ÖSTAP
Engineering & Consulting GmbH

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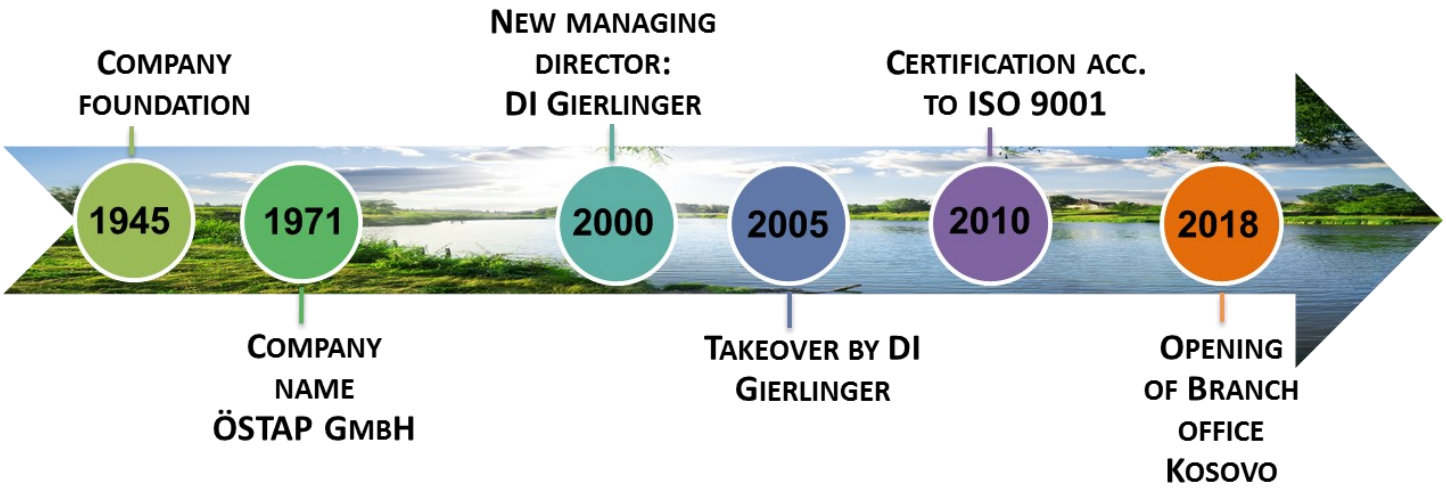
COMPANY PROFILE

ABOUT US



„Ideas for future challenges are created now."

DI CHRISTOPH GIERLINGER
MANAGING DIRECTOR

Due to our long tradition in the Austrian water and wastewater management, we offer customized solutions for our private and public clients.

Furthermore we are always endeavoured to adapt the expertise of our staff to latest technological trends, e.g. in the fields of hydrodynamical simulation, energy certificates or comprehensive solutions.

For more than 50 years we successfully realised numerous projects in Austria as well as abroad. We have provided support in the implementation for many satisfied clients. These experiences are also reflected at daily collaboration with our clients and partners.

Our team is known for in time taylored solutions according to the needs of our customers.

OUR PORTFOLIO.
AS DIVERSE AS OUR CLIENTS.

BUSINESS FIELDS	PORTFOLIO
Wastewater supply – Wastewater treatment plants	•Design •Project management •Handling of tendering procedures •Handling of subsidies & financing •Local construction supervision •Technical & financial controls •Accompanying control •Analysis of water and sewage •Health & Safety engineer
Water supply - Drinking water	
Waste management	
Digital pipeline management systems	
Surface water management	
Flood protection - Flowing water	
Hydrodynamical simulations	
Road design	

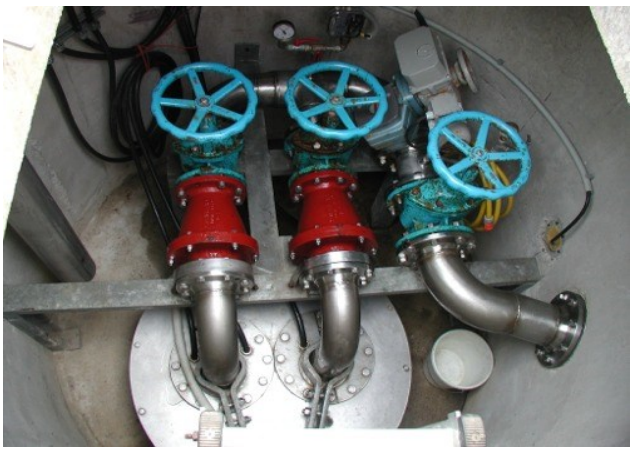
OUR VALUES & PRINCIPLES

OUR VALUES

friendly & respectful	Friendly interaction full of respect with one another and our customers and business partners is first priority.
reliable & motivated	We keep our promises and do not dread to push our limits.
competent & innovative	Based on our competences we like to strike new paths.
open-minded & willingness to learn	We think outside the box and enhance our professional competences through continuous training.
together & fair	We rely on relationship based partnershipsfull of support and integrity with one another and our external stakeholders.

WATER SUPPLY - DRINKING WATER

Water is the most important source of life. ÖSTAP offers all solutions for the supply of high quality drinking water. Our long time experience in designing water supply systems, drinking water treatment plants and water extraction facilities make us a reliable partner in all questions of the high quality product “drinking water”. We can offer a wide range of quality control and monitoring in all fields of water supply.



SCOPE OF SERVICES:

- Design of water supply systems
- Water reservoirs
- Water extraction facilities
- Water wells
- Drinking water treatment plants
- Pumping tests with
  qualitative and quantitative classification
- Hydraulic modelling of water pipe systems
- Technical inspection
  according to § 134 of Austrian federal water act

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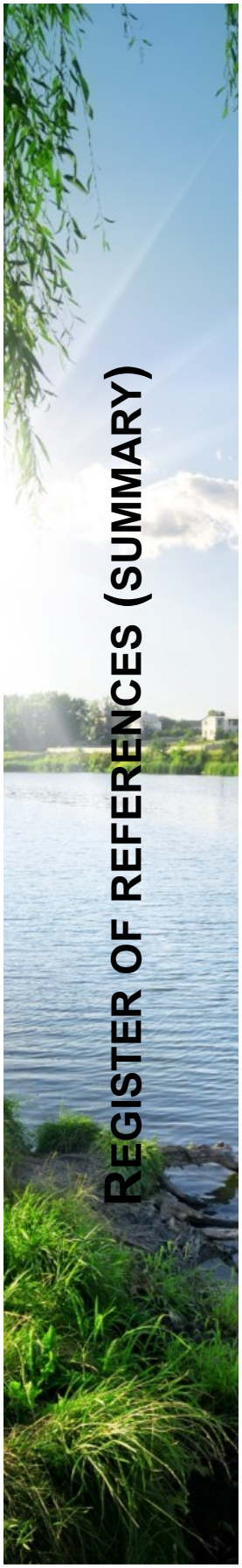

WATER SUPPLY - DRINKING WATER

CUSTOMER	PROJECT	COMPLETION
Municipality ACHAU	**Development area Sulzweg (BA 04)** Expansion of the local area around the settlement area as well as conversions in the exsisting network to optimize the operation pressure DN 150: 370m, DN 80: 526m, hydrants and house connections water law submission, funding processing, local construction supervision, handling of government aid	**2007/2008**
ecoplus - NÖ Wirtschaftsagentur GmbH	**Extension WP Wolkersdorf III (BA 10)** 177 m water supply Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2011**
Municipality STAATZ	**Settlement extension Enzersdorf (BA 07)** 467 m water supply Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2011**
Municipality PÖCHLARN	**Settlement extension Ahornstreet (BA 07)** 151 m water supply Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2012**
Municipality HAUSBRUNN	**Settlement extension 2012** 817 m water supply General project	**2012**
Municipality HARDEGG	**Transmission pipeline (BA 15), Settlement extension (BA 16)** 1.269 m transmission pipeline, 120 m water supply Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2013**
Municipality FALKENSTEIN	**Settlement extension (BA 02)** 231 m water supply General project	**2013**
Municipality POYSDORF	**Small settlement extension** 273 m water supply Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2013**
Municipality GASTERN	**Settlement extension „Bergsiedlung“ (BA 05)** Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2013**
EVN WASSER	**Connecting pipeline and link to water supply Litschau** Network calculation, submission and detail designing, tendering, handling of government aid, final approval	**2013**
Municipality LITSCHAU	**House connection Poindl (BA 09)** Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2013**
Municipality STAATZ	**Settlement extension Wultendorf (BA 06)** 1.048 m water supply Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2008-2013**
Municipality ACHAU	**Restoration of house connections and water supply in the area of state road B11 and B16** 200 m water supply, 40 house connections Submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2012/2013**
ecoplus - NÖ Wirtschaftsagentur GmbH	**Approval excisting water supply IZ NÖ Süd (Wiener Neudorf)** Line survey, network calculation, submission and detail designing, tendering, local construction supervision, handling of government aid, final approval	**2008-2014**

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WATER SUPPLY

Municipality HARDEGG

The municipality of Hardegg is located in the north of Lower Austria near the Czech border. It is a very sensitive area in the middle of the national park Thayatal, one of the most beautiful areas in Austria. Therefore the municipality is proud to have highest possible environmental standards.

The drinking water required for the supply area of the municipality of Hardegg has been withdrawn since 1972 through a horizontal drainage filter. The extracted water is transported via a booster pumping station and a transport pipe to the approx. 202 m higher water purification plant combined with a 1000 m³ water reservoir.

Beginning from 1988 ÖSTAP has carried out all necessary design, supervision and consulting works for the municipality, like design of new pipelines, renovation of existing pipelines, design of water purification station, tendering, etc.

Total length of system:	52 km
Fields of responsibility:	Concept design for the whole municipality, detail design, tendering, local construction supervision and construction management, construction safety engineer, final approval and handling of subsidy
Water extraction:	30 l/s Bank filtration of the river Thaya
Water treatment:	Demanganing and deironing filter Neutralisation and desinfection (chlorination)
Water storage:	1 reservoir V = 1000 m³ 1 reservoir V = 400 m³
Supported Villages:	Hardegg, Pleissing, Waschbach, Heufurth, Riegersburg, Mallersbach, Felling, Niederfladnitz, Weitersfeld, Oberfladnitz, Hofern
Total water consumption per year:	approx. 140,000 m³

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WASTEWATER

Wastewater systems and wastewater treatment have been two of the core competences of our work during the last 50 years. Therefore ÖSTAP has a wide ranged experience in this field. Since the early days of the company we have concentrated on designing wastewater treatment plants.

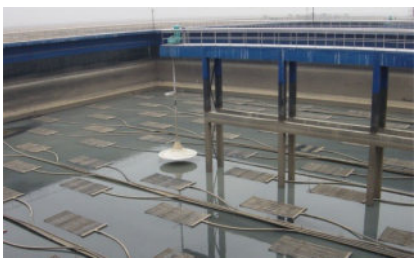
Together with strong partners we have participated in tenders all over the world, like in China, Cypress, Bulgaria, Latvia, Romania, Turkey, Croatia, etc. Wastewater pipelines and treatment is still one of our core competences.

Following the trend of digitalisation, modelling of wastewater systems becomes more and more important. Therefore we improved our skills in hydraulic modelling throughout the last years continuously. At present we are also authorised dealer for hydraulic modelling software Kanal ++ and Aqua++.

In case you are looking for a competent partner solving your wastewater problems, ÖSTAP is the right choice!

SCOPE OF SERVICES:

- Wastewater systems &
  Wastewater treatment plants
- Pre-cleaning of industrial wastewater
- Digitalisation of existing sewage systems
- Hydraulic modelling of pipe systems
- Digital documentation including TV-inspection
- Renovation of the wastewater pipelines
- Industrial wastewater treatment
- Legal consulting in wastewater topics



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WASTEWATER TREAMENT PLANTS

CUSTOMER	PROJECT	PE	COMPLE-TION
VA TECH - WABAG	**WWTP Huludao (China)** SBR Technology 4 SBR basins, sludge line with stabilization and 2 sludge centrifuges Scope of Work: General design, technical consulting	**210.000**	**2004**
PETERS ENGINEERING	**WWTP Koprivnica (Croatia)** SBR technology 4 SBR basins, Sludge line with sludge centrifuge Scope of Work: General design, detail design, local construction supervision	**100.000**	**2007**
Municipality HARDEGG	**WWTP Pleissing (Austria)** SBR Technology 2 SBR basins, 2 sludge drying beds 690 m³, pumping station in Niederfladnitz (850 PE) Scope of Work: General design, detail design, static calculation, tendering, construction supervision, health & safety engineer, project management, handling of subsidies, final approval	**1.760**	**2008**
Municipality LITSCHAU	**WWTP Litschau (Austria)** SBR Technology Reconstruction and extension under full operation 3 SBR basins, mechanical pre-treatment Scope of Work: General design, detail design, static calculation, tendering, construction supervision, health & safety engineer, project management, handling of subsidies, final approval	**6.000**	**2009**
STRABAG Umweltanlage GmbH	**WWTP Iasi (Romania)** Support and documentation of operation during rial period Scope of Work: Measuring wastewater parameters / sample analysis Elaboration of sampling strategy: Determination of sample points and timing Training laboratory staff, support in sample analysis	**933.300**	**2012**
Ecoplus GmbH	**WWTP Industrial park Wienner Neudorf** Conventional technology Renovation of plant under full operation Change of fine screen, new sludge centrifuge, surface renovation of basins, impementation of new scada system Scope of Work: Detail design, tendering, local supervision, project management, technical consulting	**15.000**	**2015-2017**
Municipality ACHAU	**WWTP Achau** SBR Technology 3 SBR basins, mechanical pre-treatment, sludge dewatering by screw press Design of a waste collection center and builders yard Scope of Work: General design, detail design	**3.100**	**2013 - 2015**
Municipality TADTEN	**WWTP Tadten** Renovation of plant under full operation Analysing plant performance, change of fine screen, implementation of new scada system Scope of Work: Detail design, tendering, local supervision, project management, technical consulting, handling of subsidies	**3.000**	**2013-2014**
Municipality KISELJAK	**WWTP Kiseljak (Bosnia & Herzegov.)** SBR Technology 4 basins, mechanical pre-treatment, sludge dewatering general design, detail design	**40.000**	**2012**

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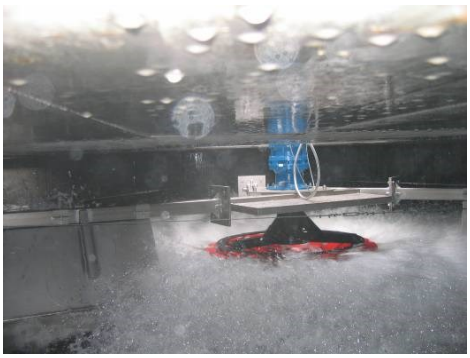
WWTP PLEISSING (Austria)

Contractor: Municipality of Hardegg
Capacity of the plant : 1760 PE (Population equivalents)

The wastewater of the villages Pleissing, Waschbach, Niederfladnitz and Heufurth is treated in the wastewater treatment plant located in Pleissing. The plant is designed as sequenced batch reactor (SBR-Technology). The sludge treatment is done through special wetland drying beds. With this process the sludge is turned into earth, which can be used for gardening. This process is consuming very low energy and is therfore very cost effective.



Scope of work:

- Feasibility study and financial assessment regarding the location of the plant
- General design for construction permit and Austrian Waterlaw permit
- Detail design
- Static calculation and construction design
- Tendering process
- Tender evaluation
- Local construction supervision
- Health and Safety Engineer
- Project management
- Handling of subsidy

Average inflow: 395 m³/d

Stages of the plant:

Mechanical pre-treatment
Compact device: fine screen, sand trap, grease trap
Biological stage
2 SBR-basins V= 442 m^3
Sludge storage
1 sludge tanks V= 360 m³
2 sludge drying beds/yards with 210 m²

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WWTP LITSCHAU (Austria)

Contractor: Municipality of Litschau
Capacity of the plant : 6.000 PE (Population equivalents)

As the existing wastewater treatment plant was not anymore state of the art regarding cleaning performance and the requirements of the EU Water Framework directive, a refurbishment had to be done. During the adaption process the plant operation had to be secured at any time. Additionally the space for extension was very limited, therefore all the construction steps had to be designed very carefully and precisely.

The construction phase started on 30.10.2007 and after a short time the SBR-treatment tanks were put into operation. The taking over of the project took place on 20.04.2009.

Scope of work:

- Feasibility study and financial assessment regarding the location of the plant
- Conceptual design for the tender
- Detail design for construction permit and Austrian Waterlaw permit
- Tendering process
- Tender evaluation
- Local construction supervision
- Handling of subsidy
- Project management
- Health and Safety Engineer

Average inflow:
1.200 m³/d

Stages of the plant:

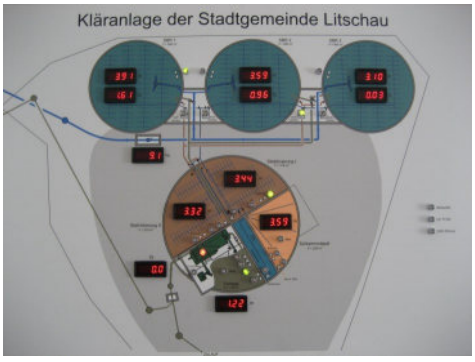
Mechanical pre-treatment
Compact device: fine screen, sand trap, grease trap

Biological stage
3 SBR-basins V = 890 m^3

Sludge storage
1 sludge tanks 226 m³

Sludge dehydration with centrifuge

Biofilter for exhaust air purification



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WWTP Koprivnica (Croatia)

Contractor: Municipality of Koprivnica
Capacity of the plant : 100.000 PE (Population equivalents)

Koprivnica is a municipality in the northeast of Croatia. About 40 % of the sewage of the city consists of industrial wastewater (Heineken brewery and Podravka alimentary).

ÖSTAP as designing company with its partners Tehnika, Biogest and Peters Engineering provided the best technical and financial solution during a tendering process.

The building permit was issued in June 2006 and the operation of the wastewater treatment plant started in April 2007 (trial period). The taking over was done 2009.

Scope of work:

- Concept design for tender
- Detailed design
- Process design
- Project management
- Technical consulting during execution
- Local technological supervision

Average inflow: 17.000 m³/d

Stages of the plant:

Mechanical pre-treatment
Coarse screen, fine screen, sand trap, grease trap
Biological stage
4 SBR-basins V= 5.990 m³
Sludge storage
3 sludge tanks V= 1.900 m³
Sludge dehydration
1 sludge centrifuge

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WWTP HULUDAO (China)

Contractor: WABAG AG/Municipality of Huludao
Capacity of the plant : 210.000 PE (Population equivalents)

Huludao is a small Chinese city 400 km north-east of Beijing at the coast of the Yellow Sea. In the year 2001 VATECH-WABAG took part in a tender for the wastewater treatment plant of Huludao and ÖSTAP was engaged to do the concept design and dimensioning for this plant.
In 2002 our work started and was finished in the year 2004.

Fields of responsibility:

- Concept design for the tender
- Technical consulting
- Support for the detailed design together with Chinese partners

Average inflow:
70.000 m³/d

Stages of the plant:

Mechanical pre-treatment
Coarse screen, fine screen, sand trap, grease trap
Biological stage
4 SBR-basins, each approx. 12.400 m^3
Sludge storage
2 sludge tanks, each approx. 3.100 m³
Sludge dehydration
2 sludge centrifuges

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WWTP IASI (Romania)

Contractor: Strabag AG

Capacity of the plant : 933.300 PE (Population equivalents)

The wastewater treatment plant Iasi has a capacity of **933.300 PE_{60}** and is divided into two lines (line 1: existing old plant; line 2: wastewater treatment according to the **AB-process.)**

Capacity of the plant:

Inflow (dry weather)	280.000 m³/d
BSB_5 - freight:	56.000kg/d
PE_{60} :	933.300 EW_{60}

The entire wastewater purification plant was only designed for carbon removal. For the future construction stages, the installation of nitrogen removal is planned.

Installed plant parts WWTP Iasi - line 2:

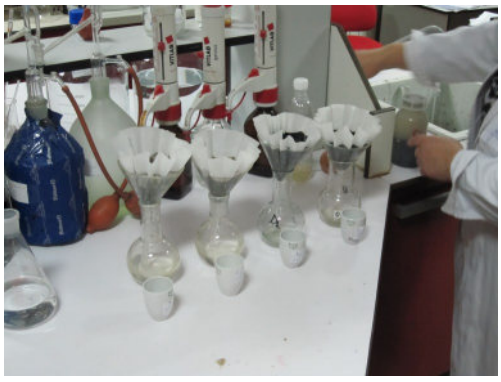
Wastewater line: coarse screen, inlet pumping station, fine screen, aerated sand and grease trap (A-stage), primary sedimentation tank, return sludge pumping station (A/B-stage), aerobic selector, aeration tank (B-stage), final clarifier, outlet pumping station

Sludge line: static thickener - primary sludge A-stage, mechanical excess sludge thickener B-stage, anaerobic sludge stabilization - digestion, sludge dehydration

Gas line: Biogas storage, gas torch, Biogas Co-generation, Boiler-unit

Scope of work:

- Support of sewage treatment plant operation
- Documentation wastewater treatment plant operation - Logging
- Sewage parameters / sample analysis
- Sampling: Determination of sample points and timing
- Training laboratory and support in sample analysis
- Project development in English



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WASTEWATER SYSTEMS

CUSTOMER	PROJECT	COMPLETION
Municipality ACHAU	**Extension settlement area Sulzweg (stage 05)** Recalculation of existing network as well as new construction of the sewer systems in the area of Sulzweg DN 600: 22 m, DN 400: 219 m, DN 300: 277 m, DN 200: 492 m, DN 150: 286 m, pressure pipe DN 100: 547 m surface water removal via infiltration submission– and detail designing, tender, local construction supervision, handling of government aid, final approval	**2007/2008**
Medimurske Vode Cakovec (Croatia)	**Sewage system Novo Selo na Dravi, Totovec, Šandorovec and Kuršanec** General design and detail design for the sewer system as well as sewage treatment plant for Novo Selo na Dravi, Totovec, Šandorovec, Kuršanec	**2010**
Municipality ACHAU	**Pumping station Siedlerstraße (stage 07)** Construction of mixed water pumping station with 2 rainwater—and 2 wastewater pumps, restoration of rain water overflow and retaining the first flush of storm water, installation of rack	**2010/2011**
Municipality HERRNBAUM-GARTEN	**Extension sewage system Herrnbaumgarten (stage 06)** 187 m sewage system, rain water overflow RÜ3 with inlet and outlet channel, adjustment of mixed water system submission– and detail designing, tender, local construction supervision, handling of government aid, final approval	**2010-2011**
ecoplus. NÖ Wirtschafts-agentur GmbH	**Extension industry park Wolkersdorf III** Each 1.200 m rainwater and wastewater system submission– and detail designing, tender, local construction supervision, handling of government aid, final approval	**2011**
Municipality STAATZ	**Extension settlement Enzersdorf (stage 06)** 400 m sewage system submission– and detail designing, tender, local construction supervision, handling of government aid, final approval	**2011**
Schön Wohnen IMMORENT Ges.m.b.H.	**Infrastructure "Wohnpark Försterweg"** wastewater sewage 1.050 lfm stone ware DN 200-250 rain water sewage 400 lfm DN 300-400 5 retention basins, 900 lfm retention trences: local construction supervision	**2012**
Municipality PÖCHLARN	**Extension settlement Ahornstreet (stage 09)** 150 m sewage system Submission designing, tender, local construction supervision, handling of government aid, final approval	**2012**
ecoplus. NÖ Wirtschafts-agentur GmbH	**Extension industry park Bruck, street 2 (stage 03)** Each 50 m rainwater and wastewater system Submission designing, tender, local construction supervision, handling of government aid, final approval	**2012**
Municipality HAUSBRUNN	**Extension settlement area 2012** wastewater system 650 m rain water system 507 m retention basin 339 m³ General project	**2012**

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WASTEWATER SYSTEMS

CUSTOMER	PROJECT	COMPLETION
Municipality HARDEGG	**Extension of settlement area Riegersburg (stage 15)** 120 m wastewater system submission– and detail designing, tender, local construction supervision, handling of government aid, final approval	**2013**
Municipality HALBTURN	**Extension of settlement area "Auf der Wiese"** 450 m wastewater system, 1 pumping station, road planning	**2013**
Municipality FALKENSTEIN	**Extension of settlement area 2013 (stage BA 02)** wastewater system 220 m rain water system 301 m drainage pipes 168 m General project	**2013**
Municipality LAA/THAYA	**Hydraulic recalculation existing sewage system "Am Anger"**	**2013**
Municipality POYSDORF	**Small extension of settlement area 2013** wastewater system 280 m rain water system, 357 m submission– and detail designing, tender, local construction supervision, handling of government aid	**2013**
Municipality GASTERN	**Extension of settlement area "Bergsiedlung" (stage 16)** submission– and detail designing, tender, local construction supervision, handling of government aid	**2013**
Municipality STAATZ	**Sewage system Staatz (stage 05)** wastewater system 1.049 m rain water system, 1.018 m submission– and detail designing, tender, local construction supervision, handling of government aid	**2008-2013**
Municipality POYSDORF	**Sewage system Poysdorf (stage 14 - 16)** wastewater system 11.379 m new building 121 m reconstruction rain water system 835 m new building 273 m reconstruction mixed water system 226 m new building 3.722 m reconstruction pressure pipe 1.054 m pumping station 7 l/s submission– and detail designing, tender, local construction supervision, handling of government aid	**2008-2013**
Stadtgemeinde LITSCHAU	**Extension of settlement area „Gopprechts" (stage 17)** wastewater system 3.268 m DN 150-200 pressure pipe 1.107 m DN 50-80 pumping stations 3 pieces submission– and detail designing, tender, local construction supervision, handling of government aid	**Since 2013**
Various employers	**Indirect discharger report for municipalities** HERRNBAUMGARTEN, ACHAU, GROSSKRUT, STRONSDORF, WILDENDÜRNBACH, HAUSBRUNN, LITSCHAU, ALTLICHTENWARTH, Municipal wastewater association of LAAER BECKEN	**2008-2016**

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Wastewater system Business park Wolkersdorf

Contractor: ecoplus nö-Wirtschaftsagentur GmbH
Implementation time: 2004 - 2011 (3 phases)

The Business park Wolkersdorf was established in the years 2004 to 2011. The park covers an area of 91 hectares and up to now 102 companies have been established in the park.

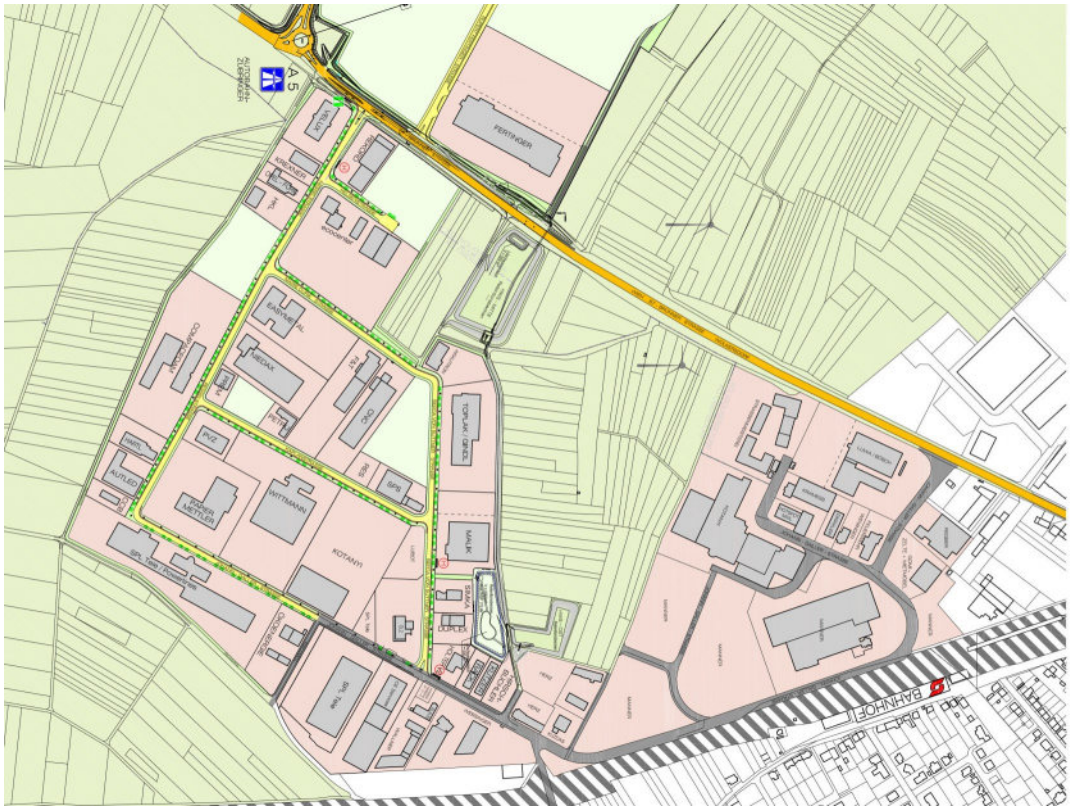
ÖSTAP was responsible for the wastewater-, stormwater- and the watersupply system. Additionally technical consulting was provided regarding the companies which settled in the park.

Scope of work:

- General and detail design
- Tendering process
- Tender evaluation
- Local construction supervision
- Taking over procedure
- Legal approval of as built design
- Health and Safety Engineer
- Project management
- Handling of subsidy

Technical data:

Wastewater system:	
DN 200 - 350	1.200 m
Rain water system:	
DN 400 -1600	1.200 m



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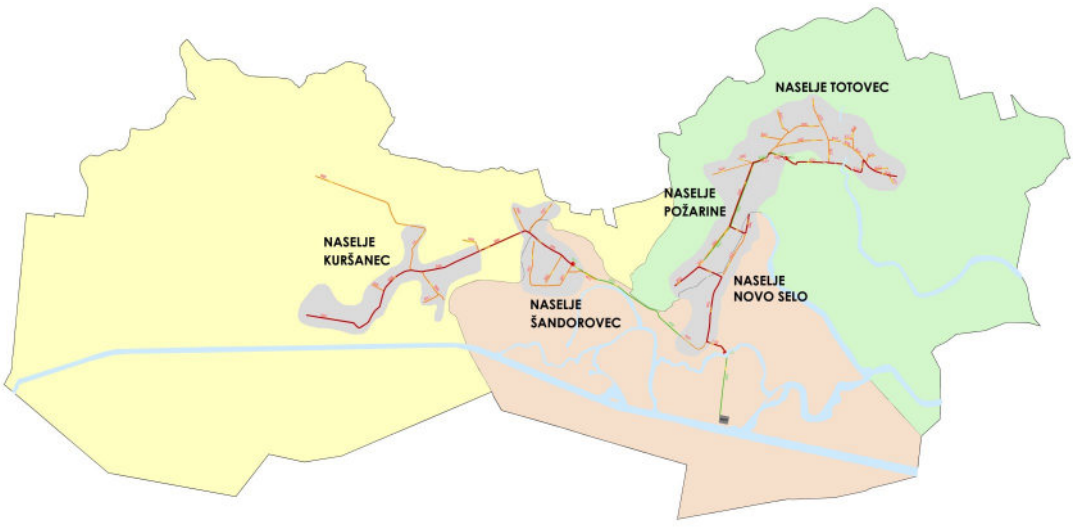
WASTEWATER SYSTEM NOVO SELO (Croatia)

Contractor: Medimurske Vode Cakovec
Implementation time: 2009 - 2010

This project includes the general design and the detailed design of wastewater- and surface water pipe system of the municipalities Novo Selo na Dravi, Totovec, Šandorovec and Kuršanec, and the wastewater treatment plant in Novo Selo na Dravi. The Municipalities are located in the district of Čakovec in the north of Croatia.

The wastewater is treated in a wastewater treatment plant with SBR-Technology in Novo Selo na Dravi. The cleaned wastewater is discharged into the river Drau through an existing network . The project was carried out on behalf of Medimurske vode (local water authority).

Fields of responsibility:	General design for construction permission detail design preparation of tender documents
Wastewater system:	Pipe diameter 250 - 350 mm
	Novo Selo na Dravi: 4.660 m
	Totovec 3.400 m
	Šandorovec 4.000 m
	Kuršanec 4.720 m
Surface water system:	Pipe diameter 300 - 800 mm
	Novo Selo na Dravi: 3.260 m
	Totovec 4.750 m
	Šandorovec 3.430 m
	Kuršanec 4.895 m
Pressure pipe, overall:	Pipe diameter 200 approx. 2,8 km
Sewage pumping station:	3 pieces
Capacity of the WWTP:	5.000 PE (population equivalent)



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WASTEWATER SYSTEM HARDEGG (Austria)

Contractor: Municipality of Hardegg (Austria)
Implementation time: 1991 - 2010

The municipality of Hardegg is located in the north of Lower Austria near the Czech border. It is a very sensitive area in the middle of the National park Thayatal, one of the most beautiful areas in Austria.
The municipality of Hardegg consists of overall 9 villages. In 1991 ÖSTAP elaborated to provide a study about sewage system of the whole municipal area. The result of this study was the installation of 5 sewage plants and the corresponding local network.
The whole building project was divided into 9 phases of construction.

Fields of responsibility:

- Feasibility study including financial assessment or the whole municipality
- General design for construction permit and permit according to Austrian water law

For 9 phases of construction:

- Detail design
- Tendering process, Tender evaluation
- Local construction supervision
- Taking over procedure
- Legal approval of as built design
- Health and Safety Engineer
- Project management
- Handling of subsidy
- Technical consulting water and wastewater

Stages of sewage system:

17.700 m vitrified clay & GRP pipe
diameter 200
14.100 m pressure pipe PE HD & GGG
50-100 pipe diameter 16 pumping stations
4 wastewater treatment plants
approx. 800 private house connections

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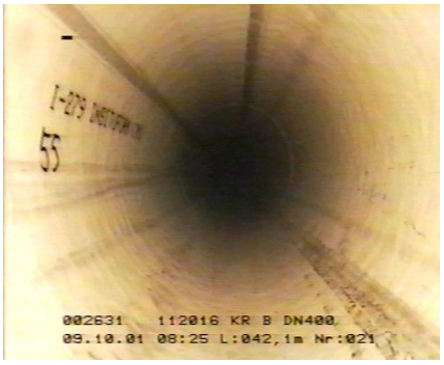
DIGITAL PIPELINE MANAGEMENT SYSTEM

Damaged, ineffective and hydraulic overloaded pipe systems are potential sources of danger for the environment because of the risk of flooding, collapse of pipes and contamination of groundwater and soil caused by harmful substances.
Furthermore an increased sewer infiltration water quotient in damaged pipes leads to an hydraulic overload of the pipe system and the WWTP.

Many sewage systems have been in use for several decades, therefore the necessity of renovation is steadily increasing.
ÖSTAP has also specialised in this field and can offer professional support for all different tasks of detection and documentation of damages as well as restoration of sewage systems.
A digital database provides a good overview of the pipe system and is the basis for future renovation and maintenance strategies. ÖSTAP provides a wide range of knowledge in preparation of digital pipe information system as well as software products in this field.



SCOPE OF SERVICES:

- Monitoring of existing pipe systems
- Digital database for wastewater and water supply pipe systems
- Digital pipe information system
- Hydraulic modelling of existing pipe systems
- Tendering and monitoring of pipe inspections (TV– inspections)
- Tendering and monitoring of pipe testing (pressure test)
- Visual or TV inspection of manholes and special buildings (pumping stations etc.)
- Interpretation of the output of inspections and surveys
- Elaboration of cadastral maps of damages
- Designing of rehabilitation and renovation measures
- Tendering
- Monitoring of restoration works
- Local construction supervision
- Implementation in GIS Systems
- Handling of subsidies

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DIGITAL PIPE INFORMATION SYSTEM

CUSTOMER	PROJECT	COMPLETION
Municipality GASTERN	**Digital pipe information system & damage assessment** KG Frühwärts: 3.070 m wastewater system DN 150-600mm KG Garolden: 7.621 m wastewater system DN 150-1000mm Township area: 23.100 m sewer pipes DN 150-1000mm and 440 shafts Measures of restoration: robotics restoration, inliner restoration, trench	**2004 2007 2014**
Municipality MÖNCHHOF	**Damage cadastre & restoration whole sewer system** Overall pipeline length 9.883 m combined wastewater sewer pipe diameter 200 - 1.200 Measures of restoration: Inliner, robotics restoration, quick-lock collar, manual restoration, men hole restoration	**2006**
SHELL Austria GmbH	**Damage cadastre & restoration of industry area „Werk Lobau“** approx. 12.000 m SW-sewer pipe diameter 150-500 inspection measures of restoration: robotics restoration, inliner restoration	**Since 2008**
Municipality LITSCHAU	**Damage cadastre & restoration whole sewer system** 17.600 m combined wastewater sewer Measures of restoration: Inliner, robotics restoration, quick-lock collar, manual restoration, men hole restoration	**Since 2012**
Municipality ACHAU	**Damage cadastre & restoration whole sewer system** 12.975 m combined wastewater sewer pipe diameter 150-200mm Measures of restoration: Inliner, robotics restoration, quick-lock collar, manual restoration, men hole restoration	**2011 - 2013**
Ecoplus GmbH	**Damage cadastre & restoration of industry area IZ NÖ SÜD** Overall pipeline length sewer system: 32.360 m Overall pipeline length water: 12.900 m Wastewater sewer pipe diameter 150 - 500 mm Rain water sewer pipe diameter 250 - 1.200 mm	**Since 2009**
Municipality ANDAU	**Damage cadastre** 36,5 km mixed - and rain water system, 10,6 km house connections	**2012-2014**
Municipality MÖNCHHOF	**Water pipeline cadastre** 23,5 km water pipeline, 950 m house connections	**2013-2014**
Municipality GROSSKRUT	**Sewage and water pipeline cadastre** 29 km mixed water system, 26 km water pipeline	**2013-2014**
Municipality FALKENSTEIN	**Sewage and water pipeline cadastre** 6,5 km rain water system, 7 km water pipeline	**2013-2014**
Municipality ACHAU	**Water pipeline cadastre** 15,5 km (incl. house connections to water flow meter)	**2014**
Municipality APETLON	**Sewage cadastre** 21,1 km mixed water system with 6,5 km house connections	**2013-2015**
Municipality PAMHAGEN	**Sewage cadastre** 13,8 km mixed water system with 6,0 km house connections	**2013-2015**
Municipality WALLERN	**Sewage cadastre** 16,4 km mixed water system with 5,0 km house connections	**2013-2015**

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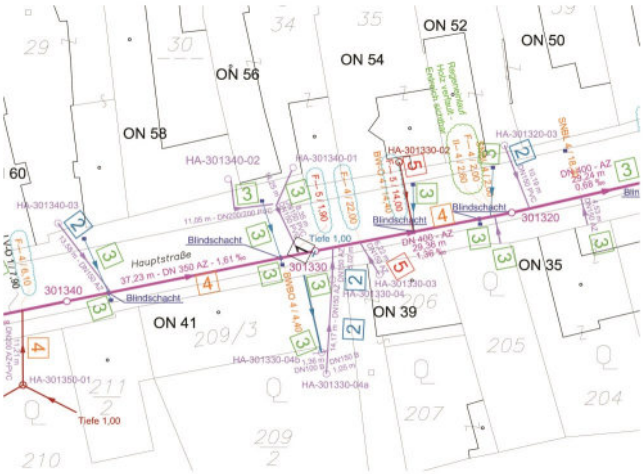
PIPE RENOVATION ACHAU (Austria)

Contractor: Municipality of Achau (Austria)
Implementation time: 2013 - 2014

The wastewater system of the municipality of Achau was mainly built in 1961. According to the age of the pipes some damages were noticed and also infiltration of groundwater was recorded at the inflow of the existing wastewater treatment plant .
Therefore the municipal government decided to review and check the whole wastewater– and watersupply system of the municipality, including house connections.
After performing a TV-inspection of the pipe all the found defects were categorized in 5 groups (1 = light damage up to 5 = severe damage, imminent danger).
According to these results a restauration strategy was elaborated and the renovation works were tendered.
After finishing the renovation work a significant improvement regarding the groundwater infiltration was measured at the inflow of the wastewater treatment plant.
The renovation work was additionally checked with TV-inspection.

Scope of work:

- Geodetical measurement of all manholes
- Elaboration of digital pipe database
- Preparation of an electronic site plan of the whole water- and wastewater system
- Tendering of TV-inspection works
- Supervision of TV-inspection
- Clustering of found defects
- Elaboration of renovation strategy
- Design of each renovation measure
- Tendering of renovation works
- Construction supervision
- Health and Safety Engineer
- Handling of subsidies



Pipe length:

- 11 km sewage system, 380 house connections
- 15,5 km water supply system incl. house connections

Restoration methods:
roboter restoration, inline system, partliner, quick lock, manual restoration

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WASTEWATER SYSTEM
Businesspark Wiener Neudorf (Austria)

Contractor: ecoplus nö-Wirtschaftsagentur GmbH
Implementation time: 2010 - 2014 (4 phases)
Topic: Renovation of pipe system, Digital database of pipe system

Ecoplus GmbH is operating the Business park in Wiener Neudorf with a total area of 350 ha. Up to now around 380 companies have been established in the park and app. 11.500 people are working there.
Ecoplus is operating the whole park, which includes a separate wastewater– and stormwater system, drinking water supply and a wastewater treatment plant.
ÖSTAP is doing technical consulting for the whole infrastructure since 1988.
As the oldest parts of the wastewater system are dating to the year 1945, ÖSTAP received the order to create a digital database of all the pipelines in the park as well as CAD base as built plan. Based on this data a TV-inspection and a damage evaluation was done. After that restoration, works were tendered and performed.

Overall length pipe system: 30.885 m waste and rain water sewage system

Scope of work:
Geodetical measurement of all manholes
Elaboration of digital pipe database
Preparation of an electronic site plan of the whole water- and wastewater system
Tendering of TV-inspection works
Supervision of TV-inspection
Clustering of found defects
Elaboration of renovation strategy
Design of each renovation measure
Tendering of renovation works
Construction supervision for renovation works
Health and Safety Engineer
Handling of subsidies

Survey methods: TV– inspection, pressure test of the manholes, and pipes

Damages at the sewer system: Consolidated accumulations, barriers (roots, extended branches), leaky joints, cracks (radial, length, transverse), corrosion, missing fragments

Restoration measures: High pressure cleaning, mechanical cleaning, robot restoration, partliner, inliner, new building, quick-lock

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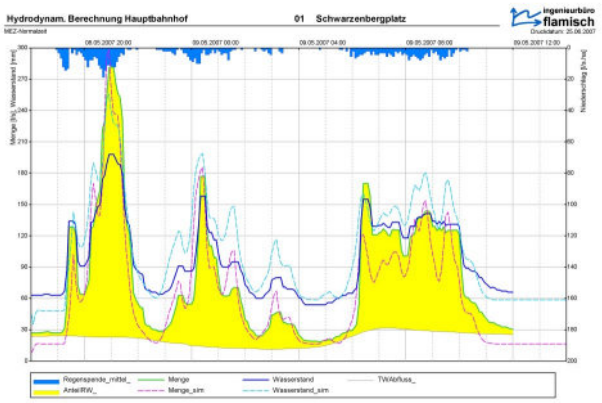
HYDRAULIC - HYDRODYNAMIC MODELLING

Hydrodynamic modelling of pipe systems is a perfect tool to display the flow conditions in the pipe very precisely. Based on the digital model the analysis of the existing network as well as for optimization and design for extension can be done.

The following steps have to followed for creating a hydraulic model of a pipe system.



Preparing a digital model of the pipe system:
Following data is required:

- Digital as built documentation
- Information about pipes like diameter, material, inclination
- Catchment area
- Statistic rainfall data
- Amount of wastewater

Calibration of the system:
To create a reliable digital model, calibration of the model is necessary.
Parallel measurements of rainfall, water level and pipeflow have to be carried out through a representative period of time (3-12 months).
Results of the measuring campaign have to be compared to computed figures. In case of differences the digital model has to be adjusted until reality and computed figures are equal

Simulation:
Once the model is calibrated numerous calculations can be performed and different scenarios can be simulated.

Results:
Layout drawings and longitudinal sections showing the hydraulic capacity of the pipe system and flood problems. charts for water level and flow.

Conclusion:
The last, but most important step is the interpretation of results and the "translation" into concrete measures and decisions.

SCOPE OF SERVICES:

- Monitoring of existing pipe systems
- Digital database for wastewater and water supply pipe systems
- Digital pipe information system
- Hydraulic modelling of existing pipe systems
- Tendering and monitoring of pipe inspections (TV– inspections)
- Tendering and monitoring of pipe testing (pressure test)
- Visual or TV-inspection of manholes & special buildings (e.g. pumping stations)
- Interpretation of the output of inspections and surveys
- Elaboration of cadastral maps of damages
- Designing of rehabilitation and renovation measures
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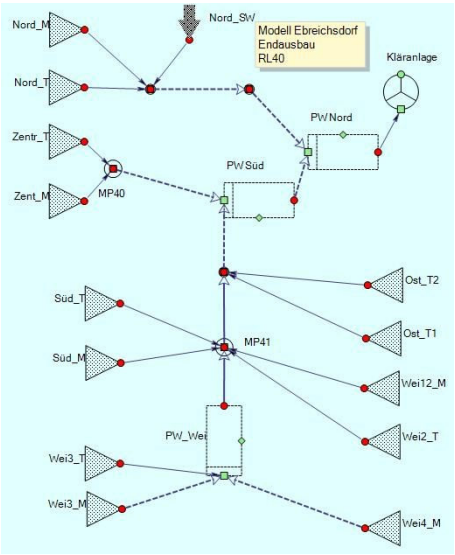
HYDRAULIC - HYDRODYNAMIC MODELLING

Hydrodynamic modelling of combined wastewater systems

In Austria the Regulation (“ÖWAV-Regelblatt”) No.19 "Guidelines for the design of storm-water overflow structures in combined wastewater systems", is the technical guideline for calculating combined wastewater systems as well as discharge of overflow to the river.

This guideline defines the rainwater treatment efficiency as the target value. This means, that a certain percentage of the rainfall runoff has to be transferred to the wastewater treatment plant. Instead of just establishing storage volume, different measures at any point of the network can be combined to reach the goal, e.g.

- Construction of basins
- Construction of storage sewers
- Real time control of the sewer system
- Increase of treatment plant inflow



This can lead to lower costs for new installations. Under appropriate conditions, the building of storage capacity can be replaced by better use of existing facilities like installed pipe capacity.

A combination of long-term simulation with a hydrological simulation model of the pipe system is required for calculating the rainwater treatment efficiency and to optimize the measures for improving the system.

In order to calibrate the simulation model, measurement data for rainfall, water level and flow in sewers is required.

By using creative solutions, highly specialized knowledge and modern working and calculation methods, a perfect state of the art solution for combined wastewater system and wastewater discharge structures can be found.

The result is saving a lot of money for construction works.

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COMPUTER-AIDED MODELLING

CUSTOMER	PROJECT	COMPLETION
Umweltministeri-um	**Research project OPTIMISCH *)** for implementation of ÖWAV-directive 19 -> project management, modelling, measurement campaigns, calibration, sensitivity analysis	**2008**
Municipality NEULENGBACH	**Network calculation water supply*)** Recalculation of existing network, optimization of expansion planning -> model adjustment, optimization of variants	**2009**
Municipality DONNERSKIR-CHEN	**Network recalculation of mixed water system*)** Proof of the transmission efficiency, optimization of the expansion planning	**2009**
Municipality WEITRA	**Network calculation water supply*)** Hydraulic calculation of whole network -> measurement campaign, computer aided simula-tion, calibration, calculation	**2009-2010**
Association for sewage treatment "An der Traisen"	**Computer-aided simulation of mixed water system *)** Adaptation of existing calculation -> fundamental review, computer aided simulation	**2010**
Abwasserverband Pielachtal	**Computer-aided simulation of mixed water system Sierningtal *)** Technological investigation of expansion variants -> computer aided modelling, measurement data analysis, calibration, calculation, comparison of vari-ants	**2010**
Innsbrucker Kommunalbetriebe	**Hydrodynamic simulation Innsbruck north** Influence detection and determination of the trans-mission efficiency for the mixed water system -> model import, area determination, consideration of settlement extensions	**2011**
via donau	**Hydrodynamic simulation Angern** Optimization of the flood pumping stations for rain water system	**2011**
Municipality MARIA ENZERS-DORF	**Hydrodynamic simulation** for detecting the hydraulic load -> measurement program, model calibration, flood detection, restoration variants	**2012-2013**
Municipality ANDAU	**Hydrodynamic simulation** for detecting the hydraulic load -> hydrological long-term simulation for the calcula-tion of the inflow wastewater treatment plant	**2013**
ÖBB Immobilien GmbH	**Hydrodynamic simulation for city extension Laxenburger Straße** Calculation of dewatering, proof of the effects on the existing sewage system of the city Vienna	**2013-2014**
ecoplus NÖ Wirtschaftsagentur GmbH	**Hydrodynamic simulation IZ NÖ-Süd** Determination of the efficiency for the wastewater and rainwater sewage system	**2013-2014**

*) Projects of DI Norbert Flamisch as engineering office Flamisch respectively Hydrocare GmbH

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SURFACE WATER MANAGEMENT

In the past years the intensity of rainfall has increased and as a result surface water disposal and flooding protection have gained importance.
Surface water disposal can be done in two ways: small-scaled local measures for single buildings or large-scaled flood retention and storage basins.
Flood protection can furthermore be secured through adequately dimensioned pipes and open channels.
We take care to design these constructions in a nature-oriented way, so that they are integrated very harmonically into the landscape.

SCOPE OF SERVICES:

- Design of infiltration systems
- Pre-treatment of street drainage water
- Drainage of parking areas
- Flood retention and storage basins
- River regulations
- Flood risk assessment
- Designing of ponds and garden ponds

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SURFACE WATER MANAGEMENT

CUSTOMER	PROJECT	COMPLETION
LKW-Walter GmbH	**Surface water disposal projects**	
	• Walter Business park III - VII (IZ NÖ Süd)	since 1985
	• Different depots of Walter Immobilien GmbH (IZ NÖ Süd)	
	• Walter Academy Hinterbrühl	2013/2014
ISOVOLTA	**Infiltration project Betriebsareal Wr. Neudorf**	
BAI Immobilien GmbH	**Surface water disposal projects**	
	• Forum Schönbrunn BA 02	2010
	• Gate 2, Zollergasse / Monscheingasse, Parkside, Eurogate BP 4+5, Wielemannsgasse	2012/2013
	• Wohnbau Aspernstraße	2014
Heimbau / Arwag / Migra	**Surface water disposal projects**	
	• Bombardiergründe Wien BP 3	2011
	• Sonnwendviertel II - BP 04, Lorenz Reiter Straße BP 02+03	2013
	• Darnautstraße / Wienerbergstraße	2014
Neues Leben	**Surface water disposal projects**	
	• Vienna: Sonnwendviertel Bauplatz C 01, WHA Gerasdorfer Str.	2011
	• Vienna: Bombardiergründe BP 1+2	2010/2011
Porsche Immobilien GmbH	**Surface water disposal projects**	
	• Restoration of surface water disposal of factory premises Huppenkothen (IZ NÖ Süd)	2013/2014
	• Survey of existing and design of extension of factory premises Wiener Neustadt	2014/2015
Dr. Ronald Mischek ZT GmbH	**Surface water disposal projects**	
	• Mautner Markhofgründe	2011
	• Seestadt Aspern BP D1, D2, D3, D6	2012/2013
	• Erlaaerstraße, Widerinstraße 18, Carlberggasse64-65	2014
Schöller Bleckmann	• Adaption of surface water disposal of office building in Ternitz	2009
	• Surface water disposal for new construction of SC/DC producing hall in 2630 Ternitz	2013
ecoplus. NÖ Wirtschafts-agentur GmbH	**Surface water disposal projects**	
	• WP Wolkersdorf: company Niedax, HKL, Ecocenter, Hartl, Fertinger, Kutzer, Postzustellzentrum, Toplak, Hirschbüchler, KFZ – Orsolic, SPL Tele + Powerlines Group	since 2012 ongoing
	• IZ NÖ Süd: company and rental objects Balfour Beatty, Businesscenter B11, CPT, AY-KA BaugesmbH, Buildings M07, M11, M15, M19M22, M28, M31, M32, M44, M45, M46, M52, M55-58, M59, M60, M61, M62, Alu Fix	since 1998 ongoing
Ferro & Partner	**Surface water disposal projects**	
	• CCK Kottingbrunn: factory premises Spörk	2011-2013
	• WP Wolkersdorf: factory premises Fertinger, Hartl	2012-2014
	• WP Bruck: Hotel Stacktower	2014

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SURFACE WATER MANAGEMENT

CUSTOMER	PROJECT	COMPLETION
REWE	**REWE central store Steyrermühl - REWE Ohlsdorf** Surface water disposal for: roof water over gravel rigol and drainage shafts, traffic areas over grass basins, mineral oil separator for for LKW-washing and garage, fat separator for kitchen, data for pumping station, definition water level for 30– resp. 100-annual flood	2012
	Surface water disposal projects IZ NÖ Süd Parking deck north, BIPA building, CD hall new, restoration test store, Wegenstein, BT 6-9, high rack storage area	since 2004
BILLA	**Frame contract Billa-branches in Lower Austria, Vienna, Burgenland** Amongst others Mistelbach, Tresdorf, Wr. Neudorf, Pöchlarn, St. Pölten, Mauerbach, Tulln, Kilb, Paudorf	since 2009
ÖBB Immobilien GmbH	**Flood protection foot tunnel station Wien Meidling** Hydraulic calculation, planning of restoration, tendering building inspection	2012
dA+ Architekten	**SPL Tele und Powerlines Group - WP Wolkersdorf**	2013/2014
Immorent	**Surface water disposal projects:** Haymogasse 23, WP Kematen, Försterweg	since 2009
Wiener Linien	**Adaption of surface water disposal of station Vienna Spittelau**	2012
Architekt Hawlik Huss	**Surface water disposal projects**	
	Rest home Poysdorf, P29 SÜBA	2010-2014
	Storage building Birostraße	2011
Goldbeck Rhomberg	**Surface water disposal projects**	
	Parking deck ReWE Wr. Neudorf, drainage TPV, Parking Manhattan Wien	2012
	Euro Plaza 1120 Vienna, Cleverline 1230 Vienna, IMS Brunn am Gebirge, ProLogis hal Himberg	2013
	Logistics center Hagenbrunn, Halle Friedl - Neutal	2014
Häusler GmbH	**Surface water disposal projects**	
	Adaption to the state of the art of existing branches Business park NÖ South	2010
	Location St. Marien / OÖ	2010
	Extension in Business Park NÖ South	2012
Buschina	**Surface water disposal projects**	
	Gatterederstraße, Pretschgasse	2004/2005
	Eduart Gärtner Straße, Engelhartstetten, Pichlgasse	2006
	Residential building Parndorf Wien South	2008
Fa. Hilti	Surface water disposal project Altmannsdorfer Straße, Vienna	2013

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SURFACE WATER DISPOSAL
REWE STEYRERMÜHL (Austria)

Contractor: REWE Austria AG
Project: Surface water disposal logistic center West Steyrermühl
Implementation time: 2011-2013

On an area of 12,1 ha (11 hectares of warehouse buildings + 1,6 ha of truck parking + 0,5 ha of car-parking), was including parking lots, access roads and necessary related infrastructure was designed and built.
ÖSTAP GmbH did the concept design for the traffic as well as surface water disposal. Furthermore, a documentation of all underground infrastructure installations were elaborated.

Scope of rainwater infiltration system:
5.700 m² infiltration basins for warehouse buildings
250 m² basins for truck parking
500 m² basins for car parking

Project steps:

March 2011	Start of design process
April 2012	start of construction work
June 2013	Start of warehous operation
Since 2013	ongoing extensions

Total investment volume: ca. € 60 Mio.

Scope of work:

- Design of rainwater infiltration system
- Mineral oil separator for truck washing and garage
- Fat separator for kitchen waste water
- Data for wastewater pumping station
- Definition water level for 30– and 100-annual flooding
- Project coordination and management for whole outdoor area.
- Technical consulting rainwater & wastewater
- General and detail design
- Construction supervision

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Design of river regulations

Contractor: Thaya water association
Project: Biotope system "Land um Laa
Implementation time: 2011-2013

Project content:
Development of measures to improve the ecological status of the local creeks and implement the requirements of the EU Water Framework Directive in the waterbodies of the municipalities Fallbach, Gaubitsch, Laa and Staatz

Project partners: land.und.wasser Engineering company
Province government of Lower Austria Dep. WA1

Total investment volume: ca. € 164.060

Scope of work:
- Calculation of hydraulic capacity of the creeks
- Environmental impact assessment regarding the elaborated measures and hydraulic impact assessment regarding the hydraulic capacity (hydraulic calculation)
- Tendering of construction works
- Local supervision of construction works
- Health & Safety engineer
- Project management

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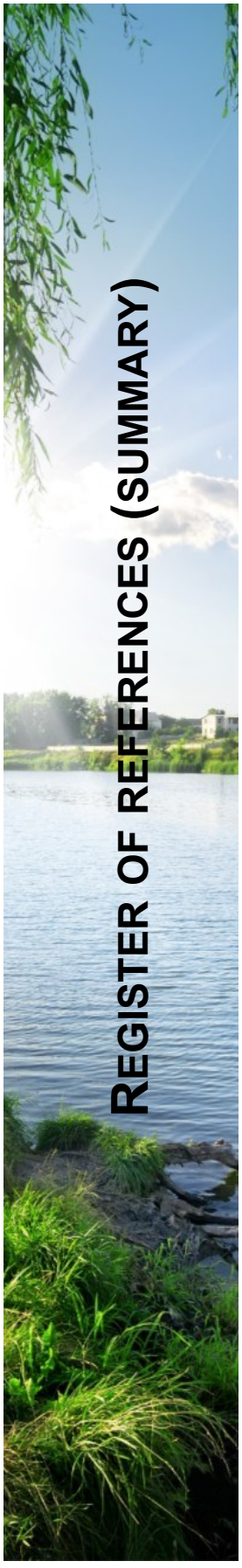

FLOOD PROTECTION - RETENTION

CUSTOMER	PROJECT	COMPLETION
Ecoplus GmbH	**Rainwater infiltration - and retention basin Industrial park Wiener Neudorf** **Short description:** 3 basins total volume V = 41.936 m³, 4 rainwater pumps with V = 6,0 m³/s, discharge pipeline DN 800 mm for discharging 500 l/s directly into river. **Scope of work:** Feasibility study, general and detail design, tendering of construction works, local construction supervision, health & safety engineer, project managment, technical consulting, handling of subsidies **Total volume of project: 2,053 Mio. Euro**	2006 -2009
Municipality STAATZ	**Flood protection Industrial park** **Scope of work:** General design, cost estimation	2009
Municipality STAATZ	**Retention basin Reitstallanlage Wultendorf** **Scope of work:** Submission planning, local construction supervision, handling of government aid	2010
Municipality WÖLLERSDORF-STEINABRÜCKL	**Flood protection Wöllersdorf-Steinabrückl** **Scope of work:** General design	2009-2011
Municipality MÖNCHHOF	**Flood protection project „Am Schranken“** **Short description:** Construction of trench system for flood protection of the settlement „Am Schranken“ 9.800 m³ retention volume, 291 m rain water system. **Scope of work:** Feasibility study, general and detail design, tendering of construction works, local construction supervision, health & safety engineer, project managment, technical consulting, handling of subsidies	2008-2011
Municipality HARDEGG	**Feasibility study for flood protection** **Scope of work:** Feasibility study for the flood protection of the whole municipality, general proposal of flood protection measures, cost estimation of measures	2012/2013
Municipality GASTERN	**Flood protection Gastern und Weißenbach** **Scope of work:** feasibility study, general design for construction permission, cost-benefit analysis of the project	2013-2014

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Rainwater drainage
Ecoplus Businesspark Wiener Neudorf (Austria)

Contractor: ecoplus nö-Wirtschaftsagentur GmbH

Implementation time: 2006 - 2009

Topic: Rainwater drainage of Business park Wiener Neudorf

For the whole Business park, due to legal regulations, the discharge of surface water from the pipe system to the river was limited to 500 l/s. Therefore a hydraulic calculation of the whole drainage system had to be made.
The result was, that a stormwater retention basis with a volume of app 45.000 m³ had to be built to guarantee a max. outflow of 500 l/s.
The stormwater retention basin consists of a stilling basin, a sedimentation basin and a retention basin. The filling of the retention basin is done through four pumps which have a total capacity of 6.0 m³/s.

Scope of work:	General and detail design Tendering of construction– and electrical works Tendering of machinery and equipment Handling of subsidy Local construction supervision Health & Safety engineer Construction management Taking over Technical consulting
Volume of retention:	1.175 m³ sedimentation and stilling basin 2.250 m³ Retention basin 1 34.110 m³ Retention basin 2
Pump capacity:	4 pumps each 2.0 m³/s (1 pump standby)
Total project volume:	**2.053 Mio. €**

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FLOOD PROTECTION MÖNCHHOF (Austria)

Contractor: Municipality of Mönchhof
Implementation time: 2008 - 2011
Topic: Flood protection of north western part of municipality

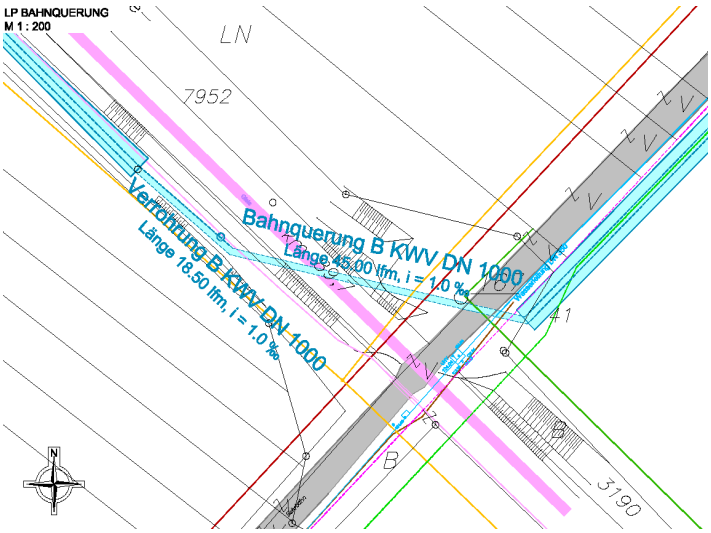
In summer, heavy rainfalls often lead to periodic flooding in parts of the municipal area of Mönchhof.
Therefore safety measures were designed in the urban area „Am Schranken".
The surface water has to be collected and safely discharched into the channel system which goes to Neusiedler lake. The new channels were connected to the existing channel system. At the same time the hydraulic capacity of the existing main channel was increased and a new crossing of the „Neusiedlerseebahn"-railroad and the main road B51 were built. The confluence of the main channel into the so called "Golser channel" will be rebuilt.

Scope of work:
General and detail design
Tendering of construction
Handling of subsidy
Local construction supervision
Health & Safety engineer
Construction management
Taking over
Technical consulting

Volume of retention: 9.800 m³ in the whole channel system

Length of open channels:
1.750 m rearrangement
780 m new construction
850 m transfigure narrow path into drain

Pipelines:
200 m DN 500 new stormwater pipe
26 m DN 1000 crossing main road
65 m DN 1000 crossing railway



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COMMERCIAL AND INDUSTRIAL WASTEWATER

A key operation area of ÖSTAP has always been the support of commercial and industrial enterprises in all questions regarding water and wastewater. We offer services in consulting, analysing of wastewater and drinking water, plant design, industrial discharger monitoring and other services around these issues.

SCOPE OF SERVICES:

- Pre-treatment solutions
- Monitoring of oil and grease traps
- Industrial discharger monitoring and support
- Technical consulting
- Treatment plants

CUSTOMER	PROJECT	COMPLETION
Dairy MILSY (Slovakia)	**Wastewater treatment plant** General and detail design according to water and building laws for the sewage plant of the factory and the biogas plant	**2005 –2008**
Organic dairy LEMBACH	**Pre-treatment plant** Submission project according to water law, pre-treatment, external monitoring, industrial discharger support	**2004—2016**
SHELL Aviation Klagenfurt	**Monitoring of petroleum trap of the tank farm for planes**	**ongoing**
St. Anna children hospital Vienna	**Yearly monitoring of the wastewater discharge**	**ongoing**
Vienna School Board Vienna	**Adaptation of the sewage plant from school ship „Bertha v. Suttner“** Adaptation of the sewage plant, adjustment of practice, creation of a practice– and maintenance book, ongoing servicing	**ongoing**
ecoplus. NÖ Wirtschafts-agentur GmbH	**Technical consulting in all aspects of wastewater disposal in Business Park NÖ Süd** Calculation for washing stations, oil separators, grease separation systems, calculation operating cost, determination of the investigation parameters; wastewater analysis	**ongoing**

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WASTEWATER TREATMENT MILSY doo (Slovakia)

Contractor: Milsy doo (Slovakia)
Implementation time: 2005 - 2008
Topic: Industrial wastewater treatment for dairy plant

Milsy is the second largest dairy plant in Slovakia and is situated in Bánovce nad Bebravou. In 2005, Milsy started a restructuring process. This includes a new sewage plant, biogas plant, a new stem production and cooling equipment.
The Biogas station is designed to take the sludge of the sewage treatment plant as well as lactose out of different production steps to increase the amount of biogas.

Total volume of investment:	**5,5 Mio. €**
Scope of work:	General design Detail design Negotiations with authorities Technical consulting
Capacity of the WWTP:	75.000 PE (Population equivalents)
Maximal inflow:	1.600 m³/d
Stages of the plant:	**Mechanical pre-treatment** Fine screen, flotation **Biological strage** Selector 2 SBR-basin each 2.500 m^3 **Sludge storage** **Biogas plant** Biogas reactor **Sludge dehydration** Sludge centrifuge

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WASTE MANAGEMENT

There is a growing demand for consulting in the fields of waste disposal and dumping as a result of strict laws in these fields. ÖSTAP offers professional consulting in all aspects of waste management.

SCOPE OF SERVICES:

- Designing of landfills
- Design of waste disposal concepts
- Landfill cover
- Landfill monitoring
- Designing of waste collection places

CUSTOMER	PROJECT	COMPLETION
NUA Abfallwirtschaft GmbH/Brantner GmbH	**Overall advice of big landfills** NUA Hollabrunn 950.000 m³, NUA Hohenruppersdorf 800.000 m³ incl. infrastructure (warehouses, reloading stations, etc.) Designing, tendering, local construction supervision, technical consulting	Since 1989
ATP&EVN Kraftwerk Dürnrohr	**Overall advice of big landfills** Tendering and local construction supervision: closure of landfill 1 - 4,5 ha; Designing and tendering 3 - 950.000 m³	2007-2008
Municipality ZISTERSDORF	**Covering measures of the landfill Windisch-Baumgarten** Designing, tendering, local construction supervision, technical consulting	2008/2009
Municipality SCHRATTENTHAL	**Completion of the landfills Schrattenthal, Waitzendorf, Obermarkersdorf** Obermarkersdorf 1,2 ha, Schrattenthal 1,3 ha, Waitzendorf 0,46 ha Designing, local construction supervision, technical consulting, landfill monitoring	2009-2010
NUA Abfallwirtschaft GmbH	**Composting plant** NUA Hollabrunn - dense asphalt surface with ventilation 7.000 m², compost leachate tank 600m³ AWG-submission planning, local construction supervision, handling of government aid	2011/2012
NUA Abfallwirtschaft GmbH	**Aerobization of organically contaminated waste** NUA Mannersdorf: Aerobisation (targeted acceleration of the degradation of organic matter by blowing in air) on an area of 20.000 m²	since 2007
Municipality ACHAU	**Waste collection center** Designing of new building in combination with wastewater treatment plant and building yard	2013

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WASTE MANAGEMENT NUA TULLN (Austria)

Contractor: NUA Abfallwirtschafts GmbH (Austria)
Implementation time: 2005 - ongoing
Topic: Landfill site Tulln (District lower Austria)

Project description:

NUA was building the landfill side in Tulln in the year 1983.

The landfill is designed for taking household and industry waste. Since the very beginning ÖSTAP is doing technical consulting and design for all construction phases. Currently the landfill is in the closing phase. ÖSTAP is appointed as supervising body and executes all necessary controls. In addition yearly reports for the government waste management authority are prepared.

Scope of work:

General - and detail design
Tendering of construction work
Local supervision
Dump supervision according to Austrian law (AWG)

Project phases:

Construction of a dump for household and industry waste inclusive attendant facilities:

- Plant and garage
- External water pipeline
- Leachate pumping station
- Active degassing of the landfill
- Surface coverage

NUA Tulln - Landfill in the decommissioning phase; Adaptation active degasification 2014

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WASTE MANAGEMENT ZISTERSDORF (Austria)

Contractor: Municipality of Zistersdorf (Austria)
Implementation time: 2008—2009
Topic: Final closing of landfill site Windisch-Baumgarten

Due to severe legal restrictions, the municipality decided to close its landfill site in Windisch- Baumgarten.
According to the Austrian Waste management law (AWG) a detailed project was elaborated to get the approval from the government of Lower Austria.

Construction work was carried out between June and December 2008 (around 7 months).

The landfill was covered with a layer of cohesive soil at least 2,0 m thick. Above this covering layer, a recultivation layer had to be applied in a thickness of 0,5 m with trees which are suitable for the location.

The challenge of the project was the management of the considerable material movements. In this case, approx. 87,000 m³ of cohesive covering material had to be transported to the landfill. This material had to been permanently protected.

The 50 cm recultivation layer (approx. 15,000 m³) was applied to the cohesive landfill cover, so that a total transport volume of approx. 102,000 m³ was reached.

Total investment costs: 250.000 €

Scope of work:
Detail design
Tendering of construction work
Local supervision



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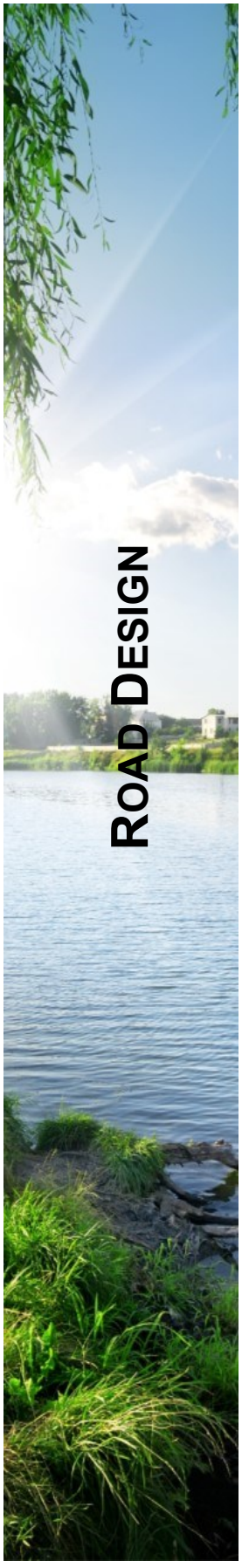

ROAD DESIGN

Due to the growing population in rural areas an essential topic is the structuring of public areas to provide a balance between streets, parking areas, pedestrian areas an green recreation zones
For this reason, the ÖSTAP offers also a comprehensive experience in designing of street and public areas.
Due to the increasing sealing of green areas, our knowledge regarding surface water disposal is an additional asset we can provide.

Parking lot in front of Wolkersdorf castle

CUSTOMER	PROJECT	COMPLETION
Municipality MÖNCHHOF	**Settlement area Kreuzjoch** **Scope of work:** Detail design, tendering, local construction supervision for an area of 15.000 m² incl. surface water disposal (Infiltration trench)	**2005-2007**
Municipality MÖNCHHOF	**Industrial park Viehdrift** 10 ha industrial park in the north-east of the municipality (rain water sewage system incl. Infiltration - and evaporation basin) as well as wastewater system and water supply system - length of street ~250 m **Scope of work:** Detail design, Tendering, Construction supervision	**2006/2007**
Schön Wohnen IMMORENT Ges.m.b.H.	**Infrastructur "Wohnpark Försterweg"** 5.500 m² streets and paths **Scope of work:** local construction supervision	**2012**
NUA Abfallwirtschaft GmbH	**Composting treatment plant** NUA Hollabrunn - High quality dense asphalt 7.000 m² **Scope of work:** Tendering, construction supervision	**2012**
Municipality PÖCHLARN	**Settlement Ahornstraße** 170 m residential street **Scope of work:** Detail design, tendering, construction supervision	**2012**
Municipality WOLKERSDORF	**Reorganisation parking lot of castle Wolkersdorf**	**2012**
GEBAUER & GRILLER	**Adaption company exit, Werk Poysdorf** **Scope of work:** Detail design obtaining permission special use of public street	**2013**
Municipality POYSDORF	**Adolf-Schwayer Street - Untere Bahnstraße** 260 m residential street (general project) **Scope of work:** Detail design, tendering, construction supervision	**2013**
Municipality ACHAU	**Settlement Sulzweg and Feldgasse** as well as reorganisation of access area of industrial zone West (street length ca. 1,3 km) incl. surface water disposal over grass depressions **Scope of work:** Detail design, tender, local construction supervision	**2013-2015**

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ROAD DESIGN ACHAU (Austria)

Contractor: Municipality of ACHAU (Austria)
Implementation time: 2015
Topic: Design of streets incl. placement for 2 settlements "Sulzweg" and "Feldgasse"

After finishing construction works for water and wastewater a provisional road was built in 2009. During the following years most of the buildings in the 2 settlements were finished and the municipality decided to build the streets.

In 2013 the detail design for the streets in coordination with the town development committee of the municipality Achau started. Apart from asphalting special attention was payed to design of parking spaces in combination with surface water disposal.

Additionally the renovation of the roads in the industrial zone West, including surface water disposal, was included in this construction phase. Construction works started in summer 2014 and were completed one year later in summer 2015.

Scope of project:

Settlement Sulzweg	4.150 m²
Sulzweg and Hintausstraße	3.150 m²
Settlement Feldgasse / Anningergasse	3500 m²
Industrial zone West	600 m²

Cost of construction works: ~1.045.000 €

Scope of Work:

- General and detail design
- Tendering
- Local construction supervision
- Health and safety engineer
- Project management
- Technical consulting

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SOFT LOAN FINANCING

To complement our services, ÖSTAP offers project financing in special cases.

Especially „Austrian Softloan“ or export financing are part of our business.
These financing instruments are only available under special conditions and in some selected countries.
For instance, infrastructural projects like water supply systems or wastewater projects in Kosovo, Mongolia etc. and before in Bosnia and Herzegovina, Albania, etc.

In addition to the above mentioned financing instruments other credit possibilities can be arranged with our bank partners.
In any case a detailed analysis has to be made for every project.
For the preparation of a project the financing of a feasibility study by means of the Austrian Softloan preparatory program are possible

ÖSTAP can be a reliable partner to check out all the possibilities in project financing and find an appropriate solution for its customers.

Soft Loan-Preparatory program projects (summary):

CUSTOMER	PROJECT	COMPLETION
Municipality TREBINJE (BiH)	**Water supply system** Detail design for water supply system of whole municipality, analysing of existing pipe network, cost estimation for building and operation costs	**2008**
Municipality SRBAC (BiH)	**Wastewater treatment plant** Idea project for whole municipality PE 6.000	**2010**
Municipality BILECA (BiH)	**Sewage system for whole municipality** General project for wastewater and rainwater system considering the existing network, cost-benefit analysis incl. measuring program, measurement of existing network, cost estimate for building and operation costs	**2009**
Municipality POSUŠJE (BiH)	**Feasibility study for sewage system** General project for wastewater treatment for whole municipal area, technical and economic analysis for different locations for treatment plants	**2009**
Municipality KISELJAK (BiH)	**Sewage treatment plant** Detail design for the municipal wastewater treatment plant PE 40.000	**2010**
Municipality PODUJEVO (Kosovo)	**Connection pipeline from City to WWTP** Detail design for the main wastewater transport line 28 km pipeline length, Diameter DN 500 - DN1000	**2015**

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SOFT LOAN FINANCING

SOFT LOAN FINANCED PROJECTS (summary):

CUSTOMER	PROJECT	COMPLETION
Municipality GRUDE (BiH)	**Water supply system municipality of Grude** Expansion of water supply system for whole municipal area Total volume of investment: € 5,0 Mio. **Softloan credit: € 2,3 Mio.** Subcontractor of TRM (Tiroler Rohre GmbH) Preparation of softloan application, local construction supervision, final report, technical consulting, project management	**2008**
Municipality POSUŠJE (BiH)	**Water supply system POSUŠJE** Expansion of water supply system for whole municipal area Total volume of investment: € 5,0 Mio. **Softloan credit: € 2,5 Mio.** Main contractor Preparation of softloan application, local construction supervision, final report, technical consulting, quality control, idea project WWTP, project management	**2009**
Municipality SRBAC (BiH)	**Water supply system SRBAC** Expansion of water supply system for whole municipal area **Softloan credit: € 1,7 Mio.** Subcontractor of Edtmayer GmbH Preparation of softloan application, local construction supervision, final report, technical consulting, quality control, project management	**2010**
Municipality KISELJAK (BiH)	**Water supply and wastewater system Kiseljak** Construction of a water supply and wastewater system for whole municipal area Total volume of investment: € 9,0 Mio. **Softloan credit: € 5,5 Mio.** Subcontractor of TRM (Tiroler Rohre GmbH) Preparation of softloan application, quality control, technical consulting, final report, idea project WWTP and sewage system, project management	**2010**
Municipality BILISHT (AL)	**Water supply system Bilisht** Construction of water supply system for the areas Bilisht and Betincka Total investment volume: € 7,5 Mio. **Softloan credit: € 7,5 Mio** Subcontractor of TRM (Tiroler Rohre GmbH) Preparation of Soft-Loan-application, local quality control, technical consulting, final report, project management	**11/2013**
Municipality PESHKOPIA (AL)	**Water supply system Peshkopia** Construction of water supply system of the whole municipality Total investment volume: € 4,0 Mio **Softloan credit: € 4,0 Mio** Subcontractor of TRM (Tiroler Rohre GmbH) Soft-Loan-application, study, detail design, local quality control, technical consulting, final report, project management	**Taking over 08/2016**
Municipality ČELIĆ (BiH)	**Water supply and wasterwater system Celic** Construction of water supply and wastewater system for whole area, renovation of main street in Celic, delivery of 3 small wastewater treatment plants, delivery of 1 sewer flushing vehicle and 1 snow plough Total investment volume: € 3,4 Mio. **Softloan credit: € 3,4 Mio.** General contractor Detail design of water supply, wastewater system for 5 villages, road design; soft-Loan-application, quality control, technical consulting, project management, construction works, final report, project management	**Taking over 31.05.2015**

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SOFT LOAN PROJECT GRUDE (BiH)

Contractor: **Municipality of Grude (Bosnia and Herzegovina)**
General Contractor: TRM—Tiroler Rohre GmbH
Implementation time: 2006 - 2008
Topic: Extension of water supply of municipality of Grude

The extension of the water supply system had highest priority for the municipality Grude. About 35 km of water pipes and fittings therefore had to be bought. Together with TRM - Tiroler Rohre GmbH this project was realized with means of the Austrian Softloan program.

Total volume of investment: **5,0 Mio. €**
Construction works 2,7 Mio. €
Pipe delivery 2,1 Mio. €
Engineering 0,2 Mio. €

Softloan Credit: 2,3 Mio. €

Scope of work:
General design, hydraulic calculation, Softloan application, local construction supervision, quality check, supervision of leak tests, final report, technical consulting

Total length of inserted pipes: 26,4 km

Dimension of installed pipes:
PE-pipes: DN 100 -150 mm
Ductile cast iron pipes: DN 200 - 400 mm

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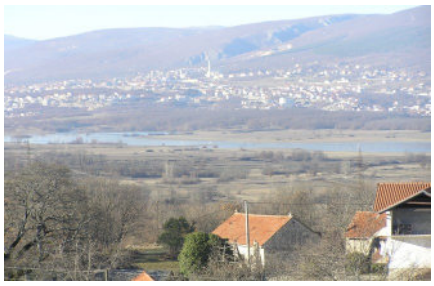
SOFT LOAN PROJECT POSUSJE (BiH)

Contractor: **Municipality of Posušje (Bosnia and Herzegovina)**
General Contractor: ÖSTAP Engineering & Consulting GmbH
Implementation time: 2007 - 2009
Topic: Extension of water supply of Municipality of Posušje

The municipality of Posušje takes its drinking water from Trbistovo lake, an artifical catchment. This lake has a storage volume of approx. 5,0 million m³ of water. It is located in the mountains approx. 900m above sea level.
To connect the lake with the existing water supply system of the city, a transmission pipeline pipe DN 400 and a new reservoir were built.

The main supply system of the municipality was also extended.
As part of the softloan project the general project of the wastewater treatment plant Posušje was prepared.



Total volume of investment:	**5,0 Mio. €**
Construction works	2,5 Mio. €
Pipe delivery	2,3 Mio. €
Engineering	0,2 Mio. €
Softloan Credit:	2,5 Mio. €

Scope of work:

General design, hydraulic calculation, softloan application, quality check, supervision of leak tests, technical consulting, final report, idea project WWTP, project management

Total length of installed pipes: 26,3 km

Dimension of installed pipes:

Ductile cast iron pipes DN 150- 400 mm

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SOFT LOAN PROJECT SRBAC (BiH)

Contractor: **Municipality of Srbac (Bosnia and Herzegovina)**
General Contractor: Edtmayer GmbH
Implementation time: 2007 - 2009
Topic: Extension of water supply of municipality of Srbac

The municipality of Srbac has expanded its drinking water system. The water of the spring „Vrijska“, which is situated 1,3 km away from Povelic, and the water of a well in Povelic will be used for drinking purposes. This water will be transported via pressure pipes to the south-eastern part of Srbac. Thereby the villages Zupslki Razboj, Cukli und Ilicani are supplied with drinking water.
To realise this project, the municipality Srbac announced a public tendering, which was won by Edtmayer GmbH in cooperation with ÖSTAP and Vododovod SRBAC d.o.o.
The project was financed by the SOFTLOAN program of the Austrian Republic.

Total volume of investment: **1,7 Mio. €**

Fields of responsibility:
Preparation of tender documentation, softloan application, quality check, supervision of leak tests, technical consulting, final report

Total length of inserted pipes: 10,3 km

Dimension of inserted pipes:
PE-pipes pipe diameter
180-400
Fittings: Ductile cast iron

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SOFT LOAN PROJECT KISELJAK (BiH)

Contractor: **Municipality of Kiseljak (Bosnia and Herzegovina)**
General Contractor: TRM - Tiroler Rohre GmbH
Implementation time: 2008 - 2010
Topic: Extension of water and wastewater system of municipality of Kiseljak

The municipality of Kiseljak is located in Central-Bosnia, approx. 40 km away from Sarajevo. The city Kiseljak already had an existing water supply and wastewater system. The water supply system had to be extended also to the neighbouring villages Fojnica and Kiselakwas.
Additionally a wastewater collecting pipeline was built to connect the village Lepenica to Kiseljak.
The preparation of an idea project of the WWTP and the sewer system of Kiseljak were also part of the Softloan-financed project.

Total volume of investment:	**9,00 Mio. €**
Construction works	3,50 Mio. €
Pipe delivery	5,00 Mio. €
Engineering	0,55 Mio. €
Softloan credit:	5,55 Mio. €

Scope of work:

General design, softloan application, quality check, leak tests, construction supervision, technical consulting, preparation general project WWTP (40.000 PE) and general project of wastewater system Kiseljak, final report, project management

Total length of inserted pipes: 31,7 km

Dimension of inserted pipes:

Ductile cast iron pipes DN 125–300 mm
Fittings: Ductile cast iron

Number of houshold connections:

3.600 pieces

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