GISwater 3.0

# QUÉ ÉS GISWATER?

PROJECTE COL.LABORATIU

SOLUCIÓ DESKTOP

GISwater

SOLUCIÓ MÒBIL

B'MAPS

## GESTIÓ DE XARXES AMB GISWATER 3. SOLUCIONS DESKTOP I MÒBIL

JOSEP LLUÍS SALA

21 DE MARÇ DE 2019

III CONGRÉS DE L'AIGUA A CATALUNYA

EVOLUCIÓ DELS USOS: REUTILITZACIÓ, ECONOMIA CIRCULAR I NOVES TECNOLOGIES

BARCELONA, 20-21 DE MARÇ DE 2019

B'GEO

OPEN GIS & WATER SOLUTIONS

# QUÉ ÉS GISWATER?

*Solució tecnològica lliure i professional, per a la gestió del cicle integral de l'aigua*

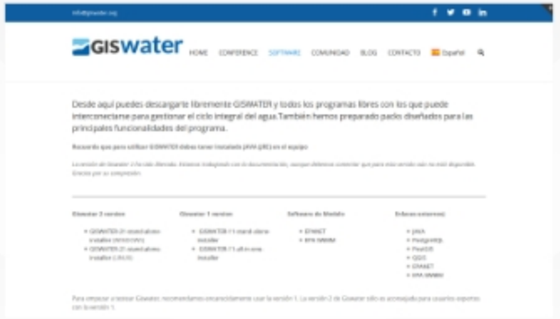
**OPEN SOURCE**

**GESTIÓ DEL CICLE DE L'AIGUA**

**UNIÓ DE TECNOLOGIES**

# OPEN SOURCE

*www.giswater.org*

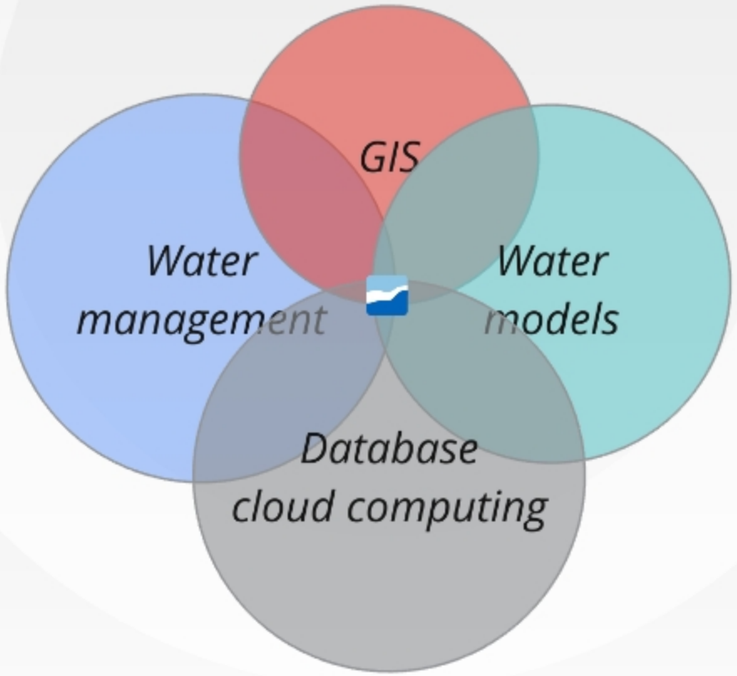


# GESTIÓ DEL CICLE DE L'AIGUA

*Xarxes d'aigua potable*

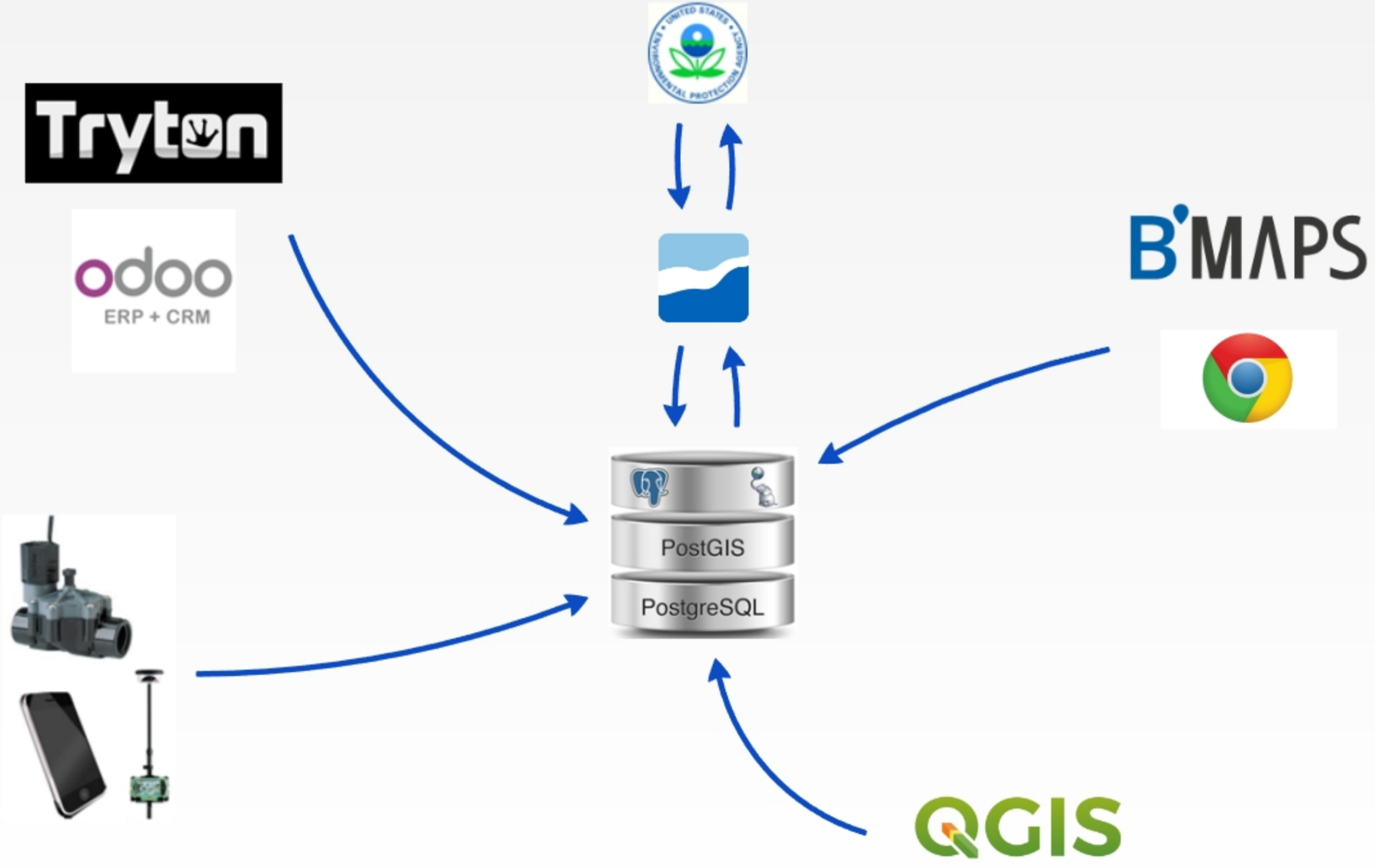
*Xarxes de sanejament i drenatge urbà*

# UNIÓ DE TECNOLOGIES




Ecosistema Giswater

# Ecosistema Giswater



# FUNCIONALITATS

GISwater

Inventari d'actius

Model hidràulic

Planificació

Anàlisi i gestió de la infraestructura

# Inventari d'actius

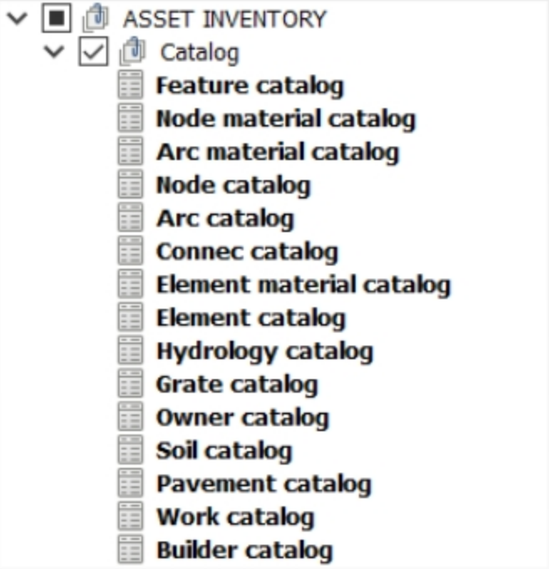
Catàlegs

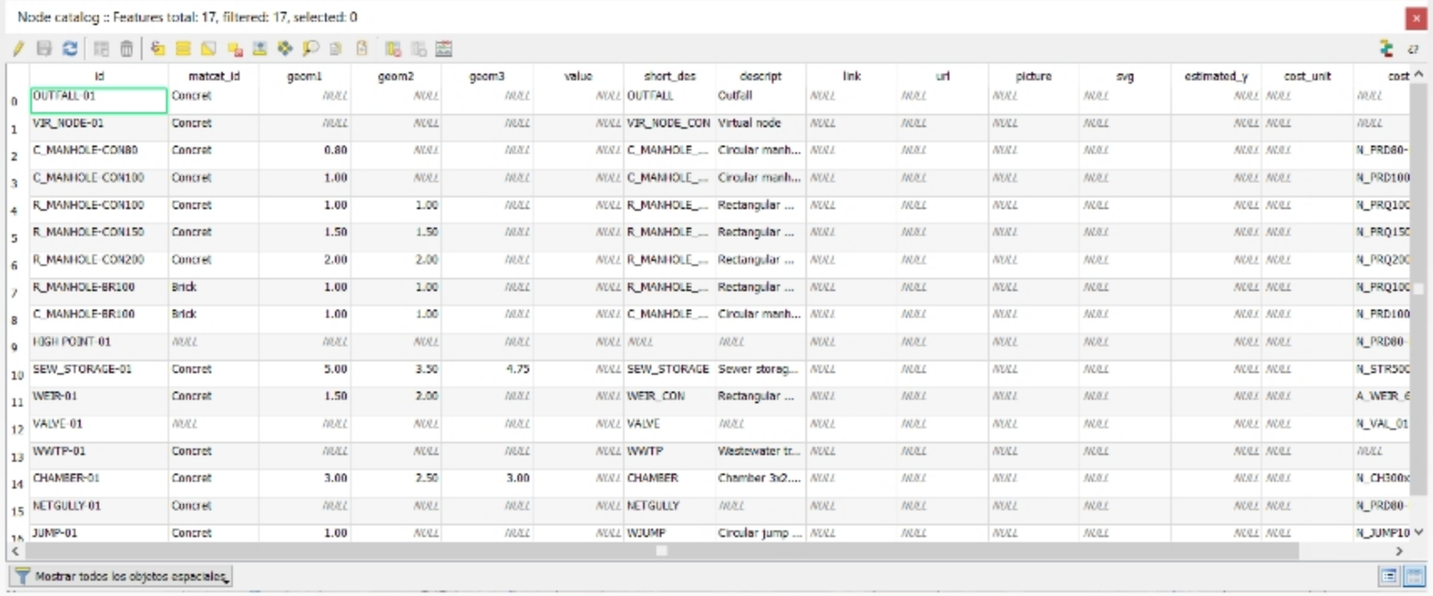
Infraestructura

Valor patrimonial

# Catàlegs

*Treballant per catàlegs*

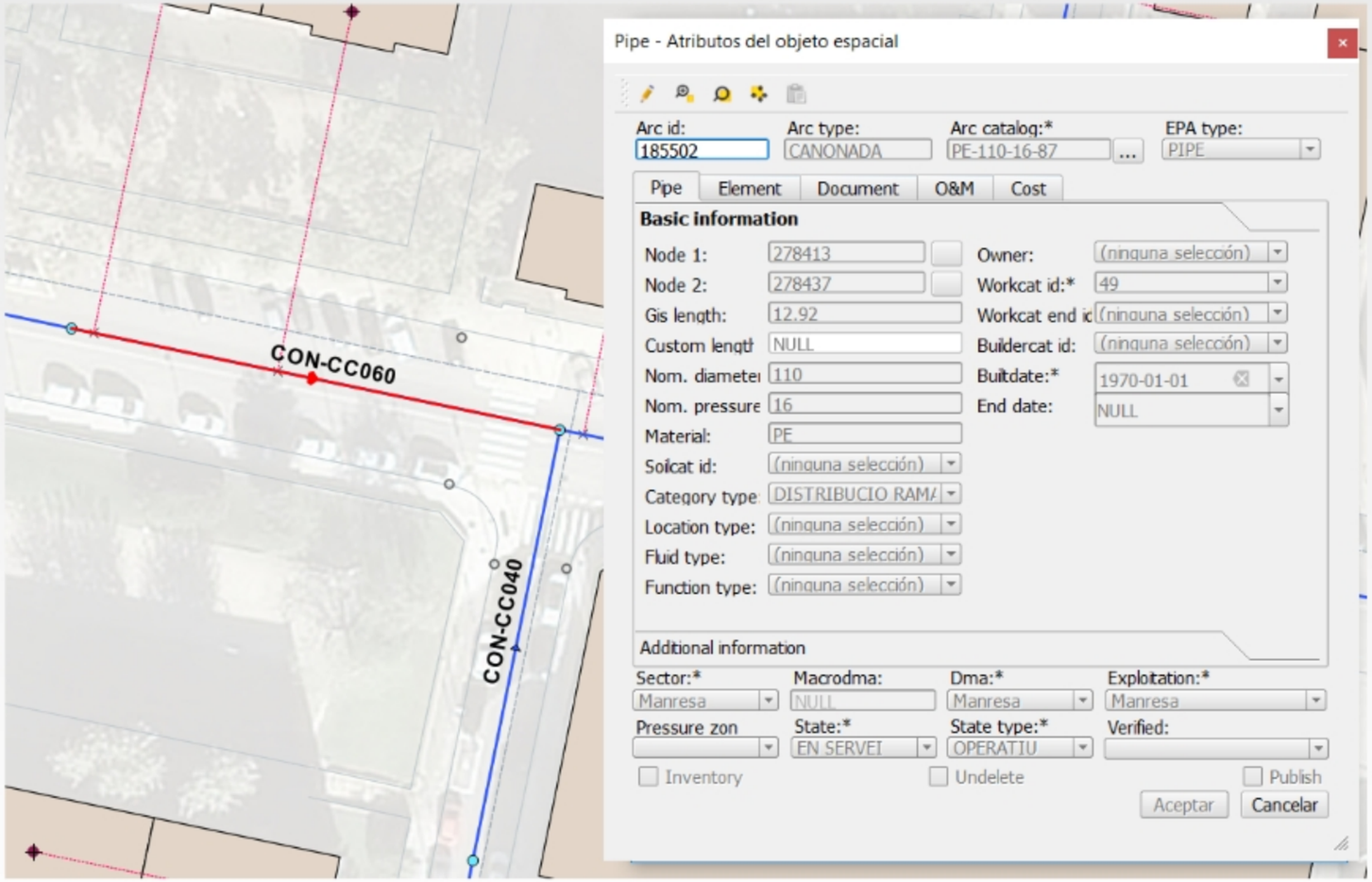


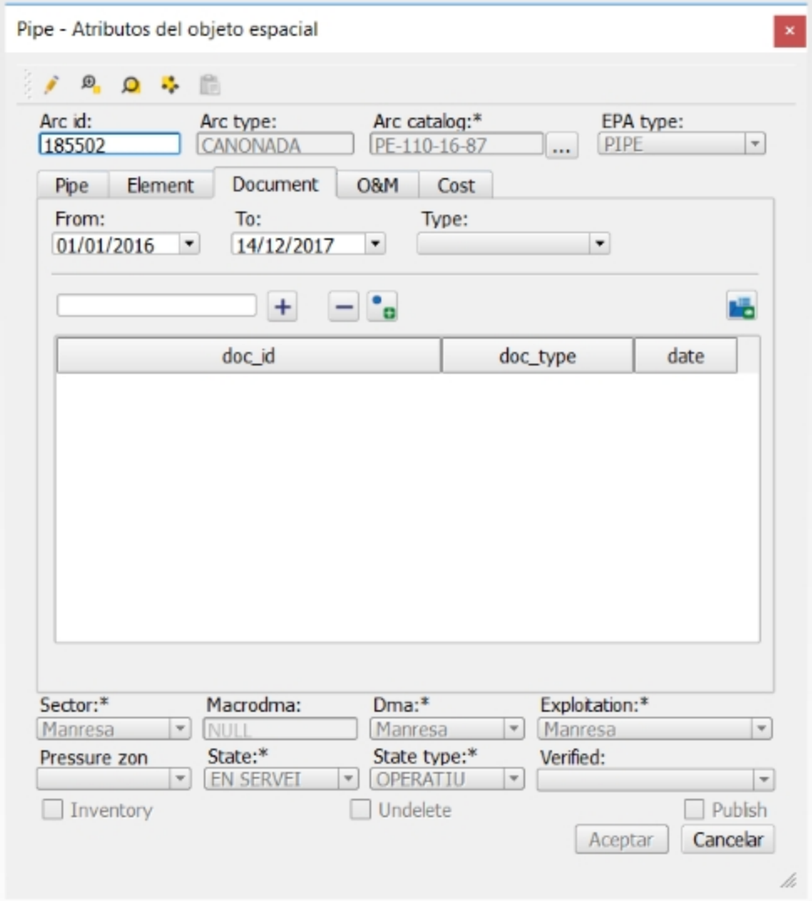




| | id | matcat_id | geom1 | geom2 | geom3 | value | short_des | descript | link | url | picture | svg | estimated_y | cost_unit | cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | OUTFALL-01 | Concret | NULL | NULL | NULL | NULL | OUTFALL | Outfall | NULL | NULL | NULL | NULL | NULL | NULL | NULL |
| 1 | VIR_NODE-01 | Concret | NULL | NULL | NULL | NULL | VIR_NODE_CON | Virtual node | NULL | NULL | NULL | NULL | NULL | NULL | NULL |
| 2 | C_MANHOLE-CON80 | Concret | 0.80 | NULL | NULL | NULL | C_MANHOLE_... | Circular manh... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRD80- |
| 3 | C_MANHOLE-CON100 | Concret | 1.00 | NULL | NULL | NULL | C_MANHOLE_... | Circular manh... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRD100 |
| 4 | R_MANHOLE-CON100 | Concret | 1.00 | 1.00 | NULL | NULL | R_MANHOLE_... | Rectangular ... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRQ100 |
| 5 | R_MANHOLE-CON150 | Concret | 1.50 | 1.50 | NULL | NULL | R_MANHOLE_... | Rectangular ... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRQ150 |
| 6 | R_MANHOLE-CON200 | Concret | 2.00 | 2.00 | NULL | NULL | R_MANHOLE_... | Rectangular ... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRQ200 |
| 7 | R_MANHOLE-BR100 | Brick | 1.00 | 1.00 | NULL | NULL | R_MANHOLE_... | Rectangular ... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRQ100 |
| 8 | C_MANHOLE-BR100 | Brick | 1.00 | 1.00 | NULL | NULL | C_MANHOLE_... | Circular manh... | NULL | NULL | NULL | NULL | NULL | NULL | N_PRD100 |
| 9 | HIGH POINT-01 | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | N_PRD80- |
| 10 | SEW_STORAGE-01 | Concret | 5.00 | 3.50 | 4.75 | NULL | SEW_STORAGE | Sewer storag... | NULL | NULL | NULL | NULL | NULL | NULL | N_STR500 |
| 11 | WEIR-01 | Concret | 1.50 | 2.00 | NULL | NULL | WEIR_CON | Rectangular ... | NULL | NULL | NULL | NULL | NULL | NULL | A_WEIR_6 |
| 12 | VALVE-01 | NULL | NULL | NULL | NULL | NULL | VALVE | NULL | NULL | NULL | NULL | NULL | NULL | NULL | N_VAL_01 |
| 13 | WWTP-01 | Concret | NULL | NULL | NULL | NULL | WWTP | Wastewater tr... | NULL | NULL | NULL | NULL | NULL | NULL | NULL |
| 14 | CHAMBER-01 | Concret | 3.00 | 2.50 | 3.00 | NULL | CHAMBER | Chamber 3x2.... | NULL | NULL | NULL | NULL | NULL | NULL | N_CH300x |
| 15 | NETGULLY-01 | Concret | NULL | NULL | NULL | NULL | NETGULLY | NULL | NULL | NULL | NULL | NULL | NULL | NULL | N_PRD80- |
| 16 | JUMP-01 | Concret | 1.00 | NULL | NULL | NULL | WJUMP | Circular jump ... | NULL | NULL | NULL | NULL | NULL | NULL | N_JUMP10 |

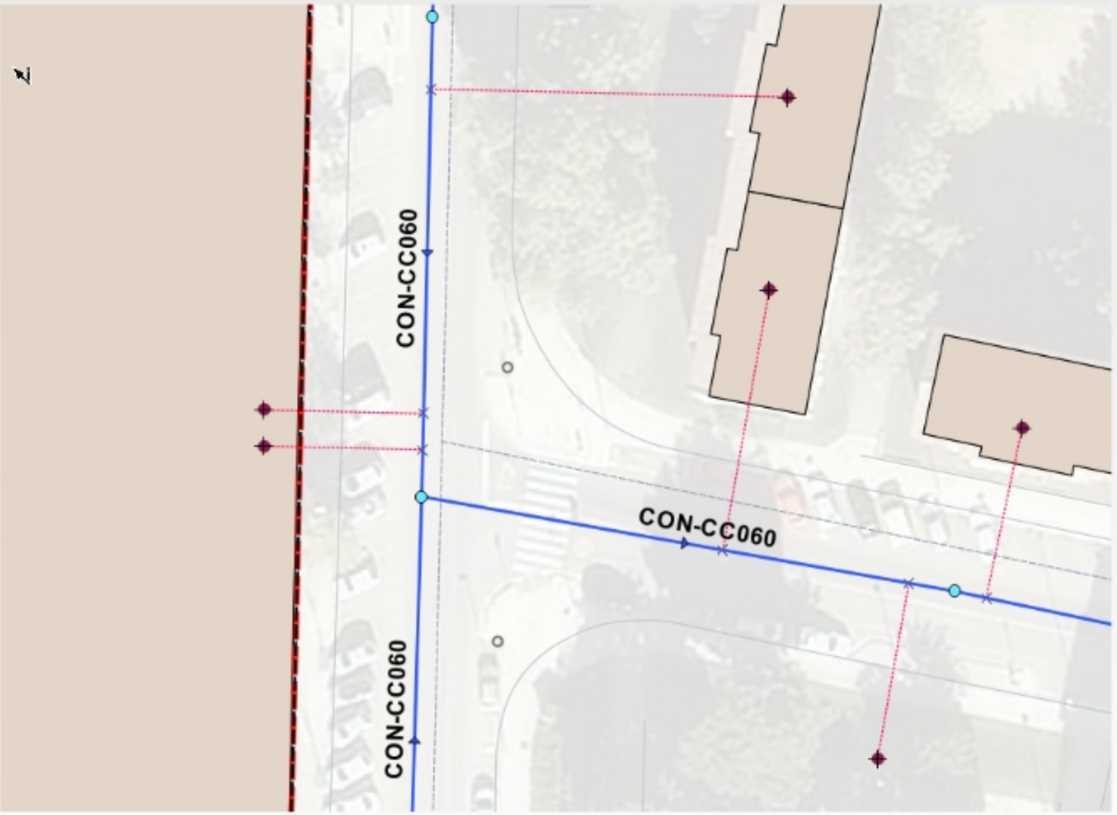
# Infraestructura

# Formularis personalitzats



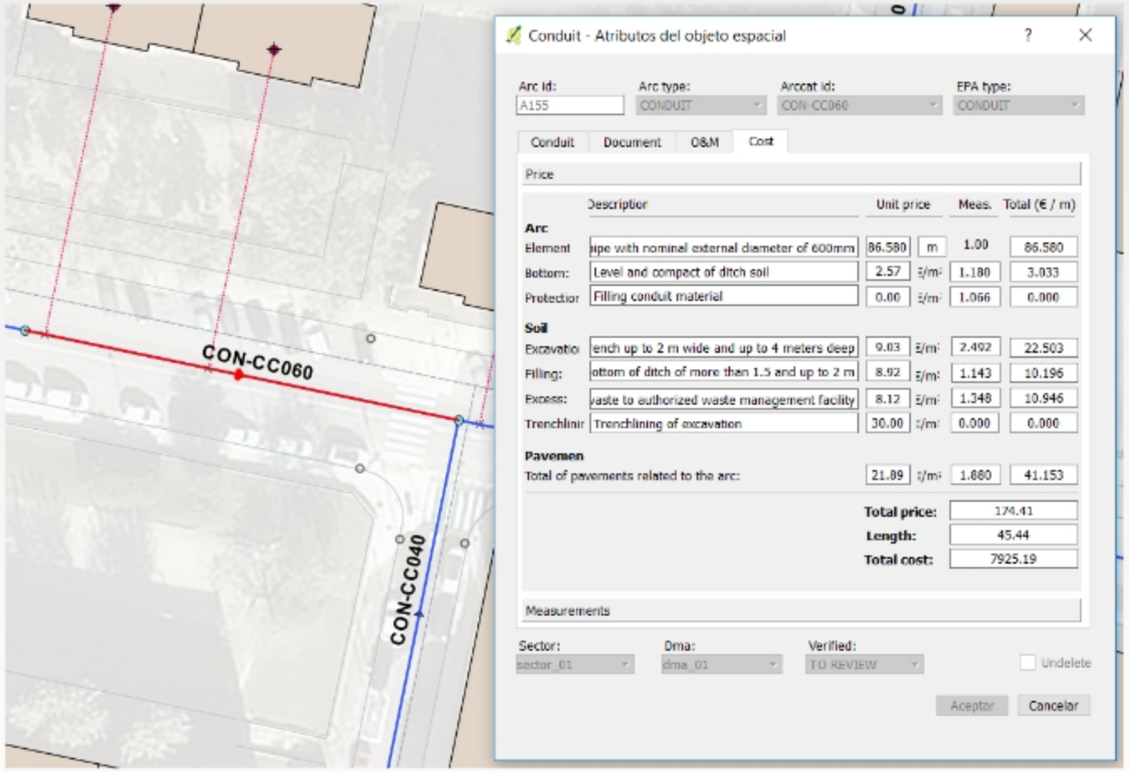



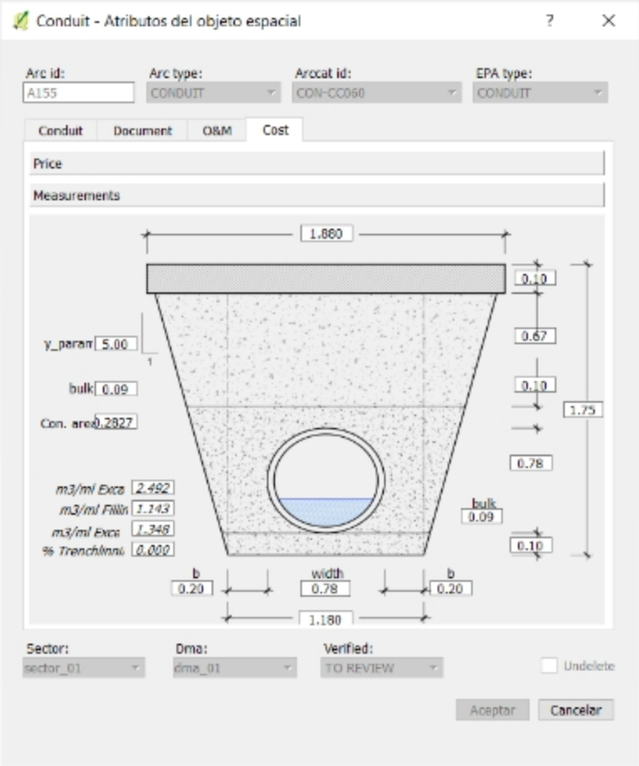
# Topologia arc-node



# Valor patrimonial

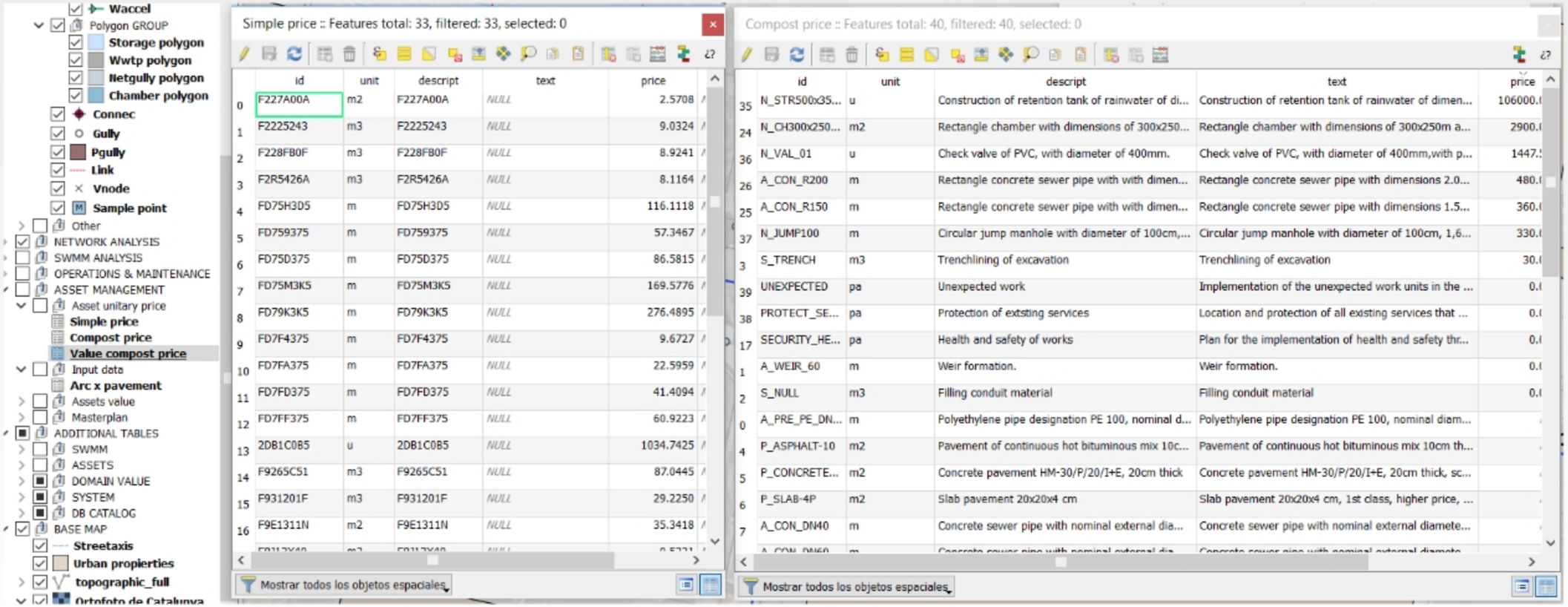
*Càlcul del valor patrimonial de la infraestructura*



# Base de preus

*Base de preus simples i composats de les diferents unitats d'obra*




| | id | unit | descript | text | price |
|---|---|---|---|---|---|
| 0 | F227A00A | m2 | F227A00A | NULL | 2.5708 |
| 1 | F2225243 | m3 | F2225243 | NULL | 9.0324 |
| 2 | F228FB0F | m3 | F228FB0F | NULL | 8.9241 |
| 3 | F2R5426A | m3 | F2R5426A | NULL | 8.1164 |
| 4 | FD75H3D5 | m | FD75H3D5 | NULL | 116.1118 |
| 5 | FD759375 | m | FD759375 | NULL | 57.3467 |
| 6 | FD75D375 | m | FD75D375 | NULL | 86.5815 |
| 7 | FD75M3K5 | m | FD75M3K5 | NULL | 169.5776 |
| 8 | FD79K3K5 | m | FD79K3K5 | NULL | 276.4895 |
| 9 | FD7F4375 | m | FD7F4375 | NULL | 9.6727 |
| 10 | FD7FA375 | m | FD7FA375 | NULL | 22.5959 |
| 11 | FD7FD375 | m | FD7FD375 | NULL | 41.4094 |
| 12 | FD7FF375 | m | FD7FF375 | NULL | 60.9223 |
| 13 | 2DB1C0B5 | u | 2DB1C0B5 | NULL | 1034.7425 |
| 14 | F9265C51 | m3 | F9265C51 | NULL | 87.0445 |
| 15 | F931201F | m3 | F931201F | NULL | 29.2250 |
| 16 | F9E1311N | m2 | F9E1311N | NULL | 35.3418 |

| | id | unit | descript | text | price |
|---|---|---|---|---|---|
| 35 | N_STR500x35... | u | Construction of retention tank of rainwater of di... | Construction of retention tank of rainwater of dimen... | 106000.0 |
| 24 | N_CH300x250... | m2 | Rectangle chamber with dimensions of 300x250... | Rectangle chamber with dimensions of 300x250m a... | 2900.0 |
| 36 | N_VAL_01 | u | Check valve of PVC, with diameter of 400mm. | Check valve of PVC, with diameter of 400mm,with p... | 1447.5 |
| 26 | A_CON_R200 | m | Rectangle concrete sewer pipe with with dimen... | Rectangle concrete sewer pipe with dimensions 2.0... | 480.0 |
| 25 | A_CON_R150 | m | Rectangle concrete sewer pipe with with dimen... | Rectangle concrete sewer pipe with dimensions 1.5... | 360.0 |
| 37 | N_JUMP100 | m | Circular jump manhole with diameter of 100cm,... | Circular jump manhole with diameter of 100cm, 1,6... | 330.0 |
| 3 | S_TRENCH | m3 | Trenchlining of excavation | Trenchlining of excavation | 30.0 |
| 39 | UNEXPECTED | pa | Unexpected work | Implementation of the unexpected work units in the ... | 0.0 |
| 38 | PROTECT_SE... | pa | Protection of extsting services | Location and protection of all existing services that ... | 0.0 |
| 17 | SECURITY_HE... | pa | Health and safety of works | Plan for the implementation of health and safety thr... | 0.0 |
| 1 | A_WEIR_60 | m | Weir formation. | Weir formation. | 0.0 |
| 2 | S_NULL | m3 | Filling conduit material | Filling conduit material | 0.0 |
| 0 | A_PRE_PE_DN... | m | Polyethylene pipe designation PE 100, nominal d... | Polyethylene pipe designation PE 100, nominal diam... | |
| 4 | P_ASPHALT-10 | m2 | Pavement of continuous hot bituminous mix 10c... | Pavement of continuous hot bituminous mix 10cm th... | |
| 5 | P_CONCRETE... | m2 | Concrete pavement HM-30/P/20/I+E, 20cm thick | Concrete pavement HM-30/P/20/I+E, 20cm thick, sc... | |
| 6 | P_SLAB-4P | m2 | Slab pavement 20x20x4 cm | Slab pavement 20x20x4 cm, 1st class, higher price, ... | |
| 7 | A_CON_DN40 | m | Concrete sewer pipe with nominal external dia... | Concrete sewer pipe with nominal external diamete... | |

# Manteniment de la infraestructura

*Despesa en manteniment en base al valor patrimonial actualitzat en tot moment*

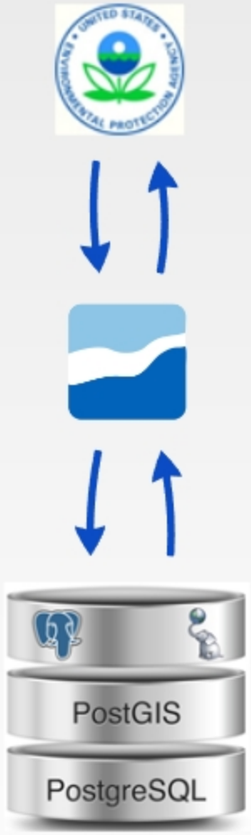
# Model hidràulic

Connexió amb EPANET i SWMM

# Connexió amb EPANET i SWMM

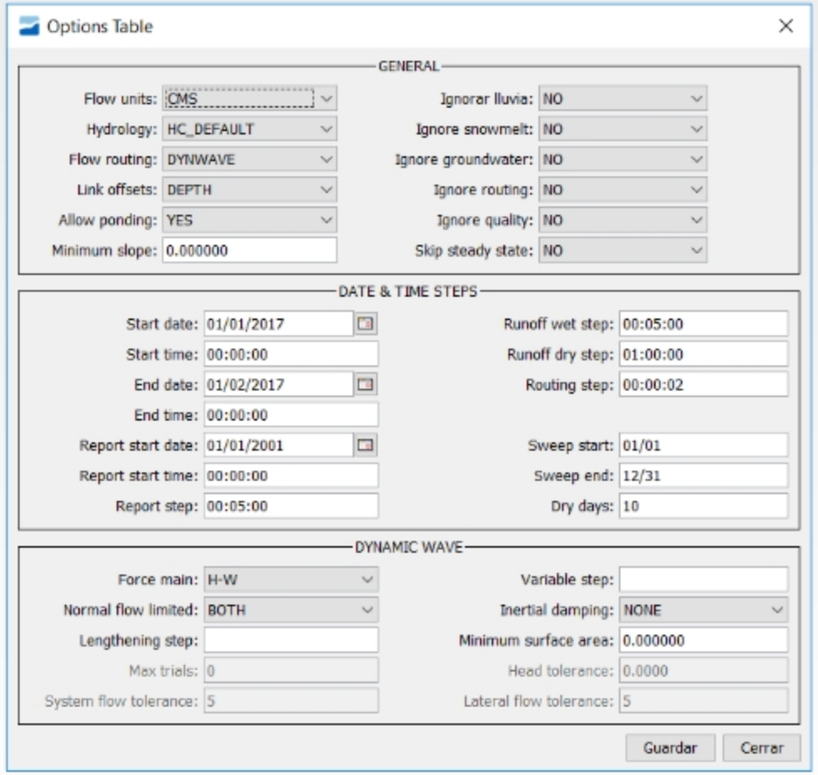
*Xarxes d'aigua potable* *EPANET*

*Xarxes de sanejament* *SWMM*

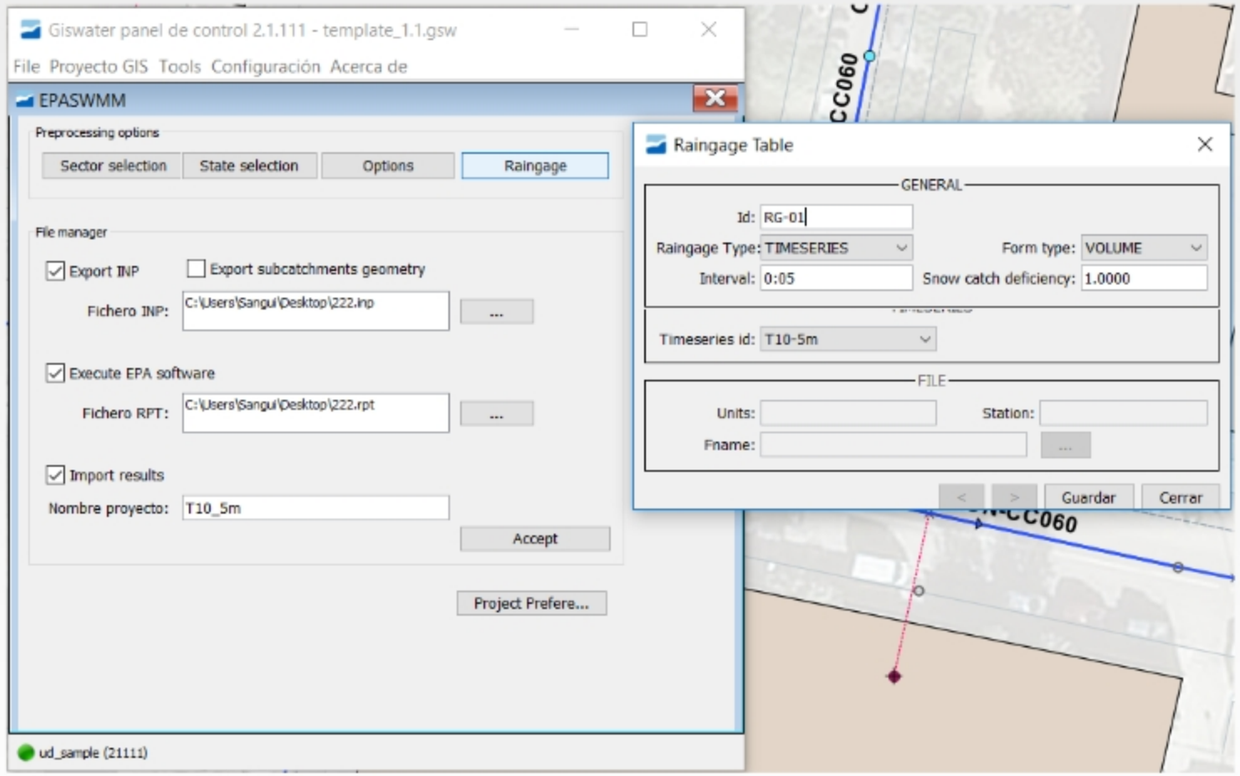


# Modelat hidràulic

*Paràmetres*




*Pluja (drenatge urbà)*

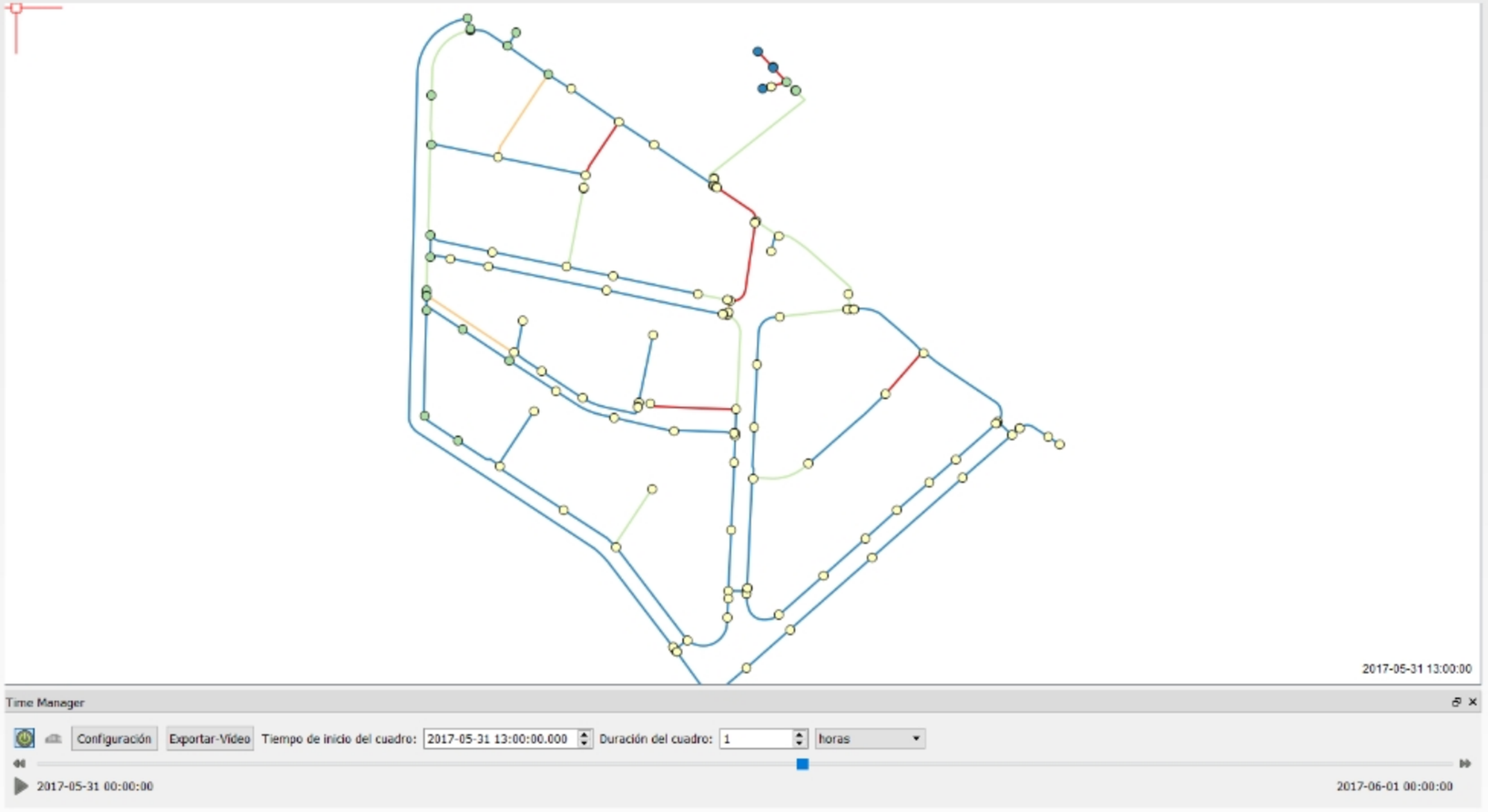


# Resultats

*Dintre de la base de dades i visibles desde QGIS*

# Simulació dinàmica

*Plugin Time manager*

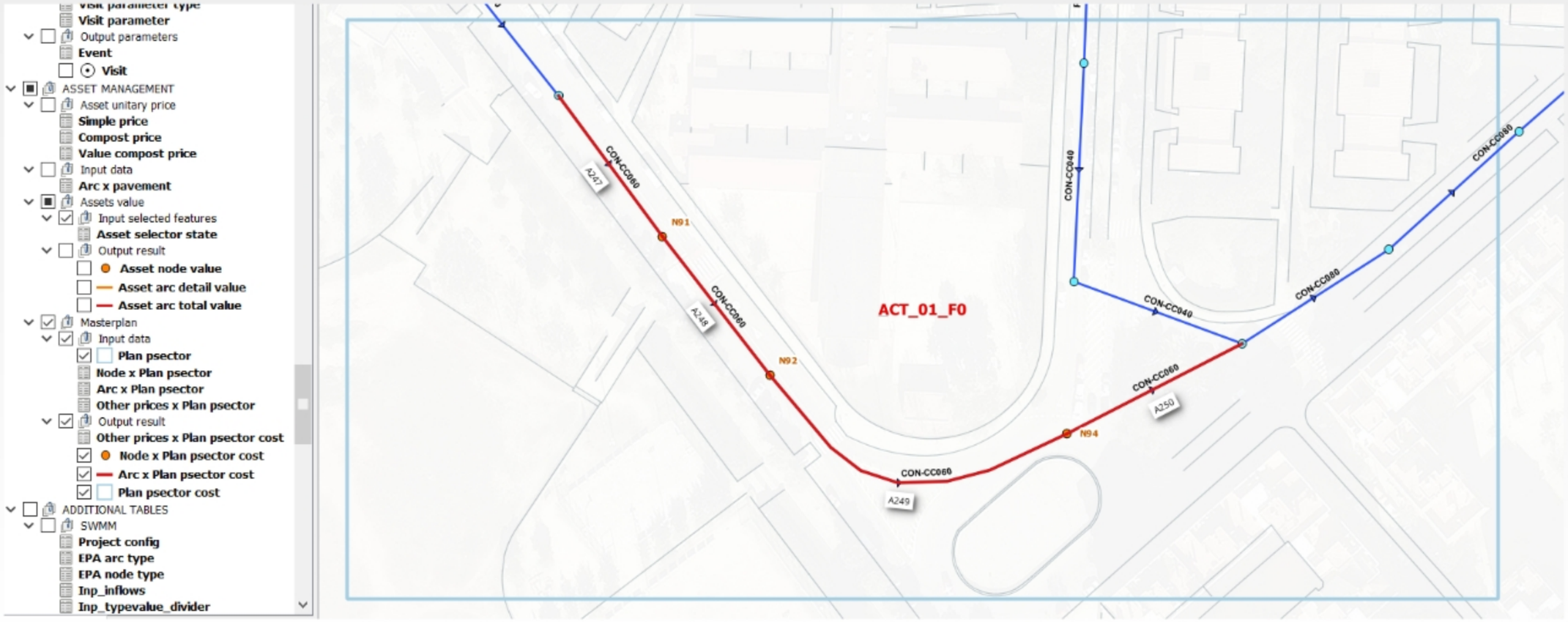


# Planificació

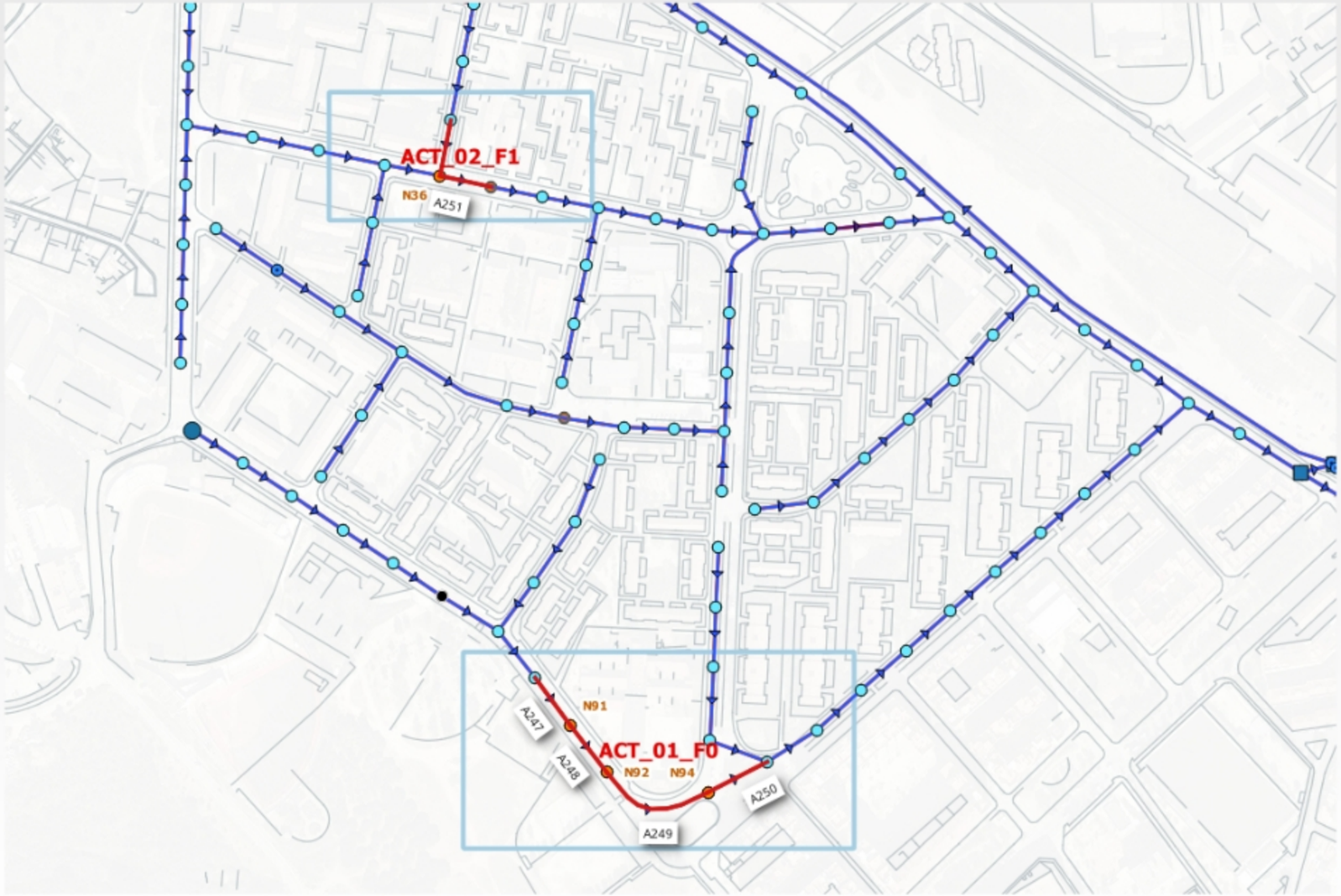
Pla Director

# Pla Director

*Es determinen les diferents actuacions a realitzar per millorar la xarxa*



# Plan Director



# Plan Director

*Valorades econòmicament de forma automàtica (base de preus - catàlegs)*

Arc x Plan psector cost :: Features total: 6, filtered: 6, selected: 0

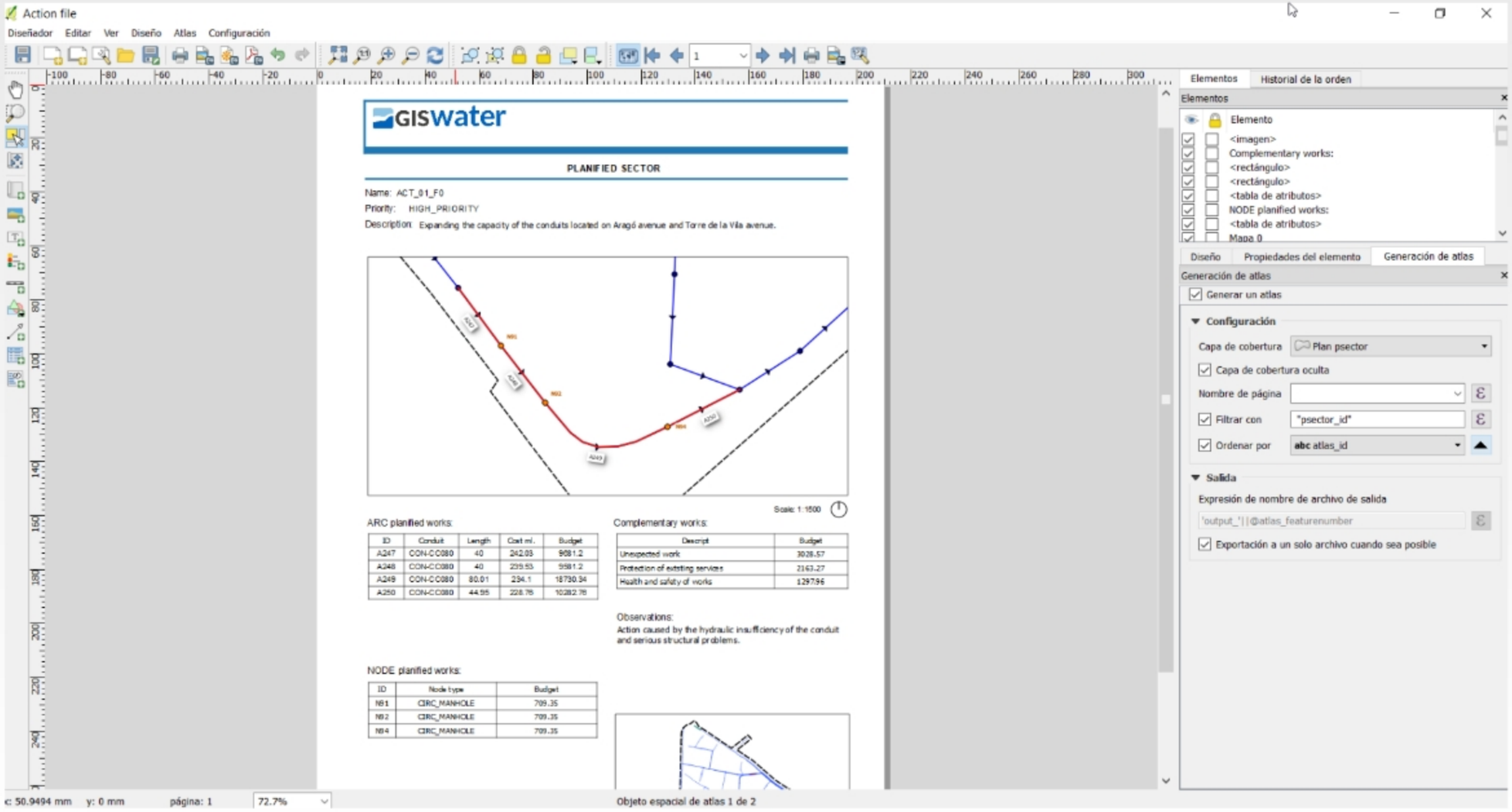
| | arc_id | arccat_id | cost_unit | cost | length | budget | psector_id | state |
|---|---|---|---|---|---|---|---|---|
| 0 | A247 | CON-CC080 | m | 242.03 | 40.00 | 9681.20 | ACT_01_F0 | PLANIFIED |
| 1 | A248 | CON-CC080 | m | 239.53 | 40.00 | 9581.20 | ACT_01_F0 | PLANIFIED |
| 2 | A249 | CON-CC080 | m | 234.10 | 80.01 | 18730.34 | ACT_01_F0 | PLANIFIED |
| 3 | A250 | CON-CC080 | m | 228.76 | 44.95 | 10282.76 | ACT_01_F0 | PLANIFIED |
| 4 | A251 | CON-CC080 | m | 227.31 | 35.00 | 7955.85 | ACT_02_F1 | PLANIFIED |
| 5 | A252 | CON-CC080 | m | 226.84 | 38.01 | 8622.19 | ACT_02_F1 | PLANIFIED |

Node x Plan psector cost :: Features total: 4, filtered: 4, selected: 0

| | node_id | node_type | descript | budget | psector_id | state | atlas_id |
|---|---|---|---|---|---|---|---|
| 0 | N91 | CIRC_MANHOLE | NULL | 709.35 | ACT_01_F0 | RECONSTRUCT | 01 |
| 1 | N92 | CIRC_MANHOLE | NULL | 709.35 | ACT_01_F0 | RECONSTRUCT | 01 |
| 2 | N94 | CIRC_MANHOLE | NULL | 709.35 | ACT_01_F0 | RECONSTRUCT | 01 |
| 3 | N36 | CIRC_MANHOLE | NULL | 709.35 | ACT_02_F1 | RECONSTRUCT | 02 |

# Fitxes d'actuació

*Atles de QGIS*



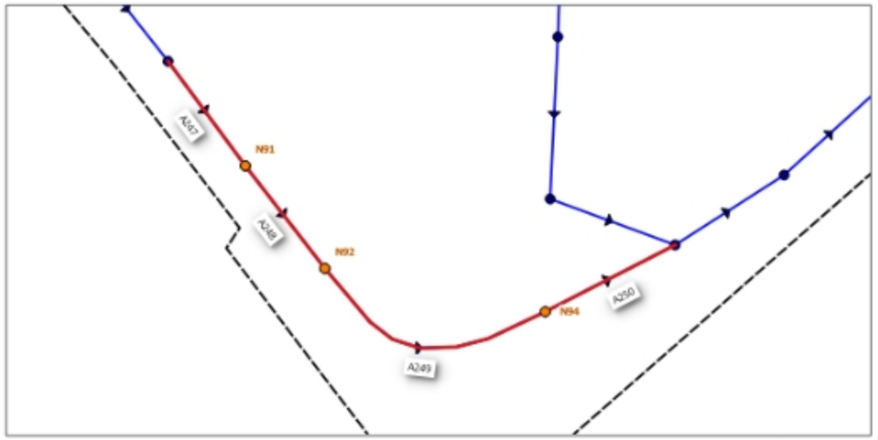
GISwater

## PLANIFIED SECTOR

Name: ACT_01_F0

Priority: HIGH_PRIORITY

Description: Expanding the capacity of the conduits located on Aragó avenue and Torre de la Vila avenue.




Scale: 1:1500

ARC planified works:

| ID | Conduit | Length | Cost ml. | Budget |
|---|---|---|---|---|
| A247 | CON-CC080 | 40 | 242.03 | 9681.2 |
| A248 | CON-CC080 | 40 | 239.53 | 9581.2 |
| A249 | CON-CC080 | 80.01 | 234.1 | 18730.34 |
| A250 | CON-CC080 | 44.95 | 228.78 | 10282.78 |

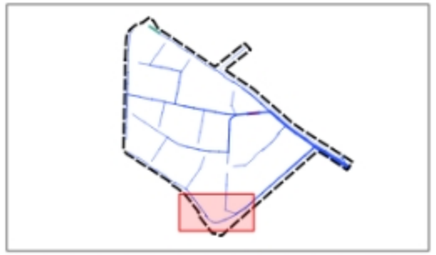
Complementary works:

| Descript | Budget |
|---|---|
| Unexpected work | 3028.57 |
| Protection of existing services | 2163.27 |
| Health and safety of works | 1297.96 |

Observations:
Action caused by the hydraulic insufficiency of the conduit and serious structural problems.

NODE planified works:

| ID | Node type | Budget |
|---|---|---|
| N91 | CIRC_MANHOLE | 709.35 |
| N92 | CIRC_MANHOLE | 709.35 |
| N94 | CIRC_MANHOLE | 709.35 |



Total BME: 56914.63 €

Total BCE: 67728.41 €

# Anàlisi i gestió de la infraestructura

Gestió documental

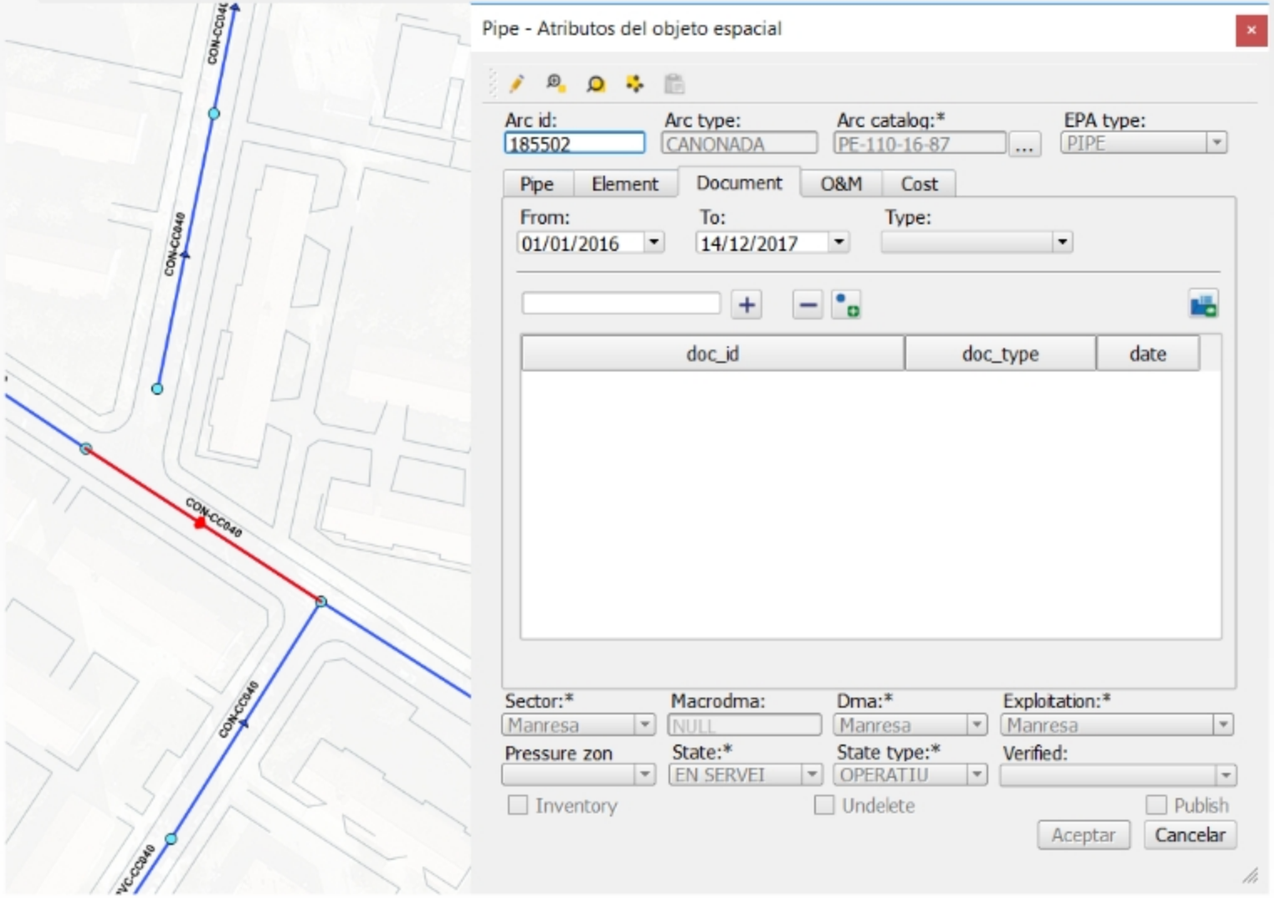
Gestió esdeveniments

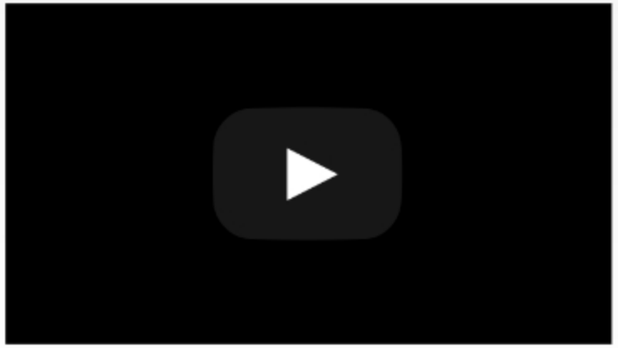
Conexió amb SCADA

Plugin QGIS

# Gestió documental

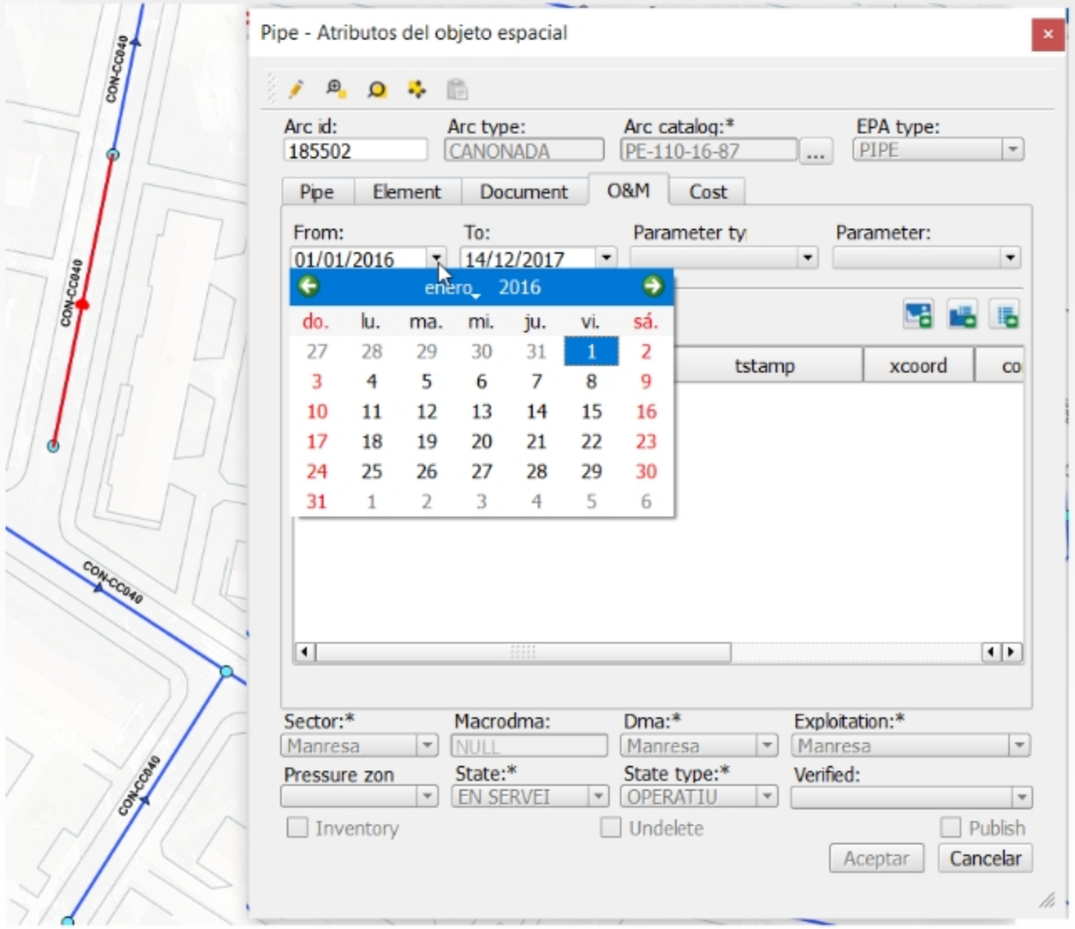
*Vincle de documents, texts, fotos, vídeos a cada element de la xarxa*





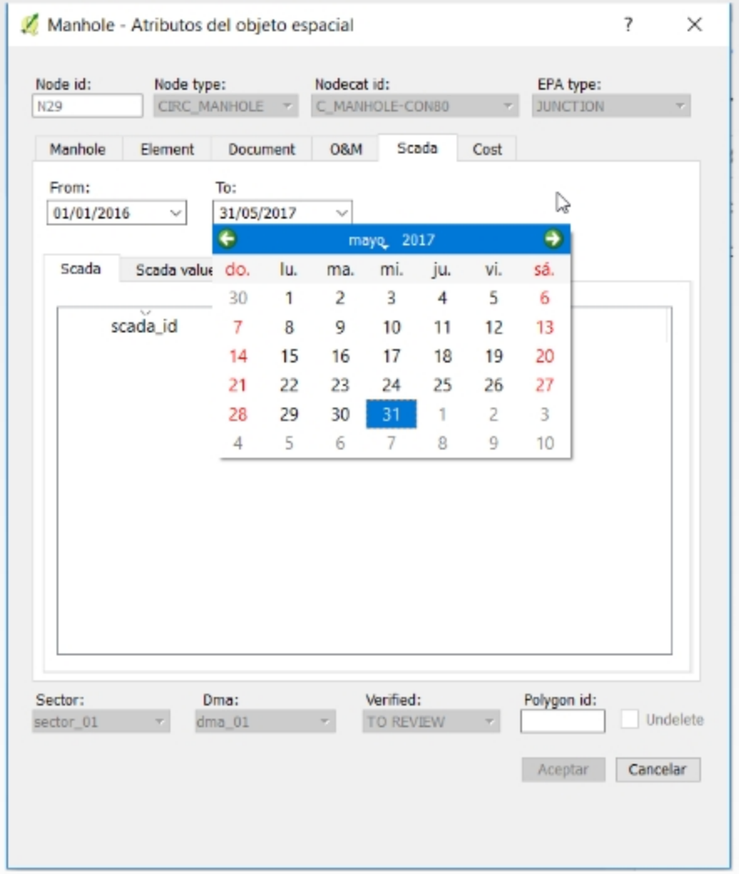
# Gestió esdeveniments

*Inventari, visites, neteges, averies*



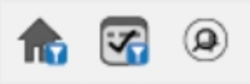
# Mapa de calor d'avaries

# Conexió amb SCADA



# Plugin QGIS

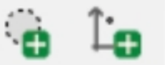
*Basic tool bar*



*Operations & management*

*Edit tool bar*

*CAD tool bar*



*EPA tool bar*

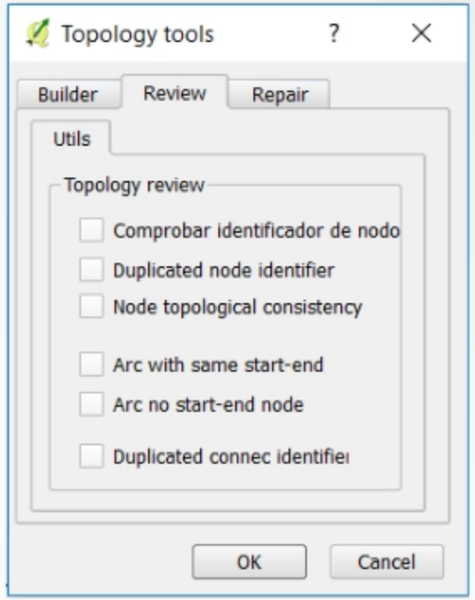
*Masterplan tool bar*

# Plugin QGIS

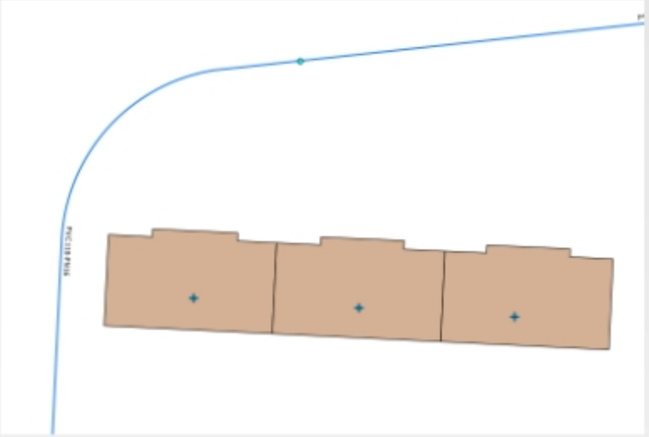
*Talla tram per node - Junta tram*

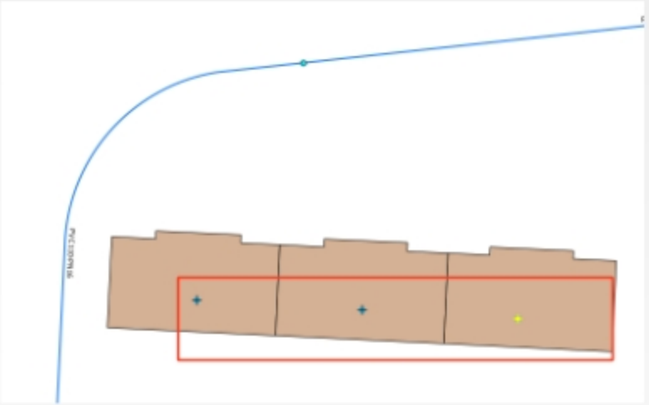
# Plugin QGIS

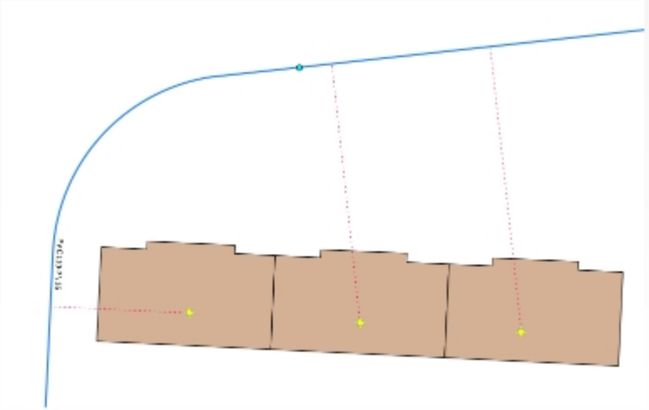
*Eines de topologia*




*Connector d'escomeses*





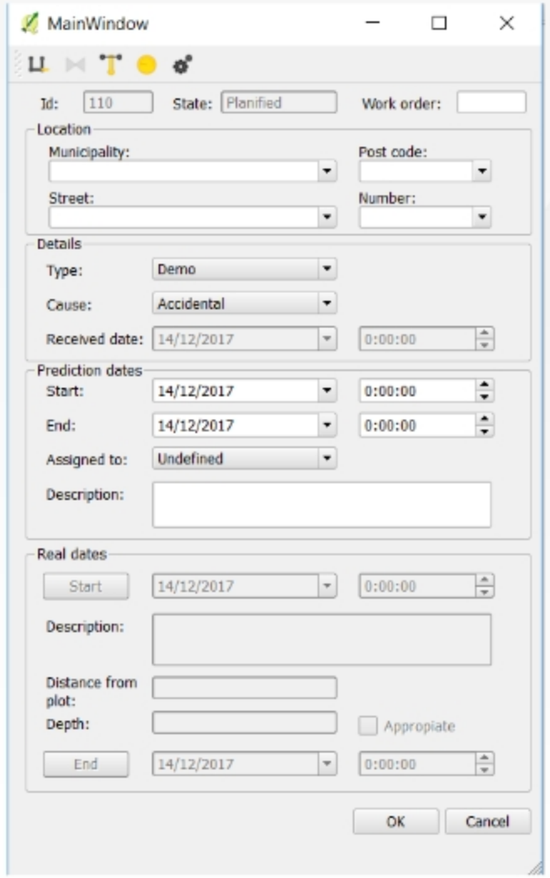


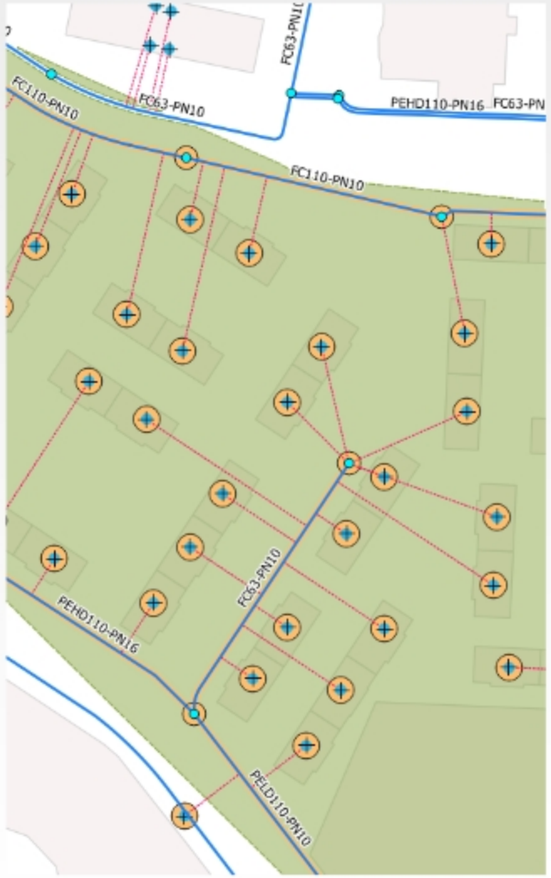
# Anàlisi connectivitat

*Aigües amunt - Agües avall*

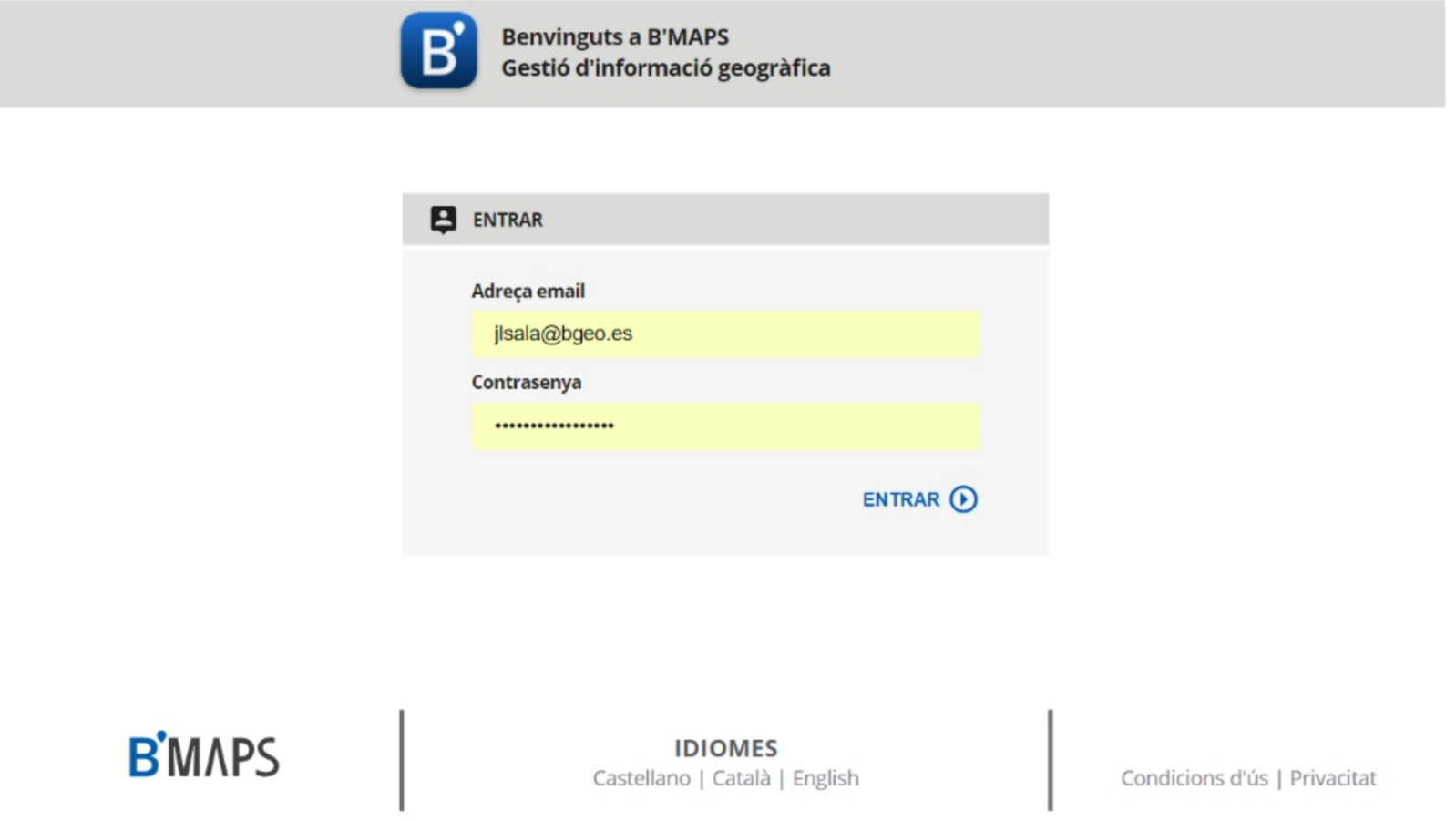
# Polígon de tall

*Polígon de tall - Gestor de polígons de tall*

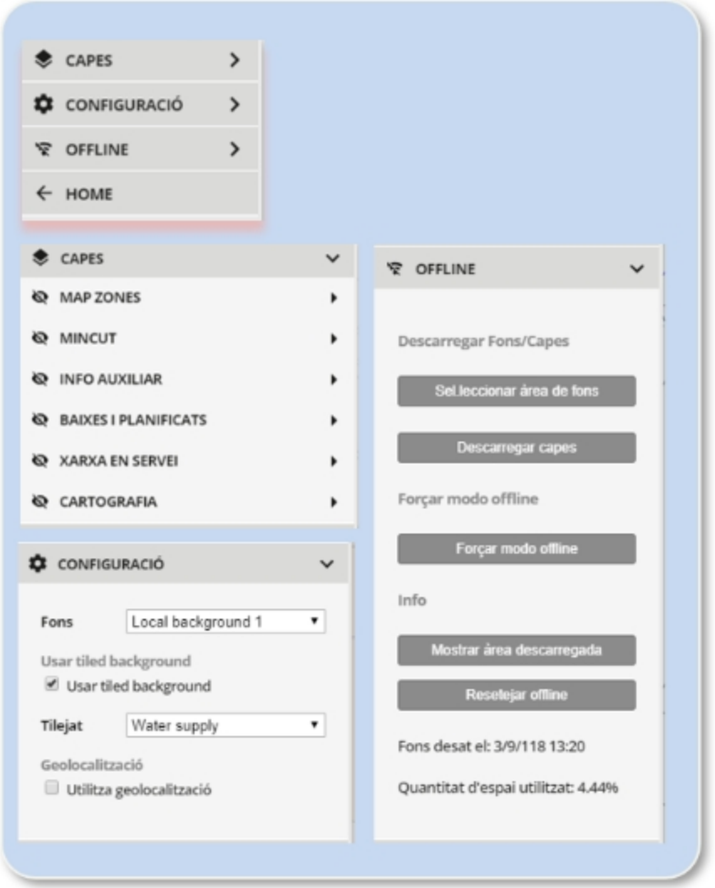


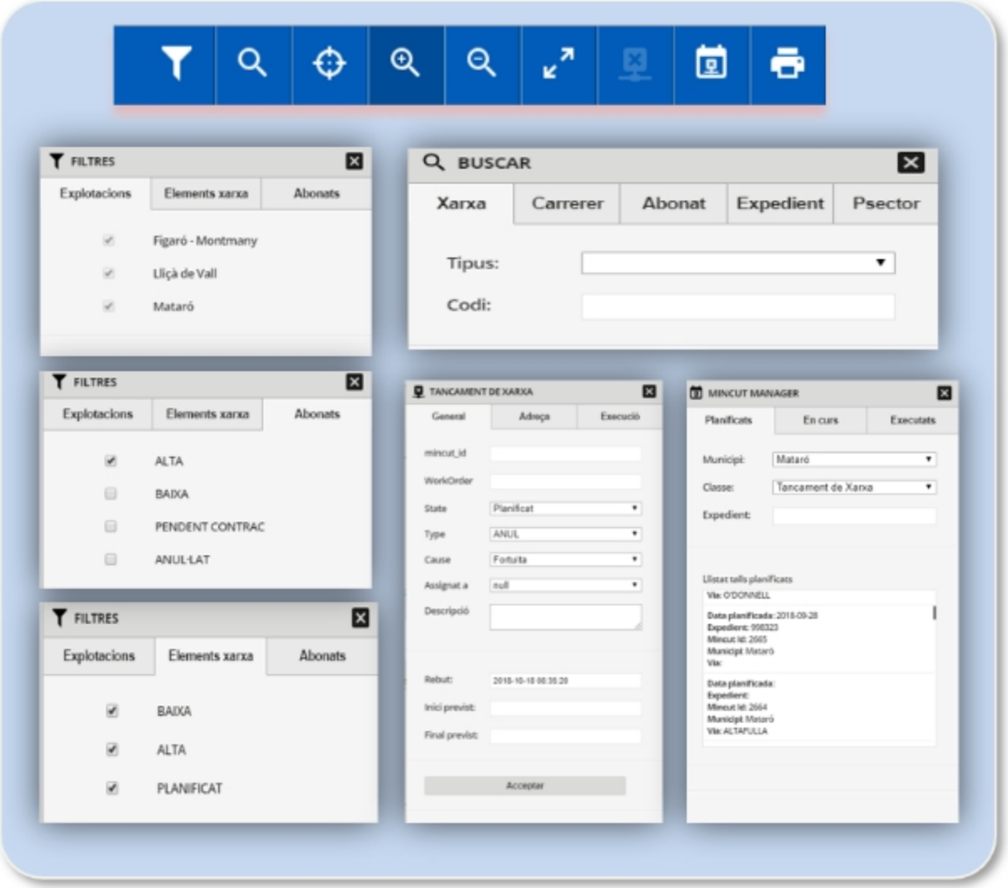


B'MAPS

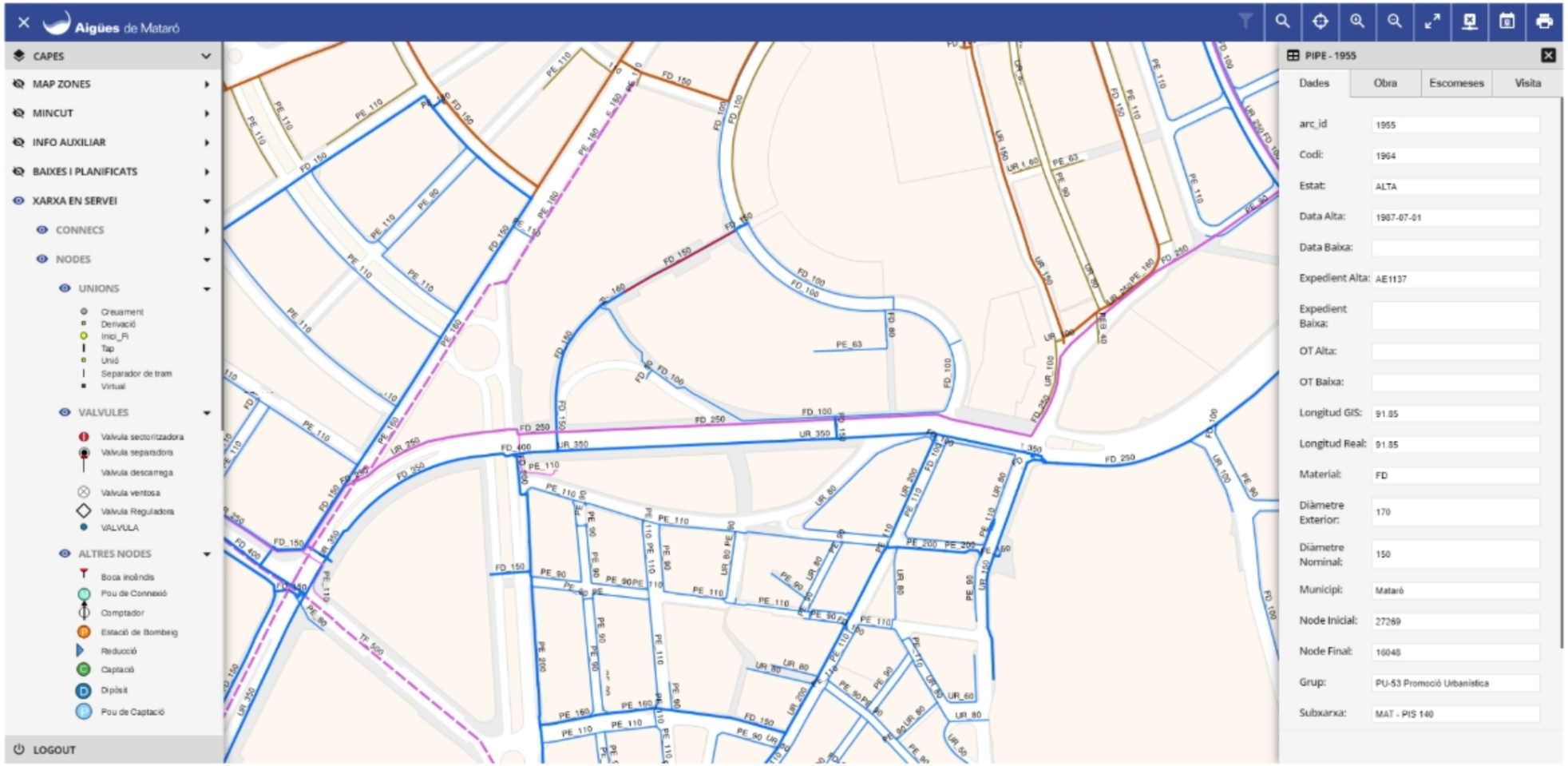

Benvinguts a B'MAPS
Gestió d'informació geogràfica
ENTRAR
Adreça email
jlsala@bgeo.es
Contrasenya
ENTRAR
B'MAPS
IDIOMES
Castellano | Català | English
Condicions d'ús | Privacitat

# Solució web i mòbil

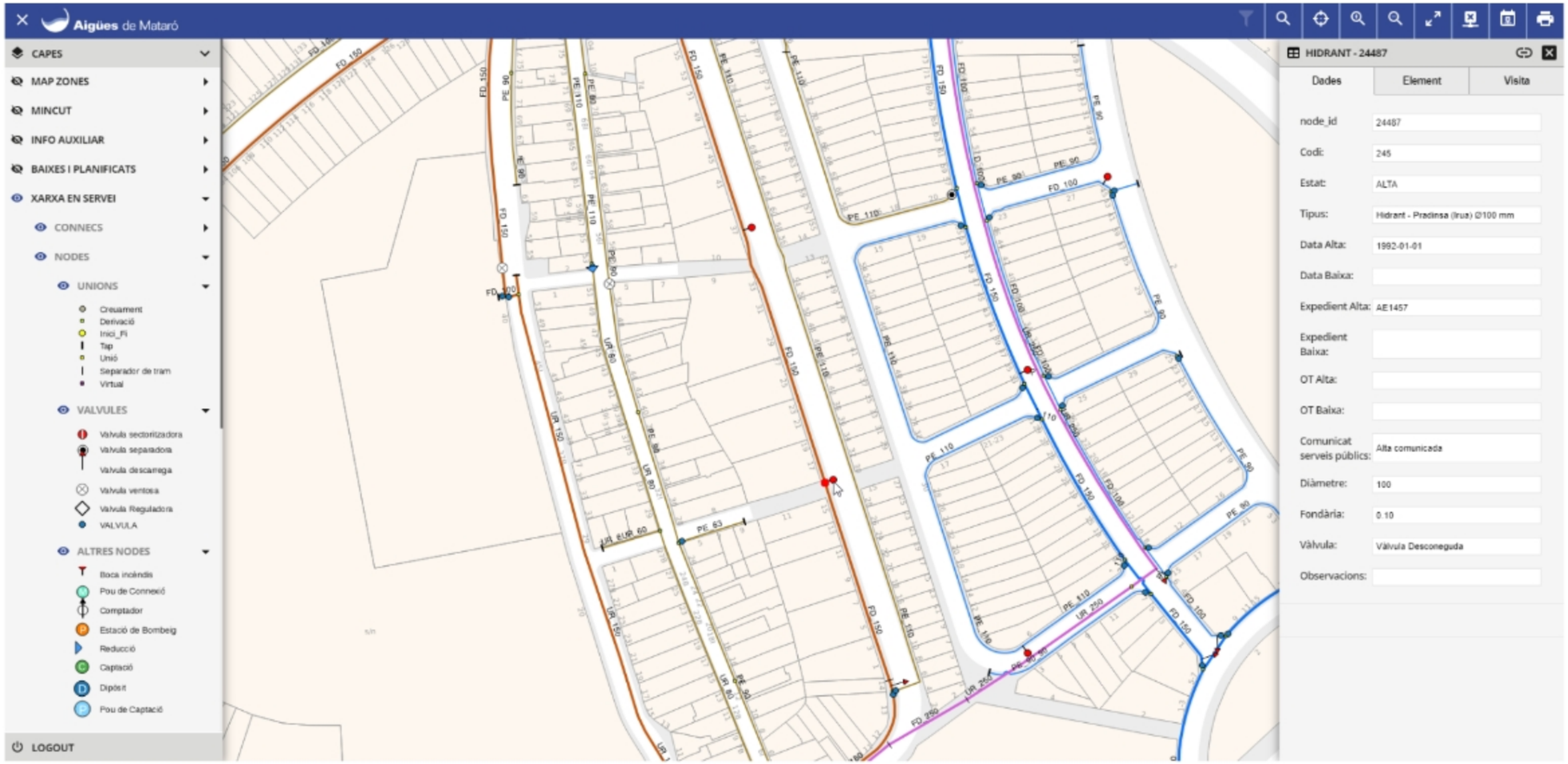


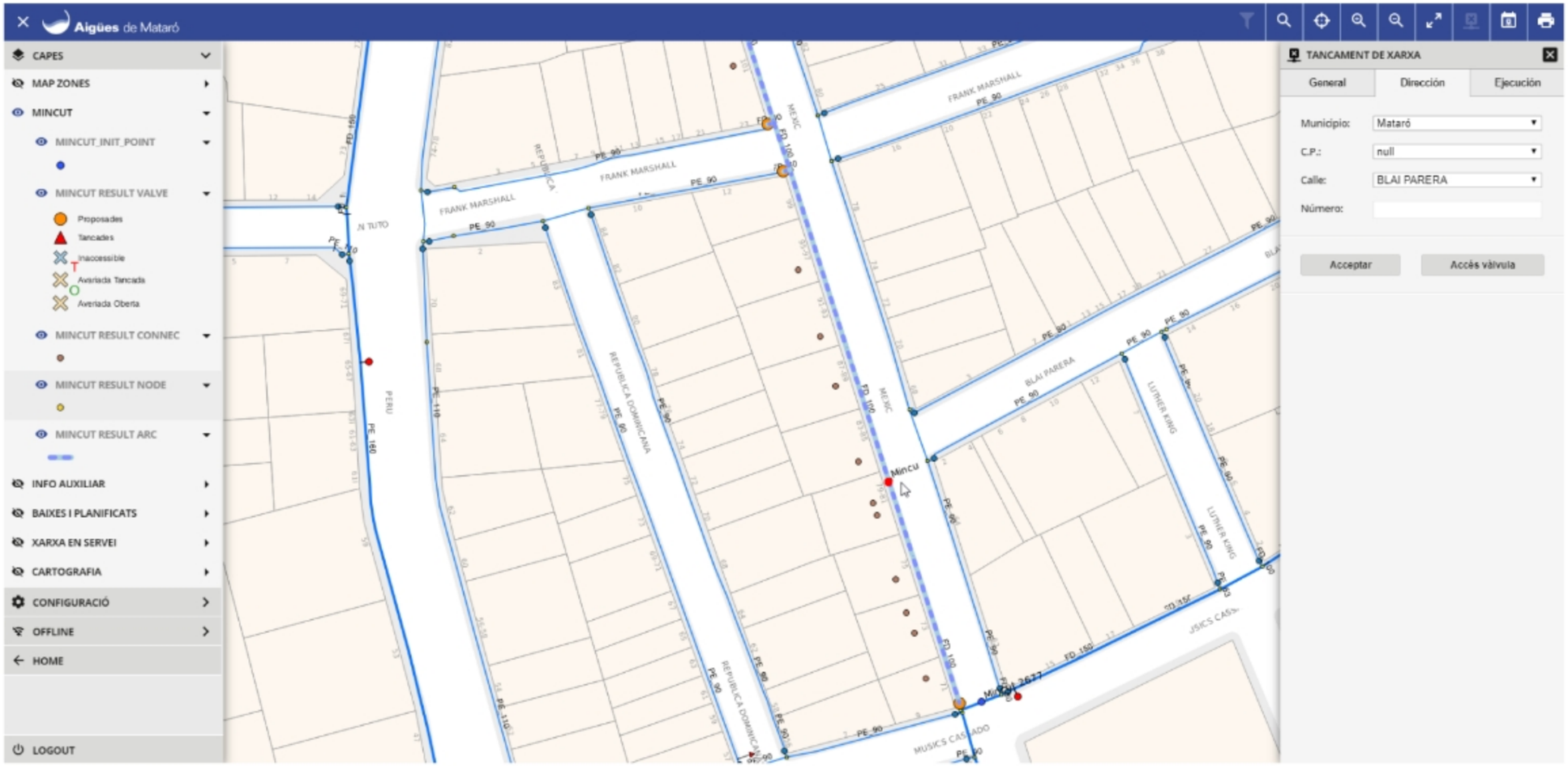
# Manteniment de l'inventari



# Gestió de la infraestructura



# Operativa de xarxa



# Projecte col.laboratiu

- *Col.laboració entre diferents companyies que formen part de la comunitat*
- *Programació de la versió 3 amb aportacions de les companyies*
- *Projecte en evolució i de futur, el futur que marca la comunitat*

- Aigües de Castellbisbal, SA
- Aigües de Mataró, SA
- Aigües de Vic, SA

- Aigües de Banyoles, SA
- Aigües de Barberà, SA
- Consorci d'Aigües de Tarragona
- Figueres de Serveis, SA
- Proveïments d'Aigua ,SA

- Aigües de Blanes, SA
- Aigües del Prat, SA

# GISWATER ASSOCIATION

info@giswater.org

giswater

HOME CONFERENCE SOFTWARE COMUNIDAD BLOG CONTACTO Español

- ASOCIACIÓN
- DONACIONES
- FORO
- EXPERTOS
- HAZ PARTE

## Historia

Giswater Association nació formalmente en febrero de 2014 fruto de la colaboración de di unieron para desarrollar una herramienta informática en código abierto para gestionar el ciclo integral del agua. Des de tion ha crecido en miembros y en actividades de difusión y promoción de esta plataforma.

## Misión

Giswater Association es una asociación sin ánimo de lucro legalmente constituida y de acurdo con lo que establece la Ley Orgánica 1/2002 de 22 de marzo. Sus fines son:

- Difundir los valores del software libre aplicados a la ingeniería y la gestión del ciclo del agua
- Desarrollar, promocionar y universalizar el uso de Giswater
- Contribuir a la investigación y desarrollo del conocimiento en las áreas de la gestión del ciclo integral del agua, la hidráulica de redes, la hidrología urbana y fluvial o la gestión del riesgo de inundaciones
- Constituirse como un referente internacional en estos ámbitos en base a sus proyectos e iniciativas

## Estructura

Giswater Asociation está formada y regida por sus asociados. La Asamblea general de Socios es el máximo órgano de decisión y se reúne, al menos, una vez al año. Entre las responsabilidades de la Asamblea están: