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1. HEAVY TRAFFIC BASELINE & IMPACTS

This section discusses existing traffic and transportation conditions and facilities, as well as the Project's potential impacts on local and regional transportation during the construction and decommissioning phases.

Because project operation would involve minimal vehicular traffic, project operations will have minimal impacts on transportation, and the operations phase is not further discussed.

1.1 Baseline

This section provides a summary of the baseline traffic characteristics and traffic safety concerns along the roads used to transport project components, personnel, materials, and supplies during project construction.

Baseline data were collected through desktop data review, including a January 2018 road survey performed by ALE Heavylift on behalf of GE, which is included as Appendix A.

1.1.1 Existing Traffic Network and Proposed Itineraries for Project Supplies

Two main routes will be utilized to transport materials to the Project.

- The anchor cages used in the foundations of the wind turbines will be transported by truck from the Buenos Aires Port, via Caleta Olivia, located approximately 25 km to the north of Cañadon Seco.
- Likewise, some worker, material, and supply trips may travel to the Project from Caleta Olivia or Comodoro Rivadavia Port (about 40 km north of Caleta Olivia).
- All other traffic, including WTG components (blades, nacelles, hubs, tower segments, etc.) will be transported from Puerto Deseado to the Project.

Table 1-1 describes the roads to be used by project vehicles traveling to the site from either Caleta Olivia or Puerto Deseado. YPF Luz has stated that anchor cages and other occasional trips between Buenos Aires and the project site would fit within conventional containers or on conventional flatbed trucks. Due to the limited number of such trips during project construction and the conventional nature of the vehicles involved, this section does not provide a detailed evaluation of roads between Buenos Aires and Caleta Olivia.

Table 1-1 Route from Puerto Deseado to Cañadon Leon

Road	Segment	Distance Utilized (km)	Road Type	Lanes	Pavement
RN 281	Puerto Deseado – Jaramillo (RN 3)	123	National Road	2	Asphalt
RN 3	Jaramillo (RN 281) – Fitz Roy	16	National Road	2-4	Asphalt
RP 43	Fitz Roy – Pico Truncado	58	Provincial Road	2-4	Asphalt
RP 12	Pico Truncado – Project Site	30	Provincial Road	2	Asphalt
RP 12	Caleta Olivia – Project Site	23	Provincial Road	2	Asphalt

RN = National Road; RP = Provincial Road

Source: ALE Heavylift, 2018.

Those roads generally have a paved width of about 7.5 meters and have gravel shoulders. Within cities or other settlements, the roads often have multiple lanes in each direction, center medians, and dedicated turn lanes. Other affected roads, such as those leading from ports to national routes, have varying characteristics.

Table 1-2 shows the range of average annual daily traffic (AADT) for major roads along the proposed route. No traffic volume data were available for RP12.

Table 1-2 Average Annual Daily Traffic (AADT)

Road Name	Segment	AADT/TMDA
RN281	Puerto Deseado – Jaramillo (RN 3)	201 – 1,000
RN3	Jaramillo (RN 281) – Fitz Roy	1001 – 4,000
	Near Caleta Olivia	1001 – 4,000
RP43	Near Fitz Roy	1,001 – 4,000
	Near Fitz Roy to Pico Truncado	201 – 1,000

Source: Ministerio de Transporte 2019[1]

No readily available data or studies describe known points of congestion or delay along the proposed routes. The Google Maps traffic visualization tool suggests that traffic along RP 12 and some segments of other roads is generally free-flowing or has limited delays in more developed areas near Fitz Roy and Pico Truncado, essentially at peak hours (morning and evening) (Google 2019).[2]

1.1.2 Condition of Transportation Infrastructure

Based on photography captured in 2018 and 2019, the roads in Table 1-1 are generally in good condition and are well maintained (ALE Heavylift 2018, ERM site visit 2019). Pavement markings and signage are generally intact, and potholes or cracks are not prevalent. Nonetheless the region around the Project is heavily used for oil and gas exploration and production, and thus experiences frequent heavy truck traffic and associated infrastructure degradation.

1.1.3 Transportation Safety

Based on the relatively low traffic volumes listed in Table 1-2 (for example, even if limited to daylight hours, 4,000 vehicles per day on National Road 3 is equivalent to less than 10 vehicles per minute, in both directions) and the limited number of major intersections or interchanges, crash rates on affected roads are likely to be low.

[1] Minsterio de Transporte. 2019. Sistema de Información Geográfica (SIG) de la Dirección Nacional de Vialidad (SIG-Vial). https://www.argentina.gob.ar/vialidad-nacional/sig-vial

[2] The "typical traffic" tool shows the generalized average speed of traffic, based on historical data collected from smartphones running on Android software. These data are only published visually (i.e., specific speeds are not provided). Google does not provide data on traffic congestion, volume, or mode of transportation. Google. 2019. Plan Your Commute or Trip. https://support.google.com/maps/answer/7565193?co=GENIE.Platform%3DAndroid&hl=en

1.2 Impacts

Traffic associated with project construction could impact existing transportation conditions and resources in three primary ways:

- Increased congestion or delay;
- Degradation of affected road infrastructure; and
- Increased transportation safety risk.

This section discusses the project's transportation impacts, based on the impact assessment framework provided in Section 6. Impacts associated with project decommissioning are expected to be similar to those experienced during construction; therefore, decommissioning is not discussed in any further specific detail.

1.2.1 Project Activities Impacting Transportation Resources

Project construction would involve the following activities with the potential to impact transportation:

- The movement of WTG components from ports to the project site. Each WTG would require 10 separate haul movements (initial Project EIA, 2017), all of which will be oversize loads—either extremely long, as in the case of blades or tower segments, or wide and/or heavy, for nacelles and other components. Project construction would require a total of 290 round-trips to deliver WTG components;
- Worker bus trips to and from the project site. Project construction would generate up to 6 bus round trips per day;
- Delivery of construction materials (i.e., aggregate, concrete, rebar, piping, or other special materials); substation, transmission line, and telecommunication components;
- Delivery of construction equipment to and from the site; and
- Consumable supplies (water, petrol, etc.).

Construction materials, equipment, and consumable supplies would be delivered via conventional trucks (i.e., tractor trailers or dumpers). The Project has not determined the number of such truck trips; however, the Project will likely generate several truck trips per day during construction.

This SLIP assumes that wind turbine component deliveries would include front and rear escort vehicles and/or police vehicles to halt or otherwise manage non-project traffic. Escort vehicles would have exterior flashing lights, flags, high visibility markings, and other identifying characteristics, as required by law. Pilot vehicles should be equipped with radios or other communication systems to maintain contact with the escorted truck and other escort drivers.

1.2.2 Receptor Sensitivity

Receptors for transportation impacts include other users of the public roads described in Section 5.1.1. These users are likely to be unaccustomed to frequent heavy-truck traffic or substantial congestion; however, as residents of a rural part of Argentina, these users likely have experience dealing with unexpected road conditions. As a result, based on the methodology described in Section 6.2, receptor sensitivity for transportation impacts is medium.

1.2.3 Discussion of Impacts

This section discusses transportation impacts in terms of congestion and delay, transportation infrastructure, and transportation safety.

1.2.3.1 Traffic Congestion and Delay

WTG components can weigh several hundred tons, and require trailer trucks with up to 42 axles. These trucks are oversized loads that could require more than just a single lane on straight-line road segments. At intersections or sharp curves, WTG component trucks would likely block the entire intersection or road. Trucks carrying WTG components would also move at slower speeds and would be dangerous to pass.

As a result, delivery of WTG components would cause temporary delays for non-project road users. Vehicles following the trucks paths would be delayed by the slow speed of the trucks and the inability to safely pass. Vehicles traveling in the opposite direction would need to slow to pass on straight road segments, and may need to stop entirely on curves or at intersections (including those near delivery ports).

Some construction equipment may also require oversize-load trucks, although substantially smaller than trucks carrying WTG components.

Other project trucks and buses would be similar in size and weight to trucks normally seen on public roads throughout Argentina. These truck trips would typically represent an incremental increase in existing traffic, and would not likely generate congestion or delay.

Overall, delays for non-project road users would be sporadic, and would primarily be associated with movement of the WTG components. While some non-project road users would find the delays to be unacceptable, project activities would not prevent non-project road users from reaching their destination, and would not permanently block access to other roads or uses. As a result, project-related traffic congestion and delay would have a medium magnitude, and the Project's overall impacts on traffic congestion and delay would be ***moderate***.

1.2.3.2 Degradation of Transportation Infrastructure

Project vehicles would degrade roads faster than typical automobiles, particularly along pavement edges or where cracks or potholes already exist. As described in Section 1.2, existing heavy truck traffic in the region already causes some road degradation. Project-related trips would likely result in incremental additional damage in a region where such infrastructure degradation is common. As a result project-related road degradation would have a low magnitude, and the Project's overall impacts on road infrastructure would be **minor**.

1.2.3.3 Transportation Safety Impacts

The Project would impact transportation safety through physical intrusion into other traffic and through increased traffic volume. To avoid trucks carrying WTG components, non-project vehicles may need to (or may be directed to) pull onto the gravel shoulders to allow larger vehicles to pass. In cases where non-project traffic must stop altogether (such as at intersections or on sharp curves), vehicles approaching stopped traffic if not sufficiently warned. Project-related traffic could also delay emergency response.

The risk of a crash or injury generally increases as overall traffic volume increases. The presence of heavy trucks, which have longer stopping distances and more momentum in a crash, also increases the risk and severity of traffic incidents. Excluding trucks carrying WTG components, the overall increase in project traffic would thus incrementally increase transportation safety risks.

Overall, project-related increases in transportation safety risk would have a medium magnitude, and the Project's overall impacts on transportation safety would be ***moderate***.

1.3 Mitigation Measures and Residual Impact

Recommended mitigation measures to address the transportation impacts described in Section 0 include use of convoys and time-of-day travel restrictions.

- Grouping of project trucks (including, but not limited to trucks carrying WTG components) into convoys (multiple large trucks traveling together, with front and rear escort vehicles) would avoid some potential traffic and transportation impacts, such as by maintaining proper speed. Convoys would also consolidate traffic delays and congestion. While it would take longer for a convoy to pass a given location, use of a convoy would reduce the number of instances of such delays.
- Project truck trips—specifically trucks hauling WTG components—should be scheduled to avoid the busiest time of day on public roads. These "peak" hours typically occur in the morning and afternoon but would be determined through consultation with local authorities. This could include nighttime travel for some truck trips. Consolidating truck travel outside of peak hours would reduce congestion and delay, and would also reduce the risk of crashes or other incidents.

The tables below summarize the Project's impacts on congestion and delay, infrastructure degradation, and transportation safety, considering the mitigation measures described above.

Impact description Traffic congestion and delay.	
Mitigation measures Use of convoys, time-of-day restrictions.	
Residual impact evaluation Use of mitigation measures would reduce the pre-mitigation impacts.	
Impact Rating for Traffic Congestion and Delay	Minor

Impact description Degradation of road infrastructure.	
Mitigation measures None	
Residual impact evaluation None	
Impact Rating for Road Infrastructure Degradation	Minor

Impact description Transportation safety risk.	
Mitigation measures Use of convoys, time-of-day restrictions.	
Residual impact evaluation Use of mitigation measures would reduce the pre-mitigation impacts.	
Impact Rating for Transportation Safety Risk	Minor

APPENDIX A. ROAD SURVEY (ALE HEAVYLIFT, JANUARY 2018)

ROUTE SURVEY CAÑADÓN LEÓN WIND FARM

GE imagination at work

Contact:	Rene Buscatti	**E-mail:**	Rene.buscatti@ge.com
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Date:	26/01/2018	**Nº Pages:**	115
N°/Ref:	ALE-09-AA394206-COMM-RTE-001	**Rev:**	1

All business is undertaken subject to the company's conditions of contract. Copies of these will be supplied on application.

1.INDEX

1. INTRODUCTION

This report describes the main obstacles identified in the route survey to Cañadón León Wind Farm, performed on the second week of January of 2018.

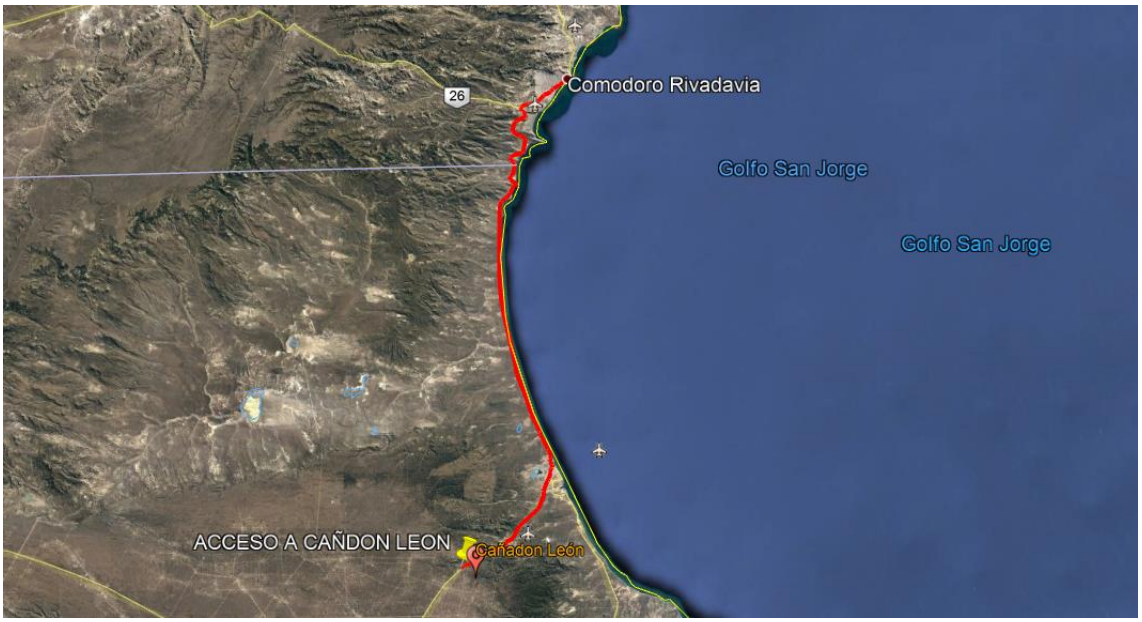
ALE studied two possible routes:

- From Comodoro Rivadavia Port to Cañadón León wind farm
- From Puerto Deseado Port to Cañadón León wind farm

2. ROUTES PERFORMED

2.1. COMODORO RIVADAVIA PORT TO CAÑADÓN LEÓN WIND FARM

The route performed from Comodoro Rivadavia Port to Cañadón León Wind Farm is the most direct route to the jobsite.



STRETCH	DISTANCE (KM)	ACUM. (KM)
Av. Hipólito Yrigoyen	10.10	10.10
National Route 3	67.2	77.30
Porvincial Route 12	54.5	131.8

2.2. PUERTO DESEADO PORT TO CAÑADÓN LEÓN WIND FARM

The route performed from Puerto Deseado Port to Cañadón León Wind Farm is the most straight forward of accessing the jobsite. It will be used for Bicentenario and Los Hercules wind farms.

STRETCH	DISTANCE (KM)	ACUM. (KM)
Exit from Puerto Deseado port (West alternative)	2.8	2.8
Exit from Puerto Deseado port (East alternative)	2	2
Road between Costanera Calufo and Ing. Briano street	0.3	2.3
Ing. Briano Street	6.4	8.7
National Route 281	120	128.7
National Route 3	16	144.7
Provincial Route 43	58.2	202.9
Provincial Route 3	29.9	232.8

3. EXECUTIVE SUMMARY

On the second week of January a Route Survey was performed from the ports of Comodoro Rivadavia city in Chubut and Puerto Deseado in Santa Cruz to Cañadón León wind farm in the province of Santa Cruz. Two different ports were assessed for the offloading and transport of wind power generation equipment to the Cañadón León Wind Farm, located in the vicinity of Cañadón Seco town in Santa Cruz. The main findings are summarized below:

ROUTE FROM COMODORO RIVADAVIA

The transport from Comodoro Rivadavia port has a total length of 132 km, and is the shortest transport route alternative studied.

Regarding Comodoro Rivadavia port, custom area and storage area were recently expanded. The exit of the port has been improved recently and there are plans to do more adjustments for the exit of the transport cargo. Also, this part has recent previous experience handling the components for Manantiales Behr wind farm.

Once we go out of the port to the south, the road continues by Av. Hipolito Irigoyen and the transport has to go through the city for 10 km, it will be necessary to interrupt traffic for the transport of the components.

At the exit of Comodoro Rivadavia city there is a prolonged slope (Stretch Av. Hipólito Yrigoyen) and it could difficult the transport of the wind turbine components, particulary blades in uphill curves.

The greatest problem on this route alternative is the crossing of Caleta Olivia city. The main roads of this city are under construction and there is no defined route. This stretch through the city will need a detailed swept path analysis in further engineering stages and a general review of the current roads available before the transport. Also, there are high level of urban obstacles present.

ROUTE FROM PUERTO DESEADO

The transport route from Puerto Deseado port has a total length of 232 km, and is the longest transport route alternative studied.

This seems the most suitable route given the low traffic, clear conditions through most part of the road and lack of visible attached road improvements costs. Puerto Deseado is currently improving its facilities and it should be checked with port authorities the feasibility of blade transport exit, but there should be ongoing transports for Parque Bicentenario Wind Farm. Route 281, RN 3 and RP 43 are mostly clear excepting some wide curves at roundabouts. RP12 has some traffic increases due to the proximity to Caleta Olivia which could be a minor issue. The proposed access point to the wind farm has a high slope on a gravel road and with curves, the access should probably be performed on high ground, in order to avoid climbing up slopes at the jobsite entrance. This issue will define the wind farm entrance but will depend on the exact jobsite area

4. ARGENTINE TRANSPORT LEGISLATION

The Argentine transport law (decree number 79/98, date 22nd January 1998, section 2.3) states that the "trailers with more than 4 tires per axle, are allowed to have a total gross load of 1.8 tons per tire".

(Law available in Spanish under in the link below of the Chamber of Private Transport Companies)

Even though this restriction has no engineering background, it is what's requested as minimum by authorities when asking for road permits. This is the reason why road transports in Argentina are always executed with a large amount of axle lines. In order to provide as an idea, the chart below shows the axle lines needed to transport components of different weights:

Weight of component	Axle lines needed (single or total side-by-side)	Trailer's weight	Gross weight	Weight per wheel (t)
100	10	37	137	1,71
200	20	74	274	1,71
250	24	88,8	338,80	1,76
300	32	118,4	418,4	1,63
350	36	133,20	483	1,67

The same law applies to lighter transports (as Lowboys, etc.)

Besides such initial restriction, if a transport crosses a bridge or any kind of civil structure, authorities could ask for a lower weight axle (minimum required: 14,4tons) or also a girder frame trailer, depending on the result of the engineering study executed by them.

Therefore, the company that will execute the transport should propose a transport configuration to the authorities. Later, the final transport configuration will depend on the recommendation made by them, after carrying out engineering studies of the infrastructure to be crossed.

5. COMODORO RIVADAVIA PORT

Comodoro Rivadavia Port is located, along with the city of the same name, in the center of San Jorge Gulf, in Chubut Province, Argentina. Its coordinates are 45° 52' S, 67° 29' W.

It has an 216 meters long overseas wharf. This port, traditionally of agitated internal waters, is protected by a work of shelter of 300 meters of length. Along the pier the depth is 10 meters and in all the port is 8 meters.

It also has two mooring sites for fishing vessels of 100 and 108 meters in length.

The port has two storages area for 20' and 40' containers. The first has an area of 4,500 m2 unpaved and the second of 3,000 m2 is paved.

It also has a mobile crane with a maximum capacity of 45 tons and a forklift of 7 tons.

Overseas wharf

Front dock length: 216 m (with Stage III extension, total: 288 m)

Spring width: 20 m

Overload: 3,5 tn / m2

Draft at the wharf: -8.30 m average

Draft at the port: -6.00 m on average

Bollards: 12, of 80 Tn of bit of bit, provided with plate of fusible bolts.

Storage area: 6900 m2

Services:

Operation hours: 24 hours a day

Electric energy distribution: 3 boards with sockets of 110/220 and 380

Drinking water: 5 sockets

Fuel: 3

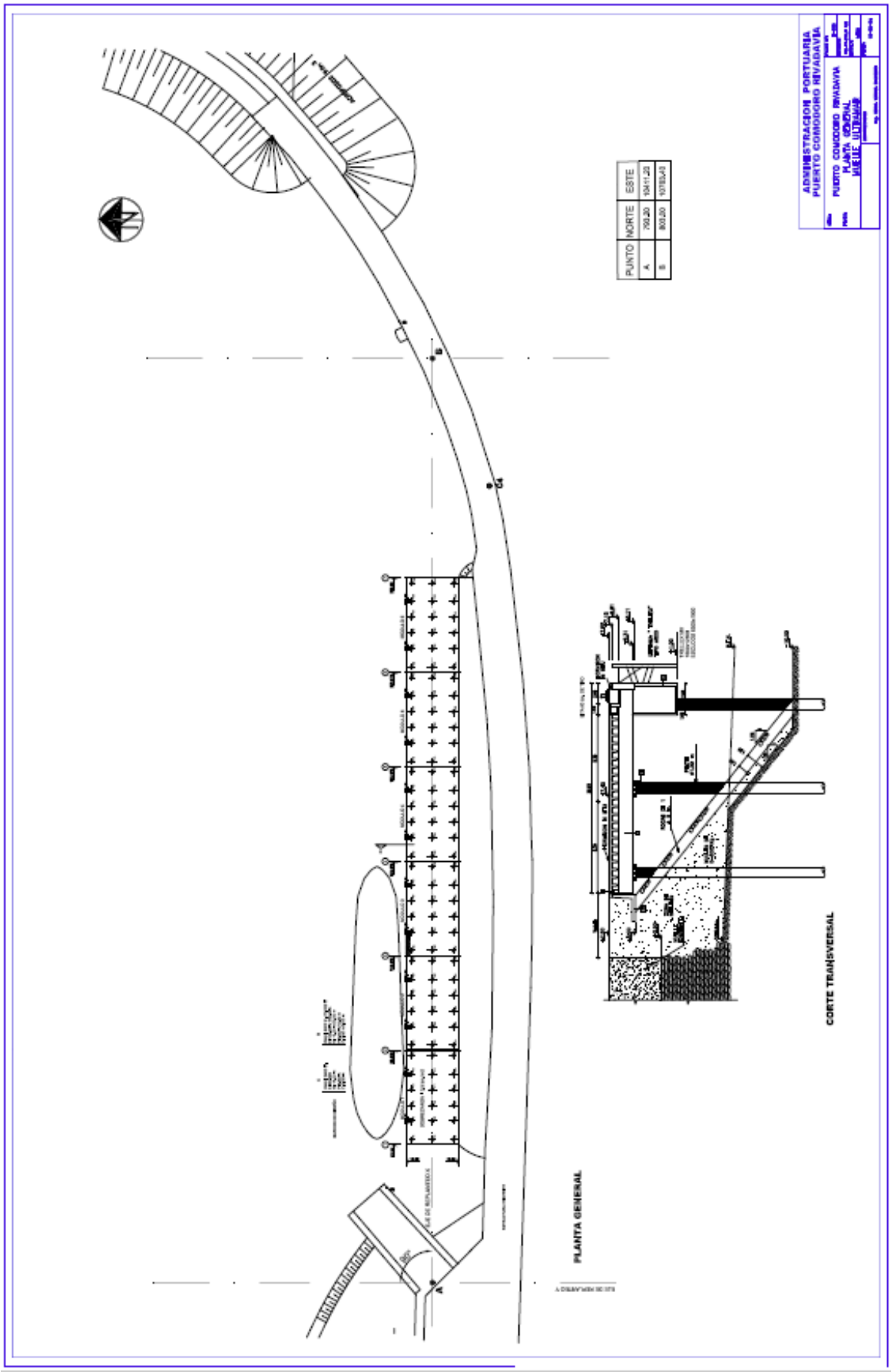
Beacons: of autonomy of operation, one at the beginning of the Work of shelter and another in the hill of the same one.

Fire System: Using submerged Flyght pumps, which take sea water, and three hydrants for connection of hoses and endowment of permanent guard of PNA, pump.

Equipment and supplies for PLANACON Procurement.


YPF


CORMORAN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PUERTO CONSORCIO RIVADAVIA
PUERTO CONSORCIO RIVADAVIA
PLANTA GENERAL
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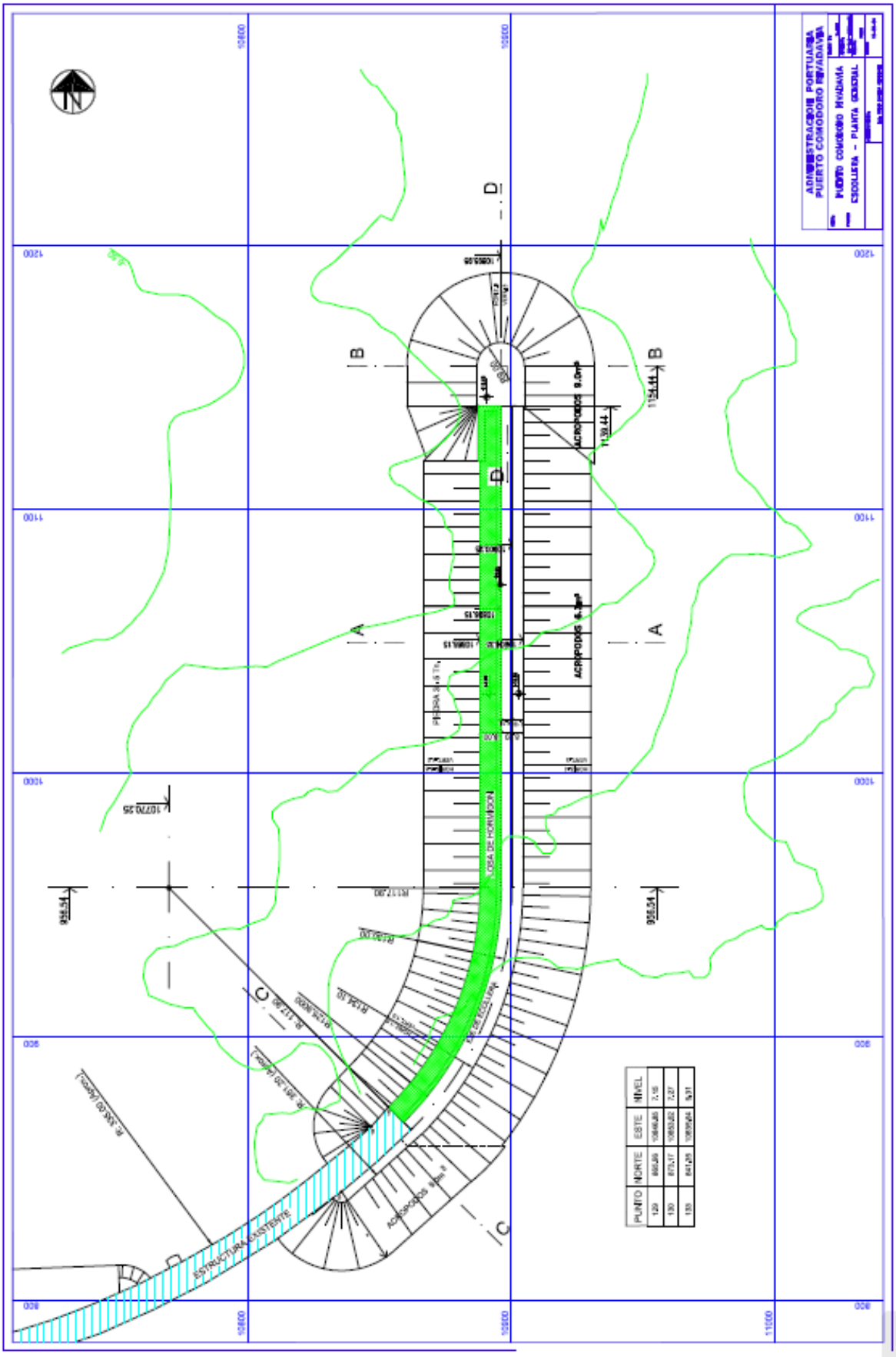
799,20
1041,23
B
803,20
1078,43
PLANTA GENERAL
CORTE TRANSVERSAL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PUNTO
NORTE
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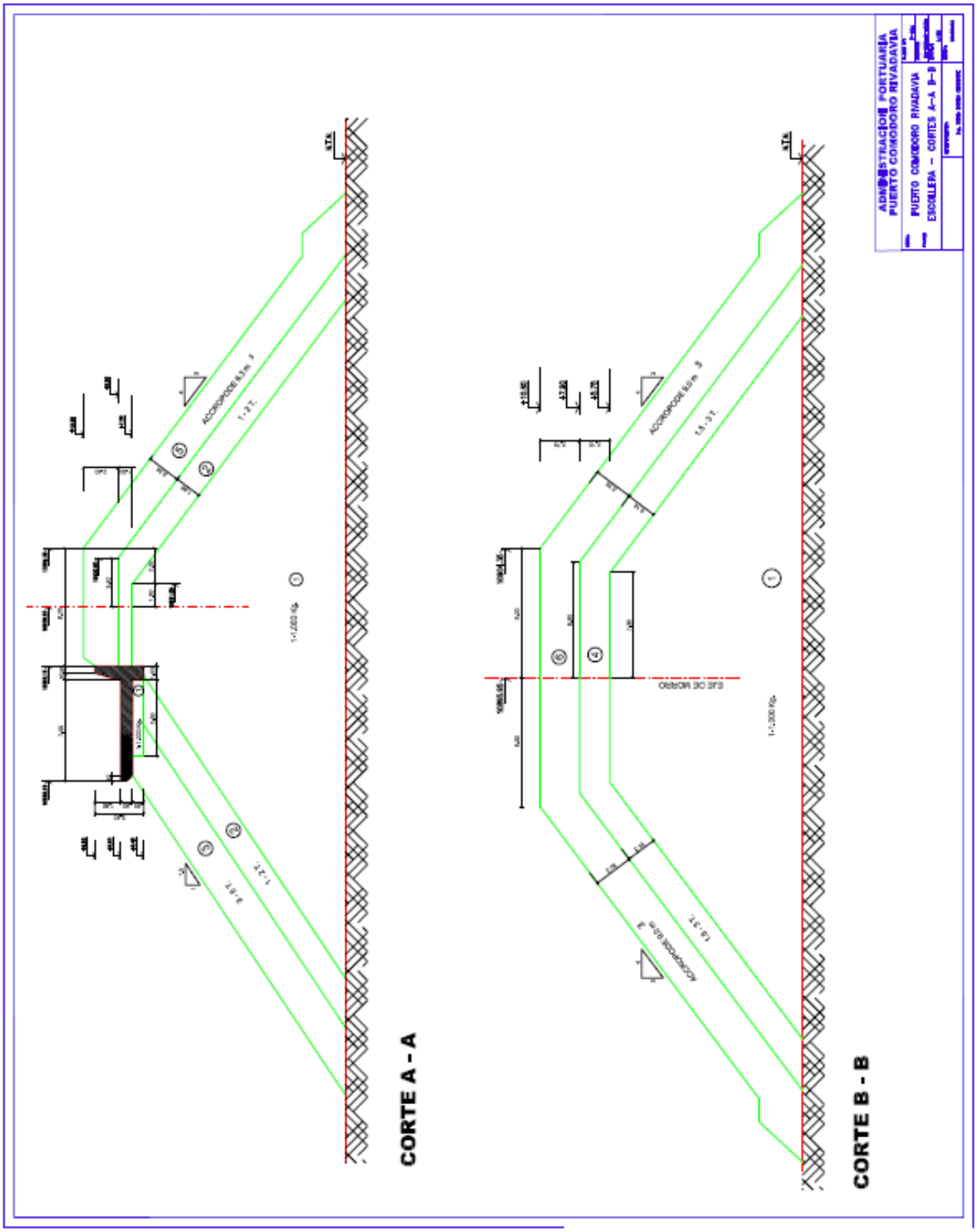

CORTE A - A
CORTE B - B

6. PUERTO DESEADO PORT

Puerto Deseado Port is located in the city of the same name, at the north of Santa Cruz Province, on the northern shore of the Rio Deseado. Its coodinates are 47 º 45 '10.5 "S, 65 º 55' 41.2" W.

Puerto Deseado port is a natural and multipurpose port. Its predominant market is fishing, but is also suitable for Merchant Ships, Container, Cruise Ship, Fish, etc.

The port is for public use, owned by the province of Santa Cruz. It is managed and operated by the Executing Unit Port Santa Cruz (UN.E.PO.SC).

Figure 1: Plan view of Puerto Deseado Port

TARIFFS PUERTO DESEADO PORT

Its tariffs can be checked at the following link:

http://www.uneposc.com.ar/web/tarifario.php

CONTACT FOR PUERTO DESEADO PORT

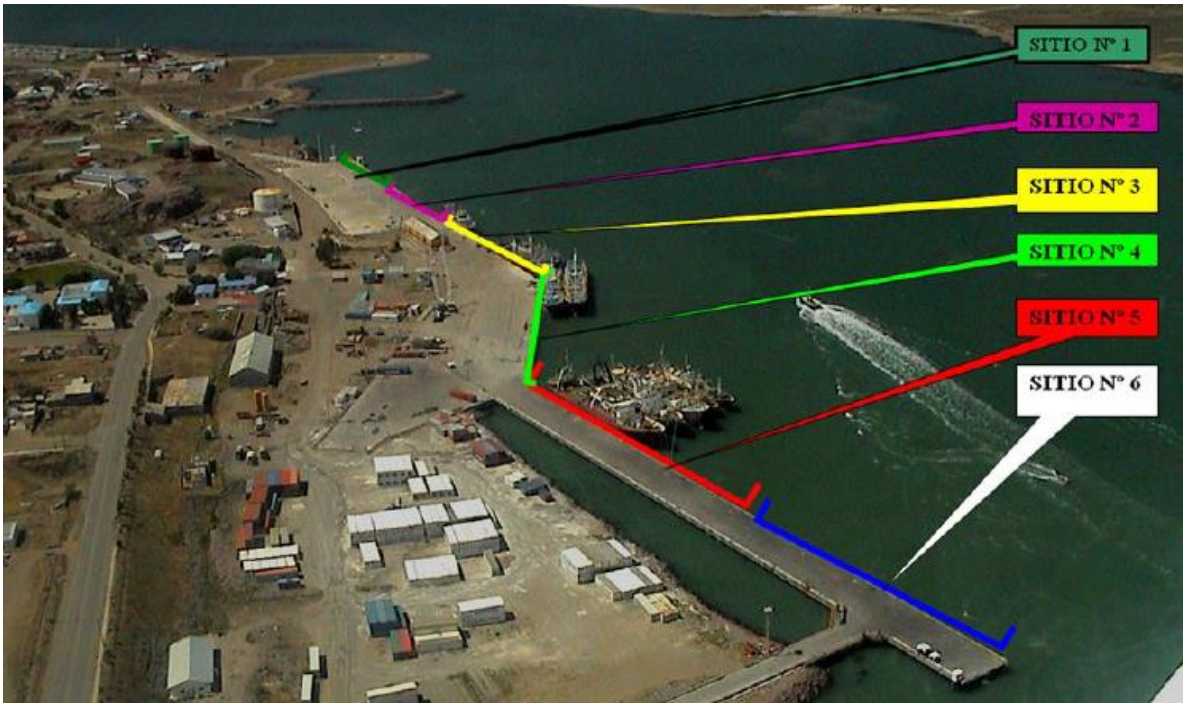
Patricia Marcela Figueroa (port subadminitrator): subadminitrador@e-puerto.com

Telephone number: 0297 - 4872228

PORT FEATURES

In this port is operated with discharge of fishing vessels, refrigerated and general cargo.
Also, it has a permanent and growing activity, with containers belonging to Overseas and Coastal traffic.
General cargo ships that operate normally with a frequency of 15 days; reach maximum lengths of 180 m, but there are no disadvantages in operating larger ships as long as their draft is compatible with the depths available at the wharf.

QUAYS FEATURES



The port has four (4) operational fronts dock and an auxiliary spring (Site 7) currently out of service. The 4 operating fronts are divided into six (6) sites, named:

SPRING LENGTH:

SITES 1 AND 2 = 214.60 m.

SITE 3 = 128.60 m.

SITE 4 = 145.90 m.

SITES 5 AND 6 = 250,00 m.

OPERATING WIDTH

SITES 1 and 2: 21,00 m wide.

SITE 3: variable. Minimum 14.50 m; Maximum 22.00 m.

SITE 4: variable. Minimum 22.00 m; Maximum 30.00 m.

SITES 5 AND 6: 17,00 m.

DEPTH

Depth minimum foot spring, regarding the local zero:

SITES 1 and 2: 11,00 m.

SITE 3: 9.00 m.

SITE 4: 9,00 m.

SITES 5 AND 6: 10,50 m.

DOCK FENDERS

Site 1 and 2: Metal shields coated with antifriction material and 2 elastic deflectors (shock absorbers) of diameter 800 mm.

Site 3: Shield coated metal bearing material and 1 snap defense (shock) 1,000 mm diameter circular.

Site 4: Currently the site has temporary defenses. It is planned to install metal shields coated with antifriction material and circular dampers, identical to those of Site 3. All these new elements to be placed are already available in the port.

Sites 5 and 6: Con escudos metálicos recubiertos con material antifricción y defensas elásticas del tipo trapecial cerradas. El estado de las defensas es bueno

BOLLARDS

SITES 1 AND 2: 10 of 60 t each.

SITES 3 & 4: 8 of 80 t.

SITES 5 AND 6: 9 and 30 t 3 100 t.

STORAGE FEATURES

Has a closed warehouse, enabled goods import / export of 572 m 2. At the same there is a custom area of 5.095 m2 paved and fenced.

It has another open plaza tax unpaved for all types of heavy goods import (drawers, equipment, containers, vehicles, machinery, etc..) Of approximately 10.000 m2. It has a parking lot for trucks of approximately 8.000 m2.

Behind the Sites 1 and 2 has a new beach is a paved area of approximately 7.000 m2.

Behind the Sites 5 and 6 has a beach unpaved 17.000 m2, which in the future will form the Fiscal Small square of Puerto.

SERVICES

DRINKING WATER FOR VESSELS

The service is staffed by UN.E.PO.S.C. There is a reservoir of 400,000 liters. SITES for 1, 2, 3 and 4, and 18,000 liters. SITES for 5 and 6.'s new sites 1 and 2 have a total of 5 ports 3 "c / u, can provide 20 m3 / h each.

Site 3 has 2 sockets 2 "c / u, at a rate of 18/20 m3/hc/u; Site 4: 2 shots of 2 "at a rate of 18/20 m3 hour c / u; Sites 5 and 6 have 3 shots 2.5 "at a rate of 25/28 m3 hour c / u.

ELECTRICITY FOR SHIP

At Sites 1 and 2 there are 5 cameras with AC outlets (3 x380V) and single phase to supply vessel. Each outlet can supply a three-phase power of 30 kw.

FUEL SUPPLY FOR VESSELS

The service is provided by private companies. For the supply of fuel to vessels sourcing has the following ports:

• In the Sites 1 and 2: 4-neck 4 "and 3 6" for each of the three suppliers, arranged in five chambers. Total = 15 mouths. The mouths of 6 "are commonly used to download fuel tank vessels.

• At Site 3 2 4 mouths "belonging to the firm YPF S.A

• At Site 4: 4-neck 4 "belonging to the firm CHALLACO SRL, and 2 4" belonging to the firm YPF S.A.. Total = 6 mouths. CURRENTLY NOT OPERATE

• In Room 5 and 6: 4-neck 4 "belonging to the firm YPF S.A.

COLLECTION OF BILGE WATER

At Sites 1 and 2 are fixed for capturing ships bilge liquids facilities. They consist of five receiving mouths located in the same chamber that the fuel supply. The liquids are pumped through a single steel pipe 4 "diameter to a metal storage tank 35 m3 capacity located in the northeast end of Site 1. At the remaining sites bilges are emptied by truck service atmospheric port services by companies authorized to do so.

LIGHTING SYSTEM

8 light towers of 20m height are installed at sites 1 and 2. Each the towers has got 3 to 5 projectors of 1000 W each, suitably oriented to prevent shadow cones and dazzlings. Three towers are installed on the back beach and they have got 1 to 2 projectors of 1000 MW each.

On site 3 and 4 are installed 5 steel light towers. Each tower has got 5 projectors of 1000 MW each.

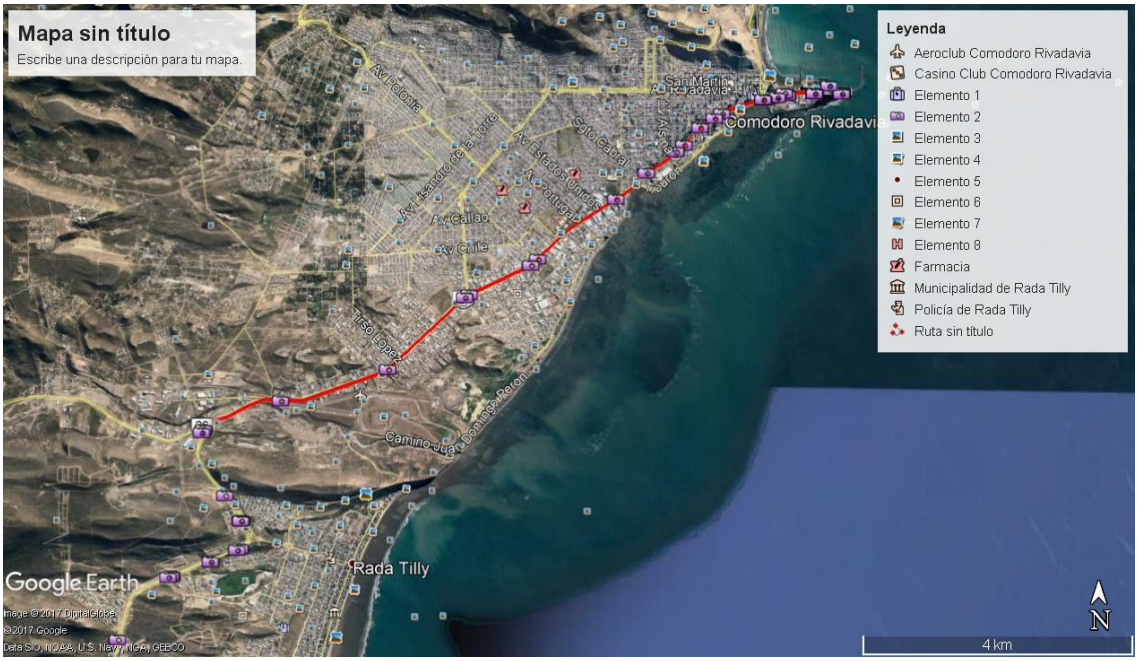
On sites 5 and 6 are installed 7 steel light towers of 8 meters height. 6 of these towers have got 2 refletors of 400MW each and the other one has got 1 reflector of 250MW.

QUAY BEACON

At the east end of Site 1, two beacons are installed, whose headlights have acrylic lens of 150 mm diameter. One of the beacons was installed at the front end of the quay and the other perpendicular to the front end of the quay.

7. TECHNICAL EVALUTATION OF ROUTE – FROM COMODORO RIVADAVIA PORT

7.1. STRETCH AV. HIPÓLITO YRIGOYEN



STRETCH OBSTACLE QUANTIFICATION			
Traffic Light	15		
Boulevard	1		
Cables	LV	MV	HV
	9		

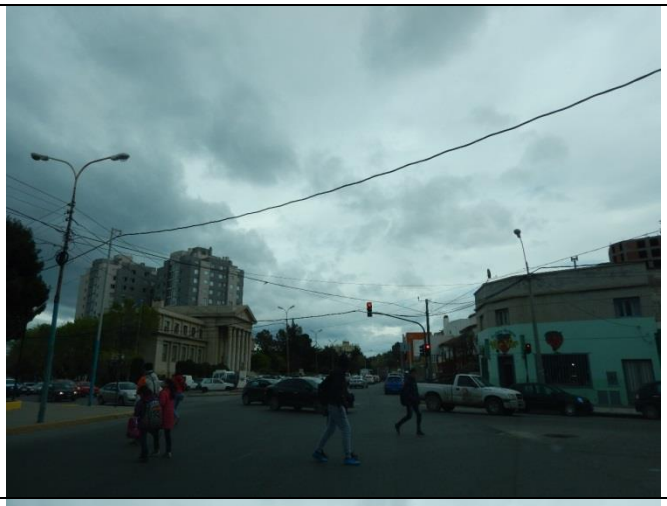
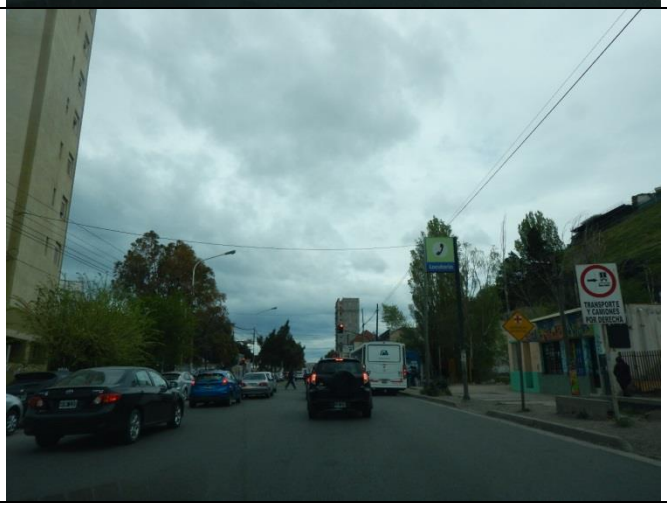
Km.	Description	Image	Comments
0		  	Comodoro Rivadavia Port

			
		 	Port Exit Road

	CURVE	 	Wide, has already been adapted for blade turning
0,1	BOULEVARD		Prior removal of cars to be agreed with port

0.3	CABLES		HEIGHT: 6,6m
0	CURVE		On boulevard
0.4	TRAFFIC LIGHT		HEIGHT: 6.3m
0.6 0.7 0.8	CABLES		
0.8	TRAFFIC LIGHT		HEIGHT: 6.3m
	CABLES		

0.9	TRAFFIC LIGHT		Urban Area HEIGHT: 6.3m
1.1	TRAFFIC LIGHT		Cables HEIGHT: 6.3m Urban área
1.3	TRAFFIC LIGHT		With Cables Possibly will need lifting HEIGHT: 6.3m Urban área

0	TRAFFIC LIGHT		HEIGHT: 6.3m
2	CABLES		
0	TRAFFIC LIGHT		HEIGHT: 6.3m
3	SLOPE		
3.2	TRAFFIC LIGHT		Bypassable HEIGHT: 6.3m
3.4	TRAFFIC LIGHT		Bypassable HEIGHT: 6.3m
3,9	CABLES		Traffic Light

4.5	CABLES		
4.6	SLOPE		
5.5	TRAFFIC LIGHT		Speed radar HEIGHT: 6.3m

6.1	TRAFFIC LIGHT		HEIGHT: 6.3m
6.5	TRAFFIC LIGHT		Bypasseable
6.6	ROAD STATUS		
6.8	TRAFFIC LIGHT		Bypasseable
7	SLOPE		Downhill, mild
7.7	TRAFFIC LIGHT		
8.3	CABLES		km 1839 RN3

8.8	TRAFFIC LIGHT		Only a Pole remains With cable WIDTH: 7.7m HEIGHT: 6.7m
9.5	CABLES		HEIGHT: 6.2m
10.1	ROUND POINT	 	End of stretch

7.2. STRETCH NATIONAL ROUTE 3 TO CALETA OLIVIA

STRETCH OBSTACLE QUANTIFICATION			
Traffic Light	6		
Pedestrian Bridge	1		
Cables	LV	MV	HV
	7		
Bridge	1		
Culvert	22		
Round Point	4		

Km.	Description	Image	Comments
1.1	SLOPE		

1.4	PEDESTRIAN BRIDGE	  	Material: Concrete See possible bypass in last picture WIDTH: 10m HEIGHT: 5,35m

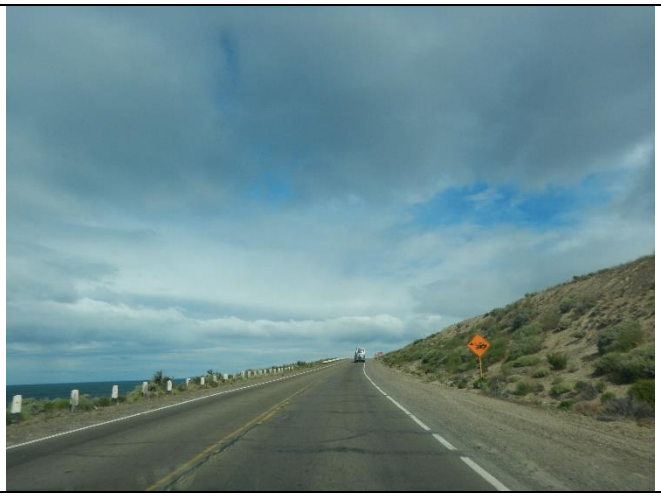
1.9	SLOPE	 	
2.4	ROAD WORKS		New lane under construction

3.1	BRIDGE	  	Recently built HEIGHT: 5.68m
3.8	CABLES		New asphalt on the side lane HEIGHT: 8m

5.3	CURVE		
7.1	SLOPE		
9.1	CURVE		
10	SLOPE		Downhill, 3Deg
11	CABLES		HEIGHT: 6.5m

13.5	SLOPE		
14.9	ROAD STATUS		Deteriorated road, under manteinance Km 1857 WIDTH: 6.9m
16.3	CURVE		Uphill slope
16.7	SLOPE		Downhill
17.5	SLOPE		Uphill Poor road conditions
19	CULVERT		
19.5	CULVERT		LENGTH: 1.60m WIDTH: 6.90m
20.1	CULVERT		
20.5	CULVERT		LENGTH: 6m

			WIDTH: 6.90m
21.1	CULVERT		LENGTH: 1.6m
21.7 to 27.8	5 CULVERTS		
28.1	CHECKPOINT		Milestone km 1870 RN3
28.9	CULVERT		
30.5	CULVERT		LENGTH: 4m
31.7 32.1	CULVERT		

33.6	SLOPE		
36.5	ROAD STATUS		Poor manteinance, holes
45.5	CULVERT	 	LENGTH: 18m WIDTH: 6.9m Nº SPANS: 4

		 	
46.4 to 49,3	3 CULVERTS		
51.1	CULVERT		LENGTH: 1.6m
51.5 52.5 56.1	CULVERT		
61.6	ROAD WORKS		End of road Works Circunvalación Caleta Olivia RN3

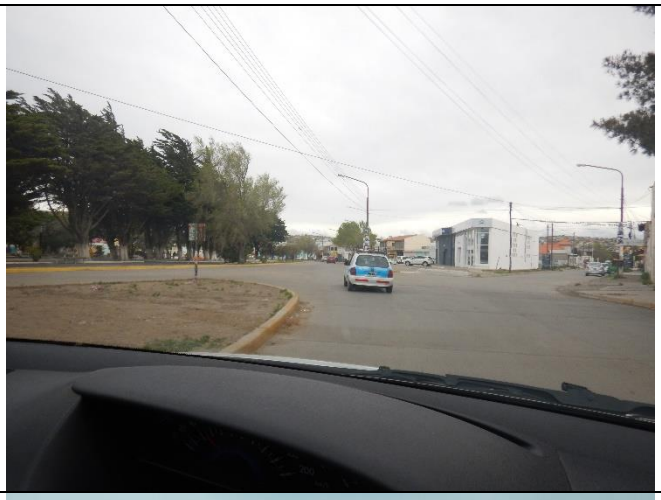
65		 	Ingreso Caleta Olivia
65.6	SLOPE		

66	ROUND POINT	 	
66.2	SLOPE		Downward
66.4	CABLES		Urban area, thinner road and multiple cables HEIGHT: 5.99m

65		  	View of Heavy access, might have to be performed
66,4	CABLES		

66,5	TRAFFIC LIGHT		Multiple Cables
67	URBAN AREA		Traffic lights, cables, trees
67,3	CABLES		
67,8	CABLES		
65	CABLES		Urban area
65,1	TRAFFIC LIGHT		
65,2	ROUND POINT		Monument to the oil maker Light poles to remove. Heavy urbanized area

			
65,2	CURVE		RN26
65,7	URBAN AREA		
65,9	TRAFFIC LIGHT		

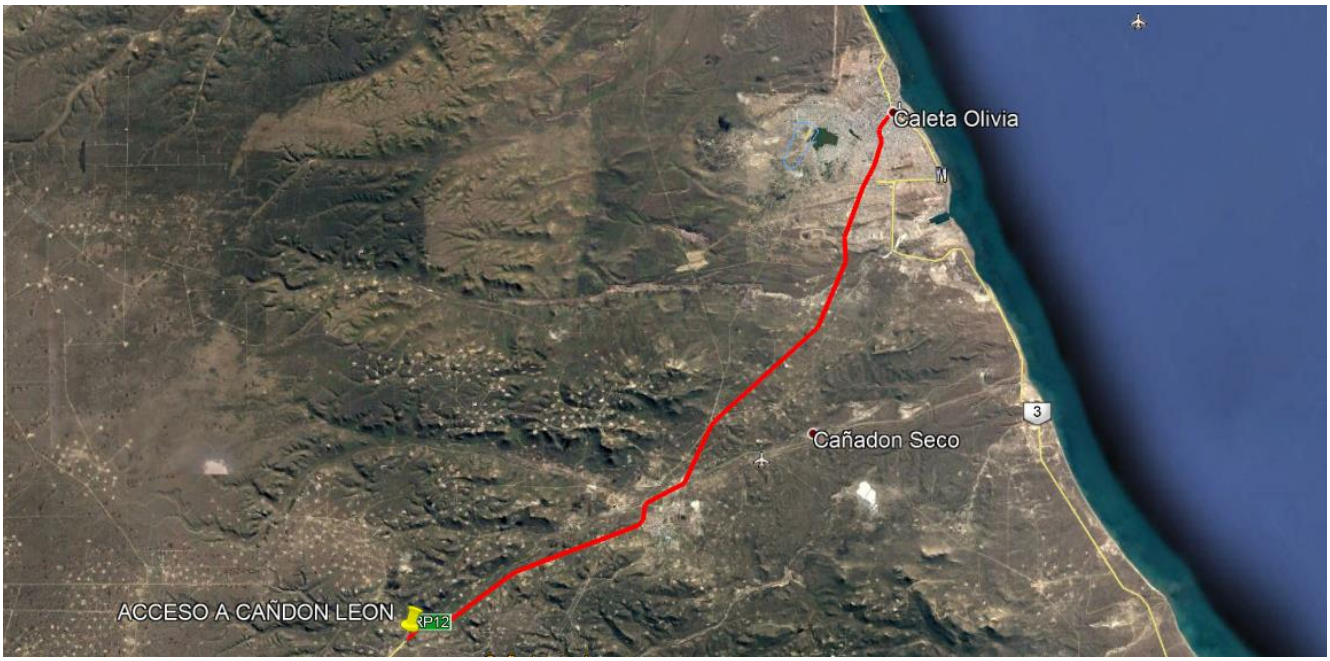
66,1	ROUND POINT		
66,2	TRAFFIC LIGHT		
66,4	TRAFFIC LIGHT		Cables, more urban area HEIGHT: 5.6m

66,6	ROUND POINT	 	
67	SLOPE		Uphill, urban

67,2	ROAD WORKS	 	Road unavailable, under construction, currently unusable for transport

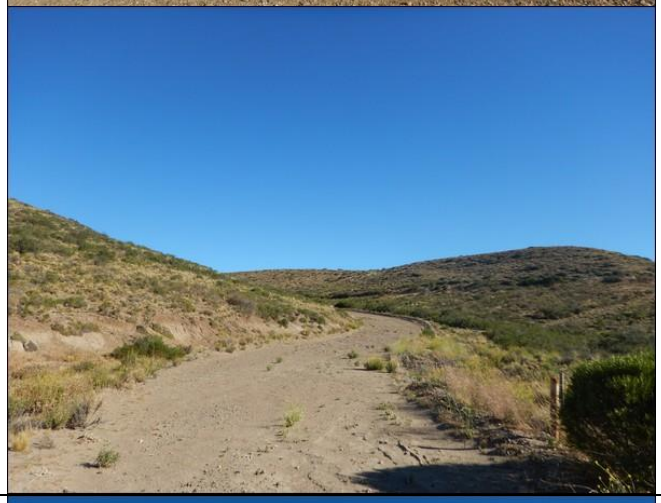
This route should be verified with local authorities prior to the transport as all access roads are subject to some degree of pending road works.

7.1. STRETCH PROVINCIAL ROUTE 12 TO ACCESS TO CAÑADÓN LEÓN WIND FARM



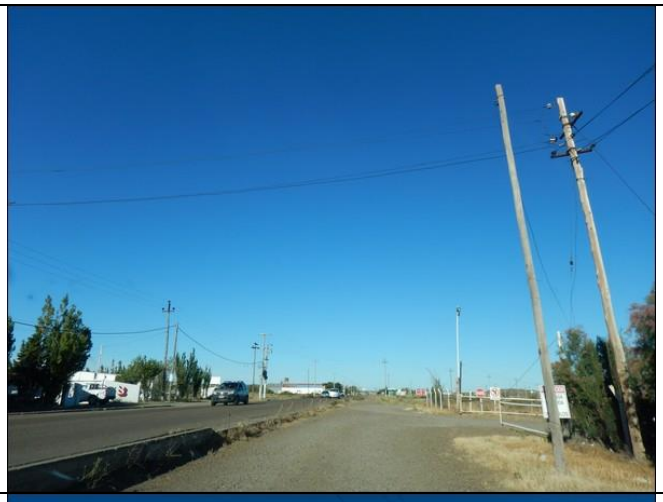
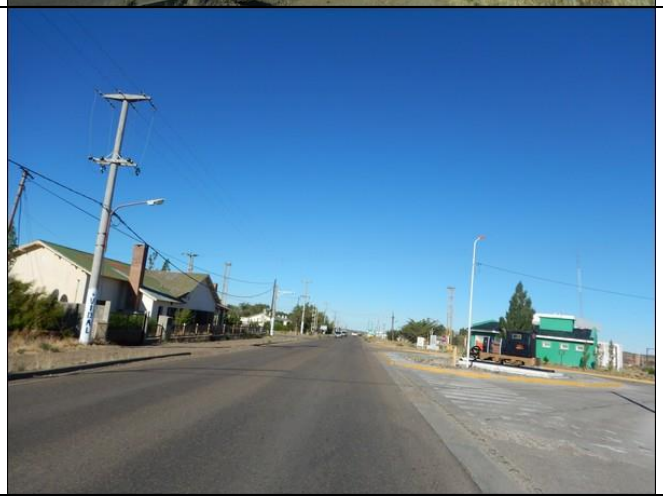
STRETCH OBSTACLE QUANTIFICATION			
Curve	4		
Slope	7		
Cables	LV	MV	HV
	14		
Round point	3		
Culvert	1		
Road works	2		
Boulevard	1		

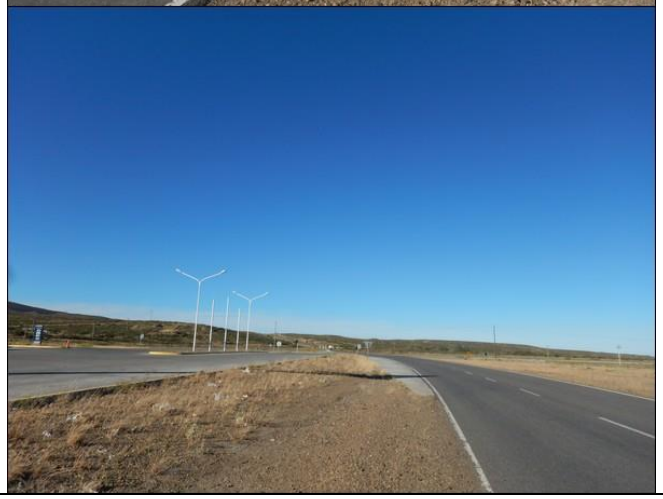
The following stretch will be assessed form Cañadón León wind farm jobsite to Caleta Olivia.

Km.	Description	Image	Comments
0	JOBSITE	 	This particular entrance, looks not like the best. Probably an entrance uphill would be better, to be at nearer Pico Truncado, a higher elevation.
30.5	CURVE		Downhill slope

1.4	CURVE	 	See small YPF station nearby, downhill slope with curve and counter curve.
1.4	CABLES		Comes from a small generating station
1.4	CABLES		
1.9	CABLES		

4.7	ROAD STATUS		Gravel shoulders, mild slopes.
5.8	CABLES		
7.1	SLOPE		Downhill 2%, spans 1.3km
7.5	CABLES		
8.5	CURVE		
9.2	CABLES		

9.8	CABLES		
9.9	CABLES		
10	CABLES		

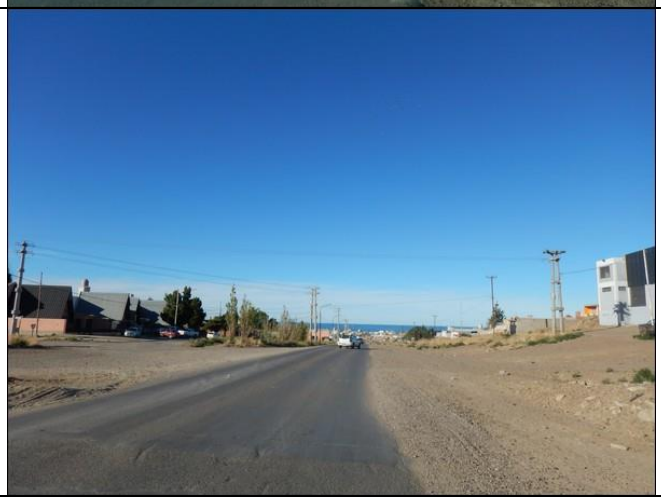
10.1	URBAN AREA		Multiple LV cables Above 6m Cañadon Seco town
10.5	CABLES		
10.7	ROUND POINT	 	Parking area at gasoline station, wide roundabout without turning problems

			
11	CABLES		
11.3	SLOPE		Uphill with curve, slope spans for 1.5km
11.8	CABLES		
13.4	SLOPE		Downhill

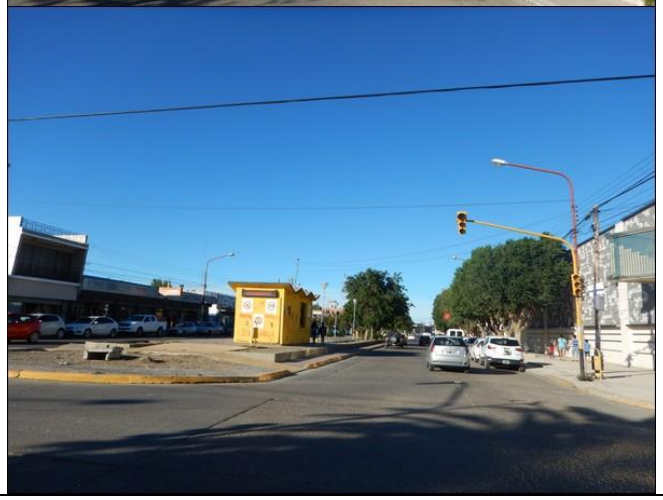
14.2	CULVERT		
14.4	SLOPE		Uphill for 500m 2%
15.4	CABLES		LV
17.3	CURVE		Downhill
18.8	SLOPE		Downhill
20.1	SLOPE		Uphill

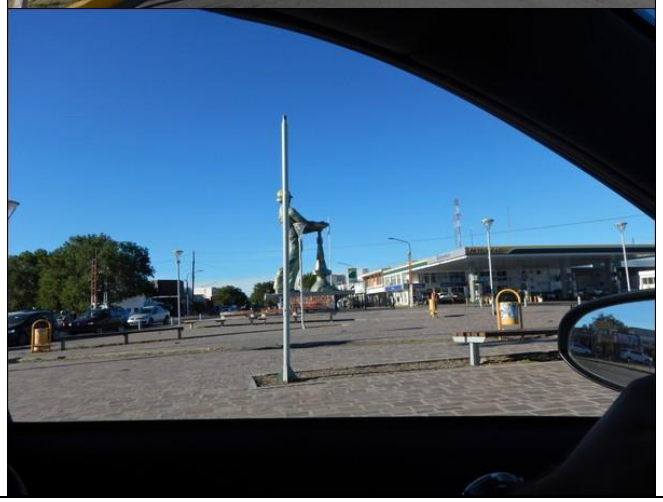
20.9	ROAD WORKS	  	Gravel on the street, clearly unfinished roadworks.
21.1	ROAD STATUS		Beginning of gravel road
21.6	ROAD STATUS		Gravel road, poor conditions

21.8	CABLES		
22.1	ROAD STATUS	 	Beginning of partly asphalted road, on construction

22.6	ROAD WORKS	 	Ongoing viaduct work, seems abandoned for now, there's a roundabout
22.9	URBAN AREA		Multiple LV cables, above 6m height and traffic lights Caleta Olivia entrance Heavy urban area

23.6	BOULEVARD		
23.9	ROUND POINT		Roundabout, middle of Caleta Olivia Not suitable for odd cargo
24.3	URBAN AREA		Traffic light

24.6	URBAN AREA	  	Multiple cables, traffic lights, traffic, probably not the best alternative



8. TECHNICAL EVALUTATION OF ROUTE – FROM PUERTO DESEADO PORT

8.1. STRETCH EXIT FROM PUERTO DESEADO PORT (WEST ALTERNATIVE)

STRETCH OBSTACLE QUANTIFICATION			
Round point	1		
Cables	LV	MV	HV
	1		

Km.	Description	Image	Comments
0	CURVE	 	Exit from Puerto Deseado, gate after slope, to be adequate on December WIDTH: 8,4m Extra 1m to the light pole
0	ROAD STATUS		WIDTH: 9,5m

0,1	CURVE		
0,1	CABLES		TYPE: LV HEIGHT: 5,45m
0,2	SLOPE		With curve, 3 deg

0,9	CURVE		KM3 RN 281 Review slopes About 4Deg transverse and 3 Longitudinal. WIDTH: 6.8m
2,8	SLOPE		
2,8	ROUND POINT		Looks wide enough for taking on the right way, if any light poles have to be removed after a swept path analysis then taking against flow could avoid any works WIDTH: 6.8m

8.2. STRETCH EXIT FROM PUERTO DESEADO PORT (EAST ALTERNATIVE)

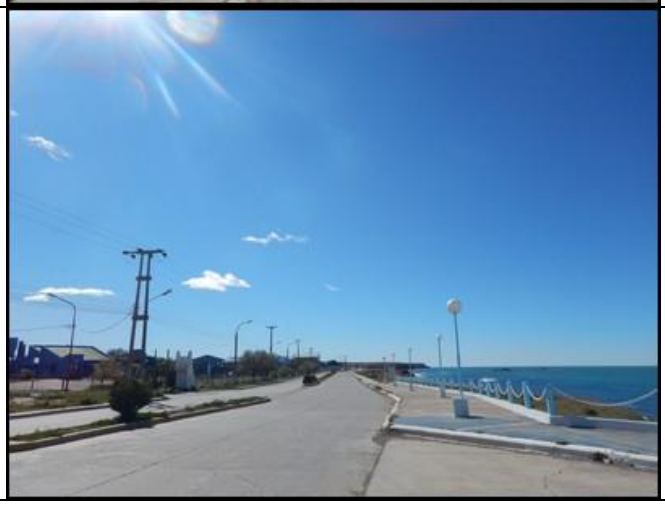
STRETCH OBSTACLE QUANTIFICATION			
Round point	1		
Cables	LV	MV	HV
	2		
Boulevard	2		
Baden	1		
Bridge	1		

Km.	Description	Image	Comments
0			Port side exit, ascending ramp of 2 Degrees.
			Exit Gate WIDTH: 8m
0,1	ROAD STATUS		Concrete road, clear and without slop WIDTH: 8m

0,2	CURVE		WIDTH: 8m

0,3	CURVE	 	Counter Curve, OK WIDTH: 8m
0,6	CURVE		

		 	
0,7	BOULEVARD		Check with transit local authorities to remove parking cars,

0,8	CABLES		TYPE: LV HEIGHT: 6,11m
1	BADEM		Depressions and speed hump.
1,2	ROAD STATUS		WIDTH: 6,8m

1,7	SLOPE		
2	ROUND POINT	 	

8.3. STRETCH ALTERNATIVE 1 – ROAD BETWEEN ING. BRIANO STREET AND COSTANERA LOTUFO

STRETCH OBSTACLE QUANTIFICATION			
Bridge	1		
Boulevard	1		
Cables	LV	MV	HV

Km.	Description	Image	Comments
2,1	DIRT ROAD		
2,3	SLOPE		Earthworks needed
2,4	CURVE		small curve
2,6	SLOPE		Costanera S.A Deposito fiscal

2,6	CURVE		Check
2			Alternative, performing the 90 Deg turn at the round point.
2	CABLES		EIGHT: 5,88m

2,2	CABLES		Several Cables, LV, Lowest HEIGHT: 4,94m
2,3	CURVE	 	

			
2,3	BOULEVARD		WIDTH: 6,8m
2,5	BRIDGE		N°SPANS: 1 N°BEAMS: 6 LENGTH: 14m WIDTH: 8m

0			Junction between variants END OF STRETCH

8.4. STRETCH ALTERNATIVE 2 – ROAD BETWEEN COSTANERA LOTUFO AND ING. BRIANO STREET

STRETCH OBSTACLE QUANTIFICATION			
Cables	LV	MV	HV
	1		1
Culvert	1		

This road continues the last stretch from Costanera Lofuto to Ing. Briano street within a second road more suitable for the transport of wind components.

Km.	Description	Image	Comments
0,2	CABLES		
0,2	CULVERT		LENGTH: 1,6m

0,3	SLOPE		With curve, 4%

8.5. STRETCH ING. BRIANO STREET

STRETCH OBSTACLE QUANTIFICATION			
Round point	6		
Cables	LV	MV	HV
	2		1
Culvert	2		
Railroads	1		

This road continue the last stretch from Costanera Lofuto to Ing. Briano street within a second road mora suitable for the transport of wind components.

Km.	Description	Image	Comments
			Road alternative between Costanera Lotufo and Ing. Briano street.
0,2	CABLES		
0,2	CULVERT		LENGTH: 1,6m
0,3	SLOPE		With curve, 4%
0,4	CURVE		

1,1	ROUND POINT		8.7m width in the circle, Check with swept path analysis, crossing over would be easier. EXISTENT BYPASSS WIDTH: 8.7m

			
1,2	ROAD STATUS		WIDTH: 6.7m
2,1	FFCC		Unused
2,7	CURVE		Mild

3,6	ROUND POINT		

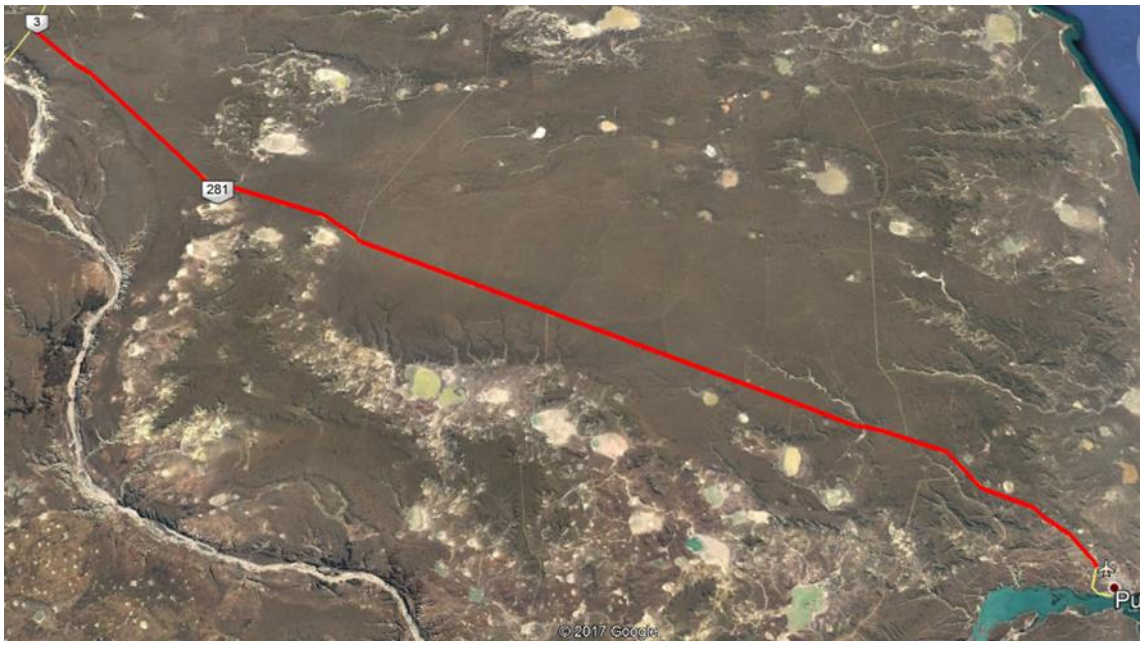
			
3,6	ROUND POINT	 	

			
4	ROUND POINT	 	Check radius

4,4	SLOPE		0,04
4,5	CABLES		TYPE: HV HEIGHT: 8.12m
4,7	CABLES		TYPE: LV HEIGHT: 9,65m
5,8	CURVE		

6	CABLES		TYPE: LV HEIGHT: 5,46m
6,4	ROUND POINT	 	END OF STRETCH

8.6. STRETCH NATIONAL ROUTE 281



STRETCH OBSTACLE QUANTIFICATION			
Culverts	34		
Round point	1		
Cables	LV	MV	HV
	7		
Boulevard	1		

Km.	Description	Image	Comments
0,2	CABLES		Will require lifting TYPE: LV HEIGHT: 5,34/5,5m

1,1	CABLES		HEIGHT: 5,66m
1,6	CULVERT		LENGTH: 1,2m KM7 NR281
2	CULVERT		LENGTH: 1,2m
2,2	CABLES		HEIGHT: 6,5m
2,8	SLOPE		3%, WITH CURVE
4,4	CULVERT		UPHILL, 4%
5,1	SLOPE		
5,4	CURVE		MILD
6	CABLES		

8,4	CULVERT		MILD SLOPE UPWARDS
10,1	SLOPE		4% DOWNWARDS AND UPWARDS
11,2 11,7	CULVERT		
12,7	CHEK POINT		TELLIER ENTRANCE KM18 RN281 POLICE CONTROL
13,5	URBAN AREA		TELLIER 4xLV CABLES HEIGHT: 6,65m
13,9	CABLES		

14,2	URBAN AREA		END OF URBAN AREA
14,7	CULVERT		KM20 RN281
17,5	CULVERT		LENGTH: 1,2m
17,6	CULVERT		LENGTH: 1,2m
19,3 21,4	CULVERT		
22,1	CABLES		
22,1	SLOPE		
22,5	CULVERT		
23,1	SLOPE		UPHILL 4%
23,6 24,3 24,7 25,2 27,9 28,9	CULVERT		KM29 RN281
32,4	ROAD STATUS		KM38 RN281, CLEAR ROAD WITH GRAVEL SHOULDERS, LOW TRANSIT WIDTH: 6.4m
35,1 38,5 44,2	CULVERT		

53,6	CULVERT		Clear road LENGTH: 1,6m WIDTH: 6,4m
57,1	CULVERT		LENGTH: 1,2m WIDTH: 6,4m
59,1 64,2 68,8	CULVERT		
74,7 76,4 80,6 84	CULVERT		KM81
86,7	CURVE		MILD
86,8 88	CULVERT		

95	CHECKPOINT	 	PARQUE EOLICO JARAMILLO (BICENTENARIO) EN CONSTRUCCIÓN, A LLEGAR PARTES EN DICIEMBRE A PUERTO DESEADO WIDTH: 6,4m
98	CULVERT		
111,3	ROAD STATUS		Dirt road Entry to jaramillo

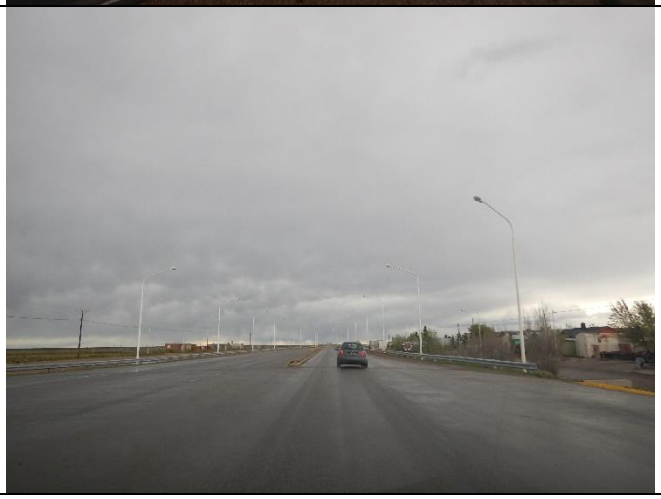
111,8	CABLES		
112,8	BOULEVARD		Main entrance Jaramillo
113 116	CULVERT		
120	ROUND POINT		KM 118 RN281 END OF STRETCH

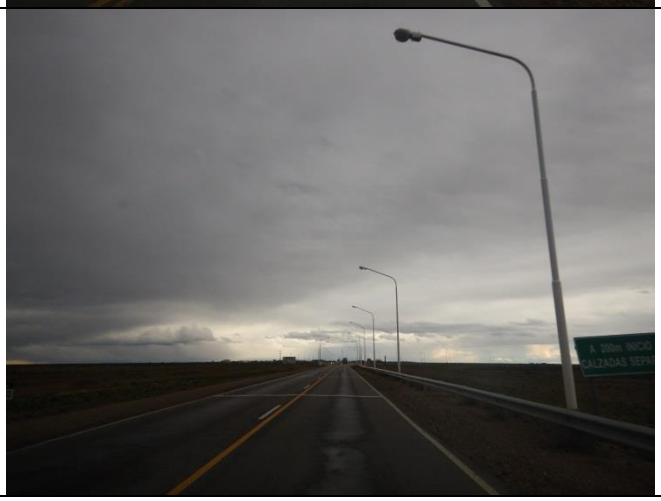
			

8.7. STRETCH NATIONAL ROUTE 3

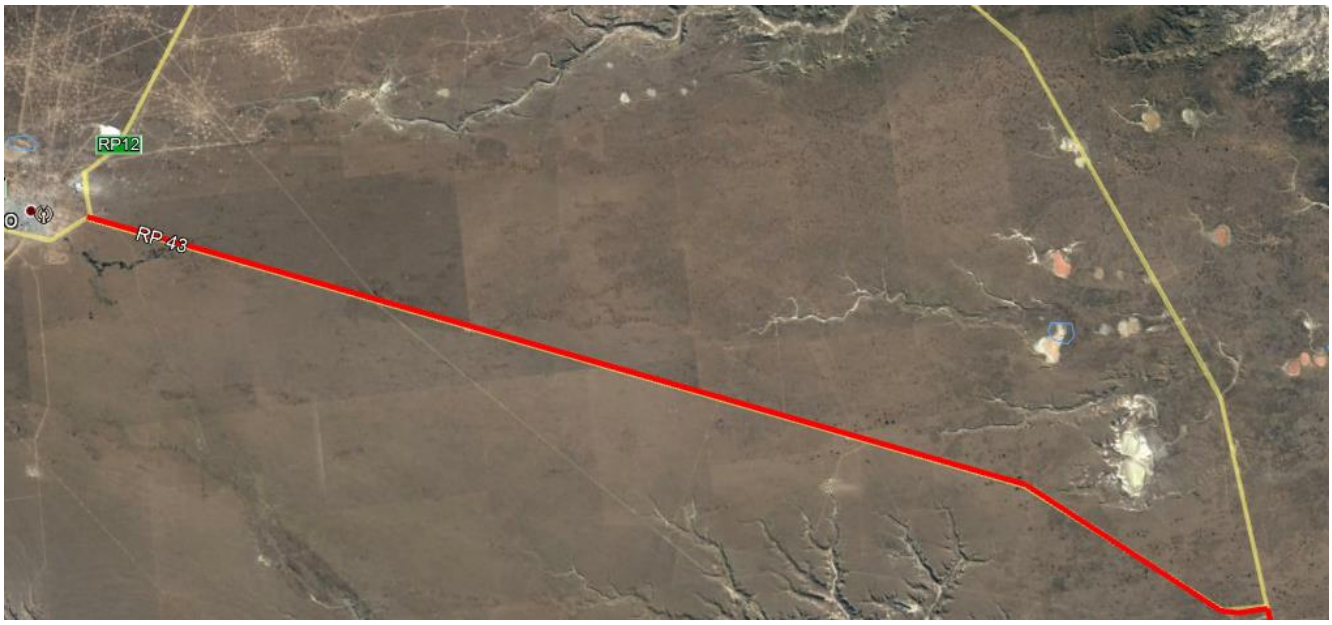
STRETCH OBSTACLE QUANTIFICATION			
Culverts	2		
Round point	1		
Cables	LV	MV	HV
		1	
Boulevard	1		

Km.	Description	Image	Comments
0	ROUND POINT		Crossing with RN281, elongated roundabout with tight curves. Analyze possible adequate necessary

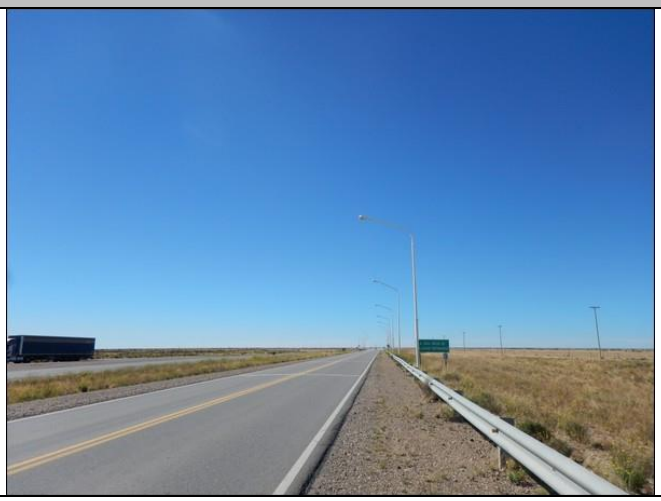
1,50	CULVERT		Milestone km 1995
3,30	CULVERT		
4,30	CURVE		
5,60	CULVERT		
8,30	CABLES		TYPE: MV HEIGHT: 9.60m
14,50	BOULEVARD		Fitz Roy Exit

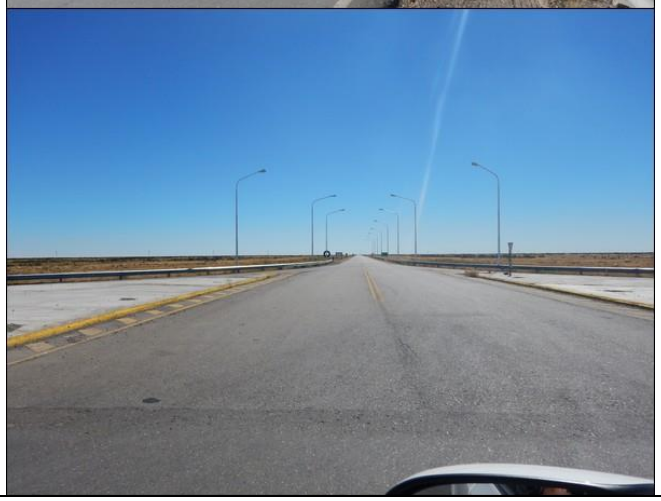
70	URBAN AREA		Milestone km 1981 Urban Area Fitz Roy
16	BOULEVARD		Crossing with RP43; KM 1980 RN3 END OF STRETCH

8.8. STRETCH PROVINCIAL ROUTE 43



STRETCH OBSTACLE QUANTIFICATION			
Culverts	19		
Round point	1		
Cables	LV	MV	HV
		1	
Boulevard	1		
Curve	1		
FFCC	1		
Parking area	1		

Km.	Description	Image	Comments
0,00	BOULEVARD		Milestone 1981 RN 3

			
0,00	CURVE	 	Measured from inner end boulevard to end of asphalt. CHECK Curve and light poles interference WIDTH: 8m

			
0,00	ROAD STATUS		Beginning of RP43 WIDTH: 8.1m
1.7	FFCC		Unused an abandoned railway
2.6	CULVERT		Typical LENGTH: 6.4m WIDTH: 1.1m
4.4 6.7	2 CULVERTS		LENGTH: 6.4m WIDTH: 1.1m
9.5	CULVERT		LENGTH: 6.4m WIDTH: 1.1m

12.8 14.3	CULVERT		LENGTH: 6.4m WIDTH: 1.1m
17.3	ROAD STATUS		Beginning of concrete shoulders, might be suitable as a parking area
18.1	CULVERT		LENGTH: 6.4m WIDTH: 1.1m
20.5	PARKING AREA		Abandoned train station. Other trailers seen parked in the area
21.2 to 38.6	7 CULVERTS		LENGTH: 6.4m WIDTH: 1.1m
38.7	ROAD STATUS		Clear. Gravel shoulders with shrubs, otherwise ideal for transport.

41.3	ROAD STATUS		LENGTH: 6.4m
43.5 to 53.5	6 CULVERTS		LENGTH: 6.4m WIDTH: 1.1m
58,00	CABLES		132Kv TYPE: MV HEIGHT: 7.4m
58,00	ROUND POINT	 	Curve see possible removals of wood signs WIDTH: 5.4m

			
58,20	END OF STRETCH		

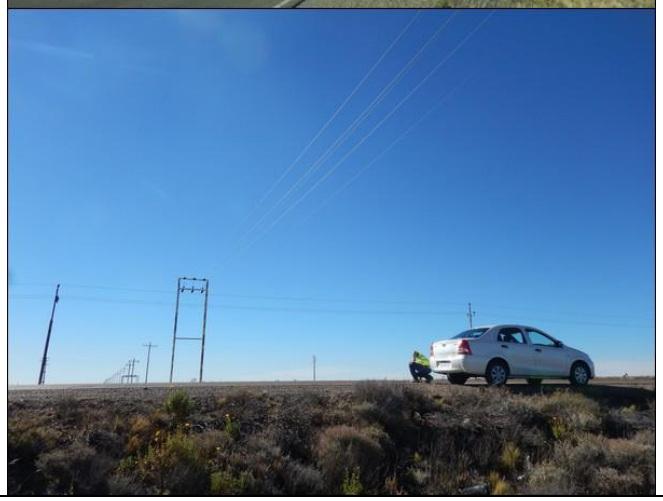
8.9. STRETCH PORVINCIAL ROUTE 12

STRETCH OBSTACLE QUANTIFICATION			
Boulevard	2		
Curve	1		
Cables	LV	MV	HV
	9		
FFCC	1		
Culvert	2		
Parking area	1		
Gas line	1		

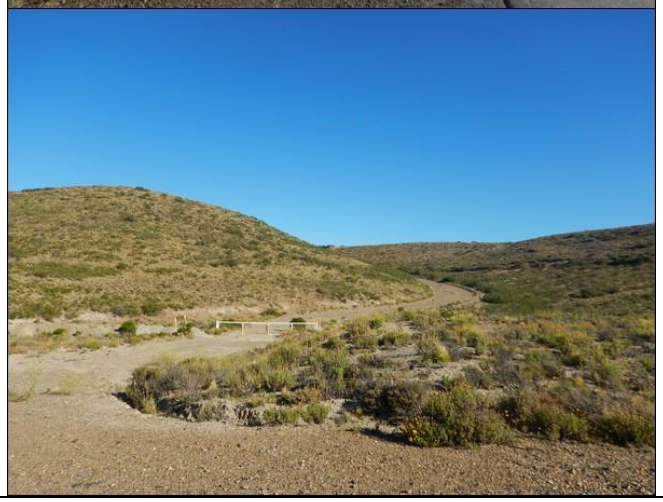
Km.	Description	Image	Comments
0,00	CABLES		
	BOULEVARD		
	FFCC		
	CULVERT		
0.4	ROAD STATUS		Dual lane, clear
1,00	BOULEVARD		Begins tri lane

			
2.2	CURVE	 	Curve on to Caleta Olivia, and access to park end of dual lane

			
2.2	CULVERT		
6.8	ROAD STATUS		
6.8	CABLES		LV 13KV
6.9	CABLES		LV 13KV
9.2	GAS LINE		Gas line crossing, oil field area
13.1	CABLES		LV Heightened

14.2	CABLES	 	LV Heightened
15.6	CABLES		LV Heightened
16.5	SLOPE		Upwards, 1.5%
16.8	CABLES		
22,00	ROAD STATUS		Traffic
22.7	PARKING AREA		
22.7 22.8	CABLES		

		 	
25.8	ROAD STATUS		Clear route, increased traffic between Pico Truncado and Caleta Olivia Poor demarcation. Gravel shoulders of about 1.5m
29.4	SLOPE		Downhill, wider road 11m

29,90	JOBSITE	  	The current road identified as the most direct entrance to the jobsite has a steep curve and uphill gravel stretch. The are probably better entrances near Pico Truncado where there is a higher elevation. This will depend, however, on the final location of the wind farm.