

## **Appendix A2**

### **Environmental Impact Assessment for the Sorek Desalination Plant**

Submitted by: The Water Authority & MEKOROT (The National Water Company)

Prepared by: *Aviv – Management, Engineering & Information Systems Ltd.*

December 2009

## **Summary**

In accordance with future plans to construct desalination plants along the coast, there is a plan to construct a SWRO plant in the area between the Sorek River and the site of the Dan Region Sewage Treatment Plant, with an overall output of about 300 million cubic m a year. The plant would be constructed in two completely separate stages of about 150 million cubic m a year for each module.

The plan is located on an area of some 347 dunams, on which a desalination plant will be constructed on some 193 dunams and two desalinated water reservoirs on 150 additional dunams.

The water will be pumped from the reservoirs in three directions by means of a pumping station, which will be positioned between them:

South to the line connecting the product water from the Palmachim desalination plant to the Western Yarkon line – a line of some two (2) Km in length with a diameter of 1000" and further down the line a diameter of 54" and a length of two Km, parallel to the line from the Palmachim desalination plant to the Palmachim separator valve on the Western Yarkon line.

The design of the desalination plant, for the purpose of statutory submission is for two 150 million cubic m plants, with each plant being divided into two modules with identical outputs and a seawater pumping station on ground common to both plants (in effect two separate pumping stations will be built).

At this stage, the design of the desalination plant is still general and is not detailed. The detailed design of the construction of the buildings and the type and size of the equipment systems at the site will be carried out by the Concessionaire following the selection thereof and at the sole responsibility thereof. **The Environmental Impact Assessment, was prepared for the Water Authority and Mekorot in accordance with the Directives of the Committee for National Infrastructures of January 1, 2009 (attached as an Appendix hereto), and include all the Directives required by the National Master Plan for Sites for Seawater Desalination (NMP 34/B/2) for the preparation of an environmental document. The EIA is for this planning stage, and therefore, there are issues that will be completed during the detailed design stage.**

The fundamental and guiding design for the plant and the detailed design of the reservoirs and the water pipelines was carried out with a sincere intention to prevent the creation of environmental nuisances and/or damages, including the attempt to minimize the harm to the sand dunes areas.

### **Following is a summary description of potential impacts**

#### **Expected impacts at sea and on the seabed**

- Nuisances are expected during the construction works at sea, such as: turbidity and suspension of sand, exposure of organisms and a temporary change in the sand

transport regimes. The damage to the marine environment during the construction works is temporary and local. On completion of the works the habitat will be restored.

- The only elements affecting the sea during the operation are the suction head and the discharge of the concentrate. The plant's piping is buried at least two (2) meters below the sea bottom, and, therefore, the sea is not expected to be affected at all. The location for the concentrate discharge, including their calculated concentrations, will be determined during the detailed design stage. Materials that might negatively impact the sea and the biota therein, will be treated on land. Due to system operation considerations, the seawater suction velocity will be kept slow (about 10 cm/sec.) and this will have no effect at all on the seabed, which is at least four meters below the suction openings. Only minimal impact is expected on marine animal biota lacking selfmovement abilities (mainly plankton).

### **Expected Impacts on the terrestrial environment**

The area of the plant, the reservoirs and the supply lines are located in the landscape unit known as the Rishon Sands, which is defined as highly sensitive. The implementation of the plan, which is the subject of this review may affect the sandy environment in the following ways:

- Fragmentation of the habitat and expansion of the danger of the expulsion of the species indigenous to the sands.
- The spread of invasive plants, a consequence of the planned massive earthworks.
- Light pollution, which may change the balance of nocturnal prey-predator in the dunes and impact on the population of sea turtles along the coastline.
- Damage to trees; although the trees along the pipeline path and in the region of the plan are not defined as protected trees, there is no doubt that that they have great landscape value.

However, it must be emphasized that the masterplans have designated the area as an infrastructure area in which are planned: an LPG (Liquefied Petroleum Gas) site, a desalination plant and an extension to the Dan Region Sewage Treatment Plant. These plans will take up much of the open spaces in existence today between the Dan Region Sewage Treatment Plant and the Sorek River.

The piping route, from the pumping station on the coast to the plant, passes through the Sorek River estuary landscape unit along the river and at a minimal distance of 15 m from the river until its crossing at the estuary. This landscape unit is highly sensitive, characterized by the river in the center and on both sides, mainly the heavy soil deposits on the northern side,. This landscape unit narrows towards the west and is bordered on both side by sand areas. Towards the estuary the river widens but its outlet to the sea is narrow and occasionally blocked. On both banks there are Eucalyptus groves and dense water flora.

### **Impacts expected on the coastal environment**

The Palmahim coastline is a valuable coast as it is an open area with no urban development from the Sorek estuary southwards. From the estuary northwards the area is fenced with a security fence and it is used for security purposes by the IDF (Israel Defense Forces).The pumping station will be erected on the north shore of the Sorek River within the area of the security facility that has been disturbed by earthworks and covering with bedding. During the course of the station construction works, as well as the construction of a piping corridor from the pumping station to the sea, there will be a large concentration of heavy mechanical equipment in the area and the construction works will require the presence of numerous work crews over a period of between one to two years, depending on the possible work timetables, due to Ministry of Defense limitations. There is no doubt that these works will impact the landscape throughout the period of the works. On completion of the works, the piping will be covered and at a

distance of some 350 meters from the coast there will be a concrete building, the main part of which will be underground while the above ground part will cover an area of some 800 square meters; this will include the pumps building and the electricity room. The landscape rehabilitation plan will take this issue into account in order to minimize the landscape impact expected from the station.

### **Landscape**

The topographical character of the Plan region is the coastal plain sand dunes with Kurkar [aeolianite; cemented sand] ridges. Therefore, the site visibility is neither continuous nor uniform. The capability to create concealment by means of high trees will ensure that visibility of the facility and the reservoirs from Route 4, built-up areas in Rishon Le Zion and the area settlements will be very low. From the direction of the Sorek National Park there is complete concealment by Eucalyptus groves. Closer (up to 500 meters), the plant and the reservoirs will constitute a visual violation of the continuity of open, "natural" looking space. From the physical aspect, the plant will block the open space in existence today between the Dan Region Sewage Treatment Plant and the agricultural land south of the overflow channel.

The pumping station will be located at a distance of some 350 meters from the shore and some 10-15 meters from the north river bank. To the north, the pumping station will be concealed by batteries built by the IDF and by the first Kurkar ridge. To the south, the river estuary and the sea shore from an undamaged area and the pumping station will be fully visible from Kibbutz Palmachim. Removing the pumping station to a distance of 350 meters from the river estuary will reduce the negative visual impact and, since the top of the facility is only about 5-6 meters above ground, it is possible to minimize the impact with the use of finishing and shade materials.

During the construction works of the pumping station and the pipeline from it to the depth of the sea and to the desalination plant, a severe violation of the surface area is expected, including prominence in the landscape. This too will only last for a short and determined time and on completion of the works the land will be restored to its previous state, keeping in mind that the rate of restoration in a sandy habitat is very speedy.

The laying of the conducting lines from the reservoirs to the national water supply systems will cause a temporary violation of the surface and the landscape, however, on completion of the works, the land will be restored to its previous state and all that will remain on the surface is a number of small vents and, therefore, their impact on the landscape is minor, and painting them in the appropriate shade will camouflage them in the landscape.

### **Noise**

The Plan includes three sources of noise: the seawater pumping station, the desalination plant and the product water pumping station.

The nearest noise receptors are the houses of Kibbutz Palmachim, which are located about 615 meters south of the planned pumping station and the residences of the military facility to which the survey referred as being adjacent to the facility's eastern fence.

The findings of the model run showed that the noise levels calculated for all the sources comply with the requirements of the law and the requirements of the Ministry of Defense.

### **Air Quality**

The energy consumption of the plant is based on the national electricity grid. Therefore, the plan does not include any factors constituting a source of air pollution to the environment.

The proximity of the plant, which is the subject of this review to the Dan Region Sewage Treatment Plant was examined by the survey conductors and it was found that:

- The location of the plan at a distance of 450 meters from the southern fence of the Dan Region Sewage Treatment Plant positions the Plan outside the sphere of influence of the aerosols of the aeration ponds.
- The findings of the air pollution survey carried out for the plan for the construction of a thermal facility for handling the Dan Region Sewage Treatment Plan sludge, determined that the potential impact of the emission of pollutants from the thermal facility on the quality of air in the region of the Plan is extremely small. It is important to emphasize that this plan was rejected by the planning authorities and instead the Dan Region Sewage Association is promoting a plan for anaerobic/heat drying treatment of the sludge, technologies that are not supposed to create aerosol hazards and/or air pollution.
- It must be emphasized that the plant in its entirety is a completely closed and sealed system.
- In order to minimize, as much as possible, the potential for environmental impacts of any kind, directives for the design and operation of the plant have been formulated in **Chapter 5** of this document.