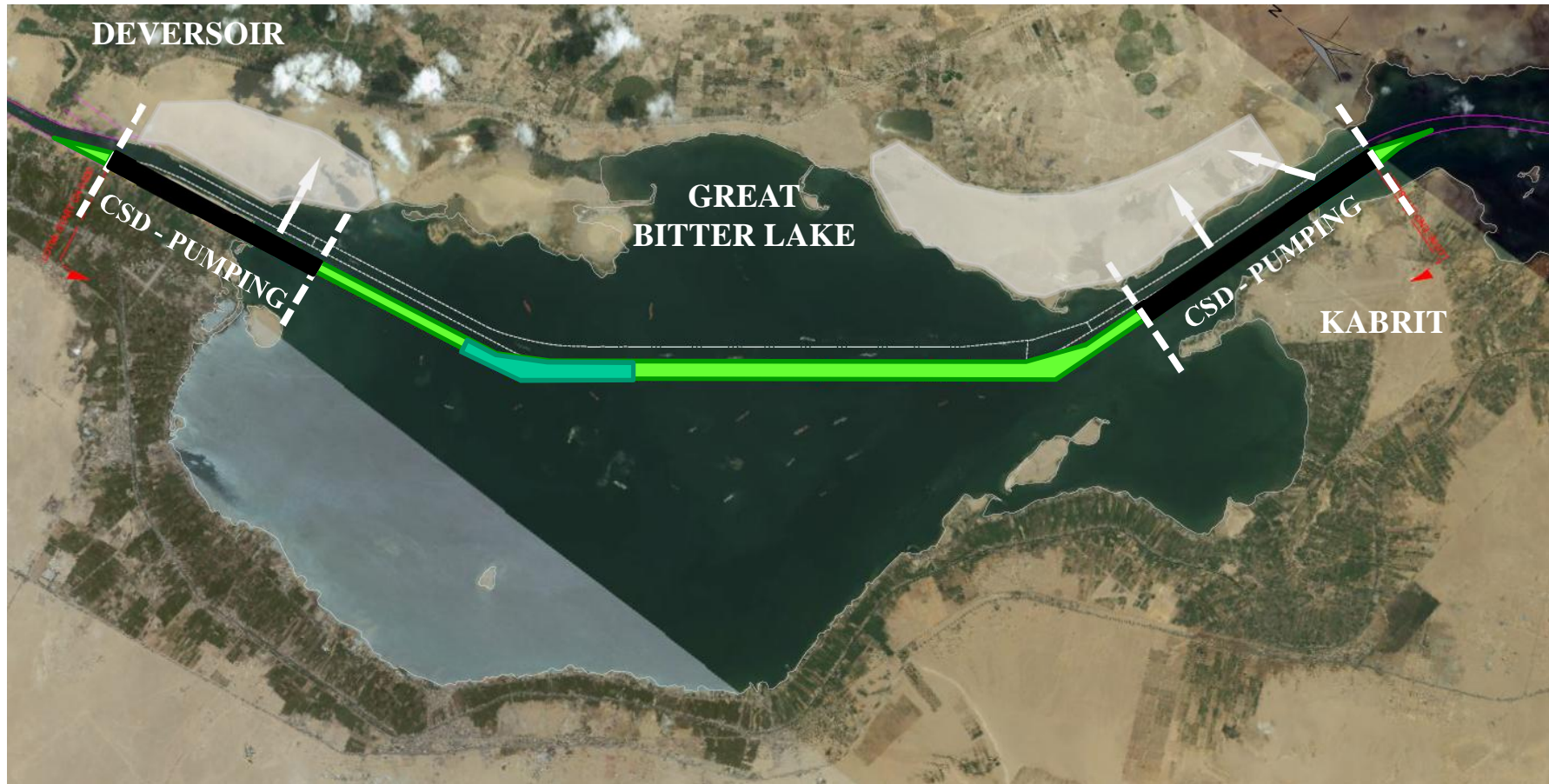


Trailing with Trailing Suction Hopper Dredgers



Suez Canal Expansion - Approach

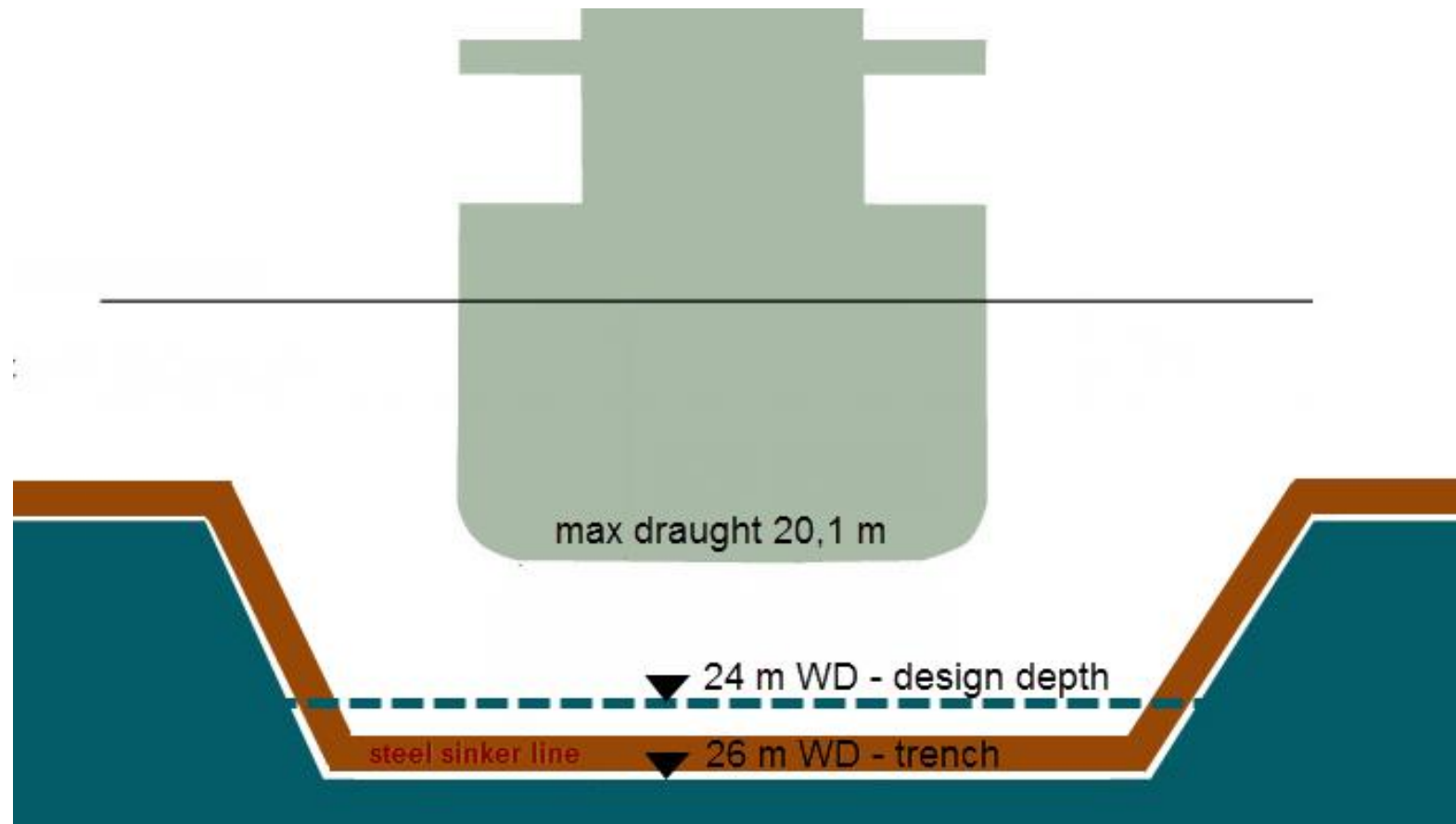
Lot 6: People – Know How - Technology



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology

Kabrit & Deversoir



6 sinkerlines positioned underneath existing Suez Canal



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology

Kabrit & Deversoir



Installation of sinkerline in East main channel



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology



Kabrit/Deversoir

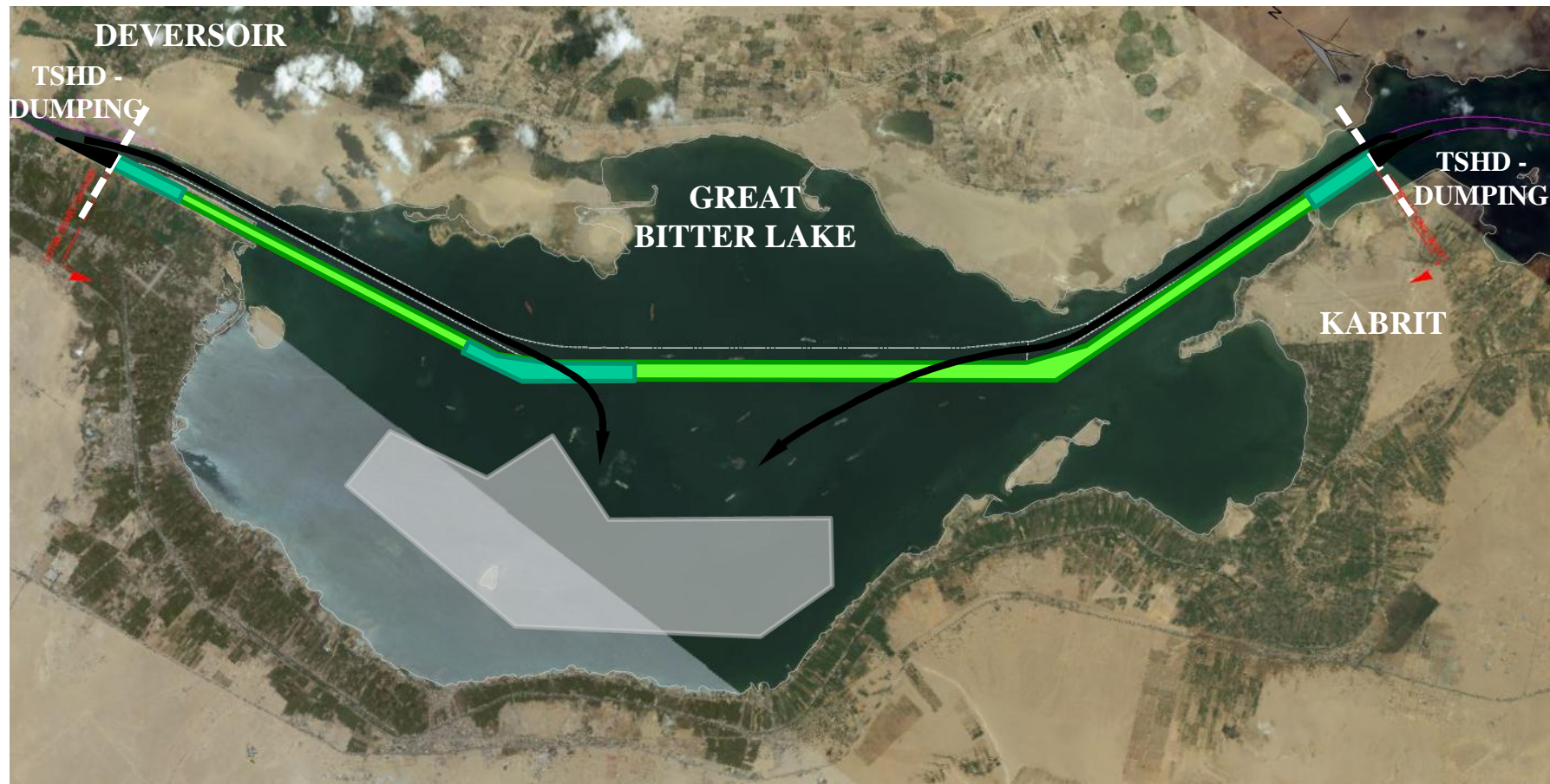


Pumping ashore with CSDs



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology



Suez Canal Expansion - Approach

Lot 6: People – Know How - Technology

Extremities



Trailing with Trailing Suction Hopper Dredgers

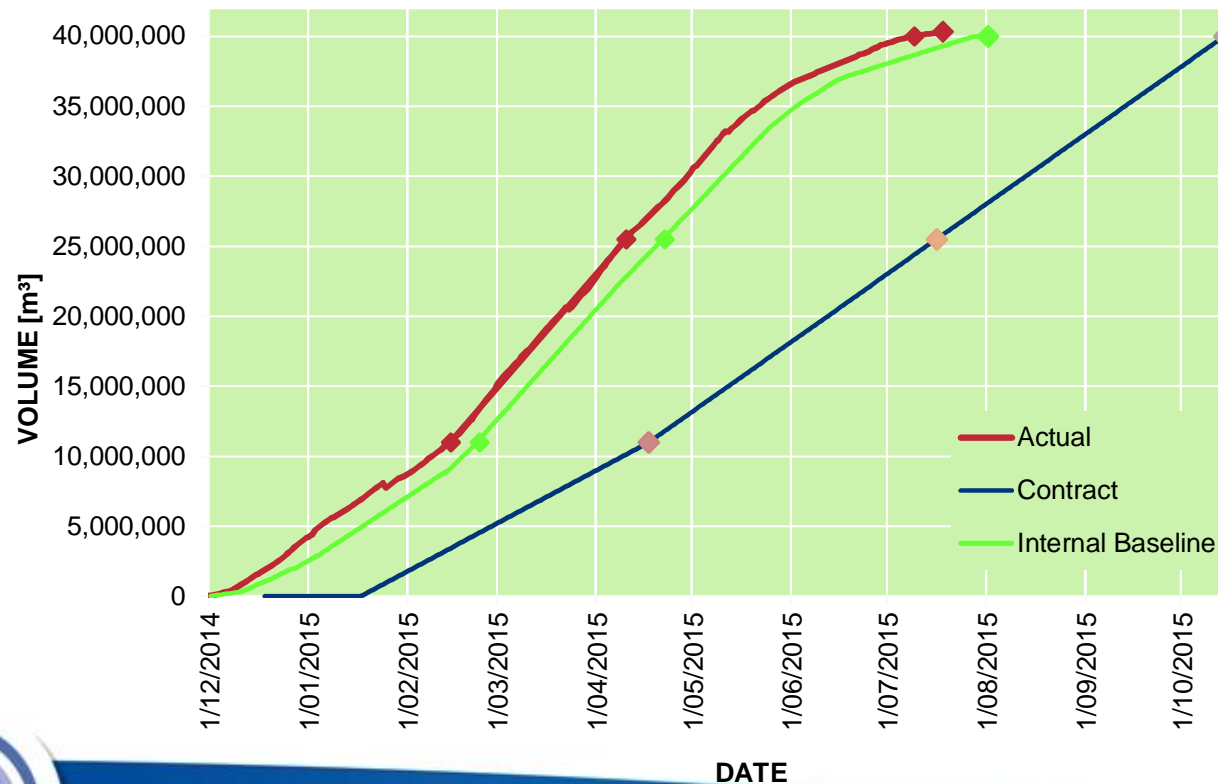


Suez Canal Expansion - Approach

Lot 6: Timeline



- 1st milestone 11.000.000 m³ achieved on February 14th 2015
- 2nd milestone 25.500.000 m³ achieved on April 12th 2015
- Completion of West channel achieved on **July 18th 2015**

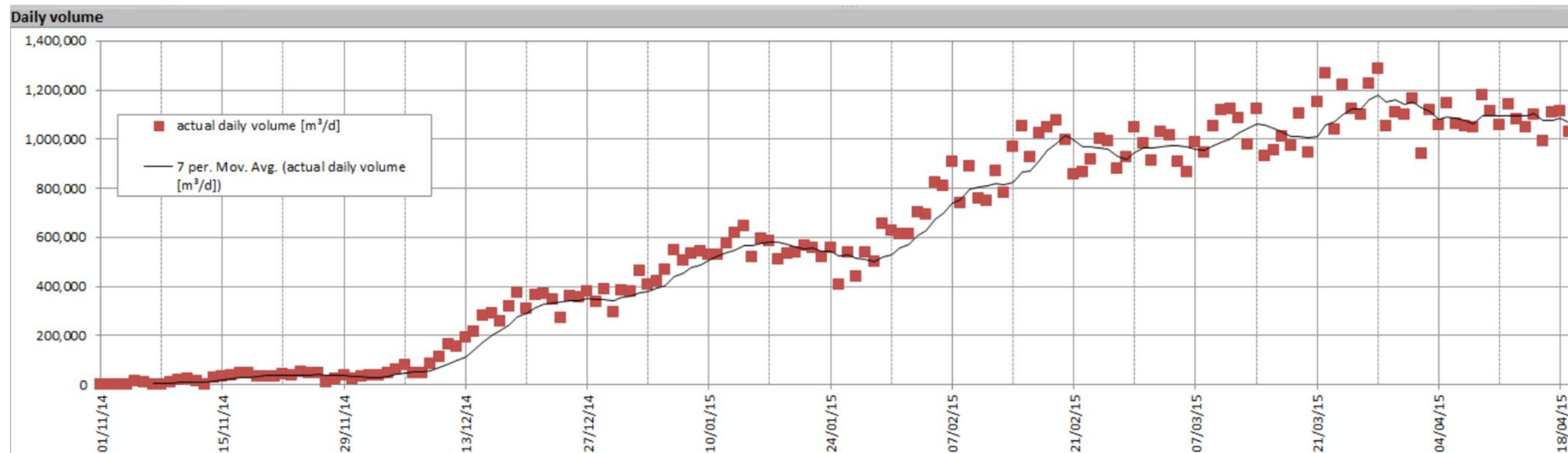


Suez Canal Expansion - Achievement

Lot 2: dredging 1,000,000m³ per day

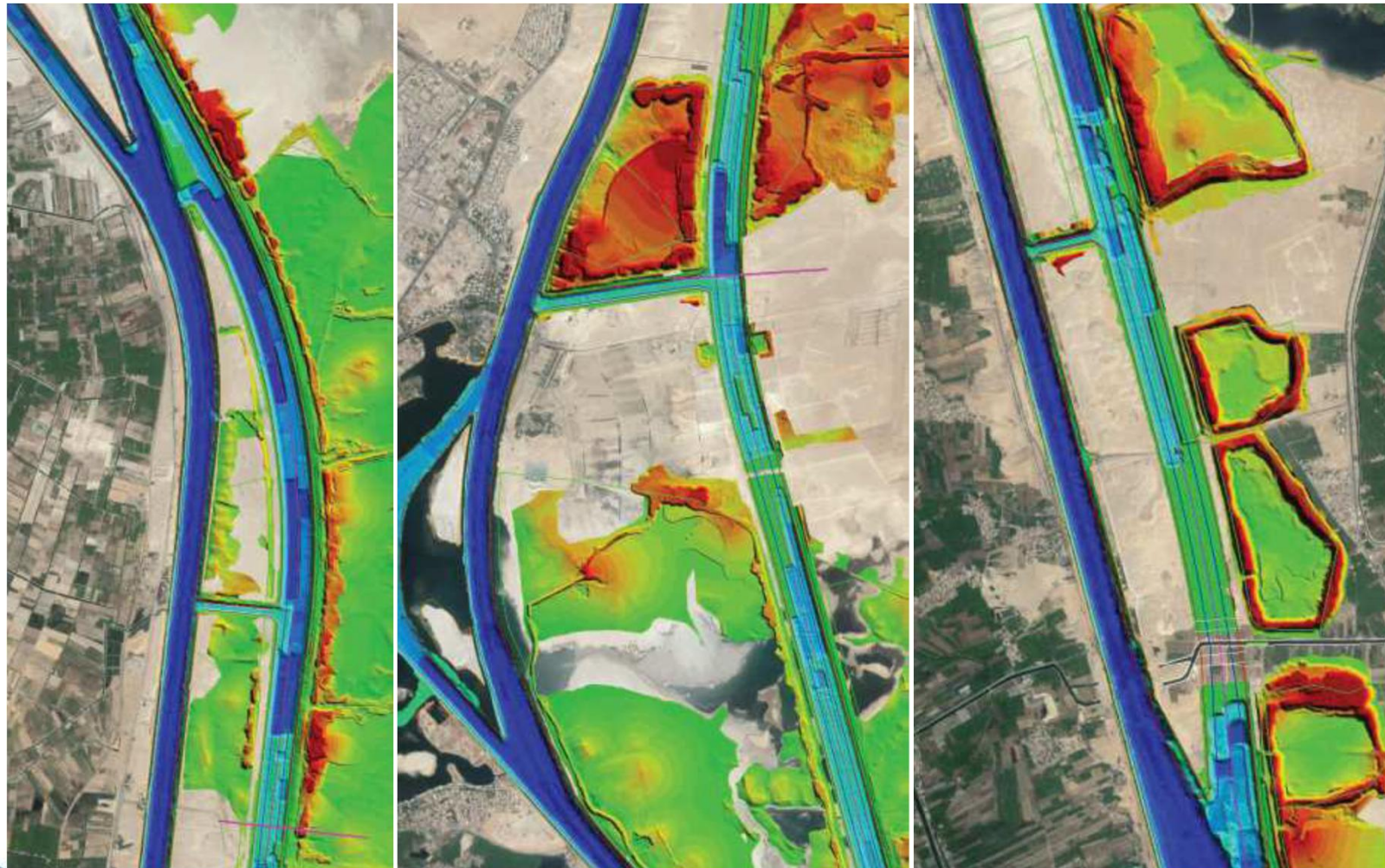


New insights on production model and introduction of a special class:
New Generation CSD's
Newly build vessels like Ibn Battuta prove to be able to pump this material with higher densities than anticipated:
Continuously > 1.5t/m³ (almost like a discharging TSHD)



Suez Canal Expansion - Success

On time delivery



Suez Canal Expansion - Success

On time delivery



MSC Zoe, largest container vessel in the world, passing the completed canal



Conclusions



- ⇒ the Suez Canal is key to Global Logistics
- ⇒ the Suez Canal Expansion has a significant impact
- ⇒ Dredging is a problem-solving and solution-oriented sector !



Dredging is a problem-solving and solution-oriented sector !



Dredging is a problem-solving and solution-oriented sector !



Thanks



Thank you !

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