Environmental Assessment

Mazar-e-Sharif Industrial Park
Balkh Province, Afghanistan

Final

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1.0 PURPOSE AND NEED FOR PROPOSED ACTION

1.1 Introduction

This document was prepared to comply with Title 22 of the U.S. Code of Federal Regulations, Part 216 (22 CFR 216) - Agency Environmental Procedures. This reflects the requirements of Executive Order 12114, issued January 4, 1979, entitled Environmental Effects Abroad of Major Federal Actions, and the purposes of the National Environmental Policy Act of 1970, as amended (42 U.S.C. 4371 et. seq.). These are intended to implement the requirements of the Act as they affect USAID activities. Pursuant to 22 CFR 216, actions with the potential for significant impact require the preparation of an EA and subsequent approval of the EA and its recommendations to avoid or otherwise mitigate potential adverse impacts.

As required by 22 CFR 216, the introduction to this environmental assessment (EA) shall briefly specify the underlying purpose and need to which the U.S. Agency for International Development (USAID) is responding in putting forward this proposed action.

This project will comply with Afghanistan's Environment Act, which was promulgated by presidential decree on December 18, 2005. The Act was published in issue no. 873 of the Official Gazette (January 19, 2006 or 29 Jadi, 1384). Further, Afghanistan's National Environmental Protection Agency (NEPA) is currently developing sets of regulations under the Act, including regulations for environmental impact assessment (EIA). The EIA regulations are being drafted in accordance with NEPA's draft national EIA policy, which was circulated for comment to stakeholders during February 2006. Final action has not been taken. While these regulations have not yet been finalized, park management is committed to applying best practices to all aspects of this project. By applying best practices and exercising diligence, this project will comply with all applicable U.S. and international guidance.

Since 2002, the United States of America, through entities such as USAID, has been working to ensure the economic recovery and political stability in Afghanistan. Activities include projects tied to USAID's Sustainable Economic Policy and Institutional Reform Support (SEPIRS) Program is the sponsor of the proposed site preparation of the Mazar-e-Sharif Industrial Park. This project will include the design and construction of key site infrastructure, including water and wastewater systems, and solid waste management. Consistent with the scoping statement for this document, issues to be considered shall include, at a minimum, geology, seismic risk, traffic, noise, cultural and historical resources, and stakeholder input.

USAID is committed to undertaking activities that are both economically sustainable and protective of the environment. The strategic objective of this proposed project is infrastructure development, economic governance and humanitarian assistance. Further, this proposed action would stimulate economic growth in Balkh Province. The project budget is roughly $2.8 million for land development and $4.25 million for the power-generating facility. Project completion is expected to be the end of 2006. This document provides stakeholders, including the Industrial Parks Development Department within the Afghanistan Investment Support Agency (IPDA/AISA), with a full discussion of significant effects of the proposed action.

1.2 The Proposed Action

The Government of Afghanistan proposes to prepare a site in Balkh Province, Afghanistan, for the Mazar-e-Sharif Industrial Park. This proposed project includes site preparation and installation of critical infrastructure. Owned by the Government of Afghanistan, this 15-hectare site is located approximately 22 kilometers (15 miles) to the south-east of Mazar-e-Sharif and roughly 7 kilometers (less than 5 miles) to the south-east of the airport. This site is part of a larger industrial area – roughly 400 hectares - designated by local government, according to a master industrial development plan for Mazar-e-Sharif.

This document does not address potential impacts associated with individual tenants. Based on consultation with the NEPA, a process has been developed for assessing the potential impacts of prospective tenants. This process is described in section 2.3.1 of this document.

Located in northern Afghanistan, Mazar-e-Sharif is the provincial capital of Balkh Province. The city is roughly 320 kilometers (200 miles) north of Kabul and 56 kilometers (35 miles) south of the border with Uzbekistan. Mazar-e-Sharif is found in one of Afghanistan's most fertile regions. The area relies on extensive irrigation by the Balkh River to produce cotton, grain, and fruit. The town's industries include flour milling and the manufacturing of silk and cotton textiles. Mazar-e-Sharif is a center for Afghanistan's oil industry. Its population is estimated at 232,800 (U.S. Census Bureau, 2001). The inhabitants of Mazar-e-Sharif are mainly Uzbeks, Tajiks, and Turkmens.

Like much of Afghanistan, Mazar-e-Sharif and the surrounding area suffer from sluggish economy. Developing this industrial park is a step towards stimulating the area's economic growth. This project would involve preparing the site for future tenants. Site preparation will include the design and installation of critical infrastructure, which will address water and wastewater, energy and transportation issues.

The site will be used for industrial development purposes to further economic growth in Balkh Province. Based on consultation with local authorities, it has

been determined that this land is not needed to carry out other plans and programs. The proposed action would contribute to goals for targeted, sustainable growth in the region.

Alternatives are: (1) No Action, that is, leave the site in its current state; (2) to develop the site on an as-needed basis; and (3) to prepare the site as a whole for industrial development. Site preparation will include designing and implementing all utilities including gas, electricity, water, and sewer.

1.3 Conclusions

The EA finds the following major conclusions.

- Through the application of best management practices and best engineering practices, no significant adverse impacts are likely to result from the proposed action, provided that the actions to avoid or otherwise mitigate potential adverse impacts are incorporated.

- Temporary impacts may occur during site preparation, including temporary effects on air quality and noise levels due to construction. These impacts are considered to be less-than-significant and will be mitigated by actions discussed in this document.

1.4 Areas of Controversy

"Areas of Controversy" are areas of disagreement emerging from stakeholder interaction in defining the proposed action. No such areas of controversy have emerged.

1.5 Issues to be Resolved

There are no issues to be resolved.

1.6 Organization of this Environmental Assessment

This EA is organized as follows:

- Chapter 1 discusses the purpose and need for the proposed action;
- Chapter 2 describes the proposed action and the alternatives analyzed;
- Chapter 3 provides an overview of the existing environmental conditions of the potentially affected environments;
- Chapter 4 describes commitments to minimize adverse impacts;
- Chapter 5 presents the list of agencies and persons consulted;
- Chapter 6 is the list of preparers; and
- Chapter 7 provides supporting information, including sources of information and a list of acronyms.

2.0 ALTERNATIVES

The following three alternatives were considered:

- No Action, that is, to retain the land in its current state;
- Develop the site on an as-needed basis; and
- Prepare the site as a whole for industrial development.

2.1 Alternative 1 - No Action

Under the No Action alternative, site conditions would remain unchanged. While preserving the site's existing conditions, this alternative eliminates any opportunity for economic development. If this site were left unused, developing an industrial park would require evaluation of other sites, including currently undeveloped or greenfield sites.

2.2 Alternative 2 – Prepare the Site on an As-Needed Basis

Under this alternative, the Government of Afghanistan would retain this land until such time as industries desiring to locate on the site have been identified by a local development board or through self-identification. While allowing more direct control over the specific site tenants, this alternative could result in piecemeal site preparation inconsistent with a coherent strategy. The environmental effects of this alternative would be similar to those associated with the preferred alternative. However, overall quality might suffer because the site would be developed on a piecemeal basis.

This alternative would require greater resources for monitoring and administrative costs of transferring individual tracts of land instead of handling one large transfer. This alternative also would restrict the opportunity for self-direction by the local community.

2.3 Alternative 3 – Prepare the Site as a Whole, the Preferred Alternative

Alternative 3 is the preferred alternative. This alternative provides the most economic benefits to the area while requiring fewer resources. Appropriate mitigation measures would minimize environmental impacts.

This alternative would provide the best overall balance between site preparation and environmental protection. By restricting development by way of protective covenants, environmental quality would be maintained. Standards developed and implemented by IPDA/AISA would assure a properly planned, quality industrial

park. This alternative would yield the best economic benefits and a better potential for community-based and directed development. This alternative provides the community with more autonomy, with restrictions limited to guidelines and commitments developed through the review process. This alternative requires less staff and budgetary resources for implementation and ensures a more even partnership.

2.3.1 Future Review and Approval

Potential environmental impact of tenants will be evaluated on a case-by-case basis. Based on consultation with NEPA, a process has been developed for assessing the potential impacts of potential tenants. The IDPP/AISA will conduct this process. Individual tenants will be required to comply with the following two-step process.

1. The investor must provide facility-specific information, for example, basic operations, raw materials and their sources, type(s) of product(s), production volume, and other data, as applicable.

2. The investor must provide detailed information on the production process, including projected energy consumption, projected water consumption, potential waste products generated by the facility, and proposed waste management processes.

This approach is consistent with procedures followed for industrial parks near Kabul and Kandahar.

In general terms, the following uses will be considered for the proposed site.

1. Light and medium manufacturing, assembling, and warehousing for distribution purposes.
2. Transportation and service facilities.
3. Retail sale of food, beverage, and other such convenience items to persons employed on the property, as long as these items are not offered for sale to the general public.
4. Temporary structures necessary and incidental to any construction activity.
5. Utility facilities necessary for the provision of public services and pollution control facilities associated with site use.
6. Other industrial uses not listed above, subject to prior review and approval.

The following uses are expressly prohibited.

1. Temporary or permanent residential use.

2. Retail sale of products not manufactured or handled at wholesale by the owner or lessee.
3. Wreck, junk, or commercial waste processing; salvage yards; or similar activities (except as incidental and integral to permitted uses).
4. Any other purpose other than such as may be expressly approved by IPDA/AISA.

Building exteriors shall incorporate structural arrangements and color schemes that will limit visual discord with the natural background.

Nighttime lighting for the industrial park and buildings located in it shall incorporate features for limiting the increase in brightness of the nighttime sky.

The front, rear, and sides of all buildings shall be visually screened from adjacent parcels and offsite property, using methods such as architectural fencing, berms, and plantings, individually or in combination.

Noise levels in areas of the industrial park used for office buildings shall not exceed 75 dB, and in areas to be used for wholesale, industrial, manufacturing, and utilities shall not exceed 80 dB. Further, noise generated in the industrial park shall not exceed 65dB at any existing residence.

Should there be any inadvertent archaeological discoveries during site preparation or construction, IPDA/AISA shall determine appropriate measures to identify, evaluate, and manage these discoveries.

All land disturbances shall be conducted using best management practices to control erosion and sedimentation.

All construction in the proposed industrial park will comply with the seismic load design of the 2003 edition of the International Building Code (IBC). In addition, landslide protection will be addressed through sound site development.

2.3.2 Water and Sewer Needs for Alternative 3

It is expected that two on-site wells will be drilled to provide potable water for the Mazar-e-Sharif Industrial Park. Practically all potable water in Afghanistan comes from either a natural source or man-made well. Water from both wells will be tested for potability. These wells will have insignificant or little impact on natural water streams, since there are no natural streams located within 4 km of the site. The wells will be installed by a contractor to the Government of Afghanistan.

A septic system will be built to accommodate the sanitary needs of site occupants. Septic wells are prevalent systems for wastewater treatment in Afghanistan. Before building the septic system, the soil will be tested for permeability. Technologists, Inc. (Ti) has hired a contractor to conduct this test.

As reported by the U.S. Environmental Protection Agency (EPA), when properly sited, designed, constructed, and operated, septic systems "pose a relatively minor threat to drinking water sources." (U.S. Environmental Protection Agency 2001) All septic tanks will be managed and maintained by IPDA/AISA.

Industrial wastes generated by park tenants will be considered on a case-by-case basis. Industrial waste management activities will be regulated by IPDA/AISA.

2.3.3 Power Generation for Alternative 3

Electric supply is not yet adequate as the result of the long years of turmoil. The Mazar-e-Sharif Industrial Park will use diesel-fueled generators for power. These generators would be used until the transmission grid is re-built. It is estimated that the Mazar-e-Sharif site requires roughly 7.5 MW of power, which would require five 1.5-MW generators.

Operating these generators will require aboveground storage tanks (ASTs) for diesel fuel storage. The AST system is made up of the tank, a catch basin to trap fuel (should a tank leak or rupture), a concrete pad to retain fuel spilled during vehicle servicing, and a roof structure to reduce evaporation and to keep water from collecting in the catch basin. Since all of the fuel components of this system are above ground, a leak can be visually detected as soon as it occurs. Also, if a leak does occur, all fuel will be contained by the concrete catch basin until it can be disposed of properly.

The National Fire Protection Association (NFPA) recommends that ASTs be located on a high, well-drained site, a minimum of 40 feet (including fueling apron) from any buildings and other combustible materials. The tanks should be installed in an east-west orientation. This reduces the amount of solar radiation the tank receives and keeps evaporation losses and condensation within the tank to a minimum.

ASTs are generally made of steel and should be designed and built in accordance with the NFPA Standards and the Underwriters Laboratories (UL), Standard 142. The ASTs will be painted a reflective color to reduce evaporation losses and moisture condensation within the tank. A low-pressure valve installed on top of the tank will also reduce the amount of evaporation and condensation.

The use of natural gas was considered. The choice between diesel and natural gas involves trade-offs between competing fuels. At this time, the lack of infrastructure eliminates consideration of natural gas as fuel for the Mazar-e-Sharif generators.

While the use of solar energy was considered, it was determined to be an unfeasible source of power for the park. While solar power is a clean method of

energy production, costs can be very high. Not only are solar panels expensive, they are constructed from fragile materials and must be constantly maintained and often replaced. While solar power has been used by commercial facilities, these operations typical use a few kilowatts of power. Given the power requirements for this industrial park, solar energy is not a feasible option.

2.4 Alternative Locations

The prospect of alternative locations was considered. The site under consideration is located in an area that the government has designated for industrial development. The site has direct access to the main highway leading to both Mazar-e-Sharif and the airport. Alternative sites could require more infrastructure work, with potentially significant environmental impacts. Therefore, alternative sites were dropped from further consideration.

2.5 Comparison of Alternatives and the Preferred Alternative

The No Action Alternative leaves the site unchanged, ensuring continuation of existing environmental conditions at the site, while precluding any immediate opportunity for economic development.

Alternative 2, sale of land to industrial users on an as-needed basis, would allow greater control over specific industries that could locate at the site. However, this alternative would result in case-by-case decisions that may ultimately be inconsistent with an overall industrial development plan. Alternative 2 would require a much greater commitment of management resources to recruit individual industries and transfer many individual tracts of land instead of handling one large transaction.

Alternative 2 also would limit the ability of the local communities to plan and direct development in their area. The environmental effects of Alternative 2 would be similar to Alternative 3, but overall site quality might be impaired because development would proceed without the benefits of an overall site plan.

Alternative 3, the Preferred Alternative, would allow planned, coordinated preparation of the site.

Analyses in this EA are based on the assumption that all land would be disturbed under either Alternative 2 or 3. The site has been carefully screened to identify sensitive resources. Land areas containing sensitive resources will be excluded from development activities. Commitments listed in Chapter 4 would limit all impacts to insignificant levels. Socioeconomic impacts for either Alternative 2 or 3 would be positive.

3.0 THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

The following environmental issues pertinent to the proposed action and the comparison of alternatives were identified and are addressed in this EA.

- Geology and Soils
- Seismic Considerations
- Transportation
- Noise
- Cultural and Historical Resources
- Air Quality
- Water Quality
- Floodplains
- Ecology
- Prime Farmlands, Wetlands, Managed Areas and Recreation
- Socioeconomic
- Visual Quality
- Solid and Hazardous Wastes
- Landslides
- Cumulative Impacts
- Irreversible or Irretrievable Commitment of Resources
- Relationship Between Local Short Term Uses of the Environment and the Maintenance and Enhancement of Long Term Productivity

A summary of potential environmental issues can be found in Appendix A.

As discussed earlier, this project will comply with Afghanistan's Environment Act, which was promulgated by presidential decree on December 18, 2005. Further, the NEPA is currently developing sets of regulations under the Act, including regulations for environmental impact assessment (EIA). The EIA regulations are being drafted in accordance with NEPA's draft national EIA policy, which was circulated for comment to stakeholders during February 2006. This document is consistent with the vision delineated by the draft EIA policy.

3.1 Geology and Soils

There is little, if any, information regarding the geology and soils of the proposed site. Geotechnical information will be collected to support all site design parameters. A soils analyses and geotechnical report may be required. At a minimum, soil boring logs and basic soils design assumptions shall be shown on the designer-prepared construction drawings. The design/build firm will be responsible for performing a topographic survey, soil borings and soil testing to verify the actual site conditions.

Before site work begins, a geotechnical engineer shall perform a site-specific geotechnical exploration/testing program to accurately characterize the site. This engineer also will perform the final design for all geotechnical features of work. The design/build firm shall be fully responsible for acceptable pavements and other geotechnical aspects of the proposed project. Any investigations, identification of subsurface materials and laboratory testing of soils and aggregate materials shall be in accordance with applicable ASTM standards and good geotechnical practice.

3.2 Seismic Considerations

Afghanistan is one of the most active seismic regions of the world. The geological structure of Afghanistan is the result of accretion of colliding Gondwanan microplates or fragments onto the margins of Eurasia along the Herat-Panjshir E-W striking geosuture. Similar structures along the Chaman-Moqor NE-SW striking fault system, the Sarobi-Altimore NE-SW arcuate fault system, and other secondary faults cover most of the regions of Afghanistan.

According to the Global Seismic Hazard Assessment Programme (GSHAP), northeastern Afghanistan has the highest earthquake hazard. Here a maximum peak ground acceleration (PGA) ranges from 0.24g to in excess of 0.48g in the eastern-most regions.

With this in mind, all construction in the proposed industrial park will comply with the seismic load design of the 2003 edition of the International Building Code (IBC). Updated standards have been incorporated, including the 2002 edition of Minimum Design Loads for Buildings and Other Structures.

3.3 Transportation

3.3.1 Affected Environment

Mazar is the main transport hub for northern Afghanistan. The site is located on the main highway connecting Mazar to Kabul.

Any roadwork performed during site preparation will be consistent with applicable codes and standards. When codes and standards are in conflict, the most stringent shall apply. Further, all work shall be designed and constructed to meet all Afghanistan codes, standards and laws. In the absence of Afghanistan codes, standards and laws U.S. or Internationally recognized codes, standards, and laws shall be used. Examples of standards to be used include the latest editions of two documents from the American Association of State Highway and Transportation Officials (AASHTO): *A Policy on Geometric Design of Highways and Streets*, and *Manual on Uniform Traffic Control Devices*.

While final design and construction has not yet been determined, it is expected that compacted gravel base roads with a chip seal topping will be constructed. Main roads will be 9 meters wide; sub-roads will be 7 meters wide. Roads will be graded for proper drainage, provided with necessary drainage structures and completed with prescribed surfaces in accordance with applicable sections of TM 5-822-2, *General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas,* and TM 5-822-5, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas.* Road sections will be surfaced with minimum 50 mm chip seal topping over a 150 mm aggregate base and 300 mm scarified sub grade. The base courses shall be compacted to 95% proctor density durable aggregate uniformly moistened and mechanically stabilized by compaction.

Parking areas will be built with an aggregate base of 150 mm. Aggregate Base Course (ABC) material must be well graded, over subgrade of 150 mm in depth scarified and compacted to 95% proctor density durable aggregate uniformly moistened and mechanically stabilized by compaction. Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557or equivalent standards.

Street and traffic control sign requirements will conform to the *ASHTO Manual on Uniform Traffic Control Devices.* Actual sign design shall be to Afghan and internationally accepted standards.

3.3.2 Environmental Consequences

The existing road should be able to handle the increased traffic adequately, with little effect on other road users. Site preparation would result in the generation of additional traffic on the adjacent roadway network. Increased traffic would result from laborers involved in site preparation and construction, employees commuting to/from the site, consumers, and truck deliveries and shipments. Given current conditions in Afghanistan, however, it is very difficult to develop reliable estimates of traffic and potential impacts to the transportation network.

3.4 Noise

High noise levels can interfere with communication, damage hearing, cause sleep deprivation, and disrupt concentration. Noise is measured logarithmically in decibels (dB). Due to its logarithmic scale, if a noise increases by 10 dB, it sounds as if the noise level has doubled. If a noise increases by 3 dB, the increase is just barely perceptible to humans. Often sound is measured as "A-weighted;" this filters out low frequency sounds which humans are unable to hear and is more indicative of the noise people actually hear. In general, the Sound Pressure Level from an outdoor noise source radiates out from the source, decreasing 6 dB per doubling of distance. Thus, a noise measured at 80 dB 50 feet away from the source will be 74 dB at 100 feet, 68 dB at 200 feet, and 62 dB at 400 feet.

Due to the potential for sleep disruption, loud noises between 10 p.m. and 7 a.m. are normally considered more annoying than loud noises during the day. Therefore, community noise levels are often measured by the Day-Night Average Sound Level (Ldn), which is an average of noise in a 24-hour period; however, a 10 dB penalty is added to noise between 10 p.m. and 7 a.m. In the United States, there is a goal of 55 dB for Ldn in outdoor spaces.

3.4.1 Affected Environment

The area surrounding the site is rural. The proposed site is part of a 400-hectare parcel of land designated for industrial park development by the government. The nearest homes are an estimated 5 to 6 kilometers from the proposed site.

3.4.2 Environmental Consequences

3.4.2.1 Construction Impacts

Park construction would require equipment for excavation, such as backhoes, front loaders, bulldozers, and dump trucks; materials-handling equipment, such as cement mixers and cranes; and, compressors, generators, and pumps. Noise generated from this type of equipment would range from 87 to 99 dBA at 30 feet (Cowan, 1994), which would be equivalent to 57 to 69 dBA at 1,000 feet.

Construction is expected to temporarily increase noise levels in the vicinity. Given the distance to the nearest homes, construction noise from the industrial park is of no concern.

Construction activities would also increase traffic on local roads. Large trucks would produce noise levels around 89 dBA at 30 feet (Cowan, 1994), which is equivalent to 77 dBA at 120 feet.

3.4.2.2 Operational Impacts

Park construction and development would generally increase noise levels. In addition, generator use and increased traffic will contribute to noise levels. This increase would depend on many factors, including size of the park, types of facilities, use of noise control devices, number of employees, and the amount of increased traffic. However, given the distance to the nearest homes, operational noise from the industrial park is of no concern.

Following guidelines set by the U.S. Department of Housing and Urban Development, areas to be used for office buildings should not exceed an Ldn of 75 dBA. Areas to be used for wholesale, industrial, manufacturing, and utilities should not exceed an Ldn of 80 dBA. Additionally, under the guidelines,

development of the park should not cause the Ldn at nearby residences to exceed 65 dBA.

Project engineers will examine several approaches to cutting generator noise. Noise barriers and air intake silencers can provide significant noise reduction. Noise also can be cut through modifications to a generator's exhaust, intake, ventilation, enclosure and mounting. Sound attenuation baffles can be installed on the cooling air inlet and outlet.

Another possible approach to reducing noise is limiting the hours of operation. When power demands drop, generator operation also may decrease.

Developing an industrial park on this site would likely increase traffic on local roads. This increase in traffic would not cause a significant increase in noise levels along these roads, although the noise from the industrial park and the additional traffic would generally be noticeable.

3.5 Cultural and Historical Resources

3.5.1 Affected Environment

Mazar-e-Sharif and Balkh Province have a long history of human occupation. There is, however, no record of the site hosting cultural or historical resources.

3.5.2 Environmental Consequences

Cultural and historical resources should not be affected by construction of the proposed industrial park. In the event of an inadvertent discovery of a cultural or historical artifact, IPDA/AISA and local authorities shall be notified. Appropriate measures to identify, evaluate, and manage these discoveries will be determined and implemented.

3.6 Air Quality

The Mazar-e-Sharif Industrial Park site is located roughly 22 kilometers from Mazar-e-Sharif. Climate factors can affect air quality. In the Mazar-e-Sharif area, March and April are the wettest months at roughly 40 millimeters/month. The month of August is the driest, averaging 0 millimeters/month. The average monthly air temperature ranges from 39°F in January to 90°F in July.

3.6.1 Affected Environment

A 2004 article highlighted some of the growing air pollution problems affecting Afghanistan (Saba, D., April 2004). Earlier, the January 2003 UNEP Post-Conflict Environment Assessment Report carried out air sampling at Mazar-e-Sharif and other sites in Afghanistan. At all sites, results indicate high amounts

of dust and concentrations of polyaromatic hydrocarbons (PAHs). Benzo-a-pyrene is one of the pollutants detected and is believed to increase risk of lung cancer. The highest concentrations were detected in Mazar-e-Sharif, where analyses show 13.6 Ng/m3. The World Health Organization (WHO) average values for urban areas range from 1 to 10 Ng/m3.

3.6.2 Environmental Consequences

There are no impacts associated with the No Action alternative. Alternatives 2 and 3 have similar potential for air quality impacts. Individual sources would be expected to have minor air quality impacts. However, cumulative impacts from either alternative would be a potential concern.

As noted earlier, potential environmental impact of tenants will be evaluated by IPDA/AISA on a case-by-case basis. Individual tenants will be required to provide detailed information on the production process, including projected air emissions and proposed control technologies. Based on this case-by-case review by IPDA/AISA, both individual and cumulative impacts will be identified. By controlling the tenant mix, potential environmental impacts associated with air emissions can be minimized. In addition, there would be minor pollution from increased operational traffic as a result of development of facilities.

Generators may result in an increase in air pollutants, mostly nitrogen oxides (NOx). Engine manufacturers have addressed the cutting of emissions through engine design, fuel and lubrication formulations, and exhaust after-treatment. Controls can be used to cut NOx and other emissions.

Temporary and intermittent air quality impacts would be associated with site preparation and construction activities. Air pollution from construction equipment, fugitive dust emissions from operation of this equipment during dry conditions, and increased traffic during construction would cause some minor and temporary air quality issues. However, the project team can use reasonable precautions to prevent fugitive dust emissions.

3.7 Water Quality

Any site work on water and wastewater infrastructure will consistent with applicable codes and standards. When codes and standards are in conflict, the most stringent shall apply. Further, all work shall be designed and constructed to meet all Afghanistan codes, standards and laws. In the absence of Afghanistan codes, standards and laws U.S. or Internationally recognized codes, standards, and laws shall be used. Examples of standards that may be used include:

- American Water Works Association (AWWA) C500, *Metal-Sealed Gate Valves for Water Supply Service* (1993);
- AWWA C651, *Disinfecting Water Mains,* 1992; and

- TM 5-820-4, *Drainage for Areas other than Airfields,* Department of the Army and the Air Force (http://www.hnd.usace.army.mil/techinfo/).

As noted earlier, potential environmental impact of tenants will be evaluated by IPDA/AISA on a case-by-case basis. Individual tenants will be required to provide IPDA/AISA with detailed information on the production process, including water consumption and wastewater generation and treatment. Based on this case-by-case review, both individual and cumulative impacts will be identified. By controlling the tenant mix, potential environmental impacts associated with water consumption and wastewater generation can be minimized.

Water supply will be provided by two new groundwater wells to be installed by a contractor to the Government of Afghanistan. In Afghanistan, practically all potable water comes from either natural sources or man-made wells. Water from both wells will be tested for potability. These wells will have insignificant or little impact on natural water streams, since there are no natural streams located within 4 km of the site. Further, based on experience at the Bagrami Industrial Park, tenants typically have low water requirements.

These wells will be drilled to a depth of 60-100 meters. A contractor to the Government of Afghanistan will build the wells. This project will include construction of a permanent well house with concrete slab floor will be constructed using best engineering practices. The floor of the well house shall slope away from the casing approximately 2 cm per 30 cm (1/8" per foot). The well house design will allow for the removal of the well pump, motor and drop pipe. The well house would protect valves and pumping equipment, plus provide freeze protection for the pump discharge piping beyond the check valve. The well house shall be insulated and a heating unit installed. The well shall be protected from unauthorized use by a security fence with lockable gate. Once completed, well ownership will be transferred to the Park Management Association. Park water systems will be designed to conserve resources and reduce pollution.

Well water will be disinfected in accordance with AWWA A 100 or equivalent. Bacteriological samples shall be collected and examined in accordance with Standard Methods for the Examination of Water and Wastewater by a qualified laboratory. It is expected that a hypo-chlorinator shall be used to feed a sodium hypochlorite solution of 5-15% available chlorine into the system. The hypo-chlorination system shall consist of a chemical solution tank for hypochlorite, diaphragm-type pump, power supply, water pump, pressure switch and storage tank (optional hydro-pneumatic/storage). The pump shall feed a hypochlorite solution in proportion to the water demand. The hypo-chlorinator shall have a pumping rate, liters per day (lpd) (gallons per day (gpd)) adequate to deliver 5 percent (5%) available hypochlorite solution adjustable to the quantity of water being produced from the source. Dosage rate will vary somewhat depending on actual pump production rate and available residual chlorine in the system.

A water distribution system will be built. Pipe diameters used in the system could range from 100 mm to 300 mm, using ductile iron conforming to AWWA C151, installed in accordance with C 600 or polyvinyl chloride (PVC) as per ASTM D 1784 and 1785. Pipe service connections from the distribution main to the well building shall be either PVC plastic Schedule 80 ASTM D 1785 or copper tubing conforming to ASTM B 88M, Type K, annealed. PVC shall not be used above grade. The distribution network shall be laid out in a combination grid and looped pattern with dead ends. Dead end sections shall either have blow off valves or fire hydrants (flushing valves) installed for periodic flushing of the line.

The project may require construction of a circular steel or circular concrete ground storage reservoir (GST) to be located on the ground surface. This storage reservoir shall be constructed and heated to prevent freezing of the tank and pipes entering tank. Storage volume requirements will be based on final design population. The storage facility shall be located above drainage areas and locations subject to flooding. The storage facility shall be located on the higher elevations of the site to promote gravity flow and reduce pumping requirements. Overflow and air vents shall be screened so that birds, insects, rodents and debris cannot enter the reservoir.

A sanitary sewer collection and treatment system shall be constructed. This system may include, but not be limited to piping, connections, oil water separators, access manholes, cleanouts, and septic tanks. The system will be designed and built in accordance with the International Plumbing Code. System design will use approved field survey data.

3.7.1 Affected Environment

3.7.1.1 Surface Water

Mazar-e-Sharif is located in between the Rud Khana-e Shahi (Shahi River) and the Balkh River. The Balkh river, with its 18 tributaries, makes it independent of other water sources of the region. The site for the proposed industrial park is located between the Balkhab River and Amu River. The closest surface water is an irrigation canal located roughly 4 kilometers to the north-east of the site. This canal flows from west to east.

Balkh province consists of Balkh, Charbulak, Sholagra, Daulatabad, Nahri Shahi, Chimtal Shoortipa, Charkent and Mazar-e-Sharif districts. Most of the population in these districts uses water from irrigation canals as a drinking water supply. In some areas, water is supplied through shallow and deep groundwater wells.

UNEP has reported that there is a considerable need to extend the city's supply network. A World Bank project is expected to reconstruct and rehabilitate the existing network only. Extending the network will require identifying groundwater resources of proper quality and quantity.

3.7.1.2 Groundwater

There is a general lack of understanding about the underlying geologic conditions in the Mazar-e-Sharif region, which complicates groundwater resource management. While available information is limited, ongoing studies by several international organizations should increase the knowledge of geology and groundwater resources throughout Mazar-e-Sharif and Afghanistan. Considerable information should be gathered during the drilling and construction of the two wells that will serve this industrial park.

3.7.2 Environmental Consequences

Alternative 1 – No Action—This has no effect on surface waters or groundwaters.

Since there are no surface waters in the vicinity of the site, no environmental impacts are expected under Alternatives 2 and 3.

Under Alternatives 2 and 3, groundwater impacts from all properly managed activities would be insignificant. The types of industries expected to be located in the park would not be expected to withdraw additional groundwater for their operation. Proper engineering practices will be applied to any waste or chemical storage, preventing groundwater contamination. The limited overall density of development and amount of impervious surface created would not greatly alter groundwater recharge.

All design will focus on protecting groundwater. At a minimum, the following criteria will be satisfied.

- Sanitary sewers will be located no closer than 30m horizontally to water wells or reservoirs to be used for potable water supply.
- Sanitary sewers will be no closer than 3m horizontally to potable water lines; where the bottom of the water pipe will be at least 305mm above the top of the sanitary sewer, horizontal spacing shall be a minimum of 1.8m.
- Sanitary sewers crossing above potable water lines shall be constructed of suitable pressure pipe or fully encased in concrete for a distance of 2.7m on each side of the crossing. Pressure pipe will be as required for force mains in accordance with local standards and shall have no joint closer than 0.9m horizontally to the crossing, unless the joint is encased in concrete.

Sanitary wastewaters will be collected and carried to septic tank adsorption field systems. A septic system will be built to accommodate the sanitary needs of site occupants. Septic wells are prevalent systems for wastewater treatment in Afghanistan. Before building the septic system, the soil will be tested for permeability. A contractor has been hired to perform this testing. As reported by

the U.S. Environmental Protection Agency (EPA), when properly sited, designed, constructed, and operated, septic systems "pose a relatively minor threat to drinking water sources." (U.S. Environmental Protection Agency 2001) All septic tanks will be managed and maintained by IPDA/AISA. Factors to be considered include the following:

- Higher daily wastewater volumes and faster flow rates;
- Higher organic content in wastewaters;
- Potential for cleaners and other chemicals in wastewater; and
- Leachfield siting constraints.

The wastewater flow rate shall be calculated as 80% of daily water use rate. Septic system design will be consistent with best engineering practices. The septic tank shall be located so that it is readily accessible. Minimum horizontal separation distances will be defined between the tank and assorted features such as wells, pipelines and buildings. A key factor is ensuring that drainfield soils are well drained but yet still retain water long enough to allow for proper wastewater treatment. A properly designed and maintained septic system can manage wastewaters from the proposed industrial park. Best practices will be defined and implemented. A key element will be establishing a regular pumping schedule. Commercial septic tanks typically require considerably more frequent pumping than residential systems.

Process Wastewaters

IPDA/AISA will evaluate process wastewaters generated by tenants on a case-by-vase basis. Individual tenants are responsible for making wastewater management decisions prior to discharge to the septic system. Depending on the process, various constituents may have to be removed before final discharge. Of primary concern are those that are *p*ersistent in the environment, *b*ioaccumulate, and/or are *t*oxic (PBTs).

IPDA/AISA will not prescribe treatment methodology. Tenants may choose from a variety of treatment methods, depending on the type and quantity of constituents. Possible choices may include chemical methods, such as precipitation and neutralization, and physical methods, such as skimming, filtering, and cooling.

Once a tenant's process wastewaters have been treated to an acceptable level, the treated wastewater may then be discharged to the park's septic system.

Storm Water

Precipitation ranges from 0 to roughly 40 millimeters/month. Storm water runoff may become contaminated as it flows over construction areas or over commercial and industrial surfaces (roofs, parking lots, outdoor inventory

storage, etc.). Routine BMPs can effectively control storm water runoff. As appropriate, sampling for applicable contaminants may be required. Storm water management design will efficiently remove water without flooding or ponding within the site. It is expected that storm water management will be accomplished primarily through site grading.

Runoff will be calculated using the Rational Method, which is defined in Chapter 2 of TM 5-820-4, *Drainage for Areas Other Than Airfields*. It should be recognized that Afghanistan is one of the few countries in the world with little if any statistical data of any sort. Currently, USAID is working to develop this needed information. As for this project, calculations are based on a theoretical maximum for the area.

Engineers will design and implement an effective system to control storm water at the proposed industrial park. Final design parameters will be based on storm data, for example, storm drains and culverts shall be sized for a design storm with a return period of 10 years. Provisions shall be made to protect all buildings and critical structures from a major storm event with a return period of 100 years. New storm drainpipes shall be designed for gravity flow during the 10-year design storm unless otherwise approved by the IPDA/AISA. The hydraulic grade line shall be calculated for the storm drain system and all energy losses accounted for. Design computations shall adhere to procedures contained in TM 5-820-4. Storm drain systems shall be designed to provide a minimum flow velocity of 0.75 meters per second when the drains are one-third or more full.

After construction, treatment should not be required for storm water runoff from most new industries. On-site processes and other factors will determine the need for treatment. If contamination occurs, storm water collection and treatment would be required. Proper design and operation will ensure that discharges of storm water runoff will have minimal negative environmental impacts. A site-specific stormwater pollution prevention plan will be developed. This plan will ensure that practices are in place to reduce exposure of industrial materials to stormwater, such as good housekeeping, spill prevention and cleanup and structural and non-structural controls.

3.8 Floodplains

3.8.1 Affected Environment

While this site is not located in a flood plain, flash floods are not unusual in Balkh Province. In 2003, for example, the United Nations Assistance Mission in Afghanistan (UNAMA) deployed assessment teams in response to severe floods in a number of districts around Mazar-e-Sharif and neighboring villages. As a result of the flooding, 11 compounds belonging to the Department of Agriculture were completely destroyed.

Site grading will ensure adequate drainage so that no areas will be flooded due to a rainfall of a 10-year frequency. Drainage of the area will be compatible with the existing terrain. All new facilities will be a minimum of 0.15 meters above finished grades. Positive drainage shall be provided away from buildings and roads and for all areas. Existing drainage ways shall be utilized to the extent possible. Swales between buildings and parking areas shall be avoided if possible, unless utilized for stormwater management. The site shall be graded will grade the site such that all stormwater management is functional and in accordance with Best Management Practice requirements. Parking areas shall be graded such that stormwater is directed off to the side. These parking areas will be constructed with various gravel sizes, making the areas porous, thereby reducing runoff and inducing groundwater recharge.

3.8.2 Environmental Consequences

In response to concern about the possibility of flash flooding, engineers may assess the benefits of constructing a floodway. Further, under Alternatives 2 and 3, the site will be laid out in a manner that maximizes stormwater control, thereby minimizing flooding concerns.

3.9 Ecology

3.9.1 Affected Environment

Afghanistan is home to a wide variety of plant and animal life. A more detailed discussion can be found in Appendix B.

Over 120 mammal species are found in Afghanistan. Some species have been categorized as threatened by the World Conservation Union (IUCN). The most seriously endangered are the goitered gazelle, leopard, snow leopard, markor goat, the Asiatic black bear, and Bactrian deer.

The endangered salamander *Batrachuperus mustersi* does not occur near this proposed site. This amphibian is found only in streams in the Hindu Kush of Kabul Province.

Over 450 bird species are found in Afghanistan. Species identified as globally threatened are the Siberian crane, white-headed duck, marbled teal, Pallas's sea-eagle, greater spotted eagle, imperial eagle, lesser kestrel, corncrake, sociable lapwing and the pale-backed pigeon. The IUCN has categorized the Siberian crane as Critically Endangered. It faces an extremely high risk of extinction in the wild. The global population, estimated to contain 2,500–3,000 birds, is divided into three groups. Only a single breeding pair may remain in the central group, which formerly used wetlands in Afghanistan (and Iran) as stopover points during migration between breeding grounds in Russia and the

wintering area in India. In Afghanistan, the key resting site is Ab-e-Estada in Gazni Province.

No aquatic species occur on the proposed industrial park site.

3.9.2 Environmental Consequences

No known threatened or endangered plants have been observed or reported in the area of the proposed site. No occurrences of or suitable habitat for threatened or endangered plant species were identified during field inspections of the proposed site. Therefore, none of the proposed alternatives are expected to have impacts on threatened or endangered plant species or their habitats. The plant communities that occur on the site are common to, and representative of, Balkh Province.

Although construction of the proposed facility would affect some plants, the loss is expected to be insignificant. Field surveys indicate that these vegetation communities are characterized by common and widespread species in Balkh Province that would not be adversely affected by the loss of these populations.

No endangered or threatened species were identified on the site. Wildlife habitats that occur on the site are common throughout the region. Site development would remove some plant habitat and displace wildlife populations that favor these habitats. Most species would find refuge in similar habitats adjacent to the site. Following development, many of these species would likely re-colonize in areas surrounding the proposed industrial park. Thus, the proposed project is not expected to result in significant adverse impacts to terrestrial animal populations of the site. Further, implementing BMPs will mitigate any potential concerns.

Site development may result in an increase in populations of animals that favor recently modified habitats. Some might become a "nuisance" in the area.

The proposed development of the park will not affect any aquatic habitats.

3.10 Prime Farmland, Wetlands, and Managed Areas and Recreation

3.10.1 Affected Environment

Neither wetlands, prime farmland, managed areas nor recreation opportunities were identified on or in the vicinity of the proposed industrial park site.

3.10.2 Environmental Consequences

There are no potential environmental consequences associated with prime farmlands, wetlands, managed areas or recreation areas.

3.11 Socioeconomics

While Afghanistan is an essentially agrarian country, only a relatively small part of the country's land area is suitable for arable farming or horticulture, including both irrigated as well as rain-fed farming. Prior to the Soviet occupation, roughly 85 per cent of the population derived their main livelihood from agriculture.

The Transitional Authority recognizes that a variety of projects – including environmental management efforts - can create numerous employment opportunities when coupled with labor-intensive methods. One important consideration is giving priority to hiring of Afghan professionals and staff members. When needed, appropriate training should be provided to supplement or compliment existing skills. Further, in response to the need for labor services, the Ministry of Labour and Social Affairs and International Labour Organization (ILO) have been working together to establish Employment Services Centers throughout Afghanistan, including opening a center in Mazar-e-Sharif.

3.11.1 Affected Environment

The proposed industrial park is in Balkh Province, which will be the primary labor market for such a park. Secondary labor markets may include neighboring provinces. Mazar-e-Sharif has a history as a chief commercial center. Leading products of the province are fruit, grain, tobacco, silk, cotton, and wool.

3.11.1.1 Population

The U.S. Census Bureau has reported that the population of Mazar-e-Sharif is estimated at 232,800. The inhabitants of Mazar-e-Sharif are mainly Uzbeks, Tajiks, and Turkmens.

3.11.1.2 Labor Force and Unemployment

Afghanistan is an extremely poor country, highly dependent on farming and livestock. Years of Soviet and Taliban control have had a significant negative effect on the economy, further complicated by several years of severe drought.

An estimated 30 per cent of the Afghan work force is unemployed. In addition, the United Nations High Commissioner for Refugees (UNHCR) has estimated that over one million Afghans have returned home from Pakistan, Iran and other countries.

3.11.1.3 Jobs

The 2000 estimated labor force of Afghanistan was 10 million. Many workers have come to Mazar-e-Sharif from across Afghanistan. While jobs are available

in private housing developments and with local NGOs funded by the United Nations or other international bodies, many Afghans have trouble finding employment. One problem is that the years of Soviet and Taliban control have left Afghanistan with few industries where Afghan men can get the necessary experience. In addition, illiteracy levels are high.

3.11.1.4 Income

The 2000 per capita personal income in Afghanistan (purchasing power parity) was estimated to be $800. Laborers in the Mazar-e-Sharif area are expected to meet this annual income estimate.

3.11.2 Environmental Consequences

Under the No Action alternative, the site would remain undeveloped. There would be no effects on the local economy, population, public services, or local government revenues.

Developing the proposed industrial park would lead to important increases in employment, income, and population in the area. While good estimates of impacts cannot be made without specific plans or proposals, a general idea of possible impacts can be surmised by examining similar projects.

Depending on the blend of industries, it is estimated that this industrial park can provide employment for roughly 3,000 workers. With additional jobs from multiplier effects, the total increase in jobs could exceed 5,000.

The park also could stimulate the development of additional properties in the immediate area, which could lead to additional increases in jobs and income.

Increases in jobs and in population may lead to a need for additional housing and to an increase in the needed level of community services, such as schools, fire and police protection, and medical services. However, this growth in jobs and in population would occur over a period of several years, allowing providers of these services time to accommodate growth. While some investment in facilities and equipment may be necessary, local government revenues would also increase. The revenue increase may lag the need for investment somewhat, but the incremental nature of the growth should help local governments keep pace. Similarly, growth in housing needs would be incremental. Because of the incremental nature of the anticipated growth, insignificant impacts on housing and community services would be expected.

If applicable, site preparation will include erection of suitable temporary fences, lighting, and necessary structures to safeguard the site, materials and plant against damage or theft and for the protection of the general public.

3.12 Visual Quality

3.12.1 Affected Environment

While visual quality can be important, the proposed site is of limited scenic attractiveness, with little vegetation. Still, design will minimize discord to viewers of the property from surrounding locations and also to maintain attractiveness within the park and long-term economic value to tenants and community.

There is no development in the immediate vicinity of the affected area. The site is roughly 22 kilometers from Mazar-e-Sharif City. The nearest residences are an estimated 5 to 6 kilometers from the proposed site.

3.12.2 Environmental Consequences

Under the No Action alternative, the site would not be developed further. A visually unremarkable area would remain unremarkable.

Under Alternative 2, parcels are sold on an as-needed basis, which would gradually change the existing landscape to a developed area. Visual coherence would be reduced and scenic attractiveness would be affected. Impacts would depend on the visual sensitivity of site planning and individual architectural designs. Activities, equipment, and materials used during construction would add temporary visual discord until project cleanup was complete for each project. This process could occur over many years as the individual sites are developed.

If nocturnal operations occur, the residences some 5-6 kilometers away would likely notice an increase in background sky brightness. This increase in brightness would be mitigated by first evaluating the need for various nighttime activities. Other work would include determining the appropriate lighting level and frequency for these activities, minimizing the quantity and use of lights, and implementing appropriate "dark sky" techniques.

Earthwork would be required as each parcel is developed. Careful design will substantially reduce impacts. Vegetative buffers around each site would minimize visual impacts. Extensive plantings are proposed.

Broadly horizontal buildings with rooftops below the skyline and with a subtle scheme of natural colors would minimize contrast with the environment and be visually compatible. Dark roofs would provide much less contrast than light ones. Buildings with rooftops could cause adverse contrast and visual discord and would need special attention to color and structure to reduce the effect.

To minimize visual impacts, each project would need to adhere to the following development standards.

- The exteriors of buildings to be located in the park shall incorporate structural arrangements and color schemes that will limit visual discord with the natural background.
- Nighttime lighting for the industrial park and buildings located in it shall incorporate features for limiting effects on background sky darkness.
- All buildings shall be visually screened from adjacent parcels and off-site property at the front, rear, and sides, using methods such as architectural fencing, berms, and plantings, individually or in combination.

It has been determined that the visual impacts of Alternative 2 would not be significant.

Under Alternative 3, the Preferred Alternative, the land's visual character would be changed at a faster rate. Temporary visual discord would not last as long with simultaneous project construction. Visual concerns under this alternative would be similar to Alternative 2, although congestion of traffic would be expected to be greater, albeit for a shorter period of time.

Under this alternative, specific mitigation concerns would be similar to those described in Alternative 2, but would cover the entire park at one time. Through adherence to the development standards identified above, it has been determined that the visual impacts of Alternative 3 would not be significant.

3.13 Solid and Hazardous Wastes

The industrial park will include collection points suitable for solid waste disposal. These collection points will be built with 2-meter high fences, metal roofs, and with 2-meter metal gates. Storage areas will be located on reinforced concrete slabs. Hazardous waste management demands will be based on case-by-case reviews of prospective tenants. IPDA/AISA will be the managing agency for these collection points.

3.13.1 Affected Environment

At this time, it is difficult to assess whether tenants will generate solid or hazardous and special wastes. All waste generation will be regulated by IPDA/AISA. To ensure proper management, wastes generated by individual tenants will be examined on a case-by-case basis. The use of hazardous materials – for example, industrial chemicals and lead-based paint - will be avoided. Asbestos-containing material (ACM) shall not be used in the design and construction of this project. If no other material is available that will perform the required function or where the use of other material would be cost prohibitive, a waiver for the use of ACM must be obtained from IPDA/AISA.

3.13.2 Environmental Consequences

All prospective tenants and employees will be trained on proper waste management procedures. During construction, measures shall be taken to prevent chemicals, fuels, oils, greases, waste washings, herbicides and insecticides, and construction materials from affecting the site and surrounding area.

The park's waste management strategy will emphasize cleaner production and pollution prevention. Tenants will seek maximum re-use and recycling of materials. Toxic materials risks will be reduced through materials substitutions and integrated site-level waste management. In addition, park tenants could link to entities in the surrounding region as consumers and generators of usable by-products via resource exchanges and recycling networks.

Since the park would be new and specific tenant industries have not been identified, it is impossible to quantify future impacts. However, it is possible to describe the general categories of waste and their most probable impacts on the environment.

Solid Waste - Solid waste disposal requires a landfill designed to restrict the migration of materials from the landfill into the environment. Solid wastes that are managed and disposed of in accordance with applicable regulations would not have a significant adverse impact on the environment.

Construction wastes are typically nondegradable and inert. It is possible that these wastes would be buried on site. Proper management and disposal of these construction wastes would not have a significant impact on the environment. All construction waste will be collected into containers before disposal. These wastes include general waste and trash (nontoxic, non-hazardous), and hazardous wastes. Separate containers would be provided for the collection and separation of waste, trash and other refuse. Additional separate containers would be provided with lids for hazardous wastes to prevent sparks or other ignition sources from coming into contact with hazardous wastes. Hazardous wastes can include used oil, used oil filters, oily rags and flammable wastes as well as caustics, acids, harmful dusts, etc.

Solid wastes will be collected on site. Trucks operated or contracted by the local government will collect solid wastes. These wastes will be transported to a municipal solid waste landfill. This landfill is located west and less than 10 kilometers away from the proposed industrial park.

In addition, local government will study a recycling initiative.

Hazardous Wastes - Should hazardous wastes be generated, these would be managed in a safe, environmentally sound manner. This would include the use of tracking and handling protocols.

As discussed earlier, prospective tenants will be considered on a case-by-case basis. Particular attention will be paid to waste generation and management. Prospective operations that may generate these wastes will require further review.

Hazardous materials may be associated with construction. Pesticide or herbicide use will comply with proper application techniques. Should construction activities result in the generation of hazardous wastes, these would be managed in a safe, environmentally sound manner. Tracking and handling protocols would be put into place.

Hazardous substances in wastewater would be pretreated to nonhazardous levels and discharged to the on-site septic system.

Proper management and disposal of hazardous wastes would not have a significant impact on the environment.

3.14 Landslides

All site development will proceed by reducing the potential impacts of landslides. A soil engineer or geologist will assess issues associated with development. A slope maintenance program will be implemented to gather basic site information, thereby allowing suitable approaches to potential problem areas. Development will incorporate landslide protection measures. A very practical approach is relying on slope planting techniques to provide protection. Vegetation can play a key role in slope stabilization and erosion control. Further, smart construction practices would be used. Buildings, for example, would be equipped with flexible pipe fittings, which are less likely to break or leak.

3.15 Cumulative Impacts

Cumulative impacts of either Alternative 2 or Alternative 3 are not expected to be significant. Property with known sensitive ecological resources would not be transferred. The resources that would be affected are common in the area, and proposed mitigation measures would limit any potential impacts. Thus, impacts of site development are expected to be small.

3.16 Irreversible or Irretrievable Commitment of Resources

22 CFR 216 requires an analysis of significant irreversible or irretrievable effects resulting from implementation of proposed actions. Resources that are irreversibly or irretrievably committed to a project are those typically used on a

long-term or permanent basis. Resources used on a short-term basis that cannot be recovered (such as metal, wood, fuel, paper, and other natural resources) also are irretrievable. Another irretrievable resource is human labor. These resources are irretrievable in that they would be used for one project when they could have been used for other purposes. Another impact that falls under the category of irretrievable commitment of resources is the destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementing the proposed action would require commitment of non-renewable resources for both construction and long-term operation/maintenance. These resources include water, energy, lumber, sand, gravel, and metals. Use of these resources would represent an incremental effect on the regional consumption of these commodities. In addition, the project would commit work-force time for construction, engineering, environmental review and compliance, operation and maintenance.

In summary, commitments of the proposed action that would be considered irreversible or irretrievable would be the use of material resources and human labor associated with construction and operation of the new park. Commitment of resources for construction will not be significant. Park operation will require long-term use of energy, maintenance material, and human resources. However, the long-term social and economic benefits of the proposed action are expected to exceed these commitments.

3.17 Relationship between Local Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

22 CFR 216 requires that the relationship between short-term use of the environment and the impacts that such use may have on the maintenance and enhancement of long-term productivity of the affected environment are addressed. Of particular concern are impacts that narrow the range of beneficial uses of the environment. It is anticipated that implementation of the proposed action would not result in any impacts that would significantly narrow the range of future beneficial uses of the environment. There will be no long-term risks to health, safety, or the general welfare of the public communities surrounding this industrial park.

4.0 COMMITMENTS TO MINIMIZE ADVERSE IMPACTS OF THE PROPOSED ACTION

The project team, which consists of USAID representatives and the IPDA/AISA, is committed to avoiding or minimizing adverse impacts associated with this proposed action. At a minimum, the following codes and standards shall be used. The publications shall be the most recent editions. Standards specified shall be ASTM or equivalent. Standards other than those mentioned may be accepted provided they meet the minimum requirements. The project team shall submit proof of equivalency to IPDA/AISA for approval. Any time two or more standards conflict, the most stringent shall apply.

- TI 800-01 Design Guide Corps of Engineers
- IBC International Building Code (Latest Edition)
- IPC International Plumbing Code (Latest Edition)
- IMC International Mechanical Code (Latest Edition)
- NFPA National Fire Protection Association.
- ASME American Society of Mechanical Engineers.
- AWS American Welding Society.
- ACI American Concrete Institute.
- ASTM American Society of Testing Materials.
- ACI 318, Building Code Requirements for Structural Concrete (Latest Edition).
- NFPA 70, National Electrical Code (Latest Edition).
- NFPA 101 Life Safety 2005 code.
- UFC-3-520-01 Interior Electrical Systems.

The publications to be taken into consideration shall be those of the most recent editions. Standards other than those mentioned above may be accepted if the standards chosen are internationally recognized and meet the minimum requirements of the specified standards.

When adverse impacts are identified, potential remedies can be identified. The project team recognizes that there are four primary methods for dealing with impacts, have been considered in order.

- Avoidance - After the project so an impact does not occur.
- Minimization - Modify the project to reduce the severity of an impact.
- Mitigation - Undertake an action to alleviate or offset an impact or to replace an appropriated resource.
- Enhancement - Add a desirable or attractive feature to the project to make it fit more harmoniously into the community. (Note: this is not designed to replace lost resources or alleviate impacts caused by the project.)

Project design options will be based on best practices. When adverse impacts are identified, the project team will:

- Identify design or engineering options to deal with these impacts - starting with avoidance, and then moving on to minimization and mitigation techniques.
- Consider enhancement opportunities that are a reasonable expenditure of funds and help the project fit into the community.

As discussed earlier, potential environmental impact of prospective tenants will be evaluated on a case-by-case basis. Based on consultation with NEPA, a process has been developed for assessing the potential impacts of potential tenants. IPDA/AISA and Afghanistan's Environmental Protection Agency will be responsible for conducting and reviewing the assessment.

A variety of best practices will be introduced throughout the development process. Water systems, for example, will be designed to conserve resources and reduce pollution. Buildings will be constructed to maximize energy efficiency through facility design or rehabilitation, co-generation, energy cascading, and other means. The waste management strategy will emphasize cleaner production and pollution prevention, especially with toxic substances. Tenants will seek maximum re-use and recycling of materials. Toxic materials risks will be reduced through materials substitutions and integrated site-level waste management. In addition, park tenants could link to entities in the surrounding region as consumers and generators of usable by-products via resource exchanges and recycling networks. Further, the park will encourage environmentally-friendly businesses, including materials recyclers and re-users.

The Mazar-e-Sharif Industrial Park is located in a very dry area. The nearest surface water is an irrigation canal, which is roughly 4 kilometers away. There are no wetlands on the site. Flood plains are not a concern. Historically, floods have occurred infrequently, with last unofficial record suggesting that it has been 20-30 years since the last flood. Due to the potential for damaging flash floods, the project team will study the need for constructing a floodway. Curbside accommodation also is incorporated in the design. A planned storm water drainage pond will provide additional control.

Sanitary wastewaters will be collected and carried to a septic tank adsorption field system. Engineers adhering to best engineering practices will design the septic system for the proposed industrial park project.

The exteriors of buildings to be located in the park shall incorporate structural arrangements and color schemes that will limit visual discord with the natural background. Best practices may include consideration of sustainable green building codes and building and parking area designs to mitigate or reduce greenhouse gas emissions.

Nighttime lighting for the industrial park and buildings located in it shall incorporate features for limiting in the increase in brightness of the nighttime sky.

Noise levels in the industrial park shall not cause the Ldn at any nearby residence existing at the time of the land transfer to exceed 65 dBA.

All land disturbances shall be controlled using BMPs.

All construction in the proposed industrial park will comply with the seismic load design of the 2003 edition of the International Building Code (IBC), which establishes the minimum regulations for building systems using prescriptive and performance-related provisions. In addition, landslide protection will be addressed through sound site development.

Should there be any inadvertent archaeological discoveries within the proposed site, IPDA/AISA shall be notified. IPDA/AISA shall determine appropriate measures to identify, evaluate, and treat these discoveries.

5.0 CONSULTATION AND COORDINATION EFFORTS

Public participation and interagency coordination/review are part of the regulatory process during the preparation of an EA. Public and appropriate federal, state, and local agencies were invited to provide input during the scoping process and were provided a copy of the draft EA for review and comment. Section 5.1 describes the scoping process to determine the content of the EA, and Section 5.2 discusses the intergovernmental and public review of the draft EA.

5.1 Scoping

One activity in EA preparation is the description of what the evaluation will cover, that is, the scope of the document. An important part of this "scoping" process is the solicitation of public participation in the determination of the issues to be evaluated and the inclusion of that information in the evaluation process. This section summarizes USAID's efforts to solicit comments that helped to define the content of the EA.

USAID formally began the process for this project by issuing a Request for Quotation in April 2004. Responses to this Request for Quotation were delivered on May 27, 2004. The Statement of Work was titled "Afghanistan Industrial Parks Revitalization Project." The mission of this effort is to provide developed land to investors to set up their industries. This project focuses on establishing modern, strategically located, well-managed, regulated, and attractive industrial estates. These industrial estates will play a key role in the future of Afghanistan's economy by energizing the private sector, encouraging entrepreneurship, creating jobs, and reducing capital flight. The end result is the acceleration of the economic development of Afghanistan's industrial sector, including small and medium enterprises of all types.

All industrial parks are managed by the Industrial Parks Development Authority (IPDA), which is part of the Afghanistan High Commission for Investment (HCI). The government's focal point for policy-making on investment, the Commission is made up of representatives from the Ministries of Commerce, Justice, Foreign Affairs, Finance, Planning and Reconstruction. The Commission is chaired by the Minister of Commerce. When a proposed investment pertains to a particular sector, the relevant Minister(s) shall be invited to participate in meetings of the High Commission.

The proposed site was selected for development by the Government of Afghanistan (GOA), which is the site owner. The GOA worked with the Balkh Provincial Government in selecting this site, consistent with the Law on Domestic and Foreign Private Investment in Afghanistan. By encouraging and supporting private domestic and foreign investors, this law aims to foster economic recovery, expand the labor market, advance national revival, increase the standard of living, and help in Afghanistan's reconstruction process.

In January 2005, Mohammad Ashraf, IPDA President, hosted a meeting to discuss the siting of this industrial park with Atta Mohammad Noor, governor of Balkh Province, and Yunus Moqim, mayor of Mazar-e-Sharif. A second meeting was held in July 2005, where siting at the proposed location was confirmed. In brief, local authorities view this proposed project at an undeveloped site as a suitable site for an industrial park that contributes to helping the area's economy. In August 2005, President Karzai approved this proposed location.

In November 2005, the scoping statement for this EA was "approved with these conditions: the scope shall include consideration of geology, soils, seismic risk, traffic, noise, cultural and historical resources, and stakeholder input through a to-be-documented transparent process involving government officials at the regional and local levels, and village leaders, subject to the overview and approval of the Mission Environmental Officer." [Personal communication, Mr. B. Popkin, USAID, to Mr. M. Kaiser, Kabul/PPDO, November 29, 2005.]

5.2 Lead and Cooperating Agencies

USAID is the lead agency in preparing this EA. As noted earlier in this document, oversight for the Mazar-e-Sharif Industrial Park is the responsibility of the IPDA, part of the Afghanistan High Commission for Investment. This Commission is made up of representatives from the Ministries of Commerce, Justice, Foreign Affairs, Finance, Planning and Reconstruction. As such, these six agencies are kept abreast of activities associated with the Industrial Parks Program. This EA will be delivered to these and other entities, as discussed on Section 5.3.

5.3 Distribution of the Draft Environmental Assessment

Copies of this EA will be delivered to the following.

- National Environmental Protection Agency
- Ministry of Light Industry
- Ministry of Commerce
- Ministry of Finance
- Ministry of Mines and Industries
- Ministry of Foreign Affairs
- Ministry of Electricity and Water

In addition, this document also will be made available on request. Finally, this EA will be placed on USAID's Web site.

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7.0 SUPPORTING INFORMATION

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7.2 Acronyms and Abbreviations

AISA	Afghan Investment Support Agency
BMP	Best Management Practice
dB	decibel
dBA	A-weighted decibel
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
IBC	International Building Code
ILO	International Labour Organization
IPDA	Industrial Parks Development Authority
IUCN	World Conservation Union
Ldn	Day-Night Average Sound Level
m3	cubic meter
MIWRE	Ministry of Irrigation, Water Resources and Environment
MOLI	Ministry of Light Industry
Ng/m3	Nanograms per cubic meter
NEPA	National Environmental Protection Agency
NOI	Notice of Intent
NOx	Nitrogen Oxides

PAHs	Polyaromatic Hydrocarbons
PBT	persistent, bioaccumulate, and toxic
PGA	Peak ground acceleration
UN	United Nations
UNAMA	United Nations Assistance Mission in Afghanistan
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
USAID	U.S. Agency for International Development
WHO	World Health Organization

Appendix A
Environmental Issues Associated with the Proposed Action

The following table summarizes environmental issues and potential concerns associated with the proposed action.

Environmental Issue	*Potential Concerns*
Geology and Soils	• Geotechnical information will be collected to support all site design parameters. • A topographic survey, soil borings and soil testing will be performed to verify site conditions. • All activities shall be in accordance with applicable ASTM standards and good geotechnical practice.
Seismic Considerations	All construction will comply with the International Building Code, 2003 edition.
Transportation	The proposed action would result in additional traffic on area roads. Existing roads should be able to handle the increased traffic adequately, with little effect on other users.
Noise	There are no nearby communities that would be affected by site noise.
Cultural/Historical Resources	Cultural and archeological resources should not be affected by the proposed action. Should there be any inadvertent archaeological discoveries, IPDA/AISA and local authorities shall be notified.
Air Quality	• Individual sources may have minor air quality impacts. Cumulative impacts may be a potential concern unless commitments were made to limit manufacturing industries to the light and medium categories, which would minimize overall emissions from the industrial park. • Minor pollution from increased operational traffic as a result of development of facilities. • Generators may result in an increase in air pollutants, mostly nitrogen oxides (NOx). • Temporary and intermittent air quality impacts would be associated with site preparation and facility construction activities.
Water Quality	• Given the distance to the nearest surface water, impacts are likely to be minimal. • Groundwater impacts from properly managed activities would be insignificant. All construction – e.g., septic systems – would adhere to best engineering practices.
Floodplains	Flash flooding is a potential concern. Engineers will assess the benefits of constructing a floodway. The site will be laid out to maximize storm water control, thereby minimizing flooding concerns.
Ecology	• Neither uncommon plant communities nor

	threatened species were identified on the site. Construction may affect some plants, but the loss is expected to be insignificant. Site development may result in an increase in populations of animals that favor recently modified habitats. Some of these species might become a "nuisance" in the area. • No aquatic communities would be affected. • No sensitive aquatic animals will be affected. • There are no expected impacts on threatened or endangered species or their habitats.
Prime Farmlands, Wetlands, Managed Areas and Recreation	• No prime farmlands will be affected. • No wetlands will be affected. • There would be no effects to managed areas or recreational opportunities.
Socioeconomic	• The proposed action could lead to increases in employment, income, and population. • It is estimated that this industrial park can provide employment for over 3,000 workers. With additional jobs from multiplier effects, the total increase in jobs could exceed 5,000. • Increases in jobs and in population may lead to a need for additional housing and to an increase in the needed level of community services, such as schools, fire and police protection, and medical services. • Due to the incremental nature of the anticipated growth, insignificant impacts on housing and community services would be expected.
Visual Quality	• The proposed action would change the existing landscape from a level of common scenic attractiveness to an area of urban-scale industrial and commercial development. • Area residents would notice an increase in background sky brightness. • By adopting development standards, visual impacts would be minimized.
Solid/Hazardous/Special Wastes	• Solid waste collection points will be provided. • The park's waste management strategy will emphasize cleaner production and pollution prevention. • Solid waste can be disposed of in a properly designed landfill, mitigating any potential environmental impact. • Hazardous and special wastes will be managed on a case-by-case basis.
Landslides	All development will proceed by reducing the potential impacts of land movement. Where appropriate, a soil engineer or engineering geologist will assess issues associated with development.
Cumulative Impacts	Cumulative impacts are not expected to be significant.

Appendix B
Plants and Animals found in Afghanistan

Afghanistan is home to a wide variety of plant and animal life. Common plants include camel thorn, locoweed, spiny restharrow, mimosa, and wormwood.

Over 120 mammal species are found in Afghanistan. Some species have been categorized as threatened by the World Conservation Union (IUCN). The most seriously endangered are the goitered gazelle, leopard, snow leopard, markor goat, the Asiatic black bear, and Bactrian deer.

Other wild animals of Afghanistan include Marco Polo bears, foxes, hyenas, ibex, jackals, sheep, urials, wolves, mongooses, wild boar, hedgehogs, shrews, hares, mouse hares, bats and various rodents.

The following four species of reptile are believed to be restricted to Afghanistan: the geckos *Asiocolotes levitoni* and *Cyrtopodion voraginosus*, and the lacertid lizards *Eremias afghanistanica* and *E. aria*. The salamander *Batrachuperus mustersi* occurs only in mountain streams in the central Hindu Kush of Afghanistan and is believed to be at risk from habitat modification and conflict.

Over 450 bird species are found in Afghanistan. Species identified as globally threatened are the Siberian crane *(Grus leucogeranus)*, white-headed duck *(Oxyura leucocephala)*, marbled teal *(Marmaronetta angustirostris)*, Pallas's sea-eagle *(Haliaeetus leucoryphus)*, greater spotted eagle *(Aquilla clanga)*, imperial eagle *(Aquilla heliaca)*, lesser kestrel *(Falco naumanni)*, corncrake *(Crex crex)*, sociable lapwing *(Vanellus gregaria)* and the pale-backed pigeon *(Columba hodgsonii)*. Among these, the Siberian crane is of particular significance. IUCN has categorized this species as Critically Endangered. It is believed to face an extremely high risk of extinction in the wild in the immediate future. The global population, estimated to contain 2,500–3,000 birds, is divided into three groups. Only a single breeding pair may remain in the central group, which formerly used wetlands in Afghanistan (and Iran) as stopover points during migration between breeding grounds in Russia and the main wintering area in India. In Afghanistan, Ab-e-Estada was the key resting site.

Other birds of interest found in Afghanistan include greater flamingo *(Phoenicopterus ruber)* and houbara bustard *(Chlamydotis undulata)*. The country has one endemic bird species, Meinertzhagen's snow finch *(Montifringila theresae)*, and major breeding populations of six other restricted regional species: yellow-eyed pigeon *(Columba eversmanni)*, plain willow warbler *(Phylloscopus neglectus)*, Brooks's willow warbler *(P. subviridis)*, variable wheatear *(Oenanthe picata)* and Dead Sea sparrow *(Passer moabiticus)*. The population of yellow-eyed pigeon is particularly important because the species is rare and declining throughout its Central Asian range. Afghanistan also has significant numbers of breeding lammergeier *(Gypaetus barbatus)*, black vulture *(Aegypius monachus)* and other birds of prey.

There is limited information about the freshwater fishes of Afghanistan. Known fish include three species of snow trout *Schizothorax* and five loaches *Noemachilus* that appear to be restricted to Afghanistan (species taxonomy in both genera is not well established).

APPROVAL OF RECOMMENDED ENVIRONMENTAL ACTIONS:

CLEARANCE:

Deputy Mission Director
Approval: _____ 22 April 07
Carl Abdou Rahmaan Date

Mission Environmental Officer (A)
Approval: _____ 17/April/07
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