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RECORDS 1959 No. 156

PRELIMINARY REPORT OF AN UNDERWATER GRAVITY SURVEY

DARWIN - WYNDHAM 1958

by

L.W. Williams and S. Waterlander

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CONTENTS

ABSTRACT

The Underwater Gravity Survey of North Australian waters was extended from Darwin to Wyndham on a regional basis. Detailed surveys were made in two areas of interest to oil prospecting companies. Gravity readings were made at approximately 130 stations and the results were reduced by tying to pendulum stations and existing land stations adjacent to the area. The results are given in tabulations, and a brief mention of the trends in the gravity anomalies is made.

1. INTRODUCTION

As a continuation of the marine gravity surveys in waters to the north of Australia, combined regional and detailed surveys were carried out between Darwin and Wyndham using a "North American" underwater gravity meter installed in M.V. Kano, a 60-ft motor launch under charter.

Following a request from Associated Australian Oilfields, N.L. for work on Permit to Explore No.2, four traverses, with stations at one-mile intervals, were run at right angles to the coast to the north of Port Keats. Another traverse was run from Port Keats towards Keep Inlet with stations at two-or five-mile intervals.

At the request of Gulf Oil Syndicate a traverse was run from Keep Inlet to Cambridge Gulf with stations at two-mile intervals. This traverse was extended to tie into the Wyndham pendulum station.

Because the inlets opening into Cambridge Gulf are so shallow and the currents so strong, the underwater gravity meter was not used in them, but readings were taken around the shore using a Worden gravity meter.

The survey vessel left Darwin on 16th July 1958 and the survey was completed at Wyndham on 1st August 1958.

2. FIELD WORK

On all traverses except those with 1-mile station intervals, the drift control on the underwater gravity meter was obtained from ties to Darwin and Wyndham pendulum stations. Also, numerous land readings with a Worden gravity meter and ties to existing land stations enabled a check to be made in case "jumps" occurred.

On the traverses with station intervals of 1 mile (Traverses 86, 87, 88 & 89) and for the Cambridge Gulf survey with the Worden gravity meter, drift control was maintained by repeat readings on base stations.

Station positions were located wherever possible by using a horizontal sextant and/or compass bearings to land marks. Where this was not possible (outer ends of traverses 86, 87, 88 and 89, and generally between Pearce Point and the mouth of Cambridge Gulf) the positions were determined using dead reckoning and the ship's log.

3. REDUCTION OF RESULTS

All anomalies have been reduced to Mean Sea Level (M.S.L.) using Admiralty Tide Tables to allow for the state of the tide.

The results were first reduced for Bureau of Mineral Resources regional gravity requirements using observed gravity values, determined with the underwater gravity meter, and based on pendulum station values. A density of 2.67 g/c.c. was used.

To fit in with existing land surveys carried out by Mines Administration, the results of the more detailed traverses were then reduced by adjusting the observed gravity value of the first station on each detailed traverse to an adjoining land station. This was done by assuming that the underwater gravity station and the land station had the same Bouguer Anomaly, and accepting the observed gravity value given for the land station. A density of 2.0 g/c.c. was used in this reduction.

The observed gravity values measured with the underwater gravity meter at the first station on each detailed traverse have been compared with the observed gravity values given by Mines Administration for the adjoining land stations. The results are given in the following table.

STATION NO.	COMPANY SURVEY			B.M.R. SURVEY		
	Observed Gravity	Obs.Gravity at M.S.L.	Int.	Observed Gravity	Obs.Gravity at M.S.L.	Int.
	978	978		978	978	
B16(86)	334.68	335.58		317.47	316.10	
			+7.11			+5.16
B26(87)	342.00	342.69		323.28	321.26	
			+4.80			+6.39
S18(88)	345.96	347.49		328.20	327.65	
			-9.20			-10.01
S24(89)	337.53	338.29		319.17	317.64	
			+5.12			+6.05
B37(90)	341.53	343.41		325.10	323.69	
			+56.30			+67.60
A9(106)	397.83	399.71		392.67	391.29	

It will be seen that successive intervals agree fairly well, considering that the underwater gravity stations were not exact reoccupations, with the exception of the interval between B37(90) and A9(106). As this interval was checked with the BMR Worden meter, it is considered that the BMR interval is the more reliable.

4. RESULTS

The results described here are those based on pendulum station values and assuming a density of 2.67 g/c.c. The anomalies obtained by fitting the underwater gravity meter measurements to existing land stations and using a density of 2.0 g/c.c. are listed in the table, but are not discussed.

The Bouguer Anomalies, positive at Darwin, remain positive until the north side of Anson Bay. They then become negative and the largest negative value is recorded near Hyland Bay, slightly north of Port Keats.

There is a maximum at Station 101, near the centre of Queen's Channel, and another minimum at Station 116, east of Cambridge Gulf.

The values become positive entering Cambridge Gulf and remain positive to Wyndham.

Along the more detailed traverses, the anomalies on Traverse 86 show a small maximum; on Traverses 87 and 88 they become more negative going west, and on Traverse 89 they become slightly more negative and then increase at the western end.

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY.

+4.65

Station	Latitude	Longitude	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction	Terrain Corr.	Bouguer Anomaly
	o '	o '								
*			*							
B16	13 33'45"	129 48'5	13	978 334.68	978 332.24			+0.90		+8.0
86	13 34.0	129 48.5	24.8	337.14	332.42	-1.68		+0.31		+8.0
86A	13 34.0	47.2	46.8	338.01	332.42	-3.17		+0.58		+7.7
86B	13 34.0	45.8	57.7	338.33	332.42	-3.91		+0.71		+7.9
86C	13 33.5	44.4	64.2	340.51	332.07	-4.35		+0.79		+9.5
86D	13 33.0	43.1	63.7	341.18	331.73	-4.32		+0.79		+10.6
86E	13 33.0	41.9	63.5	338.36	331.73	-4.30		+0.79		+7.8
86F	13 33.0	40.6	66.6	335.07	331.73	-4.51		+0.82		+4.3
86G	13 33.0	39.3	75.6	331.91	331.73	-5.12		+0.94		+0.6
86H	13 33.0	38.1	79.8	329.42	331.73	-5.41		+0.99		-2.1
*			*							
B26	13 40'40"	129 46.5	10	342.00	336.97			+0.69		+10.4
87	13 40.5	46.5	36.4	344.65	336.88	-2.47		+0.45		+10.4
87A	13 40.4	45.5	49.3	345.33	336.81	-3.34		+0.61		+10.4
87B	13 40.3	44.4	37.7	343.25	336.74	-2.55		+0.47		+9.1
87C	13 40.2	43.3	48.3	341.85	336.67	-3.27		+0.60		+7.2
87D	13 40.1	42.3	50.1	337.78	336.60	-3.39		+0.62		+3.1
87E	13 40.0	41.3	63.6	334.85	336.53	-4.31		+0.79		-0.6
87F	13 39.9	40.2	68.0	331.85	336.46	-4.61		+0.84		-3.7
87G	13 39.8	39.2	71.9	330.96	336.39	-4.87		+0.89		-4.8
S18*	13 46.40	129 47.4	22.0*	345.96	341.11			+1.53		+11.0
88	13 47.8	47.4	9.9	348.82	341.92	-0.67		+0.12		+11.0
88A	13 47.7	46.2	31.3	347.09	341.85	-2.12		+0.39		+8.2
88B	13 47.6	44.9	37.5	342.48	341.78	-2.54		+0.46		+3.3
88C	13 47.5	43.6	42.6	338.77	341.72	-2.89		+0.53		-0.7
88D	13 47.4	42.3	48.7	336.96	341.65	-3.30		+0.60		-2.7
88E	13 47.3	40.9	55.3	336.15	341.58	-3.75		+0.68		-3.8
88F	13 47.2	39.6	63.8	335.78	341.51	-4.32		+0.79		-4.6
88G	13 47.1	38.3	69.2	335.92	341.44	-4.69		+0.86		-4.7

Area: Bonaparte Gulf

Traverse: 06/87/88

Date of Survey: JULY 1958.

Meter: North American Marine

Sensitivity: 0.12665

Datum: * Company land Stn. Height above MSL.

Density Factor: 2.0

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

+4.65

Station	Latitude ° '	Longitude ° '	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction.	Terrain Corr.	Bouguer Anomaly.
S24*	13 54'10"	129 43'	11 *	978 337.53	978 346.34			+0.76		-3.4
89	13 53.8	43.0	27.6	339.58	346.10	-1.87		+0.34		-3.4
89A	13 53.7	41.6	38.4	338.86	346.03	-2.60		+0.47		-4.7
89B	13 53.6	39.8	46.7	338.69	345.96	-3.16		+0.58		-5.2
89C	13 53.5	38.2	45.9	338.67	345.89	-3.11		+0.57		-5.1
89D	13 53.4	36.6	56.6	338.95	345.82	-3.84		+0.70		-5.4
89E	13 53.3	35.0	46.2	338.25	345.75	-3.13		+0.57		-5.4
89F	13 53.2	33.4	41.2	337.91	345.68	-2.79		+0.51		-5.4
89G	13 53.1	31.8	63.5	338.75	345.61	-4.30		+0.79		-5.7
89H	13 53.0	30.2	68.7	338.87	345.54	-4.66		+0.85		-5.8
89I	13 52.9	28.6	47.3	335.67	345.48	-3.20		+0.58		-7.8
89J	13 52.8	27.0	76.6	337.53	345.41	-5.19		+0.95		-7.5
89K	13 52.7	25.4	80.5	338.07	345.34	-5.45		+1.00		-7.1
89L	13 52.6	23.8	84.3	339.23	345.27	-5.71		+1.04		-6.1
89M	13 52.5	22.2	85.8	340.64	345.20	-5.81		+1.06		-4.7
89N	13 52.4	20.6	82.0	341.50	345.13	-5.56		+1.01		-3.5
B37*	14 05'20"		27.0*	341.53	354.22			+1.88		-6.2
90	14 03.5	129 34.0	25.6	343.54	352.98	-1.73		+0.32		-6.2
91	14 01.5	29.4	46.4	351.26	351.50	-3.14		+0.57		+1.8
92	14 05.8	27.2	64.8	358.89	354.54	-4.39		+0.80		+5.4
93	14 10.4	24.9	60.5	367.50	357.81	-4.10		+0.75		+11.0
94	14 14.5	22.8								
95	14 19.2	22.8	41.9	377.36	364.10	-2.84		+0.52		+15.6
96	14 24.8	21.1	24.9	383.38	368.14	-1.69		+0.31		+18.5
97	14 27.8	19.9	128.7	398.15	370.31	-8.72		+1.59		+25.4
98	14 29.0	18.7	87.3	402.97	371.18	-5.92		+1.08		+31.6
99	14 30.5	17.5	101.9	408.61	372.27	-6.91		+1.26		+35.3
100	14 31.8	16.3	91.0	410.76	373.21	-6.17		+1.13		+37.2
101	14 33.2	15.1	76.4	416.24	374.24	-5.18		+0.95		+42.4

Area	Traverse	Date of Survey
Bonaparte Gulf	89/ (90-105)	JULY 1958.

Meter	Sensitivity	Datum	Density Factor
North American Marine	0.12665	* Company land Stn. Height above MSL.	2.0

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

+4.65

Station	Latitude ° '	Longitude ° '	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction	Terrain Corr.	Bouguer Anomaly.
102	14°34.9'	129°13.9'	66.7	978 416.29	978 375.48	-4.52		+0.83		+41.8
103	14 36.2	12.7	67.6	416.40	376.43	-4.58		+0.84		+40.9
104	14 37.8	11.5	58.6	415.56	377.59	-3.97		+0.73		+39.4
105	14 39.2	10.3	66.2	414.14	378.62	-4.49		+0.82		+36.5
A9*	14 55'10"		27*	397.83	390.43			+1.88		+13.9
106	14 54.2	129 03.7	25.0	400.33	389.71	-1.69		+0.31		+13.9
107	49.6	01.2	22.8	400.59	386.29	-1.55		+0.28		+17.7
108	49.0	128 59.0	32.2	400.06	385.85	-2.18		+0.40		+17.1
109	48.4	57.0	26.6	397.81	385.40	-1.80		+0.33		+15.6
110	47.8	54.9	32.3	396.14	384.96	-2.19		+0.40		+14.0
111	47.2	53.0	29.8	388.24	384.52	-2.02		+0.37		+6.7
112	46.6	50.9	28.7	381.34	384.07	-1.94		+0.35		+0.3
113	46.0	48.8	38.3	377.59	383.63	-2.60		+0.47		-3.5
114	45.4	46.7	42.2	374.89	383.18	-2.86		+0.52		-6.0
115	44.8	45.0	50.8	372.94	382.74	-3.44		+0.63		-8.0
116	44.2	42.6	46.4	371.89	382.30	-3.14		+0.57		-8.3
117	43.6	40.0	46.4	377.37	381.85	-3.14		+0.57		-2.4
118	43.0	37.9	58.6	378.00	381.41	-3.97		+0.72		-2.0
119	43.2	35.2	60.2	373.99	381.56	-4.08		+0.74		-6.3
120	43.4	33.8	31.9	373.80	381.70	-2.16		+0.39		-5.0
121	43.6	31.7	27.8	375.96	381.85	-1.88		+0.34		-2.8
122	43.8	29.2	26.7	379.62	382.00	-1.81		+0.33		+0.8
123	44.0	27.1	30.3	379.04	382.15	-2.05		+0.37		-0.1
124	44.2	25.0	28.6	379.84	382.30	-1.94		+0.35		+0.6

Area	Traverse	Date of Survey
Bonaparte Gulf	90-105 106-124	JULY 1958.

Meter	Sensitivity	Datum	Density Factor
North American Marine	0.12665	* Company land Station Height above MSL.	2.0

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SECTION

Station	Latitude ° '	Longitude ° '	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction.	Terrain Corr.	Bouguer Anomaly.
134	15°00.8	128°08.0'	124.3	978 412.88	978 394.64	-8.42	+9.82	+2.60		+12.4
135	02.0	06.7	109.6	415.69	395.54	-7.43	+12.72	+2.29		+15.0
136	04.2	06.8	83.8	415.60	397.20	-5.68	+12.72	+1.75		+14.5
137	06.0	05.7	59.1	416.54	398.55	-4.01	+13.98	+1.24		+15.2
138	09.2	06.0	60.0	415.77	400.97	-4.07	+10.73	+1.26		+12.0
139	12.5	06.2	51.8	416.91	403.47	-3.51	+9.93	+1.08		+11.0
140	14.4	05.9	41.2	416.03	404.91	-2.79	+8.33	+0.86		+9.2
141	17.0	05.9	69.7	417.86	406.89	-4.72	+6.25	+1.46		+7.7
142	20.0	05.0	26.3	416.22	409.18	-1.78	+5.26	+0.55		+5.8
143	22.2	05.5	40.3	417.67	410.86	-2.73	+4.08	+0.84		+4.9
144	24.8	06.2	36.4	419.22	412.87	-2.47	+3.88	+0.76		+4.6
145	27.0	05.8	38.3	418.13	414.55	-2.60	+0.98	+0.80		+1.8
146	14 49.5	23.4	43.4	382.45	386.22	-2.94	-6.71	+0.91		-5.8
147	53.0	23.9	29.4	379.58	388.82	-1.99	-11.77	+0.62		-10.6
148	52.0	18.9	57.9	394.14	388.07	-3.92	+2.15	+1.21		+3.4
149	53.4	20.5	38.4	387.36	389.12	-2.60	-4.36	+0.80		-3.6
150	56.0	20.1	48.2	387.71	391.05	-3.27	-6.61	+1.01		-5.6
151	59.1	21.0	26.8	385.19	393.36	-1.82	-9.99	+0.56		-9.4
152	15 10.9	07.6	58.0	415.74	402.25	-3.93	+9.56	+1.21		+10.8

Area	Traverse	Date of Survey
Cambridge Gulf		JULY - AUGUST 1958.

Meter	Sensitivity	Datum	Density
North American Marine	0.12665	Wyndham P.S. M.S.L.	2.67

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

Station	Latitude	Longitude	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction.	Terrain Corr	Bouguer Anomaly
104	14° 37.8	129° 11.5	58.6	978 397.12	978 377.59	-3.97	+15.56	+1.23		+16.8
105	39.2	10.3	66.2	395.70	378.62	-4.49	+12.59	+1.39		+14.0
106	54.2	03.7	25.0	392.67	389.71	-1.69	+1.27	+0.52		+1.8
107	49.6	01.2	22.8	392.92	386.29	-1.55	+5.08	+0.48		+5.6
108	49.0	128 59.0	32.2	392.38	385.85	-2.18	+4.35	+0.67		+5.0
109	48.4	57.0	26.6	390.11	385.40	-1.80	+2.91	+0.56		+3.5
110	47.8	54.9	32.3	388.43	384.96	-2.19	+1.28	+0.68		+2.0
111	47.2	53.0	29.8	380.51	384.52	-2.02	-6.03	+0.62		-5.4
112	46.6	50.9	28.7	373.59	384.07	-1.94	-12.42	+0.60		-11.8
113	46.0	48.8	38.3	369.82	383.63	-2.60	-16.41	+0.80		-15.6
114	45.4	46.7	42.2	367.11	383.18	-2.86	-18.93	+0.88		-18.1
115	44.8	45.0	50.8	365.15	382.74	-3.44	-21.03	+1.06		-20.0
116	44.2	42.6	46.4	364.09	382.30	-3.14	-21.35	+0.97		-20.4
117	43.6	40.0	46.4	369.55	381.85	-3.14	-15.44	+0.97		-14.5
118	43.0	37.9	58.6	370.17	381.41	-3.97	-15.21	+1.23		-14.0
119	43.2	35.2	60.2	366.14	381.56	-4.08	-19.50	+1.26		-18.2
120	43.4	33.8	31.9	365.94	381.70	-2.16	-17.92	+0.67		-17.3
121	43.6	31.7	27.8	368.09	381.85	-1.88	-15.64	+0.58		-15.1
122	43.8	29.2	26.7	371.73	382.00	-1.81	-12.08	+0.56		-11.5
123	44.0	27.1	30.3	371.14	382.15	-2.05	-13.06	+0.63		-12.4
124	44.2	25.0	28.6	371.93	382.30	-1.94	-12.31	+0.60		-11.7
125	45.2	22.6	44.8	377.10	383.04	-3.04	-8.92	+0.94		-8.0
126	46.6	21.7	61.8	390.93	384.07	-4.19	+2.67	+1.29		+4.0
127	48.5	20.6	63.9	391.10	385.48	-4.33	+1.29	+1.34		+2.6
128	50.0	18.4	67.3	390.97	386.59	-4.56	-0.18	+1.41		+1.2
129	51.2	16.5	72.1	389.35	387.48	-4.89	-3.02	+1.51		-1.5
130	53.3	14.8	68.3	388.26	389.12	-4.63	-5.49	+1.43		-4.1
131	55.2	12.8	70.1	402.24	390.46	-4.75	+7.03	+1.47		+8.5
132	57.2	11.0	71.4	403.12	391.95	-4.84	+6.33	+1.49		+7.8
133	59.2	09.2	70.6	406.03	393.44	-4.78	+7.81	+1.48		+9.3

Area	Traverse	Date of Survey
Bonaparte Gulf	Darwin-Wyndham	JULY 1958

Meter	Sensitivity	Datum	Density
North American Marine	0.12665	Darwin & Wyndham P.S. M.S.L.	2.67

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics

GRAVITY SURVEY

Station	Latitude ° '	Longitude	Elevation	Observed	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction	Terrain Corr	Bouguer Anomaly.
A	14 49.3	128 23.9	0	978 379.31	978 386.07	-	-6.8	-		-6.8
B	51.3	26.7	0	374.17	387.55	-	-13.4	-		-13.4
C	53.1	27.8	0	378.78	388.89	-	-10.1	-		-10.1
D	56.0	28.2	0	382.24	391.05	-	-8.8	-		-8.8
E	59.1	30.5	0	386.12	393.36	-	-7.2	-		-7.2
F	53.3	23.5	0	377.65	389.04	-	-11.4	-		-11.4
G	54.9	23.0	0	378.91	390.23	-	-11.3	-		-11.3
H	56.1	23.8	0	379.50	391.12	-	-11.6	-		-11.6
I	57.7	24.3	0	379.83	392.32	-	-12.5	-		-12.5
J	59.2	25.7	0	384.56	393.44	-	-8.9	-		-8.9
K	15 00.5	26.8	0	386.93	394.42	-	-7.5	-		-7.5
L	02.5	26.8	0	390.37	395.92	-	-5.5	-		-5.5
M	02.7	25.4	0	386.25	396.07	-	-9.8	-		-9.8
N	00.9	23.8	0	385.71	394.72	-	-9.0	-		-9.0
O	14 58.9	21.6	0	383.45	393.22	-	-9.8	-		-9.8
P	15 11.2	07.5	8	412.26	402.48	+0.75	+10.53	-0.27		+10.3
Q	12.0	08.5	0	411.14	403.09	-	+8.0	-		+8.0
R	13.3	10.7	0	412.04	404.08	-	+8.0	-		+8.0
S	14.7	11.6	0	413.34	405.14	-	+8.2	-		+8.2
T	15.4	12.2	0	413.52	405.67	-	+7.8	-		+7.8
U	16.5	12.9	0	414.40	406.51	-	+7.9	-		+7.9
V	17.3	13.8	0	414.24	407.12	-	+7.1	-		+7.1
W	18.6	15.6	0	414.31	408.11	-	+6.2	-		+6.2

Area	Traverse	Date of Survey
Cambridge Gulf		JULY - AUGUST 1958.

Meter	Sensitivity	Datum	Density
Worden 260	0.10779	Wyndham P.S M.S.L.	2.67

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

Station	Latitude o '	Longitude o '	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction	Terrain Corr.	Bouguer Anomaly
125	14 45.2	128 22.6	-44.8	978 377.10	978 383.04	-3.04		+0.55		-8.4
126	46.6	21.7	-61.8	390.93	384.07	-4.19		+0.76		+3.4
127	48.5	20.6	-63.9	391.10	385.48	-4.33		+0.79		+2.1
128	50.0	18.4	-67.3	390.97	386.59	-4.56		+0.83		+0.6
129	51.2	16.5	-72.1	389.35	387.48	-4.89		+0.89		-2.1
130	53.4	14.8	-68.3	388.26	389.12	-4.63		+0.84		-4.6
131	55.2	12.8	-70.1	402.24	390.46	-4.75		+0.87		+7.9
132	57.2	11.0	-71.4	403.12	391.95	-4.84		+0.88		+7.2
133	59.2	09.2	-70.6	406.03	393.44	-4.78		+0.87		+8.7
134	15 00.8	08.0	-124.3	412.88	394.64	-8.42		+1.54		+11.4
135	02.0	06.7	-109.6	415.69	395.54	-7.43		+1.36		+14.1
136	04.2	06.8	-83.8	415.60	397.20	-5.68		+1.04		+13.8
137	06.0	05.7	-59.1	416.54	398.55	-4.01		+0.73		+14.7
138	09.2	06.0	-60.0	415.77	400.97	-4.07		+0.74		+11.5
139	12.5	06.2	-51.8	416.91	403.47	-3.51		+0.64		+10.6
140	14.4	05.9	-41.2	416.03	404.91	-2.79		+0.51		+8.8
141	17.0	05.9	-69.7	417.86	406.89	-4.72		+0.86		+7.1
142	20.0	05.0	-26.3	416.22	409.18	-1.78		+0.32		[illegible].6
143	22.2	05.5	-40.3	417.67	410.86	-2.73		+0.50		+4.6
144 Wyndham Jetty	24.8	06.2	-36.4	419.22	412.87	-2.47		+0.45		+4.3
145	27.0	05.8	-38.3	418.13	414.55	-2.60		+0.47		+1.5
146	14 49.5	23.4	-43.4	382.45	386.22	-2.94		+0.54		-6.2
147	53.0	23.9	-29.4	379.58	388.82	-1.99		+0.36		-10.9
148	52.0	18.9	-57.9	394.14	388.07	-3.92		+0.72		+2.9
149	53.4	20.5	-38.4	387.36	389.12	-2.60		+0.48		-3.9
150	56.0	20.1	-48.2	387.71	391.05	-3.27		+0.60		-6.0
151	59.1	21.0	-26.8	385.19	393.36	-1.82		+0.33		-9.7
152	15 10.9	07.6	-58.0	415.74	402.25	-3.93		+0.72		+10.3

Area	Traverse	Date of Survey
Cambridge Gulf		JULY - AUGUST 1958.

Meter	Sensitivity	Datum	Density
North American Marine	0.12665	Wynham P.S. M.S.L.	2.0

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

Station	Latitude o '	Elevation o '	Elevation	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction	Terrain Corr.	Bouguer Anomaly
A	14 49.3	128 23.9	0	978 379.31	978 386.07	-		-		-6.8
B	51.3	26.7	0	374.17	387.55					-13.4
C	53.1	27.8	0	378.78	388.89					-10.1
D	56.0	28.2	0	382.24	391.05					-8.8
E	59.1	30.5	0	386.12	393.36					-7.2
F	53.3	23.5	0	377.65	389.04					-11.4
G	54.9	23.0	0	378.91	390.23					-11.3
H	56.1	23.8	0	379.50	391.12					-11.6
I	57.7	24.3	0	379.83	392.32					-12.5
J	59.2	25.7	0	384.56	393.44					- 8.9
K	15 00.5	26.8	0	386.93	394.42					-7.5
L	02.5	26.8	0	390.37	395.92					-5-5
M	02.7	25.4	0	386.25	396.07					-9.8
N	00.9	23.8	0	385.71	394.72					-9.0
O	14 58.9	21.6	0	383.45	393.22					-9.8
P	15 11.2	07.5	8	412.26	402.48	+0.75		-0.20		+10.3
Q	12.0	08.5	0	411.14	403.09					+8.0
R	13.3	10.7	0	412.04	404.08					+8.0
S	14.7	11.6	0	413.34	405.14					+8.2
T	15.4	12.2	0	413.52	405.67					+7.8
U	16.5	12.9	0	414.40	406.51					+7.9
V	17.3	13.8	0	414.24	407.12					+7.1
W	18.6	15.6	0	414.31	408.11					+6.2

Area: Cambridge Gulf

Traverse:

Date of Survey: JULY - AUGUST 1958.

Meter	Sensitivity	Datum	Density
Worden 260	0.10779	Wyndham P.S. M.S.L.	2.0

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

Station	Latitude	Longitude	Depth	Observed Gravity	Normal Gravity	Free Air Correction	Free Air Anomaly	Bouguer Correction	Terrain Corr.	Bouguer Anomaly
80	12 28.5	130 50.5	30.2	978 318.61	978 289.33	-2.05	+27.23	+0.63		+27.9
81	19.5	39.5	65.2	322.22	283.67	-4.42	+34.13	+1.36		+35.5
82	25.0	16.3	79.9	331.53	287.12	-5.41	+39.00	+1.67		+40.7
83	42.5	10.0	76.3	330.81	298.25	-5.17	+27.39	+1.60		+29.0
84	13 00.0	08.4	17.0	335.98	309.63	-1.15	+25.20	+0.36		+25.6
85	07.5	129 59.5	26.1	307.16	314.58	-1.77	-9.19	+0.55		-8.6
86	34.0	48.5	24.8	317.47	322.42	-1.68	-16.73	+0.52		-16.1
86 A	34.0	47.2	46.8	318.34	332.42	-3.17	-17.25	+0.98		-16.3
86 B	34.0	45.8	57.7	319.16	332.42	-3.91	-17.17	+1.21		-16.0
86 C	33.5	44.4	64.2	320.84	332.07	-4.35	-15.58	+1.34		-14.2
86 D	33.0	43.1	63.7	321.51	331.73	-4.32	-14.54	+1.33		-13.2
86 E	33.0	41.9	63.5	318.69	331.73	-4.30	-17.34	+1.33		-16.0
86 F	33.0	40.6	66.6	315.40	331.73	-4.51	-20.84	+1.39		-19.4
86 G	33.0	39.3	75.6	312.24	331.73	-5.12	-24.61	+1.58		-23.0
86 H	33.0	38.1	79.8	309.75	331.73	-5.41	-27.39	+1.67		-25.7
87	40.5	46.5	36.4	323.28	336.88	-2.47	-16.07	+0.76		-15.3
87 A	40.4	45.5	49.3	323.96	336.81	-3.34	-16.19	+1.03		-15.2
87 B	40.3	44.4	37.7	321.88	336.74	-2.55	-17.41	+0.79		-16.6
87 C	40.2	43.3	48.3	320.48	336.67	-3.27	-19.46	+1.01		-18.4
87 D	40.1	42.3	50.1	316.41	336.60	-3.39	-23.58	+1.05		-22.5
87 E	40.0	41.3	63.6	313.48	336.53	-4.31	-27.36	+1.33		-26.0
87 F	39.9	40.2	68.0	310.48	336.46	-4.61	-30.59	+1.42		-29.2
87 G	39.8	39.2	71.9	309.59	336.39	-4.87	-31.67	+1.50		-30.2
88	47.8	47.4	9.9	328.20	341.92	-0.67	-14.39	+0.21		-14.2
88 A	47.7	46.2	31.3	326.47	341.85	-2.12	-17.50	+0.65		-16.8
88 B	47.6	44.9	37.5	321.86	341.78	-2.54	-22.46	+0.78		-21.7
88 C	47.5	43.6	42.6	318.15	341.72	-2.89	-26.46	+0.89		-25.6
88 D	47.4	42.3	48.7	316.34	341.65	-3.30	-28.61	+1.02		-27.6
88 E	47.3	40.9	55.3	315.53	341.58	-3.75	-29.80	+1.16		-28.6
88 F	47.2	39.6	63.8	315.16	341.51	-4.32	-30.67	+1.33		-29.3

Area	Traverse	Date of Survey
Bonaparte Gulf	Darwin-Wyndham	JULY 1958.

Meter	Sensitivity	Datum	Density
North American Marine	0.12665	Darwin & Wyndham P.S. M.S.L.	2.67

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

GRAVITY SURVEY

Station	Latitude	Longitude	Depth	Observed Gravity	Naomal Gravity	Free Air Correction	Free Anomaly	Bouguer Correction	Terrain Corr.	Bouguer Anomaly
88G	13 47.1	129 38.3	69.2	978 315.31	978 341.44	-4.69	-30.82	+1.45		-29.4
89	13 53.8	43.0	27.6	319.17	346.10	-1.87	-28.88	+0.58		-28.2
89A	53.7	41.6	38.4	318.44	346.03	-2.60	-30.19	+0.80		-29.4
89B	53.6	39.8	46.7	318.27	345.96	-3.16	-30.85	+0.98		-29.9
89C	53.5	38.2	45.9	318.25	345.89	-3.11	-30.75	+0.96		-29.8
89D	53.4	36.6	56.6	318.53	345.82	-3.84	-31.13	+1.18		-29.9
89E	53.3	35.0	46.2	317.83	345.75	-3.13	-31.05	+0.97		-30.1
89F	53.2	33.4	41.2	317.49	345.68	-2.79	-30.98	+0.86		-30.1
89G	53.1	31.8	63.5	318.33	345.61	-4.30	-31.58	+1.33		-30.2
89H	53.0	30.2	68.7	318.45	345.54	-4.66	-31.75	+1.44		-30.3
89I	52.9	28.6	47.3	315.25	345.48	-3.20	-33.43	+0.99		-32.4
89J	52.8	27.0	76.6	317.11	345.41	-5.19	-33.49	+1.60		-31.9
89K	52.7	25.4	80.5	317.65	345.34	-5.45	-33.14	+1.68		-31.5
89L	52.6	23.8	84.3	318.81	345.27	-5.71	-32.17	+1.76		-30.4
89M	52.5	22.2	85.8	320.20	345.20	-5.81	-30.81	+1.80		-29.0
89N	52.4	20.6	82.0	321.08	345.13	-5.56	-29.61	+1.72		-27.9
90	14 03.5	129 34.0	25.6	325.10	352.91	-1.73	-29.54	+0.54		-29.0
91	01.5	29.4	46.4	332.82	351.50	-3.14	-21.82	+0.97		-20.8
92	05.8	27.2	64.8	340.45	354.54	-4.39	-18.48	+1.36		-17.1
93	10.4	24.9	60.5	349.06	357.81	-4.10	-12.85	+1.27		-11.6
94	14.5	22.8								
95	19.2	22.8	41.9	358.92	364.10	-2.84	-8.02	+0.88		-7.1
96	24.8	21.1	24.9	364.94	368.14	-1.69	-4.89	+0.52		-4.4
97	27.8	19.9	128.7	379.71	370.31	-8.72	+0.08	+2.69		+2.8
98	29.0	18.7	87.3	384.53	371.18	-5.92	+7.43	+1.83		+9.3
99	30.5	17.5	101.9	390.17	372.27	-6.91	+10.99	+2.13		+13.1
100	31.8	16.3	91.0	392.32	373.21	-6.17	+12.94	+1.90		+14.8
101	33.2	15.1	76.4	397.80	374.24	-5.18	+18.38	+1.60		+20.0
102	34.9	13.9	66.7	397.85	375.48	-4.52	+17.85	+1.40		+19.3
103	14 36.2	129 12.7	67.6	397.96	376.43	-4.58	+16.95	+1.41		+18.4

Area	Traverse	Date of Survey
Bonaparte Gulf	Darwin-Wyndham	JULY 1958.

Meter	Sensitivity	Datum	
North American Marine	0.12665	Darwin-Wyndham P.S. M.S.L.	2.67 (Density)

PLATE I

TIMOR SEA

Clarence Strait

Beagle Gulf

Port Darwin

DARWIN (PENDULUM STN. 32)

DARWIN

KATHERINE

RAILWAY

Fog Bay

Pt Blaze

Anson Bay

C Ford

Daly R.

Hyland Bay

PORT KEATS MISSION

Joseph Bonaparte Gulf

Pearce Pt

Queens Channel

Keep Inlet

Fitzmaurice River

Forsyth Creek

Victoria River

Cambridge Gulf

WYNDHAM (PENDULUM STN. 30)

Ord River

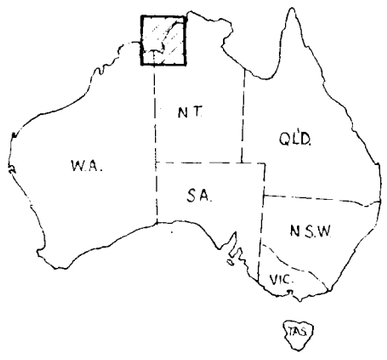
King River

WESTERN AUSTRALIA

NORTHERN TERRITORY

12°00'
14°00'
16°00'
127°50'
128°00'
129°00'
130°00'
131°00'
131°15'

LOCATION



REGIONAL (UNDERWATER) GRAVITY SURVEY (1958)

DARWIN — WYNDHAM, N.T., W.A.

LOCATION OF GRAVITY STATIONS

10 0 10 20 30 40

SCALE IN MILES

MAP DATA

MAP BASED ON ADMIRALTY CHART N°1047
AT THE MEAN SCALE 1:1,000,000
MERCATOR PROJECTION

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics

G 192-28

To Accompany Records 1959, No. 156