PULAU BUKOM - ASTER CHEMICALS AND ENERGY PTE. LTD. (OS)

JETTY	DEPTH A/S(m)	APPROACH DEPTH(m)	MIN LOA (m)	MAX LOA (m)	MAX DISPL (tons)	REMARKS
1E	11.2	15.1	-	110	10,000	
1W	11.2	15.1	-	110	10,000	
2	9.0	15.1	-	170	54,000	
3	10.1	15.1	-	170	50,000	
4	11.0	15.1	-	190	44,000	
5	12.9	15.1	70	190	55,000	
6	16.5	15.1	120	275	193,000	For vessels >75000GT, 4 big tugs in attendance for Berthing and Unberthing
7	13.7	15.1	90	245	100,000	High spot of 12.4m located 0.8c NW 1st Bukom Bn
8	16.5	15.1	90	275	180,000	Berthing speed of up to 0.15m/s at a berthing angle of 6 degrees ; For vessels >75000GT, 4 big tugs in attendance for Berthing & Unberthing
9	12.7	15.1	-	190	65,000	
10	15.3	15.1	90	265	150,000	
10A	3.8	-	-	-	-	The use of anchor is prohibited
10B	5.2	-	-	60	2,000	The use of anchor is prohibited
11	5.3	7.6	-	120	8,000	LPG Berth; See General Info item 9
12	13.0	15.1	-	120	10,000	
13	10.3	10.5	98	155	21,500	Ethylene Berth; See General Info item 10.
OSPJ	10.4	10.3		206	50,000	
OSSBM	24.4	22.8	235	345	355,000	“Swing Radius” 457m

Note: The maximum length may be increased depending on the jetty occupancy at the adjacent wharves

GENERAL INFORMATION

1. The least depth between 2nd and 3rd Bukom Beacons is 14.3m-0.8 cables South-East of 2nd Bukom Bn. (Note location of high spot of 11.6m -1.1 cables South-East of 4TH the Bukom Bn and 12.4 located 0.8c NW 1st Bukom Bn).

2. Counter current can be expected when the predicted maximum East-going stream (Ebb Tide) in the Western Anchorage is ≥ 1.0 knot. It is predicted to commence from about 2 to 3 hrs before the time of the predicted maximum Ebb Tide and continues till the time of the next slack water.

3. The safe approach to jetties along eastern edge of Pulau Bukom during Eastgoing (Ebb Tide) stream and West-going (Flood Tide) stream are on page 8 and 9.

4. The fenders at OS#9 protrude 1.5m from the wharf face and is not visible at certain heights of tide.

5. The number of mooring boats attending to vessels berthing at Shell Terminal are as follows:

   a) One Mooring Boat

      i) Vessels LOA ≤100m

   b) Two Mooring Boats

      i) Vessels LOA > 100m

   c) In circumstances where two mooring boats are required e.g. inclement weather conditions, vessels with slow reaction engines, etc 2 mooring boats could be requested.

6. Mooring arrangements as required by Marine Officer (Shell Bukom):

   a) For vessels > 5000 GRT, the minimum mooring requirement would be 2 lines, 2 backsprings and 2 breastlines for each end.

   b) Mixed mooring of wires and synthetic ropes in same direction must be avoided to avoid uneven load distribution on ropes with differing load handling properties.

Caution: Beware of underwater marine cables and pipelines in the approach of Berth 11, 12 & 13.

7. No berthing of vessel above the maximum displacement.

8. VLCCs anchoring at ATRAF on the EBB tide should be programmed for a tidal strength ≤ 1knot. 1 big tug should be in attendance.

9. Two tugs are recommended to assist for berthing and unberthing of LPG vessels at OS11, due to underwater cables in the area. Pilots may, on consultation with the master, request for additional tug, if necessary.

10. All gas/chemical carriers to OS13 to be assisted by 2 tugs, regardless of bow thrusters' condition.

11. Vessel Navigating within Bukom waters for berthing/un-berthing shall have the required number of tugs made fast/assisting in line with MPA Towage Guidelines. Prior to entering Bukom waters if tugs are not in vicinity, Bukom pilot to contact Bukom operations and do not proceed for berthing.

12. For departure, at all times, required tug(s) shall made fast/assisting until vessel has safely cleared of Bukom waters.

13. Communication: Pilot Walkie talkie P03
VHF Channel 19 (Bukom Operation)

PILOTAGE GUIDELINES

1. BERTHING (DAY)

a) **Flood Tide**

i)	OSSBM	Programmed with at least 3 hours of west-going stream.
ii)	OS1 to OS5, OS7, OS9, OS 10, OS11, OS12, OS13 & OSPJ	No restriction.
iii)	OS10A, B	Tidal strength ≤ 0.5 knot.
iv)	OS6 & OS8	For vessels >75000GT, tidal strength ≤ 1.0kt

b) **Ebb Tide**

i)	OSSBM	No berthing.
ii)	OS1 to OS9 and OS12	When no counter current exists and

OS#10 occupied by vessel > 10,000 GT - vessels' displacements restricted to ≤ 25,000 tons.

When no counter current exists and OS#10 occupied by vessel ≤ 10,000 GT – generally no restriction.

When counter current exists - vessels' displacement restricted to ≤ 25,000

iii) OS10 When no counter current exists – No restriction

When counter current exists - vessels' displacements restricted to ≤ 25,000 tons.
iv) OS10A, OS10B & OS13 No restriction.

iv) OS11 Tidal strength ≤ 0.5 knot

v) OS6 & OS8 No berthing for vessels > 75000GT

2. UNBERTHING (DAY)

a) **Flood Tide**

i) OSSBM, OSPJ No restriction.

Port A/S

ii) OS1 to OS9
OS10A, B
OS11, OS12 & OS13 No restriction.

iii) OS10
Draft >11.0m or
displacement >40,000 tons Tidal strength ≤1.0 knot.

Starboard A/S

i) OS1 to OS5, OS7, OS9,
OS 10, OS11,
OS12, OS13 & OSPJ No restriction.

ii) OS10A, B Tidal strength ≤ 1.0 knot.
(assisting big tug to provide towline).

v)	OS6 & OS8	For vessels >75000GT, tidal strength ≤ 1.0kt

b) **Ebb Tide**

i)	OSSBM	No unberthing if draft is > 15.0m.
	Port A/S	
ii)	OS1 to OS10 OS10A, B, OS12, OS13, OSPJ	No restriction.
iii)	OS11	No restriction
	Starboard A/S	
iv)	OS1 to OS10 OS11 OS12, OS13, OSPJ	No restriction.
v)	OS10A, B	Tidal strength ≤ 1.0 knot (assisting big tug to provide towline)
vi)	OS6 & OS8	No unberthing for vessels > 75000GT

3. BERTHING (NIGHT)

a) **Flood Tide**

i)	OSSBM	Programmed with at least 3 hours of west-going stream.
ii)	OS1 to OS10 OS11A and B and OS12, OS13, OSPJ	No restriction.
iii)	OS10A, B	Tidal strength ≤ 0.5 knot.
iv)	OS6 & OS8	No berthing for vessels > 75000GT

b) **Ebb Tide**

i)	OSSBM	No berthing.
ii)	OS1 to OS8	When no counter current exists and OS#10 occupied by vessel > 10,000 GT – vessels' displacements restricted to ≤ 25,000 tons. When counter current exists - vessels' displacement restricted to ≤ 25,000 or (≤ 26,000 tons for Shell 'H' class vessels)
iii)	OS9 and OS12	When no counter current exists and OS 10 occupied by vessel > 10,000 GT- vessels' displacements restricted to ≤ 25,000 tons. When counter current exists – vessels' displacements restricted to ≤ 12,000 tons.
iv)	OS10	When no counter current exists – no restriction. When counter current exists – vessels' displacements restricted to ≤ 25,000 tons.
v)	OS10A, B, OS13 & OSPJ	No restriction.
vi)	OS11	Tidal strength ≤ 0.5 knots
vii)	OS6 & OS8	No berthing for vessels > 75000GT

4. UNBERTHING (NIGHT)

a) **Flood Tide**

i)	OSSBM, OS13, OSPJ	No restriction.

Port A/S

ii) OS1 to OS9
OS10A,B
OS11
OS12 — No restriction.

iii) OS10
Draft >11.0m
or displacement > 40,000 tons. — Tidal strength ≤ 1.0 knot.

Starboard A/S

iv) OS1 to OS10
OS11and OS12 — No restriction.

v) OS10A, B — Tidal strength < 0.5 knot (assisting big tug to provide towline)

vi) OS6 & OS8 — No unberthing for vessels > 75000GT

b) **Ebb Tide**

i) OSSBM — No unberthing if draft is > 15.0m.

ii) OS13, OSPJ — No restriction.

Port A/S

iii) OS1 to OS10
OS10A, B and OS12 — No restriction.

iv) OS11 — No restriction

Starboard A/S

v) OS1 to OS10, OS12 — No restriction

vi) OS10A, B — Tidal strength ≤ 0.5 knot. (assisting big tug to provide towline)

vii) OS11 — No restriction.

viii) OS7 & 8 — Vessels > 10,000 GT should whenever practicable exit between Second and Third Bukom Beacon or via Bukom #10.

ix) OS6 & OS8 — No unberthing for vessels > 75000GT

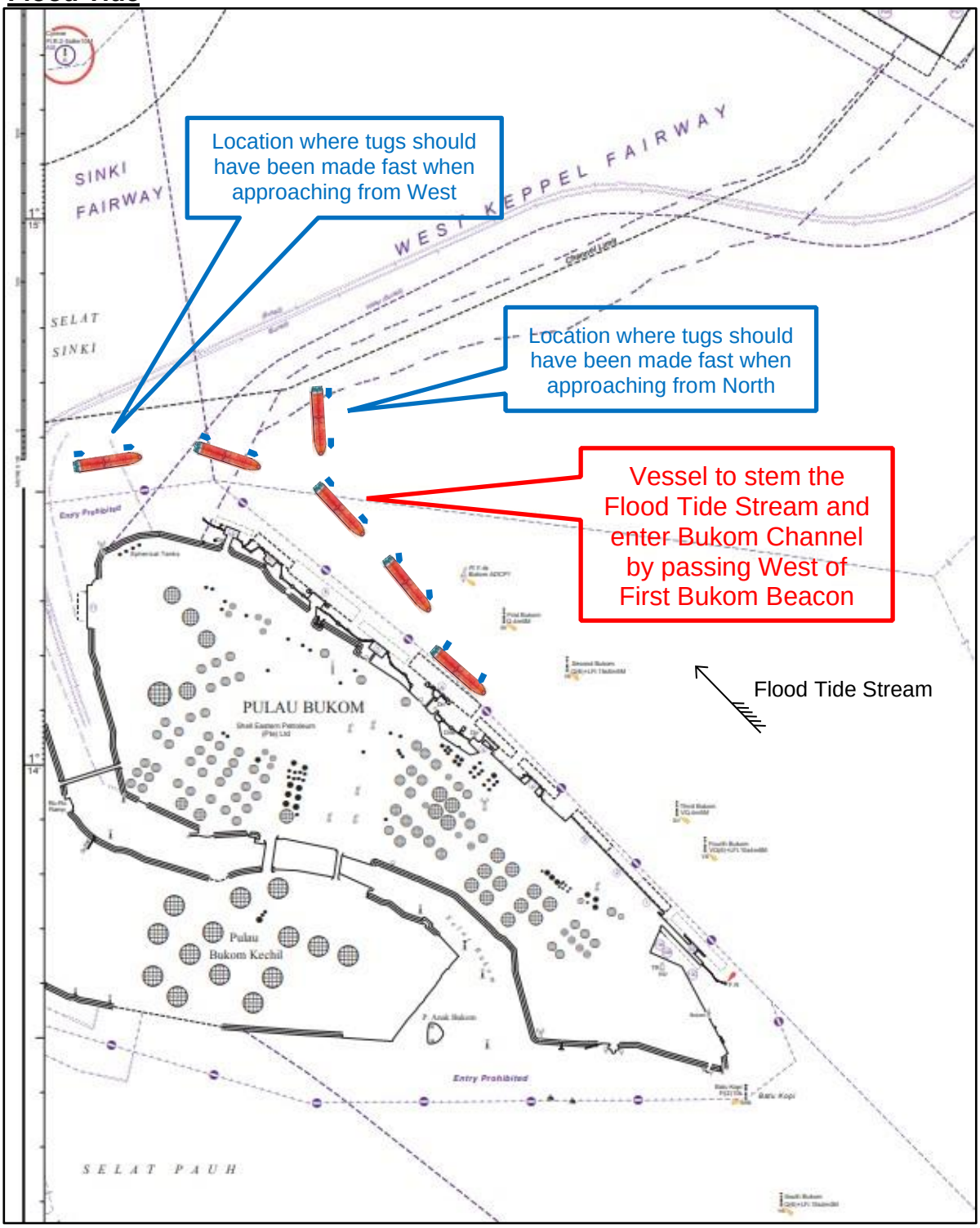
TUG ASSIGNMENT GUIDELINES

LENGTH OVERALL OF VESSEL (LOA)	NUMBER OF TUGS	REMARKS
Up to 100 metres	1 small tug	A vessel equipped with a suitable bow/stern thruster(s), in good working condition, may dispense with the need for a tug in that position.
101 to 152 metres	2 small tugs	
153 to 180 metres	2 medium tugs	
181 to 220 metres	2 medium tugs	
221 to 280 metres	2 big tugs	
281 metres and above	4 big tugs	

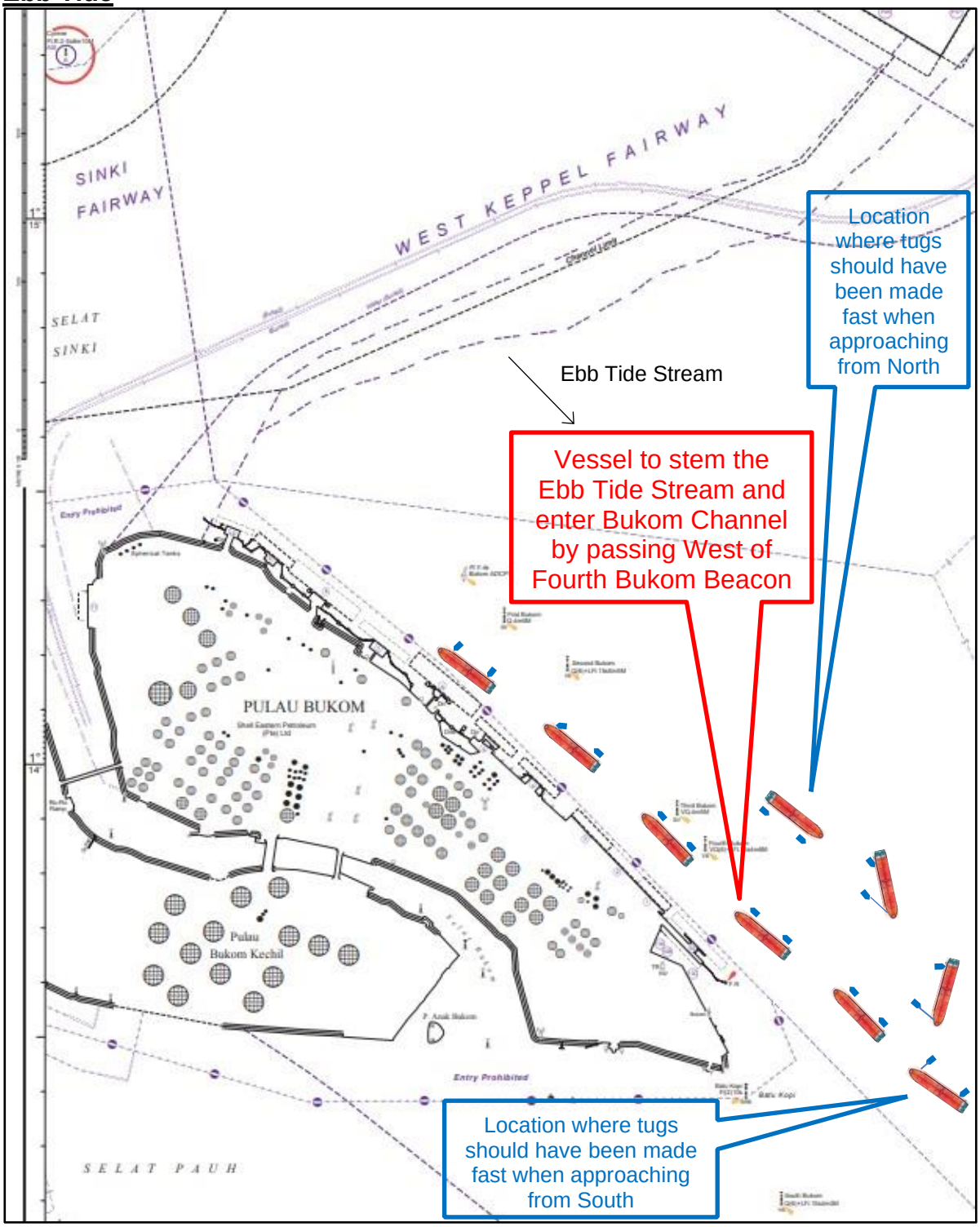
Generally, for movements at Single Buoy Mooring (SBM) and its berths at Pulau Bukom the Terminal should be consulted for their tug recommendation/requirement.

SAFE APPROACH

Flood Tide



Ebb Tide


SINKI FAIRWAY
WEST KEPPEL FAIRWAY
SELAT SINKI
Location where tugs should have been made fast when approaching from North
Ebb Tide Stream
Vessel to stem the Ebb Tide Stream and enter Bukom Channel by passing West of Fourth Bukom Beacon
PULAU BUKOM
Pulau Bukom Kechil
Entry Prohibited
Location where tugs should have been made fast when approaching from South
SELAT PAUH

CHARLET

Chartlet for illustration purposes only, not to be used for navigation. For navigation, mariners are advised to use the appropriate BA nautical charts.