Table N-3 LIST OF MONITORING AND CONTROL EQUIPMENT TO BE INSTALLED FOR CENTRAL SUPERVISORY SYSTEM (1)

NOTE: AP; AIR PURGE TYPE, AN; ANNUBAR, V ; VENTURI TUBE, (300); PIPE DIAMETER(MM), RD; ROAD, RES; RESERVOIR, ST ; STREET,
D ; DIFFERENTIAL PRESSURE TYPE, O ; ORIFICE PLATE, AV; ALTITUDE VALVE, "*"; EXISTINGS TO BE USED, Av; AVENUE, IT ; INTAKE, IC ; INTERCONNECTION,
F ; FLOAT TYPE, P ; PROPELLAR TYPE, BU; BUTTERFLY VALVE, "¥"; EXISTINGS (REPLACEMENT PERIPHERALS), HW; HIGH WAY, WW ; WATERWORKS, BPS; BOOSTER PUMPING STATION,
B ; BOURDON TUBE, PF; PARSHALL FLUME, CV; CONE VALVE, "#"; INSTALLATION OF CONTROL EQUIPMENT, SH; SHEET, OT ; OFF-TAKE, JCT; JUNCTION,

RTU NO. & LOCATION	MONITORING POINT	PHASE I														PHASE II											
		EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED				EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED			
		LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE	LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE
1	NORTH OROPOUCHE WW											5															5				
	RAW WATER	F		¥ PF		1		1									¥ F		¥ PF		1		1								
	CLEAR WATER RESERVOIR	* D-2				2											D-2				2										
	DISTRIBUTION (1050)			AN				1											¥ AN				1								
2	HOLLIS WW											3															3				
	IMPOUNDING RESERVOIR	F				1											¥ F				1										
	RAW WATER (300)			AN				1											¥ AN				1								
	DISTRIBUTION (600)			AN				1											¥ AN				1								
3	GILL TRACE											15															15				
	QUARE WATER TANK	D				1											¥ D				1										
	QUARE DISTRIBUTION (300)		¥ B	¥ V			1	1										B	¥ V			1	1								
	GILL TRACE OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	QUARE(1) OT (150)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	QUARE(2) OT (150)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	TO SANGRE GRANDE OT (400)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
4	ARIPO BPS											15															15				
	ARIPO(NEW) RAW WATER (300)			¥ O				1											¥ O				1								
	ARIPO(OLD) RAW WATER (250)			AN				1											¥ AN				1								
	FORT READ RESERVOIR (250)	D		AN		1		1									¥ D		¥ AN		1		1								
	FORT READ RESERVOIR (300)	D		AN		1		1									¥ D		¥ AN		1		1								
	ARIPO BPS (300)		B	¥ V	BU		1	1	1				1	SITE				¥ B	¥ V	# BU		1	1	1					1	CSS		
	CUMOTO(1) OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	CUMOTO(2) OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
5	GUANAPO JUNCTION											11															11				
	GUANAPO RAW WATER (300)			AN				1											¥ AN				1								
	GUANAPO RESERVOIR (300)	D				1											¥ D				1										
	GUANAPO WW DIST. (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	WW		
	DOUBLE BRIDGE OT (150)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	GUANAPO JUNCTION OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
6	DEMERARA JUNCTION											6															6				
	DEMERARA JCT OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	TUMPUNA JCT OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
7	ARIMA OLD RESERVOIR											17															38				
	ARIMA NEW RESERVOIR (375)	F		AN		1		1									¥ F		¥ AN		1		1								
	ARIMA OLD RESERVOIR (200)	D		AN		1		1									¥ D		¥ AN		1		1								
	TO MORENO ST OT (150)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	QUESNEL ST OT (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	OMERA JCT OT (150)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	ARIMA BPS (300)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		
	ARIMA WELL (200)			AN				1											¥ AN				1								
	ARIMA B/PUMPS																									4	17		2	CSS		
8	MAUSICA JUNCTION											18															18				
	OLTON RD OT (150)		B	AN	BU		1	1	1				1	SITE				¥ B	¥ AN	# BU		1	1	1					1	CSS		

Table N-3 LIST OF MONITORING AND CONTROL EQUIPMENT TO BE INSTALLED FOR CENTRAL SUPERVISORY SYSTEM (2)

NOTE: AP; AIR PURGE TYPE, AN; ANNUBAR, V ; VENTURI TUBE, (300); PIPE DIAMETER(MM), RD; ROAD, RES; RESERVOIR, ST ; STREET,
D ; DIFFERENTIAL PRESSURE TYPE, O ; ORIFICE PLATE, AV; ALTITUDE VALVE, "*"; EXISTINGS TO BE USED, Av; AVENUE, IT ; INTAKE, IC ; INTERCONNECTION,
F ; FLOAT TYPE, P ; PROPELLAR TYPE, BU; BUTTERFLY VALVE, "¥"; EXISTINGS (REPLACEMENT PERIPHERALS), HW; HIGH WAY, WW ; WATERWORKS, BPS; BOOSTER PUMPING STATION,
B ; BOURDON TUBE, PF; PARSHALL FLUME, CV; CONE VALVE, "#"; INSTALLATION OF CONTROL EQUIPMENT, SH; SHEET, OT ; OFF-TAKE, JCT; JUNCTION,

RTU NO. & LOCATION	MONITORING POINT	PHASE I															PHASE II													
		EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED				EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED			
		LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE	LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE
	BOYS LANE OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	MAUSICA JCT OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	CARAPO OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	MAUSICA OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	MALONEY JCT OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
9	AROUCA WW											9															9				
	CLEAR WATER TANK	D				1											¥ D				1										
	DISTRIBUTION (200)			AN	BU			1	1						1	SITE			¥ AN	# BU				1	1					1	WW
	BORNE AREA #1 OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	LOPINOT IC OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
10	CAURA WW											5															5				
	RAW WATER (400)			AN				1											¥ AN					1							
	CLEAR WATER TANK	D				1											¥ D				1										
	DISTRIBUTION (400)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	WW
11	TACARIGUA WW											12															13				
	CLEAR WATER RESERVOIR	¥ D				1											D				1										
	DISTRIBUTION(1) (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	WW
	DISTRIBUTION(2) (400)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	WW
	TO CAURA BPS OT (225)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	PASEA RD OT (175)		B	AN			1	1										¥ B	¥ AN	BU		1	1	1						1	CSS
12	FLOW CONTROL STATION											11															11				
	PIARCO JCT OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	BY-PASS OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	FLOW CONTROL STATION(800)		B·2	¥ V	# CV-2		2	1	2						2	SITE		¥ B·2	¥ V	# CV-2		2	1	2						2	CSS
13	ST AUGUSTINE RESERVOIR											10															14				
	RESERVOIR (750)	F		AN	AV	1		1									¥ F		¥ AN	¥ AV	1		1								
	ST JOHN RD OT (300)		B	AN			1	1										¥ B	¥ AN	BU		1	1	1						1	CSS
	TO TUNAPUNA OT (150)		B	AN			1	1										¥ B	¥ AN	BU		1	1	1						1	CSS
	RABIR ST OT (200)		B	AN			1	1										¥ B	¥ AN	BU		1	1	1						1	CSS
	RIVERSIDE RD OT (100)		B	AN			1	1										¥ B	¥ AN	BU		1	1	1						1	CSS
14	TUNAPUNA BPS											48															48				
	TUNAPUNA(1) (150)		B	AN	BU		1	1	1						1	CSS		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TUNAPUNA(2) (200)		B	AN	BU		1	1	1						1	CSS		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TUNAPUNA(3) (525)		B	AN			1	1										¥ B	¥ AN			1	1								
	PASEA ST OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TUNAPUNA RIVER (1) (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TUNAPUNA RIVER (2) (525)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TUNAPUNA B/PUMPS									6	25		3	CSS											6	25		3	CSS		
15	ST JOSEPH RESERVOIR											15															15				
	RESERVOIR	F				1											¥ F				1										
	TO ST JOSEPH OT (225)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO RIDER MAIN OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	MENDEZ STEEL SH. OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS

Table N-3 LIST OF MONITORING AND CONTROL EQUIPMENT TO BE INSTALLED FOR CENTRAL SUPERVISORY SYSTEM (3)

NOTE: AP; AIR PURGE TYPE, AN; ANNUBAR, V ; VENTURI TUBE, (300); PIPE DIAMETER(MM), RD; ROAD, RES; RESERVOIR, ST ; STREET,
D ; DIFFERENTIAL PRESSURE TYPE, O ; ORIFICE PLATE, AV; ALTITUDE VALVE, "*"; EXISTINGS TO BE USED, Av; AVENUE, IT ; INTAKE, IC ; INTERCONNECTION,
F ; FLOAT TYPE, P ; PROPELLAR TYPE, BU; BUTTERFLY VALVE, "¥"; EXISTINGS (REPLACEMENT PERIPHERALS), HW; HIGH WAY, WW ; WATERWORKS, BPS; BOOSTER PUMPING STATION,
B ; BOURDON TUBE, PF; PARSHALL FLUME, CV; CONE VALVE, "#"; INSTALLATION OF CONTROL EQUIPMENT, SH; SHEET, OT ; OFF-TAKE, JCT; JUNCTION.

RTU NO. & LOCATION	MONITORING POINT	PHASE I														PHASE II											
		EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED				EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED			
		LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE	LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE
	MATERNITY HP. OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	ST JOSEPH(1) (175)			AN				1											¥ AN				1							
	ST JOSEPH(2) (300)			AN				1											¥ AN				1							
16	VALSAYN WW											41															41				
	RAW WATER (750)			¥ V				1											¥ V				1							
	CLEAR WATER RESERVOIR	¥ D				1											D				1									
	DISTRIBUTION (750)		¥ B	¥ V	BU		1	1	1						1	SITE		B	¥ V	# BU		1	1	1						1	WW
	BOOSTER SUCTION (450)		¥ B	¥ AN			1	1										B	¥ AN			1	1							
	BOOSTER DELIVERY (450)		¥ B	AN	BU		1	1	1						1	CSS		B	¥ AN	# BU		1	1	1						1	CSS
	VALSAYN B/PUMPS									6	25		3	CSS											6	25		3	CSS		
17	URIAH BUTLER HW JUNCTION											3															3				
	STAG/NESTL OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
18	MT. HOPE RESERVOIR											23															26				
	RESERVOIR (600)	D		AN	AV	1		1									¥ D		¥ AN	¥ AV	1		1								
	CARIB(1) OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	CARIB(2) OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	MT. HOPE OT (300)																	B	AN	BU		1	1	1						1	CSS
	GORDON ST (1) OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	GORDON ST (2) OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	GORDON ST (3) OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	BROOM ST OT (200)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO SANTA CRUZ OT (250)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
19	MALICK RESERVOIR											11															11				
	RESERVOIR (750)	D		AN	AV	1		1									¥ D		¥ AN	¥ AV	1		1								
	TO BARATARIA OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	SIXTH Av. OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO LADY YOUNG Av. OT (450)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
20	EL SOCORRO WW											49															49				
	RAW WATER (750)			¥ V				1											¥ V				1							
	CLEAR WATER RESERVOIR	¥ AP				1											F				1									
	BOOSTER SUCTION (900)		¥ B				1											B				1									
	BOOSTER DELIVERY (600)		¥ B	¥ AN	BU		1	1	1						1	CSS		B	¥ AN	# BU		1	1	1						1	CSS
	DISTRIBUTION (400)		¥ B	¥ AN	BU		1	1	1						1	SITE		B	¥ AN	# BU		1	1	1						1	WW
	EL SOCORRO RD OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	DON MIGUEL RD OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	ELEVENTH ST OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	EL SOCORRO B/PUMPS									6	25		3	CSS											6	25		3	CSS		
21	LAVENTILLE											3															3				
	TO LAVENTILLE OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
22	BLACK RIVER											12															12				
	BLACK RIVER (1) OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	BLACK RIVER (2) OT (450)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	BLACK RIVER (3) OT (525)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS

Table N-3 LIST OF MONITORING AND CONTROL EQUIPMENT TO BE INSTALLED FOR CENTRAL SUPERVISORY SYSTEM (4)

NOTE: AP; AIR PURGE TYPE, AN; ANNUBAR, V ; VENTURI TUBE, (300); PIPE DIAMETER(MM), RD; ROAD, RES; RESERVOIR, ST ; STREET,
D ; DIFFERENTIAL PRESSURE TYPE, O ; ORIFICE PLATE, AV; ALTITUDE VALVE, "*"; EXISTINGS TO BE USED, Av; AVENUE, IT ; INTAKE, IC ; INTERCONNECTION,
F ; FLOAT TYPE, P ; PROPELLAR TYPE, BU; BUTTERFLY VALVE, "¥"; EXISTINGS (REPLACEMENT PERIPHERALS), HW; HIGH WAY, WW ; WATERWORKS, BPS; BOOSTER PUMPING STATION,
B ; BOURDON TUBE, PF; PARSHALL FLUME, CV; CONE VALVE, "#"; INSTALLATION OF CONTROL EQUIPMENT, SH; SHEET, OT ; OFF-TAKE, JCT; JUNCTION,

RTU NO. & LOCATION	MONITORING POINT	PHASE I														PHASE II											
		EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)						EQUIPMENT TO BE CONTROLLED				EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)						EQUIPMENT TO BE CONTROLLED			
		LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE	LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE
	TO LADY YOUNG RD OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
23	PICTON NO. 3 RESERVOIR											16															16				
	PICTON #1 RESERVOIR (400)	* D		AN	AV	1		1									D		¥ AN	¥ AV	1		1								
	PICTON #2 RESERVOIR (750)	* D-2		AN	AV-2	2		1									D-2		¥ AN	¥ AV-2	2		1								
	PICTON #3 RESERVOIR (900)	* D		AN	AV	1		1									D		¥ AN	¥ AV	1		1								
	MASALLAH ST OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	PRIZAR LANDS ST OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	KERR RD OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
24	SERVOL LIFE CENTER											9															9				
	BEETHAM DUMP OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	SERVOL LIFE C. OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO LAVENTILLE OT (525)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
25	KNAGGS HILL											19															19				
	RESERVOIR (525)	* D-2		AN	* AV-2	2		1									D-2		¥ AN	¥ AV-2	2		1								
	TO BELMONT OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO CASCADE OT (600)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO ST CLAIR OT (350)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	WESTERN MAIN ROAD (525)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	FROM SAVANNAH WELLS (300)		B	AN			1	1										¥ B	¥ AN			1	1								
	BARRACK (750)		B	AN			1	1										¥ B	¥ AN			1	1								
26	NATIONAL FLOUR MILL											3															12				
	NFM OT (100)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	PORT AUTHORITY (300)																	B	¥ P	# BU		1	1	1						1	CSS
	POST OFFICE (300)																	B	¥ P	# BU		1	1	1						1	CSS
	NATIONAL STADIUM (300)																	B	¥ P	# BU		1	1	1						1	CSS
27	TUMPUNA STORAGE LIFT PS											77															77				
	ARENA IMPOUNDING RES.	¥ AP				1											F				1										
	TUMPUNA WEIR	F				1											¥ F				1										
	TO/FROM RESERVOIR (1200)			¥ V-2				2											¥ V-2				2								
	RIVER DISCH. VALVE (1200)				¥ BU-2				2						2	CARONI				# BU-2				2						2	CARONI
	TUMPUNA S.L./PUMPS									12	59		6	CARONI											12	59		6	CARONI		
28	CARONI WTP											9															9				
	RAW WATER	¥ AP		¥ PF		1		1									¥ AP		¥ PF		1		1								
	CLEAR WATER RESERVOIR	¥ AP				1											¥ AP				1										
	CARONI NORTH (900)		* B	¥ AN	¥ BU		1	1	1						1	CARONI		B	¥ AN	# BU		1	1	1						1	CARONI
	CARONI SOUTH (1200)		* B	¥ AN	¥ BU		1	1	1						1	CARONI		B	¥ AN	# BU		1	1	1						1	CARONI
29	KELLY VILLAGE											3															3				
	KELLY VILLAGE OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
30	SCALE YARD											6															6				
	SCALE YARD OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	HINGKING RD OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
31	LAS LOMAS WW											5															5				
	RAW WATER (600)			¥ O				1											¥ O				1								

Table N-3 LIST OF MONITORING AND CONTROL EQUIPMENT TO BE INSTALLED FOR CENTRAL SUPERVISORY SYSTEM (5)

NOTE: AP; AIR PURGE TYPE, AN; ANNUBAR, V ; VENTURI TUBE, (300); PIPE DIAMETER(MM), RD; ROAD, RES; RESERVOIR, ST ; STREET,
D ; DIFFERENTIAL PRESSURE TYPE, O ; ORIFICE PLATE, AV; ALTITUDE VALVE, "*"; EXISTINGS TO BE USED, Av; AVENUE, IT ; INTAKE, IC ; INTERCONNECTION,
F ; FLOAT TYPE, P ; PROPELLAR TYPE, BU; BUTTERFLY VALVE, "¥"; EXISTINGS (REPLACEMENT PERIPHERALS), HW; HIGH WAY, WW ; WATERWORKS, BPS; BOOSTER PUMPING STATION,
B ; BOURDON TUBE, PF; PARSHALL FLUME, CV; CONE VALVE, "#"; INSTALLATION OF CONTROL EQUIPMENT, SH; SHEET, OT ; OFF-TAKE, JCT; JUNCTION.

RTU NO. & LOCATION	MONITORING POINT	PHASE I														PHASE II											
		EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED				EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED			
		LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS		ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE	LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS		ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE
	CLEAR WATER RESERVOIR	D				1												¥ D				1										
	DISTRIBUTION (600)		¥ B	¥ V	BU		1	1	1						1	SITE			B	¥ V	# BU		1	1	1							
32	JERNINGHAM JUNCTION												5																6				
	TO LAS LOMAS OT (600)		B	AN			1	1											¥ B	¥ AN	BU		1	1	1							
	JERNINGHAM JCT OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
33	CHAGUANAS												6																6				
	CHAGUANAS OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	LANGE PARK OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
34	CARLSEN FIELD WW												7																7				
	CLEAR WATER RESERVOIR	F				1												¥ F				1										
	DISTRIBUTION(1) (200)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	DISTRIBUTION(2) (250)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
35	CARAPICHAIMA												7																9				
	CARAPICHAIMA OT (200)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	TO CARLSEN FIELD OT (300)		B	AN			1	1											¥ B	¥ AN	BU		1	1	1							
	TO FREEPORT WW OT (300)		B	AN			1	1											¥ B	¥ AN	BU		1	1	1							
36	WARDEN OFFICE												9																9				
	WARDEN OFFICE OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	COUVA LANE OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	POINT LISAS OT (600)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
37	TRINGEN II												3																3				
	TRINGEN II OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
38	CALIFORNIA RESERVOIR												2																2				
	RESERVOIR (900)	D		AN	AV	1		1										¥ D		¥ AN	¥ AV	1		1								
39	TCL												3																3				
	TCL OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
40	MARAVELLA												3																3				
	MARAVELLA OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
41	SAN FERNANDO BPS												49																49				
	SAN F'DO RESERVOIR (750)	¥ D		AN	AV	1		1										D		¥ AN	¥ AV	1		1								
	MARRYAT RESERVOIR (600)	¥ D		AN		1		1										D		¥ AN		1		1								
	NAPARIMA RESERVOIR	¥ D				1												D				1										
	BOOSTER SUCTION (900)		¥ B	¥ AN			1	1											B	¥ AN			1	1								
	BOOSTER DELIVERY (900)		¥ B		* BU		1		1						1	CSS			B		# BU		1		1							
	ROUND ABOUT(1) OT (300)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	ROUND ABOUT(2) OT (525)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	FIRE BRIGADE OT (375)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	SAN F'DO B/PUMPS									6	25			3	CSS											6	25			3	CSS		
42	MOSQUITO CREEK												3																3				
	TO MOSQUITO CR. OT (600)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
43	ST CLEMENT												6																6				
	ST CLEMENT (1) OT (200)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							
	ST CLEMENT (2) OT (250)		B	AN	BU		1	1	1						1	SITE			¥ B	¥ AN	# BU		1	1	1							

Table N-3 LIST OF MONITORING AND CONTROL EQUIPMENT TO BE INSTALLED FOR CENTRAL SUPERVISORY SYSTEM (6)

NOTE: AP; AIR PURGE TYPE, AN; ANNUBAR, V ; VENTURI TUBE, (300); PIPE DIAMETER(MM), RD; ROAD, RES; RESERVOIR, ST ; STREET,
D ; DIFFERENTIAL PRESSURE TYPE, O ; ORIFICE PLATE, AV; ALTITUDE VALVE, "*"; EXISTINGS TO BE USED, Av; AVENUE, IT ; INTAKE, IC ; INTERCONNECTION,
F ; FLOAT TYPE, P ; PROPELLAR TYPE, BU; BUTTERFLY VALVE, "¥"; EXISTINGS (REPLACEMENT PERIPHERALS), HW; HIGH WAY, WW ; WATERWORKS, BPS; BOOSTER PUMPING STATION,
B : BOURDON TUBE, PF; PARSHALL FLUME, CV; CONE VALVE, "#"; INSTALLATION OF CONTROL EQUIPMENT. SH; SHEET, OT ; OFF-TAKE, JCT; JUNCTION.

RTU NO. & LOCATION	MONITORING POINT	PHASE I														PHASE II													
		EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED				EQUIPMENT TO BE INSTALLED				NUMBER OF MONITORING DATA BY CENTRAL SUPERVISORY SYSTEM (CSS)							EQUIPMENT TO BE CONTROLLED			
		LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE	LEVEL METER	PRESS GAUGE	FLOW METER	CONTROL VALVE	WATER LEVEL	WATER PRESS	FLOW RATE	VALVE STATUS	PUMP STATUS	ALARM	TOTAL	PUMP NO.	PUMP PLACE	VALVE NO.	VALVE PLACE
44 DAISY												3															3				
	DAISY OT (400)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
45 MALGRETOUTE BPS												64															64				
	BOOSTER SUCTION (900)		¥ B	¥ V			1	1										B	¥ V			1	1								
	BOOSTER DELIVERY (900)		¥ B		BU		1		1						1	CSS		B		# BU		1								1	CSS
	BUEN INTENTO OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO PRINCESS TOWN OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO MALGRETOUTE OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	MALGRETOUTE B/PUMPS									10	41		5	CSS											10	41		5	CSS		
46 BROTHER ROAD												9															9				
	BROTHER ROAD OT (150)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO PIPARO/ARCH OT (250)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TO ST JULIAN OT (375)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
47 TCO BPS												68															68				
	BOOSTER SUCTION (900)		¥ B				1											B				1									
	BOOSTER DELIVERY (900)		¥ B	¥ V	BU		1	1	1						1	CSS		B	¥ V	# BU		1	1	1						1	CSS
	RIO CLARO OT (300)		B	AN	BU		1	1	1						1	SITE		¥ B	¥ AN	# BU		1	1	1						1	CSS
	TCO B/PUMPS									12	49		6	CSS											12	49		6	CSS		
48 NAVET WW												9															9				
	HIGH DAM	F				1											¥ F				1										
	LOW DAM	F				1											¥ F				1										
	STORAGE LIFT PS (1200)			AN			1												¥ AN				1								
	RAW WATER (450)			AN-4			4												¥ AN-4				4								
	CLEAR WATER RESERVOIR	F				1											¥ F				1										
	DISTRIBUTION (900)			AN			1												¥ AN				1								
	TOTAL	38	127	160	124	38	127	160	113	58	249	745	29		113		38	131	164	136	38	131	164	125	62	266	786	31		125	
	= LIST OF ITEMS =	¥AP 4 D 11 *D 8 ¥D 5 F 10	¥B 14 B 111 *B 2	¥AN 6 AN139 ¥O 2 ¥PF 2 ¥V 11	AV 9 *AV 2 BU106 *BU 1 ¥BU 4 #CV 2								6 CARONI 23 CSS		102 SITE 7 CSS 4 CARONI		¥AP 2 D 13 ¥D 11 F 2 ¥F 10	B 20 ¥B 111	AN 1 ¥AN145 ¥O 2 ¥P 3 ¥PF 2 ¥V 11	BU 9 ¥AV 11 #BU114 #CV 2								6 CARONI 25 CSS		4 CARONI 111 CSS 10 WW	

O: FINANCIAL POSITION OF WASA

TABLE 1. STATEMENT OF REVENUE AND OPERATING DEFICITS

	'85	'86	'87	'88	'89
Revenues					
Water rates	33,010	90,266	105,882	127,179	132,200
Sewerage rates	8,628	12,521	16,969	19,015	16,756
Sunday charges & income	721	2,587	1,156	4,297	3,955
	42,359	105,375	124,008	150,492	152,910
Expenses					
Water	104,617	106,692	104,143	104,491	
Sewerage	12,077	11,689	10,185	10,465	
Administration	49,114	55,667	38,362	61,064	
Common services	87,236	90,358	82,658	77,158	
Depreciation	33,400	35,464	36,276	40,792	37,455
	286,444	299,869	271,625	293,970	270,393
Net operating deficit for the year	244,086	194,495	147,618	143,478	117,483
Accumulated operating deficit brought forward	1,422,778	1,666,863	1,861,358	2,008,975	2,152,454
Previous years expenses	-	-	-	-	2,900
Accumulated operating deficit carried forward	1,666,863	1,861,358	2,008,975	2,152,454	2,269,937

TABLE 2. BALANCE SHEET

(TT$ 10^3)

	'85	'86	'87	'88	'89
Current Assets					
Cash on hand	704	740	1	2,001	1,088
Cash at bank	27,951	184	104	266	-
Call deposits	-	-	-	1,000	2,607
Account receivable	43,245	97,168	109,480	126,534	143,154
Inventories	26,077	24,074	20,341	15,719	14,645
	97,978	122,165	129,926	145,520	161,494
Current Liabilities					
Bank overdraft	-	6,975	1,643	7,603	-
Account payable	13,177	18,980	9,323	22,981	45,779
Other creditors & accruals	11,516	45,826	17,445	54,438	79,170
Loan installments due within one year	-	-	5	5	5
	24,693	71,781	28,416	85,027	124,954
Net Current Assets	73,285	50,384	101,510	60,493	36,540
Investments	2,146	2,315	2,998	3,631	3,637
Fixed Assets	1,027,824	1,002,413	971,235	940,759	911,713
Total Net Assets	1,103,255	1,055,112	1,075,743	1,004,883	951,891
Financed by :					
Capital funds	1,064,278	1,070,674	2,971,019	3,043,640	3,108,137
General reserve	113,561	113,561	113,561	113,561	113,561
	1,177,838	1,184,235	3,084,580	3,157,201	3,221,698
Accumulated operating deficit	-1,666,863	-1,861,358	-2,008,976	-2,152,454	-2,209,927
Operating deficit advances	1,592,127	1,732,086	-	-	-
	-74,737	-129,272	-2,008,976	-2,152,454	-2,269,937
Long - term loans	153	149	139	135	130
Funds employed	1,103,255	1,055,112	1,075,743	1,004,883	951,891

TABLE 3. STATEMENT OF CHANGES IN FINANCIAL POSITION

(TT$ 10^3)

	'85	'86	'87	'88	'89
Sources of funds					
Government Grants	28,080	3,931	5,117	8,000	19,447
Advances to finance operating deficit	255,660	139,959	162,278	62,808	43,500
Contributions from other agencies	2,158	2,465	863	1,814	1,549
Decrease in grants receivable	18,000	-	-	-	-
Increase in accounts payable other credits & accruals	-10,751	40,114	-38,038	50,651	47,529
Decrease in inventories	-3,703	2,004	3,732	4,622	1,073
Total sources of fund	289,445	188,473	133,953	127,896	113,099
Application of funds					
Operating deficit for the year	244,086	194,495	147,618	143,478	117,483
Depreciation	-33,400	-35,464	36,276	40,792	37,455
Movement on general reserve	641	-	-	-	-
	211,327	159,031	111,341	102,686	80,028
Purchase of fixed assets	28,193	10,053	5,098	10,316	8,410
Loan repayments	5	5	5	5	5
Increase in investments	9	169	684	633	6
Increase in accounts receivable	11,404	53,923	12,312	17,054	16,620
Total application of funds	250,937	223,180	129,439	130,693	105,068
Net increase in borrowing	-98,508	34,705	-4,513	2,798	8,030
Borrowings					
at the beginning of the year	9,852	-28,656	6,051	1,538	4,336
at the end of the year	28,656	6,051	1,538	4,336	3,695
Represented by:					
Bank overdraft	-	-6,975	1,643	7,603	-
Cash on hand	-705	-740	-1	-2,001	1,088
Cash at bank	-27,951	-185	-104	-266	-
Call deposits			-	-1,000	2,607
	28,656	6,051	1,538	4,336	3,695

TABLE 4. DATA FROM "MOVING WASA TO FINANCIAL SELF SUFFICIENCY"

	'85	'86	'87	'88	'89
Water Revenue	33,010	90,266	105,882	127,179	132,200
Sewerage Revenue	8,628	12,521	16,969	19,015	16,756
Connection Fees		0	0	0	0
Reconnection Fees		0	0	0	0
Other	721	2,587	1,156	4,297	3,955
Operating Revenue	42,359	105,375	124,008	150,492	152,910
Personnel Costs	200,729	200,074	174,637	167,437	
Chemical Costs	6,509	14,955	14,744	15,604	
Utilities	14,414	11,925	13,152	14,777	
Materials	7,661	16,019	18,376	16,635	
Private Contractors	11,602	9,595	11,452	10,411	
Rents	3,078	2,860	3,105	3,492	
Other Costs	6,874	7,762	8,602	8,133	
Sub -total Expenses	250,884	263,190	244,058	236,689	232,938
Operation Revenue less Expenses Sub-total	-208,525	-157,815	-120,060	-86,197	-80,028
Losses on Receivables	2,160	2,266	0	16,715	
Prior Year Adjustment		-1,051	8,719	0	
Total Operating Expenses	253,044	264,406	235,349	253,404	232,938
Income before Depreciation	-210,685	-159,031	-111,341	-102,912	-80,028
Depreciation	33,400	35,464	36,276	40,792	37,455
Operating Income	-244,085	-194,495	-147,618	-143,705	-117,483
Interest Expense	0	0	0	0	0
Interest on Investments	0	0	0	0	0
Gov. Operating Subsidies	225,660	139,959	162,278	62,948	43,500
Net Income	11,575	-54,535	14,660	-80,757	-73,983

ATTACHMENT OF TABLES 1 TO 4

I. [Operating ratio] and [Ratio of personnel cost to expenses]

unit: 1,000 TT$

	'85	'86	'87	'88	'89
1. Revenues	42,359	105,375	124,008	150,492	152,910
2. Expense (excluding depreciation)	253,044	264,405	235,349	253,178	232,938*1
3. Personnel costs	200,729	200,074	174,637	167,437	135,044
4. Operating ratio (Item2/Item1,%)	5.97	2.51	1.90	1.68	1.52
5. Ratio of personnel cost to expenses (%)	79.3	75.7	74.2	66.1	58.0*2

*1: Alternative III
*2: According to the World Bank data, a similar ratio in a well run water company would be 25 % to 35 %.

II. Performance targets that was settled by WASA

(1) Reduction of the ratio of employee per 1,000 water connection from 31 to no more than 21 by 1991.

(i) $\frac{\text{Personnel (89, Jan)}}{\text{Yard Tap + House Connection(89,Sept 30) (water connection)}} = \frac{5{,}000}{163{,}810} = 3.1\%$ (per 1,000 water connection)

(ii) House connection (124,458, end of Sep.'89) shall be increased to 187,000 by 1993.

(A similar ratio of well run water and sanitation companies in Latin America and the Caribbean areas is said to be between 4 to 6 % by the information of the World Bank.)

(2) Reduction of outstanding receivables to 6.0 months by the end of 1991 and 4.0 months by the end of 1993. (originally 6.3, 4.0 each)

(3) Reduction of the operating ratio to 1.05 by the end of 1991 and 0.95 by the end of 1993. (originally 1.06, 0.98 each)

(1) and (3) of the above to be achieved principally by

(i) Staff reduction of 1,150 by the end of 1991, and 1,800 by the end of 1993. *

(ii) Mentioned above (1)-(ii)

*: Staff reduction schedule was originally proposed 1,150 by the end of 1991, 1,957 by the end of 1993 (attached sheet No.)

III. Data from Commercial Department

(1) Ratio of collection against billing

unit: TT$ Million

	'88	'89 (Nov)
Collection (A)	111	101
Billing (B)	146	147
(A)/(B) %	76.0	67.0

(2) Customers aged debtors

unit: 1,000$

	86/12	87/12	88/12
Total	96.131(100.0)	103.705(100.0)	180.606(100.0)
Current year	0.0 (0.0)	47.673(46.0)	74.060(41.0)
One year	56.023(58.3)	15.785(15.2)	31.423(17.4)
Two year	7.887(8.2)	13.680(13.2)	13.017(7.2)
Three year	2.640(2.7)	4.148(4.0)	11.653(6.5)
Over 3 years	29.582(30.8)	22.419(21.6)	50.447(27.9)

(3) Estimation of numbers of customers who do not receive their bills

WASA estimation	30,000 (12.4%)	based on the number of bills returned
The World Bank	40,000 (16.52%)	

IV. Others

(1) Account receivable

	'85	'86	'87	'88	'89
a. a/c receivable	43,245	97,168	109,480	126,534	143,154
b. provision for doubtful debts	9,869	12,135	12,135	28,850	28,850
c. b/a(%)		12.4	11.0	22.8	20.2
d. month to annual revenue		11.1	10.6	10.1	10.6

WATER COST

		'86	'87	'88	'89 estimation
(1) Produced	(1,000cu.m)		232,562	234,430	235,000
(2) Sold (1)×60%(estimation)	-do-		139,537	140,658	141,000
(3) Revenue	(TT$1,000)	105,378	124,008	150,492	162,211
(4) Expenses	-do-	299,869	271,625	293,970	201,804
(5) Depreciation	-do-	35,464	36,276	40,792	40,000
(6) Operating Income	-do-	(194,495)	(147,618)	(143,478)	(39,593)
(7) Water rates		90,266	105,882	127,179	139,074
(8) Water expenses		106,692	104,143	104,491	104,000
(9) Water revenue per cu.m (produced) (7)/(1)	TT$/m3		0.46	0.54	0.59
(10) Total cost per cu.m (produced) (4)/(1)	-do-	-	1.17	1.25	0.86
(11) Water Revenue per cu.m (sold) (7)/(2)	-do-		0.76	0.90	0.99
(12) Total cost per cu.m (sold) (4)/(2)	-do-		1.95	2.10	1.43
(13) Personnel cost	(TT$1,000)	200,074	174,637	167,437	132,251
(14) Personnel cost per cu.m (sold) (13)/(2)	TT$/m3		1.25	1.19	0.94

P: DRAWINGS

LIST OF DRAWINGS

N

DORRINGTON GARDENS W.W. BHs 5,400
RIVER ESTATE 6,820 W.W.
COVIGNE
CHAGUARAMAS
RIVER ESTATE
PARAMIN
LAPASTORA/CAPRIATA 88
LA PASTOR RES. ROA 94
COVIGE
TUCKER VALLEY 13,640
RICHPLAIN
PARAMIN W.W. BHs 390
LA PASTO -RA
LA CANOA 200
LA PASTORA WELLS 2,900
DIBE
MARAVAL W.W. 5,910
MOKA WELLS 1,590
PIPIOL 90
SIMEON 145 ROAD
TUCKER VALLEY
ST.ANNS
DUNDO HILL
NALO
HUTTON/W.W. RD.
ARIAPITA 138
83rd
HARTS CUT
CARENAGE
HOLOLO
CASCADE
LA CANOA ROAD
MON REPOS 45
GONZALES RED HILL
MORVANT
MALLICK
QUARRY R.D.
MT.HOPE
LADY YOUNG
PICTON
AL COA
POINT CUMANA
FOUR ROADS W.W. BHs 28,900
ROSS LAND
BRIEVES ROAD
KING GEORGE V PARK WELLS 10,540
ST. CLAIR WELLS 1,820
SAVANNAH WELLS 12,270
KNAGGS HILL
SECOND AVENUE
FONCETTE ROAD
MC SHINE
LAVENTILLE
EL SOCORRO W.W. BHs 24,126
VALSA W.W.BH
MONDES DRIVE
MT D'OR
IRVING ST.

LEGEND

- WATERWORKS
- WELL BOREHOLE(BH)
- SPRING
- INTAKE
- RESERVOIR (OVER 1,000 m³)
- RESERVOIR (UNDER 1,000 m³)
- BOOSTER PUMPING STATION
- HIGH LIFT PUMPING STATION
- IMPOUNDING RESERVOIR

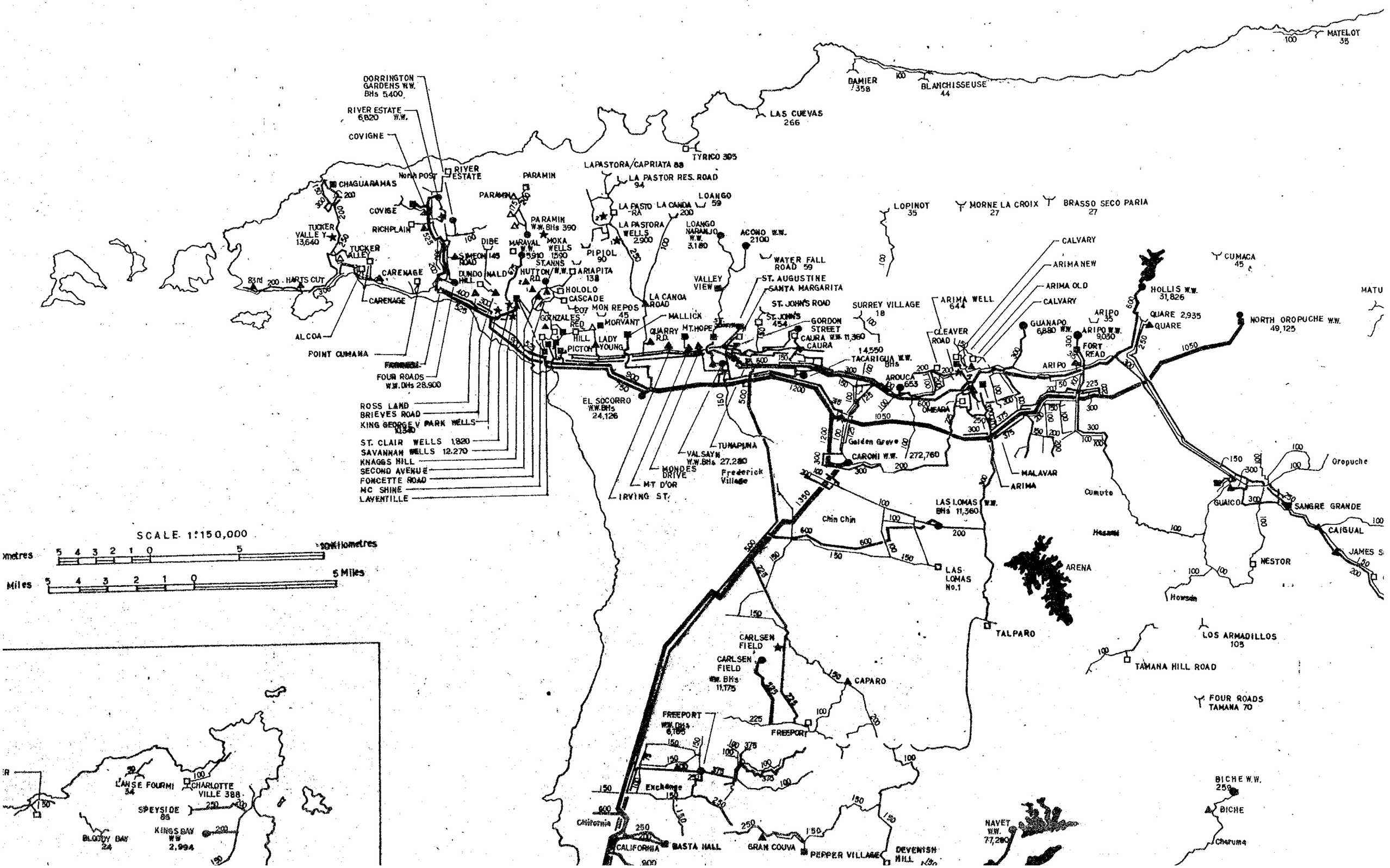
SCALE 1:150,000

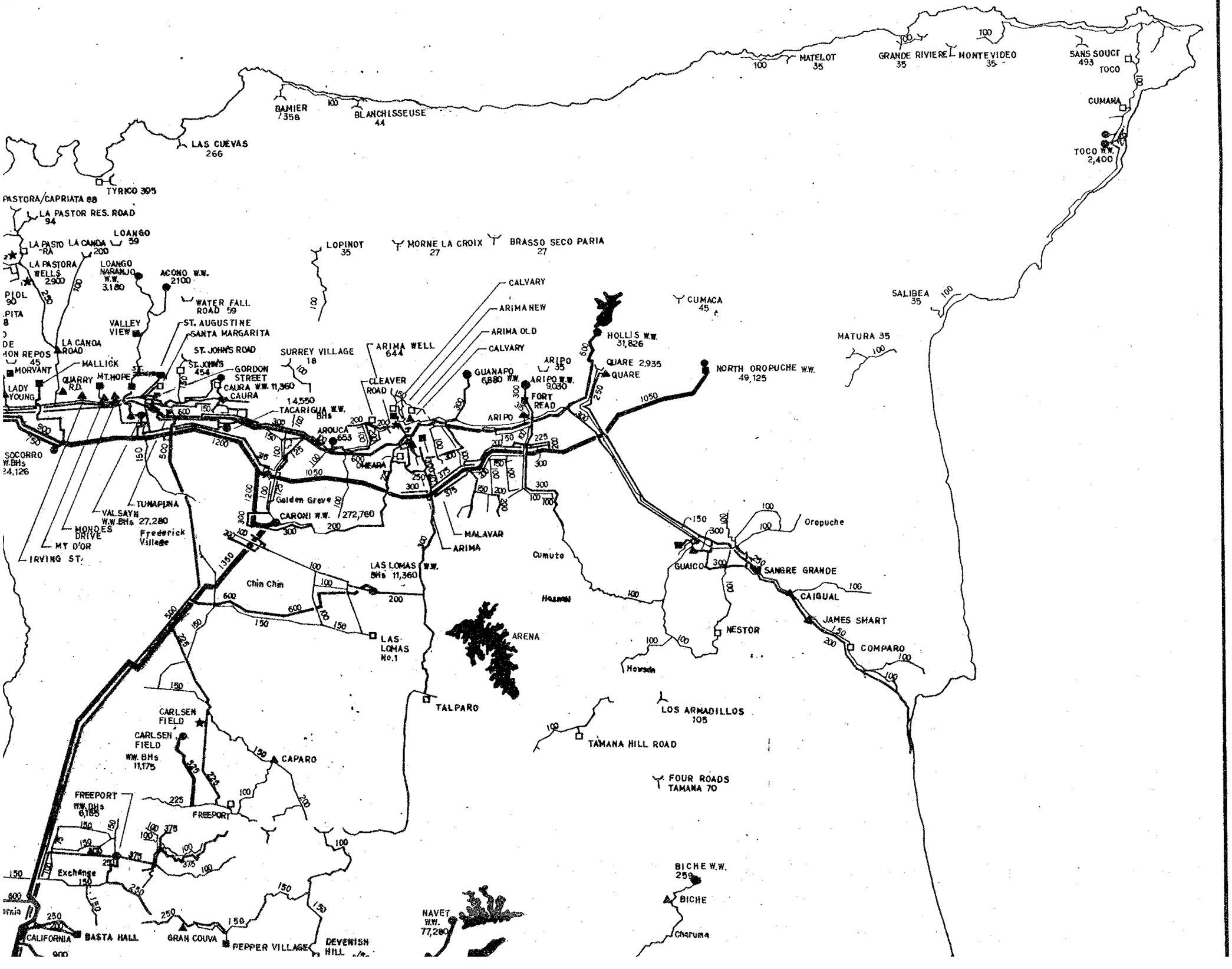
Kilometres 5 4 3 2 1 0 5 10 Kilometres

Miles 5 4 3 2 1 0 5 Miles

PARLATUVIER 70
L'ANSE FOURMI 34
CHARLOTTE VILLE 388
SPEYSIDE 85
CASTARA 80
BLOODY BAY 24
KINGSBAY WW 2,994

FREEPORT W.W. BHs 6,165
Exchange
California
CALIFORNIA
BASTA HI


DORRINGTON GARDENS W.W. BHs 5,400
RIVER ESTATE 6,820 W.W.
COVIGNE
CHAGUARAMAS
North POST
RIVER ESTATE
PARAMIN
PARAMIN W.W. BHs 390
LAPASTORA/CAPRIATA 88
LA PASTOR RES. ROAD 94
TYRICO 305
LAS CUEVAS 266
DAMIER 358
BLANCHISSEUSE 44
MATELOT 35
LOANGO 59
LOPINOT 35
MORNE LA CROIX 27
BRASSO SECO PARIA 27
CALVARY
ARIMA NEW
ARIMA OLD
CALVARY
CUMACA 45
HOLLIS W.W. 31,826
QUARE 2,935
QUARE
NORTH OROPUCHE W.W. 49,125
MATU
ACONO W.W. 2100
WATER FALL ROAD 59
VALLEY VIEW
ST. AUGUSTINE
SANTA MARGARITA
ST. JOHN'S ROAD
SURREY VILLAGE 18
ARIMA WELL 644
CLEAVER ROAD
GUANAPO 6,880 W.W.
ARIPO 35
ARIPO W.W. 9,030
FORT READ
ARIPO
TUCKER VALLEY 13,640
TUCKER VALLEY
CARENAGE
HARTS CUT
DIBE
MARAVAL W.W. 5,910
MOKA WELLS 1590
ST.ANNS
PIPIOL 90
LA PASTORA WELLS 2,900
LA CANOA 200
LOANGO NARANJO W.W. 3,180
SIMEON 145
SIMEON ROAD
DUNDO HILL
NALD
HUTTON/W.W.
ARIAPITA 138
HOLOLO
CASCADE
MON REPOS 45
MORVANT
LA CANOA ROAD
MALLICK
QUARRY R.D.
MT.HOPE
ST.
GORDON STREET
CAURA W.W. 11,360
CAURA
14,550
TACARIGUA W.W. BHs
AROUCA 653
OMEARA
ALCOA
POINT CUMANA
FOUR ROADS W.W. BHs 28,900
ROSS LAND
BRIEVES ROAD
KING GEORGE V PARK WELLS 10,340
ST. CLAIR WELLS 1,820
SAVANNAH WELLS 12,270
KNAGGS HILL
SECOND AVENUE
FONCETTE ROAD
MC SHINE
LAVENTILLE
EL SOCORRO W.W.BHs 24,126
TUNAPUNA
VALSAYN W.W.BHs 27,280
MONDES DRIVE
MT D'OR
IRVING ST.
Frederick Village
Golden Grove
CARONI W.W. 272,760
MALAVAR
ARIMA
Cumuto
Oropuche
GUAICO
SANGRE GRANDE
CAIGUAL
JAMES S
NESTOR
Chin Chin
LAS LOMAS W.W. BHs 11,360
LAS LOMAS No.1
Hosein
ARENA
Howsin
TALPARO
LOS ARMADILLOS 105
TAMANA HILL ROAD
FOUR ROADS TAMANA 70
CARLSEN FIELD
CARLSEN FIELD W.W. BHs 11,175
CAPARO
FREEPORT W.W. BHs 6,165
FREEPORT
Exchange
California
CALIFORNIA
BASTA HALL
GRAN COUVA
PEPPER VILLAGE
DEVENISH HILL
NAVET W.W. 77,280
BICHE W.W. 259
BICHE
Charuma
SCALE 1:150,000
Kilometres 5 4 3 2 1 0 5
5 Miles
Miles 5 4 3 2 1 0
L'ANSE FOURMI 34
CHARLOTTE VILLE 388
SPEYSIDE 85
BLOODY BAY 24
KINGS BAY W.W. 2,994


BAMIER 7358
BLANCHISSEUSE 44
LAS CUEVAS 266
TYRICO 305
MATELOT 35
GRANDE RIVIERE 35
MONTEVIDEO 35
SANS SOUCI 493
TOCO
CUMANA
TOCO W.W. 2,400
PASTORA/CAPRIATA 68
LA PASTOR RES. ROAD 94
LOANGO 59
LA PASTORA WELLS 2,900
LOANGO NARANJO W.W. 3,180
ACONO W.W. 2100
WATER FALL ROAD 59
VALLEY VIEW
ST. AUGUSTINE
SANTA MARGARITA
LA CANOA ROAD
ST. JOHN'S ROAD
MALLICK
MORVANT
QUARRY R.D.
MT. HOPE
GORDON STREET
CAURA W.W. 11,360
CAURA
LOPINOT 35
MORNE LA CROIX 27
BRASSO SECO PARIA 27
SURREY VILLAGE 18
ARIMA WELL 644
CLEAVER ROAD
CALVARY
ARIMA NEW
ARIMA OLD
GUANAPO 6,880 W.W.
ARIPO 35
ARIPO W.W. 9,050
FORT READ
ARIPO
HOLLIS W.W. 31,826
QUARE 2,935
QUARE
CUMACA 45
NORTH OROPUCHE W.W. 49,125
SALIBEA 35
MATURA 35
14550
TACARIGUA W.W. 8Hs
AROUCA 653
OMEARA
CARONI W.W. 272,760
Golden Grove
TUNAPUNA
VALSAYN W.W.8Hs 27,280
Frederick Village
MONDES DRIVE
MT D'OR
IRVING ST.
SOCORRO W.8Hs 24,126
MALAVAR
ARIMA
Cumuto
Oropuche
GUAICO
SANGRE GRANDE
CAIGUAL
JAMES SMART
COMPARO
NESTOR
Hosein
LAS LOMAS W.W. 8Hs 11,360
Chin Chin
LAS LOMAS No.1
ARENA
TALPARO
LOS ARMADILLOS 105
TAMANA HILL ROAD
FOUR ROADS TAMANA 70
CARLSEN FIELD
CARLSEN FIELD W.W. 8Hs 11,175
CAPARO
FREEPORT W.W. 8Hs 6,185
FREEPORT
Exchange
CALIFORNIA
BASTA HALL
GRAN COUVA
PEPPER VILLAGE
DEVENISH HILL
NAVET W.W. 77,280
BICHE W.W. 259
BICHE
Charuma

LEGEND

- WATERWORKS
- WELL BOREHOLE(BH)
- SPRING
- INTAKE
- RESERVOIR (OVER 1,000 m³)
- RESERVOIR (UNDER 1,000 m³)
- BOOSTER PUMPING STATION
- HIGH LIFT PUMPING STATION
- IMPOUNDING RESERVOIR

SCALE 1:150,000

Kilometres 5 4 3 2 1 0 5 10 Kilometres

Miles 5 4 3 2 1 0 5 Miles

W.W. BHs 28,900
ROSS LAND
BRIEVES ROAD
KING GEORGE V PARK WELLS
ST. CLAIR WELLS 1,820
SAVANNAH WELLS 12,270
KNAGGS HILL
SECOND AVENUE
FONCETTE ROAD
MC SHINE
LAVENTILLE

EL SOCORRO
W.W. BHs
24,128
MONDES DRIVE
MT D'OR
IRVING ST.

PARLATUVIER
70
L'ANSE FOURMI
34
CHARLOTTE VILLE 388
SPEYSIDE
86
BLOODY BAY
24
KINGS BAY WW
2,994
CASTARA
80
CRAIG HALL
2,461
MORIAH
LES COTEAUX
WHIM
BAD HILL
COURLAND W.W.
7,368
PATIENCE HILL
HANSON HALL
HILLSBOROUGH WEST RIVER
3,500
HILLSBOROUGH W.W.
8,582
GREEN HILL
5,360
TOCO HILL
ZION HILL
RICHMOND W.W.
2,467
FORT GEORGE
HOSPITAL
GOVERNMENT FARM No.1
335
SIPARIA HILL

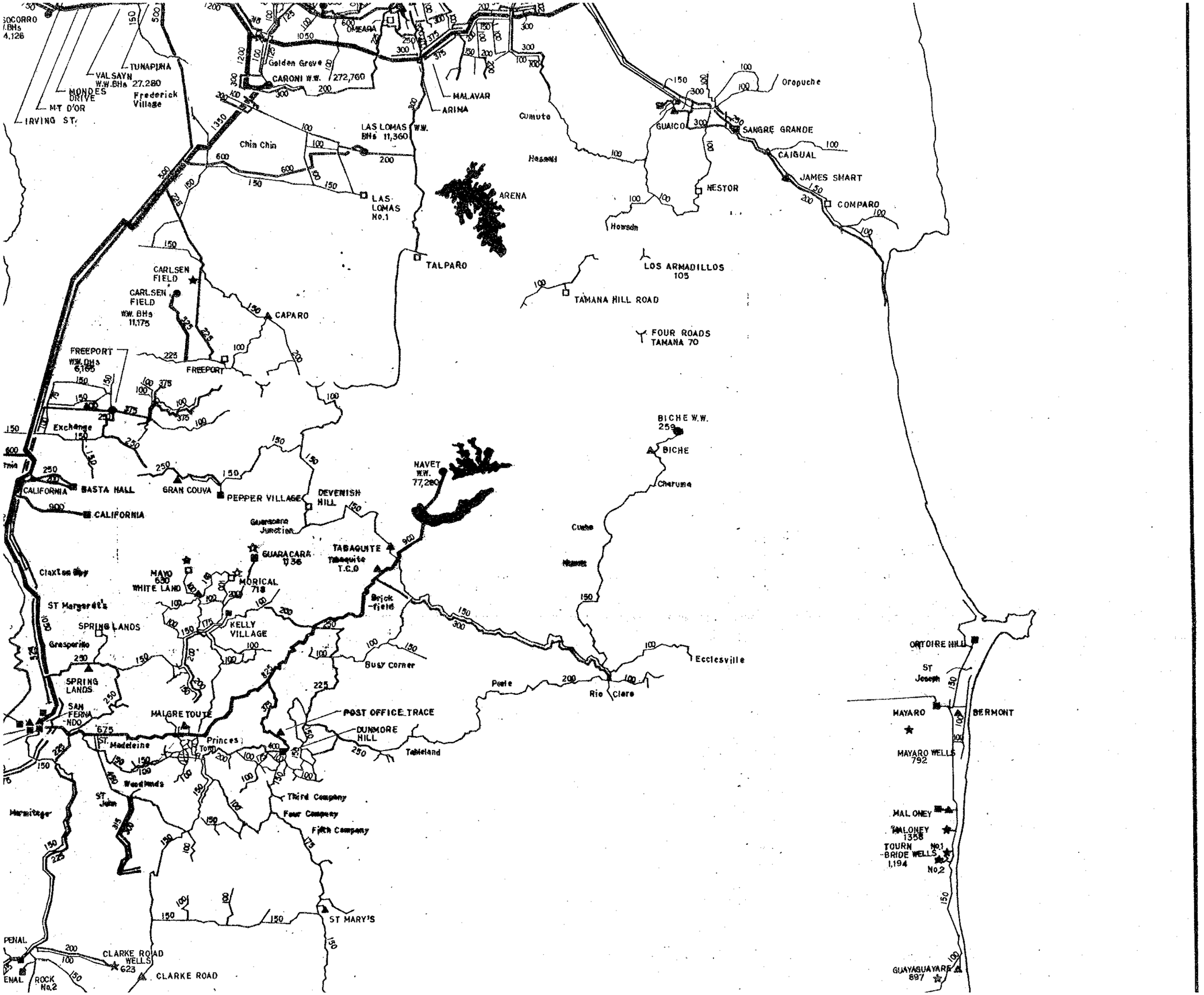
FREEPORT
W.W. BHs
6,155
Exchange
California
CALIFORNIA
BASTA
CALI
Claxton Bay
ST Margaret's
SPRING
Grasperito
SPRING LANDS
CHACON ST.
SAN FERNANDO
MARRYAT ST.
NAPARIMA
La Brea
BOODSINGH
OROPOCHE
Hermitage
Guapo
KTO
POINT FORTIN
W.W. BHs
980
Parry Lands
NEW VILLAGE
FYZABAD
W.W. BHs
1,500
Avocat
COOL MAN
Thick
Pluck
PENAL
GONZALES STREET
PENAL ROCK

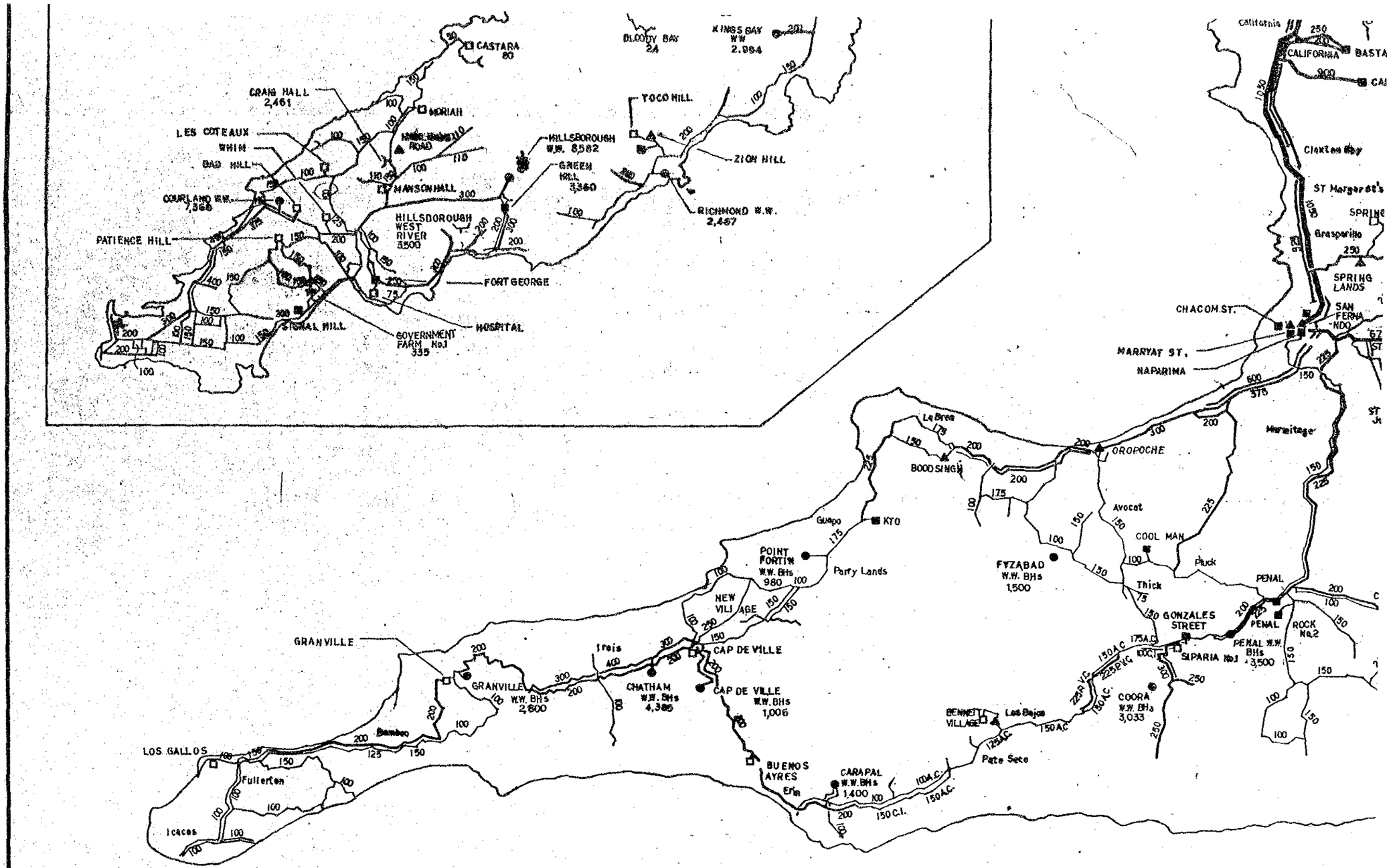
FOUR ROADS W.W. BHs 28,900
ROSS LAND
BRIEVES ROAD
KING GEORGE V PARK WELLS 10,340
ST. CLAIR WELLS 1,820
SAVANNAH WELLS 12,270
KNAGGS HILL
SECOND AVENUE
FONCETTE ROAD
MC SHINE
LAVENTILLE

SCALE 1:150,000
10 Kilometres
5 Miles

EL SOCORRO W.W. BHs 24,126
TACARIGUA W.W. BHs
ARIPO
ARIPO
ARIMA
MALAVAR
Cumuto
Orapuche
GUAICO
SANGRE GRANDE
CAIGUAL
JAMES SMA
NESTOR
Howsin
LOS ARMADILLOS 105
TAMANA HILL ROAD
FOUR ROADS TAMANA 70
TALPARO
ARENA
Hasani
LAS LOMAS W.W. BHs 11,360
LAS LOMAS No.1
Chin Chin
Golden Grove
CARONI W.W. 272,760
TUNAPUNA
VALSAYN W.W. BHs 27,280
Frederick Village
MONDES DRIVE
MT D'OR
IRVING ST.
CARLSEN FIELD
CARLSEN FIELD W.W. BHs 11,175
CAPARO
FREEPORT W.W. BHs 6,100
FREEPORT
Exchange
California
CALIFORNIA
BASTA HALL
GRAN COUVA
PEPPER VILLAGE
DEVENISH HILL
NAVET W.W. 77,280
BICHE W.W. 259
BICHE
Charuma
Cusho
Manzanilla
Brick-field
Busy Corner
Ecclesville
Rio Claro
Poole
POST OFFICE TRACE
DUNMORE HILL
Tableland
Third Company
Four Company
Fifth Company
ST MARY'S
CLARKE ROAD
PENAL
Thick
Pluck
Avocat
COOL MAN
FYZABAD W.W. BHs 1,500
Guapo
KTO
POINT FORTIN W.W. BHs 980
Parry Lands
BOODSINGH
La Brea
OROPOCHE
Hermitage
ST JOHN
Woodlands
Princes Town
MALGRE TOUTE
SAN FERNANDO
CHACON ST.
HARRYAT ST.
NAPARIMA
SPRING LANDS
Gresperite
ST Margaret's
Claxton Bay
KELLY VILLAGE
HORICAL 718
GUARACARA 0.56
TABAQUITE
Tabaquite T.C.G
MAWO 630
WHITE LAND
Guaracara Junction

L'ANSE FOURMI 34
CHARLOTTE VILLE 388
SPEYSIDE 86
KINGS BAY W.W. 2,994
BLOODY BAY 24
TOCO HILL
HILLSBOROUGH W.W. 8,582
GREEN HILL 3,360
ZION HILL
RICHMOND W.W. 2,467


SOCORRO
BHs
4,126
VALSAYN
W.W.BHs 27,280
MONDES DRIVE
M-T D'OR
IRVING ST.
TUNAPUNA
Frederick Village
Golden Grove
CARONI W.W. 272,760
O'MEARA
MALAVAR
ARIMA
Cumuto
Hosein
LAS LOMAS W.W. BHs 11,360
Chin Chin
LAS LOMAS No.1
ARENA
TALPARO
Howsin
NESTOR
GUAICO
Oropuche
SANGRE GRANDE
CAIGUAL
JAMES SMART
COMPARO
LOS ARMADILLOS
105
TAMANA HILL ROAD
FOUR ROADS
TAMANA 70
CARLSEN FIELD
CARLSEN FIELD W.W. BHs 11,175
CAPARO
FREEPORT W.W. BHs 6,165
FREEPORT
Exchange
CALIFORNIA
BASTA HALL
GRAN COUVA
PEPPER VILLAGE
DEVENISH HILL
CALIFORNIA
Guaracara Junction
GUARACARA 936
TABAQUITE
Tabaquite T.C.D
NAVET W.W. 77,280
BICHE W.W. 259
BICHE
Charuma
Cuche
Claxton Bay
MAYO 630
WHITE LAND
MORICAL 718
ST Margaret's
SPRING LANDS
Gresperito
KELLY VILLAGE
Brick-field
Busy corner
Ecclesville
Rio Clere
Pole
Tableland
SPRING LANDS
SAN FERNANDO
675
MALGRE TOUTE
POST OFFICE TRACE
DUNMORE HILL
St. Madeleine
Princes Town
Woodlands
ST John
Hermitage
Third Company
Four Company
Fifth Company
ST MARY'S
PENAL
CLARKE ROAD WELLS 623
CLARKE ROAD
ROCK No.2
ORTOIRE HILL
ST Joseph
HAYARO
BERMONT
MAYARO WELLS 792
MALONEY
MALONEY 1358
TOURN-BRIDE WELLS 1,194
No.1
No.2
GUAYAGUAYARE 897



NOTE : ESTIMATED PRODUCTIONS IN RAINY SEASON ARE SHOWN WITH NAMES OF PRODUCTION SOURCES.

AINY SEASON ARE SHOWN
SOURCES.

Fig. P-1 COMPREHENSIVE MAP

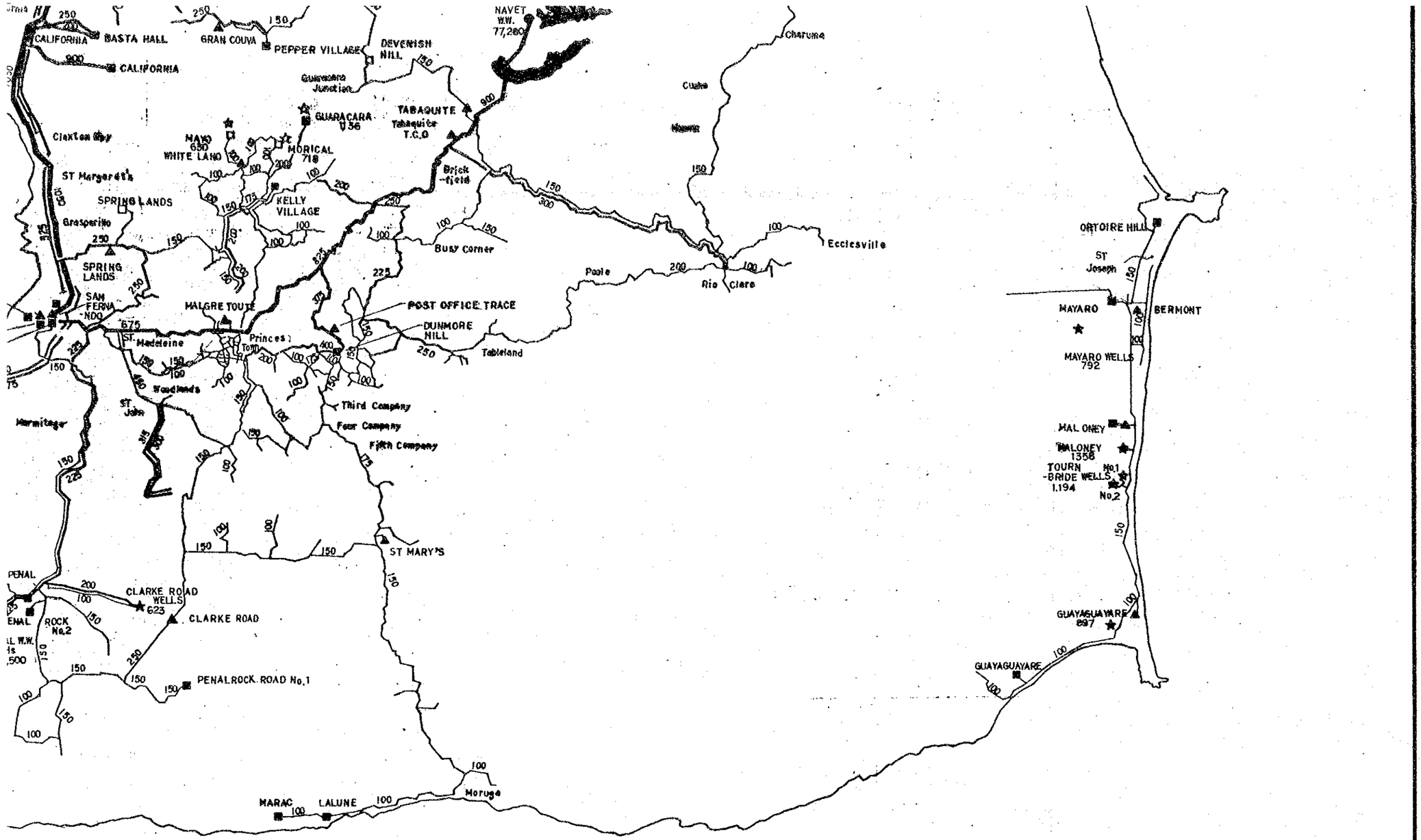


Fig. P-1 COMPREHENSIVE MAP OF EXISTING WATER SYSTEM

KNAGGS HILL
V = 27,300
H = 71.64
L = 61.68

TO BELMONT
TO CASCADE
FROM SAVANNAH WELLS
TO ST CLAIR

PICTON No1
V = 15,650
H = 109.23
L = 101.82

PICTON No2
V = 22,750
H = 89.82
L = 60.98

PICTON No3
V = 45,500
H = 92.49
L = 83.81

MALLICK
V = 22,750
H = 93.91
L = 47.21

MT HOPE
V = 22,750
H = 91.82
L = 82.91

ST JOSEPH
V = 13,650
H = 78.86
L = 74.09

ST AUGUSTINE
V = 16,835
H = 110.67
L = 104.57

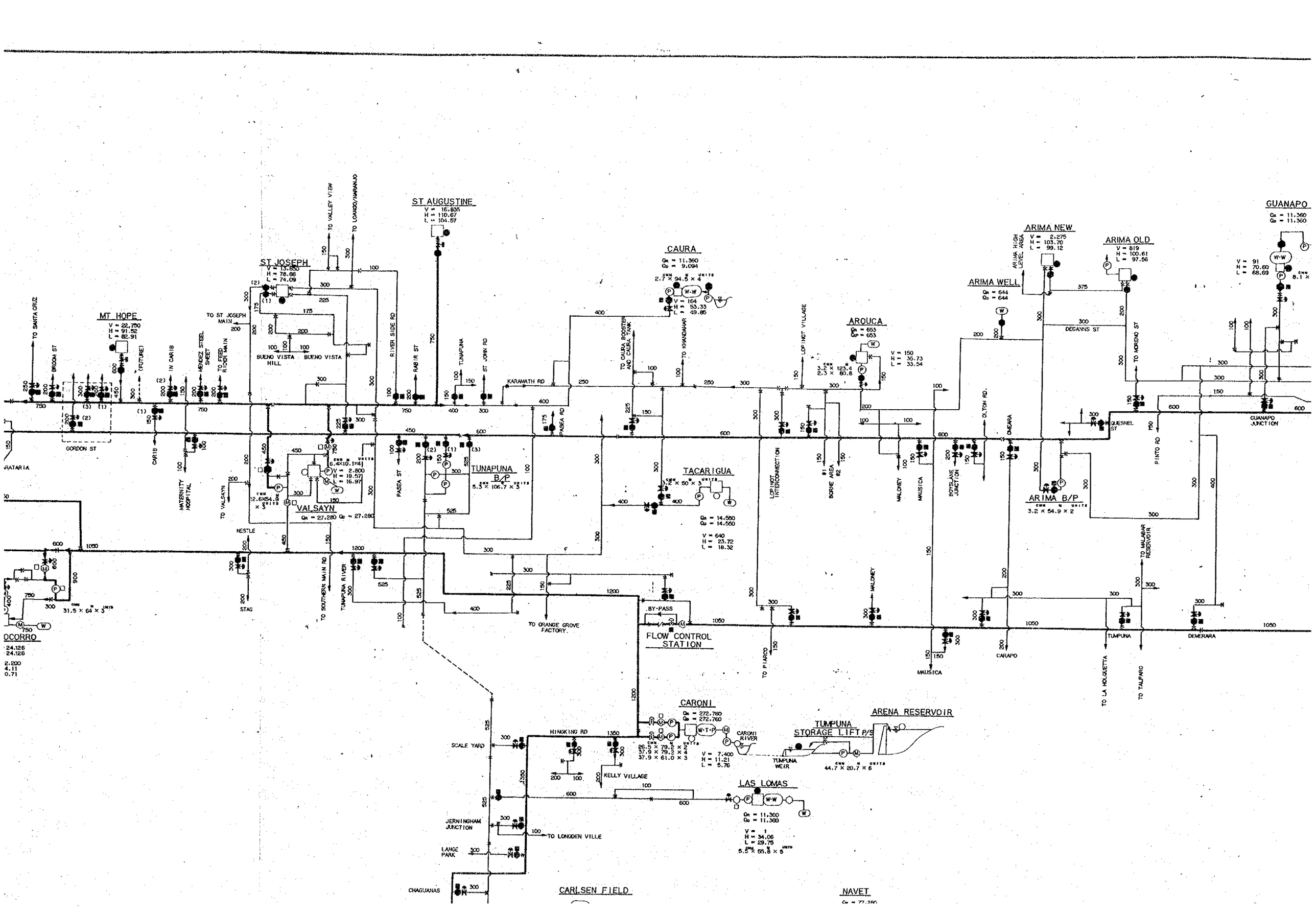
TUNAPUNA
B/P
5.3 × 106.7 × 3 UNITS

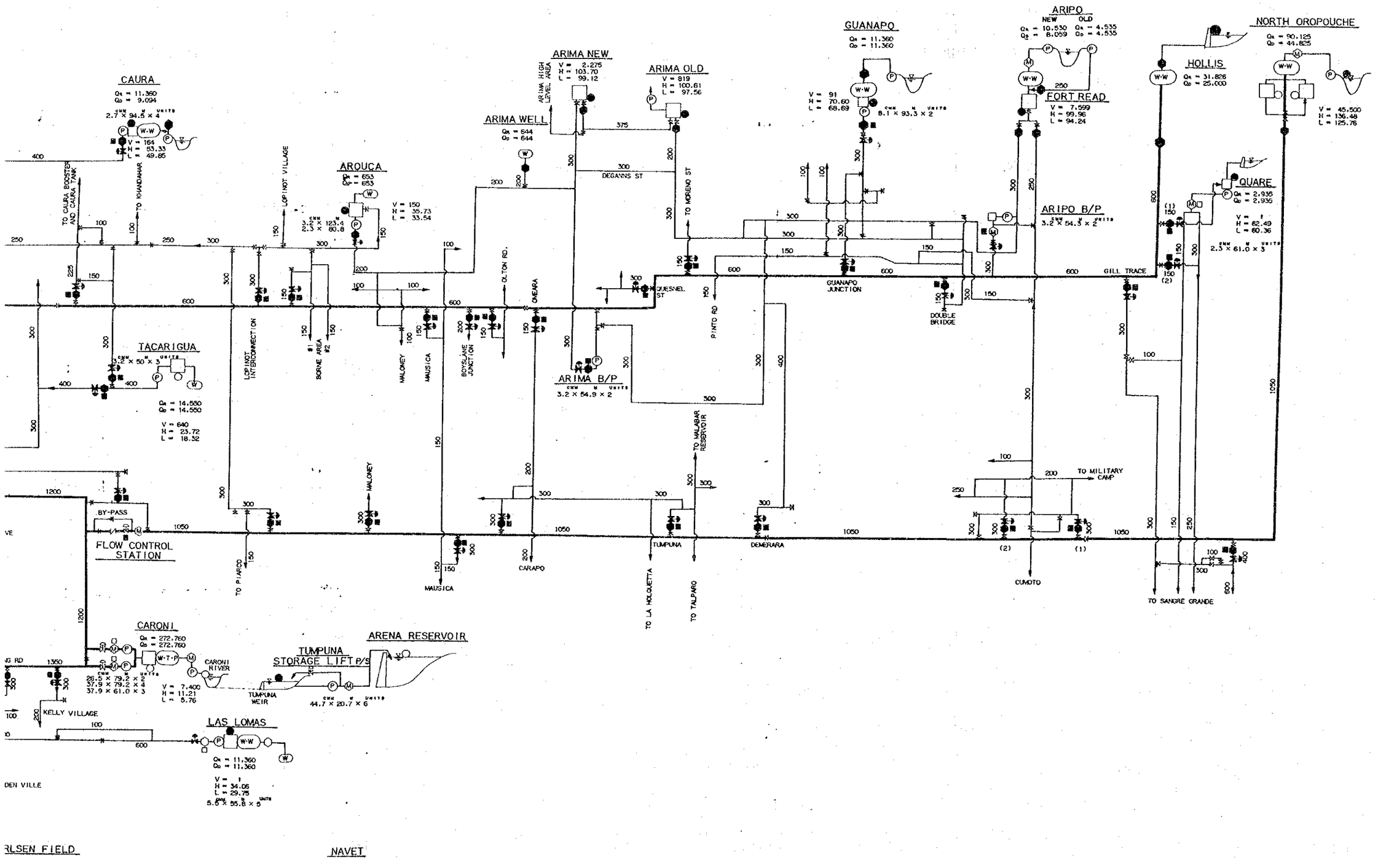
VALSAYN
Qa = 27,280 Qp = 27,280

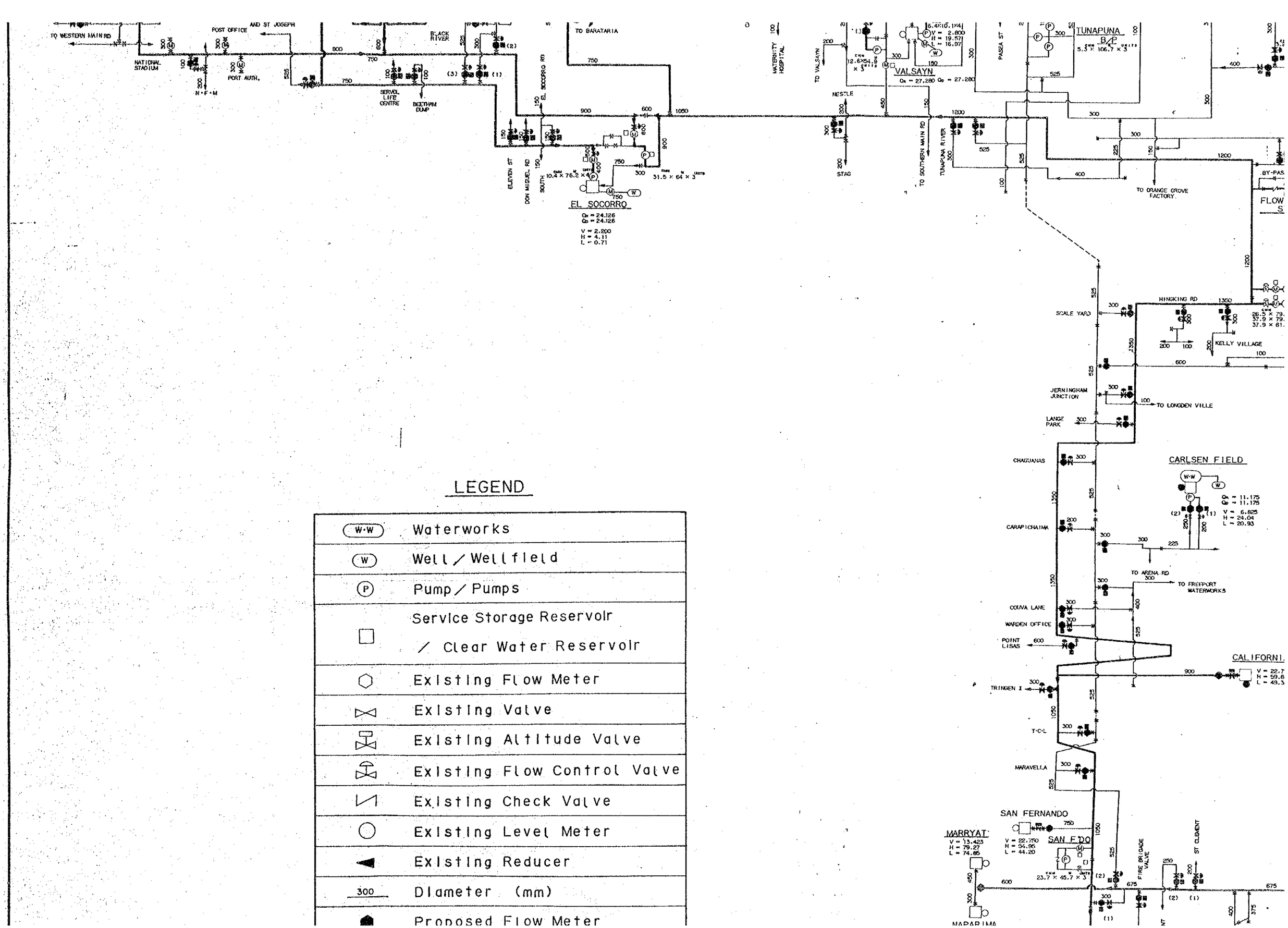
EL SOCORRO
Qa = 24,126
Qp = 24,126
V = 2,200
H = 4.11
L = 0.71

CARLSEN FIELD

TO LAVENTILLE AREA
TO LADY YOUNG AVE
TO LADY YOUNG RD
TO SANTA CRUZ
BROOM ST
(FUTURE)
IN CARIB
MENDEZ STEEL SHEET
TO FEED RIDER MAIN
TO ST JOSEPH MAIN
TO VALLEY VIEW
TO LOMARGO/HARMANJO
RIVER SIDE RD
RABIR ST
TUNAPUNA
ST JOHN RD
KARAMATH RD
TO CAURA BOOSTER AND CAURA TANK
PASEA RD
BUENO VISTA HILL
BUENO VISTA
BARRACK
TO WESTERN MAIN RD
NATIONAL STADIUM
POST OFFICE
TO LAVENTILLE RES. AND ST JOSEPH
PORT AUTH.
N.F.M
KEBER RD
PRITZAK LANDS ST
MASALLAH ST
BLACK RIVER
SERVOL LIFE CENTRE
BEETHAM DUMP
SIXTH AV
TO BARATARIA
GORDON ST
CARIB
MATERNITY HOSPITAL
TO VALSAYN
NESTLE
STAG
EL SOCORRO RD
ELEVEN ST
DON MIGUEL RD
SOUTH
TO SOUTHERN MAIN RD
TUNAPUNA RIVER
PASEA ST
TO ORANGE GROVE FACTORY
BY-PAS
FLOW
S
HINGKING RD
SCALE YARD
KELLY VILLAGE
JERNINGHAM JUNCTION
TO LONGDEN VILLE
LANGE PARK
CHAGUANAS

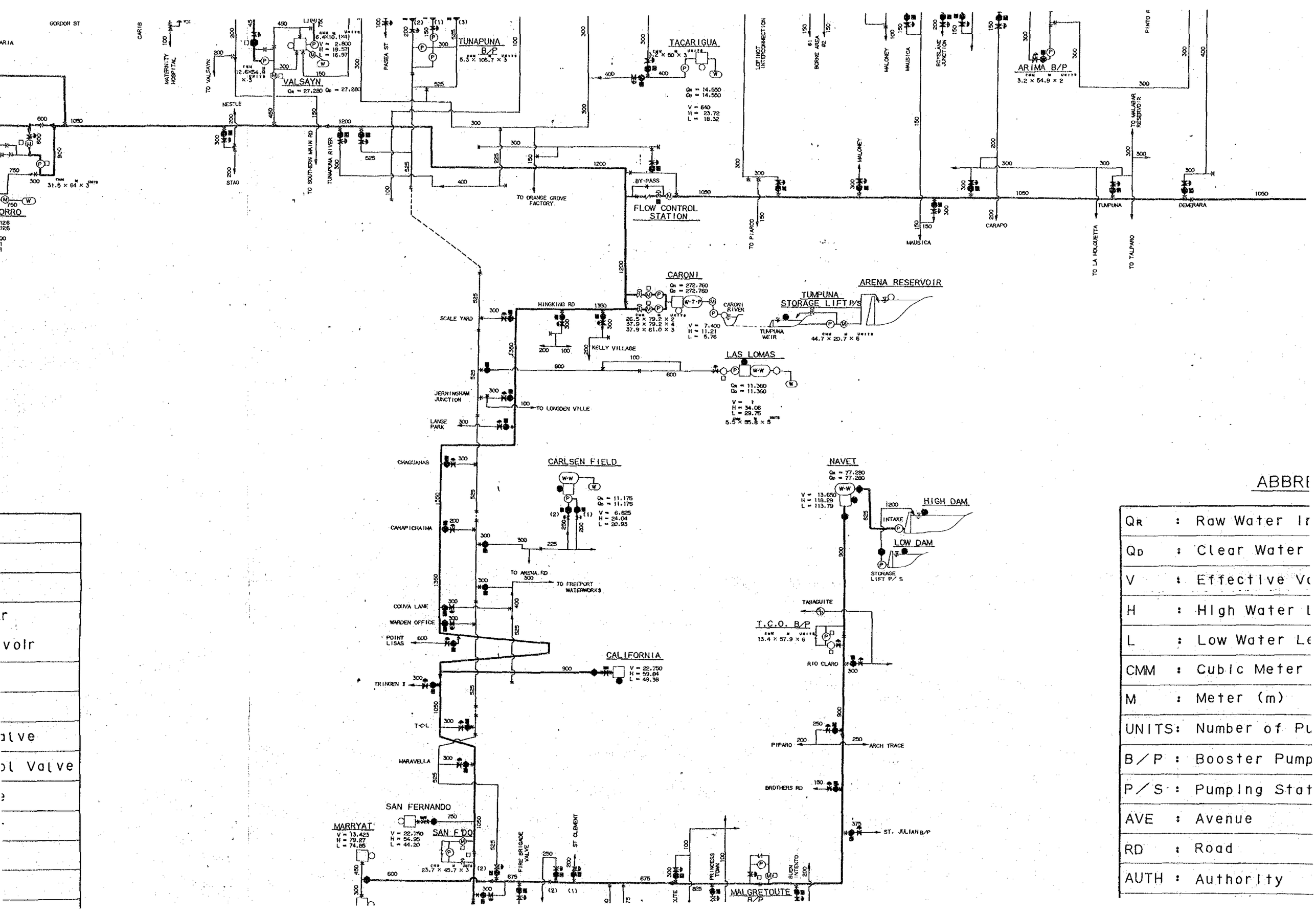

ST AUGUSTINE
V = 16,835
H = 110.67
L = 104.57
ST JOSEPH
V = 13,680
H = 78.66
L = 74.09
MT HOPE
V = 22,750
H = 91.52
L = 82.91
CAURA
Qa = 11,360
Qp = 9,094
2.7 X 94.5 X 4
V = 164
H = 55.33
L = 49.85
AROUCA
Qa = 653
Qp = 653
V = 150
H = 35.73
L = 33.54
ARIMA WELL
Qa = 644
Qp = 644
ARIMA NEW
V = 2,875
H = 103.70
L = 99.12
ARIMA HIGH LEVEL AREA
ARIMA OLD
V = 819
H = 100.61
L = 97.56
GUANAPO
Qa = 11,360
Qp = 11,360
V = 91
H = 70.60
L = 68.69
TO SANTA CRUZ
BROOM ST
(FUTURE)
TO ST JOSEPH MAIN
MENDEZ STEEL SHEET
TO FEED RIDER MAIN
IN CARIB
CARIB
GORDON ST
RIVER SIDE RD
RABIR ST
TUNAPUNA
ST JOHN RD
KARAMATH RD
PASEA RD
TO VALLEY VIEW
TO LOANDO/NARANJO
BUENO VISTA HILL
BUENO VISTA
TO CAURA BOOSTER AND CAURA PARK
TO KHANDAHAR
LOP HOT VILLAGE
LOP HOT INTERCONNECTION
BORNE AREA #1
BORNE AREA #2
MALONEY
MAUSICA
BOYSLANE JUNCTION
OLTON RD.
DIEARA
DEGANNS ST
QUESNEL ST
TO MORENO ST
PINTO RD
GUANAPO JUNCTION
ARIMA B/P
3.2 X 54.9 X 2
TO MALABAR RESERVOIR
TUNAPUNA B/P
5.3 X 106.7 X 3
TACARIGUA
3.2 X 50 X 3
Qa = 14,550
Qp = 14,550
V = 640
H = 23.72
L = 18.32
VALSAYN
Qa = 27,280 Qp = 27,280
TO VALSAYN
MATERNITY HOSPITAL
NESTLE
STAG
TO SOUTHERN MAIN RD
TUMPUNA RIVER
TO ORANGE GROVE FACTORY.
BY-PASS
FLOW CONTROL STATION
TO PIARCO
MAUSICA
CARAPO
TUMPUNA
DEMERARA
TO LA HOLQUETTA
TO TALPARO
OCORRO
24,126
24,126
2,200
4.11
0.71
CARONI
Qa = 272,760
Qp = 272,760
26.5 X 79.2 X 2
37.9 X 79.2 X 4
37.9 X 61.0 X 3
V = 7,400
H = 11.21
L = 5.76
CARONI RIVER
TUMPUNA WEIR
ARENA RESERVOIR
TUMPUNA STORAGE LIFT P/S
44.7 X 20.7 X 6
HINGKING RD
SCALE YARD
KELLY VILLAGE
LAS LOMAS
Qa = 11,360
Qp = 11,360
V = 1
H = 34.06
L = 29.75
6.5 X 66.8 X 5
JERNINGHAM JUNCTION
TO LONGDEN VILLE
LANGE PARK
CHAGUANAS
CARLSEN FIELD
NAVET


CAURA
Qa = 11.360
Qp = 9.094
2.7 x 94.5 x 4
V = 164
H = 53.33
L = 49.65
TO CAURA BOOSTER AND CAURA TANK
TO KHANDAHAR
LOP HOT VILLAGE
AROUCA
Qa = 653
Qp = 653
2.3 x 123.4 x 4
80.8
V = 150
H = 35.73
L = 33.54
ARIMA NEW
V = 2,275
H = 103.70
L = 99.12
ARIMA HIGH LEVEL AREA
ARIMA WELL
Qa = 644
Qp = 644
ARIMA OLD
V = 819
H = 100.61
L = 97.56
DEGANNS ST
TO MORENO ST
GUANAPO
Qa = 11.360
Qp = 11.360
V = 91
H = 70.60
L = 68.69
8.1 x 93.3 x 2
ARIPO
NEW
Qa = 10.530
Qp = 8.059
OLD
Qa = 4.535
Qp = 4.535
FORT READ
V = 7,599
H = 99.96
L = 94.24
ARIPO B/P
3.2 x 54.3 x 2
HOLLIS
Qa = 31.826
Qp = 25.000
NORTH OROPOUCHE
Qa = 90.125
Qp = 44.825
V = 45,500
H = 136.48
L = 125.76
QUARE
Qa = 2,935
Qp = 2,935
V = 1
H = 62.49
L = 60.36
2.5 x 61.0 x 3
GILL TRACE
QUESNEL ST
OLTON RD.
OMEARA
PINTO RD
GUANAPO JUNCTION
DOUBLE BRIDGE
TACARIGUA
2.5 x 50.8 x 3
Qa = 14.550
Qp = 14.550
V = 640
H = 23.72
L = 18.52
LOP INOT INTERCONNECTION
BORNE AREA #1
#2
MALONEY
MAUSICA
BOYSLANE JUNCTION
ARIMA B/P
3.2 x 54.9 x 2
TO MALABAR RESERVOIR
TO MILITARY CAMP
BY-PASS
FLOW CONTROL STATION
TO PIARCO
MAUSICA
CARAPO
TUMPUNA
DEMERARA
TO LA HOLQUETTA
TO TALPARO
CUMOTO
TO SANGRE GRANDE
CARONI
Qa = 272.760
Qp = 272.760
28.5 x 79.2 x 2
37.9 x 79.2 x 4
37.9 x 61.0 x 3
V = 7,400
H = 11.21
L = 5.76
CARONI RIVER
TUMPUNA WEIR
TUMPUNA STORAGE LIFT P/S
44.7 x 20.7 x 6
ARENA RESERVOIR
KELLY VILLAGE
LAS LOMAS
Qa = 11.360
Qp = 11.360
V = 1
H = 34.05
L = 29.75
5.5 x 55.8 x 5
RLSEN FIELD
NAVET



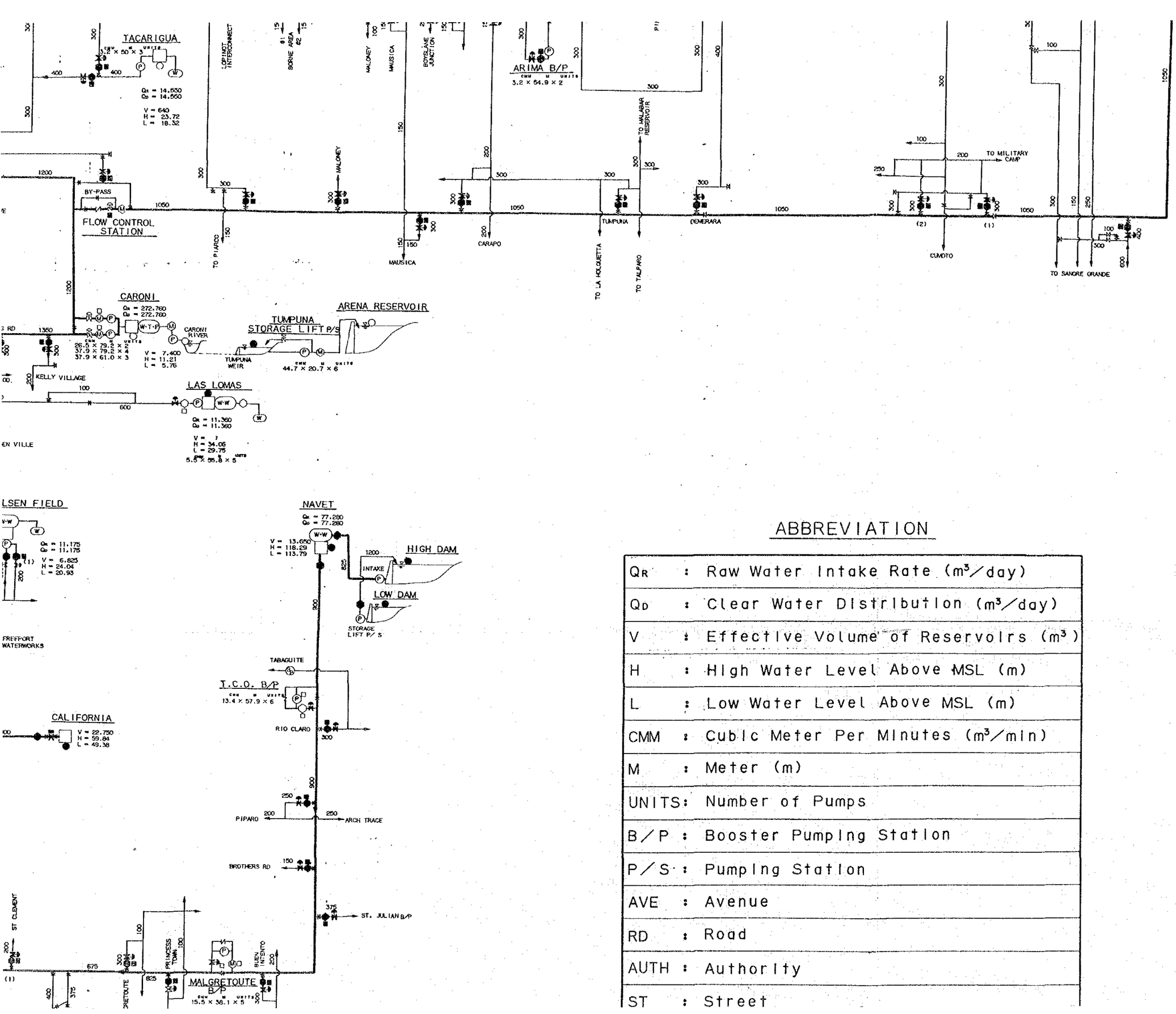
LEGEND

W·W	Waterworks
W	Well / Wellfield
P	Pump / Pumps
□	Service Storage Reservoir / Clear Water Reservoir
⬡	Existing Flow Meter
⋈	Existing Valve
	Existing Altitude Valve
	Existing Flow Control Valve
	Existing Check Valve
○	Existing Level Meter
◀	Existing Reducer
300	Diameter (mm)
⬟	Proposed Flow Meter



ABBRE

Q_R	:	Raw Water Ir
Q_D	:	Clear Water
V	:	Effective Vo
H	:	High Water L
L	:	Low Water Le
CMM	:	Cubic Meter
M	:	Meter (m)
UNITS	:	Number of Pu
B/P	:	Booster Pump
P/S	:	Pumping Stat
AVE	:	Avenue
RD	:	Road
AUTH	:	Authority

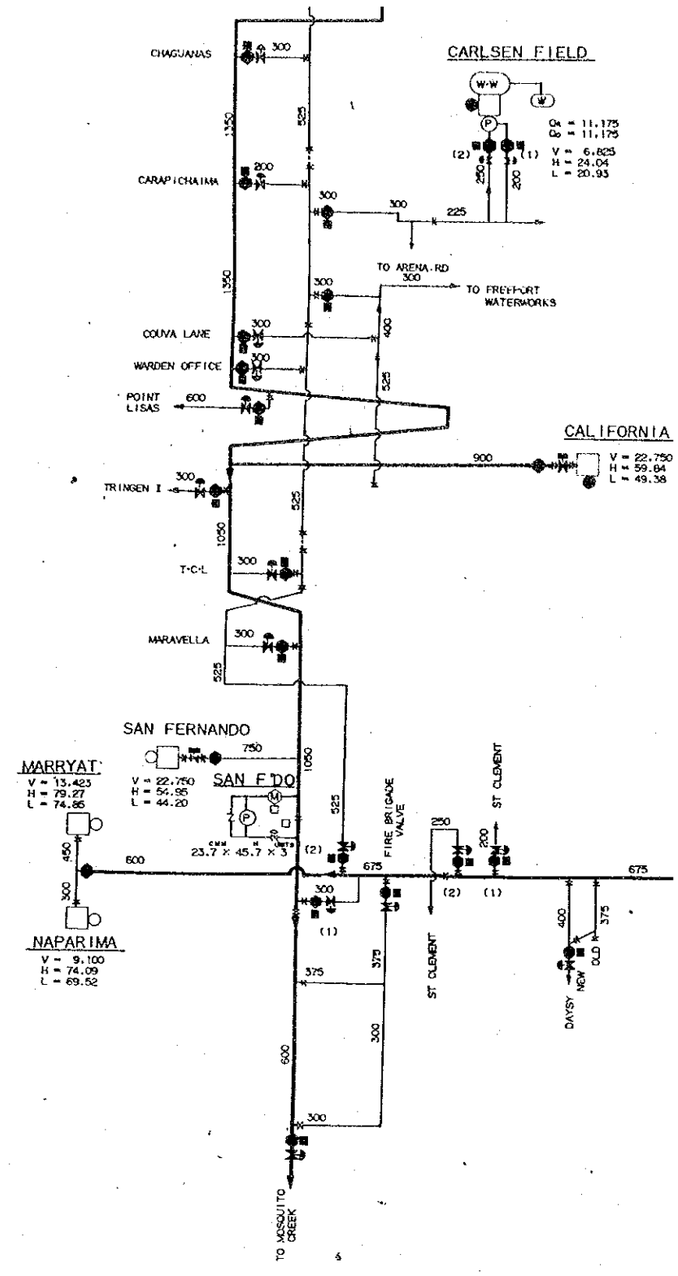


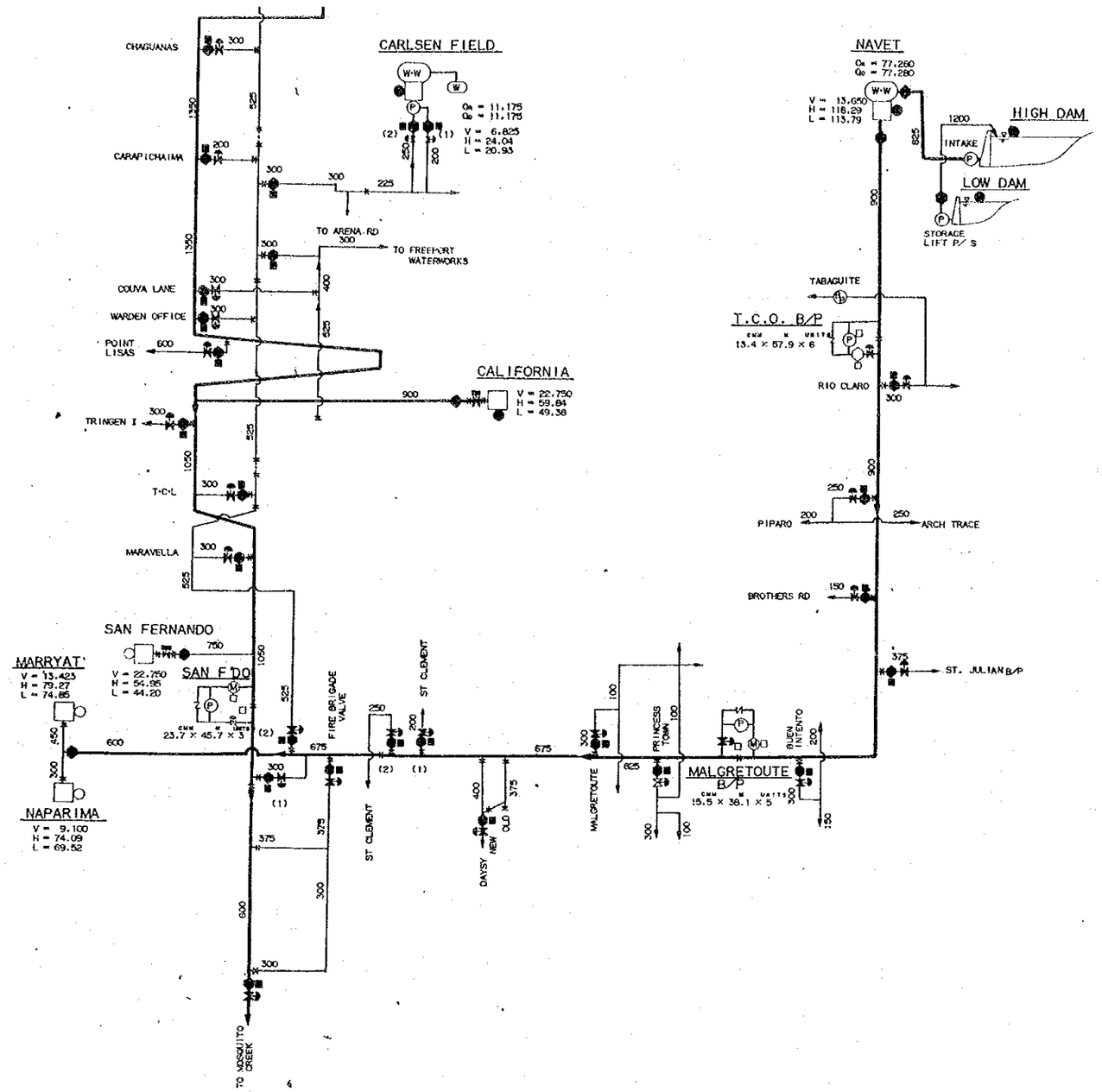
ABBREVIATION

Q_R	:	Raw Water Intake Rate (m^3/day)
Q_D	:	Clear Water Distribution (m^3/day)
V	:	Effective Volume of Reservoirs (m^3)
H	:	High Water Level Above MSL (m)
L	:	Low Water Level Above MSL (m)
CMM	:	Cubic Meter Per Minutes (m^3/min)
M	:	Meter (m)
UNITS	:	Number of Pumps
B/P	:	Booster Pumping Station
P/S	:	Pumping Station
AVE	:	Avenue
RD	:	Road
AUTH	:	Authority
ST	:	Street

LEGEND

W·W	Waterworks
W	Well / Wellfield
P	Pump / Pumps
□	Service Storage Reservoir / Clear Water Reservoir
⬡	Existing Flow Meter
⋈	Existing Valve
	Existing Altitude Valve
	Existing Flow Control Valve
	Existing Check Valve
○	Existing Level Meter
◀	Existing Reducer
300	Diameter (mm)
⬢	Proposed Flow Meter
	Proposed Flow Control Valve
	Proposed Altitude Valve
■	Proposed Pressure Guage
●	Proposed Level Meter

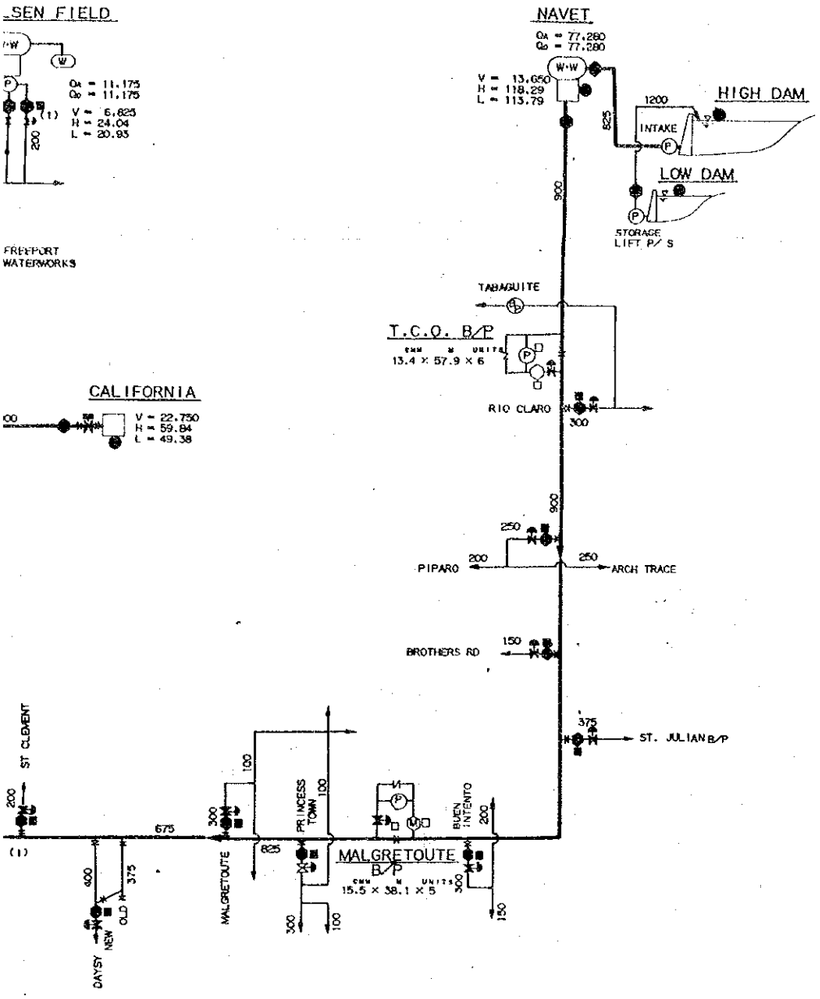




ABBREV

Q_R	:	Raw Water Int
Q_D	:	Clear Water D
V	:	Effective Vol
H	:	High Water Le
L	:	Low Water Lev
CMM	:	Cubic Meter F
M	:	Meter (m)
UNITS	:	Number of Pum
B/P	:	Booster Pumpi
P/S	:	Pumping Stati
AVE	:	Avenue
RD	:	Road
AUTH	:	Authority
ST	:	Street
RES	:	Reservoir

F



ABBREVIATION

Q_R	:	Raw Water Intake Rate (m^3/day)
Q_D	:	Clear Water Distribution (m^3/day)
V	:	Effective Volume of Reservoirs (m^3)
H	:	High Water Level Above MSL (m)
L	:	Low Water Level Above MSL (m)
CMM	:	Cubic Meter Per Minutes (m^3/min)
M	:	Meter (m)
UNITS	:	Number of Pumps
B/P	:	Booster Pumping Station
P/S	:	Pumping Station
AVE	:	Avenue
RD	:	Road
AUTH	:	Authority
ST	:	Street
RES	:	Reservoir

Fig. P-2 WATER SUPPLY SYSTEM UNDER NEW CSS (PHASE I)

KNAGGS HILL
V = 27,300
H = 71.84
L = 61.89

PICTON No1
V = 13,650
H = 108.23
L = 101.82

PICTON No2
V = 22,750
H = 69.82
L = 60.66

PICTON No3
V = 45,500
H = 93.45
L = 82.81

MALLICK
V = 22,750
H = 54.41
L = 47.21

MT HOPE
V = 22,750
H = 91.82
L = 82.91

ST JOSEPH
V = 13,650
H = 78.66
L = 74.09

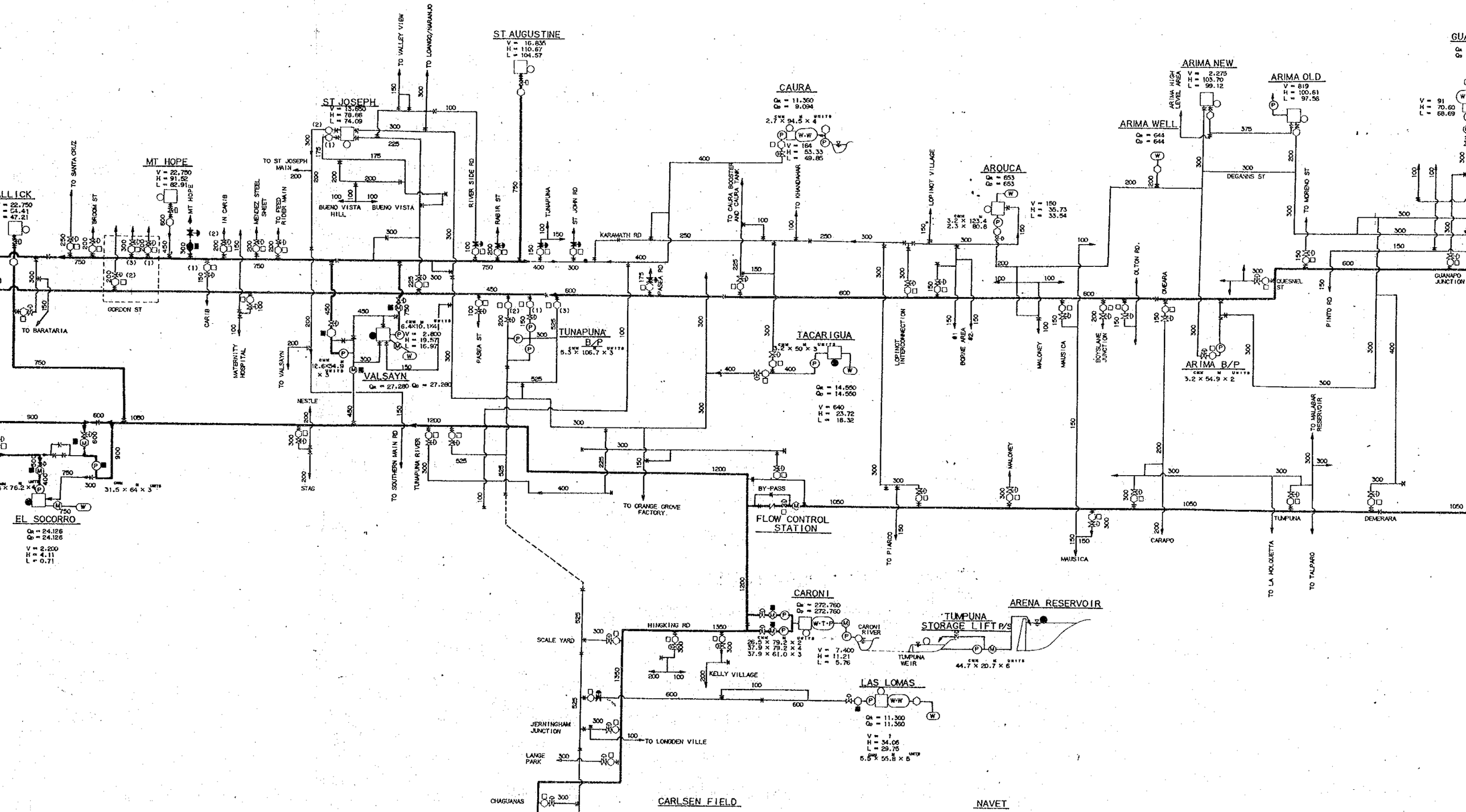
ST AUGUSTINE
V = 18,835
H = 110.67
L = 104.57

TUNAPUNA
B/P
5.3 × 106.7 × 3

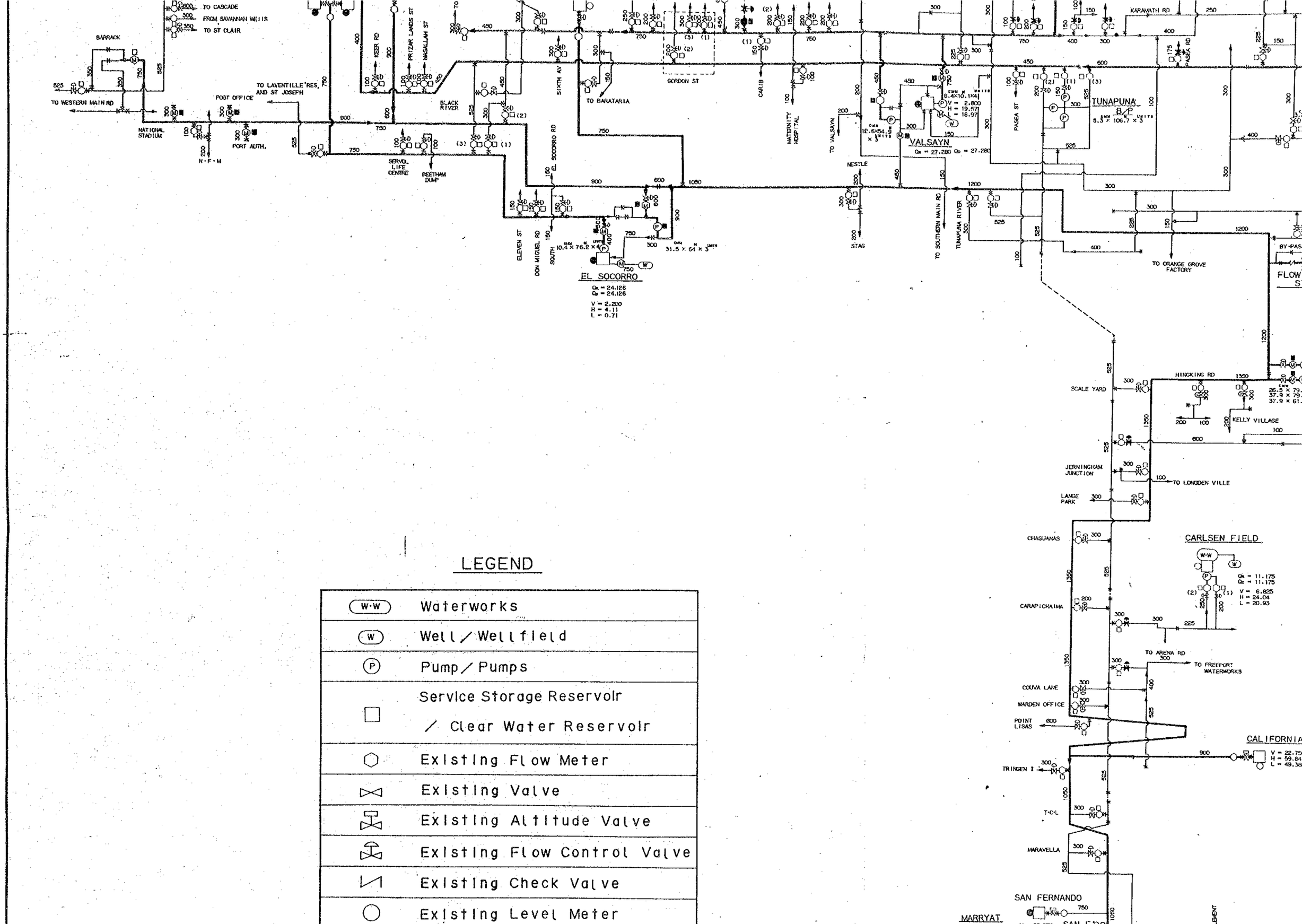
VALSAYN
Qa = 27,280 Qp = 27,280

EL SOCORRO
Qa = 24,126
Qp = 24,126
V = 2,200
H = 4.11
L = 0.71

CARLSEN FIELD

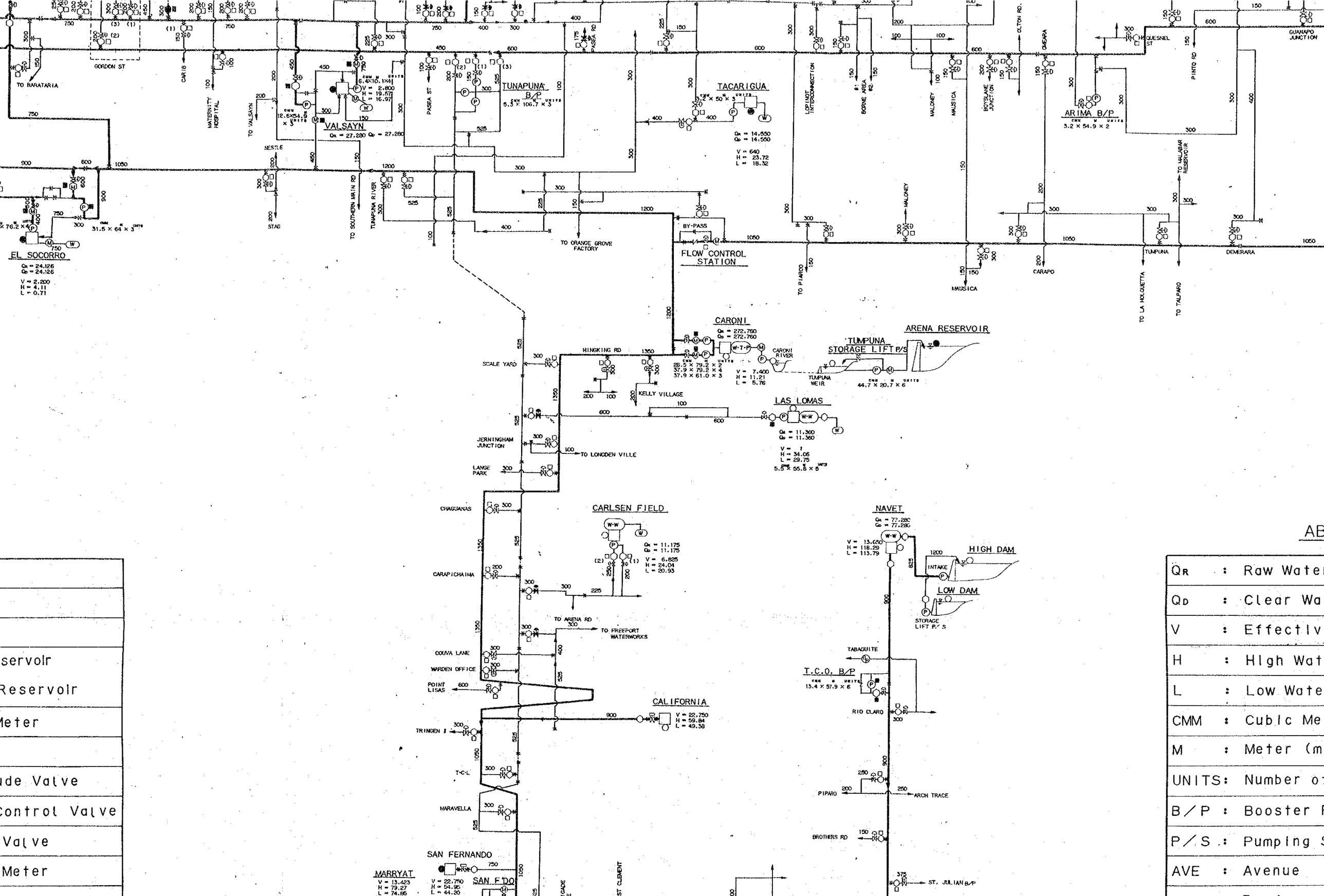

ST AUGUSTINE
V = 16,836
H = 110.67
L = 104.57
ST JOSEPH
V = 13,650
H = 78.66
L = 74.09
TO VALLEY VIEW
TO LOANDO/MARANJO
MT HOPE
V = 22,750
H = 91.52
L = 82.91
TO SANTA CRUZ
TO ST JOSEPH MAIN
TO REID RIDER MAIN
MENDEZ STEEL SHEET
BUENO VISTA HILL
BUENO VISTA
RIVER SIDE RD
RABIR ST
TUNAPUNA
ST JOHN RD
KARAMATH RD
CAURA
Qp = 11,360
Qa = 9,094
2.7 X 94.5 X 4 UNITS
V = 164
H = 53.33
L = 49.86
TO CAURA BOOSTER AND CAURA TANK
TO KHANDAHAR
LOPINOT VILLAGE
AROUCA
Qp = 653
Qa = 653
V = 150
H = 35.73
L = 33.54
ARIMA NEW
ARIMA HIGH AREA LEVEL
V = 2,275
H = 105.70
L = 99.12
ARIMA OLD
V = 819
H = 100.61
L = 97.56
ARIMA WELL
Qp = 644
Qa = 644
DEGANNIS ST
TO MORIBO ST
OLTON RD.
OKEARA
MAQUESNEL ST
PINTO RD
GUANAPO JUNCTION
ARIMA B/P
3.2 X 54.9 X 2
GORDON ST
TO BARATARIA
CARIB
MATERNITY HOSPITAL
TO VALSAYN
VALSAYN
Qa = 27,280 Qp = 27,280
PASEA ST
TUNAPUNA B/P
5.3 X 106.7 X 3
TACARIGUA
5.2 X 50 X 3
Qp = 14,550
Qa = 14,550
V = 640
H = 23.72
L = 18.32
LOPINOT INTERCONNECTION
#1 BORNE AREA #2
MALONEY
MAUSICA
BOYSLAME JUNCTION
NESTLE
STAG
TO SOUTHERN MAIN RD
TUNAPUNA RIVER
TO ORANGE GROVE FACTORY.
BY-PASS
FLOW CONTROL STATION
EL SOCORRO
Qa = 24,126
Qp = 24,126
V = 2,200
H = 4.11
L = 0.71
31.5 X 64 X 3 UNITS
TO PIARCO
CARAPO
TUMPUNA
DEMERARA
TO LA HOLQUETTA
TO TALPARO
TO MALABAR RESERVOIR
CARONI
Qp = 272,760
Qa = 272,760
26.9 X 79.2 X 2
37.9 X 79.2 X 4
37.9 X 61.0 X 3
V = 7,400
H = 11.21
L = 5.76
CARONI RIVER
TUMPUNA WEIR
ARENA RESERVOIR
TUMPUNA STORAGE LIFT P/S
44.7 X 20.7 X 6 UNITS
HINGKING RD
SCALE YARD
KELLY VILLAGE
LAS LOMAS
Qa = 11,360
Qp = 11,360
V = 1
H = 34.06
L = 29.76
5.5 X 55.8 X 5 UNITS
JERNINGHAM JUNCTION
TO LONDDEN VILLE
LANGE PARK
CHAGUANAS
CARLSEN FIELD
NAVET

CAURA
Qa = 11.360
Qp = 9.094
2.7 × 94.6 × 4
V = 164
H = 53.33
L = 49.86
TO CAURA BOOSTER AND CAURA TANK
TO KHANDAHAR
LOPINOT VILLAGE
AROUCA
Qa = 653
Qp = 653
DIV 12" x 8" x 8" 80.8
V = 150
H = 35.73
L = 33.54
ARIMA WELL
Qa = 644
Qp = 644
ARIMA NEW
V = 2,275
H = 103.70
L = 99.12
ARIMA HIGH LEVEL AREA
ARIMA OLD
V = 819
H = 100.61
L = 97.56
DEGANNS ST
TO MORENO ST
GUANAPO
Qa = 11.360
Qp = 11.360
V = 91
H = 70.60
L = 68.69
8.1 × 93.3 × 2
ARIPO
NEW
Qa = 10.630
Qp = 8.069
OLD
Qa = 4.535
Qp = 4.535
FORT READ
V = 7,599
H = 99.96
L = 94.24
ARIPO B/P
3.2 × 54.3 × 2
HOLLIS
Qa = 31.826
Qp = 25.000
NORTH OROPOUCHE
Qa = 90.125
Qp = 44.825
V = 45,500
H = 136.48
L = 125.76
QUARE
Qa = 2.935
Qp = 2.935
V = ?
H = 62.49
L = 60.36
2.5 × 61.0 × 3
GILL TRACE
GUANAPO JUNCTION
DOUBLE BRIDGE
PINTO RD
HAMOUESNEL ST
OLTON RD.
OMERARA
LOPINOT INTERCONNECTION
BORNE AREA #1
BORNE AREA #2
MALONEY
MAUSICA
BOYSLANE JUNCTION
ARIMA B/P
3.2 × 54.9 × 2
TACARIGUA
Qa = 14.550
Qp = 14.550
V = 640
H = 23.72
L = 18.32
TO MALABAR RESERVOIR
TO MILITARY CAMP
BY-PASS
FLOW CONTROL STATION
TO PIARCO
MAUSICA
CARAPO
TUMPUNA
DEMERARA
TO LA HOLLQUETTA
TO TALPARO
CUMDTO
TO SANGRE GRANDE
CARONI
Qa = 272.760
Qp = 272.760
26.5 × 79.2 × 5
37.9 × 79.2 × 4
37.9 × 61.0 × 3
V = 7,400
H = 11.21
L = 5.76
CARONI RIVER
TUMPUNA WEIR
TUMPUNA STORAGE LIFT P/S
44.7 × 20.7 × 6
ARENA RESERVOIR
KELLY VILLAGE
LAS LOMAS
Qa = 11.360
Qp = 11.360
V = ?
H = 34.06
L = 29.78
5.5 × 55.8 × 5
CARLSEN FIELD
NAVET



LEGEND

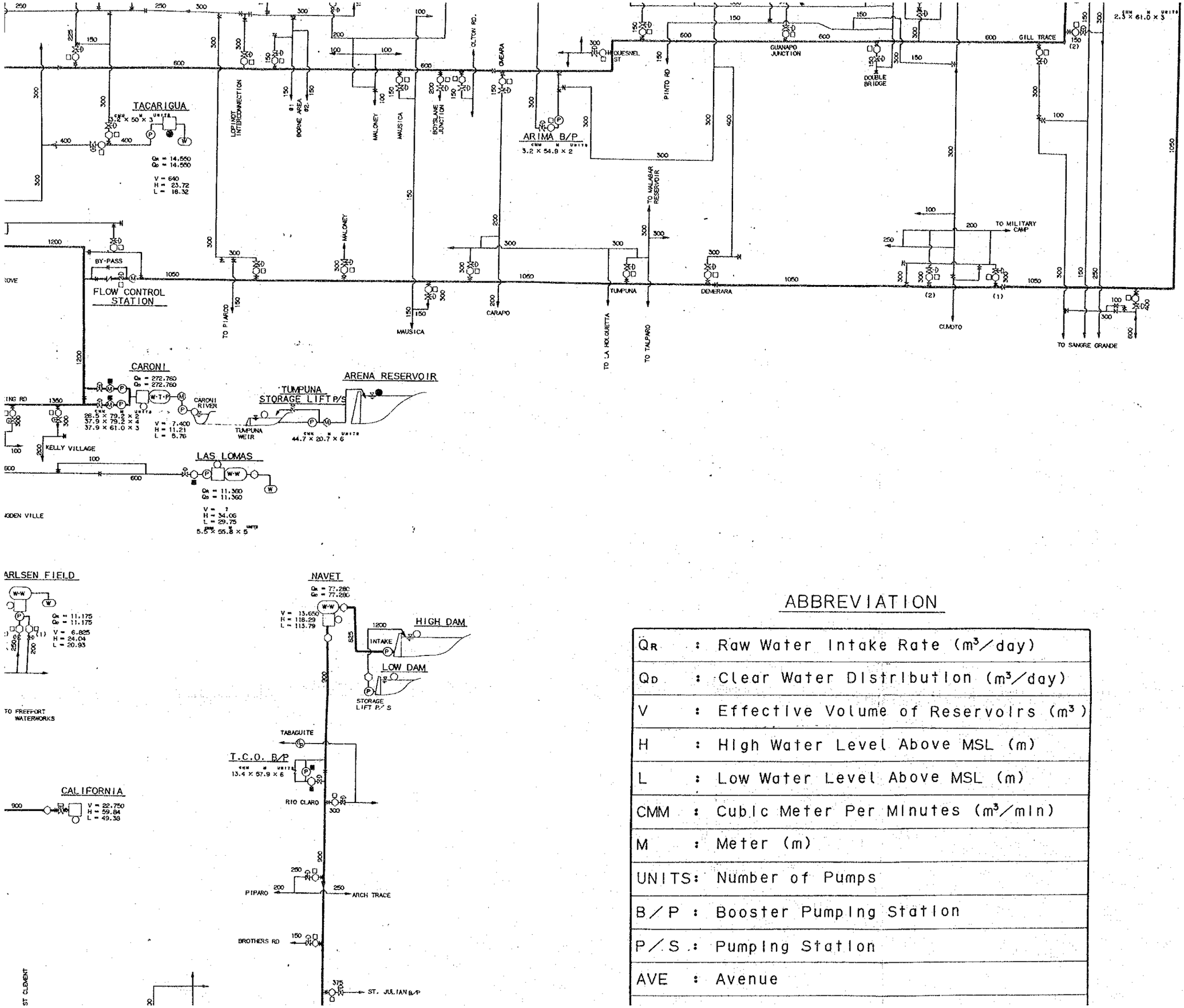
W·W	Waterworks
W	Well / Wellfield
P	Pump / Pumps
□	Service Storage Reservoir / Clear Water Reservoir
⬡	Existing Flow Meter
⋈	Existing Valve
	Existing Altitude Valve
	Existing Flow Control Valve
	Existing Check Valve
○	Existing Level Meter



servoir	
Reservoir	
Meter	
ude Valve	
Control Valve	
Valve	
Meter	

AB

Q_R	:	Raw Wate
Q_D	:	Clear Wa
V	:	Effectiv
H	:	High Wat
L	:	Low Wate
CMM	:	Cubic Me
M	:	Meter (m
UNITS	:	Number o
B/P	:	Booster
P/S	:	Pumping
AVE	:	Avenue

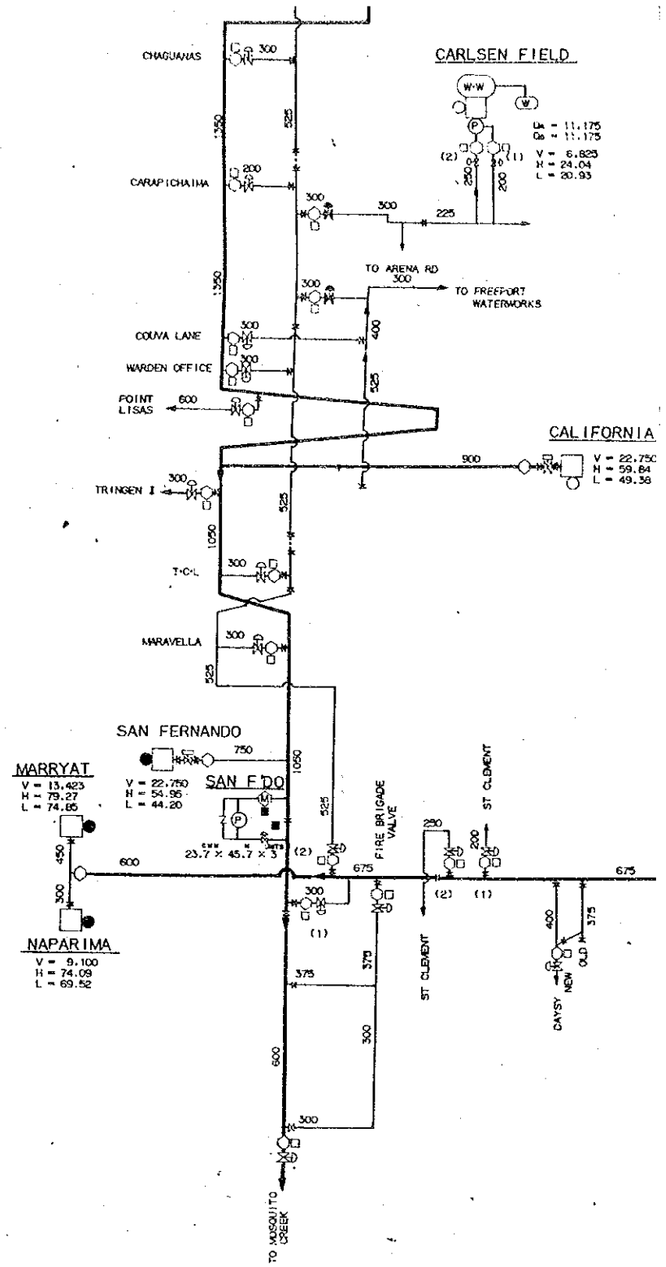


ABBREVIATION

Q_R	:	Raw Water Intake Rate (m^3/day)
Q_D	:	Clear Water Distribution (m^3/day)
V	:	Effective Volume of Reservoirs (m^3)
H	:	High Water Level Above MSL (m)
L	:	Low Water Level Above MSL (m)
CMM	:	Cubic Meter Per Minutes (m^3/min)
M	:	Meter (m)
UNITS	:	Number of Pumps
B/P	:	Booster Pumping Station
P/S	:	Pumping Station
AVE	:	Avenue

LEGEND

W·W	Waterworks
W	Well / Wellfield
P	Pump / Pumps
□	Service Storage Reservoir / Clear Water Reservoir
⬡	Existing Flow Meter
⋈	Existing Valve
	Existing Altitude Valve
	Existing Flow Control Valve
	Existing Check Valve
○	Existing Level Meter
◀	Existing Reducer
300	Diameter (mm)
⬢	Proposed Flow Meter
	Proposed Flow Control Valve
	Proposed Altitude Valve
■	Proposed Pressure Guage
●	Proposed Level Meter



]	
eservoir	
Reservoir	
Meter	
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Control Valve	
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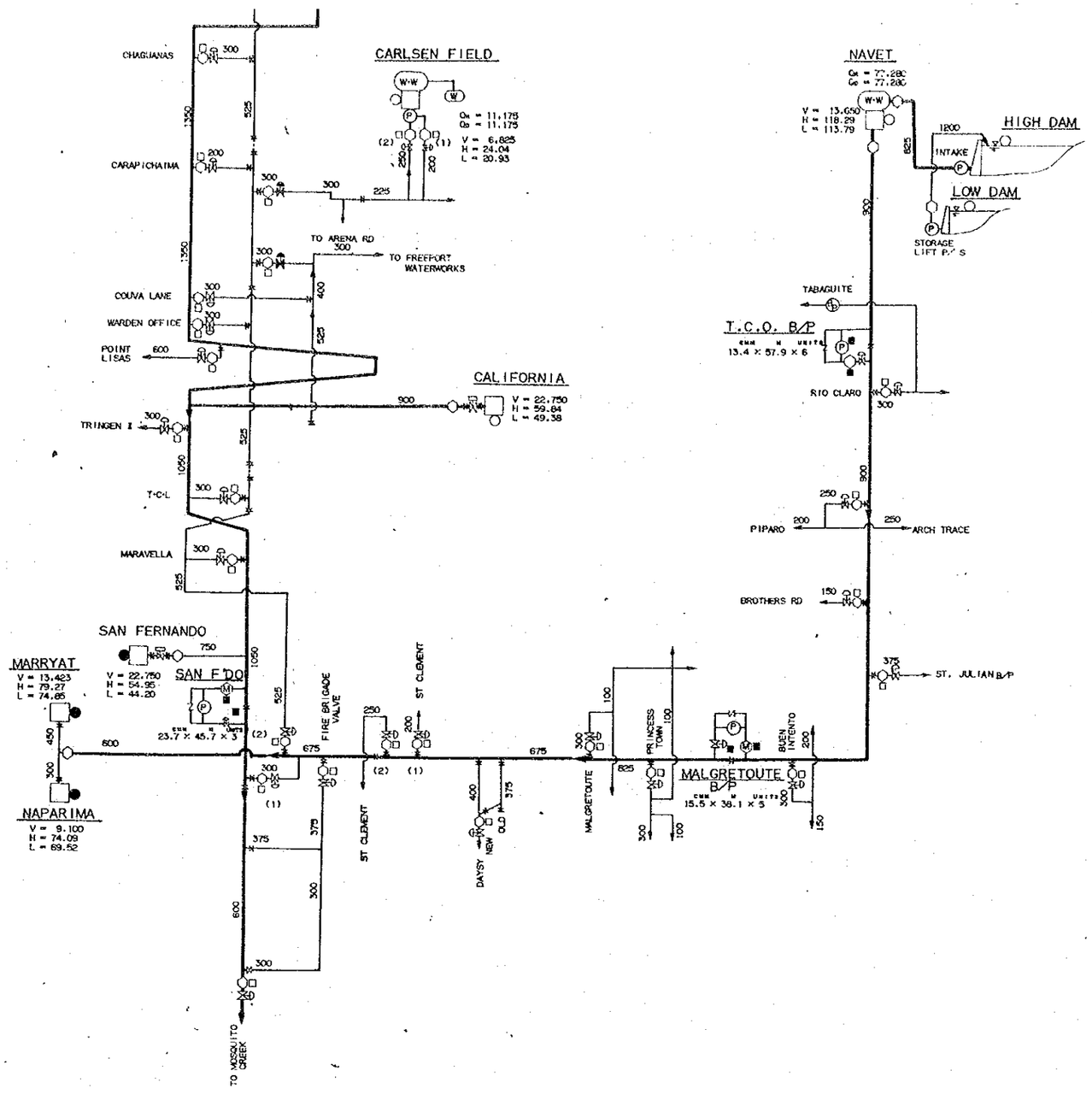
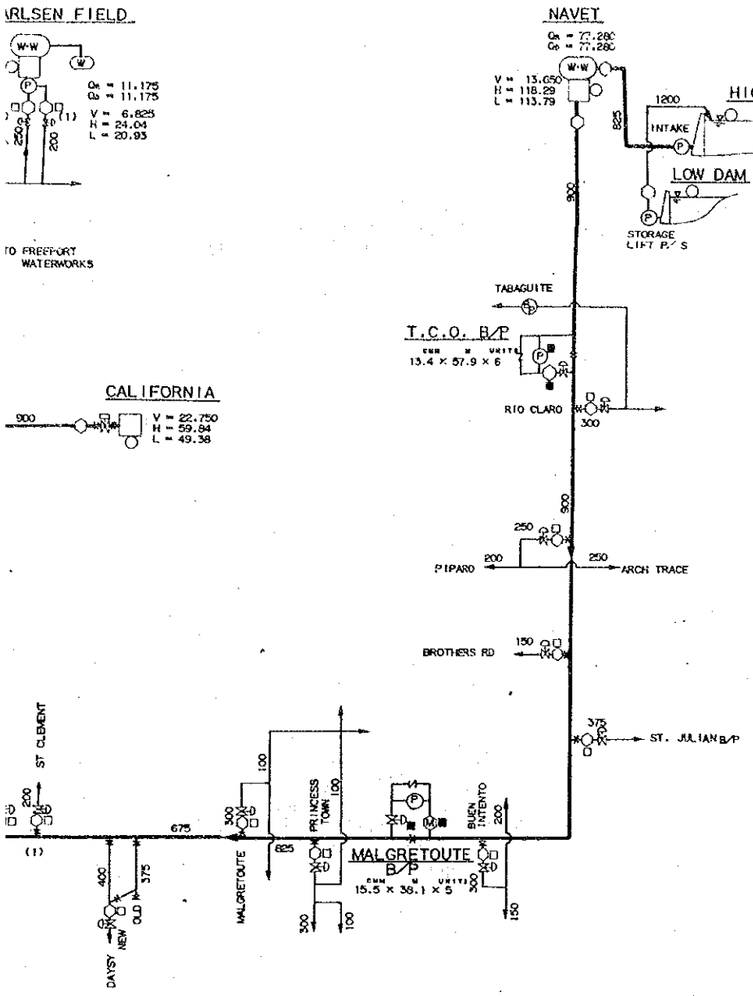


Q_R	:	Raw Wa
Q_D	:	Clear
V	:	Effect
H	:	High W
L	:	Low Wa
CMM	:	Cubic
M	:	Meter
UNITS	:	Number
B/P	:	Booste
P/S	:	Pumpin
AVE	:	Avenue
RD	:	Road
AUTH	:	Author
ST	:	Street
RES	:	Reservo



ABBREVIATION

Q_R	:	Raw Water Intake Rate (m^3/day)
Q_D	:	Clear Water Distribution (m^3/day)
V	:	Effective Volume of Reservoirs (m^3)
H	:	High Water Level Above MSL (m)
L	:	Low Water Level Above MSL (m)
CMM	:	Cubic Meter Per Minutes (m^3/min)
M	:	Meter (m)
UNITS	:	Number of Pumps
B/P	:	Booster Pumping Station
P/S	:	Pumping Station
AVE	:	Avenue
RD	:	Road
AUTH	:	Authority
ST	:	Street
RES	:	Reservoir

Fig. P-3 WATER SUPPLY SYSTEM UNDER NEW CSS (PHASE II)