

Arab Republic of Egypt

EGYPT INFRASTRUCTURE IMPROVEMENTS PROJECT

SECONDARY CITIES

Environmental Assessment

Environmental Assessment Report

For

**New Valley Governorate
El Mounira and Naser El Thowra Villages,
Kharga Oasis,
Balat, El Gedida and Tanidah Villages,
Dakhla Oasis**

**National Organization for Potable Water and
Sanitary Drainage (NOPWASD)**

**US Agency for International Development (USAID)
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CDM International Inc.

In association with



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New Valley Environmental Assessment Executive Summary

The USAID-funded Egypt Infrastructure Improvements Project is preparing to implement improvements to wastewater facilities in two villages in Egypt's New Valley (Wadi Gedid) and potentially three additional villages should funding be available. These projects in the New Valley Governorate are to be implemented for the Government of Egypt (GOE) through the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the United States Agency for International Development (USAID).

In accordance with 22 CFR 216, this is the projects' Environmental Assessment Report, a detailed study of the reasonably foreseeable significant effects, both beneficial and adverse, of a proposed action on the environment.

The project villages are El Mounira in the Kharga Oasis, and Balat in Dakhla Oasis. El Mounira is to receive a sewerage system, a pump station, a force main to a new stabilization pond wastewater treatment plant, and the treatment plant itself. Balat is to receive a new stabilization pond plant with nearly 10 times the capacity of the plant it replaces. The additional three villages are Naser El Thowra in the Kharga Oasis and El Gedida and Tanidah in the Dakhla Oasis and will each receive a sewerage system, a pump station, a force main and the new stabilization pond wastewater treatment plant. In each case, the planned population to be served is 10,000 in Year 2030.

Located some hundreds of kilometers due west of Luxor, the New Valley is a vast region in Egypt's Western Desert. In two principal "oases," groundwater is being pumped to irrigate extensive areas of new farmland, and to supply several clusters of towns and villages. Although some Pharaonic antiquities testify to occupation in ancient times, the region has in recent times been settled only since 1959.

Wastewater collection and treatment systems serve many but by no means all of the towns and villages. Some 20 villages already have stabilization ponds for wastewater treatment, but many do not, and some of the existing plants are already seriously overloaded.

Stabilization ponds use a simple wastewater treatment technology that is effective and reliable, though extensive in area required per unit capacity. They are well suited for remote desert settlements where low-tech, low-maintenance, and low-energy facilities are essential, yet the requisite space is affordable.

Environmentally positive aspects of the proposed systems are:

- The systems will give the villages a more healthful and attractive environment.
- The ponds are to be located at a distance, and generally downwind, from the densely-settled areas.
- The ponds are to be lined to limit the loss of water, and contamination of the aquifer, due to infiltration.

During design, environmental aspects to be considered include:

- In El Mounira, Naser El Thowra, El Gedida and Tanidah, wherever a sewer line stops short of reaching existing or potential sources of wastewater, the end manhole should be sized and sited to accept septage discharge from haulers emptying onsite wastewater holding tanks or soakaway pits.
- The effluent will be suitable for irrigation of woodland plantation and of certain crops. The choice of what is to be irrigated, as well as observance of seasonal requirements and limitations, will be negotiated between NOPWASD and the Ministry of Agriculture and Land Reclamation.
- In El Mounira, the proposed stabilization pond site may be threatened by the advance of several barchan dunes a short distance to the north. The prevailing winds drive these dunes south at a rate not yet determined, but burial by such dunes would clearly shorten the life of the pond system. The most practical mitigation measure would be to locate the plant out of the trajectory of the dune, or sufficiently far south as to have an acceptably long life before being buried.
- The operation of a wastewater system, even a small and simple one, requires a certain level of water quality sampling and analysis. This need could be met at wastewater plants in the regional capitals, Kharga and Mout, with wastewater laboratories sized and equipped to serve all the wastewater plants in their regions.
- From time to time the ponds, particularly the anaerobic ponds, will need to be dredged of sludge. An item for longer-term planning for the whole region would be provision of a remote sludge-handling site. The stabilized sludge is valuable as a soil builder for woodland and certain crops.

During construction, aspects to be considered include:

- The problem of expansive soils. Where found, this problem is to be addressed by proven techniques of over-excavation and backfill with inert sand and gravel.
- The potential impact of construction activities on antiquities. There are few if any known antiquities near the proposed construction sites, but it is quite possible that buried antique objects will be unearthed during construction, and should be handled in a manner that conserves them while not unduly delaying the construction schedule.
- Sewer installation will unavoidably block streets. The width of the excavated trench plus that of the side-cast excavate will effectively block a street of typical width. Where there must be over-excavation of expansive soils, the obstruction will be even greater. If antiquities are unearthed, there will be delays in construction. Sewer installation must therefore be scheduled to occupy any one section of a street for the least possible duration, and not block more than one street at a time in any one small area.

Monitoring issues

During sewer construction, monitoring should ensure that the construction crews:

- Observe Egyptian safety regulations.
- Overexcavate trenches as needed when expansive soils are encountered.
- Are alert for antiquities encountered during excavation.
- Schedule work so as to block any one street for as short a time as possible.
- Limit the amount of dust raised, to be not much more than is typical of a desert setting.

During wastewater treatment plant construction, monitoring should ensure that the construction crews:

- Observe Egyptian safety regulations.
- Overexcavate as needed where expansive soils are encountered.
- Are alert for antiquities encountered.
- Properly install the liner that is to minimize seepage from the ponds.
- Control dust generation if it is an issue for the health and safety of construction crews and nearby residents or property.

During the years of plant operation, annual monitoring should be alert to:

- Any complaints of excessive odor or noise from the pump stations, which are located within the village.
- Any complaints of excessive odor from the stabilization ponds, particularly those of Balat, which are surrounded, at a distance, by irrigated fields and some residences.
- Any complaints of insect pests such as mosquitoes or flies attributed to the stabilization ponds.
- The presence, numbers, general health, and species of birds on the ponds.
- The rate of barchan dune advance toward the El Mounira stabilization ponds.
- The quality and consistency of routine sampling at the wastewater plants, and analysis of the samples on site or at the analytical laboratory, wherever located.

- Whether disposal operations are proceeding satisfactorily, with effluent flowing from the plant and being used productively for irrigation, or being stored, or used in another acceptable manner.

Final words

Experience with the 20 or so existing stabilization pond systems in the New Valley, and those elsewhere in Egypt, has been mostly positive. Aside from odor problems at some overloaded ponds, and some damage to buildings due to sewer leaks in areas of expansive soils, the problems appear to be few. The principal message from New Valley citizens and their representatives is that they are impatient to receive more such systems.