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Issue Date : January 2012
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**JOINT USER COMPLEX AND
WHOLESALE FISH MARKET AT
AREA 44, TUEN MUN**

**FOURTEENTH QUARTERLY
ENVIRONMENTAL MONITORING &
AUDIT REPORT
(NOVEMBER 2011 – DECEMBER
2011)**

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

COMMERCIAL-IN-CONFIDENCE

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EXECUTIVE SUMMARY

Allied Environmental Consultants Limited (AEC) has been appointed to conduct an environmental monitoring and audit (EM&A) program for the Joint User Complex and Wholesale Fish Market (WFM) at Area 44, Tuen Mun.

The construction works were commenced on 31st July 2008 while major construction works of the Project were substantially completed in September 2010 and handover works were completed in November 2010, thus the EM&A programme for construction phase was terminated effective from 23rd December 2010.

The operation of the WFM was commenced on 23rd December 2010. This report is the fourteenth and last quarterly EM&A report, which detailed the environmental monitoring and audit results recorded for operational phase during the period from 1st November 2011 to 31st December 2011.

Impact environmental monitoring for the Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun has been carried out at Yuet Wu Villa. Odour patrol and noise monitoring were conducted within the period of 0300-0630 hours. The odour intensity ratings in the reporting period were 1-No Odour. The minimum and maximum average noise level measured at Yuet Wu Villa was 50.9dB(A) $L_{eq(5min)}$ and 56.6dB(A) $L_{eq(5min)}$ respectively.

Based on the odour patrol results, the odour patrol complied with the environmental requirements in EM&A Manual. The measured noise monitoring results were higher than the predicted noise levels due to the increment of noise level from ambient background noise levels.

In the reporting period, no non-compliance, complaint, inspection notice, notification of summons or prosecution was received.

There was no major change in the operation of WFM.

Monitoring works had been conducted for 12 months of the operational of the Wholesale Fish Market as stated in EM&A Manual and the approved Environmental Permit EP-296/2007. The EM&A requirements were fulfilled and the completion of EM&A programme shall be notified to the EPD. The operation phase EM&A programme was completed and no further works should be carried out in future.

1. PROJECT BACKGROUND

A Joint User Complex and Wholesale Fish Market (WFM Complex) at Area 44 in Tuen Mun is designed and built by Architectural Services Department on behalf of Agriculture, Fisheries and Conservation Department, Marine Department, Home Affairs Department, and Food and Environmental Hygiene Department of the Hong Kong SAR. The WFM Complex is to provide a permanent site for the relocation of the existing temporary wholesale fish market at Tuen Mun Area 27 and to accommodate a community hall, a dragon boat racing spectator stand, and other community facilities for public use. The development is a 3-storey complex to accommodate a wholesale fish market, a public toilet, a refuse collection point and a marine refuse collection point at the ground floor, a community hall on the first floor, and a dragon boat race spectator stand with landscaped deck on roof level. The Wholesale Fish Market is categorized as a designated project under the Environmental Impact Assessment Ordinance (EIAO) and therefore a detailed Environmental Impact Assessment (EIA-085/2002) has been conducted in year 2002 and an Environmental Permit (EP-296/2007) was issued by Environmental Protection Department in December 2007. The construction works were commenced on 31st July 2008. Major construction works of the Project were substantially completed in September 2010 and handover works were completed in November 2010. The EM&A programme of construction phase was terminated and the EM&A programme of operational phase was commenced effective from 23rd December 2010.

The subject site is located at Castle Peak Bay of Tuen Mun given in Figure 1. The subject site is bounded to the north by a future local open space presently used as a temporary car park, to the east by Castle Peak Bay typhoon shelter, to the south by a future lorry park and to the west by Wu Shan Road. Yuet Wu Villa being the nearest residential establishment is located at around 85m from the site boundary. Key personnel and contact particulars are summarized in Table 1.

Table 1 Contact Details of Key Personnel

Role	Department / Company	Names	Contact Number	Fax Number
Lead User Department	Agriculture, Fisheries, and Conservation Department	Mr. K.H. Chan	2150 7092	2314 2866
		Ms. Louise Li	2150 7104	
Environmental Permit Holder	Architecture Services Department	Mr. S.W. Chow	2867 3716	2523 9622
		Ms. Rio Kwok	2867 3706	
Environmental Team Leader	Allied Environmental Consultants Ltd.	Ms. Grace Kwok	2815 7028	2815 5399
Independent Environmental Checker	Cinotech Consultants Ltd.	Dr. Priscilla Choy	2151 2089	3107 1388

2. SENSITIVE RECEIVERS

Air Sensitive Receivers (ASRs) within 500m include Yuet Wu Villa, lawn bowling field, tennis court, which are less than 100m away from the subject site. Tuen Mun Wu Hong Clinic is located to the west at about 100m to the site boundary. Two secondary schools, Ka Chi Secondary School and South Tuen Mun Government Secondary School, are approximately 300m to the south of the site boundary.

Noise Sensitive Receivers (NSRs) within 300m are Yuet Wu Villa, Siu Hei Court, Yan Chai Hospital Low Chan Chor Si Primary School and Wu King Estate. The nearest NSR will be Block 15 of Yuet Wu Villa.

3. SUMMARY OF EM&A REQUIREMENT

For regular impact monitoring, odour patrol shall be carried out on a regular basis during the first year of operation. Odour patrol shall be carried out once a week during the first three months of operation of the WFM. The odour patrol frequency shall be reviewed afterwards.

According to the approved EM&A Manual, the Action and Limit Levels for operational phase odour patrol are summarized in Table 2.

Table 2 Action and Limit Levels for Operational Phase Odour Patrol

Parameter	Action Level	Limit Level
Perceived odour intensity	Higher than or equal to Level 3	Level 5
Incidence of odour complaints	Any incidence of odour complaint received	Two or more odour complaints received within one month

Should non-compliance of the above Action and Limit levels occurs, the Fish Marketing Organization (FMO) shall undertake corresponding in accordance with the Event/Action Plan given in the EM&A Manual.

For noise monitoring, the operational noise level shall be measured weekly in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(5min)}$ shall be used as monitoring parameter for the period from 0300 to 0630 hours. Each set of measurement shall include at least 3 consecutive $L_{eq(5min)}$ results. As supplementary information for data auditing, statistical results such as $L_{10(5min)}$ and $L_{90(5min)}$ shall also be contained for reference.

Additional noise monitoring shall not be given for marine traffic noise. With consideration given to the selected access route, which represent the worst-scenarios in terms of distance to nearby receivers, the highest marine traffic noise levels at nearby sensitive receivers are found to be below the prevailing background noise level they are currently exposed to. The operation of the proposed WFM is not expected to generate additional marine traffic noise within the typhoon shelter and will not cause any deterioration to the existing noise climate in the vicinity of the typhoon shelter.

From baseline monitoring results, the Action and Limit Levels for operational phase noise monitoring are summarized in Table 3.

Table 3 Action and Limit Levels for Operational Phase Noise Monitoring

Time Period	Action Level	Limit Level
All days during the night-time (2300-0700 hours)	When one documented compliant is received	58dB(A)

Should non-compliance of the above Action and Limit levels occurs, the Fish Marketing Organization (FMO) shall undertake corresponding in accordance with the Event Action Plan given in the EM&A Manual.

4. MONITORING METHODOLOGY

Odour patrol and noise monitoring were conducted around Yuet Wu Villa and at Block 15, Yuet Wu Villa. Appendix A displayed the detail schedule of the odour patrol and noise monitoring. The location plan of odour patrol and sniffing locations are shown in Figure 2. Noise monitoring was conducted at 1.2m above ground level in front of the residential block and at the junction of Wu Sau Street and Wu On Street as given in Figure 3. Due to thunderstorm, the weekly monitoring on 9th November 2011 was postponed to 11th November 2011.

5. RESULTS

Results of operational phase odour patrol and noise monitoring are summarized in Appendix B and Appendix C respectively. In the reporting period, the odour intensity ratings were 1-No Odour. The minimum and maximum average noise level measured at Yuet Wu Villa was 50.9dB(A) $L_{eq(5min)}$ and 56.6dB(A) $L_{eq(5min)}$ respectively. The measured monitoring results were higher than the predicted noise levels due to the increment of noise level from ambient background noise levels.

6. IMPLEMENTATION OF MITIGATION MEASURES

In the operational phase, the solid and liquid waste management is not applicable. The relevant parties have implemented odour and noise mitigation measures which shall include, but not limited to the following:

- The WFM Complex (including the parking area) shall be enclosed to reduce the odour nuisance to the nearby residents;
- Contract specifications on the sound power level of mechanical ventilation system shall be followed;
- Off-route lorries shall not pass along the Wu Shan Road outside Yuet Wu Villa;
- Lorries queuing and vessel's honking shall be controlled by WFM management and AFCD.

All environmental mitigation measures for operational stages stated in approved EIA Report, EM&A Manual and Environmental Permit was carried out throughout the whole operational

period as shown in Appendix D. The environmental mitigation measures undertaken were considered adequate. There was no major change in the operation of WFM and no additional environmental mitigation measures shall be given. In the coming month, the odour patrol frequency shall be reviewed.

7. NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

In the reporting period, no non-compliance, complaint, inspection notice, notification of summons or prosecution was received.

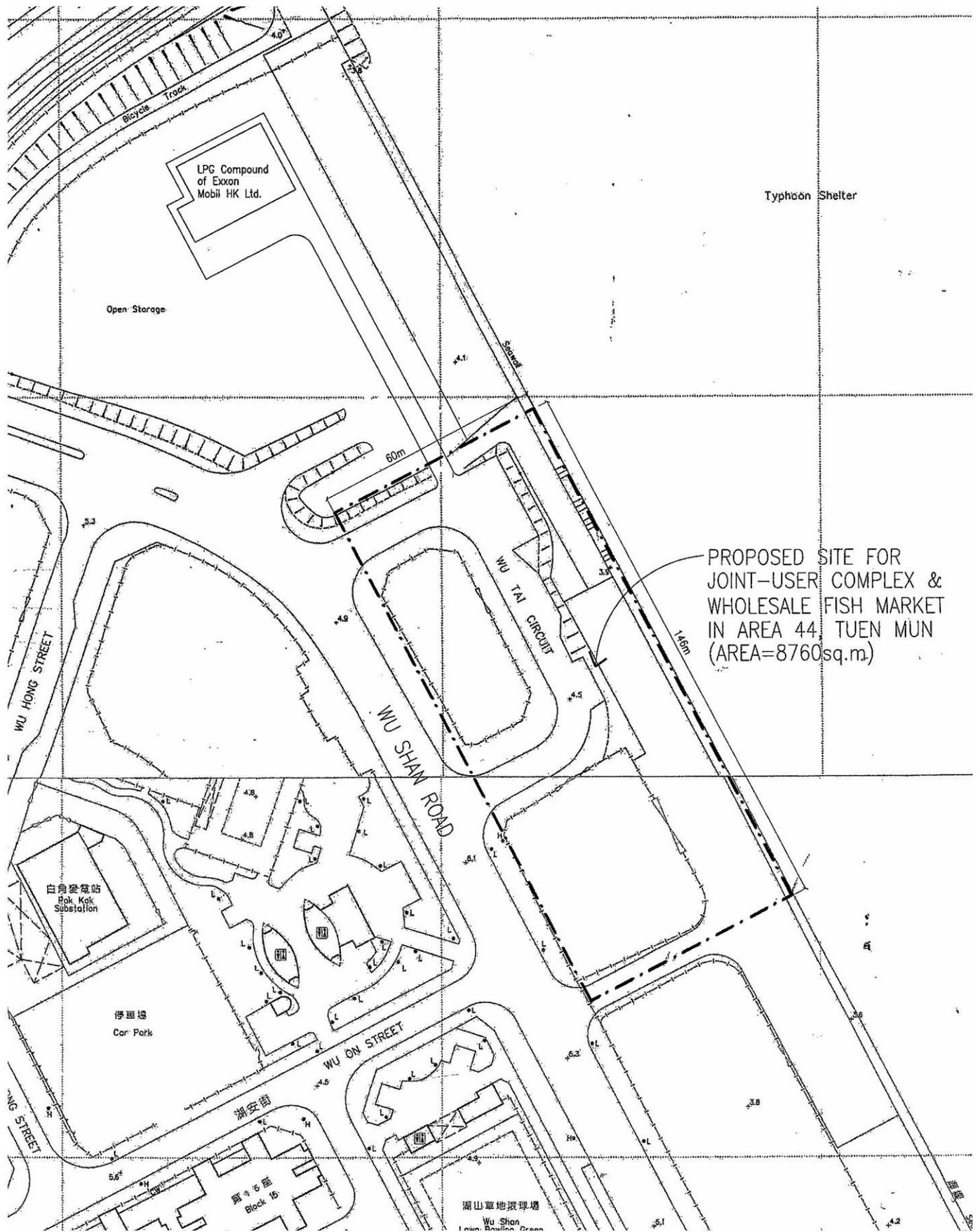
8. CONCLUSIONS

Environmental monitoring has been carried out for the Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun. Odour patrol and noise monitoring were conducted Yuet Wu Villa during the period from 1st November 2011 to 31st December 2011.

In the reporting period, the odour intensity ratings were 1-No Odour. The minimum and maximum average noise level measured at Yuet Wu Villa was 50.9dB(A) $L_{eq(5min)}$ and 56.6dB(A) $L_{eq(5min)}$ respectively. The measured monitoring results were higher than the predicted noise levels due to the increment of noise level from ambient background noise levels.

In the reporting period, no non-compliance, complaint, inspection notice, notification of summons or prosecution was received.

Monitoring works had been conducted for 12 months of the operational of the Wholesale Fish Market as stated in EM&A Manual and the approved Environmental Permit EP-296/2007. The EM&A requirements were fulfilled and the completion of EM&A programme shall be notified to the EPD. The operation phase EM&A programme was completed and no further works should be carried out in future.



**JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44,
TUEN MUN
SITE LOCATION PLAN**

Figure No.

1

Rev.:

0

Scale

NTS

Date

7/11





Legend:

→ Path of Odour Patrol

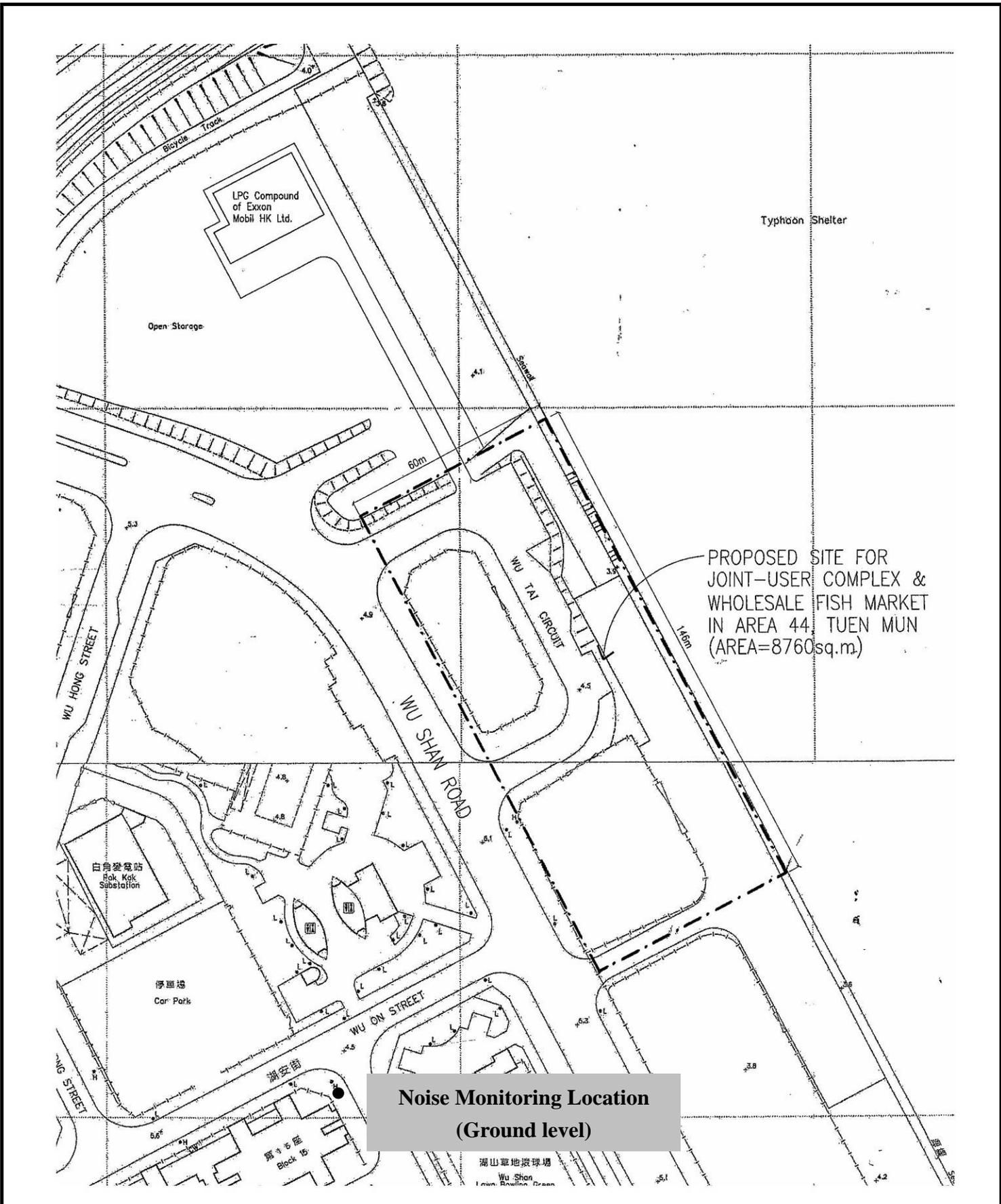
● Sniffing Location

**JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44,
TUEN MUN**

LOCATION PLAN OF OPERATIONAL PHASE ODOUR PATROL AND SNIFFING LOCATIONS

Figure No.	2	Rev.:	0
Scale	NTS	Date	7/11





**Noise Monitoring Location
(Ground level)**

**JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44,
TUEN MUN
LOCATION OF NOISE MONITORING STATION**

Figure No.	Rev.:
3	0
Scale	Date
NTS	7/11



Appendix A

*Detail Schedule of Odour Patrol and Noise
Monitoring*

Schedule for odour patrol and noise monitoring of Tuen Mun Wholesale Fish Market

Monitoring schedule for the reporting period

Date	Start Time
11 th November 2011	05:40
14 th November 2011	06:00
23 rd November 2011	05:40
1 st December 2011	05:40
8 th December 2011	05:15
12 th December 2011	05:10
22 nd December 2011	05:45
30 th December 2011	06:01

Appendix B

Summary of Operational Phase Odour Patrol

Impact Monitoring for Fish Market Project in Tuen Mun
Operational Phase Odour Patrol
Quarter: November 2011 - December 2011

Date and Time		Location	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Relative Humidity (%)	Personnel	Sniffing Location	Odour Intensity Rating (*)
11 th November 2011	5:45	Yuet Wu Villa	17.1	1.3	E	73.2	Cheng Kam Wing	L1	1
	6:07		15.8	2.5	E	81.2		L2	1
	5:57		16.6	2.5	N	79.9		L3	1
	5:45		17.1	1.3	E	73.2	Tsui Churh Yiu	L1	1
	6:07		15.8	2.5	E	81.2		L2	1
	5:57		16.6	2.5	N	79.9		L3	1
13 th November 2011	5:43	Yuet Wu Villa	21	0.4	N	76.2	Cheng Kam Wing	L1	1
	6:08		21.5	1.4	NE	75.3		L2	1
	6:00		20.9	0.6	N	77.6		L3	1
	5:43		21	0.4	N	76.2	Tsui Churh Yiu	L1	1
	6:08		21.5	1.4	NE	75.3		L2	1
	6:00		20.9	0.6	N	77.6		L3	1
23 rd November 2011	5:19	Yuet Wu Villa	21.2	0.7	N	60	Cheng Kam Wing	L1	1
	5:45		21.4	3.5	NE	57.5		L2	1
	5:36		21.4	2.5	N	57.3		L3	1
	5:19		21.2	0.7	N	60	Tsui Churh Yiu	L1	1
	5:45		21.4	3.5	NE	57.5		L2	1
	5:36		21.4	2.5	N	57.3		L3	1
1st December 2011	5:44	Yuet Wu Villa	20.1	0.5	N	66.5	Cheng Kam Wing	L1	1
	6:08		19.2	3	E	71.8		L2	1
	6:01		19.4	0.6	NE	71.2		L3	1
	5:44		20.1	0.5	N	66.5	Tsui Churh Yiu	L1	1
	6:08		19.2	3	E	71.8		L2	1
	6:01		19.4	0.6	NE	71.2		L3	1
8th Decemeber 2011	5:21	Yuet Wu Villa	20.2	1.9	N	73.2	Cheng Kam Wing	L1	1
	5:36		20	1.2	N	74.7		L2	1
	5:41		19.9	2.5	NE	75.5		L3	1
	5:21		20.2	1.9	N	73.2	Tsui Churh Yiu	L1	1
	5:36		20	1.2	N	74.7		L2	1
	5:41		19.9	2.5	NE	75.5		L3	1
12th December 2011	5:20	Yuet Wu Villa	10.9	1.4	N	44.1	Cheng Kam Wing	L1	1
	5:43		10.6	3.5	NE	47.5		L2	1
	5:35		10.7	2.6	N	47.9		L3	1
	5:20		10.9	1.4	N	44.1	Tsui Churh Yiu	L1	1
	5:43		10.6	3.5	NE	47.5		L2	1
	5:35		10.7	2.6	N	47.9		L3	1
22nd December 2011	5:47	Yuet Wu Villa	18.4	1.6	E	51.1	Cheng Kam Wing	L1	1
	6:11		17.1	2.1	E	55.2		L2	1
	6:05		17.1	1	NE	54.8		L3	1
	5:47		18.4	1.6	E	51.1	Tsui Churh Yiu	L1	1
	6:11		17.1	2.1	E	55.2		L2	1
	6:05		17.1	1	NE	54.8		L3	1
30 th December 2011	6:14	Yuet Wu Villa	15.9	1.9	E	68.9	Cheng Kam Wing	L1	1
	6:01		15.8	0.4	E	70.5		L2	1
	6:19		15.8	1.7	E	70.7		L3	1
	6:14		15.9	1.9	E	68.9	Tsui Churh Yiu	L1	1
	6:01		15.8	0.4	E	70.5		L2	1
	6:19		15.8	1.7	E	70.7		L3	1

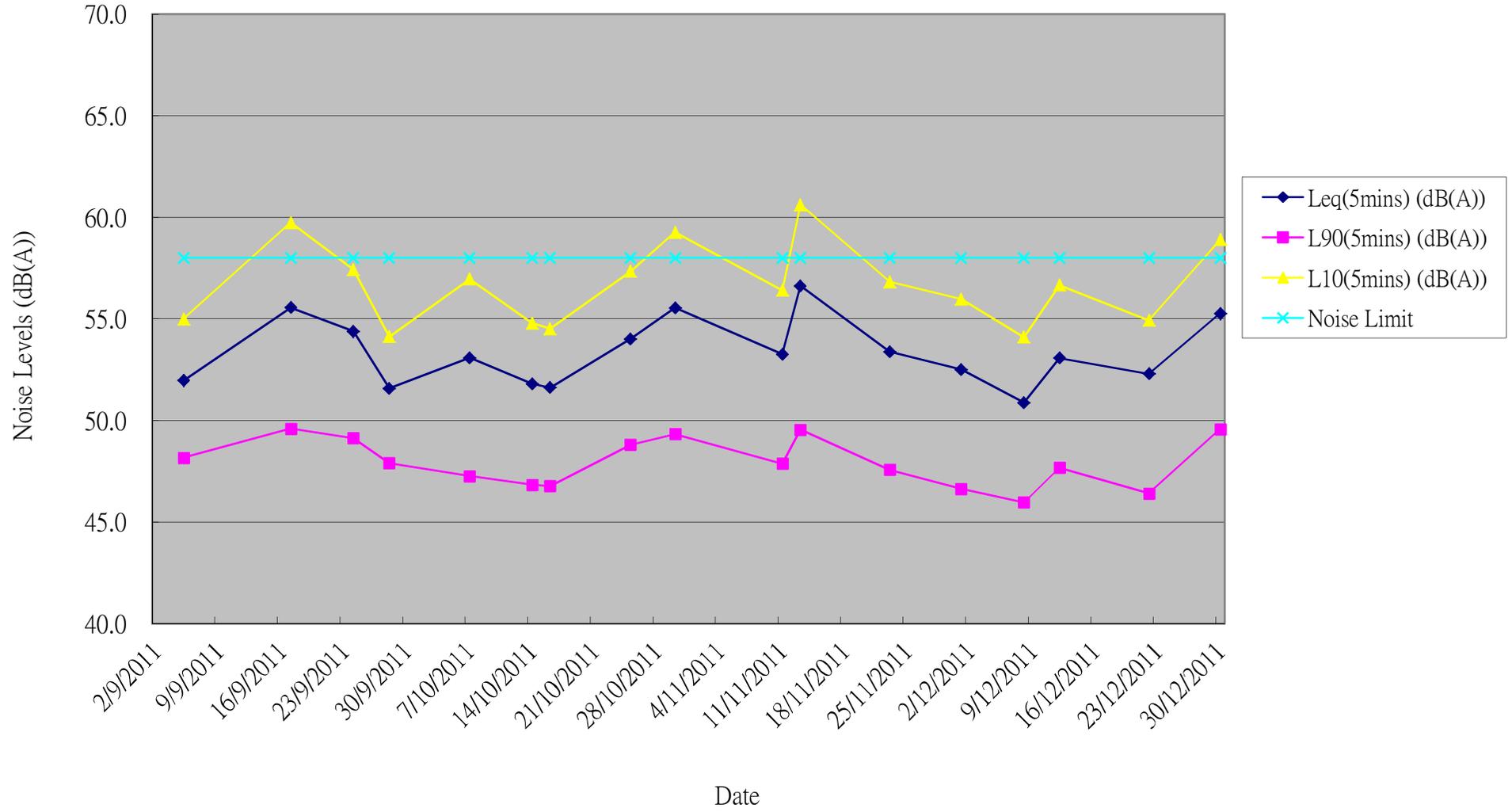
* Remarks:

1. - no odour
2. - not unpleasant
3. - slightly unpleasant
4. - unpleasant
5. - very unpleasant

Appendix C

*Summary and Graphical Plot of Operational Phase
Noise Monitoring*

Noise Monitoring Record



Appendix D

*Mitigation Measures Implementation Schedule
for Operational Stage*

EIA Ref. Section	EM&A Ref. Section	Environmental Protection Measures	Status
6.7	4.1	<p>Water Quality</p> <ul style="list-style-type: none"> • Surface drainage channels of operational areas shall be easily cleaned and connected to foul sewerage • Wastewater from toilets, kitchen, and other users of the WFM market shall be discharged into a foul sewer or a sewage treatment facility. No effluent discharge into the nullah will be allowed • The flushing water storage tank shall be properly designed so as to minimize the amount of water for each flush • Wastewater resulting from cleansing of floors of the fish market and the refuse collection units (RCP) should be discharged into a foul sewer to avoid direct discharge of wastewater to the nullah • Chemical toilets shall be provided to cope with the additional sewage generated on the day of Dragon Boat Festival 	<p style="text-align: center;">^</p>
7.2	5.1	<p>Waste Management</p> <ul style="list-style-type: none"> • In order to minimize the amount of waste disposal, durable and reusable containers should be used, where practicable, instead of plastic bags • Organic matter shall be collected and sealed in plastic bags after each operation and removed daily • The design shall allow for separation and suitable storage of broken polyfoam casings prior to collection • Municipal solid waste generated from community hall, library and offices will be segregated 	<p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>
8.7	6.1	<p>Hazard to Life</p> <ul style="list-style-type: none"> • Manually operated warning siren shall be installed to instruct people to take timely shelter • Fire drill exercises shall be organized for the workers at the site and users of the WFM • Pedestrian access to the area of podium within the 150m consultation zone should be minimized by design • LPG deliveries shall be avoided during the hours when the spectator stand is fully occupied on the day of Dragon Boat Festival • Reference shall be made to the Code of Practice for the Provision of Means of Escape in Case of Fire (Hong Kong Buildings Department [1997]) and the Code of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment (Hong Kong Fire Services Department [1997]) 	<p style="text-align: center;">^</p>

Remarks: ^ Compliance of mitigation measure;
N/A Not Applicable at this stage;

X Non-compliance of mitigation measure;
* Not satisfactory but rectified by the contractor.

As updated on 19 January 2012