APPENDIX 5F

Estimated Vessels, Construction Plant and Vehicles Used for Shah Deniz 2 Project Activities

1. Introduction

Appendix 5F summarises estimated numbers and period of use of vessels, equipment and plants that will support each phase of SD2 Project.

2. Drilling and Completion Activities

Table 1 below summarises the anticipated MODU and support vessel usage during drilling and completion activities per well.

Table 1 Use of MODU and Vessels per Well (Drilling and Completion)

Vessel/Rig	Number	Duration/ Frequency of Use	Function	Maximum Person on Board	Average Fuel Consumption (tonnes/day)
MODU	1	Continuous	Drill pilot holes, geotechnical holes and wells	120 for the Istiglal 130 for the Heydar Aliyev	9
MODU mobilisation support vessels	3	4 days	Tow out and position MODU	15	15
		4 days	Demobilise MODU		
Pre-drill programme support vessels[1]	9	Per week	Supply drilling mud, diesel and other consumables to the MODU Ship solid and liquid wastes (including lower hole cuttings) to shore for treatment/disposal	15	8
Pre-drill programme stand by vessel	1	Continuous	Back up support for MODU/support vessels	5	4
Crew change vessels[1,2]	3	Per week	Personnel transfer	15	15

1. Vessel trips may be shared with other Azerbaijan Georgia Turkey (AGT) Region Offshore installations.
2. Helicopters may be used for some crew changes.

3. Onshore Terminal Construction

Table 2 summarises the anticipated usage of key plant and equipment during SD2 Terminal Construction Activities per construction phase as per Figure 5.9 of the ESIA.

Table 2 Key Construction Equipment for the SD2 Terminal Construction Activities

	Estimated Number of Plant/Equipment per Phase					
Construction Equipment	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**
Bulldozer e.g. CAT D7 179kW (28 t)	1	1	1	1	0	0
Wheeled Loader e.g. CAT 980H 260kW	11	10	10	8	4	0
Tracked excavator e.g. CAT 329D 140kW (27 t)	7	6	6	4	2	0
Dump truck e.g. Volvo A30F (23 t 18m^3)	68	60	50	48	24	0
Motor Grader e.g. CAT 160M (25 t)	2	2	2	1	1	0
Asphalt paver (+ tipper lorry)	1	1	1	1	1	0
Road lorry e.g. Mercedes Actros 4x2 Tractor unit (39 t)	4	13	25	25	18	5
Diesel generator (150 kVA)	3	30	36	36	24	2
Mechanical water bowser / Road sweeper	8	8	8	8	8	8
Mobile telescopic crane (25t)	8	20	30	31	17	3
Mobile telescopic crane (40t)	5	15	22	23	12	2
Mobile telescopic crane (80t)	2	5	7	8	6	1
Mobile telescopic crane (120t)	1	2	6	5	3	0
Mobile telescopic crane (300t)	0	1	1	1	1	0
Mobile telescopic crane (600t)	0	1	1	1	1	0
Tower Crane	0	0	1	1	1	0
Air Compressor (8/20 m3/min)	1	11	12	12	8	1
X-Ray Equipment	1	4	8	10	6	0
TIG & MIG Welding Machine	2	10	20	24	16	1
TIG Welding Machine	4	19	44	49	30	2
MIG Welding Machine	4	19	44	49	33	2
Welding Machine (electric)	7	29	67	73	49	3
Welding Machine (Diesel)	4	19	45	49	33	2
Truck (20t)	1	6	8	8	5	2
Mini loader (Bobcat)	8	7	7	6	2	0
Man lift (cherry picker)	13	20	21	14	11	2
Drain Pump	6	6	7	4	0	0
Repair Truck	3	3	3	3	3	3
Lube Oil Truck	3	3	3	3	3	3
Vacuum Truck	1	1	1	1	1	1
Fuel bowser (10.000 litters)	3	3	3	3	3	3
Earthworks compactor / roller (18 t)						
Large rotary bored piling rig (110 t)	4	10	0	0	0	0
Large lorry concrete mixer (216kW)	14	12	10	10	5	0
Fork lift trucks e.g. CAT TH514 Telehandler	1	3	4	4	3	1
Water pump 20kW	0	5	7	7	5	0
Concrete pumps	2	3	2	2	1	0

Numbers of Offsite Vehicles and Routing

Table 3 summarises the estimated number of offsite vehicle movements expected to take place associated with the SD2 Project on the public road network. All the vehicles detailed within Table 3 are expected to travel along the main highway.

Table 3 Estimated Number of Offsite Construction Vehicles Associated with SD2 Terminal Construction and Commissioning Activities

		Estimated Number of Daily Movements					
Vehicle		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Low loader	In	10	5	5	5	2	2
	Out	10	5	5	5	2	2
Road lorry 25 T	In	50	100	200	200	75	10
	Out	50	100	200	200	75	10
Minibus (18-20 Seater)	In	25	75	100	100	100	50
	Out	25	75	100	100	100	50
7.5 Tonne Flat Bed	In	10	25	50	50	25	10
	Out	10	25	50	50	25	10
4x4 Pickup Truck	In	20	35	50	50	35	20
	Out	20	35	50	50	35	20
Private Car	In	75	150	250	250	150	50
	Out	75	150	250	250	150	50

4. Platform Installation, Hook Up and Commissioning

Table 4 summarises the estimated usage of vessels during installation, hook up and commissioning phase of the SDB platforms.

Table 4 Installation, Hook Up and Commissioning Vessels

	PR Jacket Installation		QU Jacket Installation		PR Topside Installation		QU Topside Installation		Bridge Installation		Flotel Support	
Vessel	No.	Duration (Days)	No.	Duration (Days)	No.	Duration (Days)	No.	Duration (Days)	No.	Duration (Days)	No.	Duration (Days)
DBA	1	49	1	49	1	20	1	15	1	10	1	20
Anchor handling tug	2	49	2	49	2	15	2	15	2	10	2	20
STB-01 & tow tug	1	17	1	16	1	20	1	15	1	10	-	-

5. Subsea Export and MEG Pipelines Installation, Hook Up and Commissioning

Offshore and Nearshore Vessels:

Table 5 below summarises the estimated usage of number of vessels during offshore and nearshore subsea pipelay activities.

Table 5 Offshore and Nearshore Pipelay Support Vessels

Vessel	Function	No.	Duration (Days)	POB
Pipelay barge	Pipelay	1	730	280
Anchor handling vessels	Positioning of pipelay barge and standby duty	3		15
Pipe supply vessels	Supplies pipe to the pipe-lay barge from onshore	4		10
Pipelay barge support vessels	Tow pipeline barge and support functions	2		14
Survey vessel	Inspects laid pipeline	1		26
DSV	Diver support to survey vessel	1		26

Nearshore Plant - expected plant and equipment anticipated to be used for the nearshore works (i.e. construction of the finger berms, trenching up to 3m water depth, beach pull activities and reinstatement works) comprises:

- 5 tipper trucks;
- 2 bulldozers;
- 2 back hoes;
- 3 mobile cranes; and
- 2 diesel powered generators.

Nearshore works are anticipated to last approximately 16 months.

Onshore Pipeline Construction Plant - it is anticipated the following plant will be used throughout the onshore pipeline construction works:

- 6 side booms;
- 6 excavators;
- 2 dump trucks;
- 1 forklift;
- 2 cranes;
- 2 water bowsers;
- 2 fuel bowsers;
- 1 low loader;
- 4 roller compactors; and
- 1 bulldozer.

Onshore pipeline works are anticipated to last approximately 22 months.

Pipeline Pre-Commissioning and Dewatering Plant

Up to three 7.5kW air compressor and up to two 250 kVA generators will be used during the pipeline pre commissioning and dewatering. To complete all pre-commissioning stages associated with all four pipelines it is anticipated that the air compressors will be used for 90 days and the two generators for 160 days.

6. Subsea Infrastructure Installation, Hook Up and Commissioning

Table 6 provides a summary of vessel usage during installation of the subsea infrastructure.

Table 6 Subsea Infrastructure Installation, Hook Up and Commissioning Vessels

Vessel	Function	No.	Duration	POB
DBA	Crane barge used to install subsea infrastructure	1	Approximately 7 months per flank	240
Pipelay barge	Pipelay	1	Between 26 and 82 days per flank	280
DSV	Diver support to survey vessel	1	Approximately 9 months per flank	26