FORM 5

[redacted]

Application No. : VEP-543/2018
Reference No. :
(For official use)

FORM 5
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE
(CHAPTER 499)
SECTION 13(1)

Application for Variation of an Environmental Permit

PART A PREVIOUS APPLICATIONS

☑ No previous application for variation of an environmental permit.

☐ The environmental permit was previously amended.

Application No. : .....

PART B DETAILS OF APPLICANT

B1. Name : (person or company)

Castle Peak Power Co Ltd

[Note : In accordance with section 13(1) of the Ordinance, the person holding an environmental permit or a person who assumes responsibility for the designated project may apply for variation of the environmental permit.]

B2. Business Registration No. : (if applicable) [redacted]

B3. Correspondence Address : [redacted]

B4. Name of Contact Person : [redacted]

B5. Position of Contact Person : [redacted]

B6. Telephone No. : [redacted]

B7. Fax No. : [redacted]

B8. E-mail Address : (if any) [redacted]

PART C DETAILS OF CURRENT ENVIRONMENTAL PERMIT

C1. Name of the Current Environmental Permit Holder :

Castle Peak Power Co Ltd

C2. Application No. of the Current Environmental Permit : EP-441/2012

C3. The Current Environmental Permit was Issued in : month / year

07 2012

Important Notes : Please submit the application together with

(a) 3 copies of this completed form; and

(b) appropriate fee as stipulated in the Environmental Impact Assessment (Fees) Regulation

to the Environmental Protection Department at the following address :

The EIA Ordinance Register Office,
27th floor, Southorn Centre,130 Hennessy Road,
Wan Chai, Hong Kong.

RECEIVED
8 - 6 JUN 2018
EIAO Register Office, E.P.D.

☐ Tick (✓) the appropriate box

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
Part B Schedule and Scope of Designated Project	Amend description to read "The project includes partial decommissioning of the west coal stockyard, demolition of two existing PFA silos, construction of one PFA silos and enhancement work to water management facilities."	The design has changed taking into account of the anticipated reduction in ash production due to the Government strategy to reduce the coal-fired power generation in the future.	Environmental changes are described in Section 3.2 of the Environmental Review Report enclosed with this application.	No adverse impact on the environment and the community is anticipated as a result of the proposed variation. Please refer to Section 3.4 of the Environmental Review Report enclosed with this application.	The environmental performance requirements set out in the Project Profile previously submitted for this Project will not be exceeded.	No additional mitigation measures required for the designated project elements.
Figure 1	Amend Figure 1 with the new project layout as shown in Figure 1.2 of the Environmental Review Report enclosed with this application.	The design has changed taking into account of the anticipated reduction in ash production due to the Government strategy to reduce the coal-fired power generation in future; and potential reduction of stormwater runoff catchment areas and availability of spare water storage tanks on site.	Environmental changes are described in Section 3.2 of the Environmental Review Report enclosed with this application.	No adverse impact on the environment and the community is anticipated as a result of the proposed variation. Please refer to Section 3.4 of the Environmental Review Report enclosed with this application.	The environmental performance requirements set out in the Project Profile previously submitted for this Project will not be exceeded.	One additional mitigation measure is added for management of sludge during operation phase. The dewatered sludge from the process water polishing unit shall be stored in separated enclosed container on site and shall be disposed of at WENT landfill at regular interval.
Condition 2.2	Amend description to read "The Permit Holder shall submit an updated Contamination Assessment Plan (CAP) and a Contamination Assessment Report (CAR) at least one month before the partial decommissioning works of west coal stockyard."	The decommissioning works of the existing water lagoons are no longer required. Instead, the updated CAP should cover the proposed decommissioning area of the west coal stockyard.	Environmental changes are described in Section 3.2 of the Environmental Review Report enclosed with this application.	No adverse impact on the environment and the community is anticipated as a result of the proposed variation. Please refer to Section 3.4 of the Environmental Review Report enclosed with this application.	The environmental performance requirements set out in the Project Profile previously submitted for this Project will not be exceeded.	No additional mitigation measures required for the designated project elements.

PART E DECLARATION BY APPLICANT

E1. I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental permit may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

[redacted] [redacted] [redacted]

ature of Applicant | Full Name in Block Letters | Position

on behalf of Castle Peak Power Company Limited — 8 June 2018

Company Name and Chop (as appropriate) | Date

NOTES :

1. A person who constructs or operates a designated project in Part I of Schedule 2 of the Ordinance or decommissions a designated project listed in Part II of Schedule 2 of the Ordinance without an environmental permit or contrary to the permit conditions commits an offence under the Ordinance and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

2. A person for whom a designated project is constructed, operated or decommissioned and who permits the carrying out of the designated project in contravention of the Ordinance commits an offence and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

FINAL REPORT

Castle Peak Power Company Limited

Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

Environmental Review Report

June 2018

Environmental Resources Management
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ERM

FINAL REPORT

Castle Peak Power Company Limited

Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

Environmental Review Report

June 2018

Reference 0348497

For and on behalf of
ERM-Hong Kong, Limited

Approved by: Mr Frank Wan

Signed:

Position: Partner

Date: 8 June 2018

CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

The Castle Peak Power Company Ltd (CAPCO) currently uses the West Ash Lagoons at Tsang Tsui for disposal of surplus ashes, which consist mainly of raw Pulverised Fuel Ash (PFA), rejected PFA and Furnace Bottom Ash (FBA) generated from the CPPS; and storage of process water/ stormwater runoff arising from the Castle Peak Power Station (CPPS). Hong Kong SAR Government's plan on the use of West Ash Lagoon in the future for the WENT Landfill development is going to impact on the daily operations of CPPS, especially on ash and stormwater management.

Currently, there are two Water Storage Lagoons (Lagoons Nos. 1 and 2) at CPPS for temporary storage of stormwater runoff collected from the coal stockyards and process water from the operation of CPPS which can be reused for the operation of CPPS. Surplus stormwater is pumped to the West Ash Lagoon which can be pumped back to CPPS for reuse, if required.

Without the West Ash Lagoon, there will be limited temporary storage capacity for stormwater runoff collected from CPPS. During the summer months, surplus stormwater will have to be discharged to the sea. During the winter months, there will be shortage of rainwater and the shortfall will have to be augmented by town water supply. To ensure that CPPS has adequate capability to manage stormwater and to minimise the consumption of town water, CAPCO proposed to increase the stormwater storage capacity at CPPS before handing over of the West Ash Lagoon to the Government. In addition, the ash management system will be enhanced to increase the beneficial uses of the ashes. The construction and operation of the enhanced ash utilisation and water management facilities at the CPPS are referred to "the Project".

A design scheme was put forward in 2012 to enhance the ash management system and storage capacity of the water storage lagoons at CPPS (hereafter "the 2012 Scheme"). The 2012 Scheme included two Designated Projects (DP): (a) The proposed new ash management facilities are classified as a DP under Item G.6, Part I, Schedule 2 - A waste disposal facility for pulverised fuel ash, furnace bottom ash or gypsum; and (b) the partial decommissioning of the affected portion of the West Coal Stockyard is also classified as a DP under Item 15, Part II, Schedule 2 - A store for coal and ores with a storage capacity exceeding 200 tonnes. Hence, the construction and operation of the 2012 Scheme will require an Environmental Permit (EP) under the *Environmental Impact Assessment Ordinance (EIAO)*. As the potential environmental impacts associated with the construction and operation of the 2012 Scheme is unlikely to be adverse, CAPCO was granted permission to apply directly for the EP on 27 June 2012. The Director of Environmental Protection issued an EP (EP-441/2012) to the CAPCO on 23 July 2012. The layout plan of the 2012 Scheme shown in the current EP is shown in *Figure 1.1*.

1.2 *PURPOSE AND OBJECTIVES OF THIS REVIEW*

CAPCO is currently reviewing the design of the 2012 Scheme taking account of the anticipated reduction in ash production due to the Government strategy to reduce the coal-fired power generation in the future; and potential reduction of the stormwater runoff catchment areas and availability of spare water storage tanks on site. A new scheme is being developed (hereafter "the 2017 Scheme"). The key changes to the 2012 Scheme are summarised as follows:

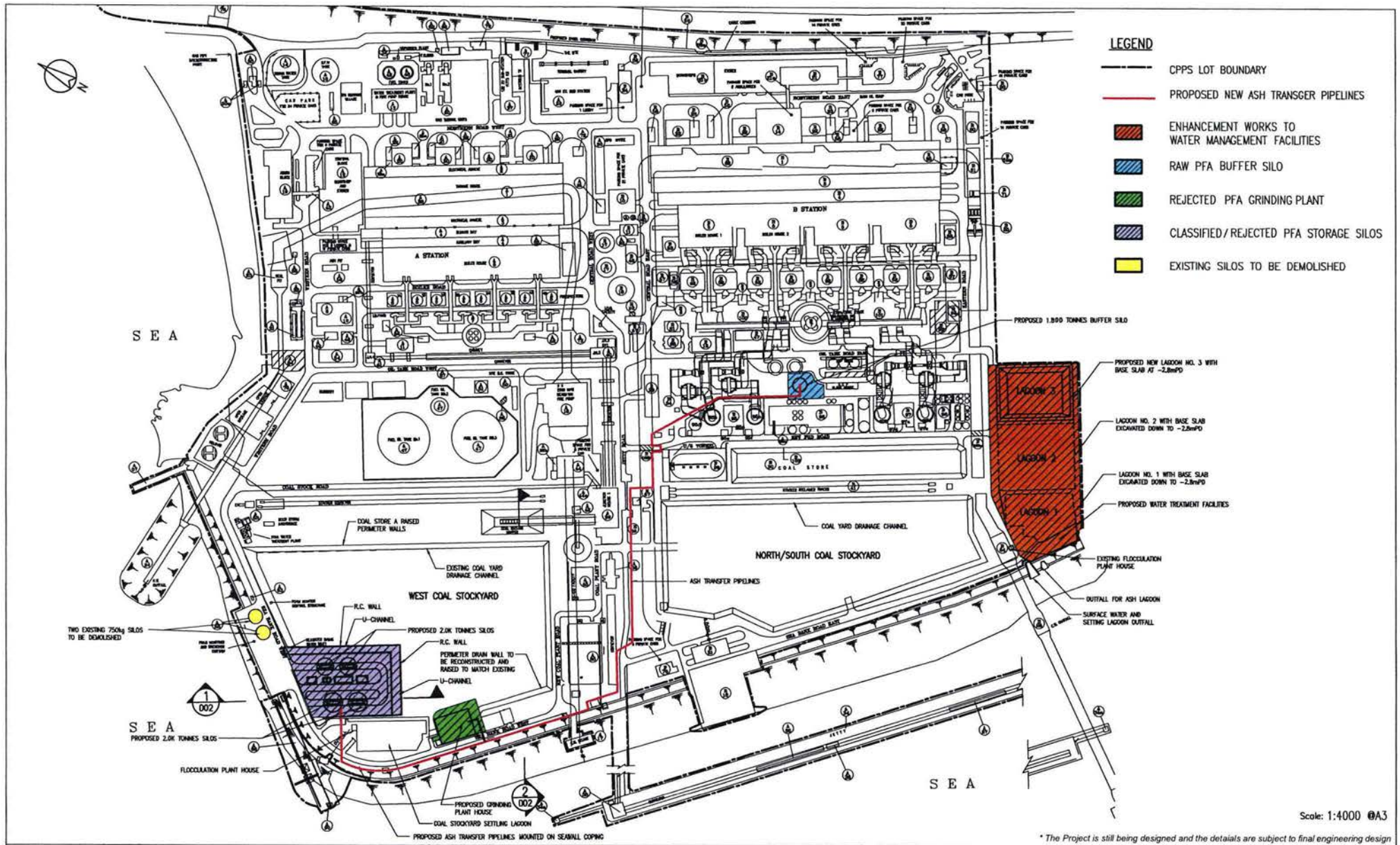
- The proposed 5 new PFA silos will not be required.
- Two existing PFA silos will be demolished and replaced by one new silo;
- New grinding plant will not be required;
- Dimension of the west coal stockyard for decommissioning is updated;
- Re-routing of the ash transfer pipeline is not required;
- New water lagoon to be replaced by above ground water tanks;
- Modification works at the existing water lagoons are not required; and
- Addition of a process water polishing unit to enhance the water quality for reuse within the power generation process.

The layout plan of the 2017 Scheme is shown in *Figure 1.2*. All design changes are within the CPPS boundary.

With the proposed changes, a Variation of Environmental Permit (VEP) is required for EP-441/2012. In supporting the application for the VEP, update of information presented in the Project Profile will be required and hence the implications of such changes would need to be reviewed from the perspective of the EIAO in this *Environmental Review (ER) Report*.

The purpose of this *ER Report* is:

- to identify and assess the key environmental implications (including air quality, noise, water quality, waste management, land contamination and landscape and visual) to the findings of the Project Profile with the implementation of the 2017 Scheme;
- to demonstrate that the proposed variations will not constitute material change to the environmental impact of the project with the mitigation measures in place; and the Project complies with the requirements described in the EIAO-TM; and
- to describe the proposed amendment to EP-441/2012.



* The Project is still being designed and the details are subject to final engineering design

Figure 1.1

Layout Plan of 2012 Scheme

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DATE: 08/11/2017

Environmental Resources Management

ERM

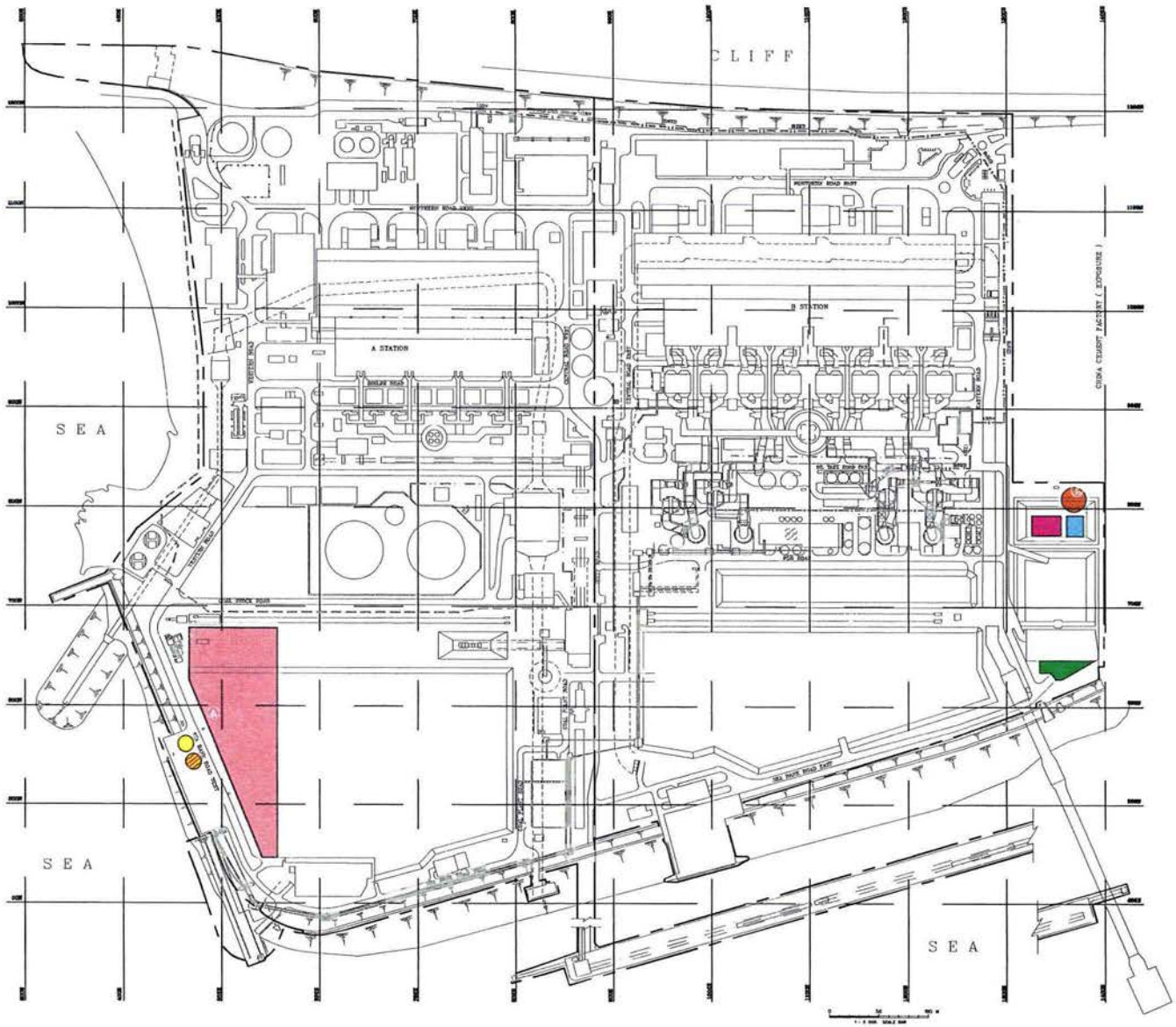

Figure 1.2

Layout Plan of 2017 Scheme

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DATE: 16/04/2018

Environmental Resources Management

ERM

1.2.1 *Structure of this Report*

The remainder of this report is set out as follows:

- *Section 2* describes the proposed changes;
- *Section 3* presents an assessment of the potential impacts on the environment with the proposed changes, compares the findings in the Project Profile and reviews the adequacy of environmental mitigation measures in the Project Profile;
- *Section 4* concludes the findings of the environmental review; and
- *Section 5* presents the proposed variation to the Environmental Permit No. EP-441/2012.

2 PROPOSED CHANGES TO THE DESIGN SCHEME

2.1 DESIGN SCHEME

2.1.1 Ash Handling and Utilisation Facilities

The key changes to the design of the ash handling and utilisation facilities from the 2012 Scheme is shown in *Table 2.1* and illustrated in *Figure 2.1*. The locations of the facilities of the 2017 Scheme are shown in *Figure 1.2*.

Table 2.1 ***Changes to the Ash Handling and Utilisation Facilities***

Item	2012 Scheme (Section 1.7.1 of the Project Profile)	Proposed Changes in the 2017 Scheme	Justifications for the Change
1	Construction of 1 new 1,800 tonnes Buffer Silo for storage of raw pulverised fuel ash (PFA)	Not required	Ash generation quantity is reduced and the existing silos have adequate capacity
2	Enhancement of the existing PFA handling and transportation system	Enhanced transfer system is not required and repair works to existing system only	Ash transfer can use the existing system without constructing new pipework so as to minimize excavation works.
3	Demolition of 2 existing 750 tonnes classified PFA silos	Same and replace by the construction and installation of 1 new PFA silo with a capacity of 750 tonnes to replace the 2 demolished classified PFA silos	New silo to be kept at the existing location to avoid construction of new ash transfer system
4	Construction and installation of 4 new PFA silos, each with a capacity of 2,000 tonnes	Not required	Ash generation quantity is reduced and less PFA storage silos are required
5	Partial decommissioning of a part of west coal stockyard	Decommissioning dimension is revised	Optimization of catchment area
6	Installation of a new grinding plant	Not required	Outlets for the off-specification PFA have been identified.

As shown in *Table 2.1* and *Figure 2.1*, the scale of the works in the 2017 Scheme is reduced as a result of a lower projected PFA generation quantity and identification of outlets for off-specification PFA. The evaluation of potential environmental impacts associated with the construction and operation of the 2017 Scheme are provided in *Section 3*.

2.1.2 Water Management Facilities

The key changes to the design of the water management facilities from the 2012 Scheme is shown in *Table 2.2* and illustrated in *Figure 2.2*. Under both 2012 and 2017 Schemes, the design of the water management facilities assume zero discharge from the water storage facilities under normal operating conditions up to 1 in 50 years rainstorm events.

Table 2.2 ***Key Changes to the Water Management Facilities***

Item	2012 Scheme (Section 1.7.2 of the Project Profile)	Proposed Changes in the 2017 Scheme	Justifications for the Change
1	Construction of a new water lagoon of capacity 52,600 m^3	Construction of a new above-ground water tank for storage of returned process water, with capacity of approximately 7,000 m^3.	Use of above-ground tank to minimise soil excavation
2	Modification to the two existing water lagoons to increase their storage capacity through lowering their base slabs by excavation	Not required	1) Avoid disturbance to the existing lagoons 2) Existing spare water tanks have adequate capacity for the storage of stormwater 3) Smaller stormwater storage requirement due to: - Rearrangement of drainage catchment to collect non-contaminated stormwater from i) the rooftop of buildings and the surrounding access road shown in Annex A and ii) the decommissioned area of the West coal stockyard for discharge into the stormwater drainage system and subsequent discharge into the sea. (refer to *Annex A*) - Reuse of the collected stormwater in the fuel gas desulphurisation (FGD) system
3	Installation of 2-stage hydro-cyclone separation facilities to reduce suspended solids (SS) levels in the returned process water	Installation of a 2-stage filter and a process water polishing unit	Further enhance the water quality for reuse within the power generation process
4	Installation of associated equipment to handle solids from hydro-cyclone or to allow SS to settle in the lagoon	Stage 1 filter to replace hydro-cyclone	Proven technology serving the same purpose
5	Modification of the existing stormwater runoff distribution system to enhance temporary storage of stormwater runoff in the coal stockyard prior to discharge to lagoons	Same	-

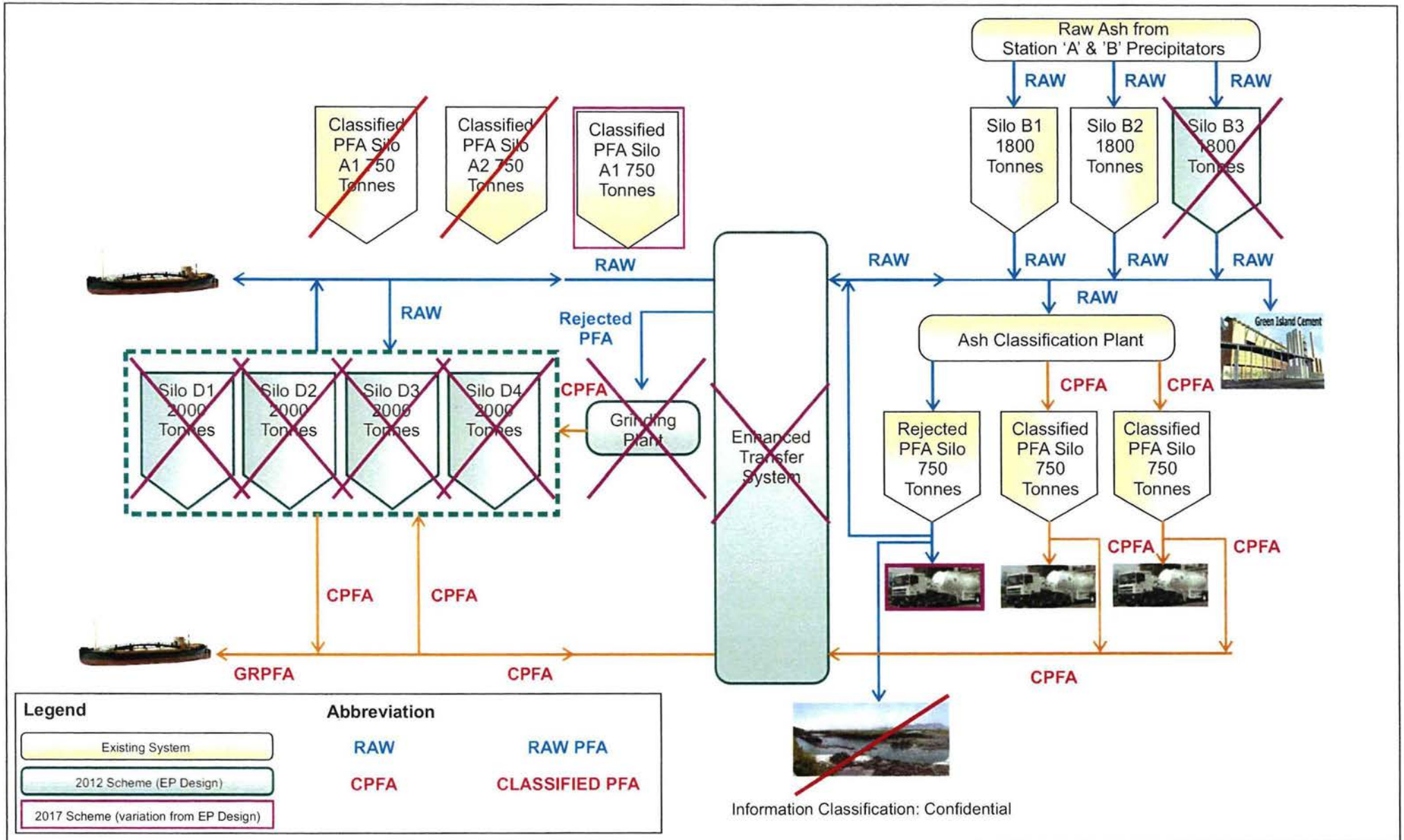

Figure 2.1

Key Changes to Ash Handling and Utilisation System

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Environmental Resources Management

ERM

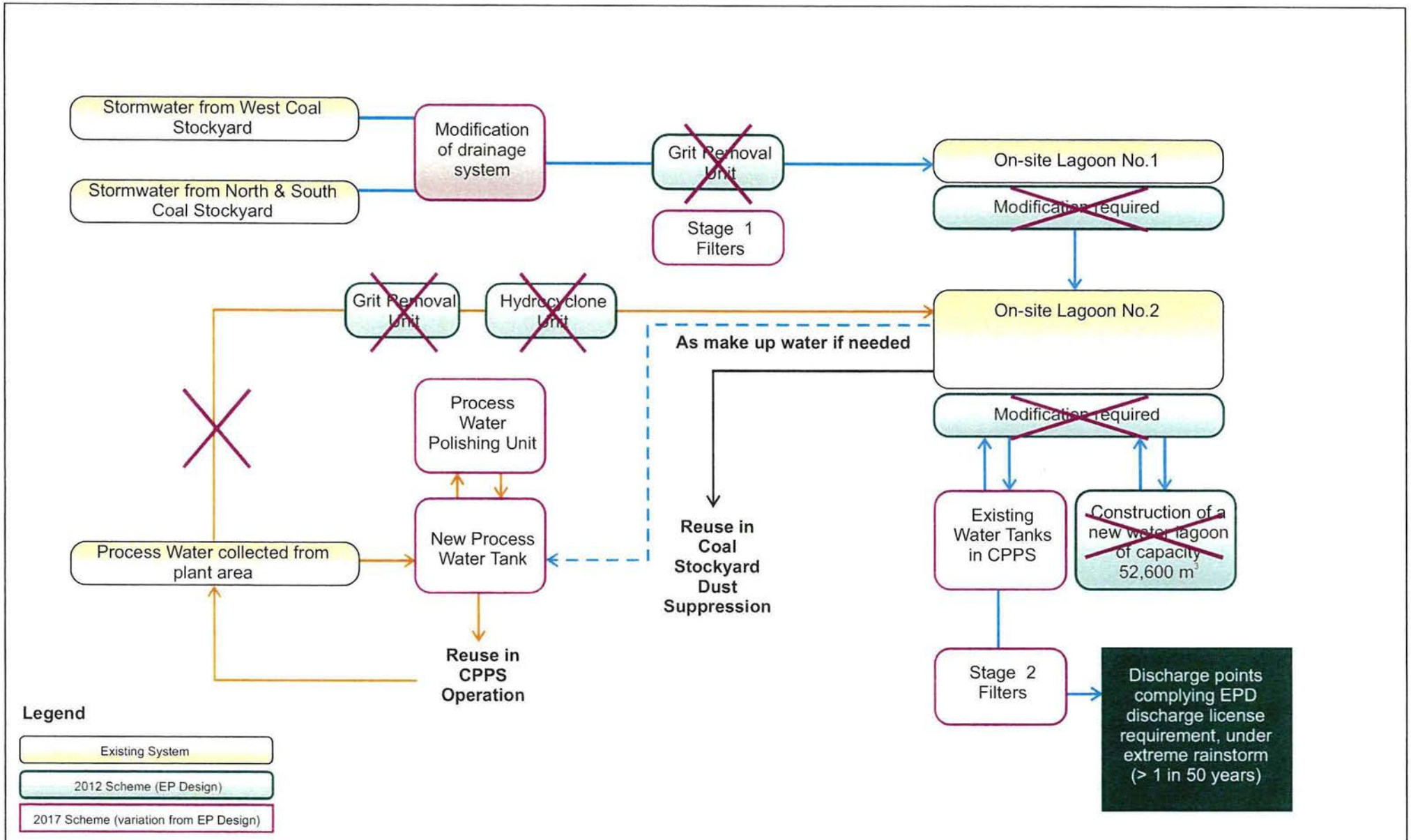

Figure 2.2

Key Changes to Water Management System

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Environmental Resources Management

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As shown in *Table 2.2* and *Figure 2.2*, the required storage capacity of the water management facilities is reduced in the 2017 Scheme. The drainage rearrangement works, which is described in *Section 2.2.3*, will ensure only clean stormwater from the decommissioned area of the West Coal stockyard be directly discharged to the sea. The evaluation of potential environmental impacts associated with the construction and operation of the 2017 Scheme are provided in *Section 3*.

2.2 CONSTRUCTION METHODOLOGY

2.2.1 *Ash Handling & Utilisation Facilities*

The key changes to the construction method of the ash handling and utilisation facilities from the 2012 Scheme are shown in *Table 2.3*.

Table 2.3 Construction Method of the Ash Handling and Utilisation Facilities

Item	2012 Scheme (Section 1.8.1 of the Project Profile)	2017 Scheme
1.	Diversion of existing utilities and reprovisioning of the affected utilities – involving localised excavation works, flame cutting and welding	Remain valid
2.	Construction of a 1,800 tonnes Buffer Silo – involving foundation and concreting works, welding of pre-fabricated steel silos or *in situ* casting of concrete silos	Not required
3.	Upgrading of the ash handling system – involving minor ground breaking, flame cutting and lifting	Remain valid
4.	Construction of a 2x 300mm ash handling and distribution pipelines – involving minor ground breaking, welding, concreting and lifting	Not required
5.	Construction of 3 x 2,000 tonnes classified PFA Storage Silos – involving foundation and concreting works, welding of pre-fabricated steel silos or in situ casting of concrete silos	Not required
6.	Demolition of the existing 2 x 750 tonnes steel silos – involving flame cutting and lifting	Remain valid
7.	Construction of 1x 2,000 tonnes classified/ground PFA Storage Silos – involving foundation and concreting works, welding of pre-fabricated steel silo or *in situ* casting of concrete silo	Construction and installation of 1 new PFA silo with a capacity of 750 tonnes. - involving foundation and concreting works, welding of pre-fabricated steel silo or *in situ* casting of concrete silo.
8.	Installation of a Grinding Plant with capacity of 45 tonnes/hr	Not required
9.	Construction of ground ash pipework	Not required

2.2.2 *Water Management Facilities*

The key changes to the construction method of the water management facilities from the 2012 Scheme are shown in *Table 2.4*. Under the 2017

Scheme, the new process water tank and process water polishing unit will be above-ground structures. The construction of these structures involves shallow foundation and concreting works, welding of pre-fabricated steel tank and equipment.

Table 2.4 ***Construction Method of the Water Management Facilities***

Item	2012 Scheme (Section 1.8.2 of the Project Profile)	2017 Scheme
1.	Diversion of existing pipework – involving localised excavations, flame cutting and welding;	Remain valid
2.	Construction of a new water lagoon (Lagoon No. 3) – involving excavation, and concreting works	Not required
3.	Reconstruction of existing Lagoon Nos. 1 and 2 – involving excavation and concreting works	Not required
4.	Construction of new pipework for the lagoons - involving localized excavations, flame cutting, welding and concreting	Not required
5.	Construction of perimeter walls for the west coal stockyard – involving excavation, concreting and lifting	Not required

2.2.3 *Partial Decommissioning of the West Coal Stockyard*

The key changes to the method of decommissioning the west coal stockyard are shown in *Table 2.5*. The decommissioned area will be left as an open space and will be continued as industrial use for the operation of the CPPS. No specific uses have been planned in this area.

Table 2.5 ***Method of the Decommissioning of the West Coal Stockyard***

Item	2012 Scheme (Section 1.8.3 of the Project Profile)	2017 Scheme
1.	The HCV Coal Pile will be removed by the Caterpillar Coal Scrapers for loading into the 32-tonne truck	Remain valid
2.	After the level of coal pile is lowered, the concerned portion of the coal yard will be emptied by use of Caterpillar Front End Loaders and/or Dozers	Remain valid
3.	During the clearance of the coal pile, coal dust will be suppressed by water sprays using the spray guns and water browser in a way similar to the existing normal operations of the coal stockyard	Remain valid
4.	The pile slope near the cleared area will be reduced and fenced off to prevent the potential collapse of the coal pile	Not required. Instead, a shallow U channel will be constructed along the edge of the decommissioned area along the new coal stockyard boundary to separate the coal pile area and collect stormwater runoff from the coal pile

2.3 *IMPLEMENTATION PROGRAMME*

The duration of construction for the 2017 Scheme (including both the ash handling and water management components) will require approximately 32 months for construction. Construction works will commence in the 1th quarter of 2018 for completion by 4th quarter of 2020.

2.4 *INTERFACING PROJECTS*

There are currently no committed interfacing projects in the vicinity of the Project site that may contribute to cumulative impacts with the Project.

2.5 *ENVIRONMENTAL BENEFITS OF THE PROPOSE CHANGES*

2.5.1 *Ash Handling and Utilisation System*

The changes will have the following environmental benefits:

- Less construction phase environmental impacts (in terms of magnitude) as a result of reduced scale of Project works;
- Avoid potential dust impact and waste disposal associated with construction of ash transfer system; and
- Less dust emission from vent air during operation as a result of reduced number of ash storage silos and deletion of the grinding plant.

2.5.2 *Water Management System*

The changes will have the following environmental benefits:

- Avoid potential construction phase environmental impacts associated with the construction of new lagoon and enhancement work at the existing lagoons;
- Less potential dust impact as a result of reduced scale of soil excavation; and
- Make the best use of available existing infrastructure.

3 IMPLICATIONS TO THE FINDINGS OF THE 2012 PROJECT PROFILE

3.1 OVERVIEW OF ENVIRONMENTAL IMPACT ASSESSED IN THE 2012 PROJECT PROFILE

The potential environmental impacts evaluated in the Project Profile for the 2012 Scheme include air quality, noise, water quality, waste management, land contamination and landscape and visual. The Project Profile also confirmed there will be no concerns on ecology, fisheries, cultural heritage and hazard to life. The Project Profile concluded that the overall environmental impacts that could arise from the construction operation of the Project are considered minor and anticipated to comply with the assessment criteria stipulated in the EIAO-TM with the implementation of general good construction site practices and the well proven measures recommended in the Project Profile.

The potential implications to the findings of the Project Profile as a result of the design change are discussed in the following section.

3.2 REVIEW OF POTENTIAL ENVIRONMENTAL IMPACTS

Table 3.1 summarises the potential environmental impacts associated with the 2017 Scheme, comparing to the 2012 Scheme.

Table 3.1 Potential Environmental Impacts of 2017 Scheme

Environmental Aspect	Potential Impacts
Air Quality (Section 3.2 of the Project Profile)	
Construction Phase	According to the Project Profile, excavation works has been identified to be the potential dust generating activities during construction phase. The 2017 Scheme will involve less excavation works and thus the construction dust emissions are expected to be lower. Adverse air quality impact is not anticipated and the conclusion in the Project Profile remains unchanged.
Operation Phase	The 2017 Scheme will not involve the operation of a new grinding plant and the number of new PFA silos in operation will also be fewer. Hence, there will be less dust emission source (filtered vent air from grinding plant and storage silos). Adverse air quality impact is not anticipated and the conclusion in the Project Profile remains unchanged.
Noise (Section 3.3 of the Project Profile)	
Construction Phase	The scale of construction works for the 2017 Scheme is smaller and hence will use less Powered Mechanical Equipment (PME). In general, noise emission from the construction work of the 2017 Scheme is reduced. Given the large separation distance (about 900m) between the works areas and the nearest sensitive receiver at Lung Tsai and the screening effects of the existing structures at the CPPS, adverse noise impact is not anticipated and the conclusion in the Project Profile remain unchanged.

Environmental Aspect	Potential Impacts
Operation Phase	According to the Project Profile, the operation of the Project will involve the use of mechanical equipment equipped on the grinder, ash distribution pumps, hydro-cyclones and water pumps etc. The 2017 Scheme will not involve operation of a new grinding plant and enhanced transfer system. The quantity of new mechanical equipment to be installed under 2017 Scheme would be fewer. Fixed plant noise generated therefore would not exceed that predicted in the Project Profile and no adverse noise impact is anticipated.
Water Quality (Section 3.4 of the Project Profile)	
Construction Phase	Under 2017 Scheme, the modification works at existing water lagoons will no longer be required. The proposed construction works of the above-ground new process water tank and process water polishing unit are expected to have smaller footprint, compared with the construction of a new water lagoon in the 2012 Scheme. Potential water quality impact is expected to be reduced. Adverse water quality impact is not anticipated and the conclusion in the Project Profile remains unchanged.
Operation Phase	Under both 2012 and 2017 Schemes, the design of the water management facilities assume zero discharge from the water storage facilities under normal operating conditions up to 1 in 50 years rainstorm events. Under extreme rainstorm events, the quality of the stormwater to be discharged will comply with the existing licence conditions issued under the *Water Pollution Control Ordinance* by the treatment of 2-stage filters under all circumstances. The rearrangement of drainage catchment also ensures only non-contaminated stormwater from the buildings, surrounding access road and the decommissioned area of the West Coal stockyard will be directly discharged to the sea. Therefore, water quality impact due to effluent discharge as predicted in the Project Profile remains unchanged .
Waste Management Implications (Section 3.5 of the Project Profile)	
Construction Phase	2017 Scheme will involve less excavation works. The quantities of excavated materials to be generated and disposed of are expected to be less than that predicted in the Project Profile. The quantity of chemical waste and general refuse to be generated in the 2017 Scheme is expected to be comparable to that of the 2012 Scheme. The conclusion in the Project Profile remains unchanged.
Operation Phase	Under both 2012 and 2017 Schemes, the grits and settled solids (coal particles) in the water management system will be collected and returned to the coal stockyard as the current practice. The operation of the proposed process water polishing unit under 2017 Scheme is expected to generate 6 tonnes of dewatered sludge per day and requires off-site disposal at landfills. As the process water has minimal organic matters, there will be no odour issues associated with the handling, transportation and disposal of the sludge at landfills. The sludge will be properly dewatered to comply with the landfill acceptance criterion. The small quantity of sludge to be disposed of at landfills is not expected to cause adverse impacts on the landfills.
Land Contamination (Section 3.6 of the Project Profile)	
2017 Scheme will involve less excavation compared to the 2012 Scheme. The Contamination Assessment Plan (CAP) in the Project Profile has been updated with the 2017 Scheme (see *Annex B*). This CAP details the past and present land uses of the Project Site in relation to possible soil and groundwater contamination. The land use changes and site layout under the 2017 scheme have been reviewed against the 2012 Scheme. The CAP also reviewed the	

Environmental Aspect	Potential Impacts
	existing data in previous site investigation (SI) which was conducted in accordance with the RBRG Practice Guide and the CAP concluded that the previous SI findings are applicable to the Project and no signs of soil and groundwater contamination (i.e. below the relevant *Risk-based Remediation Goals* (RBRGs) standards) within the Project Site. Potential land contamination impacts are considered insignificant. The conclusion in the Project Profile remains unchanged. Similar to the situation described in the Project Profile, SI was not conducted at the area of coal stockyard proposed for decommissioning as the area is currently occupied by a large coal pile and cannot be removed readily without partial decommissioning of the coal yard. The CAP has thus recommended to conduct confirmation SI at the proposed decommissioned area of the west coal stockyard after partial decommissioning of the west coal stockyard and before commencement of the construction works in this area to confirm no land contamination. The SI results will be documented in a Contamination Assessment Report (CAR). If contamination is identified, the necessary remediation method will be proposed and documented in the Remediation Action Plan (RAP) for EPD's approval. If remediation is necessary, the CAPCO will clean up the contaminated land according to the approved RAP, and a Remediation Report (RR) will be prepared to demonstrate that the concerned area(s) have been cleaned up to the relevant RBRG's standards. The RR will be submitted to EPD for agreement prior to the commencement of any development or redevelopment works.
Landscape & Visual (*Section 3.8 of the Project Profile)*	
	The proposed process water tank and process water polishing unit under 2017 Scheme will be above-ground structures. They will be designed in a way compatible with the site context. The overall visual quality from the visual sensitive receivers would therefore be expected to be same as that predicted in the Project Profile.

3.3 *REVIEW OF MITIGATION MEASURES*

Based on the findings of environmental impact assessments for the 2017 Scheme in *Section 3.2*, mitigation measures recommended in the Project Profile for the 2012 Scheme have been reviewed to evaluate their effectiveness and applicability to 2017 Scheme. *Table 3.2* summarises the mitigation measures applicable to 2017 Scheme.

Table 3.2 Descriptions of Mitigation Measures for 2017 Scheme

Environmental Aspect	Mitigation Measures
Air Quality (Section 4.1 of Project Profile)	
Construction Phase	Dust control measures recommended in the *Air Pollution Control (Construction Dust) Regulation* will be implemented to alleviate the fugitive dust impact, including: *Measures for Construction Activities involving Excavations, Loading and Unloading of Soils* • All areas involving site clearance and excavations works will be sprayed with water before, during and after the operations to maintain the entire surface wet; • Restricting heights from which materials are to be dropped, as far as practicable to minimise the fugitive dust arising from unloading/ loading; • Erection of hoarding of not less than 2.4 m high from ground level along the major work site boundary (the new process water tank and the new PFA storage silo), where appropriate; • Immediately before leaving a work site, all vehicles shall be washed to remove any dusty materials from the bodies and wheels. However, wetting of materials and surfaces should avoid excessive use of water; • Where a vehicle leaving a work site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials will not be released from the vehicle; • Any stockpile of dusty materials on-site will be covered entirely by impervious sheeting; and/or placed in an area sheltered on the top and 4 sides. They should also be sprayed with water immediately prior to any loading, unloading or transfer operation to dampen the dusty materials; • To reduce the traffic induced dust dispersion and re-suspension, the travelling speed of vehicles within the work sites should be controlled to within 10 km/h; • Any unpaved haul road shall be sprayed with water so as to maintain the entire road surface wet. *Measures for Partial Decommissioning of the West Coal Stockyard* • During the clearance of the coal pile, coal dust will be suppressed by water sprays using the spray guns and water browser as existing normal operations at the coal stockyard.
Operation Phase	The dust control system of the new PFA silo will comply with the dust emission limit of 50 mg/m^3 recommended in the *Guidance Note on Best Practicable Means for Mineral Works (PFA Classification Plant) (BPM 11/2 (96)*. This is in line with the dust emission limit for existing ash handling systems at CPPS, which are regulated under the overall *Air Pollution Control Licence* for the whole CPPS. No further mitigation measures are required for the operation of the new PFA silo.
Noise (Section 4.2 of Project Profile)	
Construction Phase	Good site practice will be recommended to minimise noise impact: • Unused equipment should be turned off. PME will be kept to a minimum and the parallel use of noisy equipment/ machinery will be avoided; • Regular maintenance of all plant and equipment; • Material stockpiles and other on-site structures will be effectively used as noise barriers, where practicable;

Environmental Aspect	Mitigation Measures
	• Use of purpose-built movable noise barrier, silencer and quiet plant as necessary.
Operation Phase	Given that the nearest NSR is about 900m away and the plant is screened by other structures within the CPPS, the incremental fixed noise impact at the identified NSRs will likely be negligible. No mitigation measures are therefore required for the proposed mechanical equipment under 2017 Scheme.
Water Quality (Section 4.3 of Project Profile)	
Construction Phase	Site runoff and drainage impacts will be controlled in accordance with the guidelines stipulated in the *EPD's Professional Persons Environmental Consultative Committee Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94).* The implementation of good housekeeping and stormwater management practices will ensure that *Water Pollution Control Ordinance (WPCO)* standards can be met and that no unacceptable impacts on the identified water sensitive receivers would arise due to the construction and demolition works. The recommended mitigation measures include: *Measures for Construction Site Runoff and Discharge* Surface runoff from the affected works areas are to be directed towards desilting facilities before discharging into the stormwater drainage; • Channels, earth bunds or sand bag barriers will be provided on-site to properly direct stormwater to the above-mentioned facilities; • Existing on-site silt removal facilities, channels and manholes, if any, will be maintained and the deposited silt and grit will be removed regularly, at the onset of and after each rainstorm and to ensure that these facilities are functioning properly at all times; • Other manholes, if any, including any newly constructed ones will be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system; • Open stockpiles of materials on site will be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms. Measures will be taken to prevent the washing away of construction materials, soil, silt or debris; • Sewage arising from the construction workers on-site will be collected by temporary sanitary facilities where necessary e.g. portable chemical toilets. Portable toilets will be used coupled with tankering away services provided by a reputable collector; • All site discharges will comply with the terms and conditions of a valid discharge licence issued by EPD; • Vehicle washing facilities will be drained into desilting facilities before discharge. Water will be recycled on-site wherever possible. It is suggested that the wash water from wheel wash basins are either reused for site watering or pumped to the on-site desilting facilities for treatment; • Desilting facilities will be checked and the deposited silt and grit will be removed regularly to ensure that they are working properly at all times.
	Protection against Accidental Spillage • The works may occasionally involve the handling of fuel and generates a small amount of chemical wastes. It must be ensured that all fuel tanks and chemical storage are sited on sealed and bunded areas and provided with locks; • If necessary, the storage areas will be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent accidentally spillage; • Oil and grease removal facilities will be provided where appropriate, for example, in area near plant workshop/ maintenance areas, if any; • Chemical waste arising from the site will be properly stored, handled, treated and disposed of in compliance with the requirements stipulated under the *Waste Disposal (Chemical Waste) (General) Regulation.*

Environmental Aspect	Mitigation Measures
Operation Phase	Water quality impacts due to effluent discharge during operation of the Project are not anticipated and hence mitigation measures are not required. No precautionary measures are required for the water management system during the dry seasons or less severe rainstorm, as the existing lagoons and the modified existing water tanks will be able to contain all the collected stormwater runoff. The proposed process water polishing unit can further improve the quality of water to be reused in the power generation process. The surplus stormwater to be discharged during the extreme rainstorm conditions will comply with the existing *WPCO* discharge licence requirements and hence no additional mitigation measures will be required.
Waste Management Implications (Section 4.4 of the Project Profile)	
Construction Phase	To further minimise waste arising and to further reduce the environmental impacts associated with handling, storage and disposal of the wastes generated from the construction of the Project, it is recommended to maximise the reuse of the excavated material on site and adopt good site management practice and enhance waste segregation on-site to facilitate of recycling certain components of the waste streams, such as metals, papers and plastics. The main contractor of the Project shall prepare a *Waste Management Plan* (*WMP*), which will become part of the *Environmental Management Plan* (*EMP*), with reference to the requirements set out in the *ETWB TCW No. 19/2005, Waste Management on Construction Sites* and the Practice Note for Authorized Persons and Registered Structural Engineers, e.g. *Practice Note No. 243 – Construction and Demolition Waste*. The WMP shall include monthly Waste Flow Tables (WFT) which indicate the amounts of waste generated, recycled and disposed of (including final disposal site), and it should be updated regularly. *General waste management measures during Construction* • The reuse/recycling of all materials on-site shall be investigated and exhausted prior to treatment/ disposal off-site; • All waste materials shall be sorted on-site into inert and non-inert C&D materials, and where the materials can be recycled or reused, they shall be further segregated. Inert material, or public fill shall be disposed of at Fill Bank at Tuen Mun Area 38 whilst non-inert materials or construction waste shall be disposed of at the WENT Landfill. • The contractor shall be responsible for identifying what materials can be recycled/ reused, whether on-site or off-site. In the event of the latter, the contractor shall arrange for the collection of the recyclable materials. • In order to monitor the disposal of public fill and construction waste at public filling facilities and landfills, and control fly-tipping, a trip-ticket system shall be implemented by the Contractor, in accordance with the contract and the requirements of *WBTC 31/2004 "Trip Ticket System for Disposal of Construction and Demolition Material"*; • Under the *Waste Disposal (Chemical Waste) (General) Regulation*, the Contractor shall register as a Chemical Waste Producer if chemical wastes such as spent lubricants and paints are generated on-site. Only licensed chemical waste collectors shall be employed to collect any chemical waste generated at site. The handling, storage, transportation and disposal of chemical wastes shall be conducted in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* and *A Guide to the Chemical Waste Control Scheme* both published by EPD; • A sufficient number of covered bins shall be provided on-site for the containment of general refuse to prevent visual impacts and nuisances. These bins shall be emptied daily and the collected waste disposed of to the WENT Landfill. Further to the issue of *ETWB TCW No. 6/2002A, Enhanced Specification for Site Cleanliness and Tidiness*, the contractor will be required to maintain a clean and hygienic site throughout the project works; • Toolbox talks should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste

Environmental Aspect	Mitigation Measures
	reduction, reuse and recycling.
Operation Phase	The dewatered sludge from the process water polishing unit shall be stored in separated enclosed container on site and shall be disposed of at WENT landfill at regular interval.
Land Contamination (Section 4.5 of Project Profile)	
Based on the recent SI result, signs of land contamination were not identified and no mitigation measures are considered necessary. However, the situation will be reconfirmed after the SI work at the coal stockyard proposed in the CAP is completed. The SI results will be documented in a Contamination Assessment Report (CAR). If contamination is identified, the necessary remediation method will be proposed and documented in the Remediation Action Plan (RAP) for EPD's approval. If remediation is necessary, the CAPCO will clean up the contaminated land according to the approved RAP, and a Remediation Report (RR) will be prepared to demonstrate that the concerned area(s) have been cleaned up to the relevant RBRG's standards. The RR will be submitted to EPD for agreement prior to the commencement of any development or redevelopment works.	
Landscape & Visual (Section 4.7 of Project Profile)	
No mitigation measures for landscape and visual impacts are considered necessary, as no adverse landscape and visual impacts are identified during the construction and operation of the Project.	

3.4 REVIEW OF MATERIAL CHANGE

For any changes to a DP, it is necessary to evaluate if the changes will constitute a "material change" under the definition of the EIAO. The *Technical Memorandum of EIA Process* (EIAO-TM) described the definition of "material change" under the EIAO.

Although an EIA Report was not prepared for the Project, it is interpreted that the environmental performance requirements in the Project Profile for the Project should serve as a reference for comparison. *Table 3.3* summarized the results of the evaluation. It is considered that the 2017 Scheme would not lead to any material change to the Designated Project (DP), or to any additional or worse environmental impact in accordance with *Sections 6.1* and *6.2* of the *EIAO-TM*, respectively. As such, the 2017 Scheme is considered as conforming to the requirements and findings set out in the Project Profile.

Table 3.3 Summary of Evaluation Results Against Section 6 of the EIAO-TM

Item	Requirements	Major Findings	Material Change?
6.1 (a)	A change to physical alignment, layout or design of the project causing an environmental impact likely to affect existing or planned community, ecologically important areas or sites of cultural heritage	No impacts beyond those predicted in the Project Profile are anticipated to be affecting existing or planned community, ecologically important areas or sites of cultural heritage. Please also refer to *Sections 3.2* to *3.3* above for detailed discussion of the assessment of the potential environmental impacts associated with the adoption of the proposed changes.	No
6.1 (b)	A physical change resulting in an increase in the extent of reclamation or dredging affecting water flow or quality likely to affect ecologically important areas, or disrupting sites if cultural heritage	Under the proposed changes, no reclamation or dredging will be undertaken.	No
6.1 (c)	An increase in pollution emissions or discharges or waste generation likely to violate guidelines or criteria in this technical memorandum without mitigation measures in place	Additional pollution emissions or discharges or waste generation due to the proposed changes are not expected to violate guidelines or criteria in the EIAO-TM without mitigation measures in place as assessed in *Sections 3.2* to *3.3* above.	No
6.1 (d)	An increase in throughput or scale of the project leading to physical additions or alterations that are likely to violate the guidelines or criteria in this technical memorandum without mitigation measures in place	The scale of the 2017 Scheme is expected to be smaller than that predicted in the Project Profile as described in *Section 2*.	No

Item	Requirements	Major Findings	Material Change?
6.1 (e)	A change resulting in physical works that are likely to affect rare, endangered or protected species, or an important ecological habitat, or site of cultural heritage.	The Project Profile confirmed there will be no concerns on ecology, fisheries, cultural heritage and hazard to life. The proposed changes described in 2017 Scheme would not raise concerns on endangered or protected species, or an important ecological habitat, or site of cultural heritage.	No
6.2	The environmental impact of a designated project, for which an environmental permit has been issued, is considered to be materially changed if the environmental performance requirements set out in the EIA report for this project may be exceeded or violated, even with the mitigation measures in place.	As assessed in *Sections* 3.2 to 3.3 above, it is predicted that the potential environmental impacts associated with the proposed changes will not exceed the environmental performance requirements stated in the Project Profile.	No

4 CONCLUSION

The potential environmental impacts associated with the proposed changes in the 2017 Scheme and the corresponding construction works have been assessed. The associated impacts are expected to comply with the requirements, recommendations and other commitments set out in the Project Profile. The proposed 2017 Scheme for the Project is not considered to constitute a material change under the statutory definition of the EIAO.

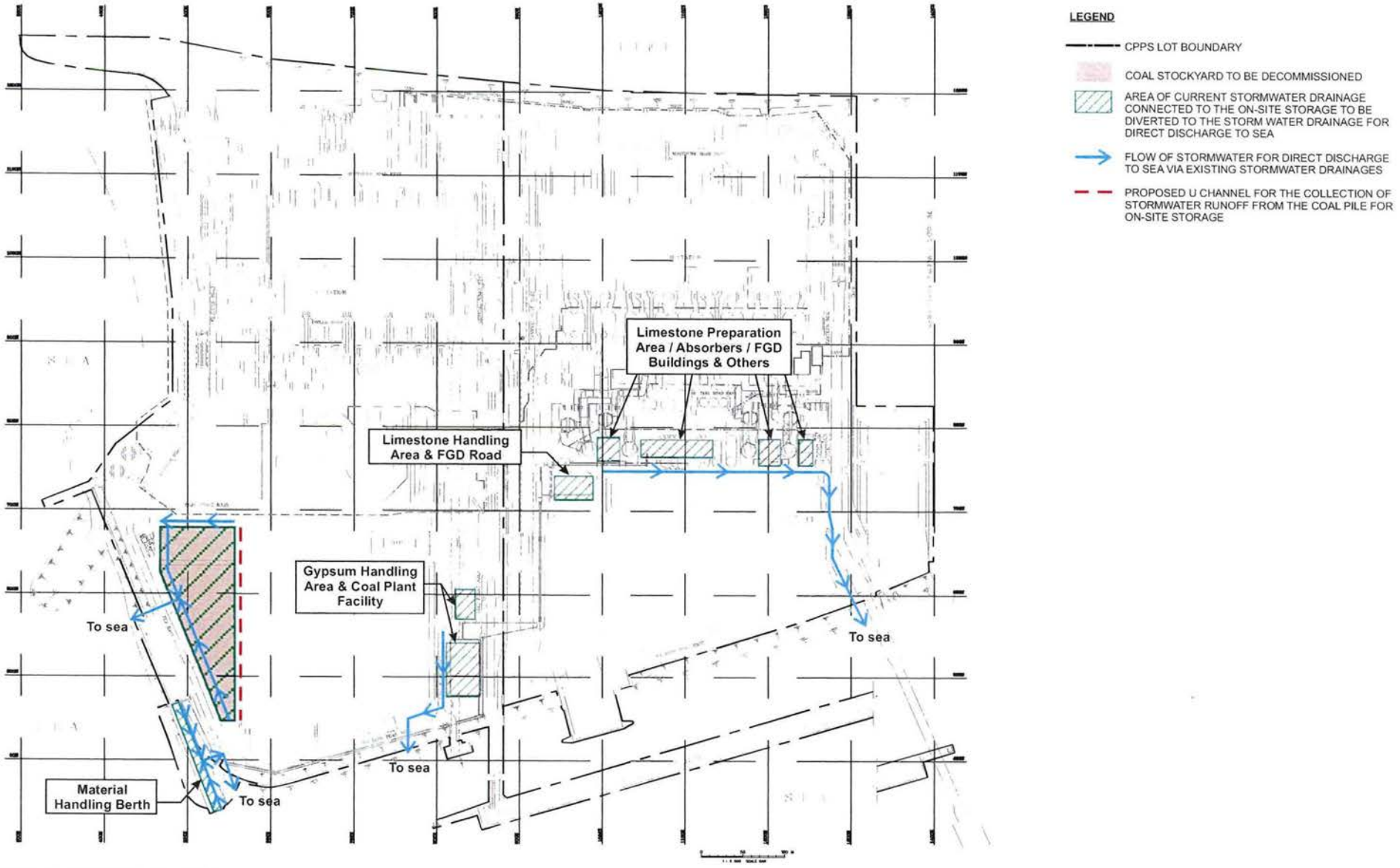
The parts in the current EP that are proposed for amendment are summarised in *Table 5.1*.

Table 5.1 Potential Amendment to the EP-441/2012

Item	Parts	Potential Amendment
1	(i) Part B Scale and Scope of Designated Project	Update the description with 2017 Scheme
2	Figure 1	Update with the layout of the 2017 Scheme
3	Condition 2.2 of EP-441/2012	Revise to read ".... before the commencement of the partial decommissioning works of the west coal stockyard.".

Annex A

Drainage Rearrangement Plan



Annex A

Rearrangement Plan for Drainage Catchment

FILE: 0348497m1.cdr
DATE: 15/03/2018

Environmental Resources Management

ERM

Annex B

Contamination Assessment Plan

REPORT

Castle Peak Power Company Limited

Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

Contamination Assessment Plan

April 2018

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REPORT

Castle Peak Power Company Limited

Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

Contamination Assessment Plan

April 2018

Reference 0348497

For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Mr Frank Wan
Signed:	
Position:	Partner
Date:	16 April 2018

CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

The Castle Peak Power Company Ltd (CAPCO) currently uses the West Ash Lagoons at Tsang Tsui for disposal of surplus ashes, which consist mainly of raw Pulverised Fuel Ash (PFA), rejected PFA and Furnace Bottom Ash (FBA) generated from the CPPS; and storage of process water/ stormwater runoff arising from the Castle Peak Power Station (CPPS). It is anticipated that the use of West Ash Lagoon in the future by the Government for the WENT Landfill development is going to impact on the daily operations of CPPS, especially on ash and stormwater management.

Currently, there are two Water Storage Lagoons (Lagoons Nos. 1 and 2) at CPPS for temporary storage of stormwater runoff collected from the coal stockyards and process water from the operation of CPPS which can be reused for the operation of CPPS. Surplus stormwater is pumped to the West Ash Lagoon which can be pumped back to CPPS for reuse, if required. Without the West Ash Lagoon, there will be limited temporary storage capacity for stormwater runoff collected from CPPS. During the summer months, surplus stormwater will have to be discharged to the sea. During the winter months, there will be shortage of rainwater and the shortfall will have to be augmented by town water supply.

1.1.1 *The 2012 Scheme*

A design scheme was put forward in 2012 to enhance ash utilization and water management facilities at the CPPS before handing over of the West Ash Lagoon to the Government (hereinafter referred as 'the 2012 Scheme').

The 2012 Scheme proposed construction works to increase the storage capacity of the existing lagoons (Lagoons Nos. 1 and 2) at the CPPS, enhance the re-use of stormwater collected for the operation of the CPPS, and increase ash utilisation by adding new buffer silos, PFA handling and transport system and a PFA grinding plant. The 2012 Scheme is a Designated Project (DP) under the Environmental Impact Assessment Ordinance (EIAO) and a Project Profile was submitted under the EIAO to apply directly for an Environmental Permit. An EP (EP-441/2012) was issued by the Director of Environmental Protection in 2012. The layout plan of the 2012 Scheme shown in the current EP is shown in *Annex A*.

1.1.2 *The 2017 Scheme*

CAPCO is currently reviewing the design of the 2012 Scheme taking account of the anticipated reduction in ash production due to the Government strategy to reduce the coal-fired power generation in the future; and potential reduction of the stormwater runoff catchment areas and availability of spare water storage tanks on site. A new scheme is being developed (hereafter "the 2017 Scheme"). The key changes to the 2012 Scheme are summarized as follows.

- The proposed 5 new PFA silos are not required.
- Re-construction of a new 750 tonne PFA silo to replace the demolition of 2 exiting PFA silos instead;
- New grinding plant will not be required;
- Dimension of the west coal stockyard for decommissioning is updated;
- Re-routing of the ash transfer pipeline is not required;
- New water lagoon to be replaced by above ground water tanks and excavations are not required;
- Modification works at the existing water lagoons are not required; and
- Addition of a process water polishing unit to enhance the water quality for reuse within the power generation process.

The layout plan of the 2017 Scheme is shown in *Annex B*. All design changes are within the CPPS boundary.

1.1.3 *Land Contamination Assessment*

CAPCO has commissioned ERM-Hong Kong, Limited (ERM) to apply for a Variation of Environmental Permit (VEP) of the approved EP (EP-441/2012). In supporting the VEP application, an *Environmental Review (ER) Report* was prepared to identify and assess the key environmental implications based on the proposed changes and implementation of the 2017 Scheme.

As part of the *ER Report*, a land contamination assessment of the works areas of the Project (the Site) has been carried out. This Contamination Assessment Plan (CAP) is prepared to identify potential sources of soil and/or groundwater contamination due to past and present operations at the works area. As the design and geological coverage between 2012 Scheme and the 2017 Scheme have been changed, the CAP in the Project Profile will need to be updated. Therefore, this CAP is prepared as part of the ER of 2017 Scheme, is prepared with a new assessment area (see *Annex B*) and will supersede the CAP in the Project Profile.

1.2 *OBJECTIVE OF THE CAP*

This CAP details the past and present land uses of the Site in relation to possible soil and groundwater contamination at the Site. This CAP reviewed the change of land use and site layout under 2017 Scheme against the 2012 LCA, evaluated the existing data in previous Site Investigation and concluded whether the findings are still valid and representative. This CAP also determined the need and methodology for an intrusive site investigation (SI) of the Project Site to identify the nature and extent of on-site contamination (if any). If required, the findings of the SI will be evaluated and reported in the

Contamination Assessment Report (CAR). If the SI results indicate that the soil and/or groundwater to be excavated or extracted for the construction of the Project exceed the Risk Based Remediation Goals (RBRGs) of corresponding future land uses, a Remediation Action Plan (RAP) will also be prepared. All the CAP, CAR and RAP will be submitted to the Environmental Protection Department (EPD) for approval.

If remediation is deemed necessary, the project proponent shall clean up the contaminated land or site(s) according to the approved RAP, and a Remediation Report (RR) to demonstrate adequate clean-up should be prepared and submitted to EPD for endorsement prior to the commencement of development or redevelopment works.

1.3 *STRUCTURE OF THIS CAP*

This section introduces the background of the Assignment, while subsequent Sections are structured according to the assessment methodology for contaminated sites.

- *Section 2* outline the statutory requirements and the evaluation criteria for this land contamination assessment;
- *Section 3* describe the project components and the associated construction works;
- *Section 4* presents the findings of the site appraisal, including site survey, information on the past and present land uses, etc;
- *Section 5* proposes the land contamination investigation programme to assess the potential contamination in the Site, if applicable; and
- *Section 6* presents the conclusion and recommendations.

This CAP is also supplemented by the following annexes:

Annex A *Layout Plan of the 2012 Scheme and 2017 Scheme*

Annex B *Works Areas of the 2017 Scheme*

Annex C *Selected Site Photographs*

Annex D *Referenced Aerial Photographs*

Annex E *Chemical Waste Producer Registration and Letter from FSD on Fire Incidents, Chemical Spillage and DG Storage*

Annex F *Previous Ground Investigation Borehole Logs*

Annex G *Sampling Location Plan*

Annex H *Details of Pilot Land Contamination Assessment*

2 STATUTORY REQUIREMENTS AND EVALUATION CRITERIA

2.1 STATUTORY FRAMEWORK

Annex 19 of the Technical Memorandum on EIA Process (TM) requires that the Project Proponent of DPs shall give consideration to the historical land uses which have the potential to cause or have caused land contamination. Being one of the listed land uses as power plant, submission of a CAP to EPD for endorsement is required.

The following key guiding documents are to be referenced for land contamination assessment:

- Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management (the RBRGs Guidance Manual);
- Guidance Note for Contaminated Land Assessment and Remediation (the RBRGs Guidance Note); and
- Practice Guide for Investigation and Remediation of Contaminated Land (the RBRGs Practice Guide).

The following legislation, documents and guidelines may cover or have some bearing upon the assessment of contamination and the handling, treatment and disposal of contaminated materials for the Project:.

- *Water Pollution Control Ordinance* (WPCO) (Cap 358);
- *Waste Disposal Ordinance* (WDO) (Cap 354);
- *Waste Disposal (Chemical Waste) (General) Regulation* (Cap 354C); and
- *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.*

2.2 SELECTION OF RBRG LAND USE SCENARIO

In accordance with Section 2 of the RBRGs Practice Guide, the site's future land use and the appropriate set of RBRGs corresponding to the land use scenarios should be determined prior to the site appraisal. The Hong Kong RBRGs were developed for four different post-restoration land use scenarios, namely:

- Urban residential,
- Rural residential,
- Industrial, and
- Public parks.

As the proposed Project comprises engineering works for the enhancement of ash utilisation and water management systems, and the future land use of the Site will be continually as industrial use for the operation in the CPPS, the RBRGs conceptual site model under industrial land use scenarios will be adopted.

3 DESCRIPTION OF THE PROPOSED PROJECT

The Project comprises two components, one for enhancement of the existing water management facilities and one for enhancement of the ash handling and utilisation facilities at CPPS.

3.1.1 *Enhancement of Water Management Facilities*

At present, the stormwater runoff collected from the coal yard and boiler backyard catchment areas is treated by sedimentation in the Lagoon Nos. 1 and 2. The current practice encourages on-site utilisation of the stormwater runoff collected at the CPPS with surplus water pumped to the Tsang Tsui PFA Lagoons. It is proposed to enhance the water management facilities by:

- Construction of a new above-ground process water tank for storage of returned process water, with capacity of approximately 7,000 m^3;
- Installation of a two-staged filter (i .e. grit removal) to reduce the suspended solids (SS) levels in the process water collected from the power generation system and a process water polishing unit to further enhance the water quality in the reuse water tank for reuse within the power generation process;
- Installation of associated equipment for handling solids generated from the filters or to allow the settlement of solids in the lagoon; and
- Modification of the existing stormwater runoff distribution system to enhance the temporary storage of stormwater runoff in the coal stockyards.

3.1.2 *Enhancement of Ash Handling & Utilisation Facilities*

Currently, the surplus raw PFA is mixed with water to form slurry and then pumped to Tsang Tsui Ash Lagoon (TTAL) through a dedicated pipeline system and the surplus rejected PFA (oversized PFA) is mixed with small amount of water to form conditioned PFA and then transported to the TTAL by dump trucks. It is proposed to enhance ash handling and utilisation by:

- Diversion of existing utilities and reprovisioning of the affected utilities - involving localised excavation works, flame cutting and welding
- Demolition of 2 existing 750 tonnes steel ash silos - involving flame cutting and lifting; and
- Construction of a new 750 tonnes PFA Storage Silos -involving foundation and concreting works, welding of pre-fabricated steel silo or in situ casting of concrete silo.

To optimise the stormwater drainage catchment, part of the west coal stockyard will be decommissioned. It is proposed to decommission by:

- HCV Coal Pile removal by the Caterpillar Coal Scrapers for loading into the 32 te truck;
- After the level of coal pile is lowered, the concerned portion of the coal yard will be emptied by use of Caterpillar Front End Loaders and/or Dozers;
- During the clearance of the coal pile, coal dust will be suppressed by water sprays using the spray guns and water browser in a way similar to the existing normal operations of the coal stockyard; and
- Construction of a shallow U channel along the edge of the decommissioned area along the new coal stockyard boundary to collect stormwater runoff from the coal pile.

The decommissioned area will be left as an open space. No specific uses have been planned in this area.

3.1 *ASSESSMENT AREA*

For the construction of the abovementioned equipment and facilities, it is anticipated that construction works will be undertaken at four (4) works areas within the Site. The assessment areas of this CAP will comprise these four works areas of this Project. *Annex B* presents the locations and boundaries of these four works areas.

Table 3.1 ***Areas Identified with Construction Works for the Project***

Associated Works Areas	Proposed Project Components
Works Area A: Contractor Village	Process Water Polishing Unit, Process Water Tank and Stage 2 Filters
Works Area B: South of Lagoon No.1	Stage 1 Filters
Works Area C: West Coal Stockyard	Partial Decommissioning of West Coal Store
Works Area D: Existing Ash Silos along Sea Bank Road West	Existing Silos A1 & A2 to be demolished and to re-construct Silo A1

4 SITE APPRAISAL FINDINGS

The site appraisal comprises site walkover, review of historical aerial photographs and maps, review of historical spillage and leakage records, and review of previous SI conducted at the Site.

4.1 SURROUNDING LAND USE OF THE ASSESSMENT AREA

The CPPS is situated along the Lung Mun Road of Tuen Mun. Surrounding land uses of the neighbouring environment of the assessment areas are summarised as follow:

North: Villages along the Lung Mun Road such as the Tung Tsui Village and Sha Po Kong Village. Further north is Lung Kwu Tan.

East: Mong Fat Mountain. Southeast of the assessment area is the Green Island Cement Plant. Further southeast is the Shui Wing Steel Mill.

South: The shore of Urmston Road Navigation Channel (also known as Dragon Drum Channel, a broad body of water between Lantau Island and Tuen Mun, which forms an inshore passage between the northwest end of Victoria Harbour and the mouth of the Pearl River).

West: The shore of Urmston Road Navigation Channel.

A site location map showing the overview of assessment area and surrounding land uses is presented in *Annex A*.

4.2 SITE WALKOVER FINDINGS

Site walkover of these four works areas were conducted on 15 August 2017. Findings of site observations were summarised in *Table 4.1* using the 'Standard Form 3.1 - Current Use' in accordance with the *RBRGs Guidance Manual*. *Annex C* presents the selected photographs of these works areas.

4.3 REVIEW OF PAST LAND USES

A review of past land uses at these four works areas were conducted by reviewing the aerial photographs in the years of 1976, 1981, 1984, 1996, 2001, 2003, 2006, 2008, 2013 and 2016. The aerial photographs and topographic maps were obtained from the Surveys and Mapping Office of the Lands Department. Key changes of site setting observed within each works areas were summarised in *Table 4.2* by using the 'Standard Form 3.2 - Past Use' in accordance with the *RBRGs Guidance Manual*. The referenced aerial photographs are attached in *Annex D*.

Table 4.1 Standard Form 3.1 Summary of On-Site Land Use – Current Use

Works Areas	Type of Facility/Business	On-site Property Land Use	Date Began	Description of Site Walkover Findings	Owner or Occupier	Approximate Size of On-site Property (m^3)	Off-site Property Affected?
Works Area A: Contractor Village	Industrial	Open Storage Contractor office	2008	Works Area A was used as on-site container office for the contractors of the Emission Control project in CPPS. The flat concrete paved area is vacant during the time of site visit. . .	CAPCO / Various contractors	6,500	No
Works Area B: South of Lagoon No. 1	Industrial	Contractor office	2006	Works Area B is occupied by a contractor for material storage. The area is fully concrete paved. Maintenance materials and repairing tools were stored inside temporary fenced storage area. .	CAPCO / Contractor	630	No
Works Area C: West Coal Stockyard	Industrial	Open storage	1986	Works Area C was used for open stockpile of coal. Ground conditions of the area could not be inspected as the entire area was homogeneously covered by coal.	CAPCO	16,000	No
Works Area D: Existing Ash Silos along Sea Bank Road West	Industrial	Coal ash storage	1989	Two PFA storage silos were installed in this area to store dry PFA produced as a by-product from the combustion of coal in CPPS. The silos were elevated by metal structure and served by two compressors sets on ground. The ground was concrete paved. No significant sources of soil and groundwater contamination were observed within the area covered under the existing silos.	CAPCO	350	No

Table 4.2 Standard Form 3.2 Summary of On-Site Land Use – Past Use

Works Areas	Type of Facility/Business	On-site Property Land Use	Date Began/ Period	Description of Site History	Owner or Occupier	Approximate Size of On-site Property (m^3)	Off-site Property Affected?
Works Area A: Contractor Village	Industrial	Open Storage Contractor office	1981	Reclamation completed and the CPPS was under construction. Temporary low-rising housing structures / container offices were observed within this works area.	CAPCO / Various contractors	6,500	No
			1996	The area of the current Contractor Village was occupied by three consecutive buildings, which resembled warehouses / workshops. The ground appeared to be concrete paved.			
			2001	The buildings observed in 1996 were demolished and replaced by some temporary structures on concrete paved ground.			
			2003 - 2008	The concrete paved grounds were used for material storage and were occupied by container offices. Minor machine/equipment repairing and maintenance activities were observed in some sheltered areas. Open areas were observed being used for storage of metal structures.			
			2017	All container offices and materials were removed from the Contractor Village Area.			
Works Area B: South of Lagoon No. 1	Industrial	Open Storage	1996	The works area was mostly vacant as shown in aerial photographs since 1996. Minor construction material storage was observed in year 2013..	CAPCO / Contractor	630	No
Works Area C: West Coal Stockyard	Industrial	Open storage	1981	Reclamation completed and the CPPS was under construction. Constructions (Temporary low-rise housing structures / container offices / workshops) were found within the southern part of the works area. .	CAPCO	16,000	No
			1984	Part of the works area was constructed with three consecutive single - storey buildings which resembled warehouses / workshops. The Coal Store A was established.			
			1986	The warehouses were removed. The whole works area was used as Coal Store A.			
Works Area D:	Industrial	Coal ash storage	1984	The area was vacant land.	CAPCO	350	No

Works Areas	Type of Facility/Business	On-site Property Land Use	Date Began/ Period	Description of Site History	Owner or Occupier	Approximate Size of On-site Property (m^3)	Off-site Property Affected?
Existing Ash Silos along Sea Bank Road West			1984 - 1990	The ash silos were erected during this period.			

4.4 *REVIEW OF HISTORICAL SPILLAGE AND LEAKAGE RECORD*

Enquiries were made to the EPD and CAPCO on chemical waste producer record and historical spillage and leakage records at CPPS. A visit to the Chemical Waste Collection Licensing Section of the EPD Territorial Control Office was arranged and information related to chemical waste producer registered in CPPS was extracted. A total of 19 chemical waste producers were registered in CPPS. *Table 4.3* summarised the list of chemical waste producers and their business nature. Upon further confirmation with CAPCO in 2017, all chemical waste producers were no longer active in CPPS except for the one held by CLP Power Hong Kong Ltd (i.e. no 9, CLP). In addition, none of these chemical waste producing activities, including the one held by CLP, were conducted within Works Areas A to D. A copy of chemical waste registration is provided in *Annex E.*

An information request was sent to CAPCO and FSD regarding the records of any historical chemical spillages, fire incidents and Dangerous Goods (DG) storage within the Works Area A to D. According to the information provided by CAPCO, DG stores were not located within Works Areas A to D. CAPCO also confirmed that no chemical spillage incidents and fire incidents were recorded within the Works Areas A to D. Information provided from FSD is provided in *Annex E.*

Table 4.3 ***List of Chemical Waste Producers Registered in CPPS***

	Company Name (English)	Company Name (Chinese)	Business Nature
1.	ABB (HK) Ltd.	N/A	Mechanical/Electrical Engineering
2.	Atlantic Projects Co.(HK) Ltd.	N/A	Engineering construction
3.	Barclay Mowlem (HK) Ltd.	百利茂林(香港)有限公司	Construction
4.	BEC Specialist (HK) Ltd.	N/A	Installation
5.	Chevalier (Envirotech) Ltd.	其士(環境技術)有限公司	Water treatment
6.	Chevalier (Envirotech) Ltd.	其士(環境技術)有限公司	Water treatment (Emission Control Project)
7.	China Harbour Engineering Co. Ltd.	中國海灣工程有限責任公司	Dredging and piling works
8.	Citic Guo Hua Trading (Overseas) Ltd.	中信國華貿易(海外)有限公司	Trading
9.	CLP Power HK Ltd.	中華電力有限公司	Electricity Generation
10.	Gammon Construction Ltd.	金門建築有限公司	Site formation, foundation and road works
11.	Hong Kong Fuji Technology Co. Ltd.	香港富士科技有限公司	Engineering
12.	Kaidai electric power environmental (HK) Co. Ltd.	凱迪電力環保(香港)有限公司	N/A
13.	Kum Shing (KF) Construction Co. Ltd.	金城營造有限公司	Construction Site
14.	Kum Shing E&M Ltd.	金城機電有限公司	Electric power generation
15.	Thermo Engineering and Consultants Ltd.	暉武工程有限公司	Corporate

	Company Name (English)	Company Name (Chinese)	Business Nature
16.	Thorn Security (HK) Ltd.	科藝防火保安工程香港有限公司	Security / fire protection system
17.	Wai Luen Development Ltd.	偉聯電力工程有限公司	Building and Construction Engineering
18.	Wan Chung Construction Company Ltd.	宏宗建築有限公司	Construction
19.	YSK2 Engineering Co, Ltd.	日昇基建工程有限公司	Demolition Works

4.5 *(HYDRO) GEOLOGY AND UNDERGROUND SOIL PROFILE*

In accordance with the records obtained from the CAPCO, ground investigations were conducted within some works areas during the Emission Control Project at Castle Peak Power Station "B" Units (ref: EIA-123/2006). Copies of relevant borehole records are attached in *Annex F*. The geological strata encountered were in general sandy fill materials with gravel sized rock fragments (~0 to 1m below base of concrete (bbc)), coarse sandy fill with cobble and boulder sized rock fragments (~1 to 7m bbc). Soil samples were generally recovered in shallow depths of boreholes.

4.6 *REVIEW OF PREVIOUS SITE INVESTIGATION*

4.6.1 *Land Contamination Assessment for 2012 Scheme in 2011 – 2012*

A Land Contamination Assessment (hereinafter referred to as 2012 LCA) was conducted during the periods between June 2011 and March 2012 for the Project Profile of the 2012 Scheme of the Project. Among a total of 46 soil samples and 10 groundwater samples (including 3 soil duplicate and 2 groundwater duplicate samples) taken from 20 sampling locations for the 2012 LCA, 24 soil samples and 8 groundwater samples (including 2 soil duplicate and 1 groundwater duplicate samples) taken from 9 sampling locations (8 boreholes and 1 trial pit) were located within or near the boundary of Works Areas A – D of the 2017 Scheme. No signs of non-aqueous phase liquid (NAPL) including stains and abnormal odour were observed during the groundwater sampling events. *Annex G1* and *G2* show these 9 sampling locations which are located within the Works Areas of the 2017 Scheme. *Table 4.5* summarises the drilling and sampling details and the analysis results of the soil samples. Soil sampling depths were determined based on the anticipated full depth of contamination or as required based on the proposed excavation depths and previous ground investigation records at these works areas.

Table 4.5 Summary of Land Contamination Assessment Results during 2012 LCA[a]

Sampling Locations	As-built Coordinate of the Sampling Locations		Drilling Depth (m bbc)	Sampling Depths (m bbc)	No. of Soil Samples Collected	No. of Groundwater Samples Collected[d]	Testing Parameters exceeding RBRGs (Y/N)					
							Heavy Metals [e]	TPH[f]	VOCs[g]	SVOCs[h]	PCBs	Free Cyanide
Works Area A: Contractor Village (Equivalent to Works Area A: Contractor Village in 2012 LCA)												
CV1	E 810022.07	N 825826.82	4.75	0.5, 1-1.5, 3-3.5, 4-4.5	4	0	N	N	N	N	N/A	N/A
CV2	E 810027.90	N 825853.76	10.10	0.5, 1.5, 2.9-3.35	3	1	N	N	N	N	N/A	N/A
CV3	E 810055.98	N 825803.87	10.00	0.5, 1.5, 4.28-4.35	3	1	N	N	N	N	N/A	N/A
CV4	E 810018.43	N 825779.68	10.05	0.5, 1.5, 3.00-3.45	3	1	N	N	N	N	N/A	N/A
CV5	E 809994.45	N 825836.88	10.05	0.5, 1.5-1.65	3 [b]	1	N	N	N	N	N/A	N/A
Works Area B: South of Lagoon No. 1 (Equivalent to the northern part of the Works Area B: No. 1 and 2 in 2012 LCA)												
ETP4	E 809885.14	N 825734.60	3.45	0.5, 1.5, 3.0	3	0	N	N	N	N	N/A	N/A
Works Area C: West Coal Stockyard (Equivalent to the western part of the Works Area F: West Coal Stockyard in 2012 LCA)												
EBH2	E 809375.91	N 826410.24	7.10	0.5	1	1	N	N	N	N	N/A	N
EBH3	E 809353.89	N 826381.00	7.50	0.4	1	1	N	N	N	N	N/A	N
EBH4	E 809335.89	N 826353.30	7.20	0.5, 0.8, 3.70-3.99	4 [c]	2 [c]	N	N	N	N	N/A	N

Notes:

(a) Under the 2012 scheme, the Works Areas were defined as follows: Works Area A: Contractor Village; Works Area B: Lagoon No. 1 and 2; Works Area C: South of Lagoon No.1; Works Area D: Jetty Road and Sea Bank Road West; Works Area E: West of Ash Classification Plant (ACP) Plant House and ACP Silos; Works Area F: West Coal Stockyard and Works Area G: Existing Ash Silos along Sea Bank Road West.

(b) Soil duplicate sample was collected at 0.5m bbc.

(c) Soil duplicate sample was collected at 0.5m bbc and groundwater duplicated samples was collected from the well.

(d) No signs of non-aqueous liquid phase including stains and abnormal odour were observed during the groundwater sampling events

(e) Heavy Metals: Antimony, Arsenic, Barium, Cadmium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Tin, Zinc, Mercury, Chromium (III) and Chromium (VI). For groundwater samples collected from Works Area A-E in 2012 LCA, no Heavy Metals were tested. For groundwater samples collected from Works Area F in 2012 LCA, Heavy Metal (Mercury) was tested.

(f) TPH: $C_6 - C_8$, $C_9 - C_{16}$ and $C_{17} - C_{35}$

(g) VOCs: For soil: Acetone, Benzene, Bromodichloromethane, 2-Butanone, Chloroform, Ethylbenzene, Methyl tert-Butyl Ether, Methylene Chloride, Styrene, Tetrachloroethene, Toluene, Trichloroethene and Xylenes (Total)

(h) SVOCs: For soil: Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Bis-(2-ethylhexyl)phthalate, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3cd)pyrene, Naphthalene, Phenanthrene, Phenol and Pyrene. For groundwater: Acenaphthylene, Acenaphthene, Anthracene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, Fluorene, Phenanthrene and Pyrene.

N/A - Such chemical parameter was not tested for the sample.

The laboratory analysis results indicate no exceedances of the RBRGs industrial land use for heavy metals, TPH, VOCs and SVOCs for all the soil and groundwater samples tested.

However, as the 2012 LCA was conducted five years ago, more up-to-date data should be collected to ascertain any potential contamination at these Works Areas during recent years. Also the sampling locations in the 2012 LCA cannot provide adequate coverage of all works areas identified in this Project.

4.6.2 *Pilot Land Contamination Assessment for the 2017 Scheme in 2016 – 2017*

According to the new project components in 2017 Scheme provided by CAPCO, a Pilot Land Contamination Assessment (PLCA) was conducted during the periods between August 2016 and October 2017 in order to provide more recent data to cover the Works Areas for this Project. The PLCA aimed to verify the ground condition at Works Area A – Contractor Village and Works Area B – South of Lagoon No.1, and to assess the land condition at Works Area D - Existing Silos A1 & A2 along Sea Bank Road West.

A total of 10 soil samples and 2 groundwater samples (including 2 soil duplicates) were taken from 3 sampling locations (2 boreholes and 1 trial pit) located within the boundary of Works Area A, B and D of the 2017 Scheme. *Annex G1* and *G2* show the locations of the boreholes and trial pits excavated in the PLCA. *Annex H1* shows the details of drilling method, sampling method and decontamination of equipment. *Annex H2* shows the borehole logs for these 3 sampling locations. *Table 4.6* summarises the drilling and sampling details and the analysis results of the soil samples. Soil sampling depths were determined based on the anticipated full depth of contamination or as required based on the proposed excavation depths and previous ground investigation records at these works areas.

The laboratory analysis results indicate no exceedances of the RBRGs industrial land use for heavy metals, TPH, VOCs and SVOCs for all the soil samples tested. All the boreholes excavated (except for TP1) were converted to groundwater wells and groundwater samples were taken for laboratory analysis. All the parameters (including petroleum carbon ranges (C_6 – C_8 and C_9 – C_{16}), VOCs, SVOCs) analysed were below the relevant detection limits. Petroleum carbon ranges (C_{17}-C_{35}) were detected in groundwater samples collected from AEBH1. However, their concentrations were below the RBRGs for industrial land use as well as the solubility limits. *Annex H3* shows the Standard Forms 3.2 and 3.3 of the RBRGs Guidance Manual, the summary tables of the laboratory analysis results and the laboratory testing reports issued by ALS. Quality control samples (2 sets of field blanks, 2 sets of equipment blanks and 6 sets of trip blank) were taken and no evidence of cross contamination was found. *Annex H4* shows the details of QA/QC practices and corresponding results.

The sampling locations of the PLCA provided adequate coverage of all the Works Areas identified in this Project. The site investigation and soil/

groundwater sampling of the PLCA were conducted during the period between August 2016 and October 2017 in accordance with the EPD's RBRGs Guidance Note and Practice Guide. In addition, there were no changes of land uses and no significant changes of site operations in the works areas since the completion of PLCA. It is therefore considered that the SI data collected from the PLCA is valid and representative for the land contamination assessment of this Project.

Table 4.6 Summary of Land Contamination Assessment Results during updated PLCA

Sampling Locations	As-built Coordinate of the Sampling Locations	Drilling Depth (m bbc)	Sampling Depths (m bbc)	No. of Soil Samples Collected	No. of Groundwater Samples Collected[c]	Testing Parameters exceeding RBRGs (Y/N)					
						Heavy Metals [d]	TPH[e]	VOCs[f]	SVOCs[g]	PCBs	Free Cyanide
Works Area A: Contractor Village											
TP1	E: 810038.76 N: 825805.98	1.8	0.5, 1.5	2	0	N	N	N	N	N/A	N/A
Works Area B: South of Lagoon No. 1											
AEBH1	E: 809886.08 N: 825745.58	9.6	0.5, 1.5, 3.4-3.85, 5.9	5[a]	1	N	N	N	N	N/A	N/A
Works Area D: Existing Silos A1 and A2 along Sea Bank Road West											
AEBH2	E: 809376.17 N: 826449.67	7.1	0.5, 1.5	3[b]	1	N	N	N	N	N/A	N/A

Notes:

(a) Soil duplicate sample was collected at 1.5m bbc.

(b) Soil duplicate sample was collected at 0.5m bbc.

(c) No signs of non-aqueous liquid phase including stains and abnormal odour were observed during the groundwater sampling events.

(d) Heavy Metals: Antimony, Arsenic, Barium, Cadmium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Tin, Zinc, Mercury, Chromium (III) and Chromium (VI). For groundwater samples collected, Heavy Metal (Mercury) was tested.

(e) TPH: $C_6 - C_8$, $C_9 - C_{16}$ and $C_{17} - C_{35}$

(f) VOCs: For soil: Acetone, Benzene, Bromodichloromethane, 2-Butanone, Chloroform, Ethylbenzene, Methyl tert-Butyl Ether, Methylene Chloride, Styrene, Tetrachloroethene, Toluene, Trichloroethene and Xylenes (Total)

(g) SVOCs: For soil: Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Bis-(2-ethylhexyl)phthalate, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3cd)pyrene, Naphthalene, Phenanthrene, Phenol and Pyrene. For groundwater: Acenaphthylene, Acenaphthene, Anthracene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, Fluorene, Phenanthrene and Pyrene

N/A - Such chemical parameter was not tested for the sample.

5 INTRUSIVE SITE INVESTIGATION PLAN

5.1 PROPOSED SAMPLING LOCATIONS, DEPTHS AND PARAMETERS

Table 5.1 summarises the number of sampling locations conducted and proposed within the Assessment Area. According to the proposed design outlined in the ER report, there will be no redevelopment works within the Works Area C - West Coal Stockyard except the construction of a shallow U channel along the edge of the decommissioned area along the new coal stockyard boundary to collect stormwater runoff from the coal pile. Given that the entire area within Area C has been homogeneously covered by coal and no future uses are planned (i.e. left vacant) in this area, a total of 19 investigation boreholes are proposed to further verify the land condition in the Works Area C - West Coal Stockyard.

Annex G3 shows the location of the borehole locations. With reference to the RBRG Guidance Manual, the RBRGs for industrial land use criteria were adopted for the interpretation of results. The RBRGs for soil and solubility limits are extracted and attached as *Annex J*.

Table 5.1 ***Proposed Sampling Locations for Further Site Investigation***

Works Area	Sampling Locations Conducted in the 2012 LCA and 2016 - 2017 PLCA	Proposed Sampling Locations to be Conducted
	Sampling Locations	Sampling Locations
Works Area A: Contractor Village	6[a]	-
Works Area B: South of Lagoon No.1	2[b]	-
Works Area C: West Coal Stockyard	3 [c]	19 [e]
Works Area D: Existing Ash Silos along Sea Bank Road West	1 [d]	-

Notes:

(a). 2012 LCA: soil and groundwater sampling at CV1, CV2, CV3, CV4 and CV5
2016-2017 PLCA: soil sampling at TP1

(b). 2012 LCA: soil sampling at ETP4
2016-2017 PLCA: soil and groundwater sampling at AEBH1

(c). 2012 LCA: soil and groundwater sampling at EBH2, EBH3 and EBH4

(d). 2016-2017 PLCA: soil and groundwater sampling at AEBH2

(e). Soil and Groundwater sampling at AEBH3 to AEBH21 will be conducted after the clearance of coal stockpile within Works Area C and prior to commencement of the construction of the Project.

Table 5.2 presents the number of sampling locations, their sampling methods, the number of samples, and the parameters that will be analysed. Soil sampling depths were determined based on the anticipated full depth of contamination or as required based on the proposed development, with reference to the potential excavation depths of the proposed construction works and previous ground investigation records at those particular works areas.

Table 5.3 presents the laboratory analytical methods and reporting limits proposed for the further SI (same set of methods and limits were also adopted in the PLCA). Sampling parameters for both soil and groundwater are proposed with reference to chemicals which may be encountered due to potential contaminative activities at power plant as stipulated in *EPD's Guidance Note.*

5.2 *SITE CONSTRAINTS AT PROPOSED SAMPLING LOCATIONS*

During the PLCA, SI sampling locations proposed in this CAP (AEBH3 to AEBH21) are currently located under the coal stockpile. The SI work could not be undertaken in this area until the coal stockpile is removed due to safety concerns (to avoid the SI being carried out at close proximity to the coal stockpile) and the likelihood of cross contamination (soil samples mixed with the crushed coal during sampling cannot be ruled out). It is therefore proposed that the proposed site investigation will be conducted after the clearance of coal stockpile within Works Area C.

5.3 *POTENTIAL DERIVATION FROM THE PROPOSED SAMPLING PLAN*

Detailed interpretation of the laboratory analysis results after the completion SI will be incorporated in the CAR. By experience, the exact sampling locations were subjected to fine adjustment due to site-specific conditions/ constraints (e.g. presence of underground utilities, foundations, insufficient headroom, spaces occupied by vehicles, etc) during the actual SI. All these changes in the borehole locations will be reported in the CAR.

Table 5.2 Proposed Sampling and Analysis Plan

Sampling Locations ID	Coordinate [a]		Drilling Depth and Method	Justification of the Sampling Locations	Soil		Groundwater	
					Sample Depths [b]	Parameters to be Analysed [c], [d], [e], [f]	Sample Depth	Parameters to be Analysed [d], [e], [e], [g]
Works Area F: West Coal Stockyard								
AEBH3	E: 809483.40	N: 826508.52	Borehole, 7m bbc	Ground condition verification	Manual excavation of inspection Pit (0-1.5m bbc): - To manually collect disturbed samples at 0.5m and 1.5m bbc. Rotary Drilling of boreholes from: - Continuous drilling and retrieving of soil materials for visual inspection at every 1m from the bottom of inspection pit to 2m below soil-groundwater interface for PID testing. - To collect undisturbed samples at 3.0m and 6.0m bbc.	Heavy Metals, Petroleum Carbon Ranges, VOCs, SVOCs and free Cyanide	To collect one groundwater sample at static groundwater level (Groundwater was located at approximately 4.5 to 5m bbc during previous sampling exercises at CPPS).	Heavy Metals (Mercury), Petroleum Carbon Ranges, VOCs, SVOCs and free Cyanide
AEBH4	E: 809500.72	N: 826478.55	Borehole, 7m bbc	Ground condition verification				
AEBH5	E: 809518.04	N: 826448.58	Borehole, 7m bbc	Ground condition verification				
AEBH6	E: 809457.16	N: 826493.94	Borehole, 7m bbc	Ground condition verification				
AEBH7	E: 809474.66	N: 826463.71	Borehole, 7m bbc	Ground condition verification				
AEBH8	E: 809492.05	N: 826433.57	Borehole, 7m bbc	Ground condition verification				
AEBH9	E: 809437.44	N: 826473.46	Borehole, 7m bbc	Ground condition verification				
AEBH10	E: 809453.56	N: 826445.70	Borehole, 7m bbc	Ground condition verification				
AEBH11	E: 809468.41	N: 826419.92	Borehole, 7m bbc	Ground condition verification				
AEBH12	E: 809419.41	N: 826450.16	Borehole, 7m bbc	Ground condition verification				
AEBH13	E: 809432.41	N: 826427.64	Borehole, 7m bbc	Ground condition verification				
AEBH14	E: 809444.77	N: 826406.27	Borehole, 7m bbc	Ground condition verification				
AEBH15	E: 809401.40	N: 826426.89	Borehole, 7m bbc	Ground condition verification				
AEBH16	E: 809421.11	N: 826392.68	Borehole, 7m bbc	Ground condition verification				
AEBH17	E: 809382.17	N: 826403.35	Borehole, 7m bbc	Ground condition verification				
AEBH18	E: 809396.82	N: 826378.73	Borehole, 7m bbc	Ground condition verification				
AEBH19	E: 809360.77	N: 826375.39	Borehole, 7m bbc	Ground condition verification				
AEBH20	E: 809368.28	N: 826362.32	Borehole, 7m bbc	Ground condition verification				
AEBH21	E: 809336.66	N: 826349.99	Borehole, 7m bbc	Ground condition verification				

Notes:

(a) Exact coordinates to be confirmed by contractor after sub-surface utility scanning and will be provided in the CAR.

(b) Sampling depths may be changed if there is presence of rock/ big boulders during rotary drilling. Exact sampling locations shall be subject to the instructions of land contamination specialist during supervision.

(c) Heavy Metals: Antimony, Arsenic, Barium, Cadmium, Chromium III, Chromium VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc.

(d) Petroleum Carbon Ranges: C6-C8, C9-C16, C17-C35;

(e) VOCs: Acetone, Benzene, Bromodichloromethane, 2- Butanone, Chloroform, Ethylbenzene, Methyl tert-Butyl Ether, Methylene Chloride, Styrene, Tetrachloroethene, Toluene, Trichloroethene, and Xylenes (Total);

(f) SVOCs for Soil: Acenaphthene, Acenphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis-(2-Ethylhexyl)phthalate, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Phenol, and Pyrene; and

(g) SVOCs for Groundwater: Acenaphthene, Acenphthylene, Anthracene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, Fluorene, Hexachlorobenzene, Naphthalene, Phenanthrene, and Pyrene.

Table 5.3 ***Laboratory Testing Methods and Reporting Limits***

Test Parameter	Soil		Groundwater	
	Method	Reporting Limit (mg/kg)	Method	Reporting Limit (µg/L)
Metals				
Antimony	USEPA 6020	1	-	Not Analysed
Arsenic	USEPA 6020	1	-	Not Analysed
Barium	USEPA 6020	1	-	Not Analysed
Cadmium	USEPA 6020	0.2	-	Not Analysed
Chromium III	USEPA 6020	1	-	Not Analysed
Chromium VI	USEPA 3060	1	-	Not Analysed
Cobalt	USEPA 6020	1	-	Not Analysed
Copper	USEPA 6020	1	-	Not Analysed
Lead	USEPA 6020	1	-	Not Analysed
Manganese	USEPA 6020	1	-	Not Analysed
Mercury	APHA 3112B	0.05	APHA 3112B	0.5
Molybdenum	USEPA 6020	1	-	Not Analysed
Nickel	USEPA 6020	1	-	Not Analysed
Tin	USEPA 6020	1	-	Not Analysed
Zinc	USEPA 6020	1	-	Not Analysed
Petroleum Carbon Ranges				
C6-C8	USEPA 8015	5	USEPA 8015	20
C9-C16	USEPA 8015	200	USEPA 8015	500
C17-C35	USEPA 8015	500	USEPA 8015	500
VOCs				
Acetone	USEPA 8260	50	USEPA 8260	500
Benzene	USEPA 8260	0.2	USEPA 8260	5
Bromodichloromethane	USEPA 8260	0.10	USEPA 8260	5
2-Butanone	USEPA 8260	5	USEPA 8260	50
Chloroform	USEPA 8260	0.04	USEPA 8260	5
Ethylbenzene	USEPA 8260	0.5	USEPA 8260	5
Methyl tert-Butyl Ether	USEPA 8260	0.5	USEPA 8260	5
Methylene chloride	USEPA 8260	0.5	USEPA 8260	50
Stryene	USEPA 8260	0.5	USEPA 8260	5
Tetrachloroethene	USEPA 8260	0.04	USEPA 8260	5
Toluene	USEPA 8260	0.50	USEPA 8260	5
Trichloroethene	USEPA 8260	0.1	USEPA 8260	5
Xylenes (Total)	USEPA 8260	1.5	USEPA 8260	15
SVOCs	USEPA 8270		USEPA 8270	
Acenaphthene	USEPA 8270	0.500	USEPA 8270	2
Acenaphthylene	USEPA 8270	0.500	USEPA 8270	2
Anthracene	USEPA 8270	0.500	USEPA 8270	2
Benzo(a)anthracene	USEPA 8270	0.500	-	Not Analysed
Benzo(a)pyrene	USEPA 8270	0.500	-	Not Analysed
Benzo(b)fluoranthene	USEPA 8270	0.500	USEPA 8270	1
Benzo(k)fluoranthene	USEPA 8270	0.500	-	Not Analysed

Test Parameter	Soil		Groundwater	
	Method	Reporting Limit (mg/kg)	Method	Reporting Limit (µg/L)
Benzo(g,h,i)perylene	USEPA 8270	0.500	-	Not Analysed
Bis-(2-Ethylhexyl)phthalate	USEPA 8270	5.00	-	Not Analysed
Chrysene	USEPA 8270	0.500	USEPA 8270	1
Dibenzo(a,h)anthracene	USEPA 8270	0.500	-	Not Analysed
Fluoranthene	USEPA 8270	0.500	USEPA 8270	2
Fluorene	USEPA 8270	0.500	USEPA 8270	2
Hexachlorobenzene	USEPA 8270	0.200	USEPA 8270	1
Indeno(1,2,3-cd)pyrene	USEPA 8270	0.500	-	Not Analysed
Napththalene	USEPA 8270	0.500	USEPA 8270	2
Phenanthrene	USEPA 8270	0.500	USEPA 8270	2
Phenol	USEPA 8270	0.50	-	Not Analysed
Pyrene	USEPA 8270	0.500	USEPA 8270	2
Dioxins / PCBs				
PCBs	USEPA 8270	0.1	USEPA 8270	1
Other Inorganic Compounds				
Cyanide, free	APHA 500CN:L	1	APHA 500CN:L	10

5.4 *SAMPLING METHODOLOGY*

5.4.1 *Overview*

Borehole drilling has been proposed as the means of sampling to investigate for subsequent determination of presence of soil and groundwater contamination. Soil boring and sampling will be supervised by a land contamination specialist. The soil sampling methodologies are based on methods developed by the US EPA, and adapted to Asian standards of operation and practices, as appropriate. These methods include decontamination procedures, sample collection, preparation and preservation, and chain-of-custody documentation as described in the following sections.

5.4.2 *Borehole Drilling*

The borehole will be advanced by means of dry rotary drilling method, i.e. without the use of a flushing medium, as far as practicable.

For safety reasons and to inspect for underground utilities, utility scanning will be performed at all proposed borehole locations to ensure clearance of underground structures prior to ground disturbance. In addition, an inspection pit will be excavated down to 1.5m below ground level (bgl) to manually perform underground utility clearance at each of the drillhole locations before drilling commences.

Disturbed soil samples will be collected at the depth of 0.5m and 1.5m below base of existing concrete pavement (m bbc) from the excavation pits. Soil boring using rotary drill rigs will then be performed from 1.5m bbc to a maximum depth of 6m bbc.

Soil samples will be retrieved at approximately 1m intervals for inspection of geological characters and for visual inspection for potential contamination (such as visual evidence of discolouration, staining, presence of non-aqueous liquid phase and abnormal odour). The soil profile with evidence of contamination (if any) will be recorded in the drilling log. The log will also include the general stratigraphic description, depth of sampling, sample notation, and level of groundwater (where encountered).

Undistributed soil samples will be collected at depths of 3.0m and 6.0m bbc by using U76/U100 core. Where there are suspected signs of contamination, extra samples will be taken for laboratory analysis.

5.4.3 *Soil Sampling*

The sampling programme will be undertaken with strict adherence to appropriate protocols to minimise the potential for cross-contamination between sampling locations. The following will be implemented while sampling:

- A ceramic spoon shall be used to collect disturbed soil sampling, which will be cleaned between sampling;
- Where possible, a new set of sampling equipment shall be used for each sampling event. If this is not possible then the equipment shall be cleaned with a non-phosphate detergent between each sampling event. Larger equipment such as drilling rigs, drill rods, casings, shall be steam cleaned where possible, or at a minimum pressure jet washed with water from the mains.
- The ceramic sampling spoon, sampling cores and other sampling equipments that come into direct contact with the samples shall be decontaminated first with fresh water and Decon 90 detergent; rinsed with distilled water and air dried prior to the sampling and between samples;
- Clean latex gloves shall be worn during sample collection and changed before each sample is collected to prevent cross contamination;
- The presence of volatile organic compounds (VOCs) from the samples shall be screened by using a Photo-ionisation Detection (PID) meter. Where PID readings over 20ppm are recorded or where significant visual or olfactory evidence of contamination is present, further laboratory analysis may be necessary; and
- The thickness of any free product and groundwater if present at locations shall be measured with an interface probe.

5.4.4 *Groundwater Sampling*

Groundwater samples will be collected if groundwater is encountered in the boreholes. For boreholes, groundwater monitoring wells shall be installed in

accordance with the instructions given by the land contamination specialist. *Annex I* presents a schematic drawing of groundwater monitoring well for reference.

After the installation of the monitoring wells, the depth of water table at all monitoring wells shall be measured in order to delineate the local groundwater table contours at the subject site. Well developments (approximately five well volumes) shall be carried out to remove silt and drilling fluid residing from the wells. The wells will then be allowed to stand for a day to permit groundwater conditions to stabilise.

Groundwater levels and thickness of any free product layer, if present, shall be measured at each well before groundwater samples are taken. One groundwater sample shall be collected from each well, using a disposable Teflon bailer.

5.4.5 *Sample Size*

Prior to sampling, the laboratory responsible for chemical analysis shall be consulted on the particular sample size and preservation procedures that are necessary for each chemical analysis. *Table 6.4* lists the recommended sample container types, sizes and preservation method.

Table 6.4 ***Summary of Sample Container Type, Sizes and Preservation Method***

Test Parameters	Container Type, Size and Preservation Method
Soil	
Heavy Metals	1 x 250ml glass jar with teflon-lined cap
VOCs / Petroleum Carbon Ranges	1 x 250ml glass jar with teflon-lined cap
SVOCs	1 x 250ml glass jar with teflon-lined cap
PCBs	1 x 250ml glass jar with teflon-lined cap
Free Cyanide	1 x 250ml glass jar with teflon-lined cap
Groundwater	
Metals (Mercury)	1 x 250ml plastic (no preserve)
TPH / VOCs / Petroleum Carbon Ranges	2 x 40ml amber glass vials (hydrochloric acid)
TPH / SVOCs / PCBs	1 x 1,000ml amber glass (no preserve)
Free Cyanide	1 x 250ml plastic (Sodium Hydroxide)

5.4.6 *Sample Handling and Laboratory Analysis*

All samples will be directly collected in laboratory supplied pre-cleaned sample bottles. Chain-of-custody documentation will be initiated immediately after samples are collected. Containers will be labelled in the field with the date, well designation, project name, time of collection and analysis to be performed. If the field work is expected to take several days and soil samples will be kept chilled with ice (at approximately 4°C) on-site and during transport. Samples will be delivered to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory or an equivalent laboratory approved by the Engineer, for chemical analyses. All analysis shall be conducted according to the test methods accredited by HOKLAS or

one of its Mutual Recognition Arrangement partners, along with laboratory internal Quality Assurance/Quality Control (QA/QC) procedures.

5.4.7 *Quality Assurance /Quality Control Samples*

QA/QC samples will be collected to allow an assessment of the quality of data collected. The QA/QC samples are listed below.

- At least one field soil duplicate sample and one groundwater duplicate sample will be collected for full suite analysis;
- One field blank per Works Area will be analysed for full suite analysis. The field blank will consist of laboratory supplied de-ionized water stored in the cooler boxes during sample shipment;
- One equipment blank per drilling rig mobilised will be collected and analysed for heavy metals to account for any potential cross-contamination due to drilling equipment. De-ionized water is poured onto decontaminated sampling equipment, and collected in appropriate sampling containers; and
- One trip blank per trip will be analysed for VOCs to account for any potential cross-contamination.

5.4.8 *Health and Safety*

A site health and safety plan shall be prepared before any site work is performed at the Site. The health and safety plan shall include:

- Instruction of works on work procedures, safe practices, emergency duties, and applicable regulations;
- Regularly scheduled meetings of the workers in which the possible hazards, problems of the job, and related safe practices are emphasized and discussed;
- Good housekeeping practices; and
- Availability of and instruction in the location, use and maintenance of personal protective equipment.

The specific safety measures to be implemented during the site work will depends on the nature and content of contamination, the site conditions and the regulations related to site safety requirements. As a pre-requisite, employee compensation insurance and third party insurance must be obtained for the workers and site work respectively. In general, the site work shall be performed with the following safety measures:

- Maintain proper safety devices, barriers to minimize hazards during the site investigation;

- Prohibit smoking and open flames;
- Develop and maintain a written emergency plan applicable to the land contamination site investigation;
- Maintain equipment in good operating condition and have emergency and first aid equipment ready for immediate use, where applicable;
- Conduct equipment tests to ensure that equipment is properly placed and in good operating condition, and that workers are able to respond to emergency situations;
- Require all workers employed or retained by the Contractor, or a subcontractor, to at all time wear clothing suitable for the works, weather and environmental conditions; and
- The personnel are required to wear respirator and gloves for vapour exposure protection, if necessary. Safety helmet and protective boots should be worn.

6 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The CAPCO proposes to enhance the ash utilisation and water management facilities at the CPPS. The Project under the 2017 Scheme will involve construction of a new above-ground water tank, a water polishing unit and 2-stage filters to enhance the quality of the water for reuse within the CPPS, and to replace the demolition of 2 existing PFA silos with re-construction of a new silo to maintain sufficient storage capacity of ash.

Four (4) Works Areas (A to D) have been identified for this Project where potential sources of soil and groundwater contamination were identified by site appraisal, including site walkover, review of past land uses by aerial photographs and historical maps, review of historical spillage and leakage records, review of geology and underground soil profile, and review of previous SI records and a pilot land contamination assessment. The need and extent of SI at each works area was also reviewed based on a risk-based approach.

A PLCA was conducted during the period between August 2016 and October 2017 in accordance with EPD's RBRGs Practice Guide and Guidance Note. The site investigation was undertaken at 3 locations (2 boreholes and 1 trial pit) in Works Areas A, B and D. All soil and groundwater samples collected indicate no exceedance in RBRGs for industrial land use.

6.2 THE WAY FORWARD

In order to provide adequate coverage of land contamination assessment within Works Area C, it is proposed to undertake SI with 19 boreholes evenly distributed within the West Coal Stockyard to be decommissioned. As the proposed sampling locations are located at the existing coal stockpile, the SI cannot be conducted at this stage due to safety consideration and the avoidance of cross contamination during sampling. It is therefore recommended that the SI should be carried out once the coal stockpile is removed. The corresponding results will be reported in the CAR.

The CAR will present the findings of the land contamination investigation and establish whether potential exposure pathways exist between the contaminants identified, if any, and potential sensitive receptors during the construction and operation of the Project. The analytical results will be compared against the RBRGs standards.

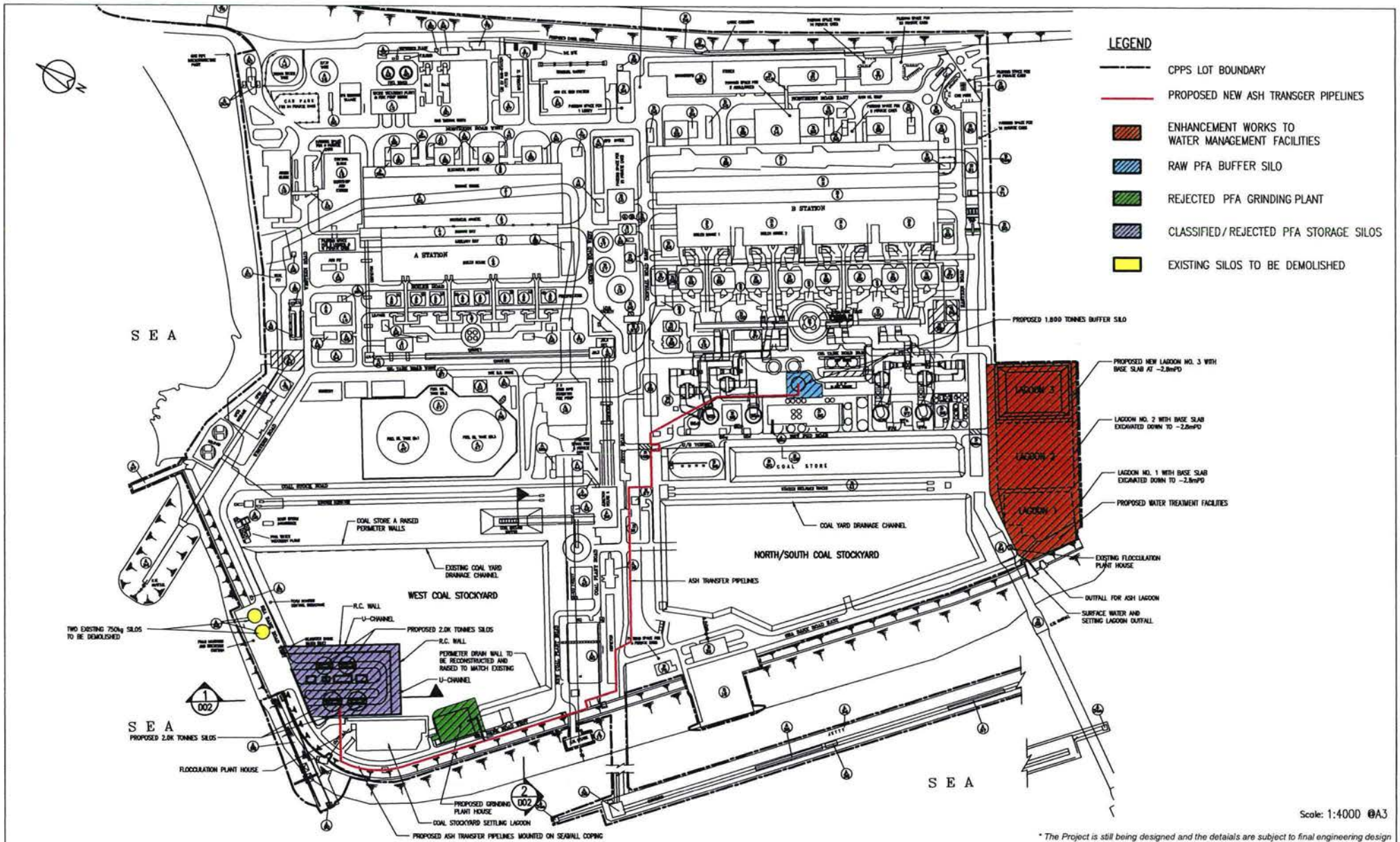
If the need for site remediation is considered necessary, the CAR will be accompanied by a Remediation Action Plan (RAP), which will be submitted to EPD for agreement. The RAP will examine the proposed remedial options and relevant issues of soil treatment versus disposal, proposed future land uses of potential risks based upon the soil, contamination type and

concentrations and any further site investigation required during the execution of the remediation work.

Upon completion of remediation work (if necessary), a Remediation Report (RR) will be prepared and submitted to EPD to demonstrate that the decontamination work is adequate and has been carried out in accordance with the approved CAR and RAP prior to commencement of any proposed construction works. No commencement of development and re-development works at the Works Areas of the Project will be carried out before the agreement of RR by EPD.

Annex A1

Layout Plan of the 2012 Scheme



* The Project is still being designed and the details are subject to final engineering design

Annex A

Layout Plan of 2012 Scheme

FILE: 0348497f.cdr
DATE: 08/11/2017

Environmental Resources Management

ERM

Annex A2

Layout Plan of the 2017 Scheme

LEGEND

CPPS LOT BOUNDARY

PROCESS WATER TANK

STAGE 1 FILTERS

STAGE 2 FILTERS

PROCESS WATER POLISHING UNIT

COAL STOCKYARD TO BE DECOMMISSIONED

EXISTING 2 SILOS TO BE DEMOLISHED

REPLACED BY RE-CONSTRUCTION OF A NEW SILO

Annex A

Layout Plan of 2017 Scheme

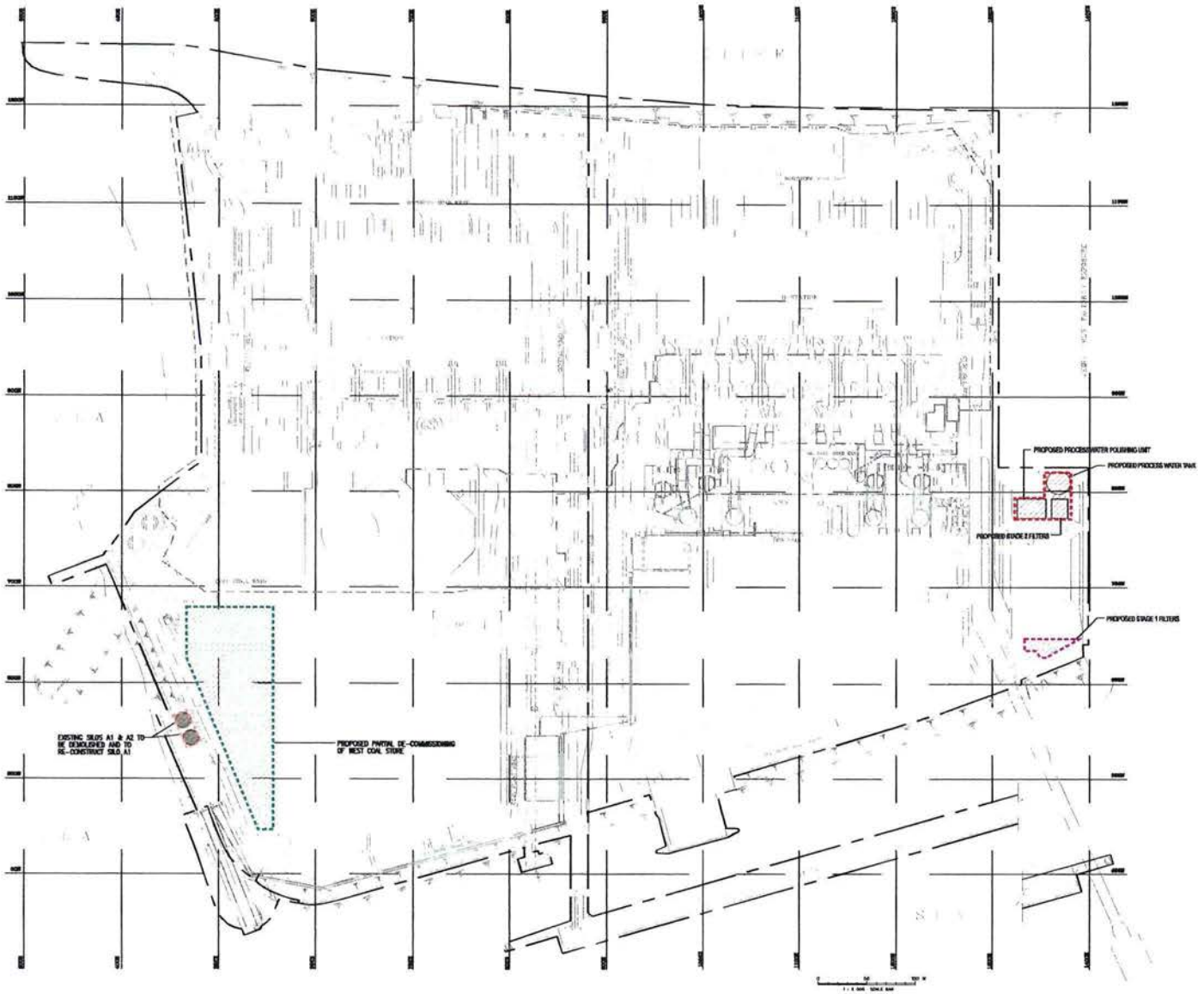
FILE: 0348497n.cdr
DATE: 16/04/2018

Environmental Resources Management

ERM

Annex B

Works Area of the 2017 Scheme



LEGENDS:

Lot Boundary of Castle Peak Power Station (CPPS)

Works Area A: Contractor Village

Works Area B: South of Lagoon No.1

Works Area C: West Coal Stockyard

Works Area D: Existing Ash Silos along Sea Bank Road West

Annex B

Works Areas of 2017 Scheme

FILE: 0348497j.cdr
DATE: 28/11/2017

Environmental Resources Management

ERM

Annex C

Selected Site Photographs

Photo 1: Contractor Village area is concrete paved.

Photo 2: Contractor Village area is concrete paved.

Photo 3: Temporary construction material storage area for Contractor at South of Lagoon No.1. The area is concrete paved.

Photo 4: Lagoon No. 1

PROJECT: CLP Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station	**TITLE:** Annex C1 Selected Site Photographs **CLP Castle Peak Power Station B**

ERM-Hong Kong, Limited
16/F Berkshire House
25 Westlands Road
Quarry Bay, HK
Tel: (852) 2271 3000
Fax: (852) 2723 5660

ERM

DATE:	CHECKED:	PROJECT: 0348497	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

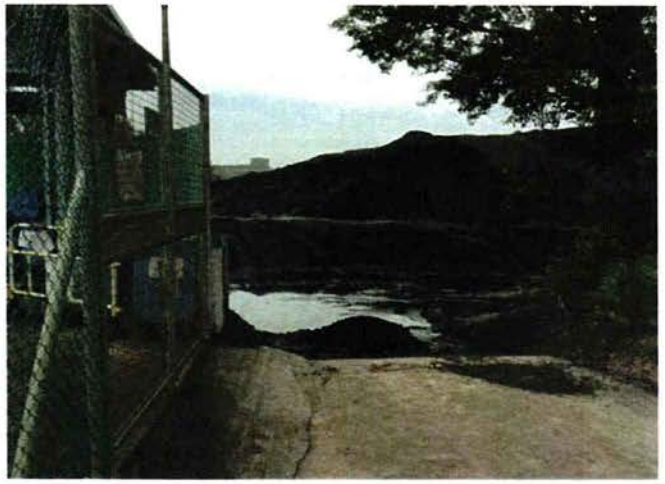


Photo 5: Entrance gate of west coal stockyard. The area is covered with coal pile.

Photo 6: Area next to Lagoon No.1 is concrete paved and stored with construction materials.

Photo 7: Existing ash silos along sea bank road west and the area is concrete paved.

Photo 8: Sea bank road west.

PROJECT:
CLP Ash Utilization and Wastewater Treatment Facility Lagoon

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Taikoo Place, Quarry Bay, HK
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ERM

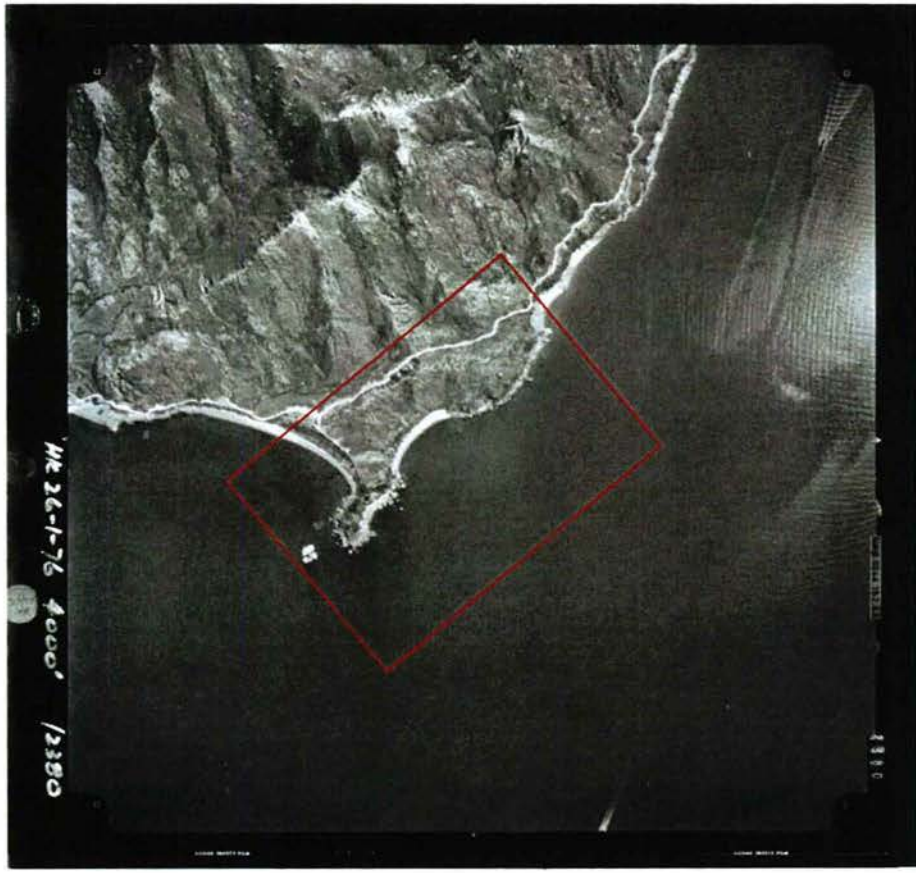
TITLE: Annex C1

Selected Site Photographs
CLP Castle Peak Power Station B

DATE:	CHECKED:	PROJECT: 0129558	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Annex D

Referenced Aerial Photographs



Year 1976 (ref: 12380, height: 4,000ft) and prior – The area and its vicinity is still part of the sea prior to reclamation work.

Year 1981 (ref: 38843, height: 4,000ft) – Reclamation is completed and the power plant was under construction. Some temporary structures were observed in the construction site.

Approximate Site Boundary

Source - GEO INFO, Lands Department, HKSARG

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TITLE: Annex D1
Referenced Aerial Photographs
CLP Castle Peak Power Station B

DATE:	CHECKED:	PROJECT: 0348497	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Year 1984 (ref: 55172, height: Oblique)
Works Area A: Contractor Village – Cars , container office and material storage were observed at this area.
Works Area B: South of Lagoon No.1 – This area was under construction.
Works Area C: West Coal Stockyard – This area was covered by coal stockpile.
Works Area D: Existing Silos along Sea Bank Road West – This area was vacant.

Year 1996 (ref: A42673, height: 5,000 ft)
Works Area A: Contractor Village – Temporary office buildings were observed.
Works Area B: South of Lagoon No.1 – Concrete paved vacant area.
Works Area C: West Coal Stockyard – No significant change was observed compared to 1984.
Works Area D: Existing Silos along Sea Bank Road West – Two ash silos were established.

Works Area A: Contractor Village
Works Area B: South of Lagoon No.1
Works Area C: West Coal Stockyard
Works Area D: Existing Silos A1 and A2 along Sea Bank Road West

Source - GEO INFO, Lands Department, HKSARG

PROJECT:
CLP Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

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TITLE: Annex D2

Referenced Site Photographs
CLP Castle Peak Power Station B

DATE:	CHECKED:	PROJECT: 0348497	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Year 2001 (ref: RW00428, height: 4,000ft)
Works Area A: Contractor Village – The temporary offices buildings observed in 1996 were replaced with temporary structures and material storage.
Works Area B: South of Lagoon No.1 – Small amount of material storage were observed.
Works Area C: West Coal Stockyard – No significant changes were observed compared to 1996.
Works Area D: Existing Silos along Sea Bank Road West – No significant changes were observed compared to 1996

Year 2003 (ref: CS17522, height 4,000ft)
Works Area A: Contractor Village – Material storage and container offices were observed in Contractor Village.
Works Area B: South of Lagoon No.1 – No significant changes were observed compared to 2001
Works Area C: West Coal Stockyard – No significant changes were observed compared to 2001
Works Area D: Existing Silos along Sea Bank Road West – No significant changes were observed compared to 2001

Works Area A: Contractor Village
Works Area B: South of Lagoon No.1
Works Area C: West Coal Stockyard
Works Area D: Existing Silos A1 and A2 along Sea Bank Road West

Source - GEO INFO, Lands Department, HKSARG

PROJECT:
CLP Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

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TITLE:
Annex D3
Referenced Aerial Photographs
CLP Castle Peak Power Station B

DATE:	CHECKED:	PROJECT: 0348497	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Year 2006 (ref: CS01519, height: 6,000ft)
Works Area A: Contractor Village – No significant changes were observed compared to 2003.
Works Area B: South of Lagoon No.1 – No significant changes were observed compared to 2003.
Works Area C: West Coal Stockyard – No significant changes were observed compared to 2003.
Works Area D: Existing Silos along Sea Bank Road West – No significant changes were observed compared to 2003.

Year 2008 (ref: CS17522, height: 6,000ft)
Works Area A: Contractor Village – No significant changes were observed compared to 2008.
Works Area B: South of Lagoon No.1 – No significant changes were observed compared to 2008.
Works Area C: West Coal Stockyard – No significant changes were observed compared to 2008.
Works Area D: Existing Silos along Sea Bank Road West – No significant changes were observed compared to 2008.

Works Area A: Contractor Village
Works Area B: South of Lagoon No.1
Works Area C: West Coal Stockyard
Works Area D: Existing Silos A1 and A2 along Sea Bank Road West

Source - GEO INFO, Lands Department, HKSARG

PROJECT:
CLP Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

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Quarry Bay, HK
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ERM

TITLE: Annex D4

Referenced Aerial Photographs
CLP Castle Peak Power Station B

DATE:	CHECKED:	PROJECT: 0348497	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Year 2013 (ref: CS44346, height: 6,000ft)
Works Area A: Contractor Village – No significant changes were observed compared to 2008.
Works Area B: South of Lagoon No.1 – No significant changes were observed compared to 2008.
Works Area C: West Coal Stockyard – No significant changes were observed compared to 2008.
Works Area D: Existing Silos along Sea Bank Road West – No significant changes were observed compared to 2008.

Year 2016 (ref: CS63470 height: 6,000ft)
Works Area A: Contractor Village – No significant changes were observed compared to 2013.
Works Area B: South of Lagoon No.1 – No significant changes were observed compared to 2013.
Works Area C: West Coal Stockyard – No significant changes were observed compared to 2013.
Works Area D: Existing Silos along Sea Bank Road West – No significant changes were observed compared to 2013.

Works Area A: Contractor Village
Works Area B: South of Lagoon No.1
Works Area C: West Coal Stockyard
Works Area D: Existing Silos A1 and A2 along Sea Bank Road West

Source - GEO INFO, Lands Department, HKSARG

PROJECT:
CLP Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

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Quarry Bay, HK
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TITLE: Annex D5

Referenced Aerial Photographs
CLP Castle Peak Power Station B

DATE:	CHECKED:	PROJECT: 0348497	
DRAWN:	APPROVED:	SCALE:	
DRAWING:		SIZE: A4	REV: 0

Annex E

Chemical Waste Producer Registration, Letter from FSD on Fire Incidents, Chemical Spillage and DG Storage

Environmental Protection Department
環 境 保 護 署

Waste Disposal Ordinance (Chapter 354)

香港法例第354章廢物處置條例

Waste Disposal (Chemical Waste)(General) Regulation

廢物處置(化學廢物)(一般)規例

Registration of Waste Producer

廢物產生者登記證

To: 致

Chemical Waste Producer 化學廢物產生者

Full Name (English) 全 名 (英 文): CLP Power Hong Kong Limited

(Chinese) (中 文): 中華電力有限公司

I.D. Card No. (if any) 身份證號碼 :(如有者): ---

Business Reg. Cert. No. (if any) 商業登記證號碼: (如有者): [redacted]

Address for Correspondence 通訊地址: [redacted]

Tel. No. 電 話: [redacted]

Fax No. 圖文傳真: [redacted]

With reference to your application dated 11 / 07 / 2017 **for registration as a Waste Producer under the Waste Disposal (Chemical Waste) (General) Regulation, the Waste Producer Number, WPN** 4|1|1|1-4|2|1-C|2|1|0|9-0|1 **is assigned to you in respect of the location or premises listed below:—**

前於 2017 年 07 月 11 日根據廢物處置(化學廢物)(一般)規例而來信，申請登記為廢物產生者，茲特配予廢物產生者編號第 4|1|1|1-4|2|1-C|2|1|0|9-0|1 號，予下開地點或處所: —

Location or Premises where the waste is produced 產生廢物的地點或處所

Name of Establishment 機構名稱: CLP Power Hong Kong Limited 中華電力有限公司

Business Reg. Cert. No. (if any) 商業登記證號碼: (如有者): [redacted]

Nature of Business 業務性質: Electricity Generation

Major chemical waste types 主要化學廢物種類: Paint, Solvents, lubricating / Insulating / Mineral Oil, Batteries, Asbestos, Acid/Alkaline Solution, Cutting Fluids, Oily Sludge, Soaking Water of Scrap Natural Gas Filter Element, Thinner, Fuel Oil, Flammable Liquid, Mercury, Cadmium Sulphate & Mercuric Sulphates, Heavy Metal, Urea and Sulphur Hexafluoride

Address 地址: [redacted]

ENVIRONMENTAL PROTECTION DEPARTMENT

Benny Poon

(POON Chun-yu, Benny)
for Director of Environmental Protection
環境保護署署長 (潘震宇 代行)

Date 日期 3 / 10 / 2017

WARNING : Any registered waste producer who fails to inform the Director of Environmental Protection of any change in his registration particulars commits an offence and is liable on conviction to a fine of $10,000.

警 告 : 任何已登記的廢物產生者，若其登記資料有任何改變而不知會環境保護署署長，即屬違法，被定罪者最高罰款港幣10,000元。

消防處
香港九龍尖沙咀東部廣東道1號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (175) in FSD GR 6-5/4 R Pt. 17
來函檔號 YOUR REF. :
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

[redacted]

(Attn: [redacted]

Dear [redacted]

Land Contamination Assessment at
Castle Peak Power Station, 1 Lung Yiu Street, Tuen Mun
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 3.11.2017 regarding the captioned request and reply below in response to your questions:-

According to our record, from the year of 2012 to present moment, dangerous goods licenses have been issued by this department to the subject address, with details as shown in **Appendix A**. No incident record was found at the aforesaid location with your given conditions.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(KONG Wai-chung)
for Director of Fire Services

Appendix

Land Contamination Assessment at
Castle Peak Power Station, 1 Lung Yiu Street, Tuen Mun
Request for Information of Dangerous Goods & Incident Records

Item	Type of DG	Quantity	Storage Method
1.	Cat. 2	100 Cylinders	G/F
2.	Cat. 5	50,000 L	G/F

Annex F

Previous Ground Investigation Borehole Logs

Ground Investigation Borehole Log from Emission Control Project

PRELIMINARY

DRILLHOLE RECORD

DRILLHOLE No. DH1

SHEET 1 of 1

PROJECT PO No. 4500295935 Castle Peak Power Station Contamination Assessment Survey

METHOD IP+W+RC	CO-ORDINATES	PROJECT No. LG24009/25
MACHINE & No. Longyear L38, D85	E 809524.17 N 826128.17	DATE from 03/12/2005 to 03/12/2005
FLUSHING MEDIUM Water	ORIENTATION Vertical	GROUND LEVEL + 5.05 mPD

Drilling Progress	Casing Depth/Size	Water Depth (m)	Water Recovery %	Total Core Recovery %	Solid Core Recovery %	R.Q.D.	Fracture Index	Tests	Samples No	Type	Depth	Reduced Level	Depth (m)	Legend	Grade	Description
03/12/2005	PX											5.05	0.00			
								PID = 2.00 ppm	1		0.50					Brown, very silty fine to coarse SAND with some angular fine to coarse gravel sized strong rock fragments (FILL)
									2		0.60	4.45	0.60			
				79						T3-NB						Light grey and brown, angular COBBLE and BOULDER sized up to 0.56m strong rock fragments (FILL)
			0	100						T3-NB	1.23					
				88						T3-NB	1.56					
	PX 2.07									T3-NB	2.07	2.98	2.07			
	HX			84						T3-NB						2.07-2.50m: with steel bar fragments
			50	79						T3-NB	2.50	2.55	2.50			
				60						T2101	2.84					
				74						T2101	3.33					
				56						T2101	3.86					
			50							T2101						
				59						T2101	4.74					
				60						T2101	5.10					
				84						T2101	5.60					
03/12/2005	HX 6.27	2.38m at 13:00								T2101	6.21	-1.22	6.27			End of investigation hole at 6.27m
													10.00			

- Small Disturbed Sample
- Water Sample
- SPT Liner Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- Piston Sample
- Packer Test
- Piezometer / Standpipe Tip
- Standard Penetration Test
- Pressuremeter Test
- Permeability Test
- Impression Packer / Televiewer Test
- In-situ Vane Shear Test

LOGGED H.K.Fung

DATE 12/12/2005

CHECKED I.S.McGlen

DATE 21/12/2005

REMARKS

1. Inspection pit excavated to 0.60m depth.
2. Groundwater sampling well installed at 5.00m.
3. PID test carried out at 0.60m depth.

PRELIMINARY

DRILLHOLE RECORD

DRILLHOLE No. DH2

SHEET 1 of 1

PROJECT PO No. 4500295935 Castle Peak Power Station Contamination Assessment Survey

METHOD IP+W+RC	CO-ORDINATES E 809543.86 N 826138.36	PROJECT No. LG24009/25
MACHINE & No. Longyear L38, D85		DATE from 01/12/2005 to 02/12/2005
FLUSHING MEDIUM Water	ORIENTATION Vertical	GROUND LEVEL + 5.12 mPD

Drilling Progress	Casing Depth/Size	Water Depth (m)	Water Recovery %	Total Core Recovery %	Solid Core Recovery %	R.Q.D.	Fracture Index	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
01/12/2005	PX							PID = 2.00 ppm	1 0.50 2 1.00	5.12 4.12	0.00 1.00			Greyish brown, very silty fine to coarse SAND (FILL)
			0	63 78 100 73 80					T6-1B 1.78 T6-1B 2.38 T6-1B 2.70 T6-1B 3.32	1.80	3.32			Light grey and brown, angular COBBLE with some coarse gravel sized moderately strong to strong rock fragments (FILL) 3.32-3.76m: with some sandy SILT
01/12/2005		Dry at 18:00							T6-1B 3.78	1.36	3.76			
02/12/2005		Dry at 08:00	50	63 80 50 44					T6-1B 4.52 T6-1B 5.24	0.60 -0.12	4.52 5.24			4.52-5.24m: with occasional cobble sized concrete fragments
02/12/2005	PX 6.77	2.55m at 13:00		55					T6-1B 6.28 T6-1B 6.77	-1.65	6.77			End of investigation hole at 6.77m
											10.00			

- Small Disturbed Sample
- Water Sample
- SPT Liner Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- Piston Sample
- Packer Test
- Piezometer / Standpipe Tip
- Standard Penetration Test
- Pressuremeter Test
- Permeability Test
- Impresson Packer / Televiewer Test
- In-situ Vane Shear Test

LOGGED H.K.Fung

DATE 12/12/2005

CHECKED LS.McGlen

DATE 21/12/2005

REMARKS

1. Inspection pit excavated to 1.00m depth.
2. Groundwater sampling well installed at 6.00m.
3. PID test carried out at 0.60m depth.

PRELIMINARY

DRILLHOLE RECORD

DRILLHOLE No. **DH5**

SHEET 1 of 1

PROJECT PO No. 4500295935 Castle Peak Power Station Contamination Assessment Survey

METHOD IP+W+RC	CO-ORDINATES E 809853.93 N 826111.57	PROJECT No. LG24009/25
MACHINE & No. Edeco H40, D70		DATE from 01/12/2005 to 02/12/2005
FLUSHING MEDIUM Water	ORIENTATION Vertical	GROUND LEVEL + 6.01 mPD

Drilling Progress	Casing Depth/Size	Water Depth (m)	Water Recovery %	Total Core Recovery %	Solid Core Recovery %	R.Q.D.	Fracture Index	Tests	Samples (No. Type Depth)	Reduced Level	Depth (m)	Legend	Grade	Description
01/12/2005	PX			97						6.01	0.00			Wash drilling
										5.53	0.48			Light grey and pink, angular COBBLE and BOULDER sized up to 0.61m strong rock fragments (FILL)
				86				PID = 1.50 ppm	T5-18 0.48					
									T5-18 1.10					
				82					T5-18 1.72					
									T5-18 2.23					
				64					T5-18 2.95					
				59					T5-18 3.54					
			70						T5-18 4.20					
				87					T5-18 4.68					
				73					T5-18 5.40					
				100					T5-18 6.21					
01/12/2005	PX 5.40	4.62m at 18:00							T2101 6.48					
02/12/2005	HX	4.76m at 08:00		80						-0.79	6.80			
	HX 6.48			78										End of investigation hole at 6.80m
02/12/2005		4.76m at 18:00		68							10.00			

- Small Disturbed Sample
- Water Sample
- SPT Liner Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- Piston Sample
- Packer Test
- Piezometer / Standpipe Tip
- Standard Penetration Test
- Pressuremeter Test
- Permeability Test
- Impression Packer / Televiewer Test
- In-situ Vane Shear Test

LOGGED H.K.Fung

DATE 12/12/2005

CHECKED I.S.McGlen

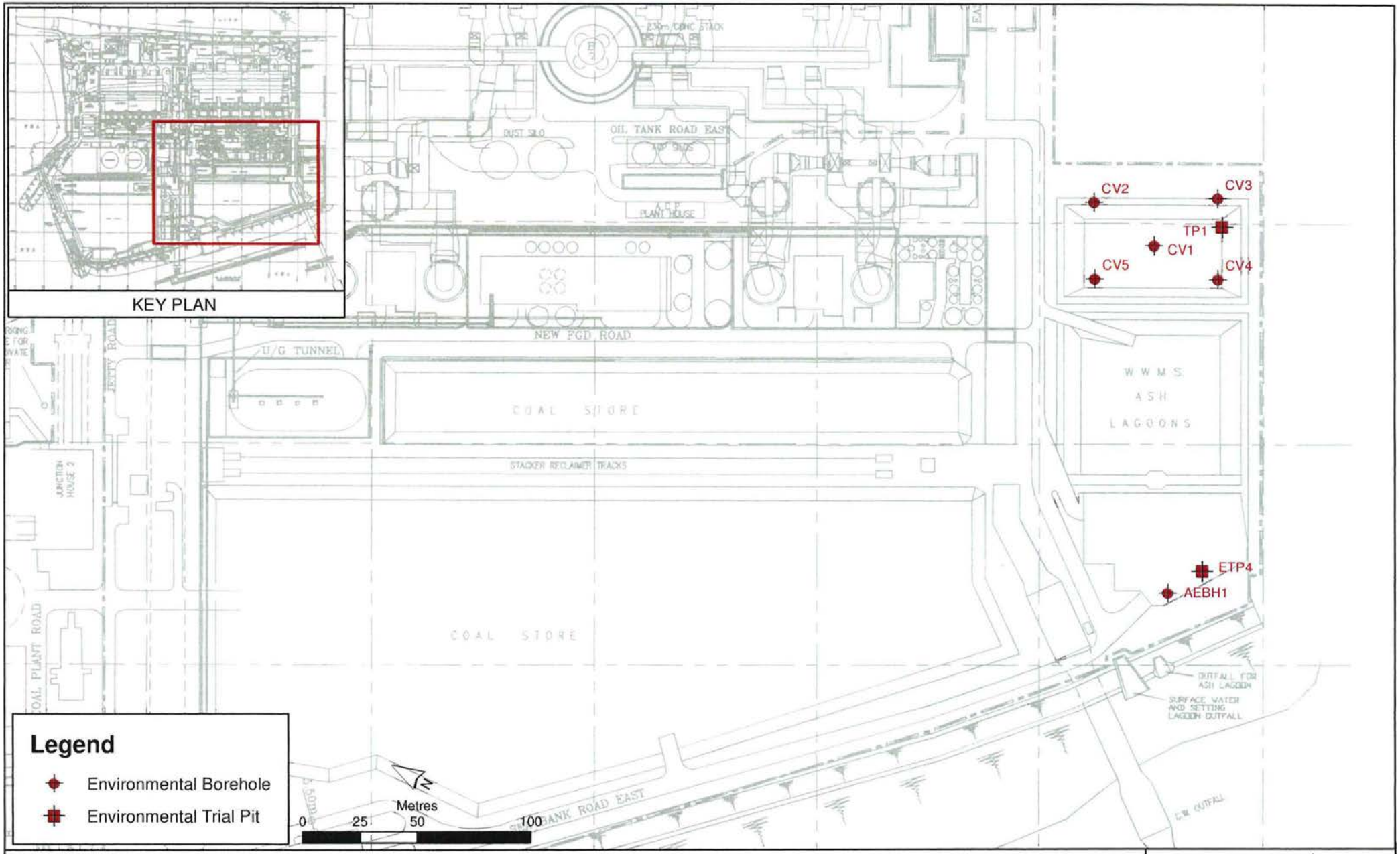
DATE 21/12/2005

REMARKS

1. Groundwater sampling well installed at 6.80m.
2. PID test carried out at 0.90m depth.

Annex G

Sampling Location Plan



Annex G1

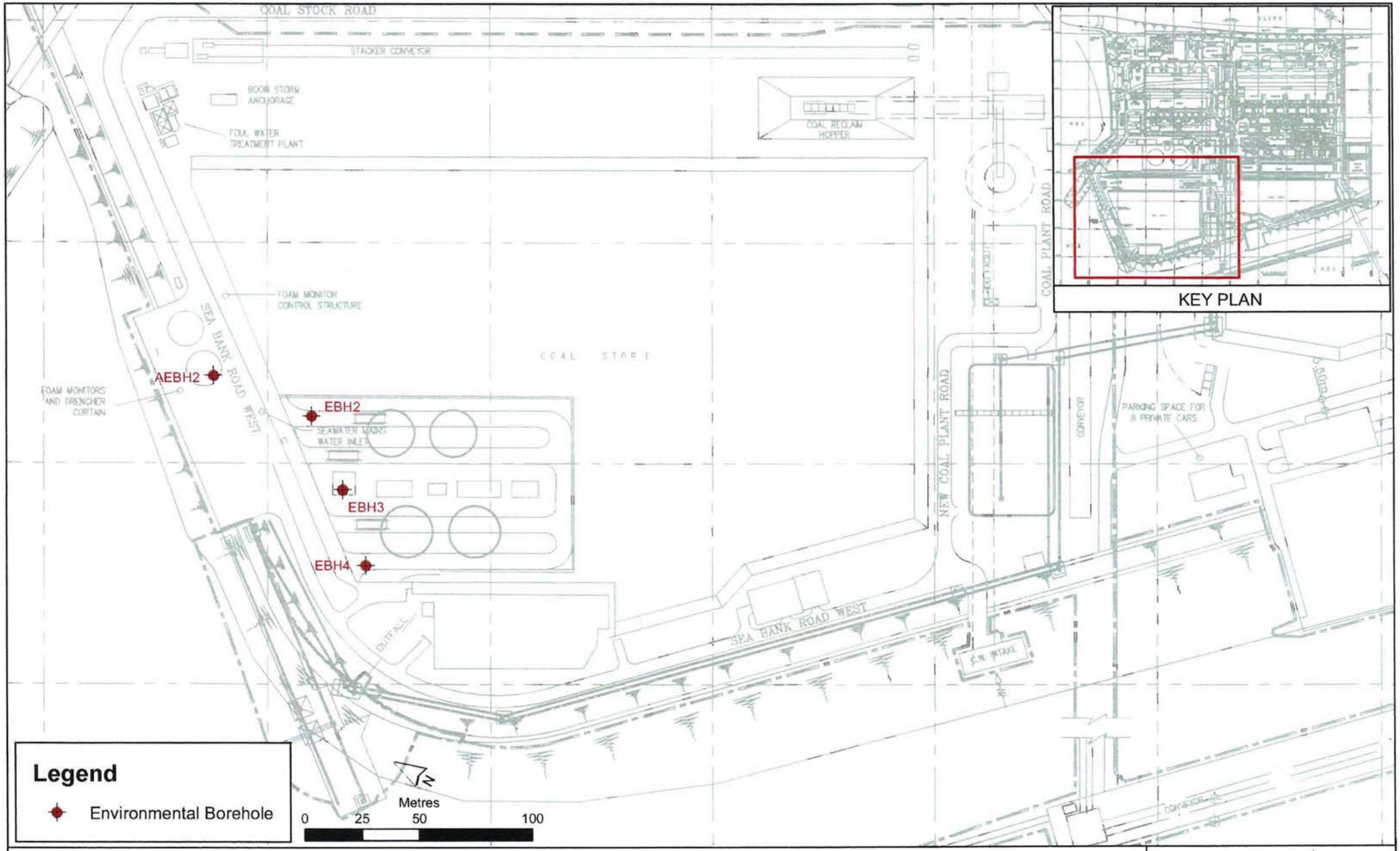
Sampling locations in previous environmental site investigations

Enhanced Ash Utilization and Wastewater Treatment Facilities in CPPS
Contamination Assessment Plan

File: T:\GIS\CONTRACT\0348497\Mxd\0348497_Boreholes_bottom_right.mxd
Date: 20/11/2017

Environmental Resources Management

ERM



Annex G2

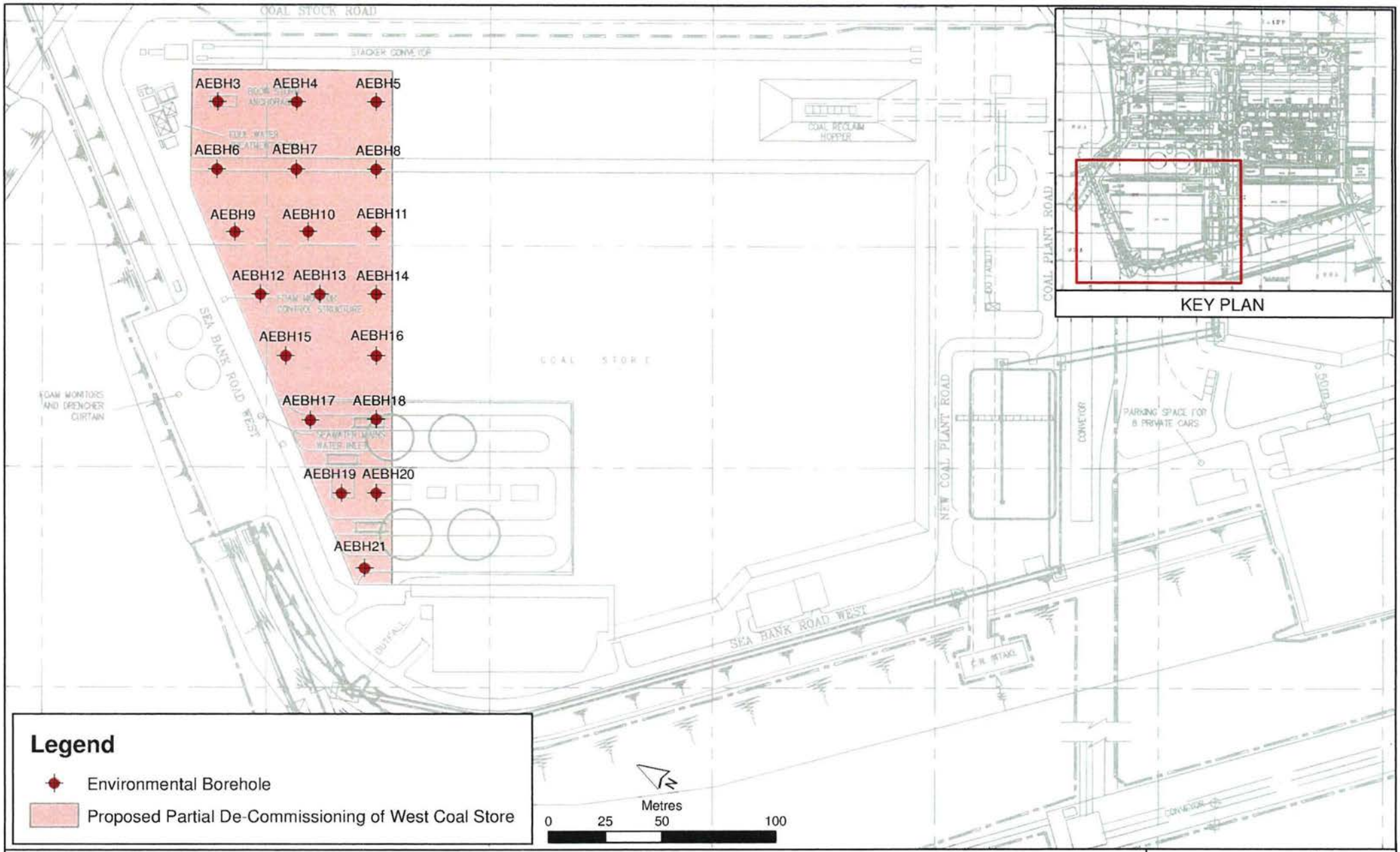
Sampling Locations in Previous Environmental Site Investigation

Enhanced Ash Utilisation and Water Management Facilities at CPPS
Contamination Assessment Plan

File: T:\GIS\CONTRACT\0348497\Mxd\0348497_Boreholes_bottom_left.mxd
Date: 13/11/2017

Environmental Resources Management

ERM



Annex G3

Environmental Site Investigation Plan

Enhanced Ash Utilisation and Water Management Facilities at CPPS Contamination Assessment Plan

File: T:\GIS\CONTRACT\0348497\Mxd\0348497_Environmental_Site_Investigation_Plan.mxd
Date: 20/11/2017

Environmental Resources Management

ERM

Annex H

Detail of Pilot Land Contamination Assessment

Annex H1

Details of Drilling, Sampling and Decontamination of Equipments

The PLCA was conducted by CAPCO's Geotechnical Contractor, the Gammon Construction Limited (Gammon) in August 2016 and CAPCO's Geotechnical Geotechnical Contractor, the Intrafor Hong Kong Limited (Intrafor) in October 2017.

For safety reasons, inspection pits were excavated manually down to 1.5m bbc, as far as practicable, for underground utility clearance at each of the sampling locations before drilling commenced. Drilling was than advanced continuously from 1.5m bbc by the dry rotary drilling method. Two rotary drilling rigs were mobilised to the Site for the sampling exercise. Water was used as a flushing medium when rock or boulders were encountered during drilling. Soil was retrieved at approximately 1m intervals for inspection for geological characteristics and for visual inspection for potential contamination (such as visual evidence of discolouration, straining, presence of non-aqueous liquid phase or abnormal odour).

For both borehole drilling and trial pit excavation, soil sampling was conducted by ERM site supervision staff on site. Strata logging for boreholes was undertaken by a qualified geologist. The logs include the general stratigraphic description, depth of soil sampling, sample notation and level of groundwater. The presence of rocks/boulders /cobbles and foreign materials such as metals, wood and plastics was also recorded. Gammon also conducted the level survey of each borehole, including as-built coordinate of sampling locations, level of the monitoring well cap (mPD) and ground level of boreholes (mPD). The soil types observed are recorded in the field boring logs (see *Annex H2*).

2 *GROUNDWATER MONTITORING WELL INSTALLATION AND WELL DEVELOPMENT*

Two boreholes conducted (namely AEBH1 and AEBH2) were converted into groundwater monitoring wells, using uPVC perforated piping with a machine slotted section (1mm or less slot aperture). The well screens were installed at a minimum of 1m above and 2m below the groundwater level. Well caps were secured to prevent contamination from the surface by filling bentonite and cement to the top of the void.

The monitoring wells were developed by bailing at least 5 times the well volume to remove standing water and allow for replenishment. The static groundwater levels were measured with an electronic groundwater level indicator in each well.

3 *DECONTAMINATION OF EQUIPMENT*

Sampling equipment used during the course of the site investigation was thoroughly decontaminated, to minimise the potential for cross-contamination. All equipment were decontaminated using a non-phosphate soap solution and water, with a distilled water rinse to clean all smaller pieces of equipment, in particular those used to sample materials such as sampling cores, hand excavation and grab samples. This cleaning procedure was repeated after use at each borehole to avoid potential cross contamination between boreholes.

Larger equipment and materials were steam cleaned using mains water, where possible, or at a minimum pressure jet washed with mains water prior to mobilisation to the Site.

During sampling and decontamination activities, disposable latex/nitrile gloves were worn to prevent transfer of contaminants from other sources. Any disposable equipment was disposed as general waste after each use.

Annex H2

Borehole logs from PLCA

Gammon

DRILLHOLE RECORD

HOLE No. **AEBH1**

OUTLINE AGREEMENT 4600005390

SHEET 1 of 2

PROJECT Outline Agreement No 4600005390 2-Year Outline Agreement for Site Investigation Works for Existing / Prospective Sites of CLP Power's Premises (2014-2016) - Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

METHOD Rotary	CO-ORDINATES	PURCHASE ORDER No. **4501019750**
MACHINE & No. MSK-15	E 809886.08 N 825745.58	DATE from 17/08/2016 to 24/08/2016
FLUSHING MEDIUM NA	ORIENTATION **Vertical**	GROUND LEVEL + 8.30 mPD

Drilling Progress	Casing depth/size	Water Depth (m)	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples No.	Type	Depth	Reduced Level	Depth (m)	Legend	Grade	Description
17/08/2016	PX	08:00										8.30	0.00			
																Reinforced CONCRETE slab.
												7.90	0.40			
									A		0.45					Grey, slightly silty fine to coarse SAND with some subangular fine to medium gravel sized rock and coal fragments. (FILL)
											0.50					
									B	INSPECTION PIT	0.95					
											1.00					
									C		1.45					
											1.50					
		Dry at 18:00							D		1.85					
17/08/2016											1.90					
20/08/2016		Dry at 08:00									2.00	6.30	2.00			
				71								6.15	2.15			Grey, light orangish brown and pink, angular to subangular coarse GRAVEL and COBBLE sized rock, concrete and coral fragments. (FILL)
												5.85	2.45			2.15 - 2.45m: In sandy silty matrix.
										T2IOI						
	PX 3.40	Dry at 18:00														
20/08/2016	HX								1		3.40	4.90	3.40			
22/08/2016		Dry at 08:00		100				45 bls								Greyish brown, slightly silty fine to coarse SAND with some subangular fine to coarse gravel sized rock fragments. (FILL)
				47					2		3.80 3.85	4.45	3.85			
																Light grey, orangish brown and pink, subangular coarse GRAVEL and COBBLE sized rock fragments. (FILL)
										T2IOI						
											5.35					
				60						T2IOI						
		Dry at 18:00									6.00					
22/08/2016																
23/08/2016		Dry at 08:00		20						T2IOI						
											7.50	0.80	7.50			
				20								0.60	7.70			7.50 - 7.70m: Boulder.
										T2IOI						
											9.00					
				27						T2IOI						
	HX 9.60	6.80m at 18:00									9.60	-1.30	9.60			
23/08/2016																
24/08/2016		7.52m at 08:00										-1.70	10.00			Wash boring, no sample recovered.

- Small disturbed sample
- Large disturbed sample
- SPT liner sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- Piston sample
- Water sample
- Piezometer / standpipe tip
- Standard penetration test
- Water absorption (Packer) test
- Permeability test
- Acoustic Televiewer Survey Test
- In-situ vane shear test
- Impression packer test

LOGGED **W K SIU**

DATE **25/08/2016**

CHECKED **T T FUNG**

DATE **26/08/2016**

REMARKS

1. Inspection pit was dug to 1.90m depth.
2. PVC pipe (dia. 50mm) was installed for collecting groundwater sample.
3. Soil samples at 0.50m, 2 nos. at 1.50m, 5.90m, U76 sample at 3.40m and water sample were sent to the laboratory.
4. Water was used as flushing medium when drilling hard material.

I:\gintw\library\10 august 2015 (new).glb\3159 clp drillhole

Gammon

DRILLHOLE RECORD

HOLE No. **AEBH1**

OUTLINE AGREEMENT 4600005390

SHEET 2 of 2

PROJECT Outline Agreement No 4600005390 2-Year Outline Agreement for Site Investigation Works for Existing / Prospective Sites of CLP Power's Premises (2014-2016) - Enhanced Ash Utilisation and Water Management Facilities at Castle Peak Power Station

METHOD Rotary	CO-ORDINATES	PURCHASE ORDER No. **4501019750**
MACHINE & No. MSK-15	E 809886.08 N 825745.58	DATE from 17/08/2016 to 24/08/2016
FLUSHING MEDIUM NA	ORIENTATION **Vertical**	GROUND LEVEL + 8.30 mPD

Drilling Progress	Casing depth/size	Water Depth (m)	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
24/08/2016		7.50m at 12:00								-1.70 -1.80	10.00 10.10			As sheet 1 of 2. End of hole at 10.10m depth.

- Small disturbed sample
- Large disturbed sample
- SPT liner sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- Piston sample
- Water sample
- Piezometer / standpipe tip
- Standard penetration test
- Water absorption (Packer) test
- Permeability test
- Acoustic Televiewer Survey Test
- In-situ vane shear test
- Impression packer test

LOGGED **W K SIU**

DATE **25/08/2016**

CHECKED **T T FUNG**

DATE **26/08/2016**

REMARKS

I:\gintw\library\10 august 2015 (new).glb\3159 clp drillhole

INTRAFOR	DRILLHOLE RECORD	DRILLHOLE No. AEBH 2
	OUTLINE AGREEMENT No. 4600006651	SHEET 1 of 1

PROJECT	Ash Handling System & Waste Water Management Facilities for Generation Business Group Heavy Load Breth Area at the Sea Bank Road West, near Ash Silos.	
METHOD **RCG**	CO-ORDINATES E **809376.17** N **826449.67**	PURCHASE ORDER No. 4501112020
MACHINE & No. **ZA017**		DATE from **13/10/2017** to **17/10/2017**
FLUSHING MEDIUM **WATER**	ORIENTATION **Vertical**	GROUND LEVEL **+ 5.54** mPD

Drilling Progress	Casing depth/size	Water Depth (m)	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples No.	Type	Depth	Reduced Level	Depth (m)	Legend	Grade	Description
13/10/2017	PX										5.54	0.00			Light brown, slightly silty fine to coarse SAND with some subangular fine to coarse gravel sized rock fragments. (FILL)
								1	D	0.50					
								2	D	1.00					
		Dry at 18:00						3	D	1.50	4.04	1.50			
13/10/2017															
16/10/2017		Dry at 11:00	53												Light grey, pink and orangish brown, COBBLE with some subangular coarse gravel sized rock and concrete fragments. (FILL)
	PX 2.20									2.20					
	HX		72							2.70					
			63							3.40					
		Dry at 18:00	36							4.10					
16/10/2017															
17/10/2017		Dry at 08:00	35							4.90					
			70							5.50					
			50							6.10					
			54							6.60					
		5.00m at 15:00	66							7.10					
17/10/2017	HX 7.10										-1.56	7.10			End of hole at 7.10m.
												10.00			

- Small disturbed sample
- Large disturbed sample
- SPT liner sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- Piston sample
- Water sample
- Standpipe tip
- Piezometer tip
- Standard penetration test
- Pressuremeter Test
- Permeability test
- Packer test
- Impression packer test
- In-situ vane shear test
- Televiewer test

LOGGED **Y.S.CHIK**
DATE **18/10/2017**
CHECKED **T.TANG**
DATE **19/10/2017**

REMARKS
1. Inspection pit excavated to 1.50m.
2. Water sample was taken at 7.10m.
3. Observation well was installed at 7.10m.

Project : Ash Handling System & Waste Water Management Facilities for Generation Business Group Heavy Load Breth Area at the Sea Bank Road West, near Ash Silos.			Logged by : Y.S.CHIK	Checked by : T.TANG	Excavation Dates : 18/10/2017 to 21/10/2017
Co-ordinates : E 810038.76	N 825805.98	Ground Level : + 7.14 mPD	Date logged : 24/10/2017	Date checked : 25/10/2017	Backfill Dates : 31/10/2017 to 31/10/2017

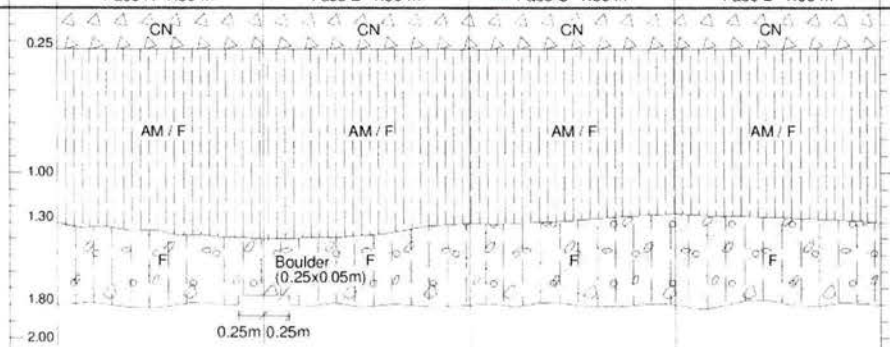
INTRAFOR

TRIAL PIT RECORD

OUTLINE AGREEMENT No. 4600006651

Purchase Order No. 4501112020

Trial Pit No. **TP1**

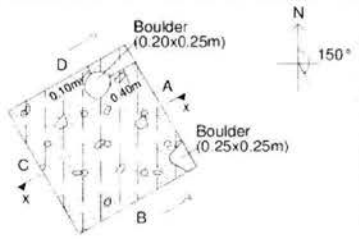


Depth (m)	Legend (Face)	Description	Grade
0.25	CN	Grey, CONCRETE with 10mm diameter steel reinforcements.	
1.30	AM / F	Very stiff, dry, SILT. (ASH MORTAR / FILL)	
1.80	F	Dense, dry, orangish brown, slightly silty fine to coarse SAND with some subangular fine to coarse gravel and cobble sized rock fragments. (FILL)	
		End of trial pit at 1.80m.	

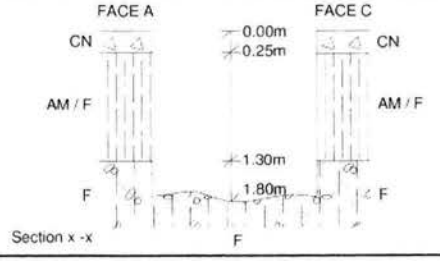
SYMBOL

- Small disturbed sample
- Large disturbed sample
- Undisturbed vertical sample
- Undisturbed horizontal sample
- Block sample
- In-situ density test
- Water sample
- Water seepage
- N - Schmidt Hammer Test

PLAN



SECTION



REMARKS

Shoring :	Timber shoring over full height
Stability :	Stable
Maxium Depth :	1.80m
Water Seepage :	No water seepage
Depth at pit centre :	Nil
Others :	Nil

Annex H3

Summary of Laboratory Analytical Results

G3-1 Standard Form 3.2 of the RBRGs Guidance Manual

Parameter	Frequency of Detection (x/y)	Range of Detected Conc. (mg/kg)	Range of Method Reporting Limit	Referenced Analytical Method	Relevant Land Use	Lowest RBRGs (mg/kg)	C_{sat} (mg/kg)	Maximum Concentration Exceeds	
								RBRGs	C_{sat}
Metals									
Antimony	1/10	1 - 2	1	USEPA 6020	Industrial	261	N/A	None	None
Arsenic	7/10	1 - 12	1	USEPA 6020	Industrial	196	N/A	None	None
Barium	10/10	22.3 - 1440	1	USEPA 6020	Industrial	10,000	N/A	None	None
Cadmium	3/10	0.2 - 0.4	0.2	USEPA 6020	Industrial	653	N/A	None	None
Cobalt	10/10	2 - 14	1	USEPA 6020	Industrial	10,000	N/A	None	None
Copper	10/10	5 - 24	1	USEPA 6020	Industrial	10,000	N/A	None	None
Lead	10/10	5 - 370	1	USEPA 6020	Industrial	2,290	N/A	None	None
Manganese	10/10	139 - 940	1	USEPA 6020	Industrial	10,000	N/A	None	None
Molybdenum	8/10	1 - 5	1	USEPA 6020	Industrial	3,260	N/A	None	None
Nickel	10/10	2 - 32	1	USEPA 6020	Industrial	10,000	N/A	None	None
Tin	10/10	1 - 4	1	USEPA 6020	Industrial	10,000	N/A	None	None
Zinc	10/10	20 - 204	1	USEPA 6020	Industrial	10,000	N/A	None	None
Mercury	2/10	0.2 - 0.4	0.2	USEPA 6020	Industrial	38.4	N/A	None	None
Chromium (III)	10/10	5 - 50	1	By calculation[e]	Industrial	10,000	N/A	None	None
Chromium (VI)	1/10	1 - 1.8	1	USEPA 3060	Industrial	1,960	N/A	None	None
Petroleum Carbon Ranges									
$C_6 - C_8$	0/10	BDL	5	USEPA 8015	Industrial	10,000	1,000	None	None
$C_9 - C_{16}$	0/10	BDL	200	USEPA 8015	Industrial	10,000	3,000	None	None
$C_{17} - C_{35}$	0/10	BDL	500	USEPA 8015	Industrial	10,000	5,000	None	None
VOC									
Various	0/10	BDL	0.04 - 50	USEPA 8260	Industrial	Various	Various	None	None
SVOC									
Various	0/10	BDL	0.200 - 5.00	USEPA 8270	Industrial	Various	Various	None	None

Parameter	Frequency of Detection (x/y)	Range of Detected Conc.	Range of Method Reporting Limit	Referenced Analytical Method	Relevant Land Use	Lowest RBRGs C_{sat} (mg/kg) (mg/kg)	Maximum Concentration Exceeds

Notes:

(a) x = number of samples above laboratory reporting limit; y = number of samples analysed

(b) RBRGs for Soil for the industrial land use was used for this Project

(c) VOCs: Acetone, Benzene, Bromodichloromethane, 2-Butanone, Chloroform, Ethylbenzene, Methyl tert-Butyl Ether, Methylene Chloride, Styrene, Tetrachloroethene, Toluene, Trichloroethene and Xylenes (Total)

(d) SVOCs: Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Bis-(2- ethylhexyl)phthalate, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3cd)pyrene, Naphthalene, Phenanthrene, Phenol and Pyrene

(e) Concentration of Chromium (III) = Concentration of Total Chromium – Concentration of Chromium (VI) according to the laboratory.

N/A – Not Applicable (no C_{sat} limits were available for these parameters)

BDL – Below Detection Limit

Various – Various RBRGs for Soil and C_{sat} for individual compound

G3-2 THE SUMMARY OF THE LABORATORY ANALYTICAL RESULTS WITH REFERENCE TO THE RBRGS SOIL AND SATURATION LIMITS (SAMPLES COLLECTED IN WORK AREA A)

Parameters	RBRGs Limit (mg/kg) [c]	Soil Saturation Limit (C_{sat}) (mg/kg)	LOR (mg/kg)	AEBH1-0.5M 0.5m HK1633725	AEBH1-1.5M[d] 1.5m HK1633725	AEBH1-3.4-3.85M 3.4-3.85m HK1634036	AEBH1-5.9M 5.9m HK1634036	AEBH2-0.5M[d] 0.5m HK1771166	AEBH2-1.5M 1.5m HK1771166	TP1-0.5M 0.5m HK1772073	TP1-1.5M 1.5m HK1772073
% Moisture Content	NA	NA	0.1%	16.8	20.0	9.1	12.0	8.5	9.6	29.5	13.7
Metals											
Antimony	261	NA	1	BDL	BDL	BDL	BDL	BDL	BDL	2	BDL
Arsenic	196	NA	1	2	4	BDL	BDL	1	1	12	6
Barium	10,000	NA	1	427	560	124	22.3	41	35	1440	290
Cadmium	653	NA	0.2	BDL	BDL	0.2	BDL	BDL	BDL	0.4	0.2
Cobalt	10,000	NA	1	14	10	14	3	3	4	5	11
Copper	10,000	NA	1	22	24	17	6	7	5	22	13
Lead	2,290	NA	1	5	12	121	370	92	78	11	36
Manganese	10,000	NA	1	257	241	940	521	548	376	139	275
Molybdenum	3,260	NA	1	1	2	BDL	BDL	1	1	5	4
Nickel	10,000	NA	1	32	23	28	2	3	2	8	21
Tin	10,000	NA	1	1	2	3	4	1	1	3	4
Zinc	10,000	NA	1	20	36	204	21	24	24	32	45
Mercury	38.4	NA	0.2	BDL	BDL	BDL	BDL	BDL	BDL	0.17	0.18
Trivalent Chromium	10,000	NA	1	23	20	50	6	7	6	28.5	34.2
Hexavalent Chromium	1,960	NA	1	BDL	BDL	BDL	BDL	BDL	BDL	1.8	BDL
Petroleum Carbon Ranges											
C_6-C_8	10,000	1,000	5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C_9-C_{16}	10,000	3,000	200	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C_{17}-C_{35}	10,000	5,000	500	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
VOCs [a]											
Various	Various	Various	Various	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SVOCs [b]											
Naphthalene	453	125	0.5	BDL	BDL	BDL	BDL	BDL	0.588	BDL	BDL
Phenol	10,000	7,260	0.5	BDL	BDL	BDL	BDL	BDL	0.76	BDL	BDL
Various	Various	Various	Various	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Notes:

(a) VOCs – Volatile Organic Chemicals including the following parameters: Benzene, Toluene, Ethylbenzene, Styrene, Xylenes (Total), Acetone, 2-Butanone, Methylene chloride, Trichloroethene, Tetrachloroethene, Chloroform, Bromodichloromethane, and Methyl tert-Butyl Ether.

(b) SVOCs – Semi Volatile Organic Chemicals including the following parameters: Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Bis-(2-Ethylhexyl)phthalate, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3-cd)pyrene, Napththalene, Phenanthrene, Phenol, Pyrene

(c) RBRGs Soil and Saturation Limits for Industrial Land Use were used for comparisons of results in this Project.

(d) A duplicate sample was taken from this location; the higher of the two results is reported in this table.

NA – no respective RBRGs/Solubility Limits available for these chemicals.

LOR – Limit of Reporting indicates the detection limits of the analytical results.

BDL – Below Detection Limit indicates the concentration is lower than the limit of reporting.

Bold results - Samples with contaminant concentrations exceeding RBRG/Soil saturation limit.

G3-3 THE SUMMARY OF THE LABORATORY ANALYTICAL RESULTS WITH REFERENCE TO THE RBRGS GROUNDWATER AND SOLUBILITY LIMITS

Parameters	RBRG Limit (μg/L) [c]	Solubility Limit (μg/L) [c]	LOR (μg/L)	AEBH1 HK1634542	AEBH2 HK1772442
Metals					
Mercury	6,790	N/A	0.5	-	-
Petroleum Carbon Ranges					
C_6-C_8	1,150,000	5,230	20	BDL	BDL
C_9-C_{16}	9,980,000	2,800	500	BDL	BDL
C_{17}-C_{35}	178,000	2,800	500	1,700	BDL
VOCs [a]					
Various	Various	Various	Various	BDL	BDL
SVOCs [b]					
Various	Various	Various	Various	BDL	BDL

Notes:

(a) VOCs – Volatile Organic Chemicals including the following parameters: Benzene, Toluene, Ethylbenzene, Styrene, Xylenes (Total), Acetone, 2-Butanone, Methylene chloride, Trichloroethene, Tetrachloroethene, Chloroform, Bromodichloromethane, and Methyl tert-Butyl Ether.

(b) SVOCs – Semi Volatile Organic Chemicals including the following parameters: Acenaphthene, Acenaphthylene, Anthracene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, Fluorene, Hexachlorobenzene, Napththalene, Phenanthrene, Pyrene

(c) RBRGs Groundwater and Solubility Limits for Industrial Land Use were used for comparisons of results in this project.

LOR – Limit of Reporting indicates the detection limits of the analytical results.

BDL – Below Detection Limit indicates the concentration is lower than the limit of reporting.

Bold results - Samples with contaminant concentrations exceeding RBRG/Solubility limit.

Various- Various RBRGs and Solubility Limits for individual compound.

Report No: HK1633725

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 11
Contact	: MR FRANKIE SIU	Contact	: Fung Lim Chee, Richard	Work Order	: HK1633725
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: frankie.siu@gammonconstruction.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 3191 5237	Telephone	: +852 2610 1044		
Facsimile	: +852 2564 6758	Facsimile	: +852 2610 2021		
Project	: ENHANCED ASH UTILISATION AND WATER MANAGEMENT FACILITIES AT CASTLE PEAK POWER STATION	Quote number	: ----	Date Samples Received	: 17-AUG-2016
Order number	: 4501019750			Issue Date	: 05-SEP-2016
C-O-C number	: H031821			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is: 17-AUG-2016 to 05-SEP-2016.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1633725

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: SOIL

Compound	CAS Number	LOR	Unit	Client sample ID / Client sampling date / time: AEBH1 - 0.5M [17-AUG-2016] HK1633725-001	AEBH1 - 1.5M [17-AUG-2016] HK1633725-002	AEBH1 - 1.5M - DUP [17-AUG-2016] HK1633725-003
EA/ED: Physical and Aggregate Properties						
EA055: Moisture Content (dried @ 103°C)	---	0.1	%	16.8	20.0	17.8
EG: Metals and Major Cations						
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1
EG020: Arsenic	7440-38-2	1	mg/kg	2	4	2
EG020: Barium	7440-39-3	1	mg/kg	427	560	506
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2
EG020: Cobalt	7440-48-4	1	mg/kg	14	10	10
EG020: Copper	7440-50-8	1	mg/kg	22	24	18
EG020: Lead	7439-92-1	1	mg/kg	5	12	10
EG020: Manganese	7439-96-5	1	mg/kg	257	241	224
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05
EG020: Molybdenum	7439-98-7	1	mg/kg	1	2	1
EG020: Nickel	7440-02-0	1	mg/kg	32	22	23
EG020: Tin	7440-31-5	1	mg/kg	1	2	2
EG020: Zinc	7440-66-6	1	mg/kg	20	30	36
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	23	20	19
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate						
Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	<0.200
Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	<5.00

Sub-Matrix: SOIL			Client sample ID	AEBH1 - 0.5M	AEBH1 - 1.5M	AEBH1 - 1.5M - DUP
			Client sampling date / time	[17-AUG-2016]	[17-AUG-2016]	[17-AUG-2016]
Compound	CAS Number	LOR	Unit	HK1633725-001	HK1633725-002	HK1633725-003
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)						
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)						
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	<1.0
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	<2.0
EP-074_SR-B: Oxygenated Compounds						
2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	<50
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5
EP-074_SR-E: Halogenated Aliphatics						
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	<0.1
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	<0.04
EP-074_SR-G: Trihalomethanes (THM)						
Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	<0.04
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	<0.1
EP-074_SR-I: Methyl-tert-butyl Ether						
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	<0.5
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates						
2-Fluorobiphenyl	321-60-8	0.1	%	**51.7**	**58.0**	**67.7**
4-Terphenyl-d14	1718-51-0	0.1	%	**77.6**	**54.1**	**61.2**
EP-080_SRS: TPH(Volatile)/BTEX Surrogate						
Dibromofluoromethane	1868-53-7	0.1	%	**96.6**	**97.1**	**95.6**
Toluene-D8	2037-26-5	0.1	%	**99.1**	**99.4**	**97.6**
4-Bromofluorobenzene	460-00-4	0.1	%	**96.9**	**98.8**	**98.0**
EP-074_SR-S: VOC Surrogates						
Dibromofluoromethane	1868-53-7	0.1	%	**96.6**	**97.1**	**95.6**
Toluene-D8	2037-26-5	0.1	%	**99.1**	**99.4**	**97.6**
4-Bromofluorobenzene	460-00-4	0.1	%	**96.9**	**98.8**	**98.0**

Sub-Matrix: WATER			Client sample ID	TRIP BLANK
			Client sampling date / time	[17-AUG-2016]
Compound	CAS Number	LOR	Unit	HK1633725-004
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)				
Benzene	71-43-2	5.0	µg/L	<5.0
Toluene	108-88-3	5.0	µg/L	<5.0
Ethylbenzene	100-41-4	5.0	µg/L	<5.0
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10
Styrene	100-42-5	5.0	µg/L	<5.0
ortho-Xylene	95-47-6	5.0	µg/L	<5.0
Xylenes (Total)	----	20	µg/L	<20
EP-074_SR-B: Oxygenated Compounds				
2-Propanone (Acetone)	67-64-1	500	µg/L	<500
2-Butanone (MEK)	78-93-3	50	µg/L	<50
EP-074_SR-E: Halogenated Aliphatics				
Methylene chloride	75-09-2	50	µg/L	<50
Trichloroethene	79-01-6	5.0	µg/L	<5.0
Tetrachloroethene	127-18-4	5.0	µg/L	<5.0
EP-074_SR-G: Trihalomethanes (THM)				
Chloroform	67-66-3	5.0	µg/L	<5.0
Bromodichloromethane	75-27-4	5.0	µg/L	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether				
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0
EP-074_SR-S: VOC Surrogates				
Dibromofluoromethane	1868-53-7	0.1	%	**99.2**
Toluene-D8	2037-26-5	0.1	%	**99.5**
4-Bromofluorobenzene	460-00-4	0.1	%	**99.2**

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4285524)								
HK1633725-001	AEBH1 - 0.5M	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	16.8	17.1	2.0
HK1634114-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	47.0	47.2	0.4
EG: Metals and Major Cations (QC Lot: 4284009)								
HK1633725-002	AEBH1 - 1.5M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	4	3	0.0
		EG020: Barium	7440-39-3	1	mg/kg	560	579	3.2
		EG020: Cobalt	7440-48-4	1	mg/kg	10	10	0.0
		EG020: Copper	7440-50-8	1	mg/kg	24	20	19.6
		EG020: Lead	7439-92-1	1	mg/kg	12	12	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EG: Metals and Major Cations (QC Lot: 4284009) - Continued								
HK1633725-002	AEBH1 - 1.5M	EG020: Manganese	7439-96-5	1	mg/kg	241	271	11.5
		EG020: Molybdenum	7439-98-7	1	mg/kg	2	2	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	22	24	6.6
		EG020: Tin	7440-31-5	1	mg/kg	2	2	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	30	29	0.0
EG: Metals and Major Cations (QC Lot: 4284012)								
HK1633725-002	AEBH1 - 1.5M	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4281599)								
HK1633387-014	Anonymous	Fluoranthene	206-44-0	150	µg/kg	492	503	2.2
		Pyrene	129-00-0	150	µg/kg	616	636	3.2
		Benz(a)anthracene	56-55-3	150	µg/kg	344	370	7.1
		Chrysene	218-01-9	150	µg/kg	373	400	7.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	434	516	17.2
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	181	217	18.2
		Benzo(a)pyrene	50-32-8	150	µg/kg	463	510	9.6
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	286	317	10.4
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	302	322	6.4
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	80	84	5.5
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	108	91	17.6
		Anthracene	120-12-7	50	µg/kg	74	80	7.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4281599)								
HK1633387-014	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	1720	1840	6.6
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	<50	0.0
		Phenol	108-95-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4277112)								
HK1632343-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4281874)								
HK1633725-001	AEBH1 - 0.5M	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4281875)								
HK1633725-001	AEBH1 - 0.5M	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0

Matrix: SOIL

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4281875) - Continued								
HK1633725-001	AEBH1 - 0.5M	meta- & para-Xylene	108-38-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	106-42-3 ----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4281875)								
HK1633725-001	AEBH1 - 0.5M	2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0
		2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4281875)								
HK1633725-001	AEBH1 - 0.5M	Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	0.0
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.0
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4281875)								
HK1633725-001	AEBH1 - 0.5M	Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	0.0
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4281875)								
HK1633725-001	AEBH1 - 0.5M	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4284009)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	83.6	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	87.3	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	95.3	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	101	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	83.7	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	91.0	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	97.0	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	86.0	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	85.8	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	87.1	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	81.8	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	87.2	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	103	----	76	118	----	----
EG: Metals and Major Cations (QC Lot: 4284012)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	96.0	----	92	122	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4281599)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	77.2	----	56	118	----	----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	74.7	----	42	110	----	----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	72.1	----	54	116	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4281599) - Continued											
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	77.2	----	58	116	----	----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	79.7	----	60	120	----	----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	79.9	----	25	128	----	----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	83.6	----	72	115	----	----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	81.6	----	71	113	----	----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	77.6	----	48	121	----	----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	91.4	----	70	115	----	----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	84.4	----	62	111	----	----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	88.8	----	70	114	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	83.5	----	37	123	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	82.0	----	57	116	----	----
Dibenz(a.h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	79.7	----	57	118	----	----
Benzo(g.h.i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	81.5	----	50	132	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4281599)											
Phenol	108-95-2	25	µg/kg	<500	500 µg/kg	59.0	----	53	129	----	----
Hexachlorobenzene (HCB)	118-74-1	25	µg/kg	<50	500 µg/kg	82.4	----	66	118	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	25	µg/kg	<1000	500 µg/kg	114	----	73	134	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4277112)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	99.1	----	77	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4281874)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	100	----	75	115	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	93.5	----	69	111	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4281875)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	95.9	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	93.3	----	70	146	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	97.8	----	80	111	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	95.7	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4281875)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	111	----	79	131	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	92.6	----	79	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4281875)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	108	----	75	125	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	94.3	----	79	109	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	91.5	----	75	107	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4281875)											

Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
			Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4281875) - Continued											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	102	----	75	123	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	102	----	79	123	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4281875)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	87.6	----	77	114	----	----

Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
			Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4284055)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	94.8	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	91.8	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	97.7	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	91.1	----	80	128	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	98.0	----	76	120	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	98.5	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.6	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4284055)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	94.4	----	65	140	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	103	----	67	118	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4284055)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	91.4	----	76	128	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	86.5	----	68	121	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	91.4	----	75	118	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4284055)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	89.6	----	66	134	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	71	125	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4284055)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	115	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations (QC Lot: 4284009)										
HK1633725-001	AEBH1 - 0.5M	**EG020: Antimony**	7440-36-0	5 mg/kg	85.3	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	78.9	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	106	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	92.8	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	85.6	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	80.8	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	84.8	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	82.9	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	86.4	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	101	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4284012)										
HK1633725-001	AEBH1 - 0.5M	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	98.0	----	75	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4277112)										
HK1632343-002	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	97.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4281874)										
HK1633725-002	AEBH1 - 1.5M	**C9 - C16 Fraction**	----	31.5 mg/kg	69.7	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	73.4	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates - Continued			
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Report No: HK1634036

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 14
Contact	: MR FRANKIE SIU	Contact	: Fung Lim Chee, Richard	Work Order	: HK1634036
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: frankie.siu@gammonconstruction.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 3191 5237	Telephone	: +852 2610 1044		
Facsimile	: +852 2564 6758	Facsimile	: +852 2610 2021		
Project	: ENHANCED ASH UTILISATION AND WATER MANAGEMENT FACILITIES AT CASTLE PEAK POWER STATION	Quote number	: ----	Date Samples Received	: 22-AUG-2016
Order number	: 4501019750			Issue Date	: 07-SEP-2016
C-O-C number	: H031822			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

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This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Chan Siu Ming, Vico	Manager - Inorganics	Inorganics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 22-AUG-2016 to 07-SEP-2016

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1634036

Sample(s) were picked up from client by ALS Technichem (HK) staff in chilled condition.
Water sample(s) analysed and reported on an as received basis.
Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.
Water sample(s) were filtered prior to dissolved metal analysis.
Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: SOIL

Compound	CAS Number	LOR	Unit	Client sample ID: AEBH1 - 3.4 - 3.85M Client sampling date / time: 22-AUG-2016 14:00 HK1634036-001	Client sample ID: AEBH1 - 5.9M Client sampling date / time: 22-AUG-2016 15:30 HK1634036-005
EA/ED: Physical and Aggregate Properties					
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	9.1	12.0
EG: Metals and Major Cations					
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1
EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1
EG020: Barium	7440-39-3	1.0	mg/kg	124	22.3
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	<0.2
EG020: Cobalt	7440-48-4	1	mg/kg	14	3
EG020: Copper	7440-50-8	1	mg/kg	17	6
EG020: Lead	7439-92-1	1	mg/kg	121	370
EG020: Manganese	7439-96-5	1	mg/kg	940	521
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1
EG020: Nickel	7440-02-0	1	mg/kg	28	2
EG020: Tin	7440-31-5	1	mg/kg	3	4
EG020: Zinc	7440-66-6	1	mg/kg	204	21
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	50	6
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate					
Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200
Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00

Sub-Matrix: SOIL			Client sample ID	AEBH1 - 3.4 - 3.85M	AEBH1 - 5.9M
			Client sampling date / time	22-AUG-2016 14:00	22-AUG-2016 15:30
Compound	CAS Number	LOR	Unit	HK1634036-001	HK1634036-005
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)					
C6 - C8 Fraction	----	5	mg/kg	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)					
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0
EP-074_SR-B: Oxygenated Compounds					
2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5
EP-074_SR-E: Halogenated Aliphatics					
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04
EP-074_SR-G: Trihalomethanes (THM)					
Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1
EP-074_SR-I: Methyl-tert-butyl Ether					
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates					
2-Fluorobiphenyl	321-60-8	0.1	%	**68.3**	**68.0**
4-Terphenyl-d14	1718-51-0	0.1	%	**85.5**	**85.6**
EP-080_SRS: TPH(Volatile)/BTEX Surrogate					
Dibromofluoromethane	1868-53-7	0.1	%	**97.2**	**95.1**
Toluene-D8	2037-26-5	0.1	%	**98.9**	**99.6**
4-Bromofluorobenzene	460-00-4	0.1	%	**97.8**	**97.0**
EP-074_SR-S: VOC Surrogates					
Dibromofluoromethane	1868-53-7	0.1	%	**97.2**	**95.1**
Toluene-D8	2037-26-5	0.1	%	**98.9**	**99.6**
4-Bromofluorobenzene	460-00-4	0.1	%	**97.8**	**97.0**

Sub-Matrix: WATER			Client sample ID	FIELD BLANK	EQUIPMENT BLANK	TRIP BLANK
			Client sampling date / time	22-AUG-2016 14:00	22-AUG-2016 14:00	22-AUG-2016 14:00
Compound	CAS Number	LOR	Unit	HK1634036-002	HK1634036-003	HK1634036-004
EG: Metals and Major Cations - Filtered						
EG020: Antimony	7440-36-0	1	µg/L	<1	<1	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	----
EG020: Barium	7440-39-3	1	µg/L	<1	<1	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	----
EG020: Copper	7440-50-8	1	µg/L	<1	<1	----
EG020: Lead	7439-92-1	1	µg/L	<1	<1	----
EG020: Manganese	7439-96-5	1	µg/L	<1	2	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	----
EG020: Nickel	7440-02-0	1	µg/L	3	<1	----
EG020: Tin	7440-31-5	1	µg/L	<1	<1	----
EG020: Zinc	7440-66-6	10	µg/L	16	54	----
EG049: Trivalent Chromium	16065-83-1	20	µg/L	<20	<20	----
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	<20	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	91-20-3	2.0	µg/L	<2.0	----	----
Acenaphthylene	208-96-8	2.0	µg/L	<2.0	----	----
Acenaphthene	83-32-9	2.0	µg/L	<2.0	----	----
Fluorene	86-73-7	2.0	µg/L	<2.0	----	----
Phenanthrene	85-01-8	2.0	µg/L	<2.0	----	----
Anthracene	120-12-7	2.0	µg/L	<2.0	----	----
Fluoranthene	206-44-0	2.0	µg/L	<2.0	----	----
Pyrene	129-00-0	2.0	µg/L	<2.0	----	----
Benz(a)anthracene	56-55-3	2.0	µg/L	<2.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	2.0	µg/L	<2.0	----	----
Benzo(a)pyrene	50-32-8	2.0	µg/L	<2.0	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L	<2.0	----	----
Dibenz(a.h)anthracene	53-70-3	2.0	µg/L	<2.0	----	----
Benzo(g.h.i)perylene	191-24-2	2.0	µg/L	<2.0	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate						
Phenol	108-95-2	2.0	µg/L	<2.0	----	----
Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L	<4.0	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	20.0	µg/L	<20.0	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)						
C6 - C8 Fraction	----	20	µg/L	<20	----	----
C9 - C16 Fraction	----	500	µg/L	<500	----	----
C17 - C35 Fraction	----	500	µg/L	<500	----	----

Sub-Matrix: WATER				Client sample ID	FIELD BLANK	EQUIPMENT BLANK	TRIP BLANK
				Client sampling date / time	22-AUG-2016 14:00	22-AUG-2016 14:00	22-AUG-2016 14:00
Compound	CAS Number	LOR	Unit		HK1634036-002	HK1634036-003	HK1634036-004
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)							
Benzene	71-43-2	5.0	µg/L		<5.0	----	<5.0
Toluene	108-88-3	5.0	µg/L		<5.0	----	<5.0
Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	<5.0
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	<10
Styrene	100-42-5	5.0	µg/L		<5.0	----	<5.0
ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	<5.0
Xylenes (Total)	----	20	µg/L		<20	----	<20
EP-074_SR-B: Oxygenated Compounds							
2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	<500
2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	<50
EP-074_SR-E: Halogenated Aliphatics							
Methylene chloride	75-09-2	50	µg/L		<50	----	<50
Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	<5.0
Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	<5.0
EP-074_SR-G: Trihalomethanes (THM)							
Chloroform	67-66-3	5.0	µg/L		<5.0	----	<5.0
Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether							
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	<5.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							
2-Fluorobiphenyl	321-60-8	0.1	%		**64.4**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**118**	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							
Dibromofluoromethane	1868-53-7	0.1	%		**99.8**	----	----
Toluene-D8	2037-26-5	0.1	%		**101**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**96.5**	----	----
EP-074_SR-S: VOC Surrogates							
Dibromofluoromethane	1868-53-7	0.1	%		**99.8**	----	**100**
Toluene-D8	2037-26-5	0.1	%		**101**	----	**99.9**
4-Bromofluorobenzene	460-00-4	0.1	%		**96.5**	----	**98.3**

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4287466)								
HK1633980-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	25.9	25.5	1.4
HK1634036-005	AEBH1 - 5.9M	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	12.0	12.7	5.6
EG: Metals and Major Cations (QC Lot: 4287318)								
HK1634036-005	AEBH1 - 5.9M	**EG3060: Hexavalent Chromium**	18540-29-9	1	mg/kg	<1	<1	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		
						Original Result	Duplicate Result	RPD (%)
EG: Metals and Major Cations (QC Lot: 4287326)								
HK1634036-005	AEBH1 - 5.9M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1	0.0
		EG020: Cobalt	7440-48-4	1	mg/kg	3	3	0.0
		EG020: Copper	7440-50-8	1	mg/kg	6	6	0.0
		EG020: Lead	7439-92-1	1	mg/kg	370	377	1.7
		EG020: Manganese	7439-96-5	1	mg/kg	521	631	19.1
		EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
		EG020: Tin	7440-31-5	1	mg/kg	4	4	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	21	22	0.0
		EG020: Barium	7440-39-3	1.0	mg/kg	22.3	22.2	0.0
HK1634262-002	Anonymous	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1	0.0
		EG020: Barium	7440-39-3	1	mg/kg	17	16	0.0
		EG020: Cobalt	7440-48-4	1	mg/kg	3	3	0.0
		EG020: Copper	7440-50-8	1	mg/kg	2	2	0.0
		EG020: Lead	7439-92-1	1	mg/kg	192	210	9.0
		EG020: Manganese	7439-96-5	1	mg/kg	536	603	11.8
		EG020: Molybdenum	7439-98-7	1	mg/kg	1	1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	<1	<1	0.0
		EG020: Tin	7440-31-5	1	mg/kg	3	3	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	43	46	6.2
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4285194)								
HK1634005-001	Anonymous	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4285194) - Continued								
HK1634005-001	Anonymous	Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4285194)								
HK1634005-001	Anonymous	Hexachlorobenzene (HCB)	118-74-1	200	µg/kg	<200	<200	0.0
		Phenol	108-95-2	500	µg/kg	<500	<500	0.0
		Bis(2-ethylhexyl)phthalate	117-81-7	5000	µg/kg	<5000	<5000	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4281874)								
HK1633725-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4283282)								
HK1633879-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4281875)								
HK1633725-001	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	106-42-3 ----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4281875)								
HK1633725-001	Anonymous	2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0
		2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4281875)								
HK1633725-001	Anonymous	Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	0.0
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.0
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4281875)								
HK1633725-001	Anonymous	Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	0.0
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4281875)								
HK1633725-001	Anonymous	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 4287329)								
HK1634036-003	EQUIPMENT BLANK	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
		EG020: Antimony	7440-36-0	1	µg/L	<1	<1	0.0
		EG020: Barium	7440-39-3	1	µg/L	<1	<1	0.0

Matrix: WATER

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 4287329) - Continued								
HK1634036-003	EQUIPMENT BLANK	**EG020: Cobalt**	7440-48-4	1	µg/L	<1	<1	0.0
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.0
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
		EG020: Manganese	7439-96-5	1	µg/L	2	2	0.0
		EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.0
		EG020: Tin	7440-31-5	1	µg/L	<1	<1	0.0
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.0
		EG020: Zinc	7440-66-6	10	µg/L	54	54	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 4287332)								
HK1634036-003	EQUIPMENT BLANK	**EG050: Hexavalent Chromium**	18540-29-9	20	µg/L	<20	<20	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4287318)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	101	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 4287326)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	85.2	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	94.0	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1.0	5 mg/kg	89.2	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	88.8	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	89.2	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	86.3	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	83.8	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	85.9	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	97.5	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	93.9	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	88.2	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	96.3	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	92.9	----	76	118	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4285194)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	71.6	----	56	118	----	----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	71.9	----	42	110	----	----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	80.7	----	54	116	----	----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	78.6	----	58	116	----	----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	81.0	----	60	120	----	----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	77.6	----	25	128	----	----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	86.9	----	72	115	----	----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	87.9	----	71	113	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4285194) - Continued											
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	80.6	----	48	121	----	----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	101	----	70	115	----	----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	79.5	----	62	111	----	----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	92.9	----	70	114	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	75.1	----	37	123	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	82.7	----	57	116	----	----
Dibenz(a.h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	82.9	----	57	118	----	----
Benzo(g.h.i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	86.2	----	50	132	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4285194)											
Phenol	108-95-2	25	µg/kg	<500	500 µg/kg	81.6	----	53	129	----	----
Hexachlorobenzene (HCB)	118-74-1	25	µg/kg	<50	500 µg/kg	77.0	----	66	118	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	25	µg/kg	<1000	500 µg/kg	106	----	73	134	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4281874)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	100	----	75	115	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	93.5	----	69	111	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4283282)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	106	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4281875)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	95.9	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	93.3	----	70	146	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	97.8	----	80	111	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	95.7	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4281875)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	111	----	79	131	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	92.6	----	79	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4281875)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	108	----	75	125	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	94.3	----	79	109	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	91.5	----	75	107	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4281875)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	102	----	75	123	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	102	----	79	123	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4281875)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	87.6	----	77	114	----	----

Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4287329)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	85.9	----	75	107	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	99.5	----	77	109	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	98.8	----	79	109	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	97.6	----	79	109	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	96.0	----	78	106	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	94.2	----	79	107	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	96.4	----	81	107	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	97.9	----	79	109	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	98.1	----	77	117	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	90.8	----	76	108	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	92.7	----	78	108	----	----
EG020: Tin	7440-31-5	10	µg/L	<10	100 µg/L	94.7	----	77	107	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	105	----	77	109	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 4287332)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	89.2	----	80	106	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4285219)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	51.2	----	36	124	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	65.0	----	39	108	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	74.9	----	33	120	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	70.4	----	37	120	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	86.8	----	45	117	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	80.2	----	46	105	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	91.8	----	64	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	97.5	----	64	121	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	78.6	----	65	120	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	90.2	----	61	135	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	73.3	----	56	124	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	86.9	----	58	129	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	77.8	----	42	114	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	78.6	----	43	113	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	78.9	----	33	115	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	86.1	----	36	124	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4285219)											
Phenol	108-95-2	5	µg/L	<5.0	0.5 µg/L	34.1	----	17	118	----	----
Hexachlorobenzene (HCB)	118-74-1	5	µg/L	<5.0	0.5 µg/L	86.3	----	33	123	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	10	µg/L	<10.0	0.5 µg/L	85.0	----	76	145	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4285220)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	87.3	----	42	99	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	83.0	----	53	134	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4286319)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	87.9	----	63	127	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4284055)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	94.8	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	91.8	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	97.7	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	91.1	----	80	128	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	98.0	----	76	120	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	98.5	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.6	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4284055)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	94.4	----	65	140	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	103	----	67	118	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4284055)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	91.4	----	76	128	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	86.5	----	68	121	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	91.4	----	75	118	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4284055)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	89.6	----	66	134	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	71	125	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4284055)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	115	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations (QC Lot: 4287318)										
HK1634036-001	AEBH1 - 3.4 - 3.85M	EG3060: Hexavalent Chromium	18540-29-9	2.5 mg/kg	105	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4287326)										
HK1634036-001	AEBH1 - 3.4 - 3.85M	EG020: Antimony	7440-36-0	5 mg/kg	89.5	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	88.2	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	93.1	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	95.1	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	78.3	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	85.5	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	92.1	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	95.8	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4281874)										
HK1633725-002	Anonymous	C9 - C16 Fraction	----	31.5 mg/kg	69.7	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	73.4	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4283282)										
HK1633879-002	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	102	----	50	130	----	----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4287329)										
HK1634036-002	FIELD BLANK	EG020: Antimony	7440-36-0	100 µg/L	85.5	----	75	125	----	----
		EG020: Arsenic	7440-38-2	100 µg/L	97.2	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	100	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	94.2	----	75	125	----	----
		EG020: Cobalt	7440-48-4	100 µg/L	94.1	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	94.4	----	75	125	----	----
		EG020: Lead	7439-92-1	100 µg/L	95.2	----	75	125	----	----

Matrix: WATER

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4287329) - Continued										
HK1634036-002	FIELD BLANK	**EG020: Manganese**	7439-96-5	100 µg/L	97.3	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	90.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	89.5	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	91.8	----	75	125	----	----
		EG020: Tin	7440-31-5	100 µg/L	92.9	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	102	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 4287332)										
HK1634036-002	FIELD BLANK	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	81.5	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Report No: HK1771166

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: INTRAFOR HONG KONG LIMITED	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 14
Contact	: TERRI TANG	Contact	: Ivan Leung	Work Order	: HK1771166
Address	: 20/F, EIGHT COMMERCIAL TOWER, 8 SUN YIP STREET, CHAI WAN, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Project	: OUTLINE AGREEMENT NO. 460006851 FOR 2-YEAR OUTLINE AGREEMENT FOR SITE INVESTIGATION WORKS FOR EXISTING/PROSPECTIVE SITES OF CLP POWER'S PREMISES (2017-2019)	Quote number	: HKE/1156/2017	Date Samples Received	: 13-Oct-2017
Order number	: —			Issue Date	: 27-Oct-2017
C-O-C number	: H035801			No. of samples received	: 4
Site	: —			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	Position	Authorised results for
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Ka Yu , Karen	Manager - Organics	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 13-Oct-2017 to 27-Oct-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1771166

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	AEBH2-0.5M	AEBH2-0.5M-DUP	AEBH2-1.5M	—	—
			Client sampling date / time	13-Oct-2017	13-Oct-2017	13-Oct-2017	----	----
Compound	CAS Number	LOR	Unit	HK1771166-001	HK1771166-002	HK1771166-003	——	——
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	8.5	8.5	9.6	—	—
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1	—	—
EG020: Arsenic	7440-38-2	1	mg/kg	1	1	<1	—	—
EG020: Barium	7440-39-3	1.0	mg/kg	41	35	26	—	—
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	—	—
EG020: Cobalt	7440-48-4	1.0	mg/kg	3	4	2	—	—
EG020: Copper	7440-50-8	1	mg/kg	7	8	5	—	—
EG020: Lead	7439-92-1	1	mg/kg	92	78	78	—	—
EG020: Manganese	7439-96-5	1.0	mg/kg	548	376	358	—	—
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05	—	—
EG020: Molybdenum	7439-98-7	1	mg/kg	1	1	1	—	—
EG020: Nickel	7440-02-0	1	mg/kg	3	3	2	—	—
EG020: Tin	7440-31-5	1.0	mg/kg	1	1	1	—	—
EG020: Zinc	7440-66-6	1	mg/kg	24	24	20	—	—
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	7	6	5	—	—
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1	<1	<1	—	—
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	—	—
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								

Sub-Matrix: SOIL			Client sample ID	AEBH2-0.5M	AEBH2-0.5M-DUP	AEBH2-1.5M	—	—
			Client sampling date / time	13-Oct-2017	13-Oct-2017	13-Oct-2017	----	----
Compound	CAS Number	LOR	Unit	HK1771166-001	HK1771166-002	HK1771166-003	——	——
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate - Continued								
EP076HK: Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	<0.50	—	—
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	<0.200	—	—
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	<5.00	—	—
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	—	—
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	—	—
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	—	—
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	—	—
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	—	—
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	—	—
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	<1.0	—	—
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	—	—
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	—	—
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	<2.0	—	—
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	<50	—	—
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	—	—
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	<0.5	—	—
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	<0.1	—	—
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	<0.04	—	—
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	<0.04	—	—
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	<0.1	—	—
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	<0.5	—	—
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	**94.2**	**90.5**	**87.4**	—	—
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	**88.0**	**86.6**	**84.2**	—	—
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	**94.4**	**94.1**	**92.6**	—	—
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	**97.0**	**101**	**98.4**	—	—

Sub-Matrix: SOIL			Client sample ID	AEBH2-0.5M	AEBH2-0.5M-DUP	AEBH2-1.5M	—	—
			Client sampling date / time	13-Oct-2017	13-Oct-2017	13-Oct-2017	----	----
Compound	CAS Number	LOR	Unit	HK1771166-001	HK1771166-002	HK1771166-003	——	——
EP-080_SRS: TPH(Volatile)/BTEX Surrogate - Continued								
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	99.3	103	104	—	—
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	94.4	94.1	92.6	—	—
EP074_SR: Toluene-D8	2037-26-5	0.1	%	97.0	101	98.4	—	—
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	99.3	103	104	—	—

Sub-Matrix: WATER			Client sample ID	Trip Blank	—	—	—	—
			Client sampling date / time	13-Oct-2017	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1771166-004	——	——	——	——
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	—	—	—	—
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	—	—	—	—
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	—	—	—	—
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	—	—	—	—
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	—	—	—	—
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	—	—	—	—
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	—	—	—	—
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	—	—	—	—
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	—	—	—	—
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	**95.5**	—	—	—	—
EP074_SR: Toluene-D8	2037-26-5	0.1	%	**99.1**	—	—	—	—
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	**108**	—	—	—	—

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1179928)								
HK1771166-001	AEBH2-0.5M	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	8.5	8.7	1.46
HK1771246-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	4.9	4.7	4.06
EG: Metals and Major Cations (QC Lot: 1174451)								
HK1771166-002	AEBH2-0.5M-DUP	EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<1	<1	0.00
EG: Metals and Major Cations (QC Lot: 1174453)								
HK1771166-002	AEBH2-0.5M-DUP	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	35	31	11.2
		EG020: Cobalt	7440-48-4	0.5	mg/kg	4	4	14.0
		EG020: Manganese	7439-96-5	0.5	mg/kg	376	391	3.99
		EG020: Tin	7440-31-5	0.5	mg/kg	1	2	17.7
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	1	<1	0.00
		EG020: Copper	7440-50-8	1	mg/kg	8	8	0.00
		EG020: Lead	7439-92-1	1	mg/kg	78	77	0.00
		EG020: Molybdenum	7439-98-7	1	mg/kg	1	2	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	3	4	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	24	27	11.9
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1176353)								
HK1771166-001	AEBH2-0.5M	Naphthalene	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: SOIL

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1176353) - Continued								
HK1771166-001	AEBH2-0.5M	Benzo(g,h,i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1176353)								
HK1771166-001	AEBH2-0.5M	Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<5.00 mg/kg	<5000	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<0.200 mg/kg	<200	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176352)								
HK1771166-001	AEBH2-0.5M	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176364)								
HK1771166-001	AEBH2-0.5M	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1176363)								
HK1771166-001	AEBH2-0.5M	Benzene	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.5	<0.5	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	106-42-3 ----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1176363)								
HK1771166-001	AEBH2-0.5M	2-Propanone (Acetone)	67-64-1	2	mg/kg	<50	<50	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<5	<5	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1176363)								
HK1771166-001	AEBH2-0.5M	Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1176363)								
HK1771166-001	AEBH2-0.5M	Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1176363)								
HK1771166-001	AEBH2-0.5M	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.5	<0.5	0.00

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

					Method Blank (MB) Report	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
						Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 1174451)											

Matrix: SOIL

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
						Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 1174451) - Continued											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	103	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 1174453)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	98.6	----	85	115	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	98.6	----	85	115	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	85.8	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	102	----	85	115	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	98.4	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	96.7	----	85	115	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	96.8	----	85	115	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	110	----	85	115	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	85.8	----	85	115	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	92.0	----	85	115	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	107	----	85	115	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	100	----	85	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	113	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1176353)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	87.5	----	63	101	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	67.8	----	40	103	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	81.1	----	56	101	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	89.6	----	61	107	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	85.0	----	68	98	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	67.2	----	42	88	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	87.6	----	59	112	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	81.9	----	55	111	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	64.9	----	58	106	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	93.8	----	71	108	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	97.9	----	55	122	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	88.3	----	53	114	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	69.6	----	31	100	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	103	----	45	126	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	102	----	40	129	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	91.9	----	43	131	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1176353)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	84.4	----	49	100	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	88.2	----	68	110	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	118	----	103	121	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176352)											

Matrix: SOIL

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176352) - Continued											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	101	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	94.9	----	55	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176364)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	91.3	----	79	112	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1176363)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.6	----	72	115	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	87.2	----	76	125	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.0	----	73	125	----	----
meta- & para-Xylene	108-38-3	0.4	mg/kg	<0.4	0.5 mg/kg	96.7	----	79	117	----	----
	106-42-3										
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	88.3	----	72	126	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	88.7	----	74	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	94.0	----	79	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1176363)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	110	----	79	119	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	96.4	----	80	115	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1176363)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	99.9	----	75	123	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	97.1	----	78	119	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	94.5	----	77	120	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1176363)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	96.4	----	75	121	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	95.5	----	73	123	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1176363)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	92.2	----	68	119	----	----

Matrix: WATER

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1180413)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	96.7	----	67	125	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	91.4	----	72	125	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	117	----	69	128	----	----
meta- & para-Xylene	108-38-3	1	µg/L	<1	4 µg/L	95.2	----	75	117	----	----
	106-42-3										
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	108	----	68	131	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	118	----	73	128	----	----

Matrix: WATER

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1180413) - Continued											
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	103	----	71	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1180413)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	96.9	----	76	130	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	110	----	69	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1180413)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	88.5	----	71	126	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	111	----	71	126	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	82.9	----	66	131	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1180413)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	118	----	75	128	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	95.8	----	64	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1180413)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	110	----	62	126	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations (QC Lot: 1174451)										
HK1771166-001	AEBH2-0.5M	EG3060: Hexavalent Chromium	18540-29-9	2.5 mg/kg	96.0	91.0	75	125	5.35	----
EG: Metals and Major Cations (QC Lot: 1174453)										
HK1771166-001	AEBH2-0.5M	EG020: Antimony	7440-36-0	5 mg/kg	97.0	102	75	125	5.02	----
		EG020: Arsenic	7440-38-2	5 mg/kg	97.3	99.9	75	125	2.64	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
		EG020: Cadmium	7440-43-9	5 mg/kg	93.2	100	75	125	7.04	----
		EG020: Cobalt	7440-48-4	5 mg/kg	99.1	96.6	75	125	2.55	----
		EG020: Copper	7440-50-8	5 mg/kg	89.0	99.8	75	125	11.4	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	96.5	93.5	75	125	3.16	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	90.0	97.4	75	125	7.90	----
		EG020: Nickel	7440-02-0	5 mg/kg	96.3	106	75	125	9.59	----
		EG020: Tin	7440-31-5	5 mg/kg	92.2	96.0	75	125	4.04	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1176353)										
HK1771166-003	AEBH2-1.5M	Naphthalene	91-20-3	250 µg/kg	87.8	----	50	130	----	20
		Acenaphthylene	208-96-8	250 µg/kg	86.2	----	50	130	----	20
		Acenaphthene	83-32-9	250 µg/kg	85.4	----	50	130	----	20
		Fluorene	86-73-7	250 µg/kg	88.2	----	50	130	----	20
		Phenanthrene	85-01-8	250 µg/kg	83.2	----	50	130	----	20
		Anthracene	120-12-7	250 µg/kg	82.9	----	50	130	----	20
		Fluoranthene	206-44-0	250 µg/kg	87.5	----	50	130	----	20
		Pyrene	129-00-0	250 µg/kg	86.8	----	50	130	----	20
		Benz(a)anthracene	56-55-3	250 µg/kg	92.0	----	50	130	----	20
		Chrysene	218-01-9	250 µg/kg	93.4	----	50	130	----	20
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	95.5	----	50	130	----	20
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	97.4	----	50	130	----	20
		Benzo(a)pyrene	50-32-8	250 µg/kg	92.4	----	50	130	----	20
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	85.7	----	50	130	----	20
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	84.5	----	50	130	----	20

Matrix: SOIL

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1176353) - Continued										
HK1771166-003	AEBH2-1.5M	Benzo(g,h,i)perylene	191-24-2	250 µg/kg	71.5	----	50	130	----	20
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1176353)										
HK1771166-003	AEBH2-1.5M	Phenol	108-95-2	250 µg/kg	91.4	----	50	130	----	20
		Hexachlorobenzene (HCB)	118-74-1	250 µg/kg	85.8	----	50	130	----	20
		Bis(2-ethylhexyl)phthalate	117-81-7	250 µg/kg	120	----	50	130	----	20
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176352)										
HK1771166-002	AEBH2-0.5M-DUP	C9 - C16 Fraction	----	31.5 mg/kg	95.8	----	50	130	----	20
		C17 - C35 Fraction	----	67.5 mg/kg	84.0	----	50	130	----	20
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1176364)										
HK1771166-002	AEBH2-0.5M-DUP	C6 - C8 Fraction	----	4.5 mg/kg	92.9	----	50	130	----	20
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1176363)										
HK1771166-003	AEBH2-1.5M	Benzene	71-43-2	0.25 mg/kg	87.7	----	50	130	----	20
		Toluene	108-88-3	0.25 mg/kg	90.9	----	50	130	----	20
		Ethylbenzene	100-41-4	0.25 mg/kg	102	----	50	130	----	20
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	106	----	50	130	----	20
		Styrene	100-42-5	0.25 mg/kg	92.2	----	50	130	----	20
		ortho-Xylene	95-47-6	0.25 mg/kg	97.2	----	50	130	----	20
		Xylenes (Total)	----	0.75 mg/kg	124	----	50	130	----	20
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1176363)										
HK1771166-003	AEBH2-1.5M	2-Propanone (Acetone)	67-64-1	2.5 mg/kg	108	----	50	130	----	20
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	98.8	----	50	130	----	20
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1176363)										
HK1771166-003	AEBH2-1.5M	Methylene chloride	75-09-2	0.25 mg/kg	90.8	----	50	130	----	20
		Trichloroethene	79-01-6	0.25 mg/kg	89.0	----	50	130	----	20
		Tetrachloroethene	127-18-4	0.25 mg/kg	85.2	----	50	130	----	20
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1176363)										
HK1771166-003	AEBH2-1.5M	Chloroform	67-66-3	0.25 mg/kg	88.2	----	50	130	----	20
		Bromodichloromethane	75-27-4	0.25 mg/kg	95.3	----	50	130	----	20
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1176363)										
HK1771166-003	AEBH2-1.5M	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.25 mg/kg	88.8	----	50	130	----	20

Surrogate Control Limits

Sub-Matrix: SOIL

Recovery Limits (%)

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Report No: HK1772073

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: INTRAFOR HONG KONG LIMITED	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 18
Contact	: TERRI TANG	Contact	: Ivan Leung	Work Order	: HK1772073
Address	: 20/F, EIGHT COMMERCIAL TOWER, 8 SUN YIP STREET, CHAI WAN, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Facsimile	: 25916139	Facsimile	: +852 2610 2021		
Project	: OUTLINE AGREEMENT NO. 460006851 FOR 2-YEAR OUTLINE AGREEMENT FOR SITE INVESTIGATION WORKS FOR EXISTING/PROSPECTIVE SITES OF CLP POWER'S PREMISES (2017-2019)	Quote number	: HKE/1156/2017	Date Samples Received	: 19-Oct-2017
Order number	: —			Issue Date	: 02-Nov-2017
C-O-C number	: H035802			No. of samples received	: 5
Site	: —			No. of samples analysed	: 5

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	Position	Authorised results for
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Ka Yu , Karen	Manager - Organics	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Leung Chak Cheong , Mike	Senior Chemist	Metals

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 19-Oct-2017 to 02-Nov-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1772073

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on dry weight basis.

Water sample(s) were filtered prior to dissolved metal analysis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Particular samples required dilution prior to PAH analysis due to matrix interference. Surrogate recoveries are not reported.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	TP1-0.5M	TP1-1.5M	—	—	—
			Client sampling date / time	19-Oct-2017	19-Oct-2017	----	----	----
Compound	CAS Number	LOR	Unit	HK1772073-001	HK1772073-002	——	——	——
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	29.5	13.7	—	—	—
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	2	<1	—	—	—
EG020: Arsenic	7440-38-2	1	mg/kg	12	6	—	—	—
EG020: Barium	7440-39-3	1.0	mg/kg	1440	290	—	—	—
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.4	0.2	—	—	—
EG020: Cobalt	7440-48-4	1.0	mg/kg	5	11	—	—	—
EG020: Copper	7440-50-8	1	mg/kg	22	13	—	—	—
EG020: Lead	7439-92-1	1	mg/kg	11	36	—	—	—
EG020: Manganese	7439-96-5	1.0	mg/kg	139	275	—	—	—
EG020: Mercury	7439-97-6	0.05	mg/kg	0.17	0.18	—	—	—
EG020: Molybdenum	7439-98-7	1	mg/kg	5	4	—	—	—
EG020: Nickel	7440-02-0	1	mg/kg	8	21	—	—	—
EG020: Tin	7440-31-5	1.0	mg/kg	3	4	—	—	—
EG020: Zinc	7440-66-6	1	mg/kg	32	45	—	—	—
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	28.5	34.2	—	—	—
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	1.8	<1.0	—	—	—
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	—	—	—
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	—	—	—
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								

Sub-Matrix: SOIL			Client sample ID	TP1-0.5M	TP1-1.5M	—	—	—
			Client sampling date / time	19-Oct-2017	19-Oct-2017	----	----	----
Compound	CAS Number	LOR	Unit	HK1772073-001	HK1772073-002	——	——	——
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate - Continued								
EP076HK: Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	—	—	—
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	—	—	—
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	—	—	—
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	—	—	—
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	—	—	—
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	—	—	—
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	—	—	—
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	—	—	—
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	—	—	—
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	—	—	—
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	—	—	—
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	—	—	—
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	—	—	—
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	—	—	—
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	—	—	—
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	—	—	—
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	—	—	—
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	—	—	—
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	—	—	—
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	—	—	—
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	—	—	—
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	**85.5**	**85.0**	—	—	—
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	—	—	—
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	**89.9**	**92.0**	—	—	—
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	**100**	**100**	—	—	—

Sub-Matrix: SOIL			Client sample ID	TP1-0.5M	TP1-1.5M	—	—	—
			Client sampling date / time	19-Oct-2017	19-Oct-2017	----	----	----
Compound	CAS Number	LOR	Unit	HK1772073-001	HK1772073-002	——	——	——
EP-080_SRS: TPH(Volatile)/BTEX Surrogate - Continued								
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	103	104	—	—	—
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	89.9	92.0	—	—	—
EP074_SR: Toluene-D8	2037-26-5	0.1	%	100	100	—	—	—
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	103	104	—	—	—

Sub-Matrix: WATER				Client sample ID	Equipment Blank	Field Blank	Trip Blank	—	—
				Client sampling date / time	19-Oct-2017	19-Oct-2017	19-Oct-2017	----	----
Compound	CAS Number	LOR	Unit		HK1772073-003	HK1772073-004	HK1772073-005	——	——
EG: Metals and Major Cations - Filtered									
EG020: Antimony	7440-36-0	1	µg/L		<1	<1	—	—	—
EG020: Arsenic	7440-38-2	10	µg/L		<10	<10	—	—	—
EG020: Barium	7440-39-3	1	µg/L		<1	<1	—	—	—
EG020: Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	—	—	—
EG020: Cobalt	7440-48-4	1	µg/L		<1	<1	—	—	—
EG020: Copper	7440-50-8	1	µg/L		<1	<1	—	—	—
EG020: Lead	7439-92-1	1	µg/L		<1	<1	—	—	—
EG020: Manganese	7439-96-5	1	µg/L		<1	<1	—	—	—
EG020: Mercury	7439-97-6	0.5	µg/L		<0.5	<0.5	—	—	—
EG020: Molybdenum	7439-98-7	1	µg/L		<1	<1	—	—	—
EG020: Nickel	7440-02-0	1	µg/L		<1	<1	—	—	—
EG020: Tin	7440-31-5	1	µg/L		<1	<1	—	—	—
EG020: Zinc	7440-66-6	10	µg/L		<10	<10	—	—	—
EG049: Trivalent Chromium	16065-83-1	20	µg/L		<20	<20	—	—	—
EG050: Hexavalent Chromium	18540-29-9	20	µg/L		<20	<20	—	—	—
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
EP076HK: Naphthalene	91-20-3	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Acenaphthene	83-32-9	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Fluorene	86-73-7	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Phenanthrene	85-01-8	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Anthracene	120-12-7	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Fluoranthene	206-44-0	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Pyrene	129-00-0	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Benz(a)anthracene	56-55-3	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Chrysene	218-01-9	1.0	µg/L		—	<1.0	—	—	—
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L		—	<1.0	—	—	—
EP076HK: Benzo(k)fluoranthene	207-08-9	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Benzo(a)pyrene	50-32-8	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Dibenz(a.h)anthracene	53-70-3	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Benzo(g.h.i)perylene	191-24-2	2.0	µg/L		—	<2.0	—	—	—
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate									
EP076HK: Phenol	108-95-2	2.0	µg/L		—	<2.0	—	—	—
EP076HK: Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L		—	<4.0	—	—	—

Sub-Matrix: WATER			Client sample ID	Equipment Blank	Field Blank	Trip Blank	—	—
			Client sampling date / time	19-Oct-2017	19-Oct-2017	19-Oct-2017	----	----
Compound	CAS Number	LOR	Unit	HK1772073-003	HK1772073-004	HK1772073-005	——	——
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate - Continued								
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	20.0	µg/L	—	<20.0	—	—	—
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L	—	<20	—	—	—
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L	—	<500	—	—	—
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L	—	<500	—	—	—
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: Toluene	108-88-3	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	—	<10	<10	—	—
EP074_SR: Styrene	100-42-5	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: Xylenes (Total)	----	20	µg/L	—	<20	<20	—	—
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	—	<500	<500	—	—
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	—	<50	<50	—	—
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	—	<50	<50	—	—
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	—	<5.0	<5.0	—	—
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	—	<5.0	<5.0	—	—
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	—	<5.0	<5.0	—	—
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	—	<5.0	<5.0	—	—
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	—	**50.8**	—	—	—
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	—	**70.4**	—	—	—
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	—	**108**	—	—	—
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	—	**101**	—	—	—
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	—	**110**	—	—	—
EP-074_SR-S: VOC Surrogates								

Sub-Matrix: WATER			Client sample ID	Equipment Blank	Field Blank	Trip Blank	—	—
			Client sampling date / time	19-Oct-2017	19-Oct-2017	19-Oct-2017	----	----
Compound	CAS Number	LOR	Unit	HK1772073-003	HK1772073-004	HK1772073-005	——	——
EP-074_SR-5: VOC Surrogates - Continued								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	—	108	110	—	—
EP074_SR: Toluene-D8	2037-26-5	0.1	%	—	101	103	—	—
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	—	110	111	—	—

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1188422)								
HK1772073-001	TP1-0.5M	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	29.5	29.5	0.00
EG: Metals and Major Cations (QC Lot: 1189815)								
HK1772073-002	TP1-1.5M	EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EG: Metals and Major Cations (QC Lot: 1189816)								
HK1772073-002	TP1-1.5M	EG020: Mercury	7439-97-6	0.05	mg/kg	0.18	0.20	9.31
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	290	302	4.11
		EG020: Cobalt	7440-48-4	0.5	mg/kg	11	13	14.9
		EG020: Manganese	7439-96-5	0.5	mg/kg	275	270	1.97
		EG020: Tin	7440-31-5	0.5	mg/kg	4	5	6.13
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	6	7	15.9
		EG020: Copper	7440-50-8	1	mg/kg	13	14	7.44
		EG020: Lead	7439-92-1	1	mg/kg	36	38	4.72
		EG020: Molybdenum	7439-98-7	1	mg/kg	4	3	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	21	24	13.6
		EG020: Zinc	7440-66-6	1	mg/kg	45	51	11.6
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1188056)								
HK1772073-001	TP1-0.5M	Naphthalene	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1188056)								

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1188056) - Continued								
HK1772073-001	TP1-0.5M	Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<5.00 mg/kg	<5000	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<0.200 mg/kg	<200	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188055)								
HK1772073-001	TP1-0.5M	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188064)								
HK1772073-001	TP1-0.5M	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1188063)								
HK1772073-001	TP1-0.5M	Benzene	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.5	<0.5	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3	0.4	mg/kg	<1.0	<1.0	0.00
			106-42-3					
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1188063)								
HK1772073-001	TP1-0.5M	2-Propanone (Acetone)	67-64-1	2	mg/kg	<50	<50	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<5	<5	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1188063)								
HK1772073-001	TP1-0.5M	Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1188063)								
HK1772073-001	TP1-0.5M	Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1188063)								
HK1772073-001	TP1-0.5M	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.5	<0.5	0.00

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 1188058)								
HK1772025-001	Anonymous	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.00
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.00
		EG020: Antimony	7440-36-0	1	µg/L	<1	<1	0.00
		EG020: Barium	7440-39-3	1	µg/L	70	67	4.83
		EG020: Cobalt	7440-48-4	1	µg/L	18	16	13.5

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 1188058) - Continued								
HK1772025-001	Anonymous	EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.00
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.00
		EG020: Manganese	7439-96-5	1	µg/L	4270	3650	15.6
		EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	0.00
		EG020: Nickel	7440-02-0	1	µg/L	2	2	0.00
		EG020: Tin	7440-31-5	1	µg/L	<1	<1	0.00
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.00
HK1772041-001	Anonymous	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.00
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.00
		EG020: Antimony	7440-36-0	1	µg/L	2	2	0.00
		EG020: Barium	7440-39-3	1	µg/L	168	162	3.41
		EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	0.00
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.00
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.00
		EG020: Manganese	7439-96-5	1	µg/L	57	57	0.00
		EG020: Molybdenum	7439-98-7	1	µg/L	61	56	8.47
		EG020: Nickel	7440-02-0	1	µg/L	1	2	0.00
		EG020: Tin	7440-31-5	1	µg/L	<1	<1	0.00
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.00
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.00
EG: Metals and Major Cations - Filtered (QC Lot: 1188059)								
HK1772025-001	Anonymous	EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	<20	0.00
HK1772043-001	Anonymous	EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	<20	0.00

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%): LCS	Spike Recovery (%): DCS	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EG: Metals and Major Cations (QC Lot: 1189815)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	108	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 1189816)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	102	----	85	115	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	98.6	----	85	115	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	91.2	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	105	----	85	115	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	105	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	102	----	85	115	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	101	----	85	115	----	----

Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations (QC Lot: 1189816) - Continued											
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	105	----	85	115	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	101	----	85	115	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	98.0	----	85	115	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	100	----	85	115	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	99.2	----	85	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	102	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1188056)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	75.3	----	63	101	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	66.2	----	40	103	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	73.5	----	56	101	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	80.0	----	61	107	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	77.3	----	68	98	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	62.7	----	42	88	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	78.8	----	59	112	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	76.2	----	55	111	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	71.3	----	58	106	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	83.3	----	71	108	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	114	----	55	122	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	82.4	----	53	114	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	63.6	----	31	100	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	72.7	----	45	126	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	74.6	----	40	129	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	67.6	----	43	131	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1188056)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	85.0	----	49	100	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	77.5	----	68	110	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	113	----	103	121	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188055)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	91.0	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	98.1	----	55	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188064)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	92.6	----	75	121	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1188063)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	86.9	----	72	115	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	89.2	----	76	125	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	108	----	73	125	----	----

Matrix: SOIL

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1188063) - Continued											
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	110	----	79	117	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	99.9	----	72	126	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	74	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	107	----	79	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1188063)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	95.4	----	79	119	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	87.7	----	80	115	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1188063)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	106	----	75	123	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	99.7	----	78	119	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	96.2	----	77	120	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1188063)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	94.3	----	75	121	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	88.2	----	73	123	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1188063)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	86.0	----	68	119	----	----

Matrix: WATER

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 1188058)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	101	----	75	107	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	96.0	----	77	109	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	99.9	----	79	109	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	102	----	79	109	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	92.2	----	78	106	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	104	----	79	107	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	96.9	----	81	107	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	91.0	----	79	109	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	113	----	77	117	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	103	----	76	108	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	93.4	----	78	108	----	----
EG020: Tin	7440-31-5	1	µg/L	<1	100 µg/L	94.2	----	77	107	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	105	----	77	109	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 1188059)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	101	----	80	106	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1188053)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	51.9	----	31	102	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	81.6	----	31	105	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	66.8	----	32	93	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	68.5	----	33	100	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	61.8	----	30	107	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	63.2	----	28	108	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	76.5	----	56	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	75.2	----	56	125	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	72.1	----	72	117	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	72.8	----	57	117	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	75.9	----	71	119	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	75.2	----	70	114	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	64.6	----	59	121	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	57.3	----	56	118	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	59.2	----	39	123	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.7	----	42	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1188053)											
Phenol	108-95-2	5	µg/L	<5.0	0.5 µg/L	18.3	----	11	83	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4.0	0.5 µg/L	81.3	----	35	103	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	10	µg/L	<10.0	0.5 µg/L	95.0	----	81	122	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188052)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	81.3	----	55	109	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	103	----	58	129	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188460)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	83.6	----	66	114	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1188458)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.0	----	67	125	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	83.4	----	72	125	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	84.0	----	69	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.7	----	75	117	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	92.6	----	68	131	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	91.1	----	73	128	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.8	----	71	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1188458)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	86.7	----	76	130	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	88.1	----	69	126	----	----

Matrix: WATER

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1188458)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	92.4	----	71	126	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	89.8	----	71	126	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	81.1	----	66	131	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1188458)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	97.1	----	75	128	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	90.0	----	64	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1188458)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	93.9	----	62	126	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations (QC Lot: 1189815)										
HK1772073-001	TP1-0.5M	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	110	102	75	125	7.55	----
EG: Metals and Major Cations (QC Lot: 1189816)										
HK1772073-001	TP1-0.5M	**EG020: Antimony**	7440-36-0	5 mg/kg	104	98.4	75	125	5.53	----
		EG020: Arsenic	7440-38-2	5 mg/kg	110	95.6	75	125	14.0	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
		EG020: Cadmium	7440-43-9	5 mg/kg	106	99.6	75	125	6.22	----
		EG020: Cobalt	7440-48-4	5 mg/kg	104	98.2	75	125	5.74	----
		EG020: Copper	7440-50-8	5 mg/kg	86.9	95.1	75	125	9.01	----
		EG020: Lead	7439-92-1	5 mg/kg	83.0	78.0	75	125	6.21	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	77.2	85.0	75	125	9.62	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	99.9	95.0	75	125	5.03	----
		EG020: Nickel	7440-02-0	5 mg/kg	95.9	97.4	75	125	1.55	----
		EG020: Tin	7440-31-5	5 mg/kg	96.4	96.1	75	125	0.312	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	# Not Determined	75	125	# Not Determined	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188055)										
HK1772073-002	TP1-1.5M	**C9 - C16 Fraction**	----	31.5 mg/kg	87.9	----	50	130	----	20
		C17 - C35 Fraction	----	67.5 mg/kg	72.3	----	50	130	----	20
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1188064)										
HK1772073-002	TP1-1.5M	**C6 - C8 Fraction**	----	4.5 mg/kg	95.5	----	50	130	----	20
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1188063)										
HK1772073-002	TP1-1.5M	**Benzene**	71-43-2	0.25 mg/kg	99.4	----	50	130	----	20
		Toluene	108-88-3	0.25 mg/kg	86.0	----	50	130	----	20
		Ethylbenzene	100-41-4	0.25 mg/kg	92.6	----	50	130	----	20
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	97.3	----	50	130	----	20
		Styrene	100-42-5	0.25 mg/kg	88.3	----	50	130	----	20
		ortho-Xylene	95-47-6	0.25 mg/kg	87.9	----	50	130	----	20
		Xylenes (Total)	----	0.75 mg/kg	94.2	----	50	130	----	20
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1188063)										
HK1772073-002	TP1-1.5M	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	99.7	----	50	130	----	20

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report										
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1188063) - Continued										
HK1772073-002	TP1-1.5M	**2-Butanone (MEK)**	78-93-3	2.5 mg/kg	90.8	----	50	130	----	20
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1188063)										
HK1772073-002	TP1-1.5M	**Methylene chloride**	75-09-2	0.25 mg/kg	88.7	----	50	130	----	20
		Trichloroethene	79-01-6	0.25 mg/kg	91.8	----	50	130	----	20
		Tetrachloroethene	127-18-4	0.25 mg/kg	84.9	----	50	130	----	20
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1188063)										
HK1772073-002	TP1-1.5M	**Chloroform**	67-66-3	0.25 mg/kg	88.8	----	50	130	----	20
		Bromodichloromethane	75-27-4	0.25 mg/kg	88.4	----	50	130	----	20
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1188063)										
HK1772073-002	TP1-1.5M	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	89.6	----	50	130	----	20

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report										
EG: Metals and Major Cations - Filtered (QC Lot: 1188058)										
HK1772024-001	Anonymous	**EG020: Antimony**	7440-36-0	100 µg/L	122	123	75	125	0.816	25
		EG020: Arsenic	7440-38-2	100 µg/L	117	116	75	125	0.858	25
		EG020: Barium	7440-39-3	100 µg/L	111	96.6	75	125	13.9	25
		EG020: Cadmium	7440-43-9	100 µg/L	113	114	75	125	0.881	25
		EG020: Cobalt	7440-48-4	100 µg/L	89.6	92.1	75	125	2.75	25
		EG020: Copper	7440-50-8	100 µg/L	101	101	75	125	0.00	25
		EG020: Lead	7439-92-1	100 µg/L	97.9	99.8	75	125	1.92	25
		EG020: Manganese	7439-96-5	100 µg/L	# Not Determined	# Not Determined	75	125	# Not Determined	25
		EG020: Mercury	7439-97-6	2 µg/L	97.6	92.6	75	125	5.26	25
		EG020: Molybdenum	7439-98-7	100 µg/L	113	113	75	125	0.00	25
		EG020: Nickel	7440-02-0	100 µg/L	87.6	90.0	75	125	2.70	25
		EG020: Tin	7440-31-5	100 µg/L	114	113	75	125	0.881	25
		EG020: Zinc	7440-66-6	100 µg/L	109	109	75	125	0.00	25
EG: Metals and Major Cations - Filtered (QC Lot: 1188059)										
HK1772024-001	Anonymous	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	101	102	75	125	0.985	----

Surrogate Control Limits

Sub-Matrix: SOIL

	Recovery Limits (%)

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Report No: HK1634542

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 5
Contact	: MR FRANKIE SIU	Contact	: Fung Lim Chee, Richard	Work Order	: HK1634542
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: frankie.siu@gammonconstruction.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 3191 5237	Telephone	: +852 2610 1044		
Facsimile	: +852 2564 6758	Facsimile	: +852 2610 2021		
Project	: ENHANCED ASH UTILISATION AND WATER MANAGEMENT FACILITIES AT CASTLE PEAK POWER STATION	Quote number	: ----	Date Samples Received	: 26-AUG-2016
Order number	: 4501019750			Issue Date	: 09-SEP-2016
C-O-C number	: H031823			No. of samples received	: 2
Site	: ----			No. of samples analysed	: 2

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is: 26-AUG-2016 to 08-SEP-2016.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1634542

Sample(s) were picked up from client by ALS Technichem (HK) staff in chilled condition.
Water sample(s) analysed and reported on an as received basis.
Water sample(s) were filtered prior to dissolved metal analysis.

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	Position	Authorised results for
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: AEBH1 Client sampling date / time: 26-AUG-2016 14:00 HK1634542-001	Client sample ID: TRIP BLANK Client sampling date / time: 26-AUG-2016 14:00 HK1634542-002
EG: Metals and Major Cations - Filtered					
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	91-20-3	2.0	µg/L	<2.0	----
Acenaphthylene	208-96-8	2.0	µg/L	<2.0	----
Acenaphthene	83-32-9	2.0	µg/L	<2.0	----
Fluorene	86-73-7	2.0	µg/L	<2.0	----
Phenanthrene	85-01-8	2.0	µg/L	<2.0	----
Anthracene	120-12-7	2.0	µg/L	<2.0	----
Fluoranthene	206-44-0	2.0	µg/L	<2.0	----
Pyrene	129-00-0	2.0	µg/L	<2.0	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate					
Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L	<4.0	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)					
C6 - C8 Fraction	----	20	µg/L	<20	----
C9 - C16 Fraction	----	500	µg/L	<500	----
C17 - C35 Fraction	----	500	µg/L	**1700**	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)					
Benzene	71-43-2	5.0	µg/L	<5.0	<5.0
Toluene	108-88-3	5.0	µg/L	<5.0	<5.0
Ethylbenzene	100-41-4	5.0	µg/L	<5.0	<5.0
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	<10
Styrene	100-42-5	5.0	µg/L	<5.0	<5.0
ortho-Xylene	95-47-6	5.0	µg/L	<5.0	<5.0
Xylenes (Total)	----	20	µg/L	<20	<20
EP-074_SR-B: Oxygenated Compounds					
2-Propanone (Acetone)	67-64-1	500	µg/L	<500	<500
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50
EP-074_SR-E: Halogenated Aliphatics					
Methylene chloride	75-09-2	50	µg/L	<50	<50
Trichloroethene	79-01-6	5.0	µg/L	<5.0	<5.0
Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	<5.0
EP-074_SR-G: Trihalomethanes (THM)					
Chloroform	67-66-3	5.0	µg/L	<5.0	<5.0
Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether					
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	<5.0

Sub-Matrix: WATER				Client sample ID	AEBH1	TRIP BLANK
				Client sampling date / time	26-AUG-2016 14:00	26-AUG-2016 14:00
Compound	CAS Number	LOR	Unit		HK1634542-001	HK1634542-002
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates						
2-Fluorobiphenyl	321-60-8	0.1	%		85.2	----
4-Terphenyl-d14	1718-51-0	0.1	%		105	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate						
Dibromofluoromethane	1868-53-7	0.1	%		102	----
Toluene-D8	2037-26-5	0.1	%		99.6	----
4-Bromofluorobenzene	460-00-4	0.1	%		98.2	----
EP-074_SR-S: VOC Surrogates						
Dibromofluoromethane	1868-53-7	0.1	%		102	98.3
Toluene-D8	2037-26-5	0.1	%		99.6	99.2
4-Bromofluorobenzene	460-00-4	0.1	%		98.2	97.9

Laboratory Duplicate (DUP) Report

Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report: Original Result	Laboratory Duplicate (DUP) Report: Duplicate Result	Laboratory Duplicate (DUP) Report: RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 4290987)								
HK1634715-001	Anonymous	**EG020: Mercury**	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%): LCS	Spike Recovery (%): DCS	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4290987)											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	84.8	----	77	117	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4285219)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	51.2	----	36	124	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	65.0	----	39	108	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	74.9	----	33	120	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	70.4	----	37	120	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	86.8	----	45	117	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	80.2	----	46	105	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	91.8	----	64	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	97.5	----	64	121	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	90.2	----	61	135	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	73.3	----	56	124	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4285219)											
Hexachlorobenzene (HCB)	118-74-1	5	µg/L	<5.0	0.5 µg/L	86.3	----	33	123	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4285220)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	87.3	----	42	99	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	83.0	----	53	134	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4286319)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	87.9	----	63	127	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4290221)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	95.3	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	96.6	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	95.1	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	88.6	----	80	128	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	94.9	----	76	120	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	96.5	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	91.3	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4290221)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	107	----	65	140	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	102	----	67	118	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4290221)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	97.0	----	76	128	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	92.4	----	68	121	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	88.8	----	75	118	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 4290221)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	98.4	----	66	134	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	95.9	----	71	125	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4290221)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	107	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	MSD	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4290987)										
HK1634714-001	Anonymous	**EG020: Mercury**	7439-97-6	2 µg/L	80.2	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-080_SRS: TPH(Volatile)/BTEX Surrogate - Continued			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Report No: HK1772442

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: INTRAFOR HONG KONG LIMITED	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: TERRI TANG	Contact	: Ivan Leung	Work Order	: HK1772442
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Project	: OUTLINE AGREEMENT NO. 460006651 FOR 2-YEAR OUTLINE AGREEMENT FOR SITE INVESTIGATION WORKS FOR EXISTING/PROSPECTIVE SITES OF CLP POWER'S PREMISES (2017-2019)	Quote number	: HKE/1156/2017	Date Samples Received	: 21-Oct-2017
Order number	: —			Issue Date	: 31-Oct-2017
C-O-C number	: H035803			No. of samples received	: 2
Site	: —			No. of samples analysed	: 2

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Leung Chak Cheong , Mike	Senior Chemist	Metals

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 21-Oct-2017 to 30-Oct-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1772442

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.

Water sample(s) were filtered prior to dissolved metal analysis.

Analytical Results

Sub-Matrix: WATER			Client sample ID	AEBH2	Trip Blank	—	—	—
			Client sampling date / time	21-Oct-2017	21-Oct-2017	----	----	----
Compound	CAS Number	LOR	Unit	HK1772442-001	HK1772442-002	——	——	——
EG: Metals and Major Cations - Total								
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	—	—	—	—
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Acenaphthene	83-32-9	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Fluorene	86-73-7	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Phenanthrene	85-01-8	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Anthracene	120-12-7	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Fluoranthene	206-44-0	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Pyrene	129-00-0	2.0	µg/L	<2.0	—	—	—	—
EP076HK: Chrysene	218-01-9	1.0	µg/L	<1.0	—	—	—	—
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	—	—	—	—
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
EP076HK: Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L	<4.0	—	—	—	—
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L	<20	—	—	—	—
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L	<500	—	—	—	—
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L	<500	—	—	—	—
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	<10	—	—	—
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	<20	—	—	—
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	<500	—	—	—
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	—	—	—
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	<50	—	—	—
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	<5.0	—	—	—
EP-074_SR-G: Trihalomethanes (THM)								

Sub-Matrix: WATER			Client sample ID	AEBH2	Trip Blank	—	—	—
			Client sampling date / time	21-Oct-2017	21-Oct-2017	----	----	----
Compound	CAS Number	LOR	Unit	HK1772442-001	HK1772442-002	——	——	——
EP-074_SR-G: Trihalomethanes (THM) - Continued								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	<5.0	—	—	—
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	<5.0	—	—	—
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	<5.0	—	—	—
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	88.6	—	—	—	—
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	96.8	—	—	—	—
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	111	—	—	—	—
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	100	—	—	—	—
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	110	—	—	—	—
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	111	106	—	—	—
EP074_SR: Toluene-D8	2037-26-5	0.1	%	100	98.4	—	—	—
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	110	109	—	—	—

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
						Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Total (QC Lot: 1193600)											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	103	----	75	121	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1193506)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	59.8	----	31	102	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	59.4	----	31	105	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	53.9	----	32	93	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	53.8	----	33	100	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	52.4	----	30	107	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	54.9	----	28	108	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	76.5	----	56	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	76.4	----	56	125	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	89.4	----	57	117	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	97.6	----	71	119	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 1193506)											
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4.0	0.5 µg/L	55.9	----	35	103	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1193507)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	70.2	----	55	109	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	96.2	----	58	129	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 1194797)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	80.2	----	66	114	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 1194796)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	82.6	----	67	125	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	81.7	----	72	125	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	85.4	----	69	128	----	----
meta- & para-Xylene	108-38-3	1	µg/L	<1	4 µg/L	87.5	----	75	117	----	----
	106-42-3										
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	86.9	----	68	131	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	83.5	----	73	128	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	86.2	----	71	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 1194796)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	111	----	76	130	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	97.9	----	69	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1194796)											

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 1194796) - Continued											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	84.3	----	71	126	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	94.3	----	71	126	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	79.7	----	66	131	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 1194796)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	91.2	----	75	128	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	80.2	----	64	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 1194796)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	112	----	62	126	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations - Total (QC Lot: 1193600)										
HK1772442-001	AEBH2	**EG020: Mercury**	7439-97-6	2 µg/L	85.7	87.5	75	125	2.08	25

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Annex H4

QA/QC Practices and Evaluation

1 *FIELD QA/QC IMPLEMETATION, SAMPLE PRESERVATION AND DELIVERY*

A QA/QC programme was incorporated into the PLCA for the Project. The programme included collection/preparation and analysis of field QA/QC samples and laboratory internal QA/QC samples.

The field QA/QC samples included soil duplicates, field blanks, equipment blanks and trip blank samples. The soil duplicate samples were collected from AEBH1- 1.5m below base of concrete (bbc) and AEBH2 at 0.5m bbc. These duplicates and field blank samples were analysed for the same suite of parameters as for the other samples. The equipment blank sample was collected for the soil sampling equipment and analysed for the target priority pollutant metals.

The laboratory QA/QC samples including method blanks, surrogates, matrix spikes and etc were prepared and analysis by the contracted laboratory, ALS Technichem (HK) Pty Ltd (ALS), in accordance with relevant USEPA's standard methods and procedures.

ERM supervised the soil and groundwater sampling to meet the requirements of the Project QA/QC and the decontamination procedures. All soil and groundwater samples (including QA/QC samples) were kept in a refrigerator at 4°C for delivery. The samples were delivered on ice with Chain of Custody to a courier and arrived at the laboratory within the sample holding time.

The Chain of Custody for the samples was maintained from the time of sample collection to sample arrival at the testing laboratory. The written record of sample handling is intended to ensure prompt sample analysis and integrity.

2 *QUALITY ASSURANCE AND CONTROL*

2.1 *SAMPLE DUPLICATION*

The relative percentage difference (RPD) was used to assess the sample collection and laboratory analysis reproducibility and precision. In accordance with the USEPA's guidance, RPDs were only calculated for the duplicate samples results that were higher than two times of the method detection limits. The USEPA acceptable limits for the RPDs are less than 50% for soil samples and 30% for groundwater samples.

The values of RPD calculated for the soil duplicate samples taken at AEBH1 (17.4%) and AEBH2 (23.2%) were within the acceptable limits.

2.2 *EQUIPMENT BLANK, FIELD BLANK AND TRIP BLANK*

Throughout the sampling period, 6 sets of trip blanks and two sets of field blanks and two sets of equipment blanks were taken and no evidence of cross contamination was found.

2.3 *LABORATORY QA/QC DATA*

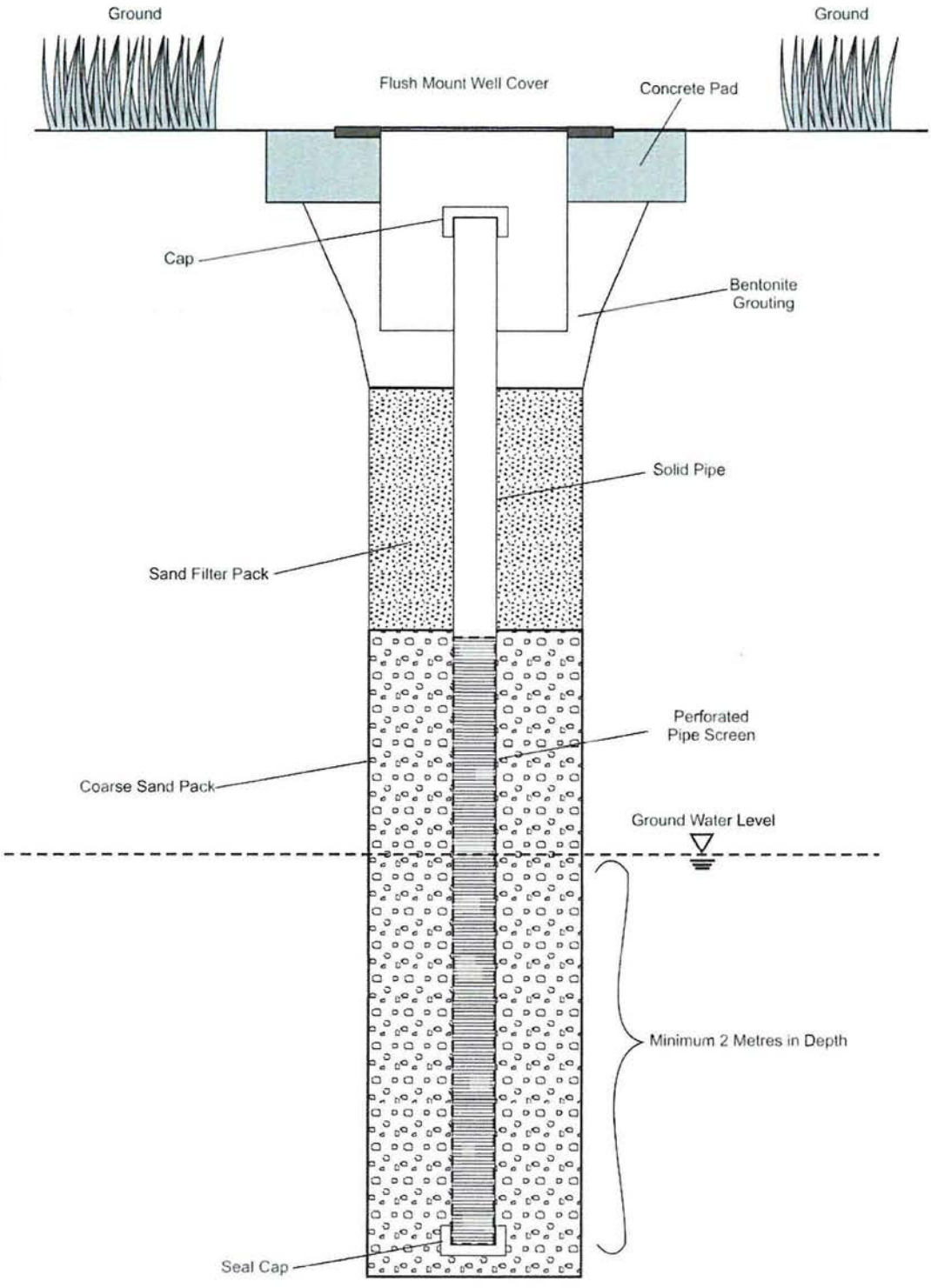
The laboratory QA/QC sample results (eg surrogate recoveries, matrix spike recoveries, method blanks, sample holding time, and other internal laboratory QA/QC) met their respective requirements.

2.4 *SAMPLE RESULTS USABILITY*

Based on the review of the QA/QC sample results for this Project, the laboratory results for the soil and groundwater sample collected for the Project are considered useable to evaluate the Site environmental conditions in accordance with the scope of the work.

Annex I

Schematic Drawing of Groundwater Monitoring Well



Annex H

Schematic Drawing of Groundwater Monitoring Well

FILE: 0125309b
DATE: 30/11/2010

Environmental
Resources
Management

ERM

Annex J

Risk-Based Remediation Goals

Table 2.1
Risk-Based Remediation Goals (RBRGs) for Soil & Soil Saturation Limit

Chemical	Risk-Based Remediation Goals for Soil				Soil Saturation Limit (C_{sat}) (mg/kg)
	Urban Residential (mg/kg)	Rural Residential (mg/kg)	Industrial (mg/kg)	Public Parks (mg/kg)	
VOCs					
Acetone	9.59E+03	4.26E+03	1.00E+04*	1.00E+04*	***
Benzene	7.04E-01	2.79E-01	9.21E+00	4.22E+01	3.36E+02
Bromodichloromethane	3.17E-01	1.29E-01	2.85E+00	1.34E+01	1.03E+03
2-Butanone	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	***
Chloroform	1.32E-01	5.29E-02	1.54E+00	2.53E+02	1.10E+03
Ethylbenzene	7.09E+02	2.98E+02	8.24E+03	1.00E+04*	1.38E+02
Methyl tert-Butyl Ether	6.88E+00	2.80E+00	7.01E+01	5.05E+02	2.38E+03
Methylene Chloride	1.30E+00	5.29E-01	1.39E+01	1.28E+02	9.21E+02
Styrene	3.22E+03	1.54E+03	1.00E+04*	1.00E+04*	4.97E+02
Tetrachloroethene	1.01E-01	4.44E-02	7.77E-01	1.84E+00	9.71E+01
Toluene	1.44E+03	7.05E+02	1.00E+04*	1.00E+04*	2.35E+02
Trichloroethene	5.23E-01	2.11E-01	5.68E+00	6.94E+01	4.88E+02
Xylenes (Total)	9.50E+01	3.68E+01	1.23E+03	1.00E+04*	1.50E+02
SVOCs					
Acenaphthene	3.51E+03	3.28E+03	1.00E+04*	1.00E+04*	6.02E+01
Acenaphthylene	2.34E+03	1.51E+03	1.00E+04*	1.00E+04*	1.98E+01
Anthracene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	2.56E+00
Benzo(a)anthracene	1.20E+01	1.14E+01	9.18E+01	3.83E+01	
Benzo(a)pyrene	1.20E+00	1.14E+00	9.18E+00	3.83E+00	
Benzo(b)fluoranthene	9.88E+00	1.01E+01	1.78E+01	2.04E+01	
Benzo(g,h,i)perylene	1.80E+03	1.71E+03	1.00E+04*	5.74E+03	
Benzo(k)fluoranthene	1.20E+02	1.14E+02	9.18E+02	3.83E+02	
bis-(2-Ethylhexyl)phthalate	3.00E+01	2.80E+01	9.18E+01	9.42E+01	
Chrysene	8.71E+02	9.19E+02	1.14E+03	1.54E+03	
Dibenzo(a,h)anthracene	1.20E+00	1.14E+00	9.18E+00	3.83E+00	
Fluoranthene	2.40E+03	2.27E+03	1.00E+04*	7.62E+03	
Fluorene	2.38E+03	2.25E+03	1.00E+04*	7.45E+03	5.47E+01
Hexachlorobenzene	2.43E-01	2.20E-01	5.82E-01	7.13E-01	
Indeno(1,2,3-cd)pyrene	1.20E+01	1.14E+01	9.18E+01	3.83E+01	
Naphthalene	1.82E+02	8.56E+01	4.53E+02	9.14E+02	1.25E+02
Phenanthrene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	2.80E+01
Phenol	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	7.26E+03
Pyrene	1.80E+03	1.71E+03	1.00E+04*	5.72E+03	
Metals					
Antimony	2.95E+01	2.91E+01	2.61E+02	9.79E+01	
Arsenic	2.21E+01	2.18E+01	1.96E+02	7.35E+01	
Barium	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Cadmium	7.38E+01	7.28E+01	6.53E+02	2.45E+02	
Chromium III	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Chromium VI	2.21E+02	2.18E+02	1.96E+03	7.35E+02	
Cobalt	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Copper	2.95E+03	2.91E+03	1.00E+04*	9.79E+03	
Lead	2.58E+02	2.55E+02	2.29E+03	8.57E+02	
Manganese	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Mercury	1.10E+01	6.52E+00	3.84E+01	4.56E+01	
Molybdenum	3.69E+02	3.64E+02	3.26E+03	1.22E+03	
Nickel	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Tin	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Zinc	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Dioxins / PCBs					
Dioxins (I-TEQ)	1.00E-03	1.00E-03	5.00E-03	1.00E-03	
PCBs	2.36E-01	2.26E-01	7.48E-01	7.56E-01	
Petroleum Carbon Ranges					
C6 - C8	1.41E+03	5.45E+02	1.00E+04*	1.00E+04*	1.00E+03
C9 - C16	2.24E+03	1.33E+03	1.00E+04*	1.00E+04*	3.00E+03
C17 - C35	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	5.00E+03
Other Inorganic Compounds					
Cyanide, free	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Organometallics					
TBTO	2.21E+01	2.18E+01	1.96E+02	7.35E+01	

Notes:
(1) For Dioxins, the cleanup levels in USEPA Office of Solid Waste and Emergency Response (OSWER) Directive of 1998 have been adopted. The OSWER Directive value of 1 ppb for residential use has been applied to the scenarios of "Urban Residential", "Rural Residential", and "Public Parks", while the low end of the range of values for industrial, 5 ppb, has been applied to the scenario of "Industrial".
(2) Soil saturation limits for petroleum carbon ranges taken from the Canada-Wide Standards for Petroleum Hydrocarbons in Soil, CCME 2000.
(3) * indicates a 'ceiling limit' concentration.
(4) *** indicates that the C_{sat} value exceeds the 'ceiling limit' therefore the RBRG applies.