La Baie ... réinvente le Mont

PRESS FILE

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Syndicat Mixte Baie du Mont-Saint-Michel

HYDRAULIC DEVELOPMENTS

A MARITIME SETTING TO RECLAIM

If nothing had been done, by 2040 the Mont-Saint-Michel would have been surrounded by salt marshes. Long restrained by the floodgates of the first dam built between 1966 and 1969, the bed of the Couesnon no longer acts as a natural tide storage basin: the river's flush capacity is reduced. The river snakes slowly amidst sediment and vegetation. The deposits of sediment in its bed and downstream of the dam show how it has gradually lost its hydraulic power.

Sediment pushed out to sea

The hydraulic aspect of the operation is working hand in hand with nature. The developments planned upstream and downstream of the new dam will help it act more effectively to give the Couesnon the force to carry sediment away from the Mont and to maintain a maritime environment around the ramparts.

This dam will not be able on its own to give the Couesnon back its full power, but when combined with hydraulic developments it will give the river its strength that it had been losing gradually over the last forty years.

A virtual aerial view of the estuary – how it will look in 2025.

THE DOWNSTREAM HYDRAULIC DEVELOPMENTS

Threshold and channels: a shared water line

Downstream of the dam, some of the rock formations holding the Couesnon back have been dismantled. They were used to build a threshold which snakes over two kilometres from the dam to the foot of the Mont, to guide the flush actions better. The two West and East channels which will then be formed will guarantee that the dam's flushes will be divided evenly on each side of the Rock.
To complete these developments, deflector screens and separators will accompany and facilitate the flow of the Couesnon over the strands. The currents will circulate more easily and strongly around the Mont, preventing sediment from building up here again.

Innovative techniques working for a prototype project

The hydraulic developments downstream of the new dam over the Couesnon require different, very specific dredging techniques carried out in a highly restricting environment (work according to the tides, the flow from the Couesnon and the management of the new dam). The work is being carried out both on the river bed and on the vegetation beds to enable a total of over 850.000 m^3 of sediment to be extracted This sediment is either reused on the site (filling in digging works, created of the causeway road, etc.) or removed - around 400.000 m^3 is being taken away using the so-called "American-style dredging" technique which is regularly implemented in ports. After extraction, this operation involves releasing the sediment directly into the Couesnon's bed during the dam flush periods and while the tide is going out to benefit from evacuation out to sea by the current.

The «Big-Float» in the Couesnon estuary.

Big Foot dumper on the banks of the Couesnon.

This method is used both for the sediment extracted from the Couesnon's bed and for the sediment extracted from the vegetation beds. All the sediment is transported to a dredging workshop where it is mixed with water before being put back under pressure into the river.

PROVISIONAL TIMETABLE FOR THE DOWNSTREAM DEVELOPMENTS

All of the work will be carried out over a period of nearly 4 years and according to the following provisional timetable:

Phase 1 - Preparatory work

(mid-May - end July 2011)

- Lorry and site machinery access route to the west of the causeway.
- Installations of premises for company personnel.

Phase 2 - Work on the right bank of the Couesnon

(June 2011 - November 2012)

- Strengthening of the current causeway road protective cordon in the southern section and dismantling of the rock cordons on the right bank (end of June to end of September 2011).
- Silt supply to the access works (end of June to end of September 2011).
- Creation of the split threshold on the right bank, with deflector screens and digging out of part of the Eastern channel. The split threshold work is planned for completion in 2014 with the connection of the reservation.

Phase 3 - Work on the left bank of the Couesnon

(November 2011 - end of 2012)

- Creation of access to the west of the Couesnon in the vegetation beds (November 2011).
- Creation of the western channel (end of 2011 / end of 2012).
- Creation of the split threshold on the left bank, with deflector screens.

Phase 4 – Dismantling of the existing causeway road and the maritime car park

- This work will also start once the pedestrian footbridge is commissioned.
- The demolition work is planned to last 5 months.

Phase 5 – Digging out of the eastern channel

- This work will also start once the pedestrian footbridge is commissioned.
- The work is planned to last 4 months.

THE UPSTREAM HYDRAULIC DEVELOPMENTS

Cleaning the banks and the river itself: the Couesnon gets its bed back.

After the advance cleaning and tree cutting along the banks at the start of 2010, the Couesnon's bed is also being cleaned. This operation is being carried out over the 4.7 km of river located upstream of the new dam, up to the Moidrey cove.
This cleaning work will enable 455 000 m³ of sediment that has built up in the river over the years to be extracted. The storage volume during filling periods will increase to 800 000 m³ in the Couesnon.

Suction dredge on the Couesnon

However, originally this meander in the Couesnon provided the river with water resources. To give it back this capacity, a hydraulic reservoir with a capacity of 300 000 m³ will be reconstituted in the cove, across 36 ha of channels (9 km in total with 700 000 m³ of material extracted) of its 86 ha.

Thanks to all of this work, over time the Couesnon will regain a storage capacity of nearly 1.1 million m³ on average, with this total rising to 1.4 million m³ of water storage during very high tides and/or when the river is high.

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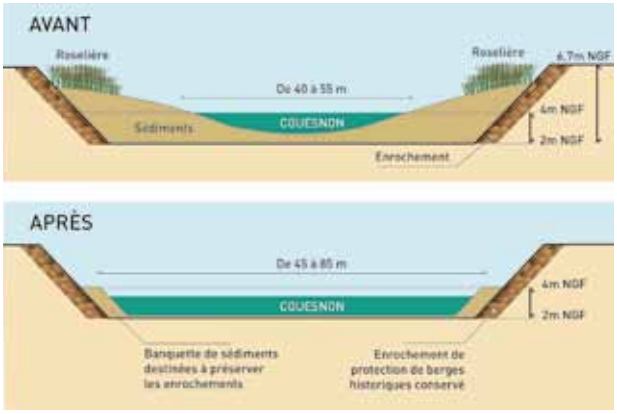

This means that the Couesnon will regain the original aspects of its bed and its natural water storage capacities, vital to the flushing operations.

Refilling of the Moidrey cove: a reconstituted reservoir

Channelling of the Couesnon, land reclamation, former dam at la Caserne and so on. The Moidrey cove has been gradually filled in over the years and is now a green pasture.

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Southern end of the Moidrey cove – January 2013.

PROVISIONAL TIMETABLE FOR THE UPSTREAM DEVELOPMENTS

All of the work is being carried out over a 4-year period, from September 2011 to the start of 2015, according to the following provisional timetable:

Phase 1 - Preparatory work
(April - October 2011)

- Advance work to strengthen secondary roads (roads which will be used by trucks)

Phase 2 - Work in the Moidrey cove
(September 2011 - March 2015)

- Installations of premises for company personnel
- Channel digging work in the Moidrey cove
- Work to dig decanting basins to enable cleaning of the sediment extracted before transport to the selected conversion sites
- Conversion of the silt with transport to external sites (mainly agricultural) considered suitable, throughout the work at the Moidrey cove
- Reconditioning of the cove at the end of the work (site roads, etc.)

Phase 3 - Cleaning in the Couesnon
(November 2011 - start of 2014)

- Stripping of the reed beds
- Sediment extraction using the suction dredge
- Decantation of the sediment into the provisional basins at the Moidrey cove

Phase 4 – Reconditioning of the roads (2015)

- Road diagnostic at the start of 2015
- Reconditioning of any roads that may have been damaged by the work during 2015

SCIENTIFIC MARKERS

Work "under surveillance"

Specific demands have been made in relation to the dredging work: dredging prohibited during fish migration periods (mid-February to mid-April and July to August), minimisation of annoyance to residents, in particular by limiting noise around residential areas, stripping of reed beds outside bird nesting periods from March to August.

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Silt decanting pots, northern section of the Moidrey cove – January 2013.

Silt conversion: 1.2 million m³ of sediment extracted

This different work will lead to some 1.2 million m³ of silt being extracted from the Couesnon's bed and the Moidrey cove. Thanks to its limestone content, this silver-grey sediment, which is a mix of sand and shell particles, specific to the Mont-Saint-Michel bay is an excellent mineral complement for the surrounding agricultural land. Silt will also be used to level out or raise the land reclaimed around the Mont; it will also be provided to several horse-riding centres which are keen to use this flexible material on their tracks.

From spring 2012 to 2015 the Syndicat Mixte is implementing a programme to convert the sediment which is extracted. This sediment is given to farmers and horse-riding centres which request it, depending on the quantities available.

TECHNICAL MARKERS

Machines downstream of the dam

- American-style dredging workshop with discharge pump
- Long arm mechanical scoops
- «Big Float» amphibious hydraulic scoop with REMU-type sieving and stirring bucket
- Dumpers and Big Foot Dumpers
- Loaders

Machines upstream of the dam

- Floating barge
- Stationary suction dredge with butterfly splash plate
- Floating and land-based pipes
- Dumpers, mechanical scoops, bulldozers, trucks, tractors, etc.

STUDIES - HYDRAULIC DEVELOPMENTS - THE PARTICIPANTS

• PROJECT OWNER

Syndicat Mixte Baie du Mont-Saint-Michel

• PROJECT MANAGEMENT GROUP

Bet Antea Group - BRL ingénierie & Partner

• COMPANIES

Downstream hydraulic developments:
DTP Terrassement
Upstream hydraulic developments:
Vinci Construction Terrassement (VCT-Representative) / Mastellotto / T.P.C. / T.P.R. /E.M.C.C.

To keep up to date with how the work is progressing :

http://www.projetmontsaintmichel.com/les_travaux/amenagements_hydrauliques_aval.html
http://www.projetmontsaintmichel.com/les_travaux/amenagements_hydrauliques_amont.html

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