

1. INTRODUCTION

1.1 Background

- 1.1.1 A Permanent Aviation Fuel Facility (PAFF) is required to ensure a secure means to supply aviation fuel during the operational lifeline of the Hong Kong International Airport (HKIA). The PAFF will replace the existing temporary Aviation Fuel Receiving Facility adjacent to Sha Chau, as the existing facility does not have sufficient capacity. The PAFF must meet the capacity demand for the 2040 planning horizon of the airport and must be able to provide for strategic storage. The Airport Authority Hong Kong (AAHK) is committed to provide a replacement facility, after which the Sha Chau facility will be used for emergency backup purposes only.
- 1.1.2 The proposed project is a designated project under Sections H.2 and L.4 of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) and as such the statutory procedures under the EIAO need to be followed and an environmental permit is required prior to the commencement of construction.
- 1.1.3 The AAHK first commissioned Meinhardt Infrastructure and Environment Ltd (known as Mouchel Asia Limited at that time) in June 2001 to provide professional environmental services in respect of assessing Tuen Mun Area 38 as the location for a PAFF and to proceed with obtaining an Environmental Permit for the PAFF based on the EIA Study Brief No. ESB-072/2001 received from the Environmental Protection Department (EPD). An EIA of the PAFF facility (EIAO Register Number AEIAR-062-2002), based upon the layout detailed in Figure 3.2a, was prepared in accordance with EIA Study Brief issued by the EPD in May 2001 and submitted under the EIAO in May 2002 and subsequently Environmental Permit EP-139/2002 was granted on the 28th August 2002.
- 1.1.4 Both as part of the statutory requirements under the EIAO and the AAHK's commitment to liaise within interested parties, AAHK has devoted a great deal of effort to consult both relevant stakeholders and public at large. Table 1.1 below provides a list of key stakeholder/public/ACE communication and consultation activities taken up by the AAHK for the PAFF in chronological order. In addition, Appendix A0 provides a full response to public comments, including those made specifically on risk during the EIA process. At the request of Tuen Mun District Council (TMDC), AAHK and the TMDC had also jointly commissioned an independent study entitled "The Permanent Aviation Fuel Facility Independent Safety and Risk Study", dated 10 December 2003 prepared by Mott Connell. Further comments from ACE on the consideration of alternative locations for the PAFF described in Section 2, are also included in Appendices A(i), (ii) and (iii).

Table 1.1 Summary of AAHK Key Stakeholder Communication / Public Consultation

Date	Brief Description of Communication / Consultation
6 Nov 01	AAHK made a presentation regarding the development for the PAFF to TMDC in the Council Meeting.

Date	Brief Description of Communication / Consultation
28 Jan 02	Invited and arranged a site visit for TMDC Chairman and 27 members to Sha Chau, Tuen Mun Area 38 and the Airport fuel facility, during which TMDC members observed a demonstration illustrating the difficulty in ignition of aviation fuel, followed by a short briefing.
5 Feb 02	In response to a request, AAHK wrote a letter to Hong Kong Association for Democracy and People's Livelihood on the design, construction and operation of the PAFF.
20 Jun 02	Made presentation of the results of the EIA to the Country and Marine Parks Board to seek endorsement for connecting the PAFF pipelines into the existing facility at Sha Chau. The Board endorsed the proposal on 9 September 2002.
2 Jul 02	Made presentation of the results of the EIA to TMDC in the Council Meeting.
8 Jul 02	Made presentation of the results of EIA to the EIA Subcommittee of the Advisory Council on Environment to seek its endorsement of the EIA Report. The Subcommittee endorsed the EIA Report.
8 Jul 02	Made presentation of the results of EIA to the mutual aid committee representatives of Tuen Mun West area (such as Butterfly Estate, Wu King Estate, Siu Hei Court and Siu Shan Court) and answered concerns of the residents had on the PAFF development.
2 Aug 02	In response to a letter by residents of Yuet Wu Villa, Tuen Mun, AAHK replied giving an explanation of the site selection process and consultations with TMDC.
21 Aug 02	Met PAFF Core Group of TMDC to update the progress of PAFF.
31 Aug 02	Invited and arranged a site visit for Tuen Mun South West Area Committee to Tuen Mun Area 38 and answered their concerns on the project.
9 Sep 02	Met with the management of Shiu Wing Steel Mill to understand and address their concerns on PAFF.
24 Oct 02	AAHK wrote to TMDC Chairman to express the wish to meet the TMDC PAFF Core Group.
1 Nov 02	AAHK wrote to Shiu Wing Steel Mill to assure that their concerns on risks had been addressed in the EIA Report.
4 Nov 02	Invited and arranged a site visit for Lung Kwu Tan Villagers and TMDC Chairman to Sha Chau and Tank Farm and answered their concerns on the project.
28 Nov 02	AAHK wrote to the TMDC Chairman providing full support for the independent safety and risk study ("independent study"). A separate letter was sent to the Coordinator of the TMDC PAFF Core Group to reassure AAHK's commitment to undertake an independent study with TMDC.
3 Dec 02	AAHK wrote to the Coordinator of the TMDC PAFF Core Group seeking comments on the scope of the independent study.
20 Dec 02	TMDC informed HKAA that they agreed with the scope to commission an independent study jointly with the details to be followed up by the PAFF Core Group.
10 Jan 03	AAHK wrote to the Coordinator of TMDC PAFF Core Group to clarify certain area of the proposed scope of the independent study.
13 Jan 03	AAHK wrote to TMDC Chairman to express its commitment to cooperate with TMDC and its wishes to expedite the independent study.
22 Jan 03	AAHK met with TMDC PAFF Core Group to discuss the proposed scope and timing of the independent study.

Date	Brief Description of Communication / Consultation
2 Mar 03	Invited and arranged a site visit for one group of representatives from Butterfly Estates Area to Sha Chau and Tank Farm and answered their concerns on the project.
9 Mar 03	Invited and arranged a site visit for another group of representatives from Butterfly Estates Area to Sha Chau and Tank Farm and answered their concerns on the project.
10 Mar 03	AAHK met TMDC PAFF Core Group to discuss the scope of the independent study.
13 Mar 03	AAHK wrote to TMDC PAFF Core Group to seek its comments on the draft invitation to tender, assessment criteria, programme and study scope for the independent study.
17 Mar 03	AAHK met TMDC PAFF Core Group to finalise the scope of the independent study.
18 Mar 03	AAHK wrote to TMDC to inform imminent commencement of the gazettal process for PAFF under the Foreshore and Seabed (Reclamations) Ordinance.
24 Mar 03	AAHK wrote to TMDC providing details on the scope and terms of the independent study.
26 Mar 03	TMDC agreed and accepted the scope and terms for commissioning of the independent study as stated in AAHK's letter of 24 Mar 03.
1 Apr 03	AAHK met TMDC PAFF Core Group to finalise the terms of the tender document.
3 Apr 03	Memorandum of Understanding signed by TMDC and AAHK regarding commissioning of an independent study jointly.
28 May 03	Consultant for the independent study was selected.
11 Jun 03	Kick-off meeting between AAHK/TMDC/independent consultant.
7 Jul 03	The independent consultant sent questionnaires to Shiu Wing Steel Mill, Castle Peak Power Station, and Green Island Cement to gather information for the independent study.
8 Jul 03	The independent consultant presented the methodology and the scope of the study in TMDC Council Meeting.
14 Aug 03	The independent consultant was invited to attend a briefing session arranged by TMDC PAFF Core Group at Tuen Mun Community Hall to make a presentation to Tuen Mun residents regarding the methodology of the study, and answered questions/concern raised by the residents.
23 Aug 03	Per invitation of a TMDC member, the independent consultant attended a community briefing session to brief the Tuen Mun residents in Butterfly Bay Area about the content and the methodology of the independent study.
26 Aug 03	A progress meeting was held between TMDC/AAHK/independent consultant.
30 Sep 03	The independent consultant attended the TMDC Council Meeting to update members on the progress of the independent study.
8 Oct 03	The independent consultant issued the draft report.
3 Nov 03	TMDC forwarded its comments on the independent study to the independent consultant.
13 Nov 03	The independent consultant replied to TMDC's comments.
12 Dec 03	The independent consultant issued the final report of the independent (dated 10 December 2003).
29 Dec 03	A briefing session was arranged to TMDC/AAHK by the independent consultant for the closing of the independent study

Date	Brief Description of Communication / Consultation
9 Feb 04	In response to a letter (dated 1 Jan 04) by TMDC Vice-Chairman regarding the results of the independent study, AAHK replied with summary of key findings of the study.
25 Nov 05	In response to a letter (dated 11 Nov 05) by the employee group of Shiu Wing Steel Mill, AAHK replied with the results of the independent study jointly commissioned with TMDC in 2003 and the enhancement of safety measures incorporated in the design.
14 Dec 05	AAHK replied to the letter from the employee group of Shiu Wing Steel Mill (dated 2 Dec 05) emphasizing that AAHK is committed to upholding the values of safety, security and environment in every facet of the operation.
16 Mar 06	In response to a letter by TMDC Vice Chairman (dated 19 Feb 06), HKAA replied incorporating the summary of the site selection process, the independent study jointly commissioned with TMDC in 2003 and enhancement of safety measures in the design of PAFF.

** Note: Consultation/communication with the public/community has inevitably been restricted since the Judicial Review proceedings were commenced by Shiu Wing Steel Ltd. in November 2002.

1.1.5 However, the decision by EPD to grant the Environmental Permit was subject to a Judicial Review and the Court of Final Appeal quashed the Environmental Permit in its judgment of July 2006.

1.1.6 Thus, while some construction works for the PAFF have been undertaken from November 2005, they were suspended following the Judgement of the Court of Final Appeal of July 2006 and in order to continue with the development of the project, the project needs to once again go through the statutory procedures under the EIAO in order to obtain a new environmental permit. The AAHK has commissioned Meinhardt Infrastructure and Environment Ltd to update the main EIA Report and ESRT Technology to undertake the Hazard to Life Assessment. A summary of the works that have been undertaken prior to the suspension of works is provided in Table 1.2 below.

Table 1.2 Summary of Construction Undertaken Before Suspension of Works

Item	Section	Description of works	Start of Works	Current Status
1	Land	Operation Building - Fire inlet chamber - Steel cofferdam - sheet pile installation	Feb-06	1) Steel cofferdam installed in position and blinding laid. 2) Steel cofferdam filled with seawater upon suspension of works.
2	Land	Operation Building - Fire inlet chamber - fixing of the rebar of base slab	Jun-06	1) Rebar fixed for the base slab. 2) Rebar dismantled upon suspension of works
3	Land	Operation building - fixing of the rebar between Grid Line A to E	Jun-06	1) Rebar about 90% complete and some formwork fixed in position.

Item	Section	Description of works	Start of Works	Current Status
				2) Rebar temporarily covered as primary protective measures. Formwork removed upon suspension of works.
6	Land	Ring beam	Feb-06	1) Ring beams for tanks nos. 1, 2, 3, 4 & 6 cast in position. 2) Ring beam for tank no. 5, 2 quarters cast in position.
7	Land	Backfilling inside ring beams	Apr-06	1) For the ring beam for tanks nos. 1, 2, 3 & 4, the back filling is up to the bitumen sand. For the ring beam for tank no. 6, the back filling is up to the granular fill.
8	Land	Bund wall footing and lower portion of wall of CH 555-000 & CH 000-075	May-06	1) The bund wall bases cast. 2) Current steel forms/moulds covered.
9	Land	Drainage works (U-channel, precast concrete pipe, catchpits & manholes)	Feb-06	1) 596 m 300mm U channel cast. 2) Catchpits nos. cp-u-1, cp-u-2, cp-u-3, cp-u-4, cp-u-8, cp-u-9, CP1, CP2, CP3 & CP4 cast 3) Manholes M13, L11 & L10 cast. Manholes M9 & M10 cast with lower portion only. 4) 300dia. -12.4m long , 375mm dia. - 20.92m long , 450mm dia.- 21.1m long , 900mm dia- 23.4m long , 1050mm dia.- 46m long & 1200mm dia.- 7.2m long precast concrete pipe cast in position 5) 184.7 m long 300mm dia. Ductile pipe in position. 6) Manholes M8 - rebar for lower portion fixed in place. 7) Oil Interceptor
10	Land	Landscaping	Mar 06	1) Transplant 209 No trees on to site. 2) 1.5m high bund 492 metres around site perimeter
11	Jetty	Marine piling	29-Nov-05	1) 100 piles (100 out of 100) driven to final set and 2 fender piles installed. 2) tension load test for pile 12A-N, compression load test for pile 12-N and pile 12A-N with anchor completed. 3) all predrilling works (31 out of 31) for anchor construction completed. 4) anchor construction (1 out of 31) for pile 12A-N completed.



Item	Section	Description of works	Start of Works	Current Status
				5) tension load test for anchor at pile 12A-N completed
				6) sealing plug (52 out of 94) for pile at pier BD1 to BD5, LP1 , LP2 completed.
12	Tank	Tank Erection (Tank 1)	11-Jul-06	1) Laying of floor plates (annular and some base) completed.
13	Tank	Tank Erection (Tank 3)	29-Jun-06	1) Laying of floor plates (annular and base) completed. 2) Welding of joints between floor plates started and suspended.
14	Tank	Tank Erection (Tank 4)	22-Jun-06	1) Laying of floor plates (annular and base) completed . 2) Welding of joints between floor plates almost completed. 3) Erection of shell plates completed and dismantled.

1.2 Purpose and Objectives of this EIA Report

- 1.2.1 In addition, as noted above, the previous EIA study (April 2002) was undertaken based upon the project layout detailed in Figure 3.2a. However, changes were made to the detailed layout and an application for a variation (Application No. VEP-133/2004) to the then valid Environmental Permit EP-139/2002 was made. A variation to the EP (EP-139/2002/A) was granted by EPD in February 2004. Thus, a key objective is to update the previous EIA to take into account the changes in the site layout. Details of the revised layout are provided in Section 3, Project Description and Figure 3.2b. Also, given the time lapse between the previous and this EIA study, relevant changes to the surrounding area including additional sensitive receivers and the latest information available have also been taken into account. In addition, the phasing of the tanks has changed with 8 (eight) to be constructed initially as shown in Figure 3.2c.
- 1.2.2 Thus, the EIA report of April 2002 has been revised per the Judgment of the Court of Final Appeal and its statutory interpretation of the EIAO and updated to take into account subsequent changes to the site layout and the surrounding area including additional sensitive receivers.
- 1.2.3 While the latest Environmental Permit EP-139/2002/A has been quashed, the previous Study Brief No. ESB-072/2001 issued by the Environmental Protection Department (EPD) in May 2001 remains valid. As such, in addition to the above, the study must comply with the EIA Study Brief and with the Technical Memorandum on EIA Process published by EPD. Thus, this EIA study has been prepared in accordance with the statutory requirements of the Environmental Impact Assessment Ordinance with a view to obtaining a new Environmental Permit for the Project. It should be noted that while certain construction activities have commenced as detailed in Table 1.1 above, the EIA presents an assessment of all the works required for the construction of the PAFF and of its operation.

1.2.4 The Study Brief defines the purpose of the EIA Study as being “to provide information on the nature and extent of the environmental impacts arising from the construction and operation of the Project and related activities that take place concurrently. This information will contribute to decisions by the Director of Environmental Protection on:

- (i) the overall acceptability of any adverse environmental consequences that are likely to occur as a result of the Project;
- (ii) the conditions and requirements for detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; and
- (iii) the acceptability of residual impacts after the proposed mitigation measures are implemented.”

1.2.5 In more detail, the specific objectives of this study defined in the Study Brief are as follows:

- (i) to describe the Project and associated works together with the requirements for carrying out the Project;
- (ii) to identify and describe elements of community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project, including natural and man-made environment and the associated environmental constraints;
- (iii) to provide information on the consideration of alternatives to avoid and minimise the environmental impacts, in particular the Sha Chau and Lung Kwu Chau Marine Parks and the habitat of the Chinese White Dolphins at the North Lantau waters;
- (iv) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
- (v) to identify and quantify any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (vi) to identify and quantify any potential impact to marine ecology and to propose measures to mitigate these impacts;
- (vii) to identify any negative impacts on site of cultural heritage and to propose measures to mitigate these impacts;
- (viii) to identify any negative impacts on fisheries and to propose measures to mitigate the impacts;
- (ix) to identify the risk due to the transportation and storage of the aviation fuel and to propose measures to mitigate the impact;
- (x) to propose the provision of mitigation measures so as to minimise pollution, environmental disturbance and nuisance during construction and operation of the Project;

- (xi) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;
- (xii) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) and the cumulative effects expected to arise during the construction and operation phases of the Project in relation to the sensitive receivers and potential affected uses;
- (xiii) to identify, assess and specify methods, measures and standards, to be included in the detailed design, construction and operation of the Project which are necessary to mitigate the identified environmental impacts and cumulative effects and reduce them to acceptable levels;
- (xiv) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the mitigation measures recommended in the EIA study, as well as the provision of any necessary modification; and
- (xv) to design and specify environmental monitoring and audit requirements to ensure the effective implementation of the recommended environmental protection and pollution control measures.

1.3 Structure of this Report

1.3.1 The report is divided into the following sections:

- (i) Section 2 provides a description of the alternatives considered in the selection of the preferred site and pipeline option for the proposed PAFF;
- (ii) Section 3 outlines of the key elements of the Project and the assumptions used as the basis for the EIA;
- (iii) Section 4 provides a description of the construction and operational air quality impacts for the facility and highlights mitigation requirements;
- (iv) Section 5 details the construction and operational noise impacts for the alignment;
- (v) Section 6 describes the water quality impacts during the construction and operational phases;
- (vi) Section 7 provides details of the ecological impact assessment and includes the assessment of submarine noise on dolphins;
- (vii) Section 8 outlines the construction and operation landscape and visual impact assessment;
- (viii) Section 9 comprises the cultural heritage impact assessment of the alignment;
- (ix) Section 10 presents the hazard to life assessment;

- (x) Section 11 details the fuel spill risk assessment and the environmental hazards associated with such spills;
- (xi) Section 12 provides an assessment of the potential impacts to fisheries;
- (xii) Section 13 comprises the land contamination assessment;
- (xiii) Section 14 details the waste management assessment;
- (xiv) Section 15 outlines the recommended environmental monitoring and audit requirements; and
- (xv) Section 16 presents a summary and conclusions, comprising the summary of environmental outcomes.