

# WATER, THE SOURCE OF THE CITY

#### BLUE TRAIL | WATER, THE SOURCE OF THE CITY

*"Water, the source of the city» is an educational walking trail, covering 4.7 km. It takes around 2h30 to complete.* 

While following the traces left by waterways in Lille, the tour offers an insight into the history and future of water in this urban setting. First, let us start with a brief introduction to the city's history.



The origins of Lille can be traced back to a marshland site, dotted with islands and crossed by a very slow river, the Deûle, supplied by the Bucquet and Becquerel waterways and marked by a 3.5m break in the slope.

In the 9th Century, a small trade and craft-based community, structured around the port activities on the Basse-Deûle, set developments in motion that, over the centuries, would profoundly transform the city's relationship to its water.



The trail begins on the Quai du Wault, a site formerly known as "Petit Rivage". You are standing opposite a lowered quay known as "The Beach".





During the 13th century, Petit Rivage became a key site in the town's economic development : The discontinuous slope between the Haute-Deûle and the Basse-Deûle obliged boats navigating between merchant towns in the Artois and the former Netherlands to transfer their cargo overland for onward transport.

This activity lead to the development of a flourishing port economy based on two key sites :

Petit Rivage (Small Shoreline), above the town, which would later become Quai du Wault and Grand Rivage (Large Shoreline), which would later become Quai de la Basse-Deûle, below the town.

Following a series of changes to the urban landscape, which gradually distanced the water from the heart of the city, the Quai du Wault no longer plays a role in port activities. The site's hydraulic system has developed in accordance with the changing use of the basin.



In the 17th century, the Quai du Wault basin was supplied with water from the fortification moats, via a water-gate located approximately where you are standing.

At that time, the parks which you can see beyond the basin were moats filled with water and formed part of the fortification.

They were crossed by a branch of the Deûle which provided a direct water supply for the intra-urban canals.



In the late 17th century, Louis XIV's engineer, Vauban made the following observation:

"There are no means of communication between the Haute and the Basse-Deûle other than push-carts and porters. The branches which cross the town are overly narrow, lined with houses and of insufficient depth for navigation."

In 1751, the Moyenne-Deûle navigation canal was dug to improve waterway travel between the Haute and the Basse-Deûle.

The canal's water supply was provided by the Quai du Wault basin and the Bucquet stream.



Lille's expansion during the 19th century, pushing the fortifications further south and creating major thoroughfares, would mark the beginning of the gradual closure of the Quai du Wault basin.





Nevertheless, a lift bridge between the Moyenne-Deûle and the basin continued to allow boats to pass.

The Quai du Wault basin was definitively closed to navigation in 1965, although its waters continued to flow towards the Moyenne-Deûle.

The basin was subsequently disconnected from the canal during sanitation works. An inverted siphon was installed to drain off any excess from the basin. Cut off from the city's hydraulic system, the water became stagnant.

As you can see at the other end of the basin, a planted embankment now stands on the site of the connection to the canal.

The restoration of the Quai du Wault in 1992, followed by the festivities of Lille 2004, "European Capital of Culture", constituted an initial step towards the redevelopment of the site.

According to the current "Plan Bleu lillois" (water plan), outlining how water will be developed and promoted within the city over the coming years, the Quai du Wault basin will be included in a dynamic and coherent hydraulic system, which should breathe new life into the site. We might even start imagining the transformation of Quai du Wault into a landing stage, providing a valuable service for Lille city centre. While reinstating the link is a very appealing idea, it remains a hypothetical one, due to significant technical and financial constraints.



Now please make your way alongside the basin towards the bridge, the Pont de la Citadelle. Continue past the former link between the Quai du Wault and the Haute-Deûle canal, cross the Square Daubenton and make for the bridge.

This trail will take you round the edge of the historic town centre, from the former upstream port, from which you have just come, to the former downstream port, where your tour will end.



# **2** PONT DE LA CITADELLE

You are now standing on the Pont de la Citadelle. Please look back towards the Quai du Wault.

Between the buildings now standing on the Façade de l'Esplanade, nothing remains of the Porte de la Barre, dating back to the 15th century.

Now, look down towards the banks of the canal: the difference in the colour of the bricks seen on the wall shows the site of the former Pont de la Barre which provided access to the Quai du Wault basin.



You are standing above the Moyenne-Deûle canal which was dug in 1750 to link the Haute-Deûle and the Basse-Deûle and avoid unloading goods and transporting them overland between the ports above and below the city.

The creation of the Moyenne-Deûle canal would have a huge impact on the city's urban priorities: Water was no longer a factor in developing its urban fabric but rather an independent navigation system which was pushed out of the city.

After losing its economic function within the city, water would gradually disappear from the town centre.

#### Please turn the other way, towards the Haute-Deûle, to learn about La Barre lock.

This lock gate connected the Moyenne-Deûle canal to the Haute-Deûle derivation canal, created after the canal was enlarged in 1858. It allowed boats to navigate a change in level of 1.5m.

It stopped being used by commercial vessels in the 1970s when a high-capacity canal, skirting round Lille Citadel, was constructed outside the city.

The Moyenne-Deûle canal now flows into the Basse-Deûle via a triple weir that we will see later on the tour. This means that boats can no longer access the Basse-Deûle via the Moyenne-Deûle.

The "Master Plan for Lille Water" outlines the long-term reinstatement of the Haute-Deûle – Basse-Deûle link, via La Barre lock, to enable pleasure boaters to reach the Lys river, to the North, without travelling through the Grand Carré Lock, which is designed for high-capacity vessels.



Please make your way towards the Citadel, passing the memorial to carrier pigeons on your left: head to the zoo entrance, then continue to the right towards the Citadel.

Next, turn left down towards the fortification moat.





#### **3** THE CUNETTE OPPOSITE THE BASTION

You are standing beside a small canal or "cunette", created at the bottom of a dry moat to drain off rainwater and create an additional obstacle in defence of the Citadel.

The cunette could also be used to evacuate water if the surrounding area was deliberately flooded by the army. It now marks the boundary between the military site and municipal land.

Water is supplied by two intakes on the Haute-Deûle.

Standing opposite, you can see one of the Citadel's bastions.



The Citadel was the key element of the defence system created for the stronghold of Lille in 1670 by Louis XIV's engineer, Vauban.

Water was used in three different ways:

- Firstly, the citadel's location - at the lowest point on the site, in an area of marshlands, broken up by very deep drainage ditches full of water - constituted an obstacle to hamper the progress of enemy armies.

- Secondly, several fortification lines were reinforced by moats, allowing the defence to be staggered over a greater depth.

- Finally, a complex hydraulic network could be used to empty and fill the moats from the citadel. Part of the city could also be flooded, as well as three of the citadel's fronts which faced out towards the countryside: in just two days, 1,700 hectares could be covered by 55cm of water, preventing any enemy approach.



Follow the path alongside the "cunette" towards the right. It is called the Voie des Combattants. Continue under the Pont Royal.

Walk past the King's Counterguard, and before you reach the demi-lune or ravelin, take the path to the right and head towards the Champ de Mars (Esplanade). Stop opposite the moat to the rear of the counterguard.





Recent works in this area unearthed a well connected to an underground canal: the Canal Vauban, which can now be seen behind the metal grating.

In the 17th century, the Deûle split naturally into two branches to the South of the fortification at a place called Le Fourchon.

When the city was expanded under Louis XIV, Vauban rerouted water from Le Fourchon when digging the canal that would later bear his name.

The Canal Vauban was initially created to facilitate the transport of materials during the construction of the Citadel between 1667 and 1671. It thus created a link between the Haute-Deûle and the Citadel's moats. It was also used to drain off water after use.



This canal channelled water from the Arbonnoise river in Wazemmes, without concern for the serious issues that redirecting the water would cause for activities along its original route.

After passing under the Moyenne-Deûle, the Canal Vauban continued its route and flowed into the Basse-Deûle at the Halle aux Sucres on Avenue du Peuple Belge.

The stronghold's defence system was organised around four floodable areas: the first two protected the city, while the third protected the area around the Citadel.

- The first flood (1) was the largest in scale. It was achieved by allowing water from the Haute-Deûle to pour into Lille, by opening the Don locks, and closing the lock at Pont de Canteleu.

- The second flood (2 and 4) extended from the dike at Faubourg de la Barre and the Haute-Deûle to the lock at Pont de la Barre, which was kept closed, while the lock at Pont de Canteleu remained open.

- The third flood (3) covered the grasslands around the entire Northern section of the Citadel and stopped at the path leading from the Porte Saint-André to the village of Lambersart.



Now please look towards the "lower communication wall".

The 'communication wall' used to connect the Citadel ramparts to the town ramparts. The foot of the wall stood in a moat for reinforced defence.



This moat was restored within the framework of the current redevelopment of the vast area that you can see before you: the "Plaine de sports" (sports and recreation area).



Make your way to the north end of the anglers' moat along the path leading towards your left. Follow this path and head left once again.



Turn right onto the grassy area and stop in front of Fossé des Pêcheurs (anglers' moat).



# **5** FOSSÉ DES PÊCHEURS

This moat bears witness to the large moat which used to surround the Citadel's second fortified perimeter until 1914, when it was filled in for military reasons.

It was re-excavated in 1937 in a bid to restore the spirit of the site, as it stood in the 18th century, but with a peaceful goal in mind: providing the people of Lille with a freshwater fishing area. The moat was then referred to as an "enclosed fishing area". This was the first step in redeveloping

the area around the Citadel into a recreational area, a vocation which has since been confirmed on a day-to-day basis.

This objective is also fully expressed in the Citadel Master Plan which outlines developments planned until 2020.

Although its Eastern section was filled in, the moat still runs alongside the demi-lunes and counterguards on the city's Western fronts, on the Lambersart side.

The moat is supplied with water from an intake on the Haute-Deûle and discharges into the waters of the Grand Carré towards which you are heading.



Please make your way back onto the Allée du Train de Loos. You are walking alongside an embankment that protects the "anglers' moat". On your right-hand side is the site of the former stadium. Please stop in front of the pond.



# **6** PIONEER POND

Located at the lowest point of the former Grimonprez-Jooris stadium, which was demolished in 2011, the pond which formed receives run-off water from ground that was levelled and turfed.

Shallow, and on a very gently slope, the level of water in the pond varies considerably depending on the season (fluctuation).

As is the case for all newly formed bodies of water, the pond was quickly colonized by pioneer aquatic fauna and vegetation. The following can be found here: reed mace (or bulrushes), yellow irises, purple loosestrife, water plantains, moorhens, dragonflies, etc.



This colonization by plants and animals constitutes the first step in the alluviation process, i.e. the natural infill of the pond. The willows, which are still at the seedling stage in 2014, contribute to the natural process, in which open water will be gradually replaced by invisible and plant-filled water.

Continue along the path, taking the right-hand fork when the path splits and stop in front of the moat on your left-hand side.



# **7** FOSSÉ DE LA TORTUE

You are now standing in front of the Fossé de la Tortue (Tortoise trench), a small stream which used to follow the course of the Deûle from the south-side of the city, and continue along part of the route of one of its Northern branches known as Le Bucquet.

The Tortue enabled the Lomme and De Santes marshlands, situated above Lille, to be drained. Water was then stored in the Grand Carré and could be used to flood the town's Northern front in the event of military threat.



The creation of the high-capacity canal in 1975 cut off the Tortue's natural route, although it can still be seen curving round the North side of the Citadel.



Nowadays, the Tortue only collects water from the surrounding area, from the Citadel's 'cunette' canal, for example, and is almost always dry.

Its path is above ground until it reaches the Allée du Train de Loos, then goes underground, beneath the site of the former stadium, and continues in the direction of the Basse-Deûle canal via a siphon beneath the Moyenne-Deûle. Take the Allée du Train de Loos towards the Moyenne-Deûle and continue further for a few metres until you reach a body of water on your left.



# 8 THE GRAND CARRÉ BASIN

You are now standing opposite the Grand Carré, thus named because the body of water formed a network of channels dug in a square (carré), collecting the drainage water from the north west section of the Citadel.

Most of the water came from the marsh drainage canal, the Tortue. This water reservoir used a series of cofferdams and gates to supply water to the city's northern moat, thus contributing to the Citadel's defence system.

The body of water is now supplied by anglers' moat and its outlet is the Moyenne-Deûle.

It flows into the Moyenne-Deûle thanks to a control structure using the principle of communicating vessels.

Continue along the Allée du Train de Loos until you reach the Avenue du Petit Paradis, at right angles to the path you are on. This takes you back to the Moyenne-Deûle which you left at the Pont de la Citadelle. Turn right along the avenue for a few metres.



#### **9** THE PETIT PARADIS SLUICING BENEATH THE MOYENNE DEÛLE

Here, the Tortue enters a siphon pipe under the plane tree on the opposite bank. It continues its journey underground, beneath the roads, and resurfaces at eco-garden which you will visit later on the tour.

The water is regulated by a structure surrounded by gratings.



*Turn back the way you came and follow the Avenue du Petit Paradis alongside the Moyenne-Deûle towards the high-capacity canal. Stop when you see the white pavilion on your right-hand side, behind the trees on the opposite bank of the Moyenne-Deûle.* 



# **10** GROUNDWATER TABLES

This Art Deco style pavilion, containing a pump house, was built in 1929. It can be used to control groundwater at the level of the chalk aquifer. If the alluvial groundwater rises, a cone of depression is created, thus protecting the cellars in the surrounding area from flooding.



The ground beneath Lille is a veritable hotchpotch of different soils and rocks, through which water circulates at varying rates.

Lille was built over three water tables which overlap and converge a few metres beneath our feet, with levels that vary according to the seasons and pumping.



Groundwater is a potentially serious threat to the city and surrounding area since it could cause flooding.

It is also a valuable resource since it supplies a considerable proportion of Lille's drinking water.

Naturally, the main drinking water abstraction points are situated to the south of the Lille urban area, above the city and its various sources of pollution.

Where the water table rises to the surface, it is both highly vulnerable to pollution and a potential cause of flooding. It therefore requires particular protection and monitoring.

This is why the new developments implemented in the area around the Citadel use an alternative rainwater collection technique, which should allow the surface water table to be refilled while protecting it from pollution, it will also use vegetation to slow runoff and limit the leakage rate into the water system.

Continue until you reach the high-capacity canal where you can see the lock in the distance. Take the path to your left-hand side and walk down the steps to the right. Stop in front of the Grand Carré lock.



#### 1 THE HIGH-CAPACITY CANAL, GRAND CARRÉ LOCK

The Basse-Deûle canal was upgraded to a high-capacity link in 1974 after the creation of Lille's river port in 1948, and the increase in tonnage carried by barges to 3,000 tonnes. The former "Freycinet-gauge" canal, a European standard implemented in 1879, allowed for the passage of barges up to a maximum limit of 350 tonnes.

In the second phase of the works, the Grand Carré lock was constructed in 1978. Twelve metres wide, it allows boats to navigate a change in water level of 3.96 metres. This meant that boats were no longer required to travel through the two existing locks: La Barre lock, that you saw at the start of the tour, and the Saint-André lock, which has since been demolished.



Let us discuss the notion of reaches for a moment, i.e. bodies of water at the same height above sea level.

Breaking down the stretches of water within the city of Lille into reaches is an essential factor in understanding the way in which the system functions.

The system operates around three different reach heights:

The upstream reach corresponds to the Haute-Deûle; i.e. the storage depth of the Grand Carré and La Barre locks at 18.68 metres.

The intermediate reach, which is often referred to as the Moyenne-Deûle, is at 17.17 metres.

The downstream reach, represented by the Basse-Deûle, the hydraulic unit to which the Vieille Deûle up to Vieux Lille belongs, is at 14.72m above sea level.

The Citadel is situated at another level, at +17.80m



Continue a few metres further and make your way under the bridge. To your right, you will see the waterfall by which the Moyenne-Deûle flows into the high-capacity canal.



# 12 THE MOYENNE-DEÛLE WATERFALL

Since the Grand Carré lock was built in 1978, to replace the La Barre and Saint-André locks, the waters of the Moyenne-Deûle flow down a drop of 2.45m into the high-capacity canal via a waterfall.

This sudden interruption compromises the low-impact waterway link and environmentally-friendly connections between the two reaches.

A new "water gate" project has been devised which would create an uninterrupted pleasure boating route through Lille, via the Moyenne-Deûle and save over 6,000 m3 of water, in comparison to the lockage manoeuvres currently carried out at the Grand Carré lock to ensure the passage of pleasure boats.

Ramps at each of the small-scale locks and fish passes would then be installed on this "green" route.



Follow this path along the canal and, before it goes under the TGV rail-bridge, walk up the path to the right then head towards the left at the top of the slope to reach the Passerelle des Abattoirs bridge.

On the way, provided that the greenery is not too dense, you should be able to see a white pavilion, containing a pump house on your right-hand side.







To the North of the city, a series of four similar, small buildings, designed by the architect Gaston Secq, were built in 1929 to contain pump houses.

One of them, which is slightly larger, includes accommodation for the caretaker.

In an Art Deco style, certain pavilions are decorated with bas-reliefs featuring a coat of arms and allegories on the theme of water. Nowadays, these pump houses are only used occasionally.





Continue until you reach the footbridge (Passerelle des Abattoirs) and use it to cross over Boulevard Robert Schuman. This takes you to the "Plaine de la Poterne", an open area named after the "postern gate", which, like the geometric route of the path, reminds us of the original fortification.

This is a former "non aedificandi" zone, i.e. non constructible for military reasons.



#### THE TORTUE, TOWARDS THE PUMP STATION

The Tortue stream, that we left as it headed underground beneath the road system, returns to the surface in this non-constructible area which still marks the city's boundary.

The Tortue curves its way along the edge of the eco-garden, where the remains of the ramparts are still visible.

It can be viewed from the bridge that links the Plaine de la Poterne to the Rue du Guet. It then heads towards the Basse-Deûle and the supply channel for the pump station.





Follow the path towards the left, then walk down the steps to your right. Cross the Tortue canal which flows into the Basse-Deûle, where Lille's former river port once stood. Continue along the canal until you reach the intersection with the supply channel.





#### **15** PUMP STATION SUPPLY CHANNEL

The supply channel brings water from the Moyenne-Deûle to the pump station, via the Tortue, to supply the Canal de Roubaix, 18km away.

The Tortue is situated at a higher level than the Basse-Deûle. Cofferdams control the differences in the levels to ensure adequate flow of water.



Continue along the canal until you reach a small arched passage on the left leading to a bridge called the Pont du Glacis over the Basse-Deûle.



#### **(b)** THE BASSE-DEÛLE AND PONT DU GLACIS

The term "glacis" (also used in English) refers to a freestanding fortification formed by gently sloping terrain.

The Pont du Glacis was restored in 1826, as indicated on the plaque on the plinth above the arch. It formed part of Vauban's fortified system and provides an indication, along with the other remains visible on this site, of the line drawn by the former ramparts. The bridge is currently in a state of serious disrepair, exacerbated by lack of maintenance and invasive vegetation.

The bridge spans the Basse-Deûle, which at this point is little more than an open sewer whose level varies depending on the level of rainfall.

This is one of the lowest points of Lille métropole, into which rainwater flows from storm drains to the East and West. The water level sometimes rises particularly high, as shown by the refuse stuck in the tree branches.



Important work is currently in progress to make the site more welcoming It involves cleaning the canal, replanting the area, improving the sewage pipes. The waste waters will be processed at the sewage treatment plant while the storm water will flow into the River Basse Deûle.



Projet «Quais de la Basse-Deûle» - séquence 2 - Plan Bleu Lille Métropole © Ville de Lille

Go back the way you came, through the arched doorway, and turn left down the path until you reach Rue du Bastion Saint-André, turn left down this street towards the pump station.



# **1** PUMP STATION

The pump station was built in 1876 by engineers working for Voies Navigables de France in order to channel water from the Basse-Deûle to supply the Canal de Roubaix, which had been created in response to the city-region's industrial development.

With work commencing in 1826, the Canal de Roubaix was created to supply factories in Roubaix and Tourcoing and facilitate exchange with Northern Europe. The first barge arrived in Roubaix in 1877, loaded with coal.



The treatment plant overlooked a dock near the Saint-André lock leading to the River Basse-Deûle.



At that time, boats unloaded the coal required to operate the three pumps via a tunnel linked to the Basse-Deûle.

First, the pumps allowed water to be brought from the Moyenne-Deûle, via the canalized Tortue, into a storage tank located below the pump station.

Next, water was channelled along a pipe to the Canal de Roubaix.

In the 20th century, the steam-powered machines were replaced by electric pumps. Nowadays, the pump station only operates on rare occasions, when the level of the Canal de Roubaix is exceptionally low.

Listed as a Historic Monument since 1999, the building features three arched bays in a neo-roman style with a cast-iron inner structure. The building was enlarged and modified on several occasions between 1896 and 1902.



Following the route taken by the Tortue has offered an insight into how this waterway, which still played a role in the military defence of the Citadel in the 18th century, would, by the 19th century, be used to further the industrial ambitions of the Lille-Roubaix-Tourcoing region.

The Basse-Deûle was covered over beyond the pump station in the 1960s. The City of Lille's Plan Bleu project includes re-excavating 350 metres of the Basse-Deûle up to Avenue du Peuple Belge, redeveloping the waterfront and providing access to high-quality mooring facilities to allow visiting boats to enter Lille's historic town-centre

The impact of the project could be further reinforced in the long term by a secondphase extension, all the way to the Hospice Comtesse. The high cost of the works renders their implementation a long-term project. The branch of the Basse-Deûle will be redeveloped in the mid-term.

Please continue along Rue du Bastion Saint-André towards Avenue du Peuple Belge. You are now standing opposite a green area, surrounded by roads. This is the site of the former Basse-Deûle water-gate, which was demolished in the early 20th century when the fortifications were dismantled.



#### **1B** THE FORMER WATER-GATE

This water-gate created a passage through to the Quai de la Basse-Deûle for vessels transporting goods.









During the 19th century, the need to expand the city fuelled by industrial success called the existence of the fortified defences into question, as water-related strategies began to favour goods transport.

Navigation was pushed out of the city and many canals were filled in.

Canals were still present in the city after World War One but a number of issues, including sanitary conditions, encouraged town-planners to continue covering them.

The infilling of the Basse-Deûle canal was completed in the 1960s, just after the inland port above the city was inaugurated.

The construction of the high-capacity canal, which bypassed the Citadel and moved the Deûle even further from the city, confirmed the river's economic purpose.

Walk down Avenue du Peuple Belge and make for the former Hospice Général, on the left.



#### **19** THE FORMER QUAYS OF THE "GRAND RIVAGE"

Lille's Hospice Général is a former hospice whose establishment was authorized by Louis XV in June 1738. Built in what was then a new district of the historic centre, on the edge of the Basse-Deûle canal, it was designed to house abandoned children, the disabled and beggars.

Understandably, activities which were thought to pollute the city's water, such as hospitals and hospices, were installed downstream of the city.

The former Hospice Général now houses the campus of Lille's IAE business school. It was listed as a Historic Monument in February 1948.

In front of the building, you can still see the lovely stones of the former canal quayside, which was originally known as "Grand Rivage".



The project for reviving the waterway at the Avenue du Peuple Belge aims to restore the heritage environment of this iconic Lille building.



Hypothèse de remise en eau de l'avenue du Peuple Belge © Ville de Lille

Taking the first street on the left after the former hospice and walking up Rue des Bateliers for 500 metres, offers a further perspective on the city's hydraulic issues.

In 2014, the creation of a new pump house here, as well as a storm overflow basin and water-treatment basin, has allowed Lille Metropole to reduce flood risks and stem the flow of extraneous clear water.

These works have ensured that clear water from groundwater tables is now available to supply the stagnant branch of the Basse-Deûle and thus favour water renewal in this section.



Croquis - Réseau des eaux claires parasites © Ville de Lille

Continue along the North side of the Avenue du Peuple Belge, beyond the Pont-Neuf. A row of garages now replaces the boat sheds of yesteryear. Continue until you reach a square called llot Comtesse.

This is where your journey ends.

From this point you can follow the traces of Lille's inner-city canals back to the Quai du Wault, via the former Saint-Pierre water mill, the moats round the feudal motte, the Canal de la Baignerie and many other sites evoking water's path through the city. But those are stories for another day...

Walking round the circuit you have completed today offers an insight into the extent to which water continues to play, as it always has, a key role in the life of this city.

#### You can follow the itinerary «Water, the source of the city» thanks to the location-based app «Walls and gardens» which can be downloaded from the AppStore and from Android.

This itinerary can be accessed in English, French, German and Dutch.

The itinerary has been devised with the support of the City department «Ville d'Art et d'Histoire».

Notebook designed and edited by the CAUE du Nord (Advisory body in Architecture Urban Planning and Environment) and the City of Lille - June 2014

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