PROJECT MEXICUS XL 1900 MEGATON CLASS - TRANSOCEANIC (transoceanic.us) COSTS
(Interactive file - inputs in green cells) Rev 5

SUMMARY

Source rivers (multiple; chose one or more):	**Pacific Mexican Rivers discharging between Yaqui and San Lorenzo Rivers**	
Deliveries place (with partial price of pipeline canals included):	**Direct Lower Colorado River Basin via Wagner Basin with possible routes to El Golfo de Santa Clara, San Felipe, Puerto Peñasco, Mexico, to AZ, CA, and NW Mexico.**	
Average rivers' flow (mil cubic meter per year)		**16,538**
Average rivers' flow (cubic meter per second)		**524**
Required flow (cubic meter per second)		**59**
Delivered water (cubic meter per year)		**1,850,220,000**
Delivered water, AFY		**1,500,000**
Delivered water cost with water price-at-source included (US$ per cubic meter)		**0.0485**
Delivered water cost with water price-at-source included (US$ per AF)		**60**
CAPEX (US$)	**$**	**833,395,097**

The water price-at-source can be covered by deliveries of water to Mexico's points of landing and their surroundings.

PROJECT PRESENTATION

Supply station(s)	**Pacific Mexican Rivers discharging between Yaqui and San Lorenzo Rivers**	
Delivery station	**Direct Lower Colorado River Basin via Wagner Basin with possible routes to El Golfo de Santa Clara, San Felipe, Puerto Peñasco, Mexico, to AZ, CA, and NW Mexico.**	
Distance, one way, km		**800**

CONSTANTS AND TRANSFORMATIONS

cubic meters for one acre ft	1233.48
meters for one ft	0.3048
Sea water density is (kg/cubic meter)	1028
Pi value	3.14159
Kilometers in one mile	1.60934

SUBMERSIBLE TRANSPORTER GEOMETRY

Radius, meters	50

Radius, ft	164
L/(2R) RATIO	7
Equivalent submersible length, m	700
Submersible Section, square meters	7854
Submersible surface (cylinder, considered closed by hemispheres)	251327
volume (cylindrical length), cubic meters	5,497,783
volume, acre-ft	4457.13
STRUCTURE	
Relative density of concrete	2.4
ballasting required (on cylindrical part), kg/square meters	700
thickness of concrete wall, m	0.510
Volume of concrete required, cubic meters	128228
Volume of concrete required, cubic yards	167716
Weight of concrete structure, metric tonnes	307748
Chamber thickness, meters	0.7
Total hull thickeness, meters	1.21
STRESSES	
Max tangent force, Newton/linear meter	1,030,050
Max tangent force, metric tonne force/linear meter	105.00
HYDRODYNAMICS	
cx (drag coefficient)	0.08
speed v, m/s	3
speed km/h	10.8
Drag force, Newton	2,906,599
Drag force, metric tonne force	296.29
Power required for cruising (w)	8,719,797
Power for cruising, Mw	8.720
POWER AND ENGINE	
Hydrodynamic efficiency	0.7

Required Engine power, Mw		12.457
Engine reserve, %		20%
Total Engine Installed Power		14.948

FIXED COSTS

SUBMERSIBLE COST

Unit Concrete price, $/cubic meter		70.00
Unit cost of armature, $/cubic meter		60.00
Unit cost of work, $/cubic meter		120.00
Total unit price of concrete, $/cubic meter		250.00
Cost of concrete for submersible, $	$	32,057,041
PROPULSOR COSTS		
Cost of propulsion $/Mw		500,000
Total cost of propulsion	$	7,474,112
INSTRUMENTATION, COMMAND AND CONTROL (ICC) +OTHER ITEMS		
Cost of ICC, BAGS OTHER STRUCTURES (AT 50% OF CONCRETE COST)	$	16,028,520
Complexity Factor		1.50
Total cost of one submersible	**$**	**83,339,510**
COST OF FIRST ARTICLE (1 X BOAT + LOAD/UNLOAD STATIONS at 150% over average costs)	**$**	**375,027,794**

VARIABLE COSTS (FUEL)

FUEL COST PER HOUR	
Fuel Consumption, kg/kWh	0.165
Fuel cost (LNG), $/kg	0.2000
Cost of fuel per hour (at required power) $/hour	411

TRIP COMPUTATION

Supply station	**Pacific Mexican Rivers discharging between Yaqui and San Lorenzo Rivers**
Delivery station	**Direct Lower Colorado River Basin via Wagner Basin with possible routes to El Golfo de Santa Clara, San Felipe, Puerto Peñasco, Mexico, to AZ, CA, and NW Mexico.**
Distance, one way, km	**800**
Distance, one way, miles	497

Stationing, days at each station		1.1
Cruise time, round trip, hours		148.15
Cruise time, round trip, days		6.17
Total travel time, hours		201
Total travel time, days		8.37
Fuel cost per trip (stationary at half consumption per hour), $	$	71,753
Submersible life (years)		30
Amortization of submersible (30 year life) $/hour		396.40
Cost of submersible per trip	$	79,656
Net cost per trip (submersible+fuel)	$	151,409
Net transport cost $/acre-ft		33.97
Cost of O+M/R+R and other costs (% of net cost)		33%
Brut cost per trip, $		177695
Brut transport cost $/acre-ft		**39.87**
Brut transport cost $/cu meter		**0.0323**

TRANSPORTATION SYSTEM CONFIGURATION AND COST

Transported water, cubic meter / year		**1,850,220,000**
Transported water, acre-ft per year		**1,500,000**
Transporter capability per boat, trips/year		43.593
Transporter capability per boat, mil cubic m/year		239.67
Transporter capability per boat, acre-ft/year		194,301
Required number of transporters		**8**
Cost of transporters (boats)	**$**	**666,716,077**
Cost of two teminal stations (each equal to one submersible transporter cost)	**$**	**166,679,019**
Total cost of transportation system	**$**	**833,395,097**

PARAMETERS

Transportation pressure drop equivalent, meters		86
Transportation pressure drop equivalent, ft		283
Water flow at stations for continuous filling/emptying, cubic m/sec		58.67
Transportation system capability (acre-ft/yr)		1,554,410

Cost of O+M/R+R and other costs, $	$	16,815,153
Unit cost of water at purchase ($/cubic meter)		0
Total cost of water, $/year		-
Markup (water)		0%
Water sale markup, $/year (includes G&A)		-
The total cost of water transportation, $/year		**59,801,467**
Unit cost of water at transportation, $ / cubic meter		**0.0323**
Unit cost of water, delivered, $ / acre-ft		**39.87**
Price for transported water with exchanged and water rights included (+50%) $ / cubic meter		**0.0485**
Cost for transported water with exchanged and water rights included (+50%) $/AF		**59.80**

6

0.025

1,917,333,407.40

1,917,333,407.40

DEMONSTRATOR MEXICUS 120 MEGATON CLASS - TRANSOCEANIC (transoceanic.us) COSTS
(Interactive file - inputs in green cells)

SUMMARY

THIS IS A DEMONSTRATION PROJECT PROPOSAL TO BRING MEXICAN RIVER WATER TO NW MEXICO AND TO EXCHANGE WATER RIGHTS AND/OR TO PIPELINE THE WATER WITH/TO THE US.

Source rivers (multiple; chose one or more):	**Pacific Mexican Rivers discharging between Yaqui and San Lorenzo Rivers**	
Deliveries place (with partial price of pipeline canals included):	**El Golfo de Santa Clara, or San Felipe, or Puerto Peñasco (preferred), Mexico, then equivalent to Mexico's Colorado Water Rights are exchanged with Lower and Upper Colorado River Basin states. Pipelines can be built for direct water import to the US Lower Colorado Basin, but are costly.**	
Average rivers' flow (mil cubic meter per year)		**16,538**
Average rivers' flow (cubic meter per second)		**524**
Required flow (cubic meter per second)		**4**
Delivered water (cubic meter per year)		**125,000,000**
Delivered water, AFY		**101,339**
Delivered water cost with water price-at-source included (US$ per cubic meter)		**0.1238**
Delivered water cost with water price-at-source included (US$ per AF)		**153**
CAPEX (US$)	**$**	**141,931,266**

The water price-at-source can be covered by deliveries of water to Mexico's points of landing and their surroundings.

DELIVERY

PROJECT PRESENTATION

Supply station(s)	**Pacific Mexican Rivers discharging between Yaqui and San Lorenzo Rivers**	
Delivery station	**El Golfo de Santa Clara, or San Felipe, or Puerto Peñasco (preferred), Mexico, then equivalent to Mexico's Colorado Water Rights are exchanged with Lower and Upper Colorado River Basin states. Pipelines can be built for direct water import to the US Lower Colorado Basin, but are costly.**	
Submersible Travel, one way, km		**800**

CONSTANTS AND TRANSFORMATIONS

cubic meters for one acre ft	1233.48

meters for one ft	0.3048
Sea water density is (kg/cubic meter)	1028
Pi value	3.14159
Kilometers in one mile	1.60934

SUBMERSIBLE TRANSPORTER DESIGN

Radius, meters	20
Radius, ft	66
L/(2R) RATIO	7
Equivalent submersible length, m	280
Submersible Section, square meters	1257
Submersible surface (cylinder, considered closed by hemispheres)	40212
volume (cylindrical length), cubic meters	351,858
volume, acre-ft	285.26

STRUCTURE

Relative density of concrete	2.4
ballasting required (on cylindrical part), kg/square meters	280
thickness of concrete wall, m	0.204
Volume of concrete required, cubic meters	8207
Volume of concrete required, cubic yards	10734
Weight of concrete structure, metric tonnes	19696
Chamber thickness (average), meters	0.28
Total hull thickeness (average), meters	0.48

STRESSES

Max tangent force, Newton/linear meter (for reference only)	164,808
Max tangent force, metric tonne force/linear meter (for reference only)	16.80

HYDRODYNAMICS

cx (drag coefficient referred to the radial section)	0.1
speed v, m/s	2.5
speed km/h	9
Drag force, Newton	403,694

Drag force, metric tonne force		41.15
Power required for cruising (w)		1,009,236
Power for cruising, Mw		1.009
POWER AND ENGINE		
Hydrodynamic efficiency		0.7
Required Engine power, Mw		1.442
Engine reserve, %		20%
Total Engine Installed Power		1.730
FIXED COSTS		
SUBMERSIBLE COST		
Unit Concrete price, $/cubic meter		70.00
Unit cost of armature, $/cubic meter		60.00
Unit cost of work, $/cubic meter		120.00
Total unit price of concrete, $/cubic meter		250.00
Cost of concrete for submersible, $	$	2,051,651
PROPULSOR COSTS		
Cost of propulsion $/Mw		500,000
Total cost of propulsion	$	865,059
WATER BAGS, WATER CONNECTOR, INSTRUMENTATION, COMMAND AND CONTROL (ICC) +MISCELLANEOUS	$	1,025,825
Complexity Factor		3.00
Total cost of one submersible	**$**	**11,827,605**
COST OF FIRST ARTICLE (1 X BOAT + LOAD/UNLOAD STATIONS at 150% over average costs)	**$**	**53,224,225**
VARIABLE COSTS (FUEL)		
FUEL COST PER HOUR		
Fuel Consumption, kg/kWh		0.165
Fuel cost (LNG), $/kg		0.2000
Cost of fuel per hour (at required power) $/hour		48

TRIP COMPUTATION

Distance, one way, km		**800**
Distance, one way, miles		497
Stationing, days at each station		1
Cruise time, round trip, hours		177.78
Cruise time, round trip, days		7.41
Total travel time, hours		226
Total travel time, days		9.41
Fuel cost per trip (stationary at full consumption per hour), $	$	10,742
Submersible life (years)		30
Amortization of submersible (30 year life) $/hour		54.01
Cost of submersible per trip	$	12,194
Net cost per trip (submersible+fuel)	$	22,936
Net transport cost $/acre-ft		80.40
Cost of O+M/R+R and other costs (% of net cost)		50%
Brut cost per trip, $		29033
Brut transport cost $/acre-ft		**101.78**
Brut transport cost $/cu meter		**0.0825**

TRANSPORTATION SYSTEM CONFIGURATION AND COST

Transported water, cubic meter / year		**125,000,000**
Transported water, acre-ft per year		**101,339**
Transporter capability per boat, trips/year		38.799
Transporter capability per boat, mil cubic m/year		13.65
Total project transport capability, acre-ft/year		11,068
Project trnsport capability acre-ft/year		110,677
Required number of transporters		**10**
Cost of transporters (boats)	**$**	**118,276,055**
Cost of two teminal stations (each equal to one submersible transporter cost)	**$**	**23,655,211**
Total cost of transportation system	**$**	**141,931,266**
Additional cost for 150 km of onshore pipeline/canals		**525,000,000**
Energy cost for transfer of water should be added		

PARAMETERS

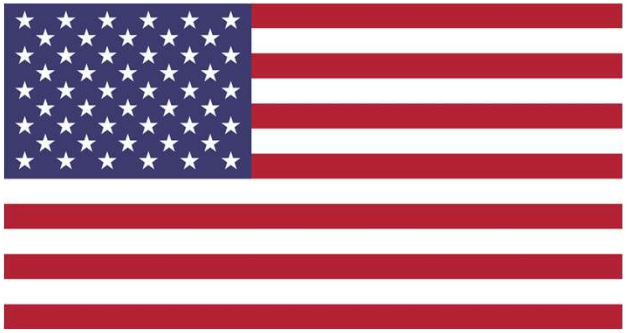
Transportation pressure drop equivalent, meters	187
Transportation pressure drop equivalent, ft	614

Water flow at stations for continuous filling/emptying, cubic m/sec		3.96
Transportation system capability (acre-ft/yr)		110,677
Cost of O+M/R+R and other costs, $	$	4,074,045
Unit cost of water at purchase ($/cubic meter)		0
Total cost of water, $/year		-
Markup (water)		0%
Water sale markup, $/year (includes G&A)		-
The total cost of water transportation, $/year		**10,314,029**
Unit cost of water at transportation, $ / cubic meter		**0.0825**
Unit cost of water, delivered, $ / acre-ft		**101.78**
Price for transported water with exchanged and water rights included (+50%) $ / cubic meter		**0.1238**
Cost for transported water with exchanged and water rights included (+50%) $/AF		**152.67**

29.32150667

123348000

0.7927448
136,518,164.50

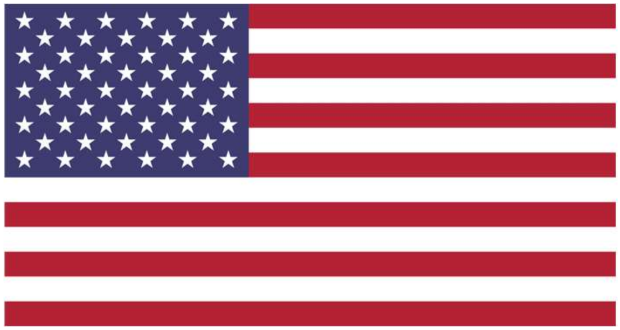
TRANS OCEANIC

PROJECT MEXICUS DEMONSTRATOR (125 MEGATON CLASS)
by TRANSOCEANIC LLC – USA
REV. NC

Water for the USA and NW Mexico from the Pacific Mexican Rivers via the Gulf of California

transoceanic.us
dorian@transoceanic.us

SW USA AND NW MEXICO NEED MASSIVE WATER



- TRANSOCEANIC CAN DELIVER MASSIVE QUANTITIES OF LONG-DISTANCE WATER FROM THE PACIFIC MEXICAN RIVERS TO NW MEXICO AND ALSO INITIATE WATER TRANSFERS AND WATER RIGHTS EXCHANGES WITH USA CONSUMERS TO SOLVE THE WATER SCARCITY IN THE COLORADO RIVER BASIN AND BEYOND
- THE PRESENT PROJECT PROPOSAL COVERS WATER DELIVERIES FOR A DEMONSTRATOR PROJECT SPECIFIED BY ARIZONA OF 100,000 ACRE-FT/YEAR.
- DIFFERENT AND LARGER PROJECT SIZES CAN AND ARE EXPECTED TO BE BUILT

TRANS
OCEANIC

FOR THE DEMONSTRATION PROJECT TRANSOCEANIC PLANS TO BRING MASSIVE QUANTITIES OF WESTERN MEXICAN RIVER WATER TO THE LOWER COLORADO RIVER BASIN BY THE SUBMERSIBLE BOATS WITH:

- lengths of 280 m;
- diameters of 40 m;
- **Fresh water carrying capacities: 352 000 cubic meters –** as large as the large crude-oil supertankers)

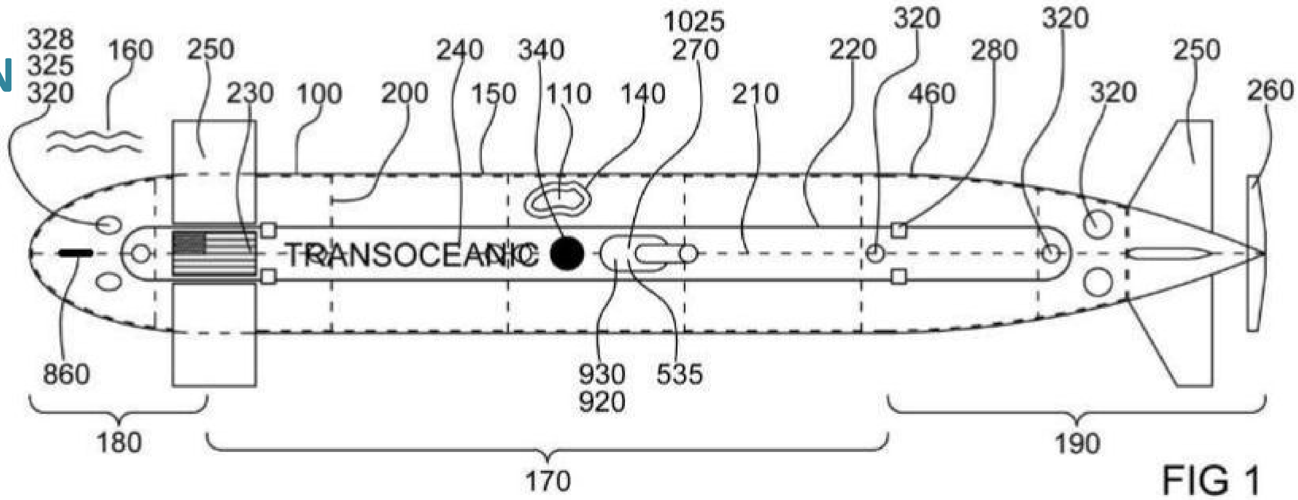


FIG 1

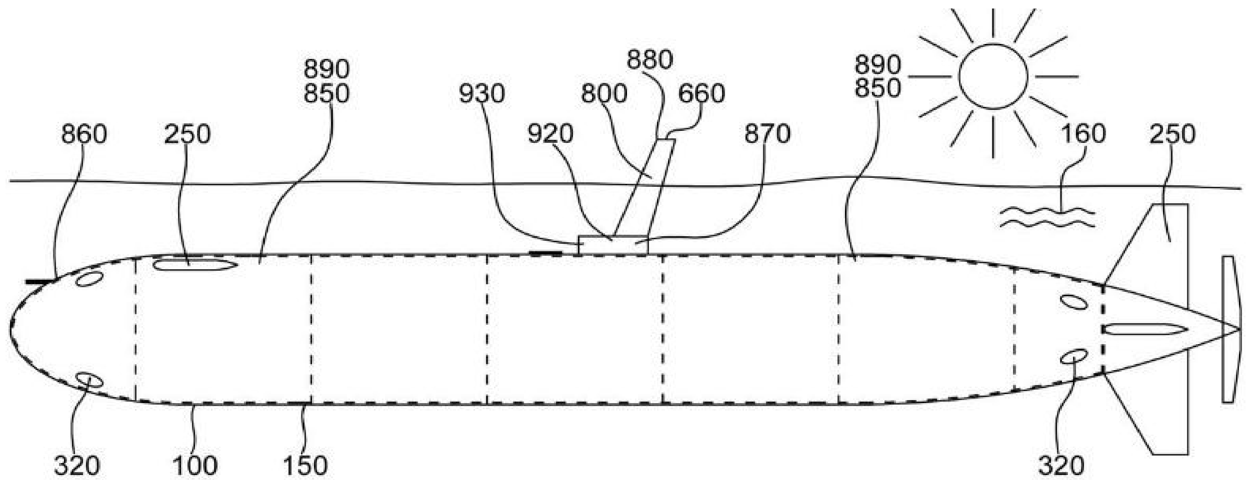
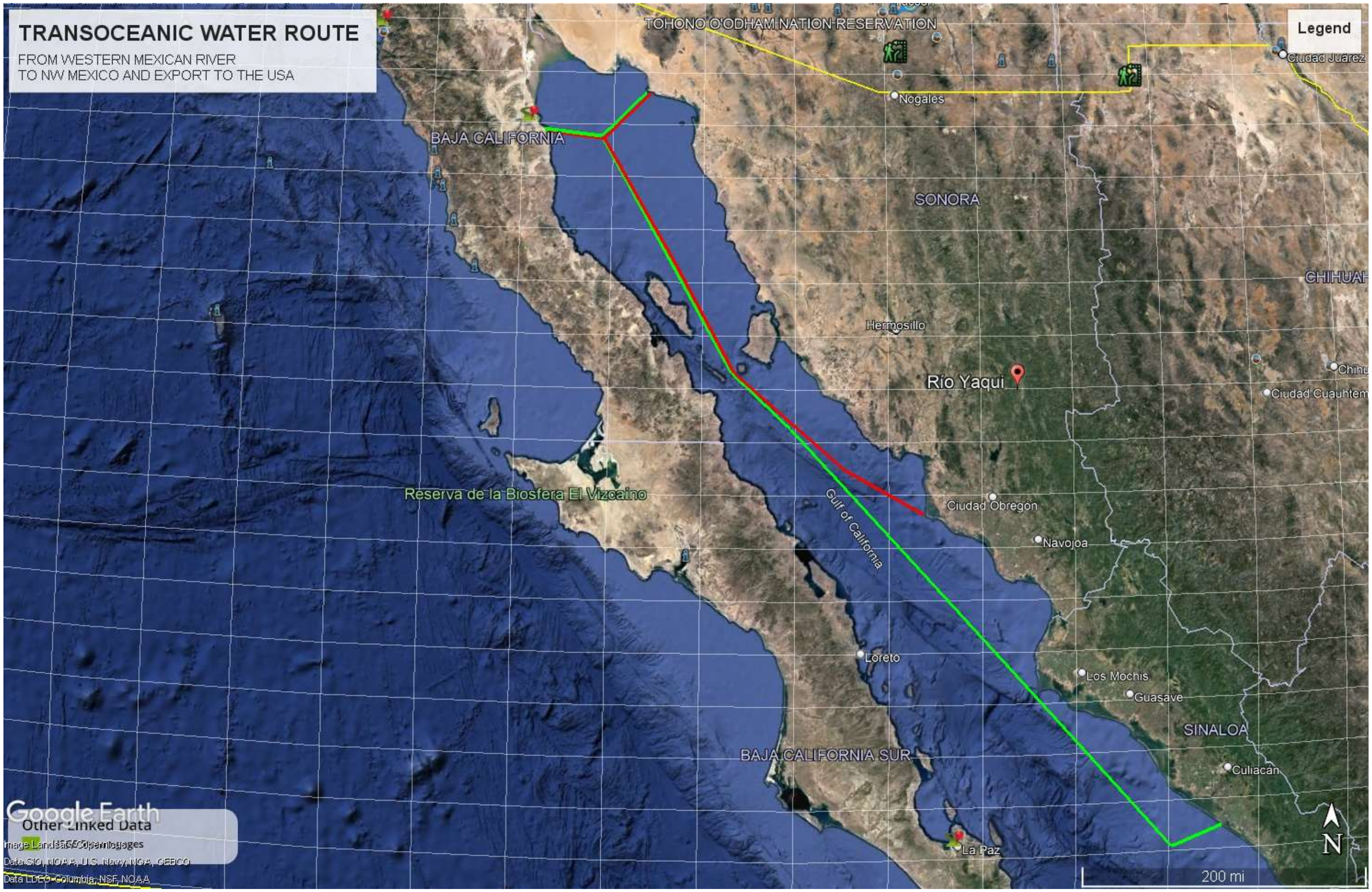


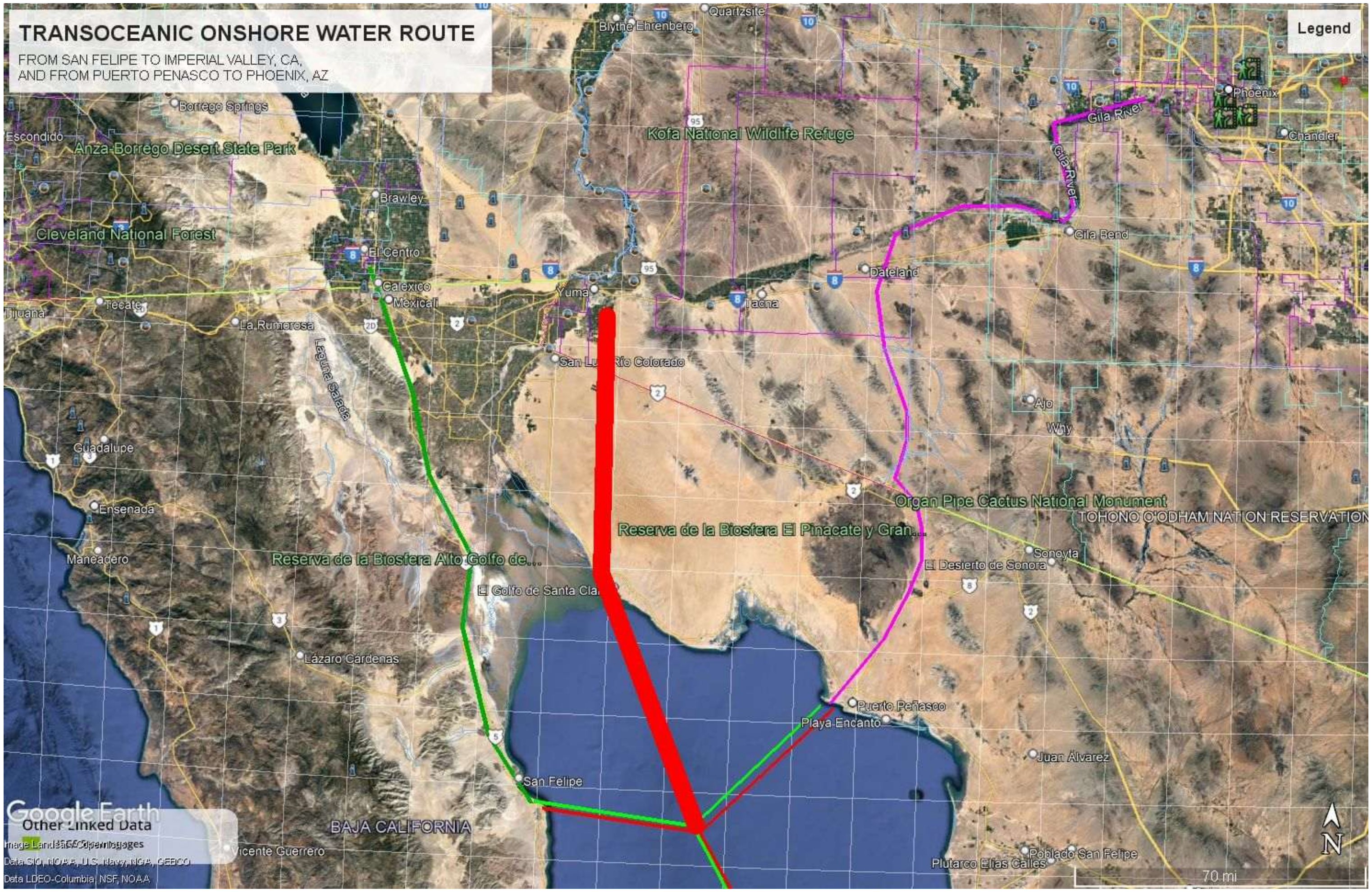
FIG 2

FOR DETAILS ABOUT TRANSOCEANIC CONFIGURATION, SEE PATENT US-11505297-B2

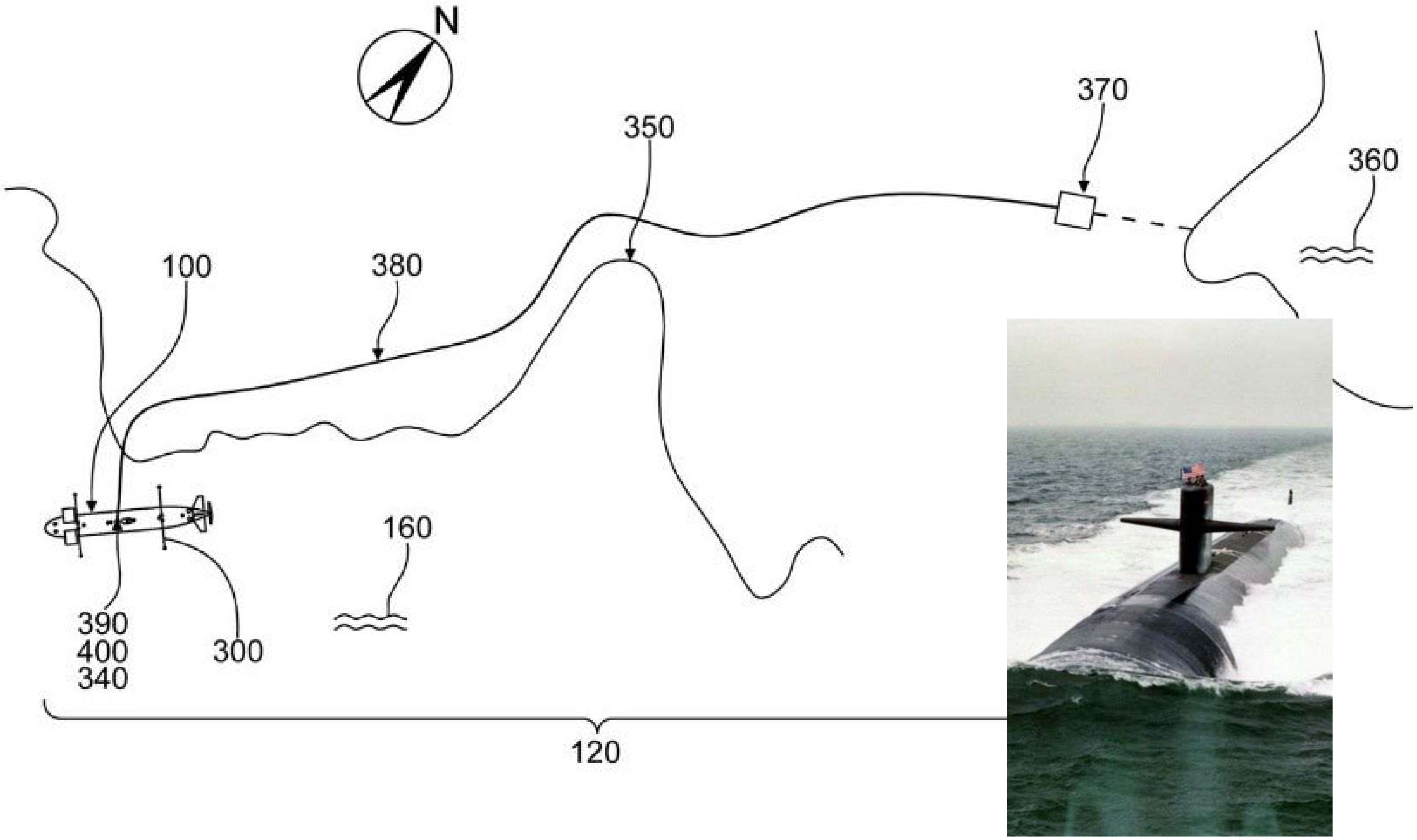
* SUBMARINE CAPABILITIES ARE PREFERRED FOR SUBMERGING DURING HIGH SWELL.



THE FRESH WATER IS DELIVERED OVER AN AVERAGE DISTANCE OF 800 KM (500 MILES) FROM THE PACIFIC MEXICAN RIVERS (preferably between Yaqui and San Lorenzo Rivers) to NW Mexico, via Wagner Basin in the Northern Gulf of California, landing at Puerto Peñasco (East Route), San Felipe, Mexico (Wester Route), or El Golfo de Santa Clara (Route details are shown on next page).
Mexico has the capacity to export water and sell its Colorado River water rights to U.S. clients, with appropriate compensation for Mexico. This process involves formal agreements and the transfer of rights, as outlined in the relevant policies.



- THE DEMONSTRATOR PROJECT by TRANSOCEANIC LLC – USA IS PLANNED TO DELIVER 125 000 000 TONNES OF WATER PER YEAR (1,500,000 AFY) TO NW MEXICO, WHICH IN ITS TURN CAN TRANSFER ITS COLORADO RIVER SENIOR WATER RIGHTS TO THE USA OR DELIVER THE WATER DIRECTLY TO THE USA.
- THE EXPECTED COSTS AND TECHNICAL DATA ARE AVAILABLE BY REQUEST
- EXPECTED COST OF ONSHORE DELIVERED WATER IS US$0.12 PER CUBIC METER ($153/AF)
- THE DEMONSTRATOR PROJECT IMPLIES AN INVESTMENT OF US$142 MILLION



The TRANSOCEANIC SUBMARINES (100) transport fresh water(360) from an offshore supply station(120) from Western Mexico (located on one of the river sources of choice)

…to an **offshore delivery station (130) in the Northern Gulf of California (Wagner Basin)**

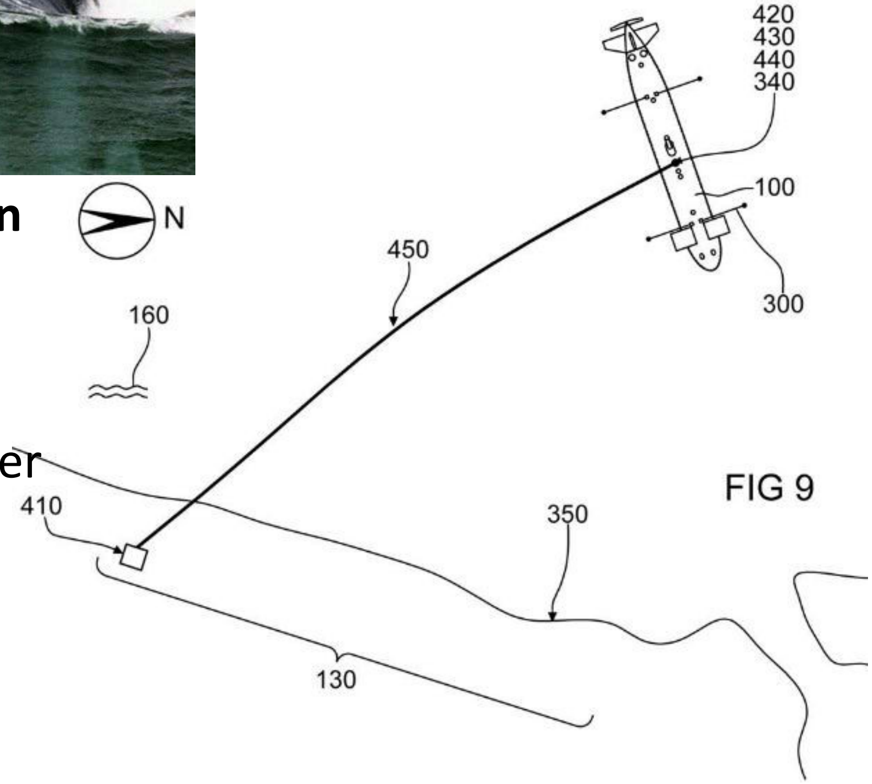
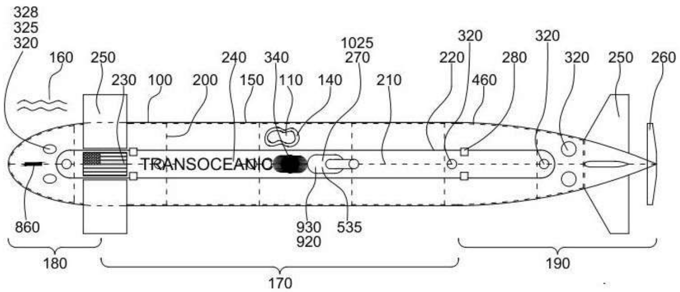


FIG 9

From the offshore delivery station, the fresh water is transferred onshore and shared between Mexico and USA.



transoceanic.us

The TRANSOCEANIC transport submersibles, usually with a capacity of 0.5 to 10 million DWT, are built with variable-ballastable reinforced concrete hulls and equipped with large, impervious, collapsible inner bladders for transporting fresh water.

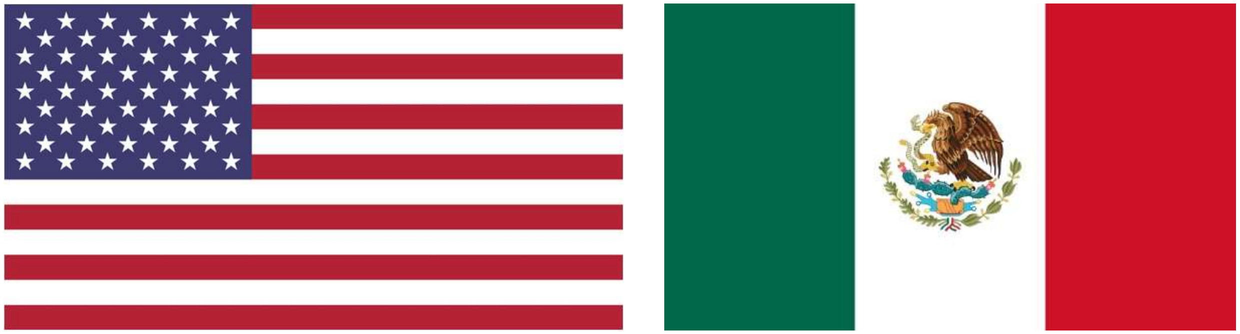
The TRANSOCEANIC systems are flexible and intelligent:

- **TRANSOCEANIC systems can be reconfigured for various water source locations, delivery points, and routes, demonstrating their adaptability and reliability to meet diverse needs;**
- **TRANSOCEANIC transport submersibles are built as Autonomous Underwater Vehicles (AUV) with the required concrete hull ballast and integrated instrumentation, command, and control systems that include protocols for economical and safe cruise, ensuring operational reliability.**
- **The TRANSOCEANIC operation requires no ballast water release into the environment (seas & oceans) and can also remove brine from desalination plants, underscoring its environmentally friendly design and commitment to sustainability;**
- **TRANSOCEANIC submarines are corrosion-resistant (built of reinforced concrete panels and sheltered collapsible bags) and are economically assembled as ultra-large structures of hundreds of thousands of tonnes.**

TRANSOCEANIC AND THE WORLD

TRANSOCEANIC (transoceanic.us) can bring gigatons (millions of acre-ft) of low-cost fresh water to arid areas, feeding the WORLD, delivering plentiful water to cities, and arresting carbon into the soil and plants.

TRANSOCEANIC's main potential markets are: Western USA (Arizona, California, Nevada), and by water rights reallocation, the whole of Colorado River Basin, NW Mexico (Baja California, Sonora), Middle East and North Africa (MENA) countries, European Union's Southern countries, South Africa/Namibia, India, Australia, Western South America, China, and possibly SAHARA (for dream projects, from the Amazon or Congo Rivers).



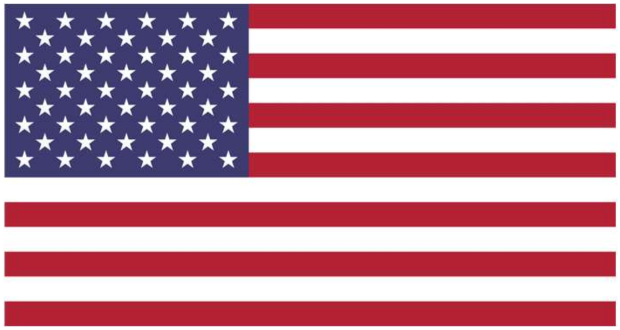
TRANS
OCEANIC

PROJECT MEXICUS DEMONSTRATOR (125 MEGATON CLASS)
by TRANSOCEANIC LLC – USA
REV. NC

Water for the USA and NW Mexico from the Pacific Mexican Rivers via the Gulf of California

transoceanic.us
dorian@transoceanic.us

SW USA AND NW MEXICO NEED MASSIVE WATER



- TRANSOCEANIC CAN DELIVER MASSIVE QUANTITIES OF LONG-DISTANCE WATER FROM THE PACIFIC MEXICAN RIVERS TO NW MEXICO AND ALSO INITIATE WATER TRANSFERS AND WATER RIGHTS EXCHANGES WITH USA CONSUMERS TO SOLVE THE WATER SCARCITY IN THE COLORADO RIVER BASIN AND BEYOND
- THE PRESENT PROJECT PROPOSAL COVERS WATER DELIVERIES FOR A DEMONSTRATOR PROJECT SPECIFIED BY ARIZONA OF 100,000 ACRE-FT/YEAR.
- DIFFERENT AND LARGER PROJECT SIZES CAN AND ARE EXPECTED TO BE BUILT

TRANS OCEANIC

FOR THE DEMONSTRATION PROJECT TRANSOCEANIC PLANS TO BRING MASSIVE QUANTITIES OF WESTERN MEXICAN RIVER WATER TO THE LOWER COLORADO RIVER BASIN BY THE SUBMERSIBLE BOATS WITH:

- lengths of 280 m;
- diameters of 40 m;
- **Fresh water carrying capacities: 352 000 cubic meters –** as large as the large crude-oil supertankers)

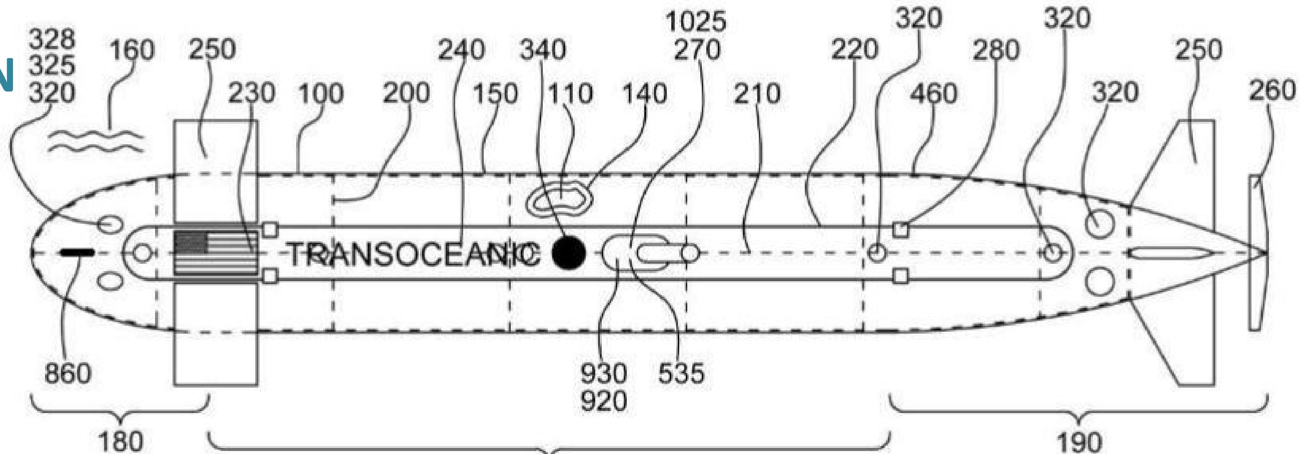


FIG 1

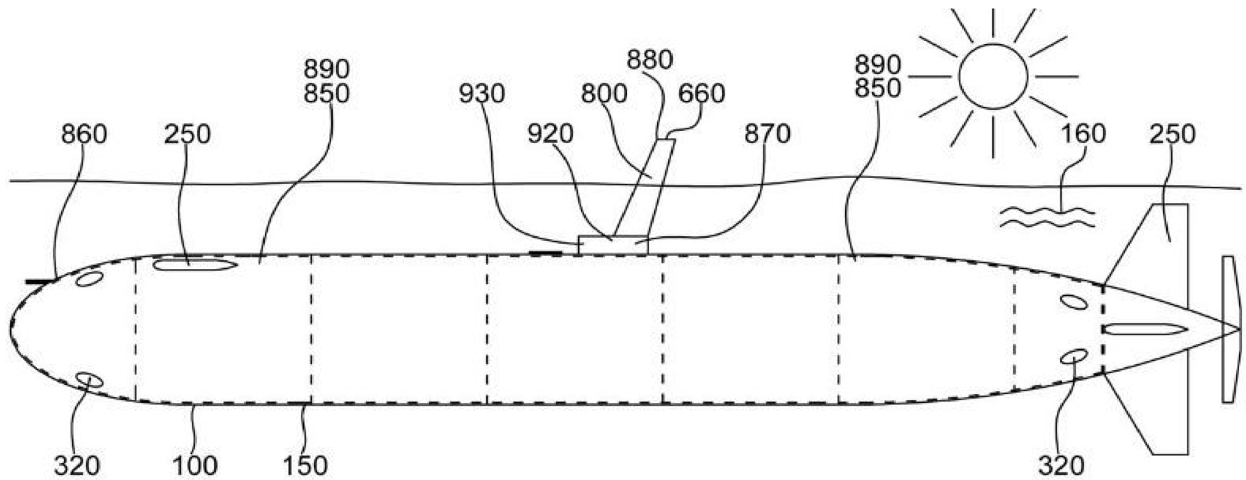


FIG 2

FOR DETAILS ABOUT TRANSOCEANIC CONFIGURATION, SEE PATENT US-11505297-B2

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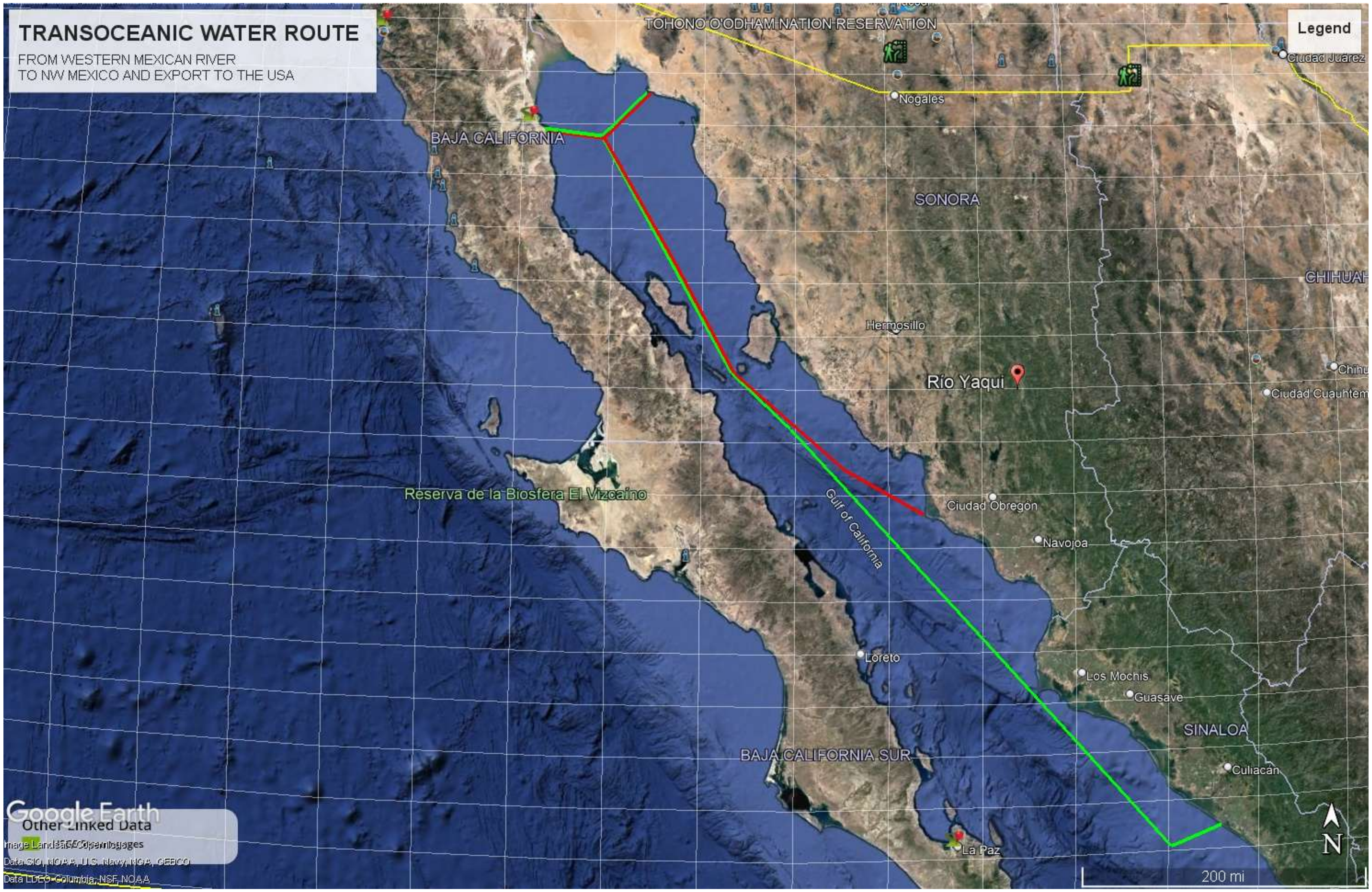
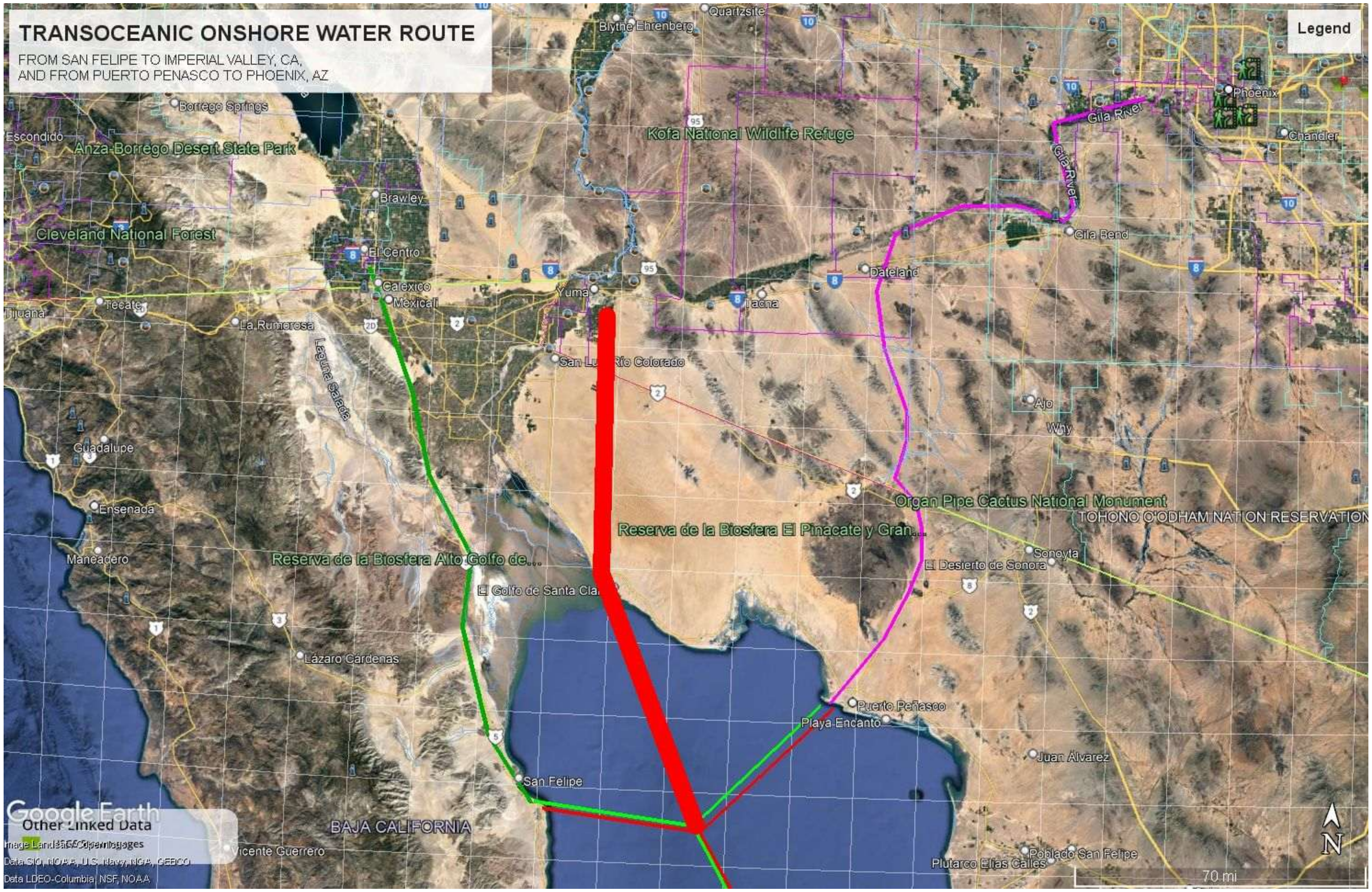
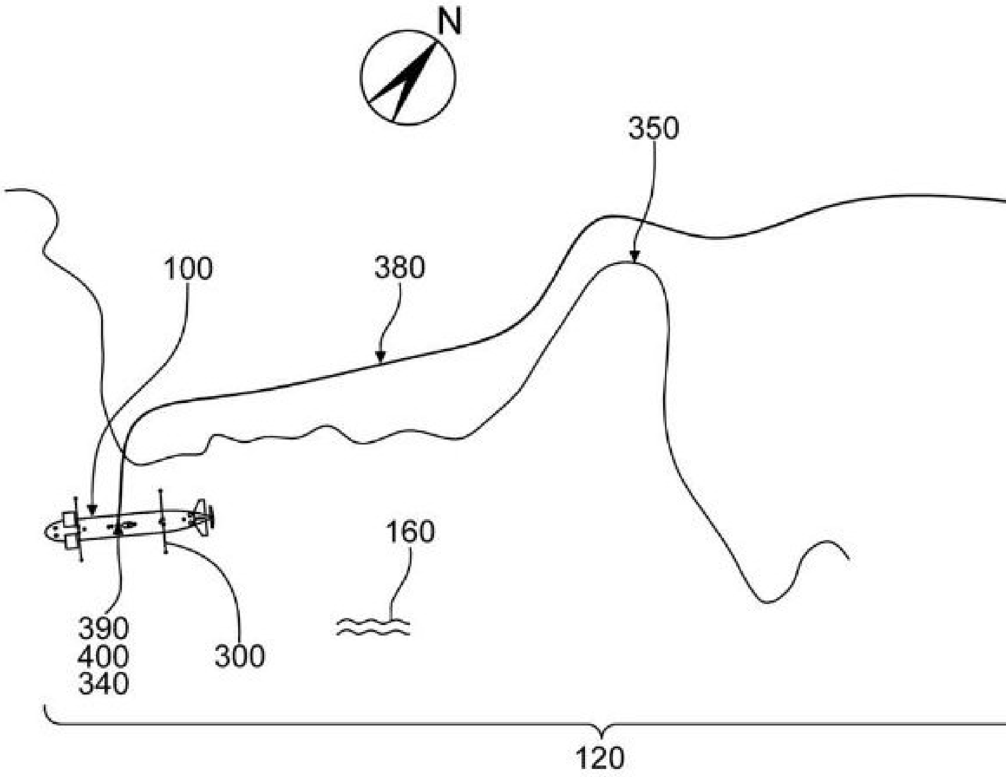


THE FRESH WATER IS DELIVERED OVER AN AVERAGE DISTANCE OF 800 KM (500 MILES) FROM THE PACIFIC MEXICAN RIVERS (preferably between Yaqui and San Lorenzo Rivers) to NW Mexico, via Wagner Basin in the Northern Gulf of California, landing at Puerto Peñasco (East Route), San Felipe, Mexico (Wester Route), or El Golfo de Santa Clara (Route details are shown on next page).

Mexico has the capacity to export water and sell its Colorado River water rights to U.S. clients, with appropriate compensation for Mexico. This process involves formal agreements and the transfer of rights, as outlined in the relevant policies.



- **THE DEMONSTRATOR PROJECT by TRANSOCEANIC LLC – USA IS PLANNED TO DELIVER 125 000 000 TONNES OF WATER PER YEAR (1,500,000 AFY) TO NW MEXICO, WHICH IN ITS TURN CAN TRANSFER ITS COLORADO RIVER SENIOR WATER RIGHTS TO THE USA OR DELIVER THE WATER DIRECTLY TO THE USA.**
- **THE EXPECTED COSTS AND TECHNICAL DATA ARE AVAILABLE BY REQUEST**
- **EXPECTED COST OF ONSHORE DELIVERED WATER IS US$0.12 PER CUBIC METER ($153/AF)**
- **THE DEMONSTRATOR PROJECT IMPLIES AN INVESTMENT OF US$142 MILLION**



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…to an **offshore delivery station (130) in the Northern Gulf of California (Wagner Basin)**

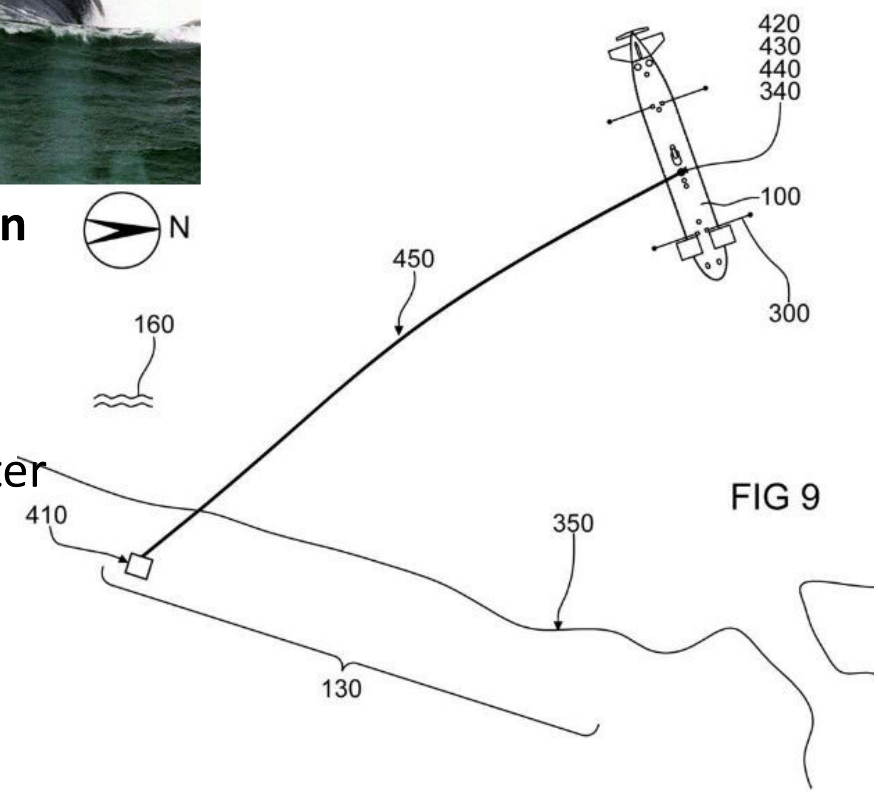
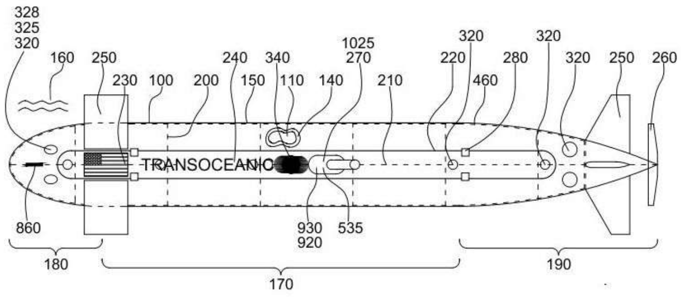


FIG 9

From the offshore delivery station, the fresh water is transferred onshore and shared between Mexico and USA.



transoceanic.us

The TRANSOCEANIC transport submersibles, usually with a capacity of 0.5 to 10 million DWT, are built with variable-ballastable reinforced concrete hulls and equipped with large, impervious, collapsible inner bladders for transporting fresh water.

The TRANSOCEANIC systems are flexible and intelligent:

- **TRANSOCEANIC systems can be reconfigured for various water source locations, delivery points, and routes, demonstrating their adaptability and reliability to meet diverse needs;**
- **TRANSOCEANIC transport submersibles are built as Autonomous Underwater Vehicles (AUV) with the required concrete hull ballast and integrated instrumentation, command, and control systems that include protocols for economical and safe cruise, ensuring operational reliability.**
- **The TRANSOCEANIC operation requires no ballast water release into the environment (seas & oceans) and can also remove brine from desalination plants, underscoring its environmentally friendly design and commitment to sustainability;**
- **TRANSOCEANIC submarines are corrosion-resistant (built of reinforced concrete panels and sheltered collapsible bags) and are economically assembled as ultra-large structures of hundreds of thousands of tonnes.**

TRANSOCEANIC AND THE WORLD

TRANSOCEANIC (transoceanic.us) can bring gigatons (millions of acre-ft) of low-cost fresh water to arid areas, feeding the WORLD, delivering plentiful water to cities, and arresting carbon into the soil and plants.

TRANSOCEANIC's main potential markets are: Western USA (Arizona, California, Nevada), and by water rights reallocation, the whole of Colorado River Basin, NW Mexico (Baja California, Sonora), Middle East and North Africa (MENA) countries, European Union's Southern countries, South Africa/Namibia, India, Australia, Western South America, China, and possibly SAHARA (for dream projects, from the Amazon or Congo Rivers).