USAID VIETNAM

FROM THE AMERICAN PEOPLE

Environmental Remediation Project: Assessments and Engineering Designs and Plans for Dioxin Containment at Da Nang Airport

ENVIRONMENTAL SCOPING STATEMENT
FINAL

December 21, 2009

USAID | VIETNAM
FROM THE AMERICAN PEOPLE

ACTION MEMORANDUM

DATE: January 19, 2010

TO: John O. Wilson, Bureau Environment Officer
Asia Bureau

THROUGH: Francis A. Donovan, Representative
USAID/Vietnam

THROUGH: Howard R. Handler, General Development Officer 2/19/10
USAID/Vietnam

FROM: Barbara R. Britton, Mission Environment Officer
USAID/Vietnam

SUBJECT: Approval of Environmental Assessment Scoping Statement for Environmental Remediation of Dioxin Contamination at Danang Airport

The purpose of this memorandum is to obtain your approval of the attached Environmental Scoping Statement in support of an Environmental Assessment to be undertaken for Environmental Remediation at Danang Airport.

Approved: ✓

Disapproved: _____

John O. Wilson, BEO

2/5/10
Date

U.S. Agency for International Development
USAID Vietnam, 15/F Tung Shing Square
2 Ngo Quyen Street
Hanoi, Vietnam

Tel: 84-4-3-935-1260
Fax: 84-4-3-935-1265

Contents

Section 1 – Introduction 1-1

Section 2 – Scoping Objectives 2-1

Section 3 – Environmental Setting

3.1 Current Characterization of Dioxin Contamination at Da Nang Airport 3-1
3.2 General Project Setting 3-4
3.3 Physical Resources 3-5
3.4 Natural and Biological Resources 3-7
3.5 Key Socioeconomic Resources 3-7

Section 4 – Project Description

4.1 Proposed Project 4-1
4.2 Estimated Volumes of Soil and Sediment to be Addressed 4-1
4.3 Landfill Siting 4-2

Section 5 – Scoping Activities

5.1 Scoping Meeting Summaries 5-1
5.2 Public Consultation During EA Scoping 5-4

Section 6 –Scope of Environmental Assessment

6.1 Project Alternatives 6-1
6.2 Issues to be Addressed in the EA 6-2
6.2.1 Known Insignificant Environmental Issues 6-2
6.2.2 Known Significant Environmental Issues 6-2
6.2.3 Potentially Significant Environmental Issues 6-2

Section 7 – Proposed Environmental Assessment

7.1 Variations in the Format of the EA 7-1
7.1.1 Differences in USAID EA and GVN EIA Requirements 7-1
7.1.2 Approach to be Used for EA and EIA Preparation 7-2
7.2 Proposed Approach to Addressing Potentially Significant Environmental Impacts 7-2
7.3 Workplan and Schedule 7-2

Section 8 – Supporting Documentation 8-1

Appendices

Appendix A1 Photographs from Scoping Visit
Appendix A2 Scoping Session Participants
Appendix A3 Summary of Environmental Issues Raised and Comments Received During Environmental Scoping Consultations
Appendix A4 Preliminary Terms of Reference for Collection of Data and Information for Environmental Baseline

Figures

Figure 1 Indicative Location of Currently-Known Hotspots, Currently-Preferred Location of On-Site Landfill, and Currently-Preferred Haul Road Alignment 3-2

Tables

Table 1 Summary information for Da Nang City Districts Adjacent to Da Nang Airport Property 3-6
Table 2 Summary of Information on Hotspots on the Da Nang Airport Property Identified in RFTOP 4-2
Table 3 Summary of EA Scoping Consultations 5-2
Table 4 Scope and Significance of Potential Environmental Issues 6-3
Table 5 Comparison of the Content and Format Required for the 22 CFR 216 EA and the GVN EIA 7-3
Table 6 Workplan and Schedule for 22 CFR 216 EA and the GVN EIA Preparation Review and Approval 7-5

List of Acronyms

asl	above sea level
BEO	Bureau Environmental Officer
CFR	Code of Federal Regulations, USA
EA	environmental assessment
EIA	environmental impact assessment
EMMP	environmental mitigation and monitoring plan
ESS	environmental scoping statement
GVN	Government of Vietnam
ha	Hectare
IEE	initial environmental examination
km	Kilometer
km^2	square kilometers
m	Meter
m^3	cubic meters
MLA	mixing and loading area
mm	Millimeter
MOD	Ministry of Defense, Vietnam
MoLISA	Ministry of Labour, War Invalids and Social Affairs, Vietnam
MoNRE	Ministry of Natural Resources and Environment, Vietnam
Office 33	Office Committee 33
pg	Pictogram
PISA	Pacer Ivy Storage Area
ppt	part per trillion
RFTOP	request for task force order proposal
RWP	remediation work plan
SA	storage area
SAP	sampling and monitoring plan
t	ton (metric)
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCVN	Vietnamese Standards
TEF	toxic equivalency factor
TEQ	TCDD toxic equivalent
TO	task order
UNDP	United Nations Development Programme
USAID	United States Agency for International Development

USEPA	United States Environmental Protection Agency
UXO	unexploded ordnance
VNEA	Vietnam Environment Administration
VNAH	Vietnam Assistance for the Handicapped

Section 1
Introduction

On September 29, 2009, USAID awarded a 12 month contract to CDM International to implement the "Environmental Remediation at Da Nang Airport: Assessments and Engineering Planning and Design" Project. The purpose of the project is to provide technical assistance to the Government of Vietnam (GVN) for containment of dioxin from the four hotspot areas of the northern end of the airport. The short term objective is to provide planning and design support for removal and containment of dioxin contaminated soil and sediment. The long term objective is to develop Vietnamese capacity for conducting environmental assessments and engineering designs and plans for removal and containment of other Persistent Organic Pollutants (POPs) at other potential sites.

Under this project, assessments, designs, and plans will be developed to support containment of dioxin contaminated soil and sediment at the Da Nang Airport. At completion it is anticipated that: 1) an environmental assessment will have addressed health and environmental impacts from remediation activities which incorporates gender issues and concerns; and; 2) engineering designs and specifications and remediation plans for dioxin containment of hotspots of the northern end of Da Nang Airport will be developed which are based on the least environmentally damaging feasible option for containing dioxin contaminated soil and sediment in a secure on-site landfill. These designs and plans will be in support of future procurement efforts for engineering and construction services for a dioxin containment activity.

The assessment, designs and plans developed under this project will address the first step in the remediation process as identified in the February 2009 Office 33/UNDP meeting, and will involve containment of dioxin from four hotspots areas of the northern end of Da Nang Airport. The containment process will likely include: 1) construction and operation of a secure landfill; 2) containment of contaminated soil from the former mixing and loading and storage areas; and 3) containment of contaminated sediment from the drainage area and wetland system which located in close proximity to residential areas.

Under this project, CDM will:

1. Conduct an environmental assessment that meets USAID's 22 CFR 216 Environmental Compliance Regulation and GVN EIA requirements for dioxin removal and containment program at Da Nang Airport and to conduct a gender analysis to meet USAID's ADS 201.3.9.3 requirement for gender considerations in project planning.

2. Develop engineering designs and specifications for construction of a secure on-site landfill for containing dioxin contaminated soil and sediment.

3. Prepare a remediation workplan, health and safety plan and on-site worker health and safety training plan, and sampling analysis and monitoring plan.

USAID/Vietnam has made a determination that engineering and construction activities for a secure on-site landfill and removal, transport and deposition of dioxin contaminated soil and sediment into the secure landfill may pose a risk to the environment, thus resulting in a positive determination under USAID's Environmental Compliance Regulation 216. A positive determination requires that an environmental assessment (EA) be completed before activities can proceed. Vietnamese environmental law and its environmental compliance regulations also require an Environmental Impact Assessment (EIA) for dioxin containment activities. Therefore, an environmental compliance document must be prepared which meets requirements of both USAID and GVN. Given the nature of dioxin toxicity, careful planning for health and safety protection and personal protective measures are a necessary part of a dioxin containment activity. Therefore, an environmental impact assessment will be developed to identify the least environmentally damaging feasible option for containing dioxin contaminated soil and sediment and to ensure a future containment activity is based on environmentally sound design. This scoping statement is the first step towards preparation of the EIA.

This document is the draft Environmental Scoping Statement (ESS) for the Project, *Environmental Remediation at Da Nang Airport: Assessments and Engineering Planning and Design for Dioxin Containment*, funded by the United States Agency for International Development (USAID). This document has been prepared in compliance with Title 22 of the U.S. Code of Federal Regulations (CFR), Part 216 (22 CFR 216). Environmental assessment work being conducted under the project is to fulfill both the requirements of 22 CFR 216 and the GVN environmental assessment requirements for the project. The GVN EIA environmental assessment requirements are defined in large part by:

- National Law on Environmental Protection: No. 52/2005/QH11
- Decree No. 80/2006/ND-CP, Detail and Guide to the Implementation of A Number of Articles of the Law on Environmental Protection
- Decree No. 80/2008/ND-CP, Amending and Supplementing A Number of Articles of Government Decree No. 80/2006/ND-CP, Detail and Guide to the Implementation of a Number of Articles of the Law on Environmental Protection
- Circular No. 05/2008/TT-BTNMT, Guide to Strategic Environmental Assessment, Environmental Impact Assessment, and Environmental Protection Commitment

The GVN environmental assessment regulations stipulate that an Environmental Impact Assessment (EIA) is required for the Project, *Environmental Remediation at Da Nang Airport*.

Section 2
Scoping Objectives

This project is subject to the Environmental Procedures established under 22 CFR 216. An Initial Environmental Examination (IEE) has determined that construction and operation and maintenance of a secure on-site landfill for Da Nang Airport dioxin hotspot remediation would pose a risk to the environment. This has resulted in a Positive Determination under 22 CFR 216, thereby requiring an environmental assessment (EA) to be completed and approved by the USAID Asia Bureau Environmental Officer.

22 CFR 216 requires that an ESS be prepared and approved as the first step of the EA process. In compliance with 22 CFR 216, this ESS:

- Determines the scope and significance of issues to be analyzed in the EA for the construction and operation and maintenance of an on-site hazardous waste landfill and associated activities.
- Identifies and eliminates from detailed study those issues that are not significant or have been covered by earlier environmental reviews.
- Describes the timing of the preparation of the environmental analysis, including any variations required in the format of the EA, including a workplan and schedule for the preparation of the EA.
- Describes how the analysis will be conducted and the disciplines that will participate in the analysis.

Section 3
Environmental Setting

3.1 Current Characterization of Dioxin Contamination at Da Nang Airport

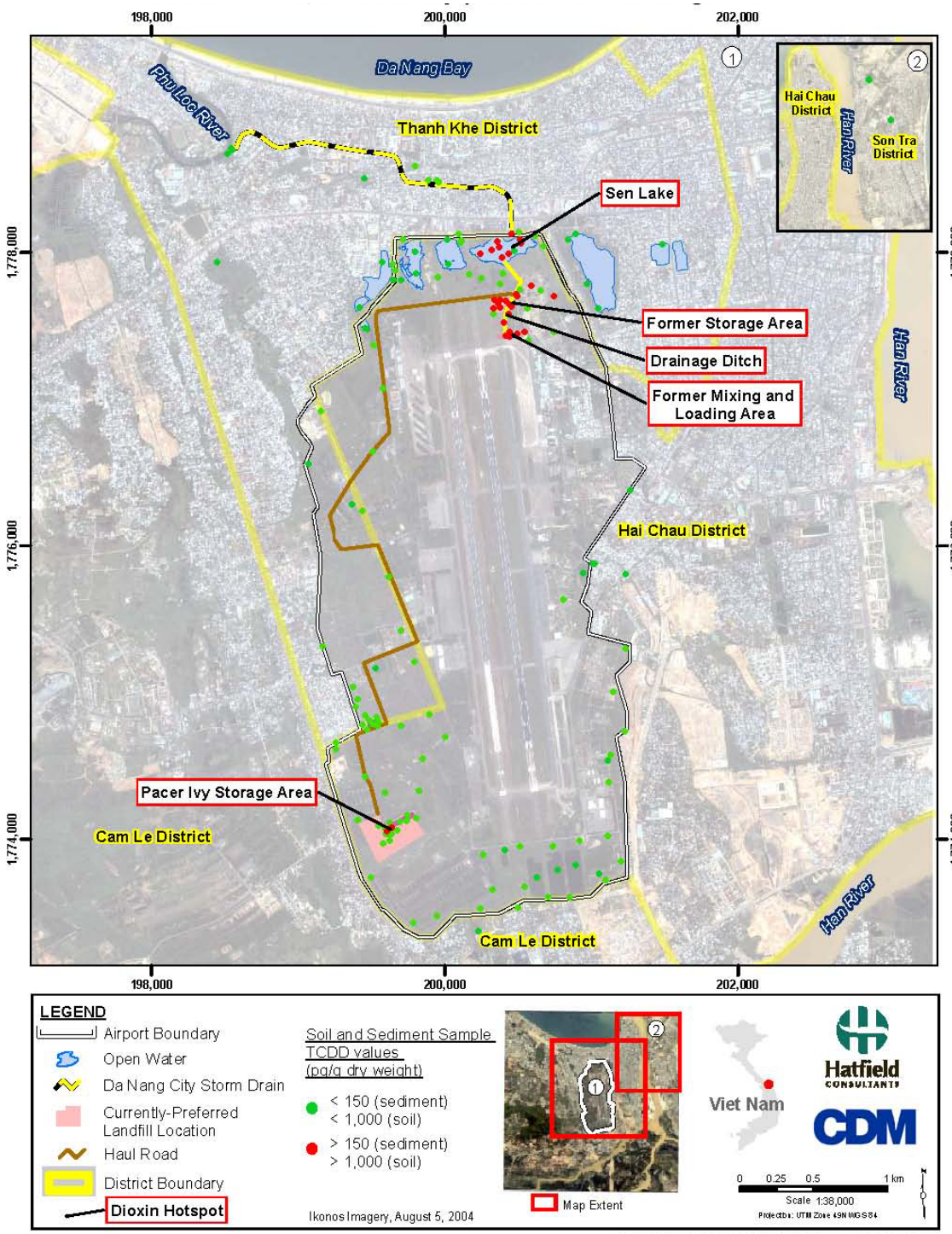
The airports at Da Nang, Bien Hoa, and Phu Cat of Vietnam have been referred to as dioxin "hotspots" due to high dioxin concentrations remaining decades after large volumes of Agent Orange and other defoliants were handled at these sites. The Government of Vietnam (GVN) has requested foreign assistance to support remediation efforts and has divided responsibilities among identified donors. It has requested assistance from the United States at Da Nang, and the UNDP at Bien Hoa.

There is consensus among GVN, USG and other donors regarding the need for dioxin removal and containment in a secure landfill at the three major hotspot sites above, to eliminate current and future potential for human and wildlife exposure. There is also agreement on a longer term goal of dioxin destruction at these sites, although more studies are needed to determine the most suitable technology option.

In 2006, GVN created the National Steering Committee 33 and assigned it responsibility for coordination of dioxin-related matters and for development of short, medium and long term implementation and research plans for dioxin removal and treatment. The Minister of Natural Resources and Environment (MoNRE) chairs the National Steering Committee, and its multi-sectoral membership includes the Academy of Science and Technology, the Ministry of Defense, the Ministry of Foreign Affairs, the Ministry of Health, the Ministry of Planning and Investment, the Ministry of Finance, the Ministry of Science and Technology, the Ministry of Justice, the Ministry of Labor, and the Ministry of Government Office. The Office of the National Steering Committee 33 (Office 33) was established under the Ministry of Natural Resources and the Environment (MoNRE) as the implementing arm of the National Steering Committee 33. Office 33 is the implementation counterpart of USAID on dioxin-related activities.

Studies of dioxin contamination of the northern area of Da Nang Airport have been conducted by the GVN, EPA and Hatfield Consultants. Results enabled the definition of certain areas as hotspots at this location (Figure 1) which include the: 2.5-acre site at the former mixing and loading area; 4-acre site at the former storage area; 1-acre drainage ditch; and 25-acre Sen Lake. Sen Lake is part of a wetland complex consisting of four area lakes and has a hydrological connection to the City of Da Nang's stormwater system. The drainage area and Sen Lake are the primary conduits for human and wildlife exposure to dioxin from this site. The GVN plans to expand the airport runway at the northern end of the airport in 2010, and has requested prompt dioxin removal from the mixing and loading and storage areas, where construction of runway and taxiways may take place.

Figure 1. Indicative Location of Currently-Known Hotspots, Currently-Preferred Location of On-Site Landfill, and Currently-Preferred Haul Road Alignment



TCDD is the most potent form of dioxin, and the contaminant present in Agent Orange used in Vietnam. In 2007, Hatfield Consultants measured dioxin in the soil and sediment of Da Nang Airport and nearby areas, measured dioxin fish tissue levels from samples collected from area lakes, and measured dioxin in human blood of airport workers and individuals living in or near the airport.

Soil and sediment samples taken from areas of the airport where Agent Orange was handled, along with sediment samples from the drainage area and Sen Lake, had elevated levels of dioxin. The GVN has proposed a nationwide clean up goal for dioxin hotspots of 1 ppb TEQ for soil and .150 ppb TEQ for sediment. According to analysis of the 2007 Hatfield sampling, average dioxin concentrations in soil found at the former mixing and loading area are 107 times above the goal. Average dioxin concentrations in soil at the former storage area exceed the goal by 27 times. Average dioxin concentrations in sediments exceed the proposed clean up goal for sediment by 67 times, and average sediment concentrations of Sen Lake are 20 times higher than the clean up goal.

Soil volume estimates have been calculated to determine the amount of soil and sediment that would need to be excavated to meet the proposed GVN clean up goals. The high end estimate is derived from the GVN Ministry of Defense which assumes a soil excavation depth of 1.8 meters to clean up to the 1 ppb level. EPA experts have calculated preliminary estimates of soil volumes, one based on site inspection and another based on soil contour modeling of currently available soil sampling data. Additional sampling may be needed to determine the actual relationship between soil depth and dioxin concentrations at this site.

Hatfield Consultants collected twelve fish samples from the lakes of the wetland complex located in and near the northern part of the airport. All tested positive for 2,3,7,8 TCDD, with levels ranging from 6.75 to 3,220 ppt in fat and .228 to 1.2 ppt in muscle. As a point of reference, FDA issued a recall of dioxin contaminated fish in 1997, where fish with dioxin levels higher than 1 ppt were withdrawn from the market.1 Fish sampled in the Hatfield study were seven to 3,220 times higher than this level.

The Hatfield study measured dioxin blood levels of 52 residents of the Da Nang area including Sen Lake workers, west airport workers, residents of Thanh Khe District (located adjacent to the north end of the airport and between the airport and Da Nang Bay), and residents of Hai Chau District (located to the northeast of the airport). Blood dioxin levels were found in all but three of the 52 individuals included in the study. The U.S. Agency for Toxic Substance and Disease Registry (ATSDR) notes that blood dioxin levels typical of those found in developing countries rarely exceed 10 ppt. Nine Sen Lake workers, nine west airport workers and seven Thanh Khe District residents

[1] Hatfield Consultants, "Assessment of Dioxin in the Environment and Human Population in the Vicinity of Da Nang Airport, Vietnam." Final Report: 2007.

had blood dioxin levels above 10 ppt. For some of these individuals, particularly among airport workers, results were associated with a high percentage contribution of TCDD to TEQ, indicating possible exposure to dioxin from hotspots at Da Nang Airport.2

Dioxin levels in fish collected from Sen Lake exceed safe fish consumption levels. Blood dioxin levels of certain airport workers, Sen Lake workers, and the residents of Thanh Khe District were found to be elevated. The highest levels were associated with Sen Lake workers who harvested lotuses and caught and consumed fish from Sen Lake. Subsequent to this study, the Ford Foundation financed interim containment measures, which included capping the mixing and loading area with concrete and fencing off Sen Lake so that the public no longer had access to the base. These measures should eliminate the highest exposures over the short term.

Longer term containment of dioxin contaminated soil and sediment is considered the first line of protection against continued human health and environmental exposure to dioxin from this site. More information is needed to characterize soil and sediment volumes to be excavated in order to meet clean up goals. Hazards to workers involved in dioxin removal activities have not been characterized and protective measures to mitigate worker risks have not been explored. Dredging the wetland lakes to remove contaminated sediment could increase the amount of sediment flowing through the drainage system, thus increasing the risk of dioxin migration off-site. Construction of an on-site landfill could result in impacts to wildlife and vegetation. Therefore, careful consideration must be given to environmental impacts associated with proposed remediation activities, and these considerations must be incorporated into remediation designs, plans, and specifications for dioxin clean up at this site.

3.2 General Project Setting

The Da Nang Airport property is located within Da Nang City and is used by both the Ministry of Defense and the Vietnam Civil Aviation Authority. It has a total area of 820 ha, of which 150 ha is allocated to civil aviation, and the remaining 670 ha is under the jurisdiction of the Ministry of Defense. It is an international airport, with flights arriving from and departing to cities such as Bangkok, Vientiane, Hong Kong, Phnom Penh, and Taipei.

Da Nang City has a population of approximately 825,000 persons as of 2008 (male: 401,235; female: 420,943), with an average population density of about 640 persons/km^2. The Da Nang Airport property is located within the urban part of Da Nang City and is surrounded by three urban districts: Hai Chau on the northeast and east; Thanh Khe on the northwest and west, and Cam Le on the southwest, south, and southeast (Figure 1). The three districts are densely populated, with most of the land in these districts used for housing, industrial facilities, transportation, and other

[2] Hatfield Consultants, "Assessment of Dioxin in the Environment and Human Population in the Vicinity of Da Nang Airport, Vietnam." Final Report: 2007.

facilities. With the exception of Cam Le District, few areas near the airport property are used for agriculture, aquaculture, or forestry. These land uses in Cam Le District are generally to the southwest of, and not immediately adjacent to, the Da Nang Airport property. General information on Da Nang City and the districts of Thanh Khe, Cam Le, and Hai Chau is provided in Table 1.

A number of people reside on the western edge of the Da Nang Airport property, between the western boundary and the active runways. These are likely military personnel and their families.

3.3 Physical Resources

Climate in Da Nang City is characterized by:

- A dry season lasting from January to July, and a rainy season lasting from August to December. Average annual rainfall is slightly above 2,000 mm, with historically 75 percent of total annual rainfall occurring in the rainy season, and 30 percent of total annual rainfall historically occurring in the month of October. Total annual rainfall has been more than 3,300 mm.
- "Winter" season from October to March in which the temperatures are somewhat cooler than the "summer" season from April to September.
- Wind direction in the winter season primarily from the east, and from the north and northwest in the summer season.
- Approximately four typhoons and tropical storms annually.

The airport property sits on three main catchments. The northern section of the airport is part of a catchment with a total area of 905 ha. This catchment contains the main dioxin hotspots and northern wetland and lakes. The northern part of the airport property drains into the Phu Loc River immediately upstream of the river's discharge into Da Nang Bay via a covered municipal stormwater discharge drain exiting Sen Lake. The drainage canal that is designated as a hotspot directs much of the drainage on the northeastern part of the airport property into Sen Lake, and there is a weir immediately downstream of the drainage canal inflow to Sen Lake that is acting as a sediment trap.

In addition, the southeastern part of airport, draining into the Han River, is part of a catchment that has a total drainage area of 650 ha; the southwestern part of the airport is part of a 875 ha catchment that also drains into the Han River.

Surface water quality assessment was beyond the scope of the site characterization studies conducted to date at Da Nang Airport. Surface water quality data may exist for the airport property and immediately downstream of the airport property, but such data were not made available to CDM during the preparation of this ESS.

Table 1. Summary Information for Da Nang City Districts Adjacent to Da Nang Airport Property

	Hai Chau District	Thanh Khe District	Cam Le District
General			
Area (ha)	2,135	936	3,376
Total Population	196,842	169,268	70,052
Male Population	94,721	83,418	33,993
Female Population	102,121	85,850	36,059
Population Density (Persons/ha)	92	181	21
Number of Wards	13	10	6
Land Use (ha, as of 2007)			
Total Agriculture Land	23	18	826
Rice	0	0	536
Other Cultivated Crops	0	10	217
Tree Crops	23	8	73
Aquaculture	0	0	28
Forestry Land	0	0	210
Special Use Land	1,328	388	956
Residential Land	473	454	676
Unused Land	311	76	680

Note: Information as of 2008 unless otherwise noted.

Other cultivated crops include beans, groundnut, corn, and other vegetables.

Tree crops include coconut, pepper, and cashew.

Forestry land is defined as land used for the cultivation of trees for timber, other building products, or pulp and paper.

Special Use Land includes roads, industrial zones, retail facilities, and canals.

The status of shallow groundwater resources on and adjacent to the airport property, as well as groundwater quality, is currently unknown; while groundwater quality data may exist for the airport property and immediately downstream of the airport property, such data were not made available to CDM during the preparation of this ESS. Groundwater quality assessment was beyond the scope of the site characterization studies conducted to date at Da Nang Airport. It is unlikely that groundwater on or downstream of the airport property contains significant levels of dioxin because of its very low water solubility, although dioxin contamination may exist on colloidal particles in the groundwater.

3.4 Natural and Biological Resources

That part of the airport property not currently under use as a civilian airport or as housing and associated infrastructure for military operations, as well as the military staff and their families, forms the largest extent of natural environment in the urban portion of Da Nang City.

Most of the vegetated portion of the airport property consists of secondary and planted forest and shrub vegetation, indicating significant historical disturbance and alteration.

There are also a series of lakes and wetlands on the north side of the airport, both within and adjacent to the airport property, lakes scattered along the west and east side of the airport, as well as a series of aquaculture ponds on the southern border of the airport property. The lakes and wetlands on the northern end of the airport property appear to once have been part of a larger coastal wetland complex running along much of coastal Da Nang City.

It is unlikely that biodiversity surveys have been conducted for the terrestrial and aquatic ecosystems on and adjacent to the airport property, given that they are small in area and situated within significant urban and transportation developments.

There are three nature reserves and protected areas in Da Nang City. The closest of these is Son Tra Nature Reserve on the northeastern end of Da Nang Bay, approximately 7 km from the northern end of the airport property.

3.5 Key Socioeconomic Resources

Aquatic resources, particularly fish and lotus, have historically been harvested by local residents in the lakes and wetlands at the north of the airport property, as well as the lakes scattered along the south, west, and east sides of the airport. Harvesting of aquatic resources from the lakes and wetlands at the north end of the airport property was prohibited in 2007 following the detection of high dioxin levels in fish tissues and higher than normal dioxin levels in the blood samples of persons using the lake for economic purposes.

There are no designated cultural and historic features on the Da Nang Airport property.

Section 4
Project Description

4.1 Proposed Project

As currently configured, the project will consist of:

- Overall construction site preparation and staging, including fencing and security provisions for construction site.
- Construction of a secure, on-site landfill at the southwestern end of the Da Nang Airport according to approved design specifications.
- Removal, transport, and deposition in the landfill of dioxin contaminated soil from the MLA, using the recently promulgated national Vietnamese clean up standards of 1000 ppt for contaminated soil.
- Removal, transport and deposition in the landfill of dioxin contaminated sediment from Sen Lake and the drainage canal using the recently-promulgated national Vietnamese standards of 150 ppt in sediments.
- Removal, transport, and deposition in the landfill of dioxin contaminated soil and sediment in other areas as identified and designated during remedial site investigations as requiring removal.
- Construction of a landfill cap, including revegetation.
- Replacement of excavated soils with clean soils and reclamation and restoration of excavated areas and all construction sites.
- Operation and maintenance activities, including monitoring.
- Engineering and environmental control and documentation of construction, operation, and maintenance activities.

4.2 Estimated Volumes of Soil and Sediment to be Addressed

Design parameters for the landfill and the remediation workplan will be based to a great extent on the soil and sediment volumes to be removed, transported, and contained. Preliminary estimates of various sources indicate a two-fold range between lower and upper end estimates (Table 2). Soil and sediment volumes will need to be determined as part of the EIA process to evaluate impacts and to support development of design parameters.

While the process of determining an approach for soil removal from the mixing and loading and storage areas is relatively straightforward, the process of sediment removal is much less so. Sen Lake in particular is part of a wetland ecosystem with a

hydrological connection to the City of Da Nang's stormwater discharge system. Residential areas are located within meters of the lake. There, an approach that minimizes releases of contaminated sediment to air, surface water, and groundwater is of high importance.

Table 2. Summary of information on Hotspots on the Da Nang Airport Property Identified in RFTOP

Hotspot	Estimated Area of Contaminated Material (ha)	Lower Estimate of Material to be Put into Landfill (t)		Upper Estimate of Material to be Put into Landfill (t)	
		Soils	**Sediments**	**Soils**	**Sediments**
Mixing and Loading Area	1.86	32,872	0	55,113	0
Storage Area	0.48	3,220	0	14,138	0
Drainage Canal	0.29	0	2,942	0	8,542
Sen Lake Complex	5.6	0	25,455	0	25,455
Total	**8.23**	**36,092**	**28,397**	**69,251**	**33,997**
		64,489		**103,248**	

Note: Data taken from RFTOP and assume a 1,000 ppt clean up target for both soils and sediments.

4.3 Landfill Siting

One of the major design issues to be considered is the location of the landfill. Environmental factors will be important to determining the final placement of the landfill. Preliminary site selection for the landfill has been conducted by Office 33 and the Ministry of Defense (MOD). The currently-preferred location of the landfill is in the southwest part of the airport property; MOD and Office 33 selected this location over three potential sites in the northern part of the airport based on criteria relating to distance from settlements and degree of interference with Da Nang Airport operations during landfill construction and operation.

There are plans to upgrade infrastructure and expand Da Nang Airport, including construction of a new terminal, lengthening the eastern runway by 300 m and extension of taxiways and technical service areas.

Section 5
Scoping Activities
5.1 Scoping Meeting Summaries

Scoping meetings to initiate the environmental impact assessment process were conducted during the period of October 13-29, 2009 (Table 3). A field trip to Da Nang Airport took place on October 14. The purpose of the visit was to tour dioxin hotspots sites and the EPA bioremediation pilot test site, and to visit with the staff of Binh Dan Hospital and the American Rehabilitation Center, located in the district adjacent and to the north of the airport. The Asia Bureau Environmental Officer (BEO), the Vietnam Mission Environmental Officer, the Director of Office 33, and the new CDM team participated in the site visit, which provided a good overview of the issues surrounding the project.

USAID and CDM sponsored a meeting with the GVN on October 15 to reconcile environmental compliance requirements of the two governments. The discussion led to four major findings:

1. The USAID procedures require an environmental assessment of alternatives and the final decision on the selection of alternatives is based on the EA. GVN procedures identify the project and the EIA is conducted only on one project alternative.

2. USAID procedures require stakeholder input into the development of the scoping statement. GVN does not require a scoping statement but requires stakeholder input for review and comment on the EIA.

3. USAID procedures evaluate alternatives and make a comparison of environmental impacts among alternatives. Once the preferred alternative is identified, an environmental mitigation and monitoring plan is developed for this alternative. Engineering designs, plans, and specifications are completed only after the BEO approves the EA. The GVN requires that the EIA be developed for the proposed project and requires submission of a prefeasibility study, designs, plans, specifications, and detailed cost estimates along with the EIA. Thus, in the case of USAID procedures, the EA is completed prior to developing the designs, specifications and detailed cost estimates, and, in case of GVN, the EIA at the same time as the preparation of designs, specifications, and detailed cost estimates.

4. GVN's EIA may require more information than USAID's EA.

Table 3. Summary of EA Scoping Consultations

Date and Location	Participating Organizations	Purpose of Consultation
October 13, 2009 USAID Ha Noi Offices	• US Embassy • USAID	• Initial consultations regarding environmental issues of landfill project
October 14, 2009 Green Plaza Hotel, Da Nang City	• Office 33 • USAID	• Overview of Da Nang Airport property, presentation of current characterization of hotspot locations, initial discussion of environmental issues
October 14, 2009 Da Nang Airport	• Office 33 • USAID • Ministry of Defense staff and officials stationed at Da Nang Airport	• Visit to airport property hotspots, current proposed location of landfill, current road linking north and south parts of airport property, discussions regarding EPA bioremediation pilot project
October 14, 2009 Binh Dan Hospital, Thanh Ke District, Da Nang City	• Doctors and staff of Binh Dan Hospital • Representatives of Vietnam Assistance for the Handicapped (VNAH) • USAID	• Overview of important public health issues in urban districts of Da Nang City
October 15, 2009 Sofitel Metropole Hotel, Ha Noi	• US Embassy • USAID • Office 33 • Department of Science, Technology and Environment, MOD • Center for Science, Technology and Environment, Department of Chemistry, MOD • Division of Science, Technology and Environment, Air Force • Corps of Engineers, MOD • Vietnam EIA Association	• Presentations and detailed discussions of environmental issues related to landfill project • Comparison and assessment of EA requirements under 22 CFR 216 and GVN EIA requirements
October 16, 2009 Sofitel Metropole Hotel, Ha Noi	• US Embassy • USAID • Office 33 • Department of Science, Technology and Environment, MOD	• Review of environmental issues that will be critical success factors in the project
October 19, 20 and 23, 2009 Vietnam Environment Administration (VNEA) offices	• VNEA and Agency for Environmental Impact Assessment and Appraisal	• Detailed discussion of EIA procedures required by GVN • Presentation by three senior VNEA officials of key environmental issues related to the project
October 21, 2009 USAID Ha Noi Office	• USAID	• Initial discussions of gender assessment and gender requirements for EA

Date and Location	Participating Organizations	Purpose of Consultation
October 23, 2009 Ha Noi School of Public Health	• Department of Community Rehabilitation, Ha Noi School of Public Health	• Review of socioeconomic survey taken of residents of Da Nang City, particularly the urban district of Linh Chieu, representative of urban districts adjacent to airport property
October 27, 2009	• USAID • USEPA	• Review of environmental issues related to landfill design requirements
October 29, 2009	• UNDP	• Discussion of upcoming UNDP-GEF project and possible synergies with USAID Da Nang project

Participants in the scoping sessions and field visit from October 13-16, 2009 favorably viewed the objective of remediating and detoxifying dioxin contaminated soil and sediment on the Da Nang Airport property. The scoping sessions identified several environmental issues of concern; these are described in Appendix A3. The following environmental issues, presented during the October 15, 2009 scoping meeting by representatives of the Department of Science, Technology and Environment of the Ministry of Defense, capture the key environmental and other issues raised during these meetings:

- Identification and characterization of contaminated areas to be contained
- Location of the landfill site
- Selection of treatment options for dioxin remediation or destruction
- Finalization of the transportation route for contaminated materials
- Stockpiling areas for construction materials, equipment, and vehicles
- Construction workers' living quarters
- Sources of construction workers and required training and equipment
- Construction equipment: sources, procurement, specifications
- Identification of project owner
- Tendering process
- Security issues
- Climatic, geological, hydrologic, and hydrodynamic conditions

- Environmental monitoring during and after construction
- Associated material sources (e.g., soil quarries to provide fill material)

Individual meetings with officials from MoNRE held between October 19-23, 2009 provided details on the specific requirements of an EIA submitted to the GVN. These are described in detail in Section 0, below.

The main outcomes of the teleconference meeting between USAID, members of the CDM team, and USEPA on October 27, 2009 are as follows:

1. Final results of the USEPA bioremediation studies currently underway at Da Nang Airport at the SA will be available in early 2010.
2. The ability to scale up bioremediation pilot results is currently uncertain, and the design requirements for an active landfill to enable bioremediation may influence the size of the landfill footprint to deal with compaction issues and may also require additional manipulation and disturbance of dioxin contaminated soil resulting in additional potential environmental contamination in air and water.

The main outcomes of the meeting with staff from UNDP Vietnam on October 29, 2009 are as follows:

1. A significant bioremediation pilot study is currently underway on the Bien Hoa l landfill, designed and constructed under MOD.
2. The upcoming UNDP-GEF project, *PIMS 3685: Environmental Remediation of Dioxin Contaminated Hotspots in Vietnam*, will provide opportunities for pilot-testing promising dioxin destruction technologies.
3. UNDP has provided support to Office 33 for compiling all existing data on dioxin concentrations in soil and sediment at Da Nang Airport.
4. The National Institute of Hydrometeorology has prepared a number of "officially-approved" climate change predictions for Vietnam.

5.2 Public Consultation During EA Scoping

A number of scoping session participants expressed the preference to follow the requirements for public consultation contained in national EIA regulations. In particular, Decree 21/2008-ND-CP states that the public consultation process during the preparation of the EIA is: (i) to be managed by the project owner; (ii) targeted at specific groups at the commune/ward level - People's Committee and Fatherland Front; (iii) focused on a review of a significant EIA document that is already prepared, containing detailed project description, assessment of environmental impacts, and an environmental protection plan. Because these procedures normally require consultation after the EIA has been prepared, and although several requests were

made to meet with stakeholders in Da Nang, this was not possible. However, these stakeholders will be provided an opportunity for input through GVN's stakeholder engagement process.

Section 6
Scope of Environmental Assessment

6.1 Project Alternatives

The scoping sessions identified a need to explore a range of viable alternatives for dioxin containment at Da Nang Airport. The landfill dioxin containment options include the following:

1. **No Action** - The No Action alternative will examine the potential environmental impacts of not addressing dioxin contamination at Da Nang. This alternative will evaluate baseline information and estimate the continuing routes of exposure that could persist over a number of years without action.

2. **Landfill Containment – Passive Landfill** - The primary focus of the EA is to plan for landfill containment of dioxin for 50-100 years. This will require that within this alternative, considerations for landfill siting alternatives be explored as well as options for removing contaminated sediment from wetland ecosystems be considered.

3. **Landfill Containment with Bioremediation—Active Landfill** - EPA is currently conducting a pilot study of the potential for dioxin destruction through bioremediation. The EA will examine the incremental potential environmental impacts that may result with a scale of up the passive landfill to the active landfill option.

4. **Thermal Destruction** - Thermal destruction was identified during scoping as an alternative to a landfill containment option for Da Nang Airport.

One of the major concerns raised during the scoping meetings, particularly during the field visit, was the potential environmental impacts associated with excavation, removal, transport, and deposition of contaminated material. The thermal destruction option for addressing dioxin contamination at Da Nang Airport was identified during the scoping sessions; this alternative may require less excavation, removal, and transport of dioxin contaminated material. Furthermore, this option would result in dioxin destruction to levels below the GVN clean up standards.

An assessment of the potential environmental impacts and required mitigation and monitoring associated with this alternative was not initially planned for in the current CDM project workplan that is focused on landfill alternatives. Nevertheless, this fourth alternative will be thoroughly examined in the preparation of the EA.

6.2 Issues to be Addressed in the EA

6.2.1 Known Insignificant Environmental Issues

As a result of environmental scoping, it is determined that the following environmental resources will not be affected by the landfill project under either alternative to be considered: landforms and topography; nature reserves and protected areas; cultural and historical resources; and tourism resources. The explanations for these determinations are provided in Table 4.

6.2.2 Known Significant Environmental issues

As a result of environmental scoping, it is determined that the environmental impacts of the project on the following environmental resources will be significant and will require mitigation, irrespective of the selected project alternative; the explanations for these determinations are provided in Table 4:

- Surface water quality on and downstream of the airport property
- Groundwater quality
- Air quality downwind of construction activities
- Noise levels around construction activities
- Lakes and wetlands at the north end and immediately outside of the airport property
- Health of construction workers and local residents (which may pose greater risks for women of reproductive age) as a result of changes in air quality and noise levels
- The possibility of unexploded ordnance anywhere on the construction site: landfill, any widening of the haul road, the soil and sediments to be excavated, the construction staging area, and locations of other construction facilities and activities

The EMMP to be prepared as part of the EA will describe measures required to effectively mitigate negative impacts on these environmental resources.

6.2.3 Potentially Significant Environmental Issues

As a result of environmental scoping, it is determined that the potential impacts of the project on the following environmental resources are uncertain at the time, and will therefore require additional assessment: surface water hydrology; soils; terrestrial ecosystems and biodiversity; groundwater resources; domestic and drinking water supply; and environmental effects associated with excavation of perhaps 100,000 m^3 of clean soil from a borrow site to fill excavated hotspot areas. The explanations for these determinations are provided in Table 4.

Table 4. Scope and Significance of Potential Environmental Issues

Environmental Resource	Summary of Existing Baseline Conditions	Potential Impact	Data and Information Requirements
		Physical Resources	
Landforms and Topography	Topography of airport property is unknown at this time, save for general understanding of drainage patterns on the airport site.	**Insignificant** – alternative is unlikely to impact landforms and topography, either on or adjacent to the airport property.	Topographic map of airport property and surrounding area
Soils	Unknown.	**Potentially Significant** – there may be soil erosion and sedimentation caused as a result of construction activities. The extent and magnitude of potential soil erosion will be a function of soil type. There is also a risk of soil erosion and slumping of the landfill itself.	Soil map of airport property and soils descriptions
Surface Water Hydrology	Generally unknown, save for general drainage boundaries; drainage system outside of airport property likely consists of closed stormwater drains.	**Potentially Significant** – there may be permanent changes to surface water flows in the northern part of the airport property and temporary changes in surface water hydrology arising from the method by which contaminated sediments in Sen Lake are removed. There are also hydrologic issues related to site flooding from storm and typhoon events during the rainy season, including how the frequency, duration, and magnitude of these factors may change with climate change.	Characterization of surface water flow regime and drainage: (i) on the airport property; and (ii) immediately downstream of airport property, including storm flow and groundwater base flow, and site flooding duration and frequency. The EMMP will need to contain a drainage control program to make these insignificant environmental impacts. Best available predictions of climate change effects on Da Nang City are required.
Surface Water Quality	There is general published information about surface water quality in Da Nang City, but the available of information on surface water quality on and in the vicinity of the airport property is	**Significant -** due to requirements for transport of up to 100,000 m^3 of contaminated soil and sediments from hotspots to a secure landfill site, and the need to fill contaminated soil excavations with similar volumes of clean soil afterwards and restore and reclaim vegetation and wetlands. Landfill site will	Characterization of surface water quality regime: (i) on the airport property; and (ii) immediately downstream of airport property, particularly with regards to suspended solids, metals and hydrocarbons. It is understood *a priori* that, in the absence of mitigation measures to control wastewater generated by the project, the effect of the project on surface

Environmental Resource	Summary of Existing Baseline Conditions	Potential Impact	Data and Information Requirements
	unknown.	also require appropriate drainage management which, if inadequate, may cause impacts to surface water quality. There are also hydrologic issues related to site flooding from storm and typhoon events during the rainy season, including how the frequency, duration, and magnitude of these factors may change with climate change.	water quality will be significant. The EMMP will need to contain a sediment and drainage control program to be implemented to make these insignificant environmental impacts. Best available predictions of climate change effects on Da Nang City are required.
Groundwater Resources	There is general published information about groundwater resources in Da Nang City, but the availability of information on groundwater resources on and in the vicinity of the airport property is unknown	**Potentially Significant** – depth of groundwater will influence depth of excavation possible for landfill. It will also influence amount of groundwater seepage into excavations and amount of pumping and treatment required from excavations before discharge into natural environment.	Characterization of groundwater flow regime on airport property, including perched water and cascading potential, and contribution to surface-water base flow and lakes and ponds
Groundwater Quality	There is very general published information about groundwater resources in Da Nang City, but the availability of information on groundwater quality on and in the vicinity of the airport property is unknown.	**Significant** – there is the potential for contamination of shallow groundwater due to leakage from the landfill (landfill leachate).	Characterization of groundwater quality on airport property, including perched water, particularly with regards to metals and hydrocarbons, and colloidal material
Air Quality	Unknown.	**Significant** – there will be requirements for transport of perhaps 100,000 m^3 of contaminated soil and sediments from hotspots to a secure landfill site, plus replacing excavated soil with similar volumes of clean soil afterwards. There will also be dust emitted from any homogenization of contaminated soil required for possible bioremediation.	None – It is understood *a priori* that, in the absence of mitigation measures to control dust, the effect of the project on air quality will be significant; a detailed assessment of impacts is not required. The EA will need to contain a sufficiently specific and stringent dust control program to be implemented to make this an insignificant environmental impact.

Environmental Resource	Summary of Existing Baseline Conditions	Potential Impact	Data and Information Requirements
Noise	Unknown.	**Significant** – there will be requirements for transport of up to 100,000 m^3 of contaminated soil and sediments from hotspots to a secure landfill site, plus replacing excavated soil with similar volumes of clean soil afterwards. The volume of truck traffic will potentially create significant noise for project construction workers, residents living along the west side of the airport property, as well as in the urban neighborhoods of Da Nang City when similar volumes of clean soil are moved onto the airport property for filling excavated areas.	None – It is understood *a priori* that, in the absence of mitigation measures to control noise, the effect of the project on noise along the west side of the airport property and in urban neighborhoods of Da Nang City will be significant; a detailed assessment of impacts is not required. The EA will need to contain a sufficiently specific and stringent noise control program to be implemented to make this an insignificant environmental impact.
Natural and Biological Resources			
Terrestrial Ecosystems and Biodiversity	Generally unknown.	**Potentially Significant** – Given the urban environment within which the airport property is located, it is unlikely that rare terrestrial ecosystems or terrestrial species would be lost as a result of the project. However, construction of the landfill, possible widening of road for hauling contaminated soil, development of a construction staging and laydown area, and other project construction facilities may permanently remove terrestrial habitat used by rare and endangered species that are on Vietnam's Redlist of Endangered Species.	Results of surveys of terrestrial ecosystems for occurrence of species on Vietnam Redlist of Rare and Endangered Species.
Wetlands	The wetlands at the north end of the airport property have been generally described.	**Significant** – there may be permanent changes to surface water flows in the northern part of the airport property and temporary changes in surface water hydrology arising from the method by which contaminated sediments in Sen Lake are removed.	Da Nang Airport Development Plan is required - Mitigation will be required to restore any wetland ecosystems. The extent to which any wetlands will need to be restored will depend on the airport development plans for the northern end of the airport property.

Environmental Resource	Summary of Existing Baseline Conditions	Potential Impact	Data and Information Requirements
		This has the potential to significantly affect existing wetlands on the north end of the airport property.	
Aquatic Ecosystems and Biodiversity	Generally unknown.	**Significant** – Given the urban environment within which the airport property is located, it is unlikely that rare aquatic ecosystems or aquatic species would be lost as a result of the project. However, possible changes in the hydrologic regime of the lakes and wetlands at the north end of the airport as a result of the project may remove habitat used by rare and endangered aquatic species that are on Vietnam's Redlist of Endangered Species.	Results of surveys of aquatic ecosystems for occurrence of species on Vietnam Redlist of Rare and Endangered Species.
Nature Reserves and Protected Areas	Three nature reserves and protected area in Da Nang City, the closest of which is at the northwestern end of Da Nang Bay (Son Tra Nature Reserve) approximately 7 km from the northern part of the airport property.	**Insignificant** – Project will not negatively influence nature reserves and protected areas outside of the airport property.	None.
Socioeconomic Resources			
Cultural and Historic Sites	There are no designated cultural and historic features on the Da Nang Airport property.	**Insignificant** – Project will not negatively influence cultural and historic sites outside of the airport property.	None.
Tourism Resources	There are also significant tourism resources throughout Da Nang City.	**Insignificant** – Most of the tourism resources are located far from the airport property.	None.
Health of Construction Workers		**Significant** – Dependent on possibility of unexploded ordnance and negative air quality and noise effects as described above. Women workers, especially if	None – EMMP will contain requirements for survey and removal of unexploded ordnance prior to any ground disturbance. In addition, mitigation of air quality and

Environmental Resource	Summary of Existing Baseline Conditions	Potential Impact	Data and Information Requirements
		nursing or pregnant, will have different risk factors that need to be considered while still offering them opportunities for employment.	noise effects as described above will remove any significant potential effects of degraded air quality and increase noise levels on the health of construction workers.
Health of Local Residents		**Significant** –Negative air quality and noise effects as described above. Women appear to be at greater risk from contaminants, especially, if nursing or pregnant.	None – EMMP will provide detailed requirements for mitigation of air quality and noise effects as described above, coupled with monitoring program. These will remove any significant potential effects of degraded air quality and increase noise levels on the health of local residents.
Domestic and Drinking Water Supply	It is generally understood that domestic and drinking water supply for residents living on airport property and residents in urban districts surrounding the airport property is provided via a piped municipal water system; this needs to confirmed.	**Potentially Significant** - Project will could negatively influence domestic and drinking water supply if groundwater wells are still being used by some residents for domestic and drinking water supply.	Confirmation of sources of domestic and drinking water supply for and drinking water supply for residents living on airport property and residents in urban districts surrounding the airport property.
Natural or Depletable Resource Requirements		**Potentially Significant –** the environmental effects associated with excavation of perhaps 100,000 m^3 clean soil from a borrow site to fill excavated hotspot areas are unknown.	Information on sources of clean soil to be used to fill excavated hotspot areas.

Section 7
Proposed Environmental Assessment

7.1 Variations in the Format of the EA

7.1.1 Differences in USAID EA and the GVN EIA Requirements

The main differences between the environmental assessment processes of USAID and the GVN are as follows. USAID requires that the EA prepared under 22 CFR 216 must be approved prior to the start of detailed design; and 22 CFR 216:

- Defines environment as the natural and physical environment
- Requires the preparation of the ESS as the means to focus the EA on significant issues and evaluate alternatives
- Indicates that public consultation is desirable but not required for EA preparation
- Specifies the required content of an EA
- Is flexible on the format with which this content is organized and presented in the EA document

In contrast, the GVN EIA regulations:

- Indicate that the approved EIA Report has a legal basis to assess the Environmental Management Program, and therefore to assess compliance.
- Require an environmental assessment that is broader in scope than the natural and physical environment and is to include land use, socioeconomic resources, public health, public infrastructure, and historical and cultural resources.
- Do not specify the level of project design required as the basis for the preparation of the EIA. The design must be presented in the Investment Report or the Economic-Technical Report or an equivalent document that is submitted together with the EIA Report.
- Specify the timing, methods, and target audiences for public consultation.
- Are specific as to both the content and format of the EIA document.
- Specify a content for the EIA which contains practically all the required content of an EA prepared under 22 CFR 216.
- Require that scoping be included as part of the EIA document.

Table 5 provides a comparison of the content and format required for the 22 CFR 216 EA and the GVN EIA.

7.1.2 Approach to be Used for EA and EIA Preparation

The overall approach to meeting the requirements of both 22 CFR 216 and the GVN regulations will be as follows. First, the scope of the environmental assessment will be the physical and natural environment to meet the requirements of 22 CFR 216, plus only those socioeconomic and other resources that may be indirectly affected by the project through changes in the physical and natural environment.

Second, a single document will be prepared that contains all the content required under both 22 CFR 216 and the GVN EIA regulations and in the format specified by the GVN EIA regulations (Table 5).

Third, this document will be submitted to USAID as the EA prepared for this project in compliance with 22 CFR 216.

Finally, this EA document will be augmented with (as required) designs, specifications, plans and associated cost estimates from Component 2 (Detailed Design) and Component 3 (Remediation Action Plan) and submitted to the GVN as the EIA for approval.

As indicated above in Section **Error! Reference source not found.**, it is expected that the GVN, as "project owner" will conduct public consultation with the draft EIA following the requirements specified in Decree 21/2008-ND-CP.

7.2 Proposed Approach to Addressing Potentially Significant Environmental Impacts

Table 4 contains a list of data and information required for the EA to better assess the potentially significant environmental impacts associated with the project. As indicated above, additional data and information will be required to fulfill the GVN EIA requirements. Together, these will form the scope of work for the engagement of local consultants; indicative Terms of Reference have been prepared and are provided in Appendix A3; primary data collection will be undertaken as appropriate. These data and information will be used along with the engineering planning and design work to assessment the environmental impacts of the project (Environmental Consequences) and to develop the EMMP.

7.3 Workplan and Schedule

The workplan and schedule for the preparation, review, and approval of the EA and EIA is provided in Table 6. This schedule will address both the landfill-based dioxin containment and thermal destruction alternatives (Section 0) as part of the EA.

Table 5. Comparison of the Content and Format Required for the 22 CFR 216 EA and the GVN EIA

Required Content and Outline of EIA under the GVN Regulations[3]	Corresponding Requirement for EA Prepared under 22 CFR 216	Comments
Not specified as a specific part of the EIA.	Summary	Executive Summary will be included
Not specified as a specific part of the EIA.	Purpose	
1. Enumeration and detailed description of the project's construction components, construction area, time and workload; operational technology for each component and the entire project.	Alternatives including Proposed Action	The GVN EIA regulations do not explicitly require evaluation of alternatives, as such evaluation is presented in the Investment Report or the Economic-Technical Report or an equivalent document that is submitted together with the EIA.
2. Overall assessment of the environmental status at the project site and neighboring areas; the sensitivity and load capacity of the environment, including land use, socioeconomic resources, public health, public infrastructure, and historical and cultural resources.	Affected Environment, with environmental defined as the physical and natural environment	The GVN definition of environment is broader than what is specified in 22 CFR 216 and includes social and other resources. Scope of EIA will include only those socioeconomic and other resources that may be indirectly affected by the project through changes in the physical and natural environment.
3. Detailed assessment of possible environmental impacts when the project is executed and environmental components and socioeconomic elements to be impacted by the project; prediction of environmental incidents possibly caused by the project.	Environmental Consequences	GVN regulations require each consequence (impact) to be assessed qualitatively and quantitatively according to (a) the project phases: design, construction and operation, (b) spatial and temporal scales; (c) sources: waste and non-waste; and (d) targets: natural, economic, cultural, social... Risks and environmental incidents/accidents potentially caused by the project must also be assessed. The consequences must be compared with applicable standards, codes and regulations.
4. Specific measures to minimize bad environmental impacts, prevent and respond to environmental incidents.	Environmental Mitigation and Monitoring Plan – mitigation component	GVN regulations require clarification of the advantages, disadvantages, feasibility, efficiency and effectiveness of each mitigation measure. If the mitigation measure involves different agencies, cite clearly these agencies and propose the cooperation mechanisms among them.
5. Commitments to take environmental protection measures during project construction and operation.	Environmental Mitigation and Monitoring Plan – mitigation component	GVN regulations determine the frequencies of monitoring and require identification (with coordinates) of monitoring stations on a map.

[3] Extracted from English translation of Article 19 of the National Law on Environmental Protection: No. 52/2005/QH11

Required Content and Outline of EIA under the GVN Regulations[4]	Corresponding Requirement for EA Prepared under 22 CFR 216	Comments
6. Lists of project items, the program on management and supervision of environmental issues during project execution.	Environmental Mitigation and Monitoring Plan – monitoring component	GVN regulations require an Environmental Management Program to be applied during each of preparation, construction and operation phases.
7. Cost estimates for building environmental protection works within the total cost estimate of the project.	Not specified as a specific part of the EA	Will be prepared and will be included in the EIA/EA document as well as in the costing developed under TO Component 3: RWP
8. Opinions of the commune or ward People's Committees and representatives of population communities in the place where the project is located.	public consultation is desirable but not required for EA preparation	Will be prepared in accordance with GVN EIA regulations
9. Citation of sources of figures and data assessment methods.	Appendices as Required	Additional material will be provided as required, including an assessment of the accuracy and reliability of the available data, and of the applied EIA methodology.

[4] Extracted from English translation of Article 19 of the National Law on Environmental Protection: No. 52/2005/QH11

Table 6. Workplan and Schedule for 22 CFR 216 EA and the GVN EIA Preparation Review and Approval.

EA Preparation Task	Start Date	End Date
Preparation of EA in Compliance with 22 CFR 216		
USAID Approval of Environmental Scoping Statement		November 11, 2009
Obtain and Analyze Existing Baseline Information	November 2, 2009	January 5, 2010
Specify Information Required for EA and EIA Preparation from Engineering Planning and Conceptual Design Task	November 2, 2009	November 6, 2009
Receive Information of Engineering Planning and Conceptual Design for both alternatives		January 1, 2010
Prepare Project Description Portion of EA Document	January 1, 2010	January 11, 2010
Conduct Environmental Impact Analysis	January 12, 2010	January 20, 2010
Develop Environmental Mitigation and Monitoring Plan	January 12, 2010	January 20, 2010
Develop draft EA Report	January 21, 2010	February 3, 2010
Submit draft EA for review		February 3, 2010
USAID review of draft EA	February 4, 2010	February 24, 2010
Prepare Final EA	February 25, 2010	March 10, 2010
Submit Final EA		March 10, 2010
USAID Approval of Final EA		March 5, 2010
Preparation of EIA in Compliance with GVN Regulations		
Presentation of Environmental Scoping Statement with GVN		November 12, 2009
Modifications of EA to produce EIA	March 16, 2010	April 6, 2010
Translate Final EA	April 7, 2010	April 28, 2010
Submit EIA to GVN		April 28, 2010
GVN Review of EIA	April 29, 2010	June 30, 2010
Prepare Final EIA	July 1, 2010	July 21, 2010
Submit Final EIA		July 21, 2010

Section 8
Supporting Documentation

Circular No. 05/2008/TT-BTNMT, Guide to Strategic Environmental Assessment, Environmental Impact Assessment, and Environmental Protection Commitment, http://www.ecolex.org/ecolex/ledge/view/RecordDetails;jsessionid=3EBACD12BC511BF8E1D0D717A5F24B89?id=LEX-FAOC085715&index=documents (English translation)

Decree No. 21/2008/ND-CP, Amending and Supplementing A Number of Articles of Government Decree No. 80/2006/ND-CP, Detail and Guide to the Implementation Of A Number of Articles of the Law on Environmental Protection, http://www.ecolex.org/ecolex/ledge/view/RecordDetails;jsessionid=3EBACD12BC511BF8E1D0D717A5F24B89?id=LEX-FAOC079328&index=documents (English translation)

Decree No. 80/2006/ND-CP, Detail and Guide to the Implementation Of A Number of Articles of the Law on Environmental Protection http://www.ecolex.org/ecolex/ledge/view/RecordDetails;jsessionid=3EBACD12BC511BF8E1D0D717A5F24B89?id=LEX-FAOC068029&index=documents (English translation)

Hatfield/10-80 (Hatfield Consultants Ltd. and 10-80 Division). 2006. Identification of New Agent Orange/Dioxin Contamination Hotspots in Southern Vietnam. Report prepared for the Ford Foundation, Ha Noi, Vietnam. Hatfield Consultants Ltd., West Vancouver, BC, Canada; 10-80 Division, Ha Noi, Vietnam.

Hatfield/10-80 (Hatfield Consultants Ltd. and 10-80 Division). 2007. Assessment of Dioxin Contamination in the Environment and Human Population in the Vicinity of Da Nang Airbase. Report prepared for the Ford Foundation, Ha Noi, Vietnam. Hatfield Consultants Ltd., West Vancouver, BC, Canada; 10-80 Division, Ha Noi, Vietnam.

National Law on Environmental Protection: No. 52/2005/QH11 http://www.ecolex.org/ecolex/ledge/view/RecordDetails;jsessionid=3EBACD12BC511BF8E1D0D717A5F24B89?id=LEX-FAOC064190&index=documents (English translation)

Da Nang Statistical Office. 2008. Da Nang Statistical Yearbook. Statistical Publishing House. 2009. 191 pp.

Da Nang Urban Environmental Company. 2006. Khanh Son Landfill Capping Project: Supplemental Environmental Impact Assessment. 61 pp.

Da Nang Urban Environmental Company. 2006. Khanh Son Landfill Capping Project: Supplemental Environmental Management Plan. 53 pp.

Da Nang Urban Environmental Company. 1998. Vietnam Da Nang Sanitation Project Environmental Impact Assessment. Volume 3 – Wastewater.

USAID. Title 22, Code of Federal Regulations, Part 216, Environmental compliance procedures.

USAID. 2009. Environmental Remediation at Da Nang Airport: Initial Environmental Examination. 15 pp.

Tran Ngoc Canh. 2008. Agent Orange/Dioxin contaminated areas at three hotspots: Da Nang, Bien Hoa and Phu Cat - situation and orientation for land-use plans, report for Office 33, MoNRE, UNDP-Vietnam. MOD: Hanoi.

TCVN. 2009. National Standard 8183: Dioxins threshold in the soil and sediment (English Translation).

United Nations Development Programme. 2009. Project Document: PIMS 3685: Environmental Remediation of Dioxin Contaminated Hotspots in Vietnam ATLAS VNM10 Award 00057593 Project 00071224. 56 pp + annexes.

Appendices

Appendix A1

Photographs from Scoping Visit

Picture 1: Former Mixing and Loading Area (October 2009)

Picture 2: Former Mixing and Loading Area (October 2009)

Picture 3: Former Mixing and Loading Area (October 2009)

Picture 4: Drainage Canal draining former Mixing and Loading Area (October 2009)

Picture 5: Former Storage Area (October 2009)

Picture 6: Sen Lake with drainage canal draining Sen Lake and leading to Da Nang stormwater drainage system (October 2009)

Appendix A2

Scoping Session Participants

Appendix A3

Summary of Environmental Issues Raised and Comments Received During Environmental Scoping Consultations

Summary of Environmental Issues Raised and Comments Received During Environmental Scoping Consultations

Environmental Issue Related to Landfill Project	Comments Received from Consultation Participants	Method for Addressing Issue
Landfill Siting	• Four alternative sites have been proposed. Selected site at south of airport is 5 km away from hotspots. Others are at northern end of the airport property, nearer to known hotspots. A location at higher elevation was selected as the preferred site; this was also discussed with the local authorities. There is strong opposition to using Sen Lake, as it receives the bulk of drainage water from the north airport area, and it is located near the local population. By 2015, the airport will handle 6 million tourists per year. North end of the airport is densely populated, so there is a lot of opposition to construction of a landfill in this area. Siting near residential areas is likely to be a very sensitive issue. • Need to identify a good location – this needs to be determined, and it cannot be decided at present; need technical support to assist in site selection.	• Site selection to be decided upon prior to preparation of the designs, specifications and plans. Site selection factors to be considered include: nearness to settlements; nearness to lakes and wetlands; potential interference with civilian airport operations. • The Environmental Assessment will examine environmental impacts associated with soil and sediment removal. Task Order (TO) Component 3: Remediation Work Plan (RWP) will consider existing airfield activities to minimize impacts to airfield schedules and safety, and will integrate security requirements of the military at Da Nang Airport.
Amount of Contaminated Soil to be Contained in Secure Landfill	• Need to better characterize the soils between heavily contaminated versus less polluted areas, and handle soils accordingly.	• Soil and sediment volumes will need to be considered as a first step in the project. This is needed to determine the environmental impact of the landfill footprint and determine the scale of the soil and sediment excavation process so that associated environmental impacts can be determined. Sampling program to be conducted as part of EIA process to better define amount and existing location of contaminated soil to be transported to and contained in the secure landfill.
Avoid excavating through the clays to impact on underlying groundwater	• Surface soils are sandy; cannot dig deeper than clay layer to avoid polluting underlying groundwater.	• Depth to groundwater will be a key consideration in the EA, and thus landfill siting. This will inform the landfill design of Component 2. • EA will consider effects of landfill on groundwater resources; the Environmental Mitigation and Monitoring Plan (EMMP) will contain mitigation measures and monitoring requirements so that Project effects on groundwater resources and groundwater quality are insignificant.

Environmental Issue Related to Landfill Project	Comments Received from Consultation Participants	Method for Addressing Issue
Excavate in a sequence to avoid spreading soil and dust contamination	• Contaminated areas are in three locations: a) hot spots; b) area around drainage canals; c) lakes (contaminated sediments). Sen Lake should be the last hot spot dealt with, to avoid spreading contamination.	• The EA will determine the best sequencing for avoiding environmental impacts. This determination will be incorporated into the remediation workplan to be developed under Component 3.
Traffic and fugitive dust from excavation to landfill or treatment sites	• Transportation of contaminated soil and sediment from contaminated areas to proposed landfill site is 5 km; there are many road intersections, and need to avoid spreading of contaminated soil and dust along the way. The roads are used by military, and are very busy. We need to ensure people do not use the excavated contaminated soil for other purposes, such as construction. Means of transport must follow regulations – need specialized equipment and vehicles for transporting the soils to the landfill. Need to also keep soil moist to avoid dust dispersion during transport. • Need multi-purpose road and decide on transportation methods to be utilized. Contractors must keep this in mind to minimize risk of further contamination.	• EA will consider effects of contaminated soil excavation and transport on generation of dust, changes in air quality, and effects on health of construction workers and location residents; EMMP will contain mitigation measures and monitoring requirements so that effects of contaminated soil excavation and transport are insignificant. • Site Health and Safety Plan to be prepared as part of TO Component 3: RWP; EMMP will contain mitigation measures and monitoring requirements so that project effects on health of local communities are insignificant. • TO Component 3: RWP will include technology, engineering controls and protective equipment to optimize excavation capacity with material hauling schedules and minimizing projected material transport distances. • Depending on airport requirements and applicable standards, EA may consider a separate traffic lane for transporting the soils to the landfill. • Depending on airport requirements and applicable standards, EA may consider a dust/noise barrier (similar to the types used for urban expressways) for the transport road.
Adverse impacts of storms, site drainage and flooding	• During recent (2009) storms, the whole area of the airport was under water. Therefore, we need to ensure that we work only in the dry season to avoid spreading contamination during construction. • During rainy season, the site will be flooded; adequate drainage system needs	• TO Component 2: Detailed Design will consider flood risk in landfill design. • EA will consider effects of the Project on surface water hydrology, surface water quality, and groundwater quality; EMMP will contain mitigation measures

Environmental Issue Related to Landfill Project	Comments Received from Consultation Participants	Method for Addressing Issue
	to be constructed and must work continuously in order to control water flow over construction area. • Groundwater and surface water management are key. Need to ensure adequate and efficient drainage of area to avoid impacts of flooding on landfill and during construction activities. • Need to survey the airport – top priority. Airport covers 800 ha. Drainage and water outlets need to be studied. There are 7 outlets to the surrounding area. Rainwater control is key – during dry season, we can excavate to 3-4 m before reaching groundwater. Groundwater is reached at only 80 cm depth in rainy season. Clay layer is at 12 m. Sen Lake is the lowest point on the airport – it is only 1 m asl. • In recent years, typhoons landing on Vietnam's soils have been stronger and stronger.	and monitoring requirements so that project effects on these environmental resources are insignificant. • Issues related to construction in different seasons (rainy and dry) will be incorporated into the scheduling of landfill construction and contaminated soil excavation and transport in the RWP. • TO Component 2: Detailed Design will consider requirements for landfill to withstand typhoons.
Design landfill with minimum footprint	• Contaminated areas comprise 6 ha of ground at a maximum elevation of 6.1 m above sea level, while the potential landfill site is about 7.5 m above sea level. Deeper and narrower landfill is needed according to VN regulations to reduce the amount of land needed. Need to determine proper depth of landfill site, and to ensure that the soil is tightly packed. Size of landfill footprint must be as small as possible. Need to divide landfill into different plots, depending on level of contamination (higher concentrations in some cells; lower concentrations in other separate cells).	• TO Component 2: Detailed Design will consider soil and groundwater characteristics to determine depth of landfill below surface. • EA will consider effects of landfill on groundwater resources; EMMP will contain mitigation measures and monitoring requirements so that Project effects on groundwater resources and groundwater quality are insignificant. • EA will consider potential effects of landfill footprint on terrestrial and aquatic resources. • Well compacted cohesive soil might hinder potential for bioremediation.
Worker health and safety	• Local contractors need training in construction of landfill. Need to carefully recruit staff / workers (both men and women) with good understanding of pollution control, and safety standards. Need to ensure we meet strict labour standards of the Vietnam Ministry of Labour, War Invalids and Social Affairs (MoLISA) for both men and women. If military personnel are used, then need to follow Decision No. 68 issued in April 2009 regarding health and safety standards for workers. Selection of sub-	• Site Health and Safety Plan to be prepared as part of TO Component 3: RWP, as well as Onsite Worker Health and Safety Training. • An institutional capacity assessment of local contractors will be developed to determine their level of understanding of worker health and safety provisions. This will be incorporated into the overall design effort.

Environmental Issue Related to Landfill Project	Comments Received from Consultation Participants	Method for Addressing Issue
	contractors is another important issue.	
Manage both excavation and filling; source of fill material	• Excavation will result in creation of a large hole (tentatively estimated at 100,000 m^3), which will require a significant amount of fill material. Where will the fill come from (hard to find in Vietnam)? Need a permit to get from airport management to use fill; need to follow GVN permit requirements.	• EA will consider the potential environmental effects associated with excavation of perhaps 100,000 m^3 clean soil from a borrow site to fill excavated hotspot areas. • The design will identify specific permits that will be required and the timeframe it will take to obtain permits.
Special requirements for construction equipment	• Working close to an operational airport should comply with special requirements for construction equipment and consequently construction methods. For example, no equipment (such as cranes) more than 3 m in height is allowed.	• TO Component 3: RWP will consider Vietnam's requirements for construction equipment in relation to aviation safety.
De-mining	• Need equipment for de-mining. To date the Army has detected and removed unexploded ordnance (UXO) in an area of some 20 ha at the proposed landfill site, and some mines are two meters in depth. The area will be identified in order to determine the need for additional UXO removal. De-mining work required needs to be included in the contractor's design – it is an important issue, as there are several large bombs/ unexploded ordnance (UXO) on the site, and there are serious safety issues to be considered.	• TO Component 3: RWP will consider requirements for survey and removal of unexploded ordnance prior to any ground disturbance.
Environmental monitoring	• Regarding environmental monitoring, it must be very effective. Depth of the landfill needs to be determined. Need to analyze and fully assess the dioxin levels at different depths (may need to dig >1 m to remove contaminated soil in some areas); time for lab analysis will slow down the remediation work. Need funding to monitor and evaluate the project over time. Need to identify the source of money for covering monitoring costs (e.g. groundwater, human health impacts, etc.).	• Sampling program to be conducted as part of TO Component 2: Detailed Design to better define amount and existing location of contaminated soil to be transported to and contained in the secure landfill. • TO Component 2: Detailed Design will consider soil and groundwater characteristics to determine depth of landfill below surface. • EMMP will include specification of a detailed monitoring program; this will be included in the Removal Action Sampling and Monitoring Plan (SAP) that will form part of TO Component 3: RWP. These plans may also address the sampling needed to confirm the excavations are to a clean depth.

Environmental Issue Related to Landfill Project	Comments Received from Consultation Participants	Method for Addressing Issue
Standards to be Used in the Remediation Project	• Bien Hoa – remediation there has included creation of a 4.3-ha landfill, which is divided into seven plots which are separate from each other. This is to ensure that rainfall does not affect timing and schedule of work, and to minimize spread of contamination during the rainy season. Need to follow US standards; this is what is being done at Bien Hoa. Controlling surface water at the construction site is key. Need to treat waters from the contaminated site. Need to agree on the standards to be used so that the landfill is secure in the long-term. Need to consider social impacts as well. Should not worry too much about the overall cost; we need to focus on other issues of greater importance.	• Issues related to construction in different seasons (rainy and dry) will be incorporated into the scheduling of landfill construction and contaminated soil excavation and transport in TO Component 3: RWP. • EA will consider effects of the project on surface water quality; EMMP will contain mitigation measures and monitoring requirements so that Project effects on surface water quality are insignificant.
Security Issues	• Security of construction site is key. The Da Nang Airport area is under control of military and we need to follow the Airport security standards and regulations. Vehicles must be follow specific height restrictions. Military standards are clear, and must be followed (i.e., access permits must be obtained for each visit to the airport).	• TO Component 3: RWP will consider security requirements of the military at Da Nang Airport.

Appendix A4

Preliminary Terms of Reference for Collection of Data and Information for Environmental Baseline

The following data and information are required to prepare the GVN EIA and the 22 CFR 216 EA:

- Da Nang Airport Master Plan
- Report of Da Nang Airport expansion EIA
- All reports prepared by MOD and USEPA on estimation of quantities of soil and sediments above dioxin thresholds
- Decision No. 68 on safety and special provisions to workers involved in dioxin-contaminated work
- Da Nang meteorological data, including long-term monthly records of temperature, precipitation, humidity, and pre-dominant wind direction
- A description of return frequencies of different sizes of rainfall events
- 1:20,000 topographic map of Da Nang City, and larger scale topographic map of Da Nang Airport
- A time series of typhoons and tropical depressions/storms experienced by Da Nang, including strength and frequency
- A description of historical flooding experienced on the Da Nang Airport property: location of flooding; as well as intensity and duration
- Characterization of air quality data on the airport property and in Da Nang City in general
- Maps of areas where the Army has removed unexploded ordnance, and depth to which unexploded ordnance has been surveyed and removed
- As-built drawings of the drainage system on and around the airport property
- As-built drawings of the temporary facilities: concrete slabs on the mixing area and loading area, the drainage channel, the upflow filter and the weir at Sen Lake intake
- Soil map of airport property at scale and description of soils, particularly with respect to erodibility
- Characterization of surface water flow regime and drainage: (i) on the airport property; (ii) immediately downstream of airport property; and (iii) Phu Loc River, including storm flow and groundwater base flow
- Characterization of surface water quality regime: (i) on the airport property; and (ii) immediately downstream of airport property; (iii) Phu Loc River, particularly with regards to suspended solids, metals and hydrocarbons

- Characterization of groundwater flow regime on airport property, including perched water and cascading potential, and contribution to surface-water base flow and lakes and ponds
- Characterization of groundwater quality on airport property, including perched water, particularly with regards to metals and hydrocarbons, and colloidal material
- Results of surveys of terrestrial ecosystems on the airport property to determine occurrence of species on Vietnam Redlist of Rare and Endangered Species, with a focus on the sites to be disturbed by the project
- Results of surveys of aquatic ecosystems on the airport property to determine occurrence of species on Vietnam Redlist of Rare and Endangered Species
- Confirmation of sources of domestic and drinking water supply for and drinking water supply for residents living on airport property and residents in urban districts surrounding the airport property
- Basic socioeconomic profile of all wards that adjoin airport property: area; population; sex ratio of population; land use; occupations, including a map of the ward boundaries