

WATER PROJECT
MAKTELLBEKKEN WATER SAMPLING
REPORT.

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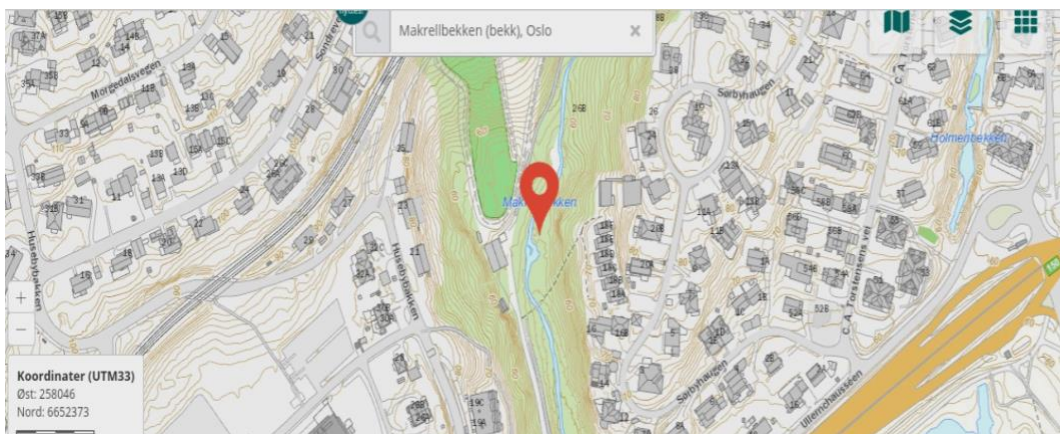


Introduction:

The project is a new water reservoir in Oslo until 2028. For this water project a water tunnel will be built. All the digging with heavy machines will cause some sort of pollution which will enter the Makrellbekken. Due to this Ramboll starts monitoring/sampling the actual pollution in the Makrellbekken creek so they can have reliable data and can immediately react if there will be a accidental spill of oil or other chemicals during the construction. If the oil gets into the creek it will have a negative effect on the life in the creek and the surroundings. This takes a lot of time to recover from an accident like that. Continuously monitoring the water is very important to avoid those incidents. So, the target values must be given while constructing the tunnel. We joined Ramboll at the water monitoring. There were three points we did the sampling. For each group one sample point.

Place and Date 4/3/2020

Makrellbekken ,



<https://vanmiljo.miljodirektoratet.no/>

Field equipment

- Life jacket
- Gloves (warm ones and one-way ones)
- Safety glasses
- Big plastic container to collect water
- Science log to note down temperature, PH, conductivity, colour, time, smell, comments
- Small brown glass container to measure mercury
- Glass bottle to measure oil
- Stickers to label each bottle
- PH and temperature measurement met



Purpose of fieldwork

Norway's capital Oslo gets its water from the lake Maridal. That are about 92 million m³ each day. Maridas provides enough freshwater for the city, but the municipal decided to add a second water resource for safety reasons. Just case if one of them gets polluted or something else happens. The new second water resource is Holsfjorden. It's even bigger than the existing water resource Maridal. To transport the water from Holsfjord to Oslo they construct a new tunnel. The tunnel is planned to be finished until 2028. The exact position of this tunnel is secret because the municipality wants to achieve a high level of security for the new water system. The company Rambøll monitors the water quality before, during and after the tunnel construction. The water samples are taken from three different spots along the creek Makrellbekken. The first spot is upstream where the water has its natural quality. The second and third spots are situated further down. There pollution with sewage or overflow from the construction works is possible. Rambøll has to control the water quality of the creek because if the ecosystem is endangered by the pollution of the tunnel drilling the project has to be paused until there is a solution for the problem.

Method

The method of use to during our tests where quite comprehensive and with different goals, there was easy tests like temperature and ph, but we also took samples to test for oils and heavy metals (mercury). These where all tests we took for Rambøll and they took the samples back to their own lab for testing there, during the fieldwork the class divided in three groups took our own samples to bring with us back to school for testing in our labs at the university.

Temperature

By taking the temperature of the stream we were trying to establish a normal temp for this time of the year and by this information we can find out if there is any spoils from the sewage during the period of drilling. We used a device that we could measure temp, ph and conductivity to measure the temperature of the stream.

PH:

We took samples for testing ph, this we took using the same device as we used for temperature and the reason for doing this would be so we could monitor the ph level of the water during the years of work and drilling. A ph level of 7 would be neutral and clean while lower and it will be acid and it can cause fish and other water living creatures to die, any higher than 7 and the water will be basic.

Oil:

We took samples for testing of oils so that we can monitor the levels of pollution in the water. Because of our temperatures here up in north the oils will take longer time to be broken down, the results of leakage will be damage to underwater life as well as life near the creek.

Heavy metals/mercury:

We also took samples to test for heavy metals in the creek. The levels of heavy metal will be very important to find, because to high levels of them are toxic especially in very high concentrations. Under construction of the tunnel they will be drilling, and this could potentially increase the levels.

Results

| | Group 1 | Group 2 | Group 3 |
|---------------------|---------------------|---------------------|----------------------------|
| PH feild | 8.2 | 8.2 | 9 |
| PH campus | 7/7/6.5 | 7/7/6.5 | 7/7.5 |
| Connectivity | 1065ms/cm | 1055ms/cm | 952ms/cm |
| Temperature | 4.2C | 4.1C | 4.2C |
| Color | Medium grey | Medium grey | Medium grey |
| Smell | Little smell | Medium smell | Strong sewage smell |



Discussion.

Monitoring of water contributes a lot towards sustainable development goals

- it is important for social -economic development.

- By monitoring water, we insure the health of both ecosystem and human survival
- Results of this monitoring show any big changes in the water like oil spill, radiation leaks, sewage on the water, water quality and this is very important when developing an emergency strategies.

Teacher-training at the university also can help achieving this goal on a longitudinal time scale by raising information about water. It's important to explain our influence on it, because we need to stop an ignorance of our influence on the planet.

Teacher should involve pupils in the process, making them feel that they are changing world now. It can be eco-marathons, competitions, researching in different water-orientated projects, which include reflection, new ideas and critical thinking.

<https://wordpress.usn.no/226782/science-and-nature/water-project/>