

An innovative system for the sustainable management of sediment in water basins: the ejector technology



TREVI Group

May 28, 2020

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The ejector



The ejector's operating principle is based on the combined effect of two different nozzles:

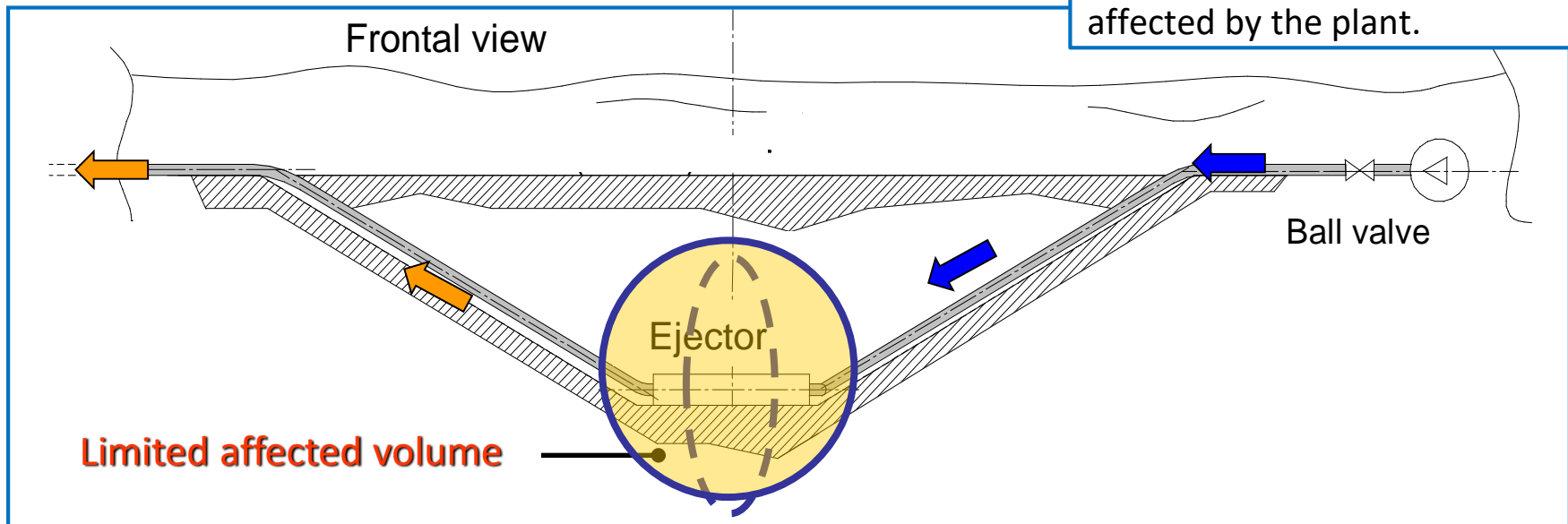
- Radial nozzles: they create a suspension of water and sediment;
- Central nozzle: thanks to the Venturi effect, the central nozzle sucks up a mixture of sediment and water and conveys it into a discharge pipe.

Aims:

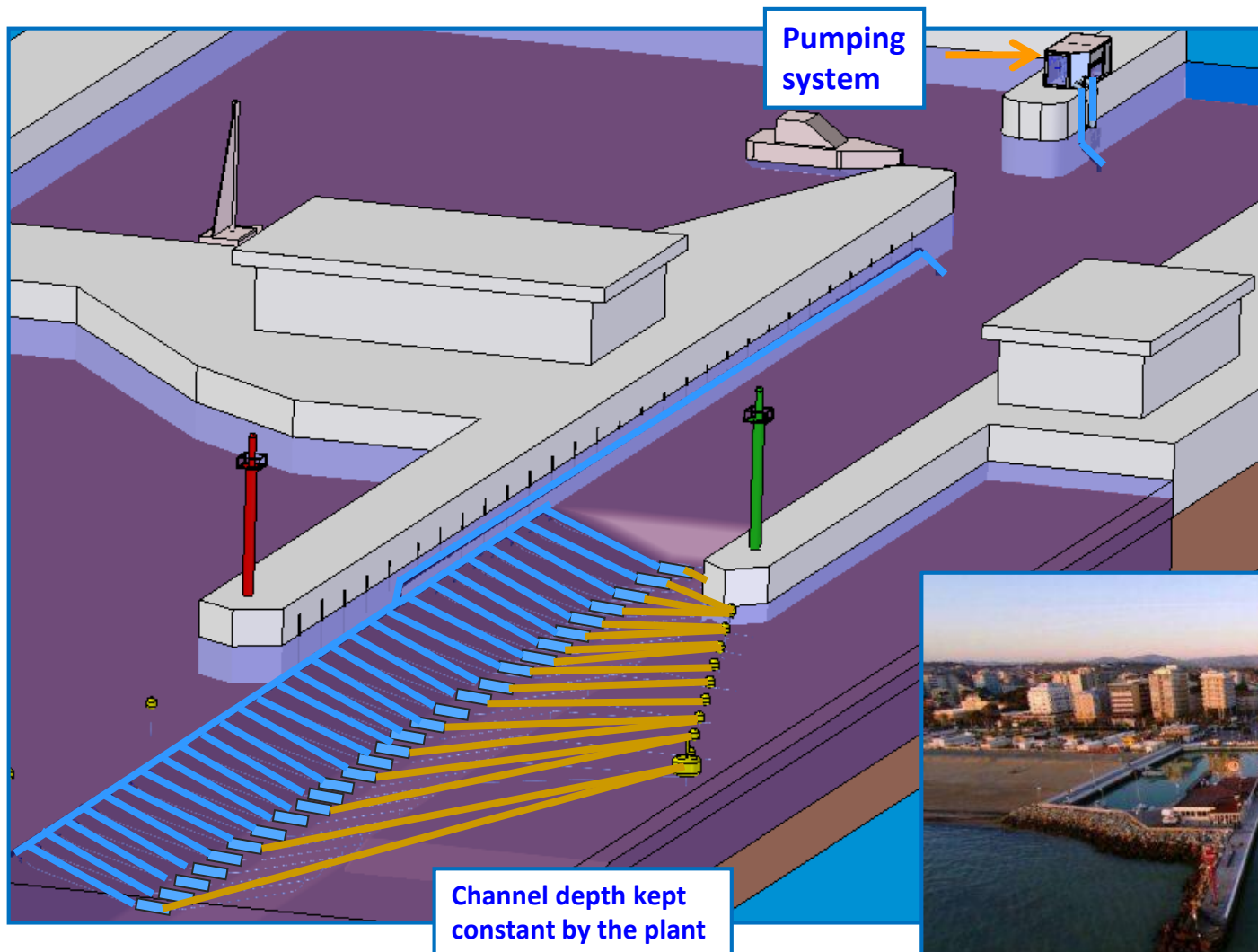
To realize a technology able to model and maintain the seabed at the entrance of the port at a certain depth and able to:

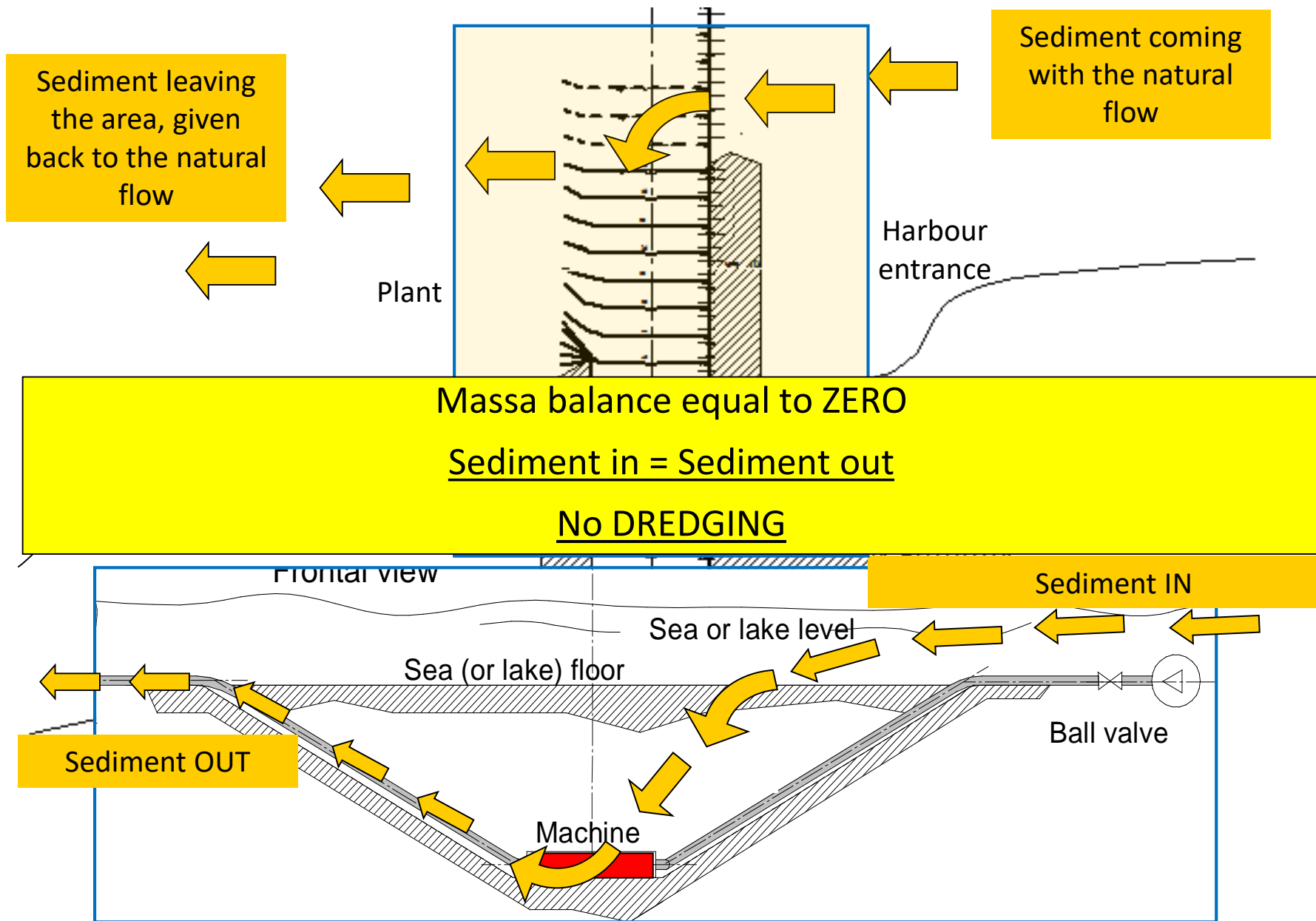
- minimize environmental impact,
- avoid the turbidity of sea water,
- not to be an obstacle during operation,
- Integration into the architecture and landscape of the port.

Ejectors work with sediment which arrives naturally in a certain area, so it does not add or remove sediment from that area. Once the system reaches *regime* operation (i.e. a few minutes), the marine ecosystem is no longer affected by the plant.



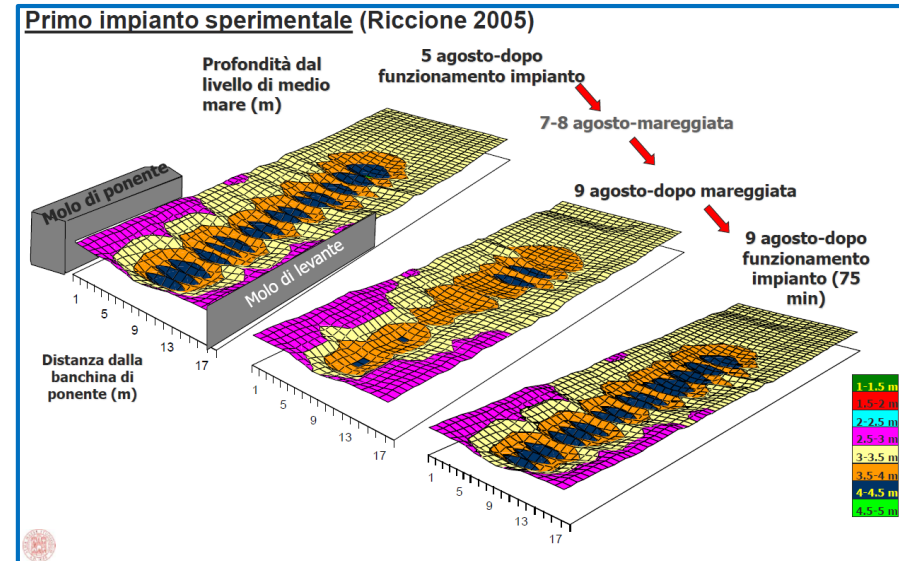
Example of installation (Riccione 2005)



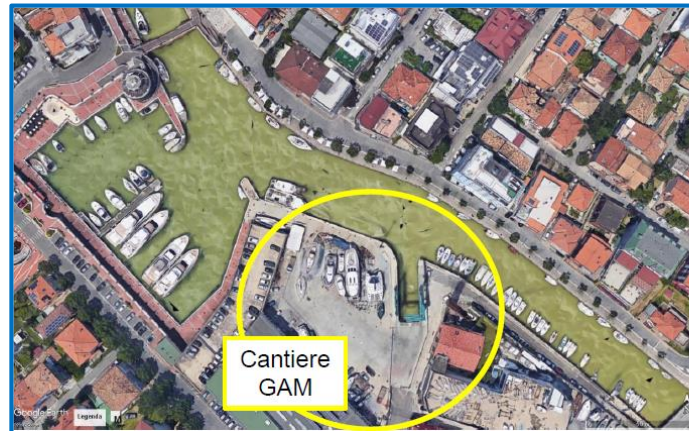


VALUE PROPOSITION: INNOVATIVE AND CUSTOMIZED SOLUTION FOR SEDIMENT MANAGEMENT.

1. Port entrances/Marinas



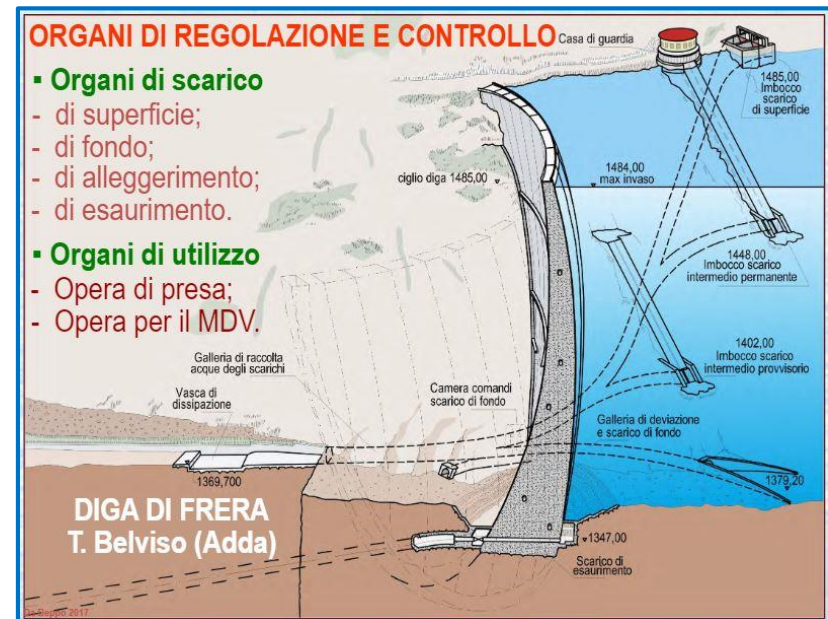
2. Shipyards/Drydocks/slipways



3. Seabed restoration at the foot of the docks

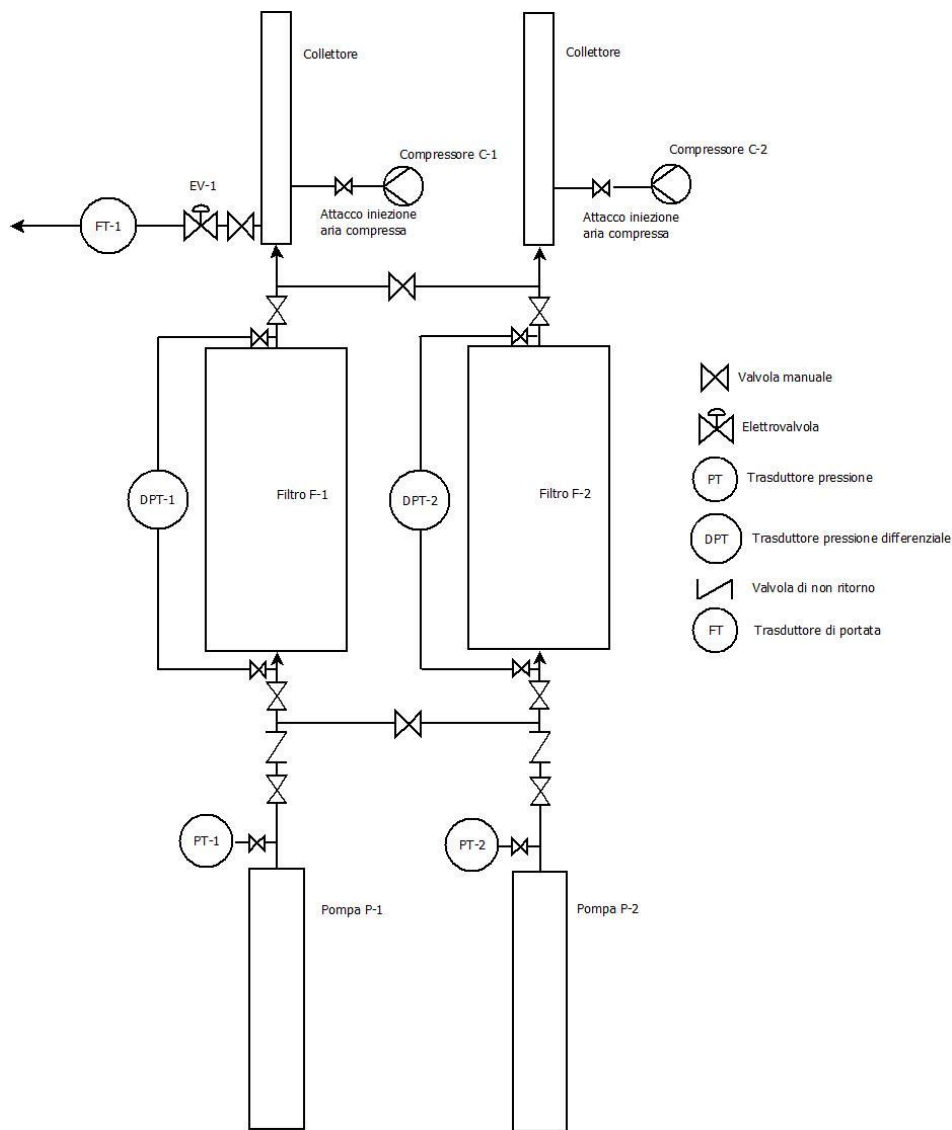


4. Protection of bottom discharges of dams / loading channels of turbines / hydraulic works



- ***Innovative and customized solution for sediment management.***
- ***Lower management cost if compared to dredging.***
- ***Navigation safety improvement.***
- ***Extended and improved port performance.***
- ***Environmental impact reduction (if compared to dredging).***
- ***Simplification in budget planning.***
- ***No authorization needed (if compared to dredging).***
- ***Sediment management not dependent from dredging companies.***

Cervia plant in a glance



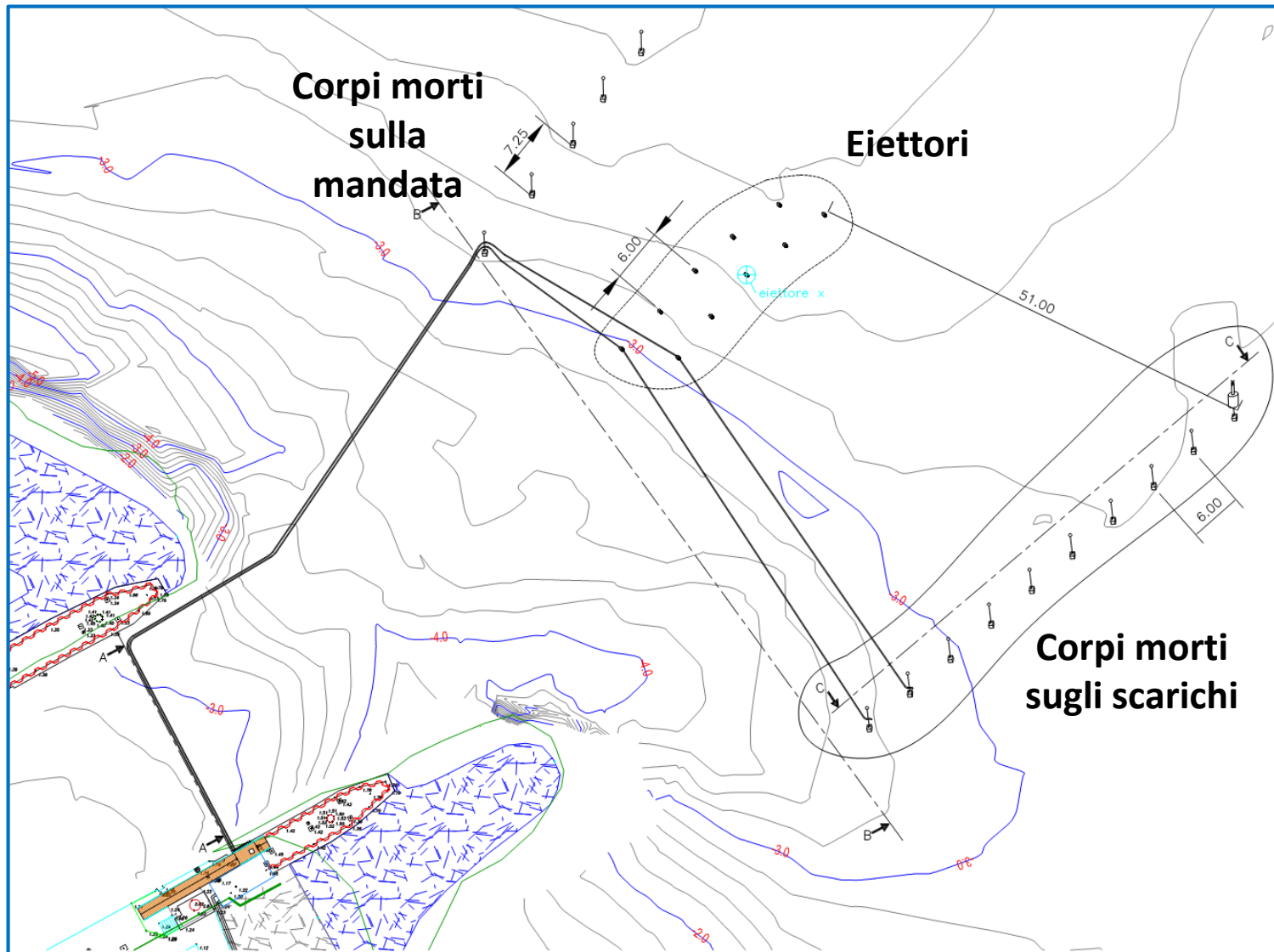
The demo plant is made by two modules of 5 ejectors each one. Each module is fed by pressurized water through a **submersible water pump**. The water flowrate can be controlled remotely by **inverter**. At the pumps outlet two **autopurging disk filters** are installed (filtration grade over 400 micron).

The following data are continuously monitored: pumps outlet pressure, pressure loss on the filters, water flowrate for each ejector.

A local meteorological station is installed for **wind** velocity and direction monitoring.

Finally, two cameras are installed for the video monitoring of the harbour channel inlet and of the filtering cabin.

Elements on the sea bed



Remote control PLC

CIE
CONCESSIONARI
INSTALLAZIONI
PIRELLA GOMME

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Tel. 0544-223000 - Fax. 0544-223001
Email: info@cieinfed.it

IMPIANTO DESABBIAMENTO CERVIA LAYOUT_FILTERO_2

00:06:32

03/09/2019

RETE OK

3.88 M/S

277.9 GR

ALTA TEMP

BATTERIA

P.EMERG

PMP

CFG

ALL

COMANDI

HOME

58.5 AMP 1

59.1 AMP 2

59.5 AMP 3

371.5 VOLT

0.02 COSFI

23 kW

***** kWh

COMPRESSORE 2
INT. SCATTATO

COLETTORE 2

VR2 28.7 gr

VR4 28.7 gr

VR6 28.0 gr

VR8 28.5 gr

VR10 28.6 gr

EIETTORE 2

MIN TORB

21.31 M3/H

TOTALIZZATORE

82375 M3

EIETTORE 4

MIN TORB

23.52 M3/H

TOTALIZZATORE

55914 M3

EIETTORE 6

MIN TORB

23.56 M3/H

TOTALIZZATORE

60144 M3

EIETTORE 8

MIN TORB

22.90 M3/H

TOTALIZZATORE

46677 M3

EIETTORE 10

MIN TORB

19.88 M3/H

TOTALIZZATORE

45095 M3

111.2 M3/H PORTATA TOTALE

FILTRO 2

DPT2 0.19 Bar

GR1-AUT LAV FILT	GR2-AUT LAV FILT	GR3-AUT LAV FILT	GR4-AUT LAV FILT
GR5-AUT LAV FILT	GR6-AUT LAV FILT	GR7-AUT LAV FILT	

PT2 3.60 Bar

ALLARME 2175 RPM

1948 ORE

26 AVV

VEL MAN

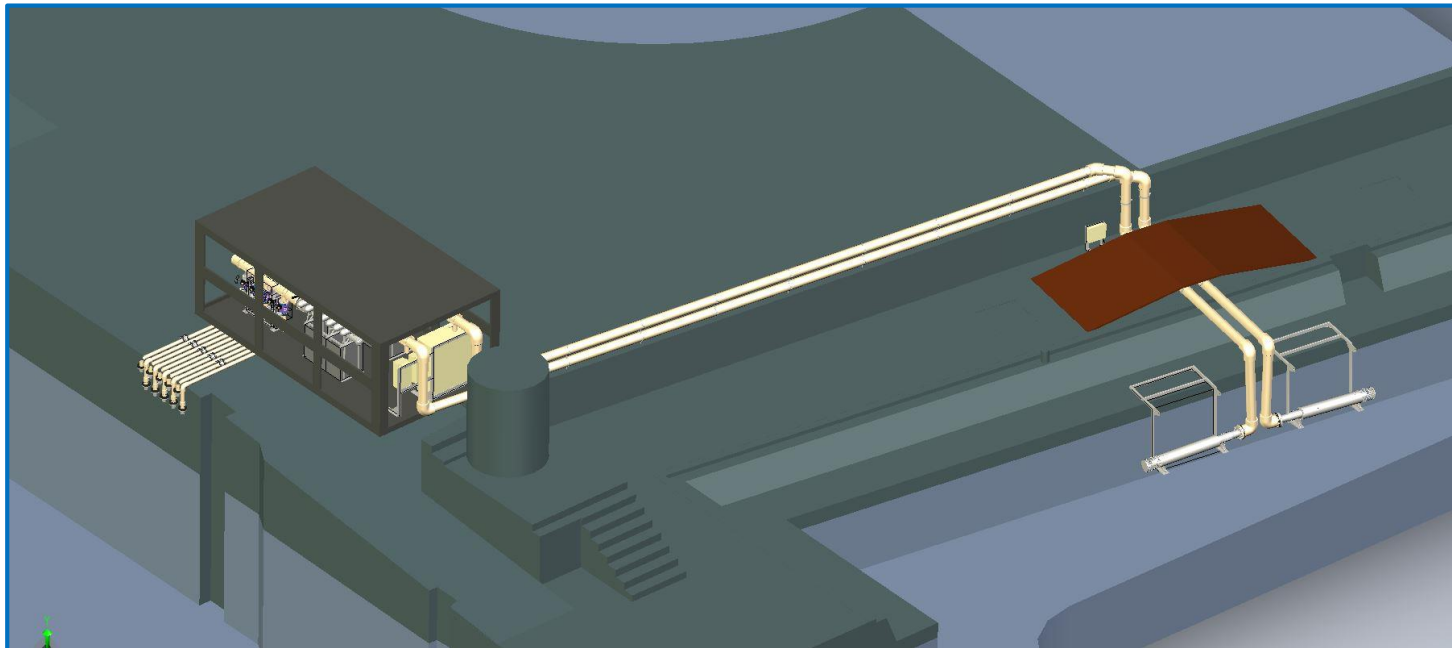
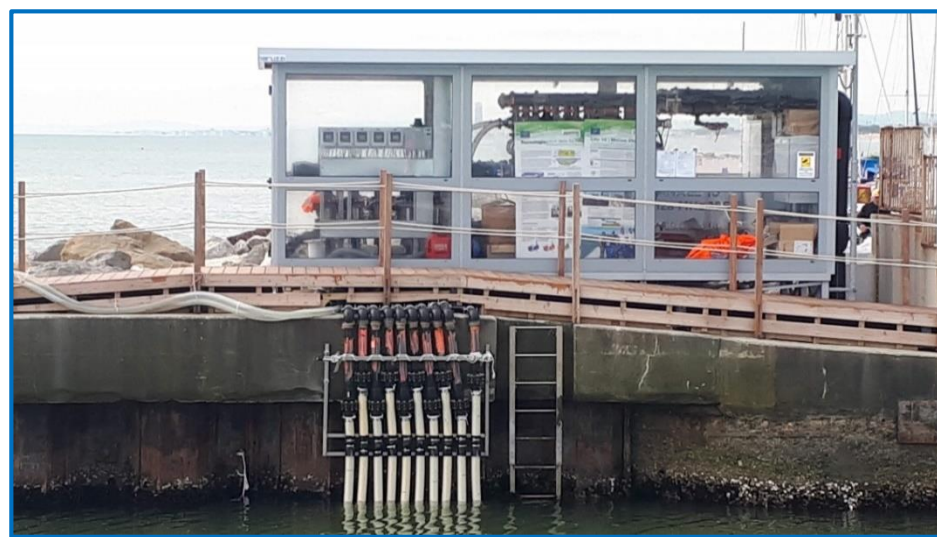
37 %

AVVIO / ARRESTO
FILTRO 2

SPENTO

POMPA 2

00:06:24 TERM : ALLARME MASSIM

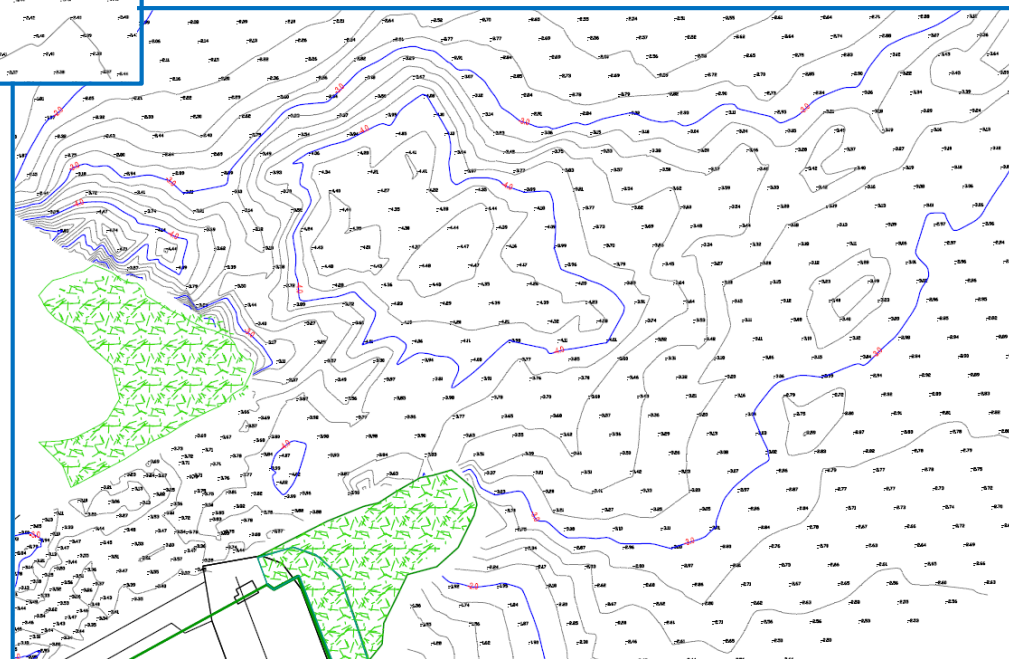
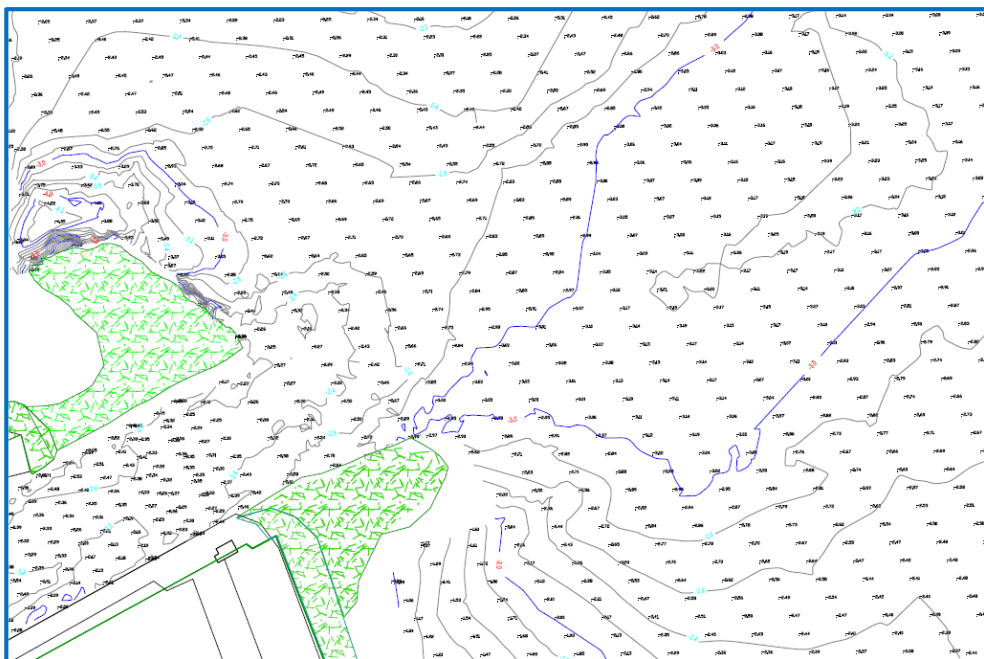




THE PLANT IN CERVIA

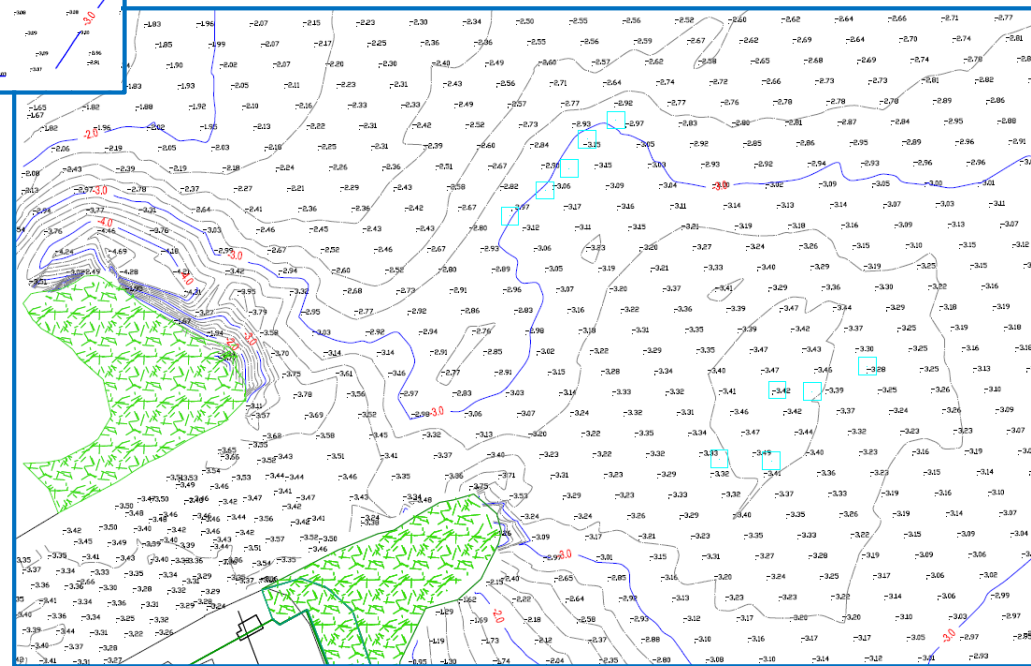
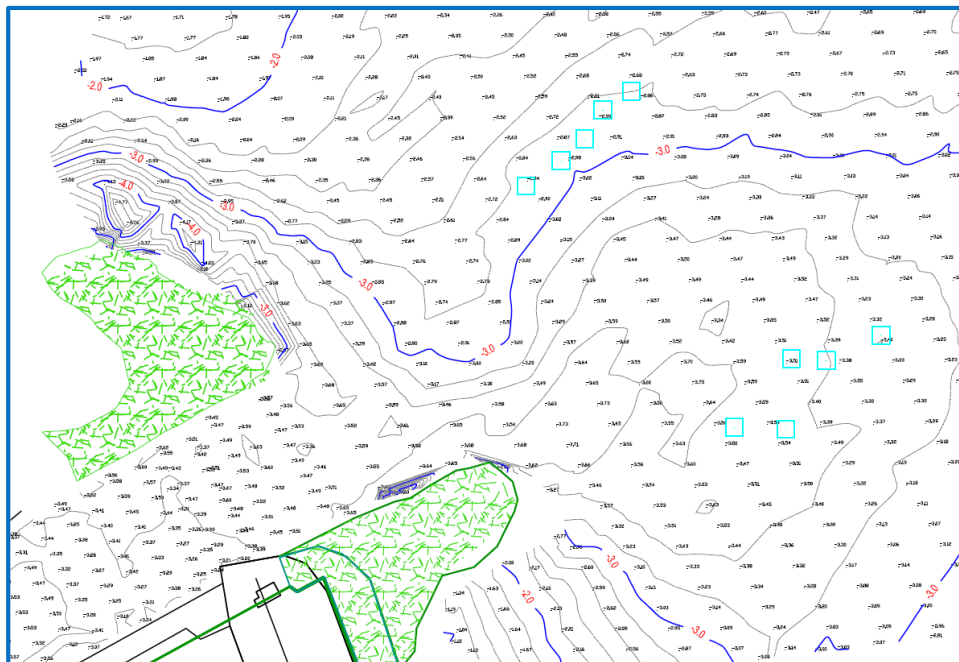
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October 10, 2018

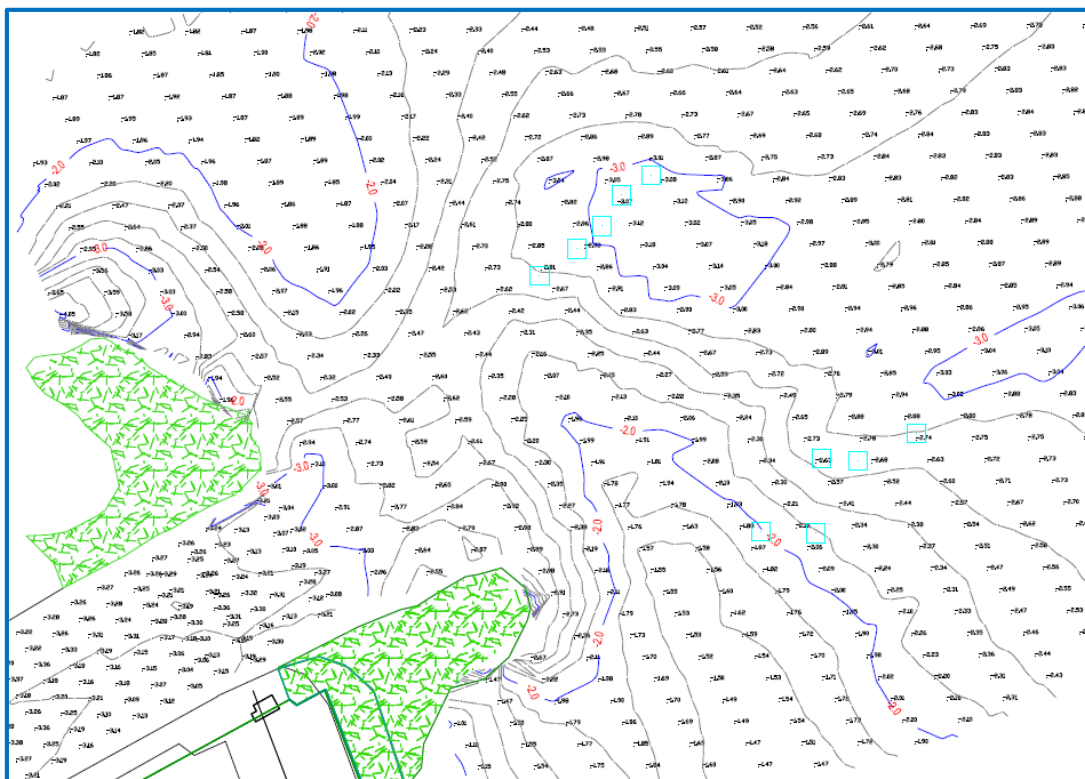


April 10, 2019

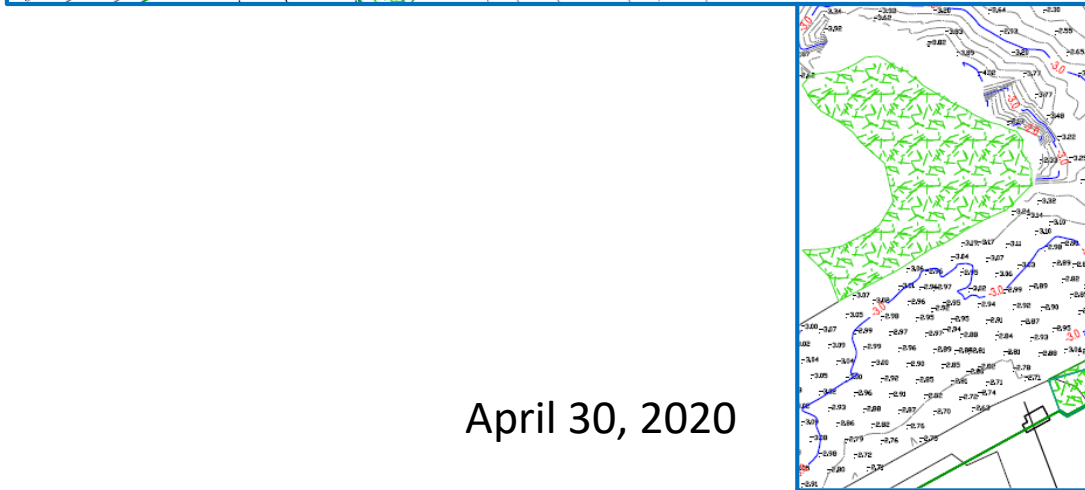
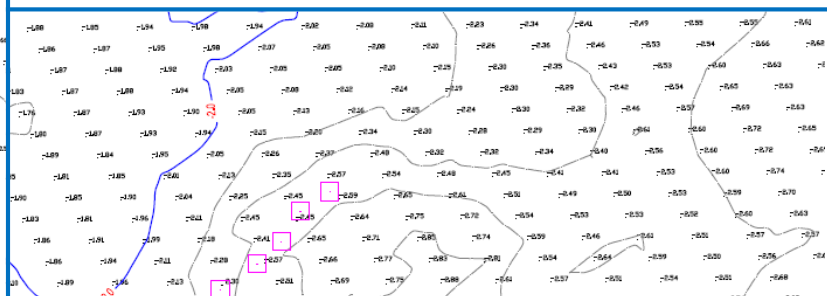
June 12, 2019



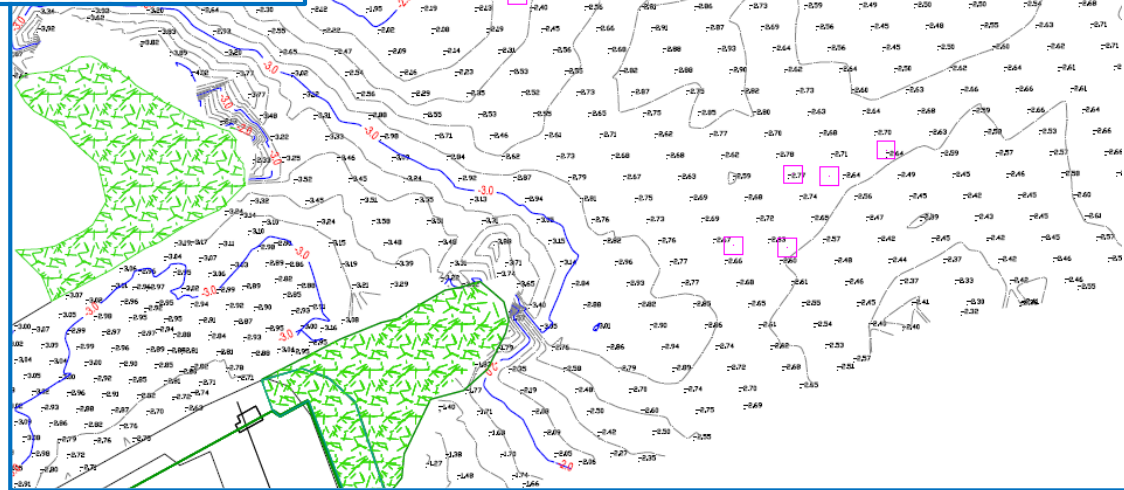
September 9, 2019



January 9, 2020



April 30, 2020





Thank you

For more info:
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