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1. 調査団員・氏名

(1) 第1次現地調査（現地調査期間：2017年5月21日～7月23日）

氏名	担当業務	所属	現地調査期間
讃良 貞信	総括	独立行政法人 国際協力機構 国際協力専門員	5月21日～5月28日
藤原 真吾	調査計画	独立行政法人 国際協力機構 地球環境部 水資源グループ 水資源第一チーム 主任調査員／課長補佐	5月21日～5月28日
今野 秀紀	業務主任／上水道計画1	(株)建設技研インターナショナル	5月21日～5月28日 6月11日～7月3日
矢山 将志	副業務主任／上水道計画2	北九州市上下水道局	6月11日～7月2日
古川 隆司	水道水源／河川・治水計画	(株)建設技研インターナショナル	6月11日～7月2日
山本 憲史	水理地質	(株)建設技研インターナショナル	5月23日～5月28日 6月11日～7月10日
松本 直秀	浄水施設計画・設計-1	(株)TEC インターナショナル	6月11日～6月30日
河上 惇一	浄水施設計画・設計-2	(株)TEC インターナショナル	6月11日～6月30日
進藤 宙	取水施設計画／河川構造物	(株)建設技研インターナショナル	5月21日～5月28日 6月11日～7月9日
水船 清司	導水・送配水施設計画・設計-1	(株)TEC インターナショナル	6月16日～7月2日
小原 卓朗	導水・送配水施設計画・設計-2	(株)TEC インターナショナル	6月6日～6月30日
佐藤 修二	設備・機材計画-2（機械設備）	(株)建設技研インターナショナル	6月18日～7月2日
松尾 直樹	施工・調達計画-1／積算	(株)建設技研インターナショナル	6月25日～7月9日
衣川 麻	施工・調達計画-2／業務調整	(株)建設技研インターナショナル	6月11日～7月10日
亀海 泰子	環境社会配慮／UXO確認	(株)建設技研インターナショナル	6月26日～7月23日
谷島 誠	財務・経営	(株)建設技研インターナショナル	6月11日～7月7日

(2) 第2次現地調査（現地調査期間：2017年8月10日～10月15日）

氏名	担当業務	所属	現地調査期間
田村 えり子	総括	独立行政法人 国際協力機構 地球環境部 水資源グループ 水資源第一チーム 課長	8月20日～8月27日
大櫃 宜弘	調査計画	独立行政法人 国際協力機構 地球環境部 水資源グループ 上水道分野インハウスコンサルタント	8月20日～8月25日
今野 秀紀	業務主任／上水道計画1	(株)建設技研インターナショナル	8月10日～9月2日
古川 隆司	水道水源／河川・治水計画	(株)建設技研インターナショナル	8月10日～9月3日

氏名	担当業務	所属	現地調査期間
山本 憲史	水理地質	(株)建設技研インターナショナル	8月20日～8月27日
松本 直秀	浄水施設計画・設計-1	(株)TEC インターナショナル	8月10日～9月1日
河上 惇一	浄水施設計画・設計-2	(株)TEC インターナショナル	8月13日～9月1日
竹田 大悟	運転維持管理 (ソフトコンポーネント)	北九州市上下水道局	8月13日～8月26日
進藤 宙	取水施設計画/河川構造物	(株)建設技研インターナショナル	8月17日～9月1日
水船 清司	導水・送配水施設計画・設計-1	(株)TEC インターナショナル	8月10日～9月2日
小原 卓朗	導水・送配水施設計画・設計-2	(株)TEC インターナショナル	8月10日～9月2日
直井 光一	設備・機材計画-1 (電気設備)	(株)TEC インターナショナル	8月20日～9月3日
佐藤 修二	設備・機材計画-2 (機械設備)	(株)建設技研インターナショナル	8月20日～9月3日
松尾 直樹	施工・調達計画-1/積算	(株)建設技研インターナショナル	8月23日～9月4日
衣川 麻	施工・調達計画-2/業務調整	(株)建設技研インターナショナル	8月10日～8月25日
亀海 泰子	環境社会配慮/UXO 確認	(株)建設技研インターナショナル	8月日～月日

(3) 第3次現地調査 (現地調査期間: 2018年6月24日～6月30日)

氏名	担当業務	所属	現地調査期間
川村 康子	総括	独立行政法人 国際協力機構 地球環境部 水資源グループ 水資源第一チーム	6月25日～6月28日
今野 秀紀	業務主任/上水道計画1	(株)建設技研インターナショナル	6月24日～6月30日
松本 直秀	浄水施設計画・設計-1	(株)TEC インターナショナル	6月24日～6月30日
竹田 大悟	運転維持管理 (ソフトコンポーネント)	北九州市上下水道局	6月24日～6月30日
亀海 泰子	環境社会配慮/UXO 確認	(株)建設技研インターナショナル	6月24日～6月30日

(4) 変更設計第1次現地調査 (現地調査期間: 2019年2月10日～2月16日)

氏名	担当業務	所属	現地調査期間
松本 重行	総括	独立行政法人 国際協力機構 地球環境部次長 兼 水資源グループ 長	2月10日～2月15日
川村 康子	企画協力	独立行政法人 国際協力機構 地球環境部 水資源グループ 水資源第一チーム 課長補佐	2月10日～2月15日
今野 秀紀	業務主任/上水道計画1	(株)建設技研インターナショナル	2月10日～2月16日
廣渡 博	副業務主任/上水道計画2	北九州市上下水道局	2月10日～2月16日

(5) 変更設計第2次現地調査（現地調査期間：2019年3月14日～4月12日）

氏名	担当業務	所属	現地調査期間
今野 秀紀	業務主任／上水道計画1	(株)建設技研インターナショナル	2月10日～2月16日
廣渡 博	副業務主任／上水道計画2	北九州市上下水道局	2月10日～2月16日
松本 直秀	浄水施設計画・設計-1	(株)TEC インターナショナル	3月31日～4月7日
三好 博文	施工・調達計画-1／積算	(株)建設技研インターナショナル	3月31日～4月4日

(6) 照査

氏名	担当業務	所属	現地調査期間
高山 一生	照査	北九州市上下水道局	—

2. 調査行程

調査行程を次頁以降に示す。

(1) 第1次現地調査(現地調査期間:2017年5月21日~7月23日)

調査スケジュール

日付		JICA		調査団員																	Meeting
				PHN:Phnom Penh		PUR:Pursat		SVR:Svay Rieng			北九州		北九州		TECI		TECI		TECI		
				業務主任/上水道計画-1	水道水源/河川・治水計画	水理地質	取水施設計画/河川構造物	設備・機材計画-1(機械関係)	施工・調達計画-1/積算	施工・調達計画-2/業務調整	環境社会配慮/UXO調査	財務・経営	副業務主任/上水道計画-2	運転維持管理(ソフトコンポーネント)	浄水施設計画・設計-1	浄水施設計画・設計-2	導水・送配水施設計画・設計-1	導水・送配水施設計画・設計-2	設備・機材計画-2(電気設備)		
田村/藤原	大塚/鎌良	今野	古川	山本	進藤	佐藤	松尾	衣川	亀海	谷島	矢山	竹田	松本	河上	水船	小原	直井				
5月21日	日			NH817 10:50-15:10 Meeting with Local Consul			NH817 10:50-15:10 Meeting with Local Consul														
5月22日	月	NH817 10:50-15:10 Meeting		Meeting with Local Consul Team Meeting			Meeting with Local Consul Team Meeting														
5月23日	火	JICA Meeting WOWRAM Meeting PUR Trip			VN921 10:30-13:55 VN920 15:55-16:50		JICA Meeting WOWRAM Meeting PUR Trip														
5月24日	水	PUR Survey PNH Trip			PUR Survey PNH Trip		PUR Survey PNH Trip														
5月25日	木	MIH Meeting SVR Trip			MIH Meeting SVR Trip		MIH Meeting SVR Trip														
5月26日	金	SVR Survey PNH Trip NH818 22:50-Arrival at Japan		SVR Survey PNH Trip Meeting with Local Consul			SVR Survey PNH Trip Meeting with Local Consul														
5月27日	土	06:45Arrival		Meeting with Local Consul NH818 22:50-			Meeting with Local Consul VN3850 21:05-22:00 NH818 22:50-														
5月28日	日			06:45Arrival			VN320 00:30-07:20 06:45Arrival														
国内作業																					
6月11日	日			NH817 10:50-15:10	NH817 10:50-15:10	TG649 11:35-19:55 Pick UP	NH817 10:50-15:10			NH817 10:50-15:10	TG649 11:35-19:55 No Pick Up			NH817 10:50-15:10	NH817 10:50-15:10						
6月12日	月			PNH	PNH	PNH	PNH			PNH	PUR	PNH		PUR	PUR				AM:MIH PM:JICA		
6月13日	火			PUR	PUR	PNH	PUR			PNH	PUR	PNH		PUR	PUR				AM: Pursat water		
6月14日	水			PNH	PNH	PNH	PHN			PHN	PHN	PHN		PHN	PHN				AM: Pursat DOWRAM Evening: MIH Hrowatari		
6月15日	木			SVR	SVR	SVR	SVR			SVR	PNH			SVR	SVR				AM:Svay WWs PM: DoWRAM		
6月16日	金			PHN	PHN	PHN	PHN			PHN	PNH			SVR	SVR	NH817 10:50-15:10	NH817 10:50-15:10		SVR WWs Meeting PM:MIH Meeting		
6月17日	土			PHN	PHN	PHN	PHN			PHN	PHN			PHN	PHN	PHN	PHN		Evening:Team Meeting		
6月18日	日			PHN	PHN	PHN	PHN	NH817 10:50-15:10		PHN	PHN			PUR	PUR	PUR	PUR				
6月19日	月			PHN	PHN	PHN	PHN	PHN		PHN	PHN			PUR	PUR	PUR	PUR		AM: MoA All: Pursat WWS		
6月20日	火			PHN	PUR	PUR	PUR	PUR		PHN	PUR			PUR	PUR	PUR	PUR		AM: MOWRAM PM: Pursat DOWRAM AMorPM:Subcontractor (Topographic Survey) All: Pursat WWs		
6月21日	水			PHN	PHN	PHN	PUR(BTB 1day trip)	PHN		PHN	PHN			PUR(BTB 1day trip)	PUR(BTB 1day trip)	PUR	PUR		AM:Prusat DOWRAM AM:Batambang WWs All: Pursat WWs		
6月22日	木			SVR(1day trip)	SVR(1day trip)	SVR(1day trip)	PHN	SVR(1day trip)		SVR(1day trip)	PHN	SVR(1day trip)		PHN	PHN	PHN	PHN		All: Pursat WWs All:Svay WWs		
6月23日	金			PHN	PHN	PHN	PHN	PHN		PHN	PHN			SVR	SVR	SVR	SVR		AM: MOWRAM		
6月24日	土			PHN	PHN	PHN	PHN	PHN		PHN	PHN			SVR	SVR	SVR	SVR				
6月25日	日			PHN	PHN	PHN	PHN	PHN	NH817 10:50-15:10	PHN	PHN			SVR	SVR	SVR	SVR				
6月26日	月			PHN	PHN	PHN	PHN	PHN	PHN	PHN	NH817 10:50-15:10			SVR	SVR	SVR	SVR		AM: MOWRAM MOA PM:Contractor All:Svay WWs		
6月27日	火			PUR	PUR	PHN	PUR	PUR	PUR	PHN	PHN	PUR		SVR	SVR	SVR	SVR		All:Svay WWs PM:PursatWws,DPW, DLMJPC		
6月28日	水			BTB	PHN	PHN	PHN	PHN	PHN	PHN	PHN			SVR-KPC-PHN	SVR-KPC-PHN	PHN	PHN		AM:Pursat DOWRAM All:Pursat WWs All:コンベンション場浄水場		

日付	JICA		調査団員																Meeting	
			CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	北九州	北九州	TECI	TECI	TECI	TECI		TECI
			業務主任/上水道計画-1	水道水源/河川・治水計画	水理地質	取水施設計画/河川構築物	設備・機材計画-1(機械関係)	施工・調達計画-1/積算	施工・調達計画-2/業務調整	環境社会配慮/UXO調査	財務・経営	副業務主任/上水道計画-2	運転維持管理(ソフトコンポーネント)	浄水施設計画・設計-1	浄水施設計画・設計-2	導水・送配水施設計画・設計-1	導水・送配水施設計画・設計-2	設備・機材計画-2(電気設備)		
田村/藤原	大塚/巖良	今野	古川	山本	進藤	佐藤	松尾	衣川	亀海	谷島	矢山	竹田	松本	河上	水船	小原	直井			
6月29日	木		PHN	SVR(1day trip)	PHN	PHN	PHN	PHN	SVR(1day trip)	SVR(1day trip)	PHN	PHN	PHN		NH818 22:50	NH818 22:50	PHN	NH818 22:50		AM:JICA All:プンブレック浄水場 All:Svay WWs AM:Svay Dowram
6月30日	金		PHN	PHN	PHN	PHN	PHN	PHN	PHN	PHN	PHN	PHN			-06:45	-06:45	PHN	-06:45		PM:MIH
7月1日	土		PHN	PHN	PHN	PHN	PHN	Structure Design NH818 22:50-	PHN	PHN	PHN	PHN					NH818 22:50			AM:Contractor
7月2日	日		PHN	Depart 14:15 - Hanoi	PHN	PHN	06:45Arrival	PHN	PHN	PHN	PHN	PHN					-06:45			
7月3日	月		PNP→Sri 8:20-		SVR(1day trip)	SVR(1day trip)		SVR(1day trip)	PHN	SVR(1day trip)	PHN	PHN								AM:Svay DoA PM:Svay DoE All:Svay WWs
7月4日	火				PHN	PHN		PHN	PHN	PHN	PHN	PHN								All:Svay WWs
7月5日	水				PHN	PUR		PUR	PUR	PUR	PHN	PHN								AM:MoP
7月6日	木				PHN	PHN		PUR	PUR	PHN	NH818 22:50-	PHN								All:Pursat WWs AM:Pursat DoA PM:Pursat DoE
7月7日	金				PHN	PHN		PHN	PHN	PHN	06:45Arrival	PHN								AM:JICA All:Pursat WWs
7月8日	土				PHN	NH818 22:50-		NH818 22:50-	PHN	PHN		PHN								
7月9日	日				TG585 21:15-08:00	06:45Arrival		06:45Arrival	NH818 22:50-	PHN		PHN								
7月10日	月				Arrival at Japan				06:45Arrival	PHN		PHN								
7月11日	火									PHN		PHN								
7月12日	水									SVR(1day trip)		SVR(1day trip)								AM:Svay DoE AM:Svay Provincial Hall PM:Svay Cloth Factory
7月13日	木									PUR(1day Trip)		PUR(1day Trip)								AM:Pursat Provincial Hall
7月14日	金									PHN		PHN								AM:MoE PM:MIH
7月15日	土									PHN		PHN								
7月16日	日									PHN		PHN								
7月17日	月									PHN		TG585 21:15-08:00								AM:MIH(Technical Note)
7月18日	火									PUR(1day Trip)		Arrival at Japan								AM:CMAC PM:Pursat WWs
7月19日	水									PHN										AM:Pursat WWs PM:MoE
7月20日	木									SVR(1day trip)										All:Svay WWs
7月21日	金									PHN										AM:PPWSA PM:MIH
7月22日	土									NH818 22:50-										
7月23日	日									06:45Arrival										

国内作業

(2) 第2次現地調査（現地調査期間：2017年8月10日～10月15日）

調査スケジュール

日付	JICA		調査団員														Meeting			
			PHN:Phnom Penh		PUR:Pursat		SVR:Svay Rieng		北九州		北九州		TECI		TECI					
			業務主任/上水道計画-1	水道水源/河川・治水計画	水理地質	取水施設計画/河川構造物	設備・機材計画-1(機械関係)	施工・調達計画-1/積算	施工・調達計画-2/業務調整	環境社会配慮/UXO調査	財務・経営	副業務主任/上水道計画-2	運転維持管理(フットホーネット)	浄水施設計画-設計-1	浄水施設計画-設計-2	導水・送配水施設計画-設計-1		導水・送配水施設計画-設計-2	設備・機材計画-2(電気設備)	
田村/藤原	大塚/鎌良	今野	古川	山本	進藤	佐藤	松尾	衣川	亀海	谷島	矢山	竹田	松本	河上	水船	小原	直井			
8月10日	木			NH817 10:50-15:10	NH817 10:50-15:10					NH817 10:50-15:10					NH817 10:50-15:10 PHN		NH817 10:50-15:10 PHN	NH817 10:50-15:10 PHN		
8月11日	金			Pursat WWs Meeting	Pursat WWs Meeting					Pursat WWs Meeting/Data Collection					Pursat WWs Meeting PUR		Pursat WWs Meeting PUR	Pursat WWs Meeting PUR		PM:Pursat WWs PM: Pursat DOWRAM
8月12日	土			PHN	PHN					PHN					PHN		PHN	PHN		
8月13日	日			PHN	PHN					PHN				TG649 11:35-19:55	PHN	NH817 10:50-15:10 PHN	PHN	PHN		
8月14日	月			MIH Meeting PHN	MIH Meeting PHN					PHN				MIH Meeting Phase 3 Meeting PHN	MIH Meeting PPWSA/シャース ト打合 PHN	MIH Meeting PPWSA/シャース ト打合 PHN	MIH Meeting PHN	MIH Meeting PHN		AM:MIH
8月15日	火			SVR(1day trip)	SVR(1day trip)					SVR(1day trip)				PUR Data Collection stay PUR	SVR WWs Meeting (SVR1day trip) PHN	SVR WWs Meeting (SVR1day trip) PHN	SVR WWs Meeting (SVR1day trip) PHN	SVR WWs Meeting (SVR1day trip) PHN		All:SVR WWs PM:Pursat WWs
8月16日	水			MIH Meeting PHN	MIH Meeting PHN					PHN				PUR to BTB BTB Interview stay BTB	MIH Meeting MIH設計基準 PHN	MIH Meeting MIH設計基準 PHN	MIH Meeting PHN	MIH Meeting PHN		PM:MIH
8月17日	木			PHN	PUR		NH817 10:50-15:10			PHN				BTB to PUR PUR interview	設計条件の確認 PUR	設計条件の確認 PUR	PUR	PUR		PM:Pursat WWs PM:バタンバン浄水場
8月18日	金			PHN	PUR→PHN PHN		PHN			PHN				PUR interview PUR to PHN	Pursat WWs Meeting 設計条件の確認 サブアリア(シャース ト) PUR	Pursat WWs Meeting 設計条件の確認 サブアリア(シャース ト) PUR	Pursat WWs PUR	Pursat WWs PUR		All:Pursat WWs AM:Pursat 電力公社 PM:ブルサット 公共事業省 DPWT DPOST and TEL Communication
8月19日	土			PHN	PHN		PHN			PHN				PHN	PUR→PHN	PUR→PHN	PUR→PHN	PUR→PHN		
8月20日	日	NH817 10:50-15:10	NH817 10:50-15:10	PHN	PHN	TG649 11:35-19:55 Pick UP	PHN	NH817 10:50-15:10		PHN				PHN	PHN	PHN	PHN	PHN	NH817 10:50-15:10 PHN	
8月21日	月	am: Consultant Meeting pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN		pm: MIH Meeting PHN				MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	pm: MIH Meeting PHN	am: Consultant Meeting pm: MIH Meeting PHN	pm: MIH Meeting PHN	pm: MIH Meeting PHN	PM:MIH
8月22日	火	PUR observation PUR	PUR observation PUR	PUR observation PUR	PUR observation PUR	PHN	PUR observation PUR	PUR observation PUR		PHN				PUR observation PUR	PUR observation PUR	PUR observation PUR	PUR observation PUR	PUR observation PUR	PUR observation PUR	PM:Pursat WWs
8月23日	水	PUR WVsmeetig PHN	PUR WVsmeetig PHN	PUR WVsmeetig PHN	PUR WVsmeetig PHN	PHN	PUR WVsmeetig PHN	PUR WVsmeetig PHN	NH817 10:50-15:10	PHN				PUR WVsmeetig PHN	PUR WVsmeetig Battam bang PUR	PUR WVsmeetig Battam bang PUR	PUR WVsmeetig PHN	PUR WVsmeetig PHN	PUR WVsmeetig Battam bang PUR	All:Pursat WWs
8月24日	木	MIH Meeting PHN	MIH Meeting NH818 22:50-	MIH Meeting PHN	PHN	PHN	MIH Meeting PHN	MIH Meeting PHN	PHN	NH818 22:50-				PHN	PUR→PHN	PUR→PHN	MIH Meeting PHN	PHN	PUR→PHN	PM:大使館表敬 PM:MIH(MD署名)
8月25日	金		06:45Arrival	PHN	PHN	PHN	PHN	PHN	PHN	PHN	06:45Arrival			JICA Report PHN TG585 21:15-	Kampong Cham PHN	Kampong Cham PHN	PUR	PUR	Kampong Cham PHN	PM:コンボンチャム水道局
8月26日	土			PHN	PHN	TG585 21:15-08:00	PHN	PHN	PHN					8:00Arrival	PHN	PHN	PUR	PUR	PHN	
8月27日	日	PHN→		PHN	PHN	Arrival at Japan	PHN	PHN	PUR Survey						PUR	PUR	PUR	PUR	PHN	

日付	JICA		調査団員																	Meeting
			CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	北九州	北九州	TECI	TECI	TECI	TECI	TECI	
			業務主任/上水道計画-1	水道水源/河川・治水計画	水理地質	取水施設計画/河川構造物	設備・機材計画-1(機械関係)	施工・調達計画-1/積算	施工・調達計画-2/業務調整	環境社会配慮/UXO調査	財務・経営	副業務主任/上水道計画-2	運転維持管理(ソフトコンポーネント)	浄水施設計画・設計-1	浄水施設計画・設計-2	導水・送配水施設計画・設計-1	導水・送配水施設計画・設計-2	設備・機材計画-2(電気設備)		
田村/藤原	大塚/鎌良	今野	古川	山本	進藤	佐藤	松尾	衣川	亀海	谷島	矢山	竹田	松本	河上	水船	小原	直井			
8月28日	月		Field Survey	Data Analysis		Structure Design	EVNMeeting Data Arrange	PUR Survey							PUR	PUR	PUR	PUR	PUR	All:Pursat WWs PM:ブルサットプロビンス管区警察委員会、公共事業局 PM:MoA, MoWRAM
8月29日	火		PUR Survey	PUR Survey		PUR Survey	PUR Survey	PUR Survey							PUR	PUR	PUR	PUR	PUR	All:Pursat WWs
8月30日	水		PUR→PHN	PUR→PHN		PUR→PHN	PUR→PHN	PUR→PHN							PHN	PHN	PHN	PHN	PHN	AM:Pursat WWsMIH Meeting 16:00
8月31日	木		PHN	PHN		Structure Design NH818 22:50-	PHN	PHN							NH818 22:50-	NH818 22:50-	PHN	PHN	PHN	PM:MIH (Technical Note)
9月1日	金		NH818 22:50-	PHN		06:45Arrival	PHN	PHN							06:45Arrival	06:45Arrival	NH818 22:50-	NH818 22:50-	Kampong Cham PHN	AM:MIH Meeting (広渡専門家)
9月2日	土		06:45Arrival	PHN			NH818 22:50-	PHN									06:45Arrival	06:45Arrival	Reporting NH818 22:50-	
9月3日	日			PHN→BGK			06:45Arrival	Data Collection NH818 22:50- 06:45Arrival											06:45Arrival	
9月4日	月																			
9月5日	火																			
9月6日	水																			
9月7日	木																			
9月8日	金																			
9月9日	土																			
9月10日	日																			
9月11日	月																			
9月12日	火																			
9月13日	水																			
9月14日	木																			
9月15日	金																			
9月16日	土																			
9月17日	日																			
9月18日	月																			
9月19日	火																			
9月20日	水																			
9月21日	木																			
9月22日	金																			
9月23日	土																			
9月24日	日																			
9月25日	月																			
9月26日	火																			
9月27日	水																			
9月28日	木																			
9月29日	金																			
9月30日	土																			
10月1日	日																			
10月2日	月																			
10月3日	火																			
10月4日	水																			
10月5日	木																			
10月6日	金																			
10月7日	土																			
10月8日	日																			
10月9日	月																			
10月10日	火																			
10月11日	水																			
10月12日	木																			
10月13日	金																			
10月14日	土																			
10月15日	日																			

(3) 第3次現地調査（現地調査期間：2018年6月24日～6月30日）

調査スケジュール

日付	JICA	調査団員																Meeting	
		PHN:Phnom Penh										PUR:Pursat		SVR:Svay Rieng					
		CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	CTII	北九州	北九州	TECI	TECI	TECI	TECI		TECI
業務主任/上水道計画-1	水道水源/河川・治水計画	水理地質	取水施設計画/河川構造物	設備・機材計画-1(機械関係)	施工・調達計画1/積算	施工・調達計画-2/業務調整	環境社会配慮/UOXO調査	財務・経営	副業務主任/上水道計画-2	運転維持管理(ソフトコンポーネント)	浄水施設計画・設計-1	浄水施設計画・設計-2	導水・送配水施設計画・設計-1	導水・送配水施設計画・設計-2	設備・機材計画-2(電気設備)				
川村	今野	古川	山本	進藤	佐藤	松尾	衣川	亀海	谷島	矢山	竹田	松本	河上	水船	小原	直井			
6月24日	日	Documentation	NH817 10:50-15:10																
6月25日	月	AM: Meeting at JICA Office PM: Meeting with MIH	AM: Meeting at JICA Office PM: Meeting with MIH																AM: Meeting at JICA Office PM: Meeting with MIH
6月26日	火	Meeting with MIH	Meeting with MIH																
6月27日	水	Meeting with MIH	Meeting with MIH																
6月28日	木	Meeting with MIH NH818	Meeting with MIH																
6月29日	金	06:45Arrival	SVR NH818 22:50-																
6月30日	土		06:45Arrival																

(4) 変更設計第1次現地調査(現地調査期間:2019年2月10日~2月16日)

変更設計第2次現地調査(現地調査期間:2019年3月14日~4月12日)

調査スケジュール		調査団員				会議
日付		CTII	北九州	TECI	CTII	
		業務主任/上水道計画-1	副業務主任/上水道計画-2	浄水施設計画・設計-1	施工・調達計画-1/積算	
		今野秀紀	廣渡博	松本直秀	三好博文	
2月10日	日	15:10 Arrival (NH817)	15:10 Arrival (NH817)			
2月11日	月	データ収集	データ収集			
2月12日	火	ミニッツ協議前協議	ミニッツ協議前協議			MIH
2月13日	水	データ収集	データ収集			
2月14日	木	ミニッツ協議	ミニッツ協議			MIH
2月15日	金	22:50 Departure (NH818)	22:50 Departure (NH818)			
2月16日	土	日本着	日本着			
国内作業						
3月14日	木		22:00 Arrival (OZ739)			
3月15日	金		MIH協議			MIH
3月16日	土		水需要予測データフォロー			
3月17日	日	16:40 Arrival (VN920)	水需要予測データフォロー			
3月18日	月	コンボントムKick-off会議	水圧試験データ確認			
3月19日	火	コンボントムKick-off会議	コンボントムKick-off会議			
3月20日	水	水需要予測検討	コンボントム大臣表敬			
3月21日	木	モンドルキリ水道局	モンドルキリ水道局			
3月22日	金	モンドルキリ水道局	モンドルキリ水道局			モンドルキリWWs
3月23日	土	水需要予測検討	水圧試験データ検討			
3月24日	日	水需要予測検討	水需要予測検討			
3月25日	月	コンボントム調印式	コンボントム調印式			
3月26日	火	コンボントム調印式	コンボントム調印式			
3月27日	水	水需要予測検討	水需要予測検討			
3月28日	木	水需要予測検討	配水管網に関する検討			
3月29日	金	コンボンスプー民間水道会社	コンボンスプー民間水道会社			コンボンスプー民間会社
3月30日	土	水需要予測検討	配水管網に関する検討			
3月31日	日	報告書作成	配水管網に関する検討	15:10 Arrival (NH817)	16:40 Arrival (VN920)	
4月1日	月	建設会社訪問	カンボット竣工式対応	建設会社訪問	積算単価収集	建設会社(ノラック)
4月2日	火	ブルサット現場調査	カンボット竣工式対応	ブルサット現場調査	ブルサット現場調査	ブルサットWWs
4月3日	水	協議資料作成	協議資料作成	調達機材検討	21:10 Departure (VN3850)	
4月4日	木	協議資料作成	協議資料作成	報告書作成	日本着	
4月5日	金	MIH協議	MIH協議	MIH協議		MIH
4月6日	土	テクニカルノート作成	テクニカルノート作成	22:50 Departure (NH818)		
4月7日	日	テクニカルノート作成	テクニカルノート作成	日本着		
4月8日	月	報告書作成	報告書作成			
4月9日	火	報告書作成	報告書作成			
4月10日	水	MIH協議	MIH協議, 23:50 Departure(OZ740)			MIH(テクニカルノート)
4月11日	木	21:10 Departure (VN3850)	日本着			
4月12日	金	日本着				

注: は、別案件での稼働を示す。

3. 関係者（面会者）リスト

Ministry of Industry and Handicraft (MIH)

•H.E. EK SONN CHAN	Secretary of State(original design phase)
•Mr. SRENG Sokvung	Director(design change phase)
•Mr. PICH Sambattratanak	Deputy Director of Department of Project
•Ms. THOR Kounthy	Official

Ministry of Environment (MOE)

•Mr. Duong Samkeat	Deputy Director of Environmental Impact Assessment Dept.
•Mr. Chhek Roth	Deputy Director of Department of Laboratory
•Mr. Siv Kung	Deputy Director of Environmental Quality Research and Laboratory

Cambodian Mine Action Centre (CMAC)

•Mr. Mong Sokunthearath	Demining Development Unit Manager
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Department of Industry and Handicraft of Pursat Province (Pursat DIH)

•Mr. CHHE Vansoda	Director
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Pursat Water Works

•Mr. KEO Sara	Director
•Mr. SIENG Sengputhea	Deputy Director

Department of Water Resources and Meteorology of Pursat Province (Pursat DOWRAM)

•Mr. KEO Vey	Director
•Mr. LAO Sokha	Technical Assistant
•Ms. Sok Solshor	

Department of Environment of Pursat Province (DOE)

•Pann Morokoth	Director
----------------	----------

Department of Public Work and Transportation of Pursat Province (DPWT Pursat)

•Mr. KHANG Penghak	Director
•Mr. KANG Kimchhun	Deputy Director
•Mr.SY VUTH	Deputy Director

EDC Pursat

•Mr. DY Sophann

Manager

Pursat DOA

•Mr. Ray Visoth

Director of DOA

•Mr. Sieng Seugputhea

Deputy Director

•Mr. Phum Vimol

Chief of Fishery

•Mr. To Chi Pech

Admin.

Pursat Provincial Hall

•Mr. Chab Neang

Governor of Pursat Municipality

Department of Land Management, Urban Planning, and Construction, Pursat (DOLMUPC)

•Mr. LEAM Bunroeurn

Director

Police office of Pursat

•Mr. PRUM Sarun

Deputy head of Pursat Police Commissioner

•Mr. YEM Makara

Head of Pursat fire department

Pursat EDC

•Mr. DY Sophann

Manager

Pursat 通信会社

•Mr. HUN NARITH

•Mr. Srun Noy Huy

Manager of brunch in Pursat

Battambang Water Works

•Mr. Touch Chhuonsaorith

Director

•Mr. Heom Siphann

Voc chief production

•Mr. Khorn Narith

Chief of Administrator

4. 討議議事録 (M/D)

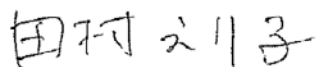
下記の討議議事録の写しを次頁以降に示す。

- (1) Minutes of Discussions on the Preparatory Survey for the Project for Explanation of Water Supply System in Pursat and Svay Rieng in the Kingdom of Cambodia (2017年8月24日署名)
- (2) Minutes of Discussions on the Preparatory Survey for the Project for Explanation of Water Supply System in Pursat in the Kingdom of Cambodia (Explanation on Draft Preparatory Survey Report) (2018年6月28日署名)
- (3) Minutes of Discussions on the 2nd Preparatory Survey for Explanation of Water Supply System in Pursat in the Kingdom of Cambodia (2019年2月14日署名)
- (4) Minutes of Discussions on the Preparatory Survey for the Project for Explanation of Water Supply System in Pursat in the Kingdom of Cambodia (Explanation on Draft Preparatory Survey Report) (2019年9月3日署名)

**Minutes of Discussions
on the Preparatory Survey for
the Project for
Expansion of Water Supply System
in Pursat and Svay Rieng
in the Kingdom of Cambodia**

Based on the several preliminary discussions between the Government of Kingdom of Cambodia (hereinafter referred to as “Cambodia”) and Embassy of Japan with reference to the No. 1523 AP3/MFA.IC dated on 26 June, 2017, Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as “the Team”) of the Project for Expansion of Water Supply System in Pursat and Svay Rieng (hereinafter referred to as “the Project”) to Cambodia, headed by Ms. Eriko Tamura, Director, Water Resources Team 1, JICA, from 20th August to 27th August, 2017. The Team held a series of discussions with the officials of the Government of Cambodia and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Phnom Penh, 24th August, 2017



Ms. Eriko Tamura
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan



H. E. Ek Sonn Chan
Secretary of State
Ministry of Industry and Handicraft
Kingdom of Cambodia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the access to safe water in the cities of Pursat and Svay Rieng through the expansion and improvement of water supply system including construction of a new water treatment plant and water distribution system.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as “the Preparatory Survey for the Project for Expansion of Water Supply System in Pursat and Svay Rieng”.

3. Project site

Both sides confirmed that the sites of the Project are in Pursat and Svay Rieng, which is shown in Annex 1.

4. Responsible authority for the Project

Both sides confirmed the authorities responsible for the Project are as follows:

- 4-1. The Ministry of Industry and Handicraft (hereinafter referred to as “MIH”) will be the executing agency for the Project (hereinafter referred to as “the Executing Agency”). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time. The organization chart is shown in Annex 2.

5. Items requested by the Government of Cambodia

5-1. As a result of discussions, both sides confirmed as follows:

PURSAT

(1) Targeted area of the Project and capacity of water treatment plant

The Team explained the targeted area of the Project as shown in Annex 3 and Cambodian side agreed on it. In conjunction with targeted area, both sides agreed that the capacity of the new water treatment plant (hereinafter referred to as “WTP”) will be around 6,600 m³/day and final capacity will be decided through the preparatory survey. The targeted area is selected based on the priority by the Cambodian side and investment efficiency. The outline of the targeted area and

facility design are as follows:

Items	Existing	Expansion	Total
Included communes	Snam Preah, Anlong Vil, Kandieng, Svay Long, Veal, Lolok Sa, Phteah Prey, Prey Nhi, Roleab, Svay At, Bateay Dei	Snam Preah, Anlong Vil, Kandieng, Kaoh Chum, Lolok Sa, Prey Nhi, Roleab, Bateay Dei	Snam Preah, Anlong Vil, Kandieng, Svay Long, Veal, Kaoh Chum, Lolok Sa, Phteah Prey, Prey Nhi, Roleab, Svay At, Bateay Dei
Population served (thousand persons)	36.3	37.3	73.6
Piped water supply coverage ratio (%)	37.7	32.1	69.8
Piped water supply coverage ratio for Urban Area (%)	53.8	31.1	84.9
Maximum daily water supply (m ³ /day)	7.260	6.600	13,860
Number of service connections (places)	7,219	7,810	15,029
Length of distributing pipes (km)(ϕ 75 or more)	100.1(52.3)	128.1(57.1)	228.2(109.4)
Length of distributing pipes per population served (m/person)(ϕ 75 or more)	2.8(1.4)	3.4(1.5)	3.1(1.5)

Note:

*1: "Piped water supply coverage ratio" indicates the relation between the populations served by piped water and the population in whole administrative area.

*2: "Piped water supply coverage ratio in Urban Area" indicates the relation between the populations served by piped water and the population in urban area.

The above figures and the design of facilities will be finalized by the subsequent detailed analysis.

(2) Location of intake facilities and Water Treatment Plant (WTP)

The Team explained the proposed locations of new intake facilities and WTP as shown in Annex 4-1, 4-2 and 4-3. Two candidate locations (Case 1 and Case 2) were compared. After the discussion, the Team and Cambodian side concluded that Case1 is further studied in the preparatory survey. The major reasons commented by Pursat Waterworks are as follows:

- 1) Enough amount of water at the intake site even in dry seasons
- 2) Cleaner raw water in the upper stream

- 3) Expectation for less soil in the intake facility
- 4) Less negative impact to neighboring community during construction and operation stages

Cambodian side promises to acquire land for those facilities by December 31, 2017.

(3) Permission of water intake

The Team requested MIH to secure permission from Ministry of Water Resources and Meteorology for intake amount at the agreed location by September 15.

(4) Current intake pump

The Team advised that the current intake pump should be repaired by Pursat Waterworks immediately to avoid further damages to the pump and possible suspension of water intake. Pursat Waterworks agreed to take necessary actions.

(5) House connections for the poor household

Cambodian side requested to Japanese side to assist the individual house connection for poor household through the provision of the materials such as water meters, fittings and pipes in the Project. Both sides confirmed that MIH will identify the poor household by poor's ID issued by Ministry of Planning according to the survey in 2010 and 2011. The Team will examine the necessity of provision and amount during the survey, in consideration of similar projects. Both sides also confirmed that Cambodian side will bear the cost for installation works.

(6) Financial sustainability

The Team explained that operational cost of Case 1 will be higher than Case 2. Annual electricity cost of Case 1 will be approximately 164,560,000 riel more than that of Case 2. The Team explained the financial analysis will be conducted in order to assess financial feasibility of the Project including impact by hiring new staff and revision of water tariff may be proposed. The Team also strongly advised to strengthen capacity for financial management such as utilization of SUMS system. In addition, the Team mentioned the simple and easily operated facilities will be considered to reduce operational and financial burden.

SVAY RIENG

(1) Change of water source to be studied in the preparatory survey

The Team explained that it is difficult to construct a new intake facility taking water

from Vay Kor Lake, since structure of existing Vay Kor Dam is weak and stable water intake will not be secured for several decades. Cambodian side understand the explanation and agreed to change water source to be studied in the preparatory survey, since the reinforcement of Vay Kor Dam is not easy and expected to take time. The Team will inform the additional study items and revised schedule of the study for Svay Rieng later.

(2) Consideration for sustainable water supply service in Svay Rieng

1) The current water tariff level in Svay Rieng is the lowest among the eight public waterworks involved in the ongoing technical cooperation project and increase of water tariff needs to be considered to cover operational cost for the new facilities. MIH committed to revise water tariff based on the financial analysis to be conducted in this preparatory survey. In addition MIH needs to reconsider to raise revised tariff by themselves again after the development of new facilities supported by Asian Development Bank (ADB) and World Bank (WB) if needed. The progress of these projects assisted by ADB and WB will be regularly informed to the Team in order to avoid duplication among projects.

2) According to the Census 2008, approximately 80% of households in Svay Rieng have tubed/pipe wells in their premises and most households may expect to use shallow wells even after the development of new water supply facilities. The detail social survey will be conducted to better understand the customers intention to use new facility and to consider measures to promote house connection. The financial analysis to assess feasibility of the project will be conducted in parallel. The implementation of the grant aid project will be decided based on the results of these feasibility studies.

(3) Permission of groundwater intake

MIH promised to request the permission for groundwater intake from Ministry of Water Resources and Meteorology after the necessary groundwater intake amount is identified by the additional study.

5-2. JICA will assess the feasibility of the all requested items through the preparatory survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

6. Procedures and Basic Principles of Japanese Grant

6-1. The Cambodian side agreed that the procedures and basic principles of Japanese Grant as described in Annex 5 shall be applied to the Project.

As for the monitoring of the implementation of the Project, JICA requires Cambodian side to submit the Project Monitoring Report, the form of which is attached as Annex 6.

6-2. The Cambodian side agreed to take the necessary measures, as described in Annex 7, for smooth implementation of the Project. The contents of the Annex 7 will be elaborated and refined during the Preparatory Survey and be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report.

The contents of Annex 7 will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

7. Schedule of the Survey

PURSAT

7-1. The Team will proceed with further survey in Cambodia until 4th September, 2017.

7-2. JICA will prepare a draft Preparatory Survey Report in English and Khmer and dispatch a mission to Cambodia in order to explain its contents around February, 2018.

7-3. If the contents of the draft Preparatory Survey Report is accepted and the undertakings for the Project are fully agreed by the Cambodian side, JICA will finalize the Preparatory Survey Report and send it to Cambodia around May, 2018.

7-4. The above schedule is tentative and subject to change.

SVAY RIENG

The Team will inform the revised schedule of the survey for Svay Rieng later.

8. Environmental and Social Considerations

8-1. The Cambodian side confirmed to give due environmental and social considerations before and during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).

8-2. The Project is categorized as “B” from the following considerations:

The project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the JICA guidelines for environmental and social considerations (April 2010), and its potential adverse impacts on the environment are not likely to be significant.

The Cambodian side confirmed to conduct the necessary procedures concerning the environmental assessment (including stakeholder meetings, Initial Environmental Impact Assessment (IEIA) and information disclosure, etc.) and make IEIA report of the Project. The IEIA approval shall be received from the responsible authorities and submitted to JICA by April 2, 2018.

- 8-3. For the Project that will result in involuntary resettlement, the Cambodia side confirmed to prepare a Resettlement Action Plan (RAP)/Abbreviated Resettlement Action Plan (ARAP) and make it available to the public. In addition, the Cambodian side confirmed to provide the affected people with sufficient compensation and/or support in accordance with RAP/ARAP, which is consistent with JICA Guidelines for Environmental and Social Considerations (April, 2010), in a timely manner.

9. Other Relevant Issues

Annex 1 Project Site

Annex 2 Organization Chart

Annex 3 Targeted area of Pursat

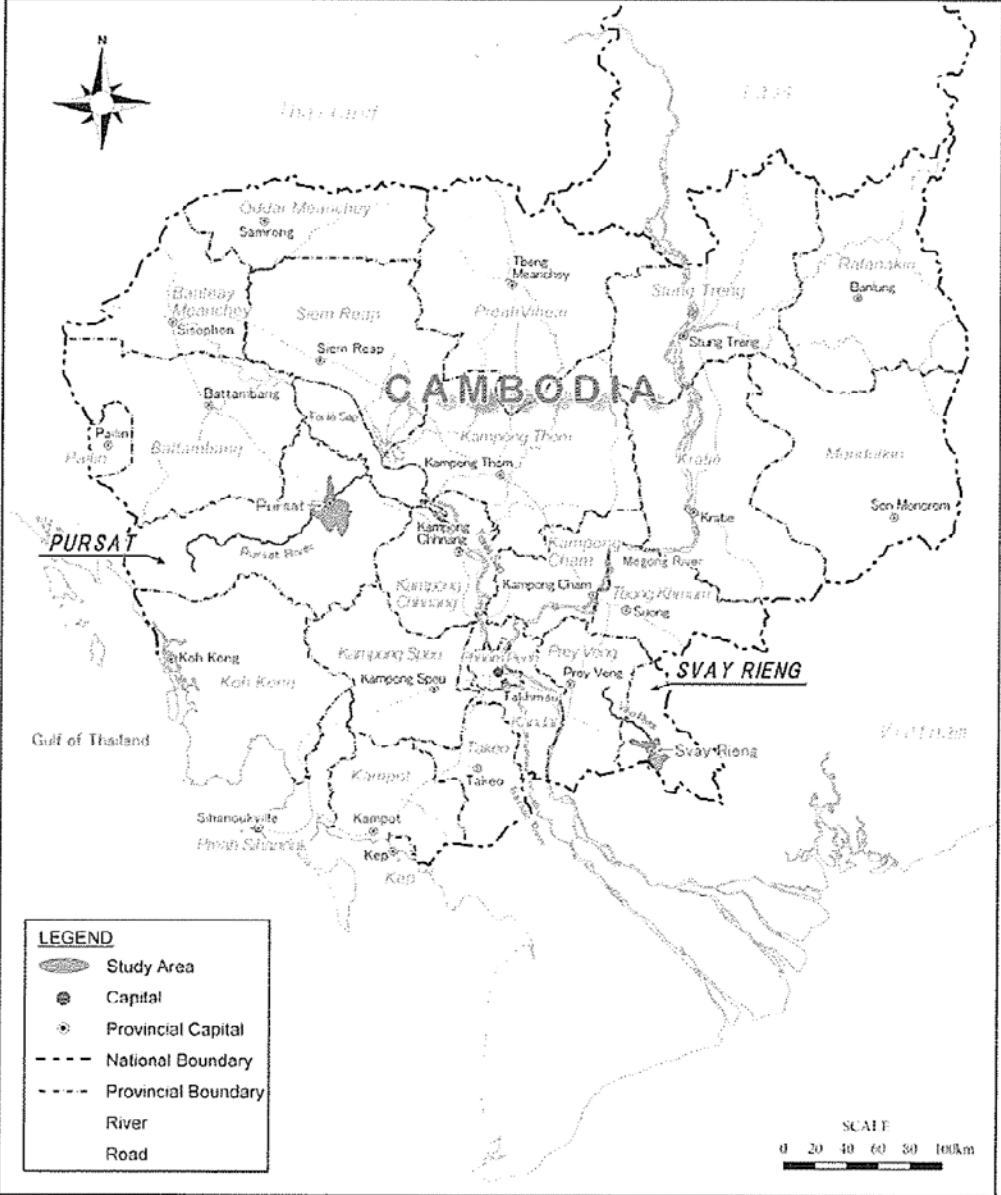
Annex 4 Location of intake and WTP in Pursat

Annex 5 Japanese Grant

Annex 6 Project Monitoring Report (template)

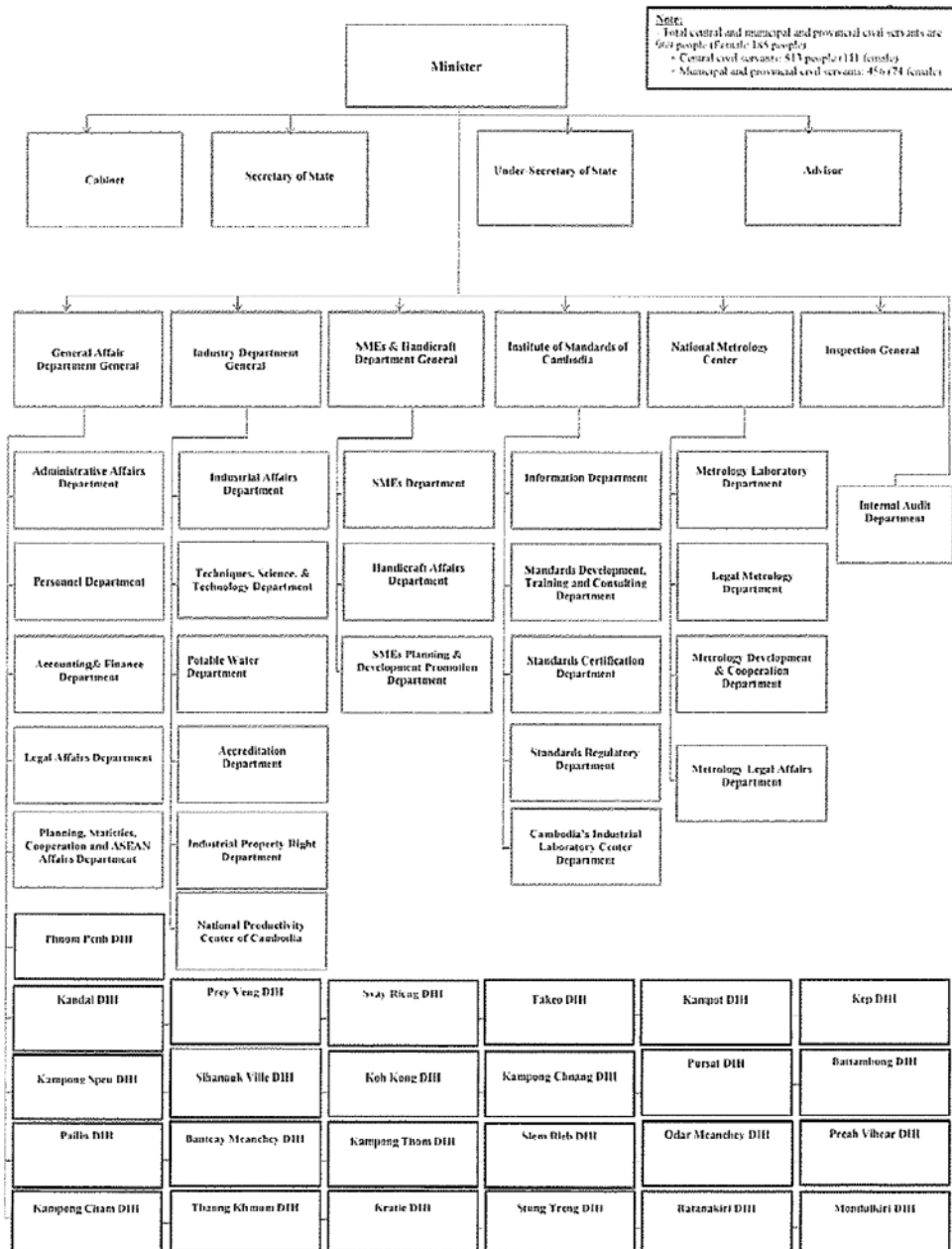
Annex 7 Major Undertakings to be taken by the Government of Cambodia

Annex 1

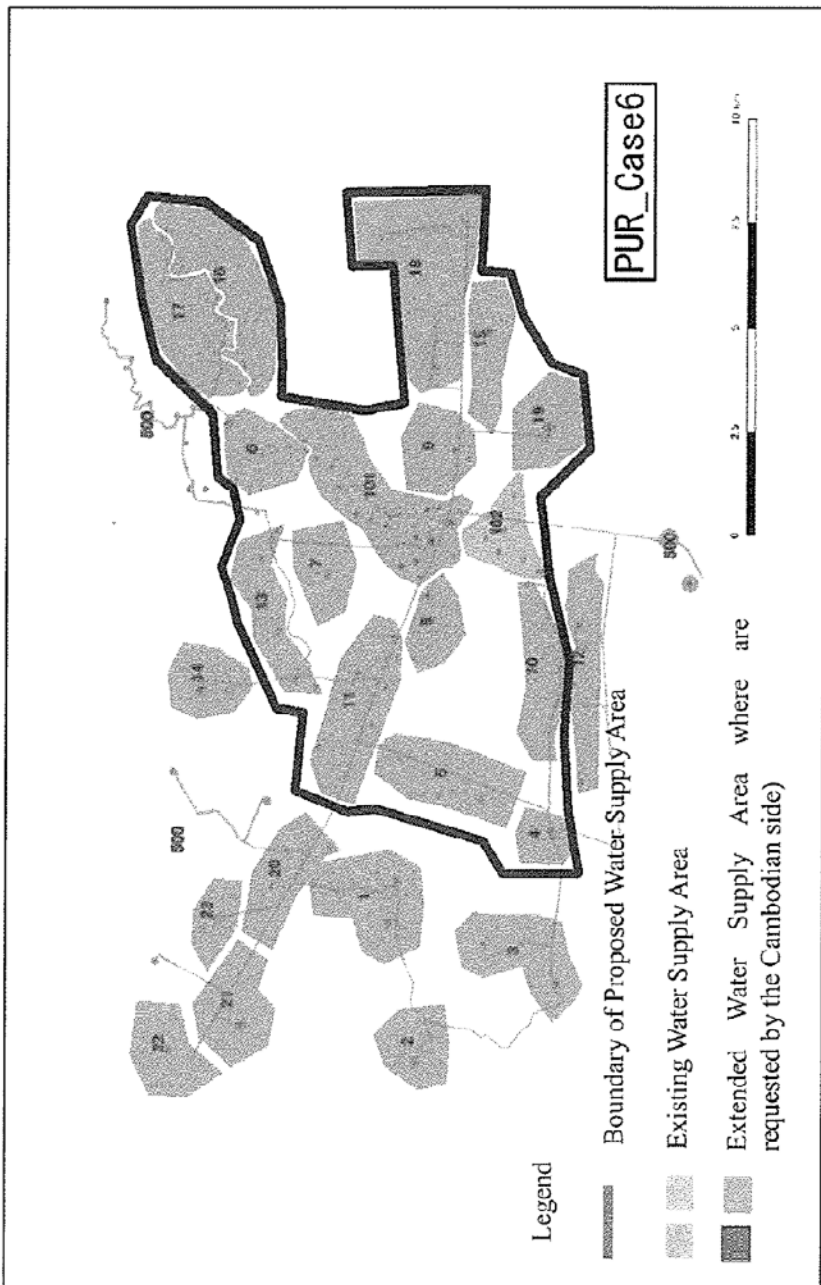


KS

Annex 2



Note:
 Total central and municipal and provincial civil servants are 662 people (Female: 183 people)
 - Central civil servants: 513 people (111 female)
 - Municipal and provincial civil servants: 456 (74 female)



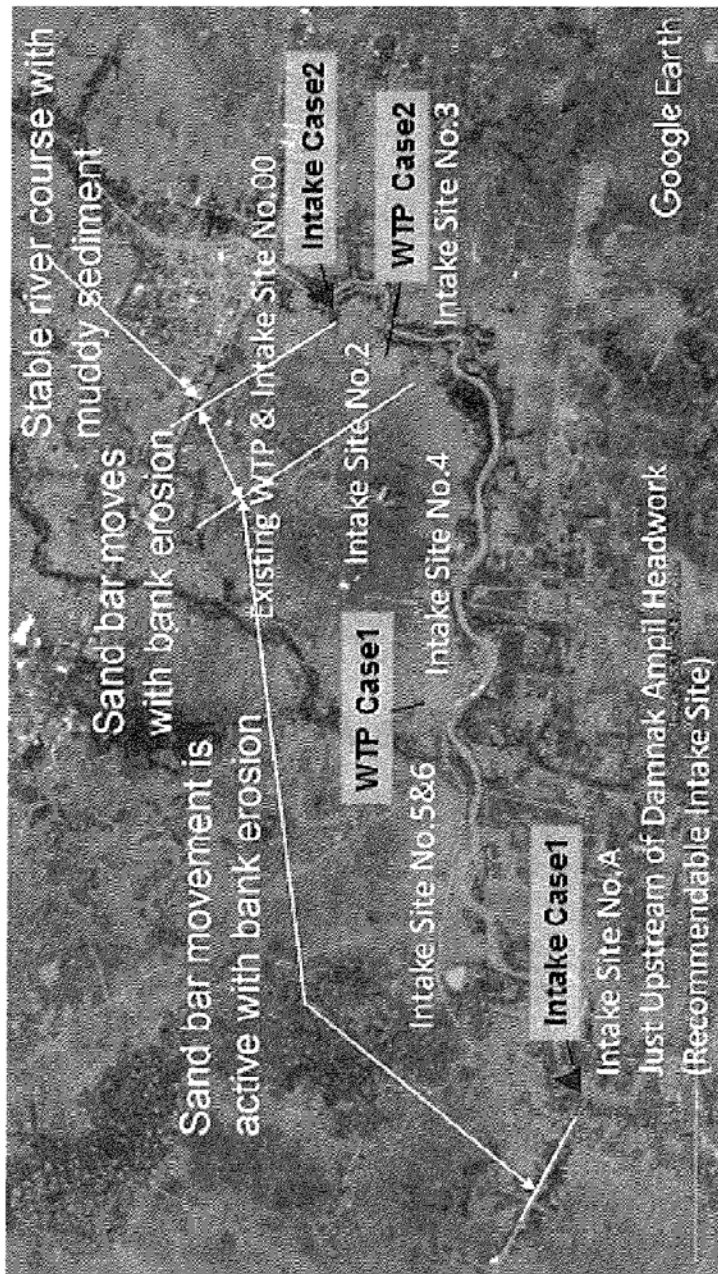
Increased Population Served: 37,300 persons Increased Maximum Daily Water Supply: 6,600 m³/ day
 Note) Numbers "1" to "23" show the expansion priority for the groups of villages based on expansion priorities set by the Cambodian side. Small numbers have high priority. Number "101" to "102" are the existing water supply areas and number "500" are the groups of villages with lower priority.

165

GA

Annex 4-1

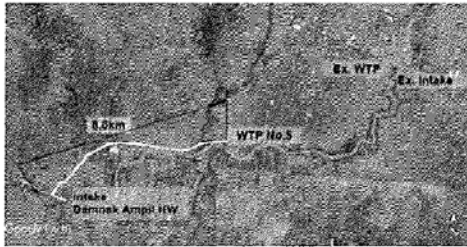
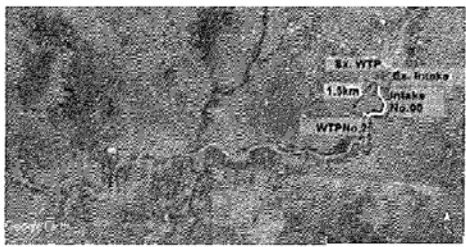
Candidate Intake Sites and Recommendable Intake Site along the Pursat River



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Pursat water intake and WTP site Selection

		Case1 (Intake : Dhamnak Ampil, Water Treatment Plant : No.5)	Case2 (Intake : near the existing intake point, Water Treatment Plant : No.2)
Plan Drawing			
Outline of Intake Site and Facilities		<p>Site Condition</p> <ul style="list-style-type: none"> - WL Condition: LWL+16.300m, HWL+18.200m Water Level Fluctuation:1.9m - Land: 100mx100m (Intake and Yard for Construction) - Not Flood Prone Area <p>Civil Work</p> <ul style="list-style-type: none"> - Conveyance Pipe: DIP350 x 8.000m - Pump Room and ancillary works : LxWxH=37.3mx8.4mx10.5m - Generator Room: LxWxH=6mx5mx4m - Land Creation: 0.5m up (EL18.070m→EL18.570m) <p>Temporary Work</p> <ul style="list-style-type: none"> - Cofferdam of River Side, Steel Sheet Pile SP-III - Excavation by Open Cut <p>Mechanical Works</p> <ul style="list-style-type: none"> - Pump Type: Horizontal End Suction Pump - Pump Head:37m - Pump :150mm/ 2duty +1 stand-by/ 30kW - Q=5.04m³/min 	<p>Site Condition</p> <ul style="list-style-type: none"> - WL Condition: LWL+11.635m, HWL+17.635m Water Level Fluctuation:6.0m - Land: 50mx50m, Residential houses are adjacent. (Intake and Yard for Construction) - Flood Prone Area, 1.5m of inundation depth from the ground in 1996 and 2006 <p>Civil Work</p> <ul style="list-style-type: none"> - Conveyance Pipe: DIP350 x 1,500m - Size of Pump Room and ancillary works : LxWxH=44.0mx8.1mx14.5m - Generator Room: LxWxH=6mx5mx4m - Land Creation: 2.0m up (EL16.135m→EL18.135m) <p>Temporary Work</p> <ul style="list-style-type: none"> - Cofferdam of River Side, Steel Sheet Pile SP-IV - Retaining Wall for Civil Work Construction SP-IV <p>Mechanical Works</p> <ul style="list-style-type: none"> - Pump Type: Horizontal End Suction Pump - Pump Head:21m - Pump :150mm/ 2duty +1 stand-by/ 15kW - Q=5.04m³/min
Outline of WTP Site and Facilities		<p>Site Condition</p> <ul style="list-style-type: none"> - Candidate Site No.5 - Area:100mx100m - Not Flood Prone Area - Distance from the River: Approx.400m <p>Civil Work</p> <ul style="list-style-type: none"> - Land Creation: 1.0m up (EL17.650m→EL18.650m) - Land Creation of Access Road: not Required (EL18.650m) <p>Temporary Work</p> <ul style="list-style-type: none"> - Access from the Main Road 	<p>Site Condition</p> <ul style="list-style-type: none"> - Candidate site No.2 - Area:100mx100m, Elementary school is adjacent. - Flood Prone Area, 1.5m of inundation depth from the ground in 1996 and 2006 - Distance from the River: Approx.400m - 4 Residential Houses along Access Road <p>Civil Work</p> <ul style="list-style-type: none"> - Land Creation: 2.0m up (EL15.260m→EL17.260m) - Land Creation of Access Road: 1.0m (EL16.260m→EL17.260m) <p>Temporary Work</p> <ul style="list-style-type: none"> - Construction Road: L=500m,W=10m
Status of the water source	Stability of water intake	<ul style="list-style-type: none"> ○ Stable river channel ○ Proven track records of the water intake for the irrigation ○ Sufficient amount of water and water depth in the dry season 	<ul style="list-style-type: none"> ○ Stable river channel ○ Located near the existing water intake facilities (upstream side) ○ Sufficient amount of water and water depth in the dry season



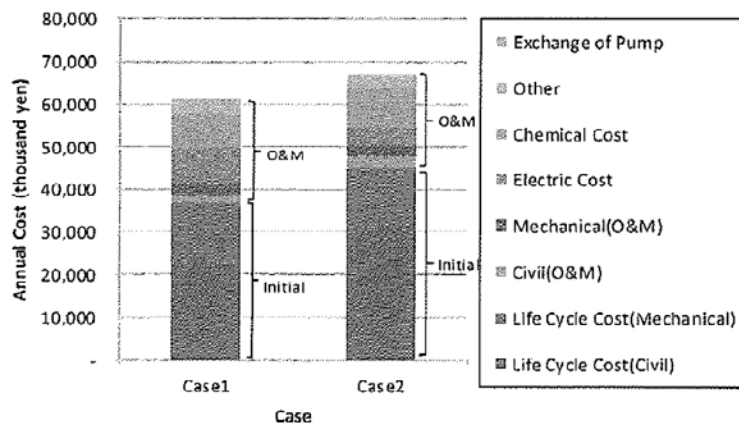
		Case1 (Intake : Dhammak Ampil, Water Treatment Plant : No.5)	Case2 (Intake : near the existing intake point, Water Treatment Plant : No.2)
	Situation of sediment	<ul style="list-style-type: none"> ○ Coarse sand and a certain amount of floating sand accumulate in the flooded pond of the weir. ○ The flow is relatively slow because of the wide flooded pond, and the migration and floating of the silt part are less. ○ Sedimentation volume is less than Case2 and the damage to the intake pump will be less. 	<ul style="list-style-type: none"> ▲ Move of sandy soil (bedload, floating sand wash load) is relatively large. ▲ The flow is relatively fast and the silt is easy to move and float. ▲ Sedimentation volume is more than Case1 and the damage to the pump will be more.
Construction	Workability	<ul style="list-style-type: none"> ○ Large-scale temporary facilities are unnecessary because changes in the water level during the dry season and rainy season are small. ○ The traffic of heavy construction machinery is easy because of flat ground shape and the stability of heavy construction machinery can be secured. ○ Easy access from the main road. ○ Construction period for pump station is relatively short because the scale of the facilities (sedimentation basin and pumping station) are smaller than Case 2. ▲ It takes time to install conveyance pipes because of long distance. 	<ul style="list-style-type: none"> ▲ Large-scale temporary earth retaining work is required, because changes in the water level during the dry season and rainy season are large and houses are adjacent to facilities. ▲ The traffic of heavy construction machinery is difficult due to the narrow space of intake site and the stability of rough terrain crane with vibro hammer cannot be secured due to the unevenness of ground surface shape. ▲ It is difficult to carry in/out construction vehicles, because the access road to the water treatment plant is narrow and passes through a residential area. It is required the embankment and widening of the existing access road, or the provision of new construction road. ▲ Construction period for pump station is relatively long because the scales of the facilities (pump station and ancillary works) are larger than Case 1. ○ The conveyance pipe is short, so the construction period is short.
	Impact on surrounding environment	<ul style="list-style-type: none"> ○ Neighboring construction is not required because there are few adjacent houses at the intake pump station and the water treatment plant site. ○ There is no houses near the WTP site ○ There is no important facilities near WTP site. 	<ul style="list-style-type: none"> ▲ Neighboring construction is required because there are houses around the intake facility. ▲ Impact on houses by widening the access road to the WTP site. ▲ Using the school route of elementary school as the access road to the treatment plant is not preferred for safety reasons. It must be set such as the detour path or the temporary school road. In addition, there is the possibility that adverse effects on the school activities by noise and vibration during the construction will occur. Therefore, measures must be taken against them.
Facilities	Civil engineering facility	<ul style="list-style-type: none"> ○ Both pumping station and ancillary works of the water intake point are smaller than those of Case 2. ○ The risk of flooding is small, and the height of land forming is low. ▲ The water conveyance pipe extension is long (8.0 km). 	<ul style="list-style-type: none"> ▲ Both pumping station and ancillary works of the water intake point are larger than those of Case 1. ▲ Since WTP site is in flood prone, it is necessary to raise the ground (about 2 m, in 1996 and 2006). ○ The water conveyance pipe extension is relatively short (1.5 km).
	Electromechanical equipment	<ul style="list-style-type: none"> ▲ Large motor output. Electricity cost is higher than Case2. 	<ul style="list-style-type: none"> ○ Small motor output. Electricity cost is lower than Case1.

	Case1 (Intake : Dhannak Ampil, Water Treatment Plant : No.5)	Case2 (Intake : near the existing intake point, Water Treatment Plant : No.2)
Operation and Maintenance	○The cleaning and parts exchange frequency of the sand sedimentation is low. ▲The distance is far between the water treatment plant and the intake pump station.	▲The cleaning and parts exchange frequency of the sedimentation basin is high. ○Easy access between the water treatment plant and the intake pump station
Cost	○Initial cost : 344,633 (thousand yen) : 36,531(thousand yen/year) ○Running cost : 24,616 (thousand yen/year)	▲Initial cost : 423,067 (thousand yen) : 44,845 (thousand yen/year) ○Running cost : 22,054 (thousand yen/year)

Unit: Thousand/yen

	Life Cycle Cost			O&M						Exchange of Pump	OM + Exchange of Pump	Total
	Civil	Mechanical	sub-total	Civil(O&M)	Mechanical (O&M)	Electric	Chemical	Other	sub-total			
Case1	22,928	13,603	36,531	2,163	2,567	8,801	7,759	75	21,365	3,251	24,616	61,147
Case2	31,660	13,185	44,845	2,987	2,488	4,401	8,819	208	18,902	3,151	22,054	66,899

Note: O&M cost of civil work is 1% of initial cost. The initial cost of civil work includes the cost of temporary work.
O&M cost of mechanical work is 2% of initial cost.



Note:

1. 1 JPY=approx . 37.4 riel(as of Aug.22, 2017)
2. The above comparison is based on the cost for yearly basis during lifecycle time.
3. The gap of electricity cost between Case 1 and Case 2 is approximately 4,400,000 yen/year (approx.164,560,000 riel) . The gap of cost for 30 years is approximately 75,000,000 yen as the present value.

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Annex 5

JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable

to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.
- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

- 1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.
- 2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

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The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

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Annex 6

<p><u>Project Monitoring Report</u> on <u>Project Name</u> Grant Agreement No. <u>XXXXXXXX</u> 20XX, Month</p>
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Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge (Designation) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Ministry	Person in Charge (Designation) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

Handwritten initials/signature

G/A NO. XXXXXXXX
 PMR prepared on DD/MM/YY

1: Project Description	
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1-1 Project Objective

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1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

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1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original <i>(proposed in the outline design)</i>	Actual
1.		

2-2 Scope of the work

Components	Original* <i>(proposed in the outline design)</i>	Actual*
1.		

Reasons for modification of scope (if any).

KC
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G/A NO. XXXXXXXX
 PMR prepared on DD/MM/YY

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	<i>(proposed in the outline design)</i>	<i>(at the time of signing the Grant Agreement)</i>	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations
 See Attachment 2.

2-4-2 Activities
 See Attachment 3.

2-4-3 Report on RD
 See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original ¹⁾²⁾ <i>(proposed in the outline design)</i>	Actual
	1.			
Total				

Note: 1) Date of estimation:
 2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original ¹⁾²⁾ <i>(proposed in the outline design)</i>	Actual

G/A NO. XXXXXXXX
 PMR prepared on DD/MM/YY

	1.			

Note: 1) Date of estimation:
 2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

<p>Original (at the time of outline design)</p> <p>name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):</p>
<p>Actual (PMR)</p>

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original (at the time of outline design)

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G/A NO. XXXXXXXX
 PMR prepared on DD/MM/YY

Actual (PMR)

3-2 Budgetary Arrangement
 - Required O&M cost and actual budget allocation for O&M

Original (at the time of outline design)
Actual (PMR)

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks (at the time of outline design)

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low

G/A NO. XXXXXXXX
 PMR prepared on DD/MM/YY

	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Handwritten signature

G/A NO. XXXXXXXX
PMR prepared on DD/MM/YY

Attachment

1. Project Location Map
 2. Specific obligations of the Recipient which will not be funded with the Grant
 3. Monthly Report submitted by the Consultant
- Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
 - Contractor's Main Staff List
4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
 5. Environmental Monitoring Form / Social Monitoring Form
 6. Monitoring sheet on price of specified materials (Quarterly)
 7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
 8. Pictures (by JPEG style by CD-R) (PMR (final) only)
 9. Equipment List (PMR (final) only)
 10. Drawing (PMR (final) only)
 11. Report on RD (After project)

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment Price (Increased) F=C+D	Condition of payment Price (Decreased) E=C-D
1 Item 1	●●t	●●	●●	●●	●●	●●
2 Item 2	●●t	●●	●●	●●		
3 Item 3						
4 Item 4						
5 Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

Items of Specified Materials	1st month, 2015	2nd month, 2015	3rd month, 2015	4th	5th	6th
1 Item 1	●	●	●			
2 Item 2						
3 Item 3						
4 Item 4						
5 Item 5						

(3) Summary of Discussion with Contractor (if necessary)

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Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction	(A/D%)	(B/D%)	(C/D%)	
Cost others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Annex 7

Major Undertakings to be taken by the Government of Cambodia

1. Specific obligations of the Government of Cambodia which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To open bank account (B/A)	within 1 month after the signing of the G/A	MEF		
2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract	MIH		
3	To approve IEIA(Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation.	within 1 month after the signing of the G/A	MIH		
4	To secure the necessary budget and implement land acquisition and resettlement (including preparation of resettlement sites), and compensation with full replacement cost in accordance with RAP	before start of the construction	MIH		
5	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	till land acquisition and resettlement complete	MIH		
6	To secure and clear the following lands 1) project sites for water treatment plants and intake facilities in both sites 2) temporary construction yard and stock yard near the Project area	before notice of the bidding document	MIH		
7	To obtain the planning, zoning, building permit	before notice of the bidding document	MIH		
8	To clear, level and reclaim the following sites	before notice of the bidding document	MIH		
9	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding documents	MIH		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	MIH		
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	MIH		
	2) Payment commission for A/P	every payment	MEF		
3	to ensure prompt unloading and customs clearance at ports of disembarkation in recipient country and to assist the Supplier(s) with internal transportation therein	during the Project	MIH		
4	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	MIH		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted	during the Project	MIH		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MIH		
7	1) To submit Project Monitoring Report	every month	MIH		
	2) To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)	MIH		
8	To submit a report concerning completion of the Project	within six months after completion of the Project	MIH		
9	To construct access roads				
	1) Outside the site	3 months before completion of the construction	MIH		
10	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site(s)		MIH		
	1) Electricity The distributing line to the site	before start of the construction			
	2) Water Supply The city water distribution main to the site	6 months before completion of the construction			
	3) Drainage The city drainage main (for storm, sewer and others) to the site	6 months before completion of the construction			
	4) Furniture and Equipment General furniture	1 month before completion of the construction			

11	To take necessary measure for safety construction - traffic control - rope off	during the construction	MIH		
12	To implement EMP and EMoP	during the construction	MIH		
13	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	during the construction	MIH		
14	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report - Period of the monitoring may be extended if affected persons' livelihoods are not sufficiently restored. Extension of the monitoring will be decided based on agreement between MIH and JICA.	- for two years after land acquisition and resettlement complete	MIH		

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implement EMP and EMoP	for a period based on EMP and EMoP	MIH		
2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between MIH and JICA.	for three years after the Project	MIH		
3	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	After completion of the construction	MIH		

2. Other obligations of the Government of Cambodia funded with the Grant

NO	Items	Deadline	Amount (Million Japanese Yen)*
1			/
2			
Total			/

* The Amount is provisional. This is subject to the approval of the Government of Japan.