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Dragflow in Mining

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DREDGING

Harbor and marina dredging
Channel and pond cleaning
Dam dredging
Land reclamation
Coastal protection
Geo-textiles filling
Sand and gravel

MINING

Tailing ponds dredging
Oils sands
Dewatering
Trench and pond cleaning
Gold and Silver mining
Bitumen pumping

INDUSTRY

Steel mills
Sewage plants
Bentonite Recycling
Civil emergencies
Industrial ponds dredging
Marble industry
Oil industry

OFFSHORE

Pipelines
High depth dredging
Sand extraction
Extra high depth dredging (>300m).

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MINE	• DRILLING POND CLEANUP • HIGH-SOLID DEWATERING • OPEN PIT CLEANUP OF HEAVY/ABRASIVE SLURRY
MINERAL TRANSPORT	• AUXILIARY PUMP IN HYDRAULIC TRANSPORT OF MINERAL
CRUSHER& MILL	• CLEANING UP TRENCHES AND SUMP BENEATH OF CRUSHERS AND MILL
PROCESS PLANT	• CONCENTRATED SLUDGES IN HEAP LEACHING/THICKNER • PUMPING OVERFLOW OF THINKERS/FLOTATION SLURRIES
TAILLING& WATER	• TAILING PONDS AND SOIL RECLAMATION • DESLUDGING OF SEDIMENTATION TANK

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DRAGFLOW HEAVY DUTY PUMPS: ACTIVE PART OF THE DE-SCALING PROCESS IN A STEEL PLANT BELGIUM- 2018

The problem

In steel plants a typical issue to deal with is the management of the oxides coming from the de-scaling process.

This material is very heavy and extremely abrasive and must be collected and separated from water before being re-used.

The solution

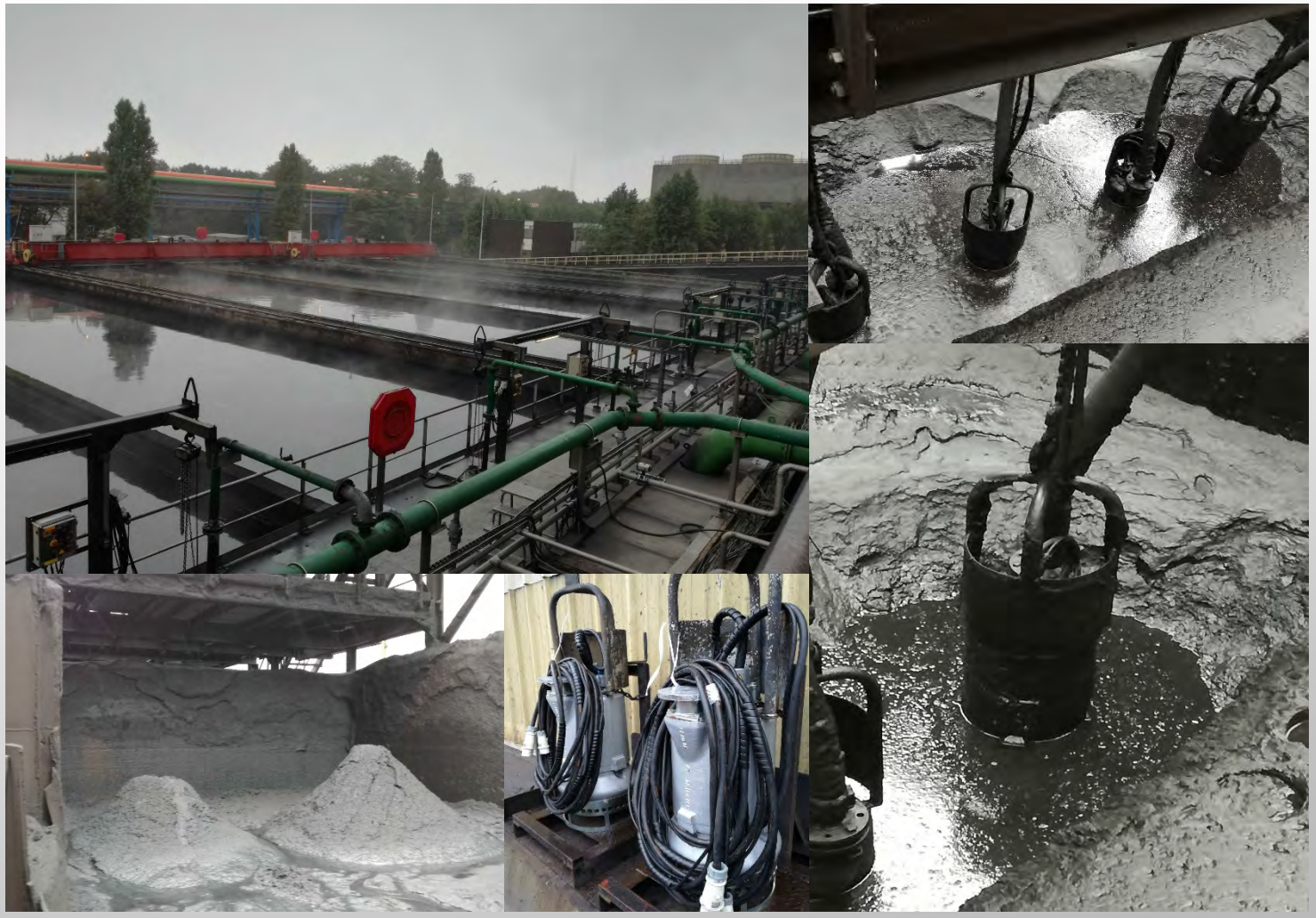
Since many years Dragflow is continuously supplying pumps to the ArcelorMittal steel plant in Ghent, Belgium.

Currently n.16 **EL7.5 pumps** are running in two different **steps of the process.**

The first 12 pumps collect the material from 6 tanks where the water from the de-scaling is collected and send it to a smaller thank where the water is partially removed. Here other 4 pumps run h24 and finally remove the solid with extremely high concentration (up yo 60/70%)

All the pumps are equipped with temperature sensors and dedicated discharge adapter to be mounted on the exiting piping system.

Thanks to the strong construction of the Dragflow pumps and the **special alloys especially designed for abrasive materials,** the life-time of the pumps is longer than any other pump that have been used in this plant.



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FLY ASH TAILINGS DREDGING

Chile 2017

Working Context description

For cleaning up a fly ash discharge pond in a thermal power plant in Chile. The gases produced by the combustion are released through a chimney where a water injection system sprays water with the addition of lime to prevent contaminants in the smoke from reaching the atmosphere. The final mixture of water with coal and silt is discharged in collection sumps going to a sedimentation pool.

The problem

The settled material becomes very compact after some time and mechanical excavation was the only way without stopping in this way the process.

Our solution

The DRAGFLOW solution was the electric agitator pump EL60A plus two electric lateral excavators EXEL20. The mechanical mixing done by the high chrome agitator together with the cutting action of the excavators' teeth could create a suitable slurry to be removed by the DRAGFLOW pump.

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FLY ASH TAILINGS DREDGING

Chile 2017

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IRON ORE TAILING POND DREDGING

Chile 2017

Working Context description

One of the world's largest mining companies ordered a **Dragflow** Dredge DRH85/180E22 for an iron mine in Brazil. Basically the iron ore slurry via 500 km "Mineral Duct" was pumping which at the port terminal it gets separated from the water and loaded on barges for the ocean transportation.

The problem

Along the 500 km pipeline when booster pump are under maintenance they need to stop the pumping and slurry discharges into a tailing pond temporarily. For this reason, the customers needed a machine capable to return them to the circuit.

Our solution

Dragflow supplied a dredge unit including Hydraulic Pump HY85/180A +two Excavators and high Jet-Ring System.

The Hydraulic Power Pack is driven by a 200 Kw electric motor and the power cord is floating from the shore to the power pack.

The dredge can be operated in two ways: controlled by one operator working inside the control cabin or directly from the shore through a wireless joystick with no operator aboard.

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PHOSPHATE PLANT TAILINGS RECLAMATION

MOROCCO 2017

Working Context description

Dragflow delivered two Remote Controlled Dredgers model DRP120 and others submergible slurry pumps (EL300B, EL604B, n.2 EL60B, EL25A) to the biggest phosphate mining company in Morocco.

The problem

The customer was looking for an efficient solution for pumping processed phosphate ore tailings back to the plant for reprocessing. Moreover, the dredging operations was necessary in order to maintain the required water capacity of the tailings ponds.

Our solution

The two electric dredges model DRP120 are working inside two tailing dams and both are equipped with an EL1204B pump as well as a water jets system to help break the settled material and increase the overall efficiency of the process. The proposed solution proved to be the most reliable proposal due to its compact construction, ease of use and the robustness that characterizes **Dragflow** pumps around the world. The dredges are only the beginning of the slurry transport system which involves other three **Dragflow** heavy duty submersible pumps, including one EL300B (325 HP) pump with a capacity of 720m3/h.

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OPEN PIT MINE CLEAN UP

Perù 2012

Context:
Minera Yanacocha (Newmont Mining), Peru. Open pit clean up. Soil bed composed by abrasive material and with diversified particle size.

Our solution:
Dragflow pump HY85B with excavators EXHY20. Once again the only solution to the most difficult pumping application in the mine.

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TAILINGS POND DREDGING

Indonesia 2006

Working Context description

The mine where Dragflow dredger is working is one of the biggest gold and copper mine in the world located in the province of Papua

The problem

The customer was looking for a complete dredging equipment, electric driven, capable able to create and handle high concentration slurry, to be place in the open pit mine.

Our solution

Dragflow dredger equipped with HY400 and 2 cutter EXHY35 was the right solution. This dredger is able to pump up to 1200 m^3/h of mixture with solid concentration as high as 50% by weight and up to a distance of more then 1 km.

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DREDGING OF AN AGGREGATES PLANT TAILING POND
SWITZERLAND 2017

Working Context description: Dragflow signed a contract in Switzerland with a large company, leader in processing aggregates for concrete, cement and asphalt production, with facilities in 90 countries.

The problem: The customer was looking for an efficient solution to remove the sediments from the tailing pond, fed by the aggregates washing plant.

Our solution: DRAGFLOW supplied a Remote Controlled Dredge model DRP120E22, equipped with the electric pump EL1204 plus two electric excavators EXEL20. Our dredging system is unique due to the compact dimensions that still guarantee optimal performances. The dredge can be assembled on shore and launched completely mounted (including pump and excavators) thanks to the dedicated lifting points. Based on the client's request, the DRAGFLOW dredge can be controlled remotely or through the on-board panel, and it includes a PLC that supervises all parameters and the position of the dredge during the operation. It can be can be moved over the pond through a system of four 110m long winches. In case the side excavators are blocked with hard material or large objects, they can be unblocked automatically by the PLC inverting the cutter heads rotational direction. The dredging unit can also work partially outside the water, thanks to the custom-designed water cooling system of the dredge. The dredge is also equipped with a high-pressure water jet-ring system to dredge the mud also when the water level is minimum.

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MINE TRENCHES CLEANING-Beneath Mills

Perù 2011-2016

Working context

Pumps have been installed in Cerro Verde and Antamina mines in Peru for pumping tailings and material from in the process plant.

The problem

Both clients where looking for a pump able to handle copper slurry with high specific gravity and with solid concentration up to 70%.

Our solution

Dragflow Pump EL35 and EL606. Pump EL606 has been supplied with: cooling jacket, to work partially submerged, high pressure water jet-ring, temperature control and moisture sensor. Impeller has been customized for the customer in order to meet the required performances.

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MINE TRENCHES CLEANING-Beneath Mills

Perù 2011-2016

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MINE TRENCHES CLEANING-Beneath Mills

Perù 2011-2016

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COAL MINE TAILING PONDS CLEANING
GERMANY 2016

Working Context description:
The request from the coal open mine (RWE) was to have a machine capable of dredging sediments from 3 ponds where all the storm water of the mine was collected, as well as the water coming from the mining machines.
The drainage pumps currently used are not able to remove the solid material from the bottom of the ponds, affecting the capacity of the ponds which was continuously decreasing.
The dredging system had to be remote controlled and capable of removing the settled fine sediment from the bottom.

Our solution
Dragflow supplied a remote controlled dredge equipped with a high head pump EL1204HH. Two electric cutters EXEL20 have been used in order to have an effective dredging of sediments, together with a jet-ring that is capable of mixing the fine material through pressurized water jets.
The dredging system has an output of 150 cubic meters per hour at a distance of 200m, overtaking a 60m hill. The discharge is located on a conveying belt which takes the material to a specific area inside the mine.

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COAL MINE TAILING PONDS CLEANING
GERMANY 2016

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ALLUVIAL GOLD MINE
COLOMBIA 2016

Project description

A Colombian alluvial gold mine company decided to install a **DRAGFLOW** hydraulic dredging unit on an earth moving machine.

The **DRAGFLOW** equipment has been fixed to the boom of a Caterpillar amphibious excavator and driven by its power unit as a normal hydraulic tool.

The unit is composed of the hydraulic pump HY50 and the frontal cutter-head DTM50.

The **DRAGFLOW** unit has been supplied for dredging sand, gravel and sludge along the channels around the alluvial mine area. The purpose of the project is to grant the necessary water depth for the navigability of the boats.

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TAILING POND DREDGING

Indonesia 2015

Working Context description

Dragflow supplied a DRH dredge to a large, surface mine operation, primarily producing copper and small amounts of gold and silver. The mine located in the southwest region of the island of Sumbawa, in the District of Sekongkang, West Nusa Tenggara Province, Indonesia.

The problem: The customer was looking for a complete dredging equipment, diesel driven, capable to create and handle high concentration slurry, to be place in the open pit mine. The project porpoise is to pump the settled material from the bottom of the tailing pond to a higher part of the mine in order to maintain the required water capacity.

The water inside the pond comes from the mining plant and the solution is acid (around PH 3).

Our solution: The Dragflow solution was a DRH Dredge equipped with pump HY85/160HC plus cutters EXHY20 and supplied with an acid resistant package. The dredging unit is able to pump up to 800 m3/h of mixture with high solid concentration and up to a distance of more than 500m. The low PH package consists in: Hull with anti-corrosion protection by using epoxy-tar-polyamide paint and cathode protection made of zinced-coated sacrificial anodes welded on the structure

Dredging unit exterior painted with epoxy-tar-polyamide based product and with bolts and nuts in stainless steel;

METALINE coating inside volute and discharge adaptor

Fresh water pump provided to flush seals pack (inclusive of 4.000 lit. tank integrated in the hull)

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AMPHIBIOUS DREDGES

IN THE RIO MAGDALENA, Colombia 2015

Working Context description

Rio Magdalena dredging project.

The customer needed a dredging machine capable to move on the ground and to enter and exit independently in the river. A self-propelled machine floating in high water like a standard dredge but also capable to move in the shallow waters along the river touching the bottom.

Our solution

DRAGFLOW supplied two Amphibious Dredges (DRM85/160E23).

The two dredges, with 265 Kw Diesel Engine as source of power, mountat the end of the excavator armthe hydraulic dredging unit HY85/160B pump + EXHY35 cutters with total capacity up to 500 m3/h and with 30-40% solid concentration by volume.

Furthermore, the machines are equipped with floating tracked undercarriage, 130 Kw power hydraulic thruster and four 8m long stabilizers spuds for fixing the dredge in the middle of the river current.

The design allows these Dredges to move on the ground like standard earth moving machine but also to float in the deep water with the stability of a standard Dragflow dredge, especially thanks to the central floater that gives the necessary buoyance.

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COPPER MINE TAILINGS

Chile 2013- Codelco

Context

Copper mine in Chile. Tailing pond filled up with heavy and abrasive solid.

The Problem

The mine needed to clean-up the pond without using hydraulic excavators. Solid specific gravity is more than 1,4. All the pump tested in the application failed to complete the job.

The solution

Dragflow Super Duty Pump EL60S, 80HP. A pump with ability to work in extreme condition with solid up to 1,6 sg. Full High Chrome solution with oversized motor.

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SEDIMENTATION TANK DE-SLUDGING

Chile 2014- Codelco

Project Description

Chuquicamata, is by excavated volume the biggest open pit copper mine in the world. The mine choose the Dragflow remote controlled dredge DRP18 to clean up the sedimentation of the water supply plant of the mine.

DRP18 is a safe and reliable dredging solution and will permit to keep in operation this vital part of the production process. This particular unit is also equipped with Dragflow Advanced Control Panel that will permit to record the most important daily parameters of the machine for early detection of possible failure but also for a detailed analysis of daily operations.

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DREDGING WITH THE AMPHIBIOUS

CHILE 2015- Codelco

The problem

The client is an important mining company in the North of Chile. The purpose of this project is to pump back to the mine and to reprocess the old tailings discharged for many years.
Since the water level in these ponds could be variable and usually less than half meter, the costumer decided to go for an Amphibious machine.

Our Solution

The new Amphibiousdredge (DRM85/160E22).
The extreme mobility in any kind of wetland and the full buoyancy, allow the Amphibious to reach the most remote location otherwise impossible to get with any other equipment.

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DRILLING OPERATIONS

New Zeland 2010

Working contest

The pond is on a drilling rig site. The rig is used for Geo-thermal power exploration.

The Problem

Pumping heavy slurry: bentonite, geo-thermal minerals, drilling fluid, sand, pumice. Performance of sucker trucks where unsatisfactory.

Our solution

Dragflow HY50 driven by a 13 Ton CAT digger. Spray ring / HH80 Sykes Pump. The unit out performed traditional method of using sucker trucks.

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PUMPING BENTONITE

Germany 2009

Working Context description

The project is the construction of a big commercial and residential area during foundations phase. Diaphragm walls are a techniques for the construction of permanent or temporary in-situ impermeable barriers. In order to stabilize side walls bentonite solution is needed.

The problem

Dirty bentonite from the bottom of the diaphragm has to be continuously pumped into a recycler for regeneration. The mixture is very heavy and composed of dirty bentonite water mixed with sand, gravel and other materials. Working depth in this project was up to 50m and distance to the recycler up to 200m.

Our solution

Dragflow electric pump EL35 equipped with pressure compensator in order to work at high depth in heavy bentonite.

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BITUMEN RECLAMATION (OIL SAND)

Canada 2007

Working Context description

Western Canada is reach of oil sand. Oil sand is a naturally occurring mixture of sand, clay or other minerals, water and bitumen, which is a heavy and extremely viscous oil that must be treated before it can be used by refineries to produce usable fuels such as gasoline and diesel.

The problem

The customer was looking for an equipment that could be able to handle high viscous and high specific weight mixtures.

Our solution

Dragflow pump HY85B with cutters EXHY20 represented the fastest and more reliable solution. The pump could be mounted and driven by an excavator already in operation on the field without the need of any additional power system and without any electric cable running on the ground.