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Kurram Tangi Dam Construction



Annex I: Health and Safety Plan Framework Final Report

December 2013

This publication was produced for review by the
United States Agency for International Development.

It was prepared by MWH under contract number AID-391-C-13-00002

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Map to Kurram Tangi Dam Project Documents

Shown below is the suite of documents submitted to USAID under Contract AID-391-C-13-00002 for the KTDP. This report is shaded in red in order to show its relationship to the full set of documentation.

ENVIRONMENTAL ASSESSMENT

VOLUME I: MAIN REPORT

VOLUME II: PROJECT ECONOMIC BENEFITS

VOLUME III: MAPS

ENVIRONMENTAL MITIGATION AND MONITORING PLAN

MAIN REPORT

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ANNEX II: WATERSHED MANAGEMENT PLAN

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LAND ACQUISITION AND RESETTLEMENT

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RESETTLEMENT ACTION PLAN (COMPONENT I)

CULTURAL HERITAGE PRESERVATION PLAN

VULNERABLE TRIBES PLAN

GENDER PLAN

KEY SUPPORTING TECHNICAL REPORTS

SUPPLEMENTAL REPORT ON GEOLOGY

SUPPLEMENTAL REPORT ON GEOTECHNICAL ASPECTS

SUPPLEMENTAL REPORT ON SEISMIC HAZARD

SUPPLEMENTAL REPORT ON HYDROLOGY

SUPPLEMENTAL REPORT ON CLIMATE CHANGE

All documents may be read as stand-alone documents, but the reader should be aware of the full set of documents available. Any one document may reference other documents in the suite in order to avoid duplication.

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Kurram Tangi Dam Construction

Annex I: Health and Safety Plan Framework

USAID Environmental Assessment of Kurram Tangi Dam Construction
Contract Number: AID-391-C-13-00002
From MWH Americas, Inc.
To USAID/Pakistan Energy Office
December 2013
Author: MWH Americas, Inc.

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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List of Acronyms

Acronym	Term
CFRD	Concrete Faced Rockfill Dam
EA	Environmental Assessments
EAP	Emergency Action plan
EIA	Environmental Impact Assessment
EMMP	Environmental Mitigation and Monitoring Plans
ESIA	Environmental and Social Impact Assessment
FATA	Federally Administered Tribal Areas
H&S	Health and Safety
KP or KPK	Khyber Pakhtunkhwa
KTDC	Kurram Tangi Dam Construction
KTMDP	Kurram Tangi Multipurpose Dam Project
MDE	Maximum Design Earthquake
MMP	Mott McDonald Pakistan
MSDS	Material Safety Data Sheets
MWH	MWH Global, Inc. or MWH, Inc.
NCSW	National Commission on the Status of Women-Pakistan
NESPAK	National Engineering Services Pakistan
NEQS	National Environmental Quality Standards
NGO	Non-governmental Organization
OBE	Operating Basis Earthquake
OSHA	Occupational Safety and Health Administration
PAP	Project Affected Persons
Pak-EPA or PEPA	Pakistan Environmental Protection Agency
PPE	Personal Protective Equipment
PSHA	Probabilistic Seismic Hazard Analysis
RLACAP	Resettlement Land Acquisition and Compensation Action Plan
REA	Rapid Environmental Assessment
ROD	Road Open Day
TESCA	Tribal Area Electric Supply Corporation
TGP	Towards Gender Party
UET	University of Engineering and Technology
UN	United Nations
UNEP	United Nations Environment Program
USAID	United States Agency for International Development
USAID/Pak	United States Agency for International Development/Pakistan
USDA	United States Department of Agriculture
USG	United States Government
USGS	United States Geological Survey
WAPDA	Water and Power Development Authority
WWF-P	World Wide Fund for Nature – Pakistan

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Health and Safety Plan Framework

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Attachment I

Examples of Common Health and Safety Issues at Construction Sites

I. INTRODUCTION

This Health and Safety Plan (HASP) framework has been prepared as a guidance document for the contractor that will perform construction activities for the Kurram Tangi Dam Project (KTDP), and the operator that will operate the project components for the KTDP. The KTDP is located in the North Waziristan Agency of Pakistan and is a complex infrastructure project that includes diversion tunnels, a dam, power tunnels, several power houses, steel penstocks, a spillway, a stilling basin, turbines, generators and weirs on rivers and canals.

This guidance document is being prepared as a part of the Environmental Assessment (EA) studies. After the award of construction contracts and prior to the start of the construction activities, the contractor in consultation with the client shall prepare project specific HASPs for the construction phase activities. These specific HASPs shall also be in accordance with Health and Safety guidelines of the national and international funding agencies such as USAID, World Bank or Asian Development Bank. In addition, the operator shall prepare project specific HASPs for the operation phase activities including maintenance. The HASPs shall follow national and international standards and include the elements of this document as well as requirements of the EA and additional contract requirements.

The information in this document shall not be used for advising, issuing direction, or assuming control over any safety precautions or programs of WAPDA or the contractor. Where this document addresses the elements of safe practices for various specific construction and operations activities, this information is provided solely as guidance of good engineering practice.

I.1. Objective: Management of Health and Safety Issues

This HASP framework is being prepared as a part of the EA studies to provide guidance for the development of the HASPs by the contractor and operator, in order to establish the work practices necessary for the protection of workers during the performance of their activities related to KTDP.

The main objective of this document is to guide the contractor and operator through the elements of safety and health and assist them with addressing known and reasonably anticipated health and safety (H&S) hazards to the workers providing services during the construction and operation stages of the KTDP. In particular, the HASP provides information intended to prevent and minimize personal injuries, illnesses and physical damage to any workers, equipment, supplies and property.

H&S planning begins with a thorough understanding of the work to be undertaken and an objective assessment of the hazards presented by those activities. Standard safe operation procedures can then be developed to mitigate, eliminate or minimize those hazards. All HASPs are “living documents” and are meant to be changed or modified as work practices, procedures, equipment, personnel etc. change.

The HASPs shall outline the objectives of the KTDP project. Specific items to be included in the plan include:

- A description of the activities to be undertaken during the project
- A project organizational structure
- Expectations of the contractor and operator and incorporation of H&S professionals
- Required training for site workers
- Early identification of H&S issues/hazards and associated risks
- H&S considerations in selection of the design process, construction and operation and maintenance of the facilities
- Risk ranking and prioritization of H&S issues
- Elimination, substitution, or minimization and control (engineering, management)
- H&S capacity building in emergency preparedness and response

1.2. Project Proponent

The Government of Pakistan, acting through WAPDA Pakistan and Irrigation & Public Health Engineering Department Khyber Pakhtoonkhwa, is the Project proponent. This will be a public sector multipurpose project providing hydropower and irrigation water. Following construction of the project it will be operated by WAPDA.

1.3. Policy Statement

It shall be the policy of the contractor and operator to plan for and conduct all activities at the KTDP in a manner that protects employees, the public, and the environment; provides for a safe and healthy work environment; and that complies with applicable regulations and contractual requirements. This commitment shall be reflected in the policy of the contractor and operator.

The contractor and operator should show that H&S is given primary importance in the planning and performance of all work activities. The contractor and operator should believe that any accident or injury to its employees is preventable. That is, they should be committed to achieving and sustaining zero accidents for its employees. A site specific H&S policy and plan should form an integral part of the approach to accomplishing work, and for complying with all applicable laws, regulations, and standards.

1.4. Safety Management

Safety, health, and environmental protection should be integrated with all KTDP construction and operations work. The contractor and operator will accomplish this objective by involving their workers in the planning process, by developing HASPs and by regularly updating the HASPs. The HASPs shall be tailored to project specific activities.

1.5. Community Outreach and Involvement

Risk management strategies shall be implemented to protect the local communities from physical, chemical, or other hazards associated with the construction and operation of the KTDP. Risk management strategies shall also be implemented to protect KTDP workers, facilities, and equipment. Risks may arise from inadvertent or intentional trespassing including potential contact with hazardous materials, exposures to structures and excavations not meant for untrained people to access, energized equipment, moving equipment, sharp objects, buildings that are vacant or under construction, physical contact with KDTP workers, transmission of diseases, etc. Community outreach programs shall be established with the goal of helping to mitigate these potential risks. The H&S Plan shall discuss community outreach and involvement activities to be performed during both construction and operation of the KTDP.

1.6. H&S Empowerment of Project Stakeholders

Workers, managers, contractors, operators, and the project owner should accept responsibility and ownership of the HASPs. The HASPs are living documents, and the goal is to have involvement from all project participants in the development and evolution of these plans. Governing principles to ensure H&S empowerment shall be provided.

1.7. Project Management Structure including H&S Personnel

The contractor and operator have responsibility for H&S on-site. They must ensure that the HASPs are in-place, workers and managers know what is in the HASPs and what is expected of them, that H&S audits are being performed by qualified workers on-site, and workers are properly equipped and trained for their jobs. Safety is not the H&S team's job nor the employee's job, it is management's job supplemented by the H&S personnel and implemented with the actions, eyes and ears of the workers. The contractor and operator will include a detailed organizational chart in their HASPs and update or modify as people and positions change.

1.8. Modifying the HASPs

The HASPs shall be treated as living documents. As such, the HASPs shall be modified when new hazards are identified, the scope of work is revised, equipment is changed, and/or the provisions specified in the HASPs are not adequate to protect the H&S of the workers. Modifications will be accomplished in consultation with the client and the designated project owners engineer.

All changes to the prepared HASPs shall be documented with an appropriate revision number and dated. The contractor and operator shall submit these changes to the client designated owners engineer. This process is to be documented in the HASP and the project files. The KTDP contractor and operator will be responsible for informing employees about all changes.

1.9. Compliance with Contractor HASP

During the construction phase, any works entering or working in the construction area of the KTDP will comply with the HASP requirements. At or prior to mobilization or commencement of the construction activities, the client shall meet with the contractor to discuss project hazards and compliance, and policies and site requirements that may impact all activities at the site. Continued coordination and cooperation will be enforced for the duration of the project in complying with the contractor HASPs.

1.10. H&S Training

The contractor will provide workers with the proper H&S job related training required for their work activities. Minimum training requirements consistent with the national and international level applicable laws, regulations and guidelines and the contractor's HASP will be furnished. The H&S staff shall complete the 30-hour OSHA training certification. At a minimum other workers performing work on the site must be familiar with the activities to be conducted by them and others within their immediate work area, the requirements of HASP, the standard safe operating procedures outlined within the HASP, working safely with the equipment issued to them, the safe use and care for personal protective equipment (PPE), and the emergency procedures to be followed. In addition, general construction safety training shall be required for all workers within the construction sites. In addition, all activities performed during the operations phase shall follow similar procedures/protocol consistent with those activities including maintenance.

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2. PROJECT DESCRIPTION AND SCOPE OF WORK

2.1. Project Location and Description

The project site is located on the Kurram and Kaitu Rivers in Kurram Agency district in the tribal territory of North West Frontier Province. The location of the project site is shown in **Figure 1**. The latitude of the dam site is 33° 11' 40" N and longitude 70° 32' 01" E. The project site is a heavy civil construction site, and project features include:

- Dam structure on Kurram River for flood control and water storage (Dams and Hydropower Development); The Kurram Tangi Dam is planned to be constructed across the Kurram River about 9 miles (14 kilometers) upstream of the existing Kurram Garhi Head-works and 19 miles (30 kilometers) north of Bannu City in Khyber Pakhtunkhwa Province.
- A control weir on Kaitu River for diversion of flows into Kurram Tangi Reservoir as well as into two new canals each to irrigate Sheratalla Plain and Spaira Ragha Plain respectively (Tribal Area Development); and
- A head regulator at the existing Kurram Garhi Head-works for diversion of flows into a new Thal Canal to irrigate Bannu Plain (Irrigation System Development), construction of five (05) powerhouses in the Kurram River and Kaitu River beds to be placed within the stretch between the dam site and Kurram Garhi Head-works.

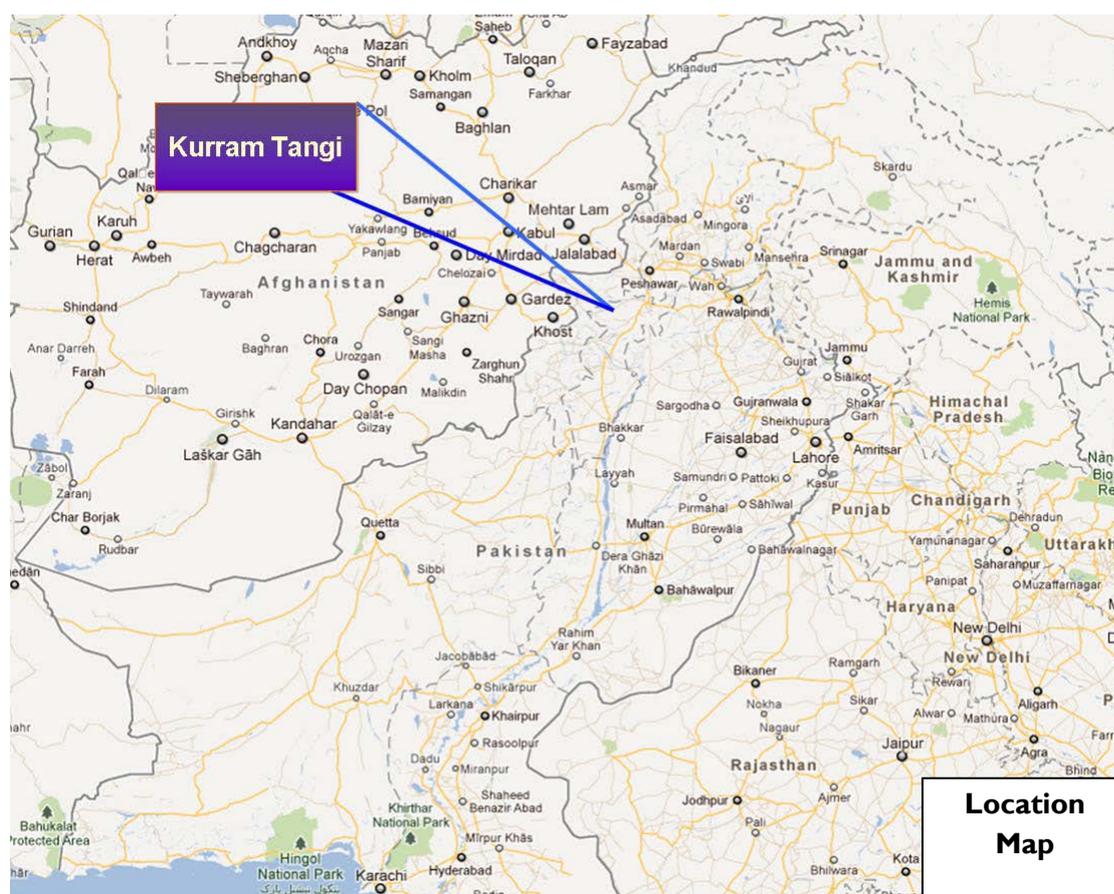


Figure 1: Pakistan map and Kurram Tangi Dam Project Location

The project site is accessible from Peshawar by paved road. Bannu is about 185 km from Peshawar. The project can be accessed from Islamabad by road via Tarnol-Fatheyjhang-Kohat-Bannu a distance of 295 km; this is a tarred road. It is likely that both these routes will be used depending on the material to be transported. The project layout is shown on Figure 2.

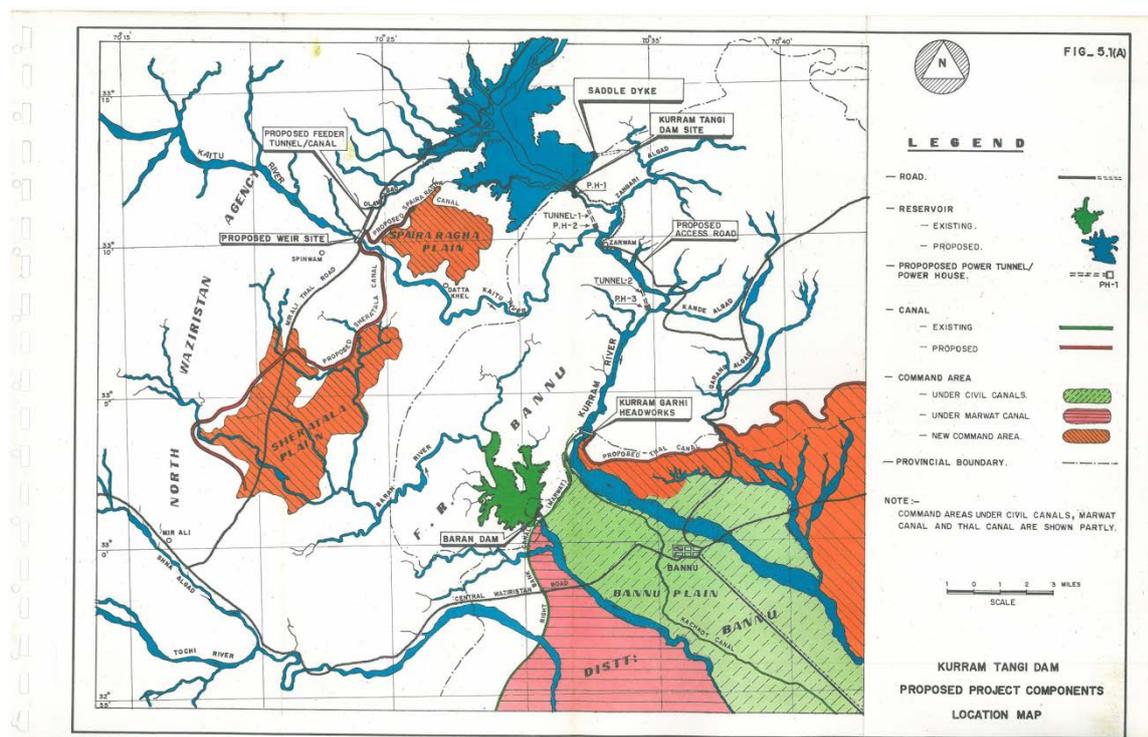


Figure 2: KTDP – Layout of Project

2.2. Scope of Work

The scope of work for the overall project will be to provide construction supervision, management and engineering services for the construction of the KTDP, as well as operation of the KTDP. The project works consists of the following features:

- I. River diversion tunnel – 20 ft diameter
- II. Diversion Tunnel Kaitu River
- III. Main Dam - Concrete Faced Rock Fill Dam (CFRD)
- IV. Powerhouse I (2 x 10.4) MW with its penstock and outflow to natural channel
- V. Tunnel I, 18 ft Diameter x 5400 ft long
- VI. Powerhouse II (2 x 10.4 MW) along with its penstock and out flow near Zarwam
- VII. Tunnel II, 18 ft Diameter x 3400 ft long.
- VIII. Powerhouse III (2 x 16.5 MW) along with penstock and outflow to river
- IX. Powerhouse IV 18 MW along with its penstock located on Kaitu Weir near Mir Ali Thal Road after diversion tunnel.
- X. Powerhouse V 400 kW along with its penstock located on Sheratala canal
- XI. Diversion Weirs on Rivers
 - a. Kaitu River near Mir Ali Thal Road
- XII. Diversion Canal
 - a. Feeder canal from after tunnel to connect KTD reservoir
- XIII. Canals:
 - a. Thal Plain canal 36 miles long
 - b. Sheratala 17 Miles long
 - c. Spaira Rogha 3 Miles long (Lift irrigation canal Head=65 ft)
 - d. Civil Canals (Aggregate length 200 miles –remodeling)
 - e. High voltage transmission lines associated with the powerhouses.

Note: For additional details, see the Project Description Chapter (3) of the EA Report.

The individual project elements are spread over a large geographic area; consequently more H&S resources will be required relative to a project where elements are in close proximity. Further, the construction work has been divided into three components (Components I, II, and III); therefore appropriate H&S planning will be required for each component during the construction phase.

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3. PROJECT ORGANIZATION, ROLES AND RESPONSIBILITIES

3.1. Project Organization

A project organizational chart shall be developed for H&S related activities for both the construction and operation phases of the KTDP.

3.2. Roles and Responsibilities

The various roles and responsibilities, as well as the various interactions between parties involved on the project shall be defined. At a minimum the following project roles shall be included in the H&S organizational structure and shall be identified on the project organizational chart. The following roles and responsibility provide a general guidance of key personnel that will be responsible for execution of the H&S Plan. (Note: the term “resident” is only used during the construction phase)

3.2.1. Construction/Site Manager

- Overall responsibility for the execution of the work on-site.
- Authorized to commit resources on behalf of the contractor/operator.
- Authorized to hire technical experts including engineers and H&S personnel.

3.2.2. Site Foreman

- Responsibility for individual work tasks in defined areas.

3.2.3. Chief (Resident) Engineer

- Overall responsibility for showing commitment, development and implementation of the HASP policy statement.
- Authorized to obtain necessary H&S resources.
- Ensure HASP risks to workers are identified and managed.

3.2.4. (Resident) Engineer

- Accountable to the Construction/Site Manager/Chief (Resident) Engineer for the implementation of their HASP responsibilities.
- Establish specific HASP procedures, which include specific objectives and targets.
- Provision of competent workers to support field operations.
- Preparation and maintenance of appropriate technical standards and other systems for adoption by workers
- Provision of authoritative advice on technical, engineering, or HASP matters, as appropriate, to the construction/operation activities.
- Assessing the quality of the contractor/operator, services and organization, with respect to legal HASP requirements.

3.2.5. Principal HASP Engineer

- Accountable to the Chief (Resident) Engineer for HASP performance.
- Demonstrate the HASP is implemented.
- Set HASP standards, objectives & challenges for continual improvement.
- Ensure that HASP risks are identified and adequately controlled.
- Achieve the established plans, objectives and targets.
- Provision and revision of HASP policy and standards.
- Provision of assurance that H&S standards are implemented by process of internal and external review.

- Establishment, monitoring, and reporting of HASP performance measures.
- Provision of opportunities to contribute to development of an HASP.
- Ensure that HASP staff have access to the project components during the construction and operation phases.
- Review on behalf of management, and custodian of, HASP related documents including the HASP policy, HASP procedures and emergency procedures submitted by the contractor/operator; periodic review and update of these documents, as appropriate.
- Gives guidance on the preparation of H&S objectives and targets.
- Monitors performance of HASP objectives and targets.
- Ensures that HASP assessments and other risk management activities are undertaken.
- Plans and maintains an audit plan for and on behalf of management. Monitors and reports on actions arising from such audits.
- Management of incident investigations; analysis and reporting of incident statistics.
- Maintains appropriate standards for safety-related equipment, including PPE.
- Identifies HASP-related training for concerned personnel.
- Promotes HASP awareness within the workforce and contractor/operator.

3.2.6. Senior HASP Engineer

- Accountable to their HASP superior for HASP performance.
- Implement the HASP plans and procedures.
- Comply with applicable standards and regulations in accordance with the contractor/operator contractual bindings.
- Identify HASP hazards and aspects, assess resultant risks and maintain effectiveness of risk control measures.
- Create a positive HASP culture among the workforce.
- Ensure that equipment conforms to agreed standards.

3.2.7. HASP Staff

HASP staff has an important role to play in the overall HASP success. The following are the general guidelines related to the HASP staff at site:

- Ensure control of work procedures and regulations are enforced, including PPE requirements.
- Conduct regular inspections of work sites for unsafe conditions and general housekeeping.
- Report, as appropriate, any unsafe conditions which cannot be immediately rectified.
- Report and investigate accidents and near misses.
- Be aware of emergency response procedures and duties.
- Promote and develop HASP awareness within the workforce.

3.2.8. Workers

- Be aware of, and observe, HASP regulations and operating procedures.
- Be aware of the Permit to Work procedures and adhere to whatever controls what may be stated within a work permit.

- Report any unsafe acts or hazardous conditions to the supervisor.
- Use correctly personal protective equipment, which may be necessary for the type of work being performed.
- Be aware of responsibilities and actions in the event of the general alarm being given, or in other emergency circumstances.
- Report any accidents or H&S-related issues, including near misses, to the supervisor.
- Participate in HASP meetings.
- Ensure waste materials and products are disposed of according to site instructions.

3.2.9. Emergency personnel including medical staff and emergency responders

- Define the roles and responsibilities of emergency personnel, including medical staff and emergency responders, that will be available during both the construction and operation phases.

3.2.10. Regulatory Liaison(s)

- Define the roles and responsibilities of regulatory liaison(s) for the KTDP.

3.3. Project Staff Health

Due to the remote nature of the project site the health status of all project personnel shall be established prior to hiring for each of the project roles. Accurate and up to date records for all project staff shall be maintained throughout the life of the KTDP.

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4. HEALTH AND SAFETY PERFORMANCE INDICATORS AND MONITORING GUIDELINES

All project construction and operation activities should be performed in accordance with applicable laws, codes, regulations, and contract documents.

4.1. Applicable Laws and Regulations

There is no independent legislation on occupational safety and health issues in Pakistan. The main law, which governs these issues, is in the Chapter 3 of Factories Act, 1934. All the provinces, under this act, have devised Factories Rules. The Hazardous Occupations Rules, 1963 under the authority of Factories Act is another relevant legislation. These rules not only specify some hazardous occupations but also authorize the Chief Inspector of Factories to declare any other process as hazardous. When possible, all applicable Government of Pakistan (GOP) laws and regulations shall be referenced and followed during preparation of the HASPs; however in most of the cases ILO, OSHA, ISO and other international laws, guidelines and provisions are being used in Pakistan for various projects.

State Government of Pakistan (GOP) and international guidelines that shall be meet for the project construction and operation. For example, occupational health and safety performance should be evaluated against USAID and international published exposure guidelines, of which examples include the “Pesticide Evaluation Report and Safer Use Action Plan” (PERSUAP), the Threshold Limit Value (TLV) occupational exposure guidelines and Biological Exposure Indices (BEIs) published by ACGIH, the Pocket Guide to Chemical Hazards published by the National Institute for Occupational Health and Safety (NIOSH), Indicative Occupational Exposure Limit Values published by European Union member states, or other similar sources.

4.2. Worker Monitoring Guidelines

The work environment should be monitored for occupational hazards related to the project. Monitoring should be designed and implemented by accredited professionals, as part of an occupational safety monitoring program. Generally, monitoring shall be performed utilizing appropriate monitoring equipment to test water quality, air quality, noise levels, and also include analysis of toxic substances.

4.3. Community Monitoring Guidelines

Most applicable laws and regulations refer to H&S standards for construction/operation workers. To ensure the safety of local communities, Pakistan EPA guidelines, and other internationally recognized H&S standards shall be followed for the protection of local residents.

A system for monitoring KTDP impacts to the local community should be designed and implemented. Monitoring should be designed and implemented by accredited professionals, as part of an occupational safety monitoring program. Again, monitoring shall generally be performed utilizing appropriate monitoring equipment to test water quality, air quality, noise levels, and also include analysis of toxic substances.

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5. STANDARD OPERATING GUIDELINES

All construction and operations activities shall be performed in accordance with applicable provisions of the laws, codes or regulations of Pakistan. All workers must comply with the applicable requirements of the HASP.

5.1. Record Keeping

Identify record keeping procedures to be followed for control of documents during the construction and operations phases. Record keeping shall include reporting or record keeping as required by WAPDA. As a minimum the following reports and records will be prepared, distributed as required and maintained in the project files.

- Incident reporting; and
- Safety and health records, including documentation of monthly safety meetings, each employee's receipt of this HASP and other documentation as may be noted herein.

5.2. Guidelines for Observed or Identified Issues/Hazards

When apparent non-compliance to the HASP or unsafe conditions or practices are observed, the responsible party shall be notified and corrective actions applied. Examples of common unsafe conditions and practices during the construction phase and associated corrective actions to be followed are provided in **Attachment I**. Identify actions to be followed after identification or observation of an issue/hazard. Clearly indicate the responsible parties for each activity and the order of notifications and activities.

5.3. Documents and Postings

Define the documents that shall be kept within the on-site project files. Identify the types and location of H&S postings during the overall project. At a minimum, the following documents are to be kept on-site within the project files:

- Monthly and periodic safety meetings documentation
- Accident/ incident investigation Reports
- Hazard Identification Register
- Monthly Reports
- Training Reports
- Work Permit Reports

The following H&S postings are to be displayed in a location where workers are likely to see them:

- Emergency notification procedures.
- A copy of emergency medical contact information.

5.4. Required Meetings

The type, purpose, and frequency of H&S meetings during the project duration shall be defined. General coordination between all the layers of the entities and between entities is an essential to have a responsible and effective H&S team. It is suggested that project meetings be conducted during both the construction and operations phases to emphasize the importance of H&S activities.

In these meetings H&S topics discussed are to be documented and attendance signature sheets collected. Representatives from each management level should be involved (from client, supervisory consultant and the contractor). The following table provides a general guide for the types of meeting that should be conducted relative to H&S issues:

Kurram Tangi Dam Construction
Health and Safety Plan Framework

Sr. #	Meeting Topic	Purpose
1	Site Orientation	To acquaint workers with the project, scope of work and the project.
2	Toolbox (pre-job hazard briefing)	To orientate workers to new tasks for a particular time period; go over any unusual occurrence from the previous periods; discuss any particular safety considerations for the new or routine tasks ahead.
3	Effective use of PPEs	To orientate workers about the specific objective and use of PPEs for specific works
4	Hazard Identification	To provide firsthand knowledge to the managers in the identification of works related hazards
5	Defensive Driving Techniques	To provide firsthand knowledge to the drivers and operators of the construction machinery and equipment
6	Accident Investigation	To provide firsthand knowledge to the managers in the accident investigations
7	Work Permit System	To provide firsthand knowledge to the technicians in the work permit system
8	First Aid	To provide firsthand knowledge of the management and workers in first aid
9	Safe Lifting Operations	To provide firsthand knowledge to the workers/operators in proper lifting operations
10	Basic Fire fighting	To provide firsthand knowledge to the workers/operators in basic fire fighting practices
11	Food Handling	To provide firsthand knowledge to the cooks and concerned staff in food handling

6. HEALTH AND SAFETY TRAINING REQUIREMENTS

6.1. General Health and Safety Training

Provide a general introduction to the H&S training for the project related to construction and operation activities.

The requirements of H&S training are an integral part of any H&S Plan. The purpose of H&S training is to educate workers about the potential H&S issues/hazards associated with construction work at the project site and operation of the project components. It should also target all the various disciplines employed in dams, weirs, hydro power plants, and irrigation canal projects. The objectives of such training are to educate workers about the potential H&S hazards associated with working at the project site. The contractor/operator is expected to provide training to workers about the hazards of the project and site before allowing them to perform work on site. The contractor/operator should investigate whether the 30-hour OSHA training certification is available in Pakistan, and if not, they should obtain it and organize for the project staff to become certified.

Examples of training (if applicable) that could apply to KTDP construction and operation activities are as follows:

- Safe operation and use of work tools and equipment;
- Mine safety in underground tunnels and caverns;
- Safely working around off-road and over the road trucks and equipment and traffic patterns;
- Hazardous materials;
- Operation of fire extinguishers;
- Hearing protection;
- Confined space entry;
- Hazardous energy controls;
- Excavations;
- Fire;
- Torch / plasma arc cutting, welding, and open flames;
- Emergency response;
- Use of PPE; and
- Workers from other regions will need to be educated about local sensitivities.

The above may not be an all-inclusive list of training requirements; therefore training requirements shall be established at the beginning of the project and updated as appropriate as the project progresses. The contractor/operator should ensure and verify that their employees have received the necessary training and the documentary evidence is available.

Type of training performed, and frequency of follow-up training programs shall be identified.

6.2. General Training Requirements

Outline training requirements for training related to each project hazard.

6.3. Coordination with WAPDA

Coordination with WAPDA regarding training exercises shall be provided to the fullest extent possible. WAPDA has been practicing a training program on other projects in KP to select locals and send them for artesian level 6 month training at WAPDA's cost, in national institutions at Islamabad and elsewhere. It is presumed that WAPDA will continue this policy, which produces

capacity building, trust and confidence in the locals and reduces poverty. The trained artesian be assured of components of the Project. Such trainings will bring accelerated social changes and acceptance of the Project.

6.4. Reference Training Matrix

Establish a matrix that identifies training required for each project role. Users should refer to the post title/duty, which most closely describes the function of the position in question, and apply its training requirements.

Establish a method of tracking status of training for project team members.

7. SITE ISSUES/HAZARDS AND THEIR CONTROLS DURING CONSTRUCTION

Site issues/hazards during all phases of construction should be identified and methods use to mitigate those issues/hazards shall be discussed. Break up site issues/hazards based on project phase. Issues/Hazards identified by the IFC General H&S guidelines are included below. Additional issues/hazards specific to this project shall be discussed, and additional issues/hazards shall be identified as appropriate.

Table 7-1: Issue/Hazard Identification during construction

Task	Issue/Hazards	Elimination, Substitution or Control Measures
<i>FOR EXAMPLE: Rock drilling in underground structures with an elevated work platform drilling machine</i>	<i>FOR EXAMPLE: Cave in of rock face or ceiling, rock falls, noise, fall from elevations, rotating equipment, heavy equipment where manual lifting is required, poor lighting, carbon monoxide due to running combustion engines, hazardous gas buildup within underground mines, struck by hazards from improperly installed rock bolts overhead.</i>	<i>FOR EXAMPLE: Mechanical ventilation must be operational at all times within the tunnels, rock bolts must be installed properly and as work progresses per the Specifications, spalling netting will be used to prevent spalling as designed, hearing protection must be worn at all times, proper lifting techniques shall be utilized, task lighting shall be adequate, air monitoring shall be conducted throughout the shift, all underground workers will sign into and out of all underground areas, safe areas of refuge shall be setup per...</i>

The following H&S items during construction shall be addressed:

Project Area Specific Issues

- Weapons – carrying a personal weapon is somewhat common in the area
- Mines
- Protection of workers, facilities, and equipment

Occupational Health and Safety

- General Facility Design and Operation
- Communication and Training
- Physical Hazards
- Chemical Hazards
- Biological Hazards
- Radiological Hazards
- Special Hazardous Environment
- Live Power Lines
- Working at Heights
- Electric and Magnetic fields
- Monitoring
- Tunnel related Hazards

Community Health and Safety Issues

- Water Quality and Availability
- Structural Safety of Project Infrastructure

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- Life and Fire Safety (L&FS)
- Explosives safety – related to quarry and excavation activities
- Land Instability – related to quarry activities
- Decommissioning activities – related to quarry activities
- Electrocution
- Electromagnetic Interference
- Visual Amenity – related to transmission lines and new project features
- Noise and Ozone – specifically related to electrical transmission and distribution
- Aircraft Navigation Safety
- Traffic safety
- Transport of hazardous materials
- Disease prevention during construction phase

8. SITE ISSUES/HAZARDS AND THEIR CONTROLS DURING OPERATION

Site issues/hazards during all phases of operation should be identified and methods use to mitigate those issues/hazards shall be discussed. Break up site issues/hazards based on project phase. Issues/Hazards identified by the IFC General H&S guidelines are included below. Additional issues/hazards specific to this project shall be discussed, and additional issues/hazards shall be identified as appropriate.

Table 8-1: Issue/Hazard Identification during operation

Task	Issue/Hazards	Elimination, Substitution or Control Measures
<insert>	<insert>	<insert>
<insert>	<insert>	<insert>

The following H&S items during operation shall be addressed:

Project Area Specific Issues

- Weapons – carrying a personal weapon is somewhat common in the area
- Mines
- Protection of workers, facilities, and equipment

Occupational Health and Safety

- General Facility Design and Operation
- Communication and Training
- Physical Hazards
- Chemical Hazards
- Biological Hazards
- Radiological Hazards
- Special Hazardous Environment
- Live Power Lines
- Working at Heights
- Electric and Magnetic fields
- Monitoring
- Tunnel related Hazards

Community Health and Safety Issues

- Water Quality and Availability
- Structural Safety of Project Infrastructure
- Life and Fire Safety (L&FS)
- Land Instability – related to quarry activities
- Electrocutation
- Electromagnetic Interference
- Visual Amenities – related to transmission lines and new project features
- Noise and Ozone – specifically related to electrical transmission and distribution
- Aircraft Navigation Safety
- Traffic Safety
- Transport of Hazardous Materials

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9. PERSONAL PROTECTIVE EQUIPMENT

Hazards exist in every workplace in many different forms: sharp edges, falling objects, flying sparks, chemicals, noise and a myriad of other potentially dangerous situations. Controlling a hazard at its source is the best way to protect employees. Depending on the hazard or workplace conditions the use of engineering or work practice controls to manage or eliminate hazards to the greatest extent possible. For example, building a barrier between the hazard and the employees is an engineering control; changing the way in which employees perform their work is a work practice control.

When engineering, work practice and administrative controls are not feasible or do not provide sufficient protection, employers must provide PPE to their employees and ensure its use. Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits.

To allow the right type of PPE to be chosen, carefully consider the different hazards in the workplace. This will enable you to assess which types of PPE are suitable to protect against the hazard and for the job to be done. Consider the following when assessing whether PPE is suitable:

- Is it appropriate for the risks involved and the conditions at the place where exposure to the risk may occur? For example, eye protection designed for providing protection against agricultural pesticides will not offer adequate face protection for someone using an angle grinder to cut steel or stone;
- Does it prevent or adequately control the risks involved without increasing the overall level of risk;
- Can it be adjusted to fit the wearer correctly?;
- Has the state of health of those who will be wearing it been taken into account?;
- What are the needs of the job and the demands it places on the wearer? For example, the length of time the PPE needs to be worn, the physical effort required to do the job and the requirements for visibility and communication; and
- If more than one item of PPE is being worn, are they compatible? For example, does a particular type of respirator make it difficult to get eye protection to fit properly?

In general, unless otherwise noted, the minimum protective equipment to be worn by the workers and visitors on the KTDP during construction and operation is given below:

Sr. #	Type of Protection	Workplace Hazard	Suggested PPEs
1	Over All, Exterior garments		Long pants, shirt with sleeves (no tank tops or shorts)
2	High Visibility Vests		A reflective vest will be worn outside of any other garments
3	Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids	Safety toed footwear / boots/ shoes
4	Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Safety glasses wide side-shields, goggles, etc.
5	Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Hard hats with top and side impact protection. Hard hats shall be worn with the brim pointed forward.
6	Hearing protection	Noise, ultra-sound	Earplugs, muffs
7	Hand Protection	Hazardous materials, cuts or	Gloves (Plastic, leather, fireproof and

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Sr. #	Type of Protection	Workplace Hazard	Suggested PPEs
		lacerations, vibrations, extreme temperature	rubber)
8	Breathing Protection	Dusts, fogs, fumes, mists, gases, smokes, vapors	Facemasks
9	Toxic Gases Protection		SCBA
10	Falling Hazard Protection		Safety Belt/Chains, Locks

The use of PPE on-site shall be mandatory. Discuss measures to be used to ensure conformance with PPE requirements, and penalties associated with non-compliance.

10. EMERGENCY PREPAREDNESS AND RESPONSE

An emergency is an unplanned event when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the project area or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational H&S.

A plan for emergency response and preparedness shall be prepared that considers all of the risks associated with the project. Identify procedures to be followed, and contacts that shall be made in the event of an emergency. Use flow charts, contact lists, etc. to clearly identify emergency procedures. Key items that should be identified in this plan, at a minimum, are discussed in the following sections.

Due to the remote nature of the project emergency preparedness activities will need to provide a sufficient level of detail to respond in a timely manner. Specific individuals to be contacted shall be identified. Also some services such as fire protection may need to be established in the project vicinity; therefore services to be established prior to construction and to be maintained during facility operation shall be identified.

10.1. Worker notification and communication system

Identify the notification and communication system to be used for worker notification. Alarm bells, visual alarms, or other forms of communication should be used to reliably alert workers to an emergency. Related measures include testing warning systems at least monthly or annually and installing a back-up system for communications with on-site and off-site resources in the event that normal communication systems are inoperable during an emergency.

10.2. Community notification system

If potential emergencies at the project site have the potential to impact local communities then communication measures to alert the community shall also be provided. Communication measures can include audible alarms such as bells or sirens, telephone call lists, and vehicle mounted speakers. Procedures for communicating the details of the emergency and advice on protection options should also be developed.

10.3. Media and agency relations

A plan for media and agency relations shall be developed. Media and agency relations shall include the identification of a trained local spokesperson for communicating emergency information to the local media, and procedures to be followed regarding the preparation of written press releases with accurate information and an appropriate level of detail for the emergency.

10.4. Mechanism for funding emergency activities

Discuss the mechanism that will be provided for funding emergency activities.

10.5. Fire services

Due to the remote nature of the project some services such as fire protection may need to be established in the project vicinity. The local level of firefighting capacity shall be evaluated; if insufficient capacity is available firefighting services shall be established and will include purchasing pumps, hoses, protective clothing, trucks, and training of fire personnel.

10.6. Medical services

Lady Reading Hospital Peshawar (LRHP) in Peshawar has an Accident and Emergency Department (A&ED) that can treat up to 80 patients at one time. The A&ED has given the hospital a reputation as one of the best providers of emergency healthcare in Pakistan. However, this hospital is located some distance from the project site; therefore location medical services shall be established for the duration of the project. Medical services shall include first aid attendants as well as other medical staff and equipment suitable for scale of the project, and for the degree of treatment that likely to be required prior to transportation to the hospital. Provisions for transport to the hospital in Peshawar shall also be provided.

10.7. Available resources

The management of available resources during an emergency event is very important. A management system shall be in place to track and manage all local resources, contacts, etc.

10.8. Mutual aid agreements

Mutual aid agreements decrease administration confusion and provide a clear basis for response by mutual aid providers. Where appropriate, mutual aid agreements should be maintained with other organizations to allow for sharing of personnel and specialized equipment.

11. COMMUNICATION WITH LOCAL COMMUNITIES

11.1. Communication in project area

Maximum use of Pashto and Urdu languages shall be made in the Project area.

Languages used for the various forms of communication are as follows:

- Verbal - Verbal communication brings in use of speech, the mother tongue in the Project area is Pashto, the Urdu language is the national language in Pakistan, and the English language is used as the international communication language. The Project area people speak Pashto language. This is a two way communication system.
- Written - The written communication in Project area is in Pashto and Urdu. English is also used on limited scale.
- Print Media - The print media communication is in Urdu and Pashto languages.
- Multimedia/TV/Cinema - Still and motion picture are useful tools. The Project area language Pashto and the national language Urdu will play an important part in communication.
- Electronic Media - The electronic media prevalent in the project area is radio and TV. National level programs are in Urdu, local programs are in Pustoo, and for wider communication English is used. This is a one way communication system.
- Signboard - The signboard is yet another important means of communication with the people. In the Project area the signboard shall be written in the Pashto, Urdu and English language.

11.2. Poverty in project area

The local communities in the project area have high poverty rates and a mostly illiterate population. The education level in Project area is low. Awareness of adults, young and children about basics of environment and other related issues affecting safety, security and health matters is not given any importance. Special provisions shall be made to educate local persons regarding security and health issues. For example, lectures in schools and speeches in Jirga can be useful tools.

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12. APPENDICES

The following appendices, at a minimum, shall be included in the contractor and operator HASPs, and shall support the information included in the report:

- A. Acknowledgement Form
- B. Organization Chart
- C. Incident/Accident Report
- D. Pre-Project Issue/Hazard Meeting
- E. Emergency Contacts
- F. List and CVs of Qualified Personnel

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Attachment I - Examples of Common Health and Safety Issues at Construction Sites

Note: The purpose of this Attachment is to provide examples of common HS issues and corrective actions; this attachment does not provide an exhaustive list. The Contractor and HS Officers shall follow appropriate rules, regulations, and standards to identify HS issues and develop appropriate corrective actions.

INADEQUATE SYSTEM FOR FIRST RESPONDERS

Problem	Corrective Action
<p>A dirty ambulance without appropriate medical equipment or staff; used primarily for domestic tasks such as buying groceries.</p> 	<p>Provide a clean well-equipped ambulance with appropriate medical staff and supplies. The ambulance shall be available for medical related emergencies at all times. An appropriate number of ambulances shall be provided for the scope of the project.</p> 

SITE IS NOT SECURED TO KEEP GENERAL PUBLIC OUT

Problem	Corrective Action
<p>Animals and general public in project area and on critical transportation routes.</p> 	<p>A number of solutions shall be provided such as:</p> <ul style="list-style-type: none"> • Providing fencing around the project area. • Providing security gates at select location in the project area. • Educate local population about safety hazards during the construction phase.

WORKERS FAIL TO USE PERSONAL PROTECTIVE CLOTHING/EQUIPMENT

Problem	Corrective Action
<p>Working without hard hats, safety vests, eye protection, and steel toe boots.</p> 	<p>Educate labors about the use of appropriate PPE for different construction activities. Management shall enforce PPE requirements and penalize workers that do not follow PPE rules while on site.</p>
<p>Welding without a safety harness, safety vests, and appropriate eye protection. Also, the edge of a steep fall is not appropriately marked or protected.</p> 	<p>To protect workers safety harnesses and other PPE shall be used as appropriate. Also, the Contractor shall include provisions to limit access to steep areas and mark them appropriately to limit injuries to workers.</p>

ELECTRICAL HAZARDS

Problem	Corrective Action
<p>High tension cable laid in superficial ditch. Also, ditch markers not provided.</p> 	<p>Consult a technical expert regarding appropriate procedures to be used when burying high tension electrical cable. Also, all buried cables shall be marked to prevent injury.</p>
<p>Welding machine cable on wet ground, and cut electrical cables.</p> 	<p>Follow appropriate safety guidelines, and consult technical expert as needed.</p>
<p>Control panels missing doors</p> 	<p>Equipment that is out dated, damaged, or otherwise presents an electrical hazard shall not be used. Equipment shall be replaced as needed.</p>

CONTAMINATION WITH OIL

Problem	Corrective Action
<p>Disposal of oil waste, and contaminated soils in overfull barrels.</p> 	<p>Appropriate waste disposal containers shall be used. The Contractor shall develop a plan for disposal of all construction waste.</p>
<p>Washing machinery in open water bodies such as rivers, streams and lakes.</p> 	<p>Management shall establish rules and procedures to be used regarding cleaning and maintenance of equipment. Internationally accepted rules and procedures shall be used to limit contamination of soils and water in the project area.</p>

IMPROPER DISPOSAL OF WASTE

Problem	Corrective Action
<p>Inadequate system for collecting trash and construction waste.</p> 	<p>The contractor shall establish a trash and construction waste collection and disposal plan for both construction work and the labor camps. Collection and disposal of waste shall follow local laws and requirements.</p>
<p>Burning trash and construction waste.</p> 	<p>Disposal of trash and construction waste shall be performed per local laws and regulations.</p>

PHYSICAL AND BIOLOGICAL HAZARDS

Problem	Corrective Action
<p>Narrow and steep site access ramps, ladders, and stairs</p> 	<p>Appropriate international safety practices shall be followed to ensure safety of laborers and management.</p>
<p>Aggregate has fallen onto walkways creating a slick walking surface.</p> 	<p>The Contractor shall maintain a clean and orderly construction site, maintain all equipment, and clean all spills.</p>
<p>Improper storage of construction materials, and mismanagement of construction laydown area.</p> 	<p>The Contractor shall maintain a clean and organized construction site and material laydown area.</p>

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Problem	Corrective Action
<p>Beehives and other pests located on construction equipment and/or near construction work areas.</p> 	<p>Appropriate procedures and protocols regarding pest controls shall be in place, and pest control personnel shall be available on an as needed basis.</p>