Iraq Infrastructure Reconstruction Program

This report includes procurement sensitive information that shall not be disclosed outside the Government and shall only be used for planning, reporting and implementiation of the program.

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Assessment Report Executive Summary

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Introduction

The United States Agency for International Development (USAID) has the mandate to rebuild infrastructure, public facilities and services in post-conflict Iraq. On April 17, 2003, Bechtel National, Inc. (Bechtel) was awarded a contract to provide construction services in support of the Iraq Infrastructure Reconstruction Program. This report summarizes the assessments Bechtel has conducted to date, recommends priority activities for restoring critical infrastructure and services, and presents the estimated costs associated with those activities.

Bechtel and USAID have jointly developed an emergency repair and rapid assessment program to meet USAID's immediate priorities. The program outlines four national priorities (port, power, airport, key bridges) and additional regional priorities to align with the regional structure of the Organization of Reconstruction and Humanitarian Assistance (ORHA), now Coalition Provisional Authority (CPA). Using the plan as a roadmap, Bechtel sequenced initial activities to focus on expediting delivery of humanitarian aid to major population centers. For example, dredging at the Port of Umm Qasr was quickly followed by rehabilitation efforts for grain handling facilities and construction of a bypass road around the damaged Al Mat highway bridge.

The assessment process began on the day of contract award. Key Bechtel program and functional managers were mobilized to a project office in McLean, Virginia. They immediately started to gather assessment data by accessing ORHA and USAID web sites and other sources. By May 6, all infrastructure program managers had mobilized to Kuwait and/or Iraq.

During this rapid mobilization period, a number of issues not anticipated by the original contract emerged. Most important are ongoing security concerns that have severely limited mobility in Iraq. Initially, Bechtel organized single-day and overnight trips from Kuwait to various Iraqi sites to conduct field assessments. Within three weeks, teams began extended trips into all four regions (North, Central, Heartland, and South), thus enabling a countrywide, systems approach to the assessment. While in Iraq, our teams were accompanied by security and explosive ordnance disposal (EOD) personnel at all times, and local Iraqi representatives whenever practical. Unfortunately, ongoing looting and vandalism have at times compromised the validity of completed assessments, and revisits are required to keep assessment reports current. Today, project camps have been established in Baghdad and Al Basrah as well as at the Port of Umm Qsar to support the conclusion of assessment efforts and the implementation phase.

Using assessment results and parametric methods of estimating, Bechtel has identified costs of contract scope of work in excess of the contract amount. The assessments and estimates have been classified as emergency, short-term, intermediate-term and long-term priorities. Short-term priorities are efforts that could be completed within a six-month duration; intermediate-term priorities are efforts that could be completed by the December 2004 contract completion date; and long-term priorities would extend beyond December 2004.

In approaching the assessments, Bechtel first tried to understand the infrastructure segment as an integrated system. This allowed us to target detail assessments to those efforts that would produce the most immediate and least cost improvements. For example, understanding the integration of the wastewater and water infrastructure in Iraq leads quickly to the conclusion that improvements to wastewater collection and treatment in the north will automatically improve water quality in the southern Iraq. Water in southern Iraq is drawn from the river water flowing from northern Iraq.

Using a systems approach and the information gathered from detailed assessments in an infrastructure segment also allows some extrapolation and broad, factored estimates of the cost for reconstruction for portions of the infrastructure segment which were listed in the contract but not assessed.

Part of Bechtel's scope of work was to provide institutional strengthening as part of the reconstruction activities. The cost for institutional strengthening has been included in our estimates though the USAID policy for institutional strengthening is still pending.

Summarized below are the results of Bechtel's assessments of the six infrastructure sectors identified in the contract: Port of Umm Qasr; Airports; Water, Waste, and Irrigation; Rail, Roads, and Bridges; and Buildings.

Port of Umm Qasr

The pre-dredging bathymetric of the immediate port area was completed in early May. A magnetometer survey of the new port has also been completed. The surveys revealed that the navigation route into the new port is silted up and confirm the presence of documented and unknown wrecks and unexploded ordnance (UXO) on the seabed of the new port. Emergency dredging operations to open up the entrance to the new port to facilitate delivery of food and other relief supplies are complete. Emergency dredging of the grain berths and new port are under way.

Bechtel has also completed a survey of four Iraqi dredges which were in the port but out of commission. We conducted assessments of essential port infrastructure, including grain handling facilities, electric power supply, and security arrangements.

A prerequisite for the effective operation of the port is a safe navigation route that can accommodate large ocean-going vessels. Bechtel recommends dredging the new port to a minimum depth of 12.5 meters. A bathymetric survey of the channel from Umm Qasr to the Arabian Gulf is currently being carried out and a recommendation on dredging of the channel will be made by July 7. In parallel, a phased approach should be put in place to rehabilitate essential port infrastructure to meet requirements recommended by Stevedoring Services of America, USAID's port operations contractor and to meet International Maritime Organization standards and requirements.

Airports

At the direction of USAID, Bechtel has shifted assessment and emergency mobilization priority from Basra to Baghdad. To date, we have completed assessments of the international airport at these two cities, as well as the national air traffic management infrastructure. Plans are under way to perform detailed assessments of three domestic airports once access clearance is granted.

Although the air traffic control and communication systems were damaged during the conflict, Bechtel's assessments reveal that Baghdad and Basra airports otherwise sustained limited conflict damage. Deficiencies in airport function and infrastructure stem from a very poor level of overall maintenance and a lack of replacement parts over the past 12 years. Assessment results have enabled Bechtel to prioritize the specific improvements that are necessary to meet airport performance benchmarks as set out in the contract. Emergency actions to open Baghdad International Airport to limited commercial flights by July 15 are already under way.

Water, Waste, and Irrigation

Bechtel performed assessments on 29 water facilities, pumps, generators, and pipelines around Al Basrah, Baghdad, and in the Heartland region. These assessments reveal that chemical feed and control systems, as well as motors, pumps, and other working mechanisms, are generally in need of either replacement or major repairs. Wastewater is being passed directly into rivers without treatment, and sewers are in danger of flooding.

An integrated approach must be taken to address the challenge of supply and distribution of potable water to the Iraqi population. Water treatment facilities in the southern area must be rehabilitated so they become much more effective in removing contaminants from the water. Wastewater treatment in the central area (from Baghdad south to Al Samawah) must be returned initially to at least the design conditions to lessen the pollutant load from raw wastewater to the river. These projects should move forward as quickly as possible. Once under way, the program should refocus to rehabilitate water treatment systems in the Central region and wastewater treatment in the North.

The Sweetwater Canal is another area of concern as it is the only source of potable water for the population base in the Basrah area. It requires dredging and general maintenance of the pump stations and the canal gates.

Power

Bechtel has completed assessments of the 400 kV and 132 kV distribution systems as well as many power generating stations in the Central and South regions and numerous substations primarily located in the South and Heartland regions.

Assessments indicate that generating stations and substations sustained limited damage during the conflict. Most of the damage found is due to extended operations, deferred maintenance, and ongoing looting and vandalism. On the other hand, the transmission system has suffered significant damage during the conflict and even further damage from ongoing looting and vandalism.

The power system in Iraq includes multiple interrelated parts, none of which can stand alone. Bechtel recommends emergency actions be taken to address immediate power needs at population centers, but also that a longer-term program be put in place to increase generation capacity and restore transmission lines and substations to support local distribution of petroleum and other industrial production.

Rail, Roads, and Bridges

Bechtel has performed 33 field assessments of CPA's 49 priority bridges and a 40-km stretch of highway between Al Diwaniyah and An Nasiriyah. Bechtel also conducted a detailed assessment of rail infrastructure associated with food delivery in the Al Basrah area.

The Iraqi road and bridge network is incomplete, even along major national highways. Military conflict, neglect, and substandard construction have caused further deterioration of the network. The lack of viable transport alternatives has caused traffic to continue on structures that are damaged or, in some cases, in imminent danger of collapse. Those structures were the focus of Bechtel's assessment efforts.

Assessments of the rail network reveal that prior to the recent conflict, train service in Iraq already suffered from inadequate maintenance of infrastructure and rolling stock. While there seems to be an adequate stock of maintenance equipment and spare parts and materials, no management plan is in place to deploy these resources effectively. During the conflict, railway facilities were specifically avoided and overall harm to the network was minimal and localized. However, the widespread looting and the vandalism that followed the fighting has caused considerable physical damage, including the loss of Iraq Republic Railway records, smashed passenger cars and destroyed electrical control panels.

Bechtel recommends focusing rehabilitation work on major artery bridges as key control points along the country's land transport network. Development of the implementation plan should be guided by USAID's priorities. For the railways, minimal rehabilitation should be carried out, primarily in the south, to facilitate food movement. Longer-term objectives should be the provision of an operational fleet of 75 locomotives and 1000 specialty freight and passenger cars, a reliable train movement control system, and institutional strengthening to develop modern management systems throughout the country's rail system.

Buildings

Bechtel has prepared a preliminary database of schools and clinics across a number of cities. Input from key stakeholders, such as CPA regional representatives, other USAID contractors, and NGOs has been collected and assessment priorities are in place. Teams have been deployed to Al Basrah and Baghdad to complete assessments of representative facilities.

Bechtel recommends the use of Iraqi subcontractors to conduct detailed assessments based on criteria established by Bechtel. Emergency rehabilitation should focus on the repair of buildings that are dilapidated through neglect and vandalism, but which have no fundamental structural flaws. It is Bechtel's preliminary conclusion that many of Iraq's schools and clinics meet such a criterion. This approach will enable the beneficial impact of rehabilitation work to reach large populations in an expeditious and cost-effective manner. Over time, this strategy can be replicated at as many population centers as funding allows. Repair or rehabilitation of remaining schools and hospitals, and selected Ministry of Heath and Ministry of Education buildings, will be a longer-term objective.

Program Challenges

The Iraq Infrastructure Reconstruction Program faces unprecedented, program wide challenges. Among these are:

- **Security and Access.** The need to provide for the secure transport of assessment teams, as well as protection from ongoing looting and vandalism of jobsites and completed projects, will add substantially to the cost of the repairs anticipated when the reconstruction program was originally conceived. Without adequate protection of facilities, looting and vandalism are unchecked, often undoing the work just completed.
- **UXO.** The presence of UXO hazards in most areas of the country slows down and increases the cost of reconstruction across all infrastructure sectors. Some areas have not been declared cleared by the military and must undergo extensive investigation prior to commencement of work in the area.
- **Contracting Strategy.** Strict adherence to international standards for contractor selection and accountability, recognition of sanctions and embargoes, contract term flow down requirements, plus differences in industry standards, payment mechanisms, and language barriers, will pose difficulties to local contractors. Adjustments must be made to recognize the need to successfully use Iraqi contractors.

Recommendations

To meet the challenges outlined above and in individual sector summaries, Bechtel recommends focusing on the following key requirements:

- **Integrated Systems Approach.** Wherever possible, infrastructure segments must be addressed as systems and not just specific pieces. Power, water, airports, rail, and the port are all integrated systems and each has to be understood as a critical component of an overall infrastructure network to arrive at the most economic and effective implementation plan.
- **Alignment with USAID Priorities.** Emergency restoration of the port, airport, and power services, as well as the repair of water and waste management facilities, roads, bridges, rail, and buildings must be sequenced to align with priorities established by USAID.
- **Addressing Short- and Long-Term Needs.** The plan forward must assign priorities in a comprehensive manner. It must be sensitive to the humanitarian mission of the program and Bechtel's responsibility to control the expenditure of funds on the program.
- **Use of Iraqi Contractors.** Innovative ways must be found to make maximum use of Iraqi subcontractors and entities. Engineering and construction skills do exist in the contracting sector and ex-ministerial, now parastatal, companies have the experience and skills necessary to do much of the work to good standards.

Bechtel's rapid assessment program has collected valuable data on Iraq's existing infrastructure needs. This report and the assessment estimates backing up our recommendations and conclusions are fact-based and accurately reflect the current situation. Bechtel is committed to working with USAID to agree on overarching priorities going forward and implement the work in accordance with those priorities.