UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

A GRAVITY AND AEROMAGNETIC SURVEY OF THE MID-TERTIARY SEDIMENTARY BASIN ON THE SOUTH COAST OF PUERTO RICO

By

Andrew Griscom and William L. Rambo

Prepared in cooperation with the

Commonwealth of Puerto Rico

Open-file report

1970

70-144

This report is preliminary
and has not been edited or
reviewed for conformity with
Geological Survey standards

Contents

Illustrations

Tables

Introduction

During the period November 18, 1963 to December 3, 1963 the U.S. Geological Survey in cooperation with the Commonwealth of Puerto Rico performed a gravity survey of the Tertiary sedimentary basin which is located along the south coast of Puerto Rico in the vicinity of Ponce. The project was initiated at the request of Mr. Carlos Vincenty, Director, Department of Industrial Research, Economic Development Administration of the Commonwealth of Puerto Rico. The purpose of the survey was to obtain information on the configuration and structure of the basin and, if possible, to locate areas which might be favorable for the accumulation of oil or gas. The accompanying index map (fig. 1) shows the survey area together with the outline of the border of the basin.

Acknowledgments

We wish to thank Mr. Carlos Vincenty, Director, Industrial Research, Economic Development Administration, for his advice and assistance concerning the field operations of the project. Several geologists of the U.S. Geological Survey, in particular Mr. Watson H. Monroe and Mr. Peter H. Mattson, gave generously of their time and knowledge of the area. Other members of the geophysical field party were Messrs. Gordon E. Andreasen, Jack L. Meuschke, James A. Pitkin, and Peter Popenoe. Mr. Randolph W. Bromery, accompanied by the senior author, during November and December of 1962, established the gravity bases at San Juan and Ponce, and tied them to Washington, D.C. The two gravity stations on Isla Caja de Muertos were established at this time.

Previous geophysical work

Previous gravity data in the project area are provided by the U.S. Coast and Geodetic Survey 1929 pendulum base at Ponce and the gravity reconnaissance survey of Shurbet and Ewing (1956). The data of Shurbet and Ewing (1956) include 48 stations within the area of this project and an additional 25 stations from outside the project area which assisted the contouring of the present survey.

From October 1947 until June 1948 United Geophysical Company, Inc., Pasadena, California, conducted a reflection seismograph survey of the south coast Tertiary sedimentary basin, not only on land but also offshore. The survey was contracted by the Puerto Rico Industrial Development Company and the results are contained in a report by W. H. Denning 1948) of United Geophysical Company. In 1958 the Maritime Oil Company of Houston, Texas, engaged C. J. Donnally of the Donnally Geophysical Company to review the records of the reflection seismograph survey. The reinterpretation is described in a report by Donnally (1958) and an additional geologic report was written at this time by R. E. Ming (1958), geologist for the Maritime Oil Company.

All of the above-mentioned reports are available for public inspection in the office of the Department of Industrial Research of the Economic Development Administration.

An aeromagnetic survey of the Ponce area was flown in 1957 by Canadian Aero Service, Ltd., Ottawa, Canada, for A. D. Fraser, Rio Piedras, Puerto Rico. The mean terrain clearance was 500 feet and the flight spacing varied from 1 to ½ mile. The map area is essentially that of the Ponce quadrangle but extends an additional 5 km to the west and to the north of the quadrangle as shown in figure 29.

During 1960 under an arrangement with the Maritime Oil Company three test wells were drilled by the Kewanee Interamerican Oil Company in the south coast Tertiary sedimentary basin. Each well penetrated volcanic rocks beneath the unconformity which is found at the base of the Oligo-Miocene sedimentary rocks. Although no oil or gas was encountered, the wells provide valuable control for the geophysical data.

In November and December 1961, the U.S. Geological Survey obtained east-west aeromagnetic profiles over the land portion of the project area at a one-mile flight spacing and a flight elevation of 500 feet above the ground. Those data are presented later in this report. In July 1962, the U.S. Naval Oceanographic Office obtained a few widely spaced aeromagnetic profiles over the offshore portion of the project area at a flight elevation of 1,000 feet. These profiles are part of a larger survey flown by the Project MAGNET aircraft to provide data requested by the National Academy of Sciences in connection with project MOHOLE.

Instruments

Two gravimeters were used in this survey, each meter being used to measure approximately half of the 665 gravity stations. A LaCoste and Romberg Model G gravimeter with a dial constant of 1.0445 mgal per dial division provided the necessary control for the base stations and a Worden gravity meter with a dial constant of 0.53875 mgal per dial division made it possible to survey rapidly the closely-spaced stations along road profiles. After tidal corrections, the drift of the Worden meter was very linear at the rate of about 0.5 mgal per day and observed gravity readings were accurate to ±0.1 mgal. The observed gravity readings of the LaCoste and Romberg meter after tidal corrections were accurate to within ±0.05 mgal except on one day when a tare or step in the drift curve introduced an uncertainty of ±0.1 mgal in about 25 stations.

Survey Procedure and Control

Base stations were occupied in the morning and in the evening as a check on instrument drift. Early in the survey intermediate bases were also occupied during the day but it was soon demonstrated that when tidal corrections were applied to the data both meters displayed a very linear drift so that the practice was not rigorously followed. The reoccupation of about 25 stations served as a check on the quality of the data and confirm the conclusions of the previous section concerning accuracy. It appears likely that the rather small daily temperature changes to which the meters were exposed contributed to the excellent performance. Approximately 665 gravity stations were occupied in an area of 1600 km^2.

In order to maintain accurate known elevations, stations were located at bench marks, sea level, spot elevations such as road junctions, or along road profiles where elevations were surveyed with a transit. The spot elevations and the surveyed elevations are the least accurate and may be in error by as much as ±0.6 m which represents an uncertainty of ±0.1 mgal in the Bouguer anomaly.

The gravity stations were located to within ±0.01' of latitude on the U.S.G.S. 1:20,000 quadrangle maps. This latitude uncertainty introduces an insignificant error of approximately ±0.01 mgal in the Bouguer anomalies.

All of the gravity stations are tied to the project base at the Ponce Intercontinental Hotel parking lot in the north corner which is most distant from the hotel or to the U.S.C.and G.S. Ponce pendulum base described below. These bases were tied to the U.S.C. and G.S. pendulum base in the House of Representatives at San Juan and the San Juan base was in turn tied to the outside gravity bench at the Department of Commerce Building in Washington, D.C. The observed gravity values for the more important bases are tabulated below in gal; the additional figure on the Puerto Rico bases requires the assumption of a value of 980.11820 for the Commerce Building base:

Ponce Intercontinental Hotel	978.60934
U.S.C.&G.S. Ponce pendulum base	978.62784
House of Representatives, San Juan	978.67552
Commerce Bldg., Washington, D.C., outside gravity bench (Behrendt and Woollard, 1961)	980.1182

It was not possible to reoccupy exactly the U.S.C. and G.S. Ponce pendulum base. The location finally used was on the curb at the southeast corner of the junction between Martin Corchado and Capitan Correa (formerly Munoz Rivera) Streets.

In order to make use of certain gravity stations from the survey of Shurbet and Ewing (1956) the observed gravity values of 31 duplicated stations in the Ponce area were compared. The values measured by the Lamont group are an average of 3.6 mgal higher than the values in this report. The Lamont group's value for the Ponce pendulum base is also higher by 3.6 mgal. As a further check, the complete Bouguer anomaly values from each duplicated station were compared. In this case the Lamont group's values are an average of only 1.6 mgal higher than the station values in this report. There thus appears to be a consistent difference of 2.0 mgal between the terrain correction values used by the Lamont group and those determined for this report. The difference is unexpected because the method of calculation and the assigned density are believed to be the same in each case. At any rate all the complete Bouguer anomalies (modified Bouguer anomalies of Shurbet and Ewing, 1956) borrowed from the Lamont group survey were reduced arbitrarily by 2 mgal (1.6 mgal rounded) in order that they would better approximate the datum level of this report.

Gravity Data Reduction

The simple Bouguer anomalies were calculated by means of a computer program which (after removal of drift and tide correction) applied to the meter reading the meter scale factor, the latitude correction taken from the International Gravity Formula of 1930, and the elevation correction. Densities of 2.67 and 2.27 were used to compute the Bouguer correction. Because in general the stations at higher elevations are on rocks approximating a density of 2.67 (Bromery and Griscom, 1964), this density was adopted for the contour maps and profiles. The lower density value is believed to approximate the density of the Tertiary rocks. The maximum difference between the two Bouguer anomalies over areas of low density Tertiary sediments is 3.15 mgal at station 1034 because of its unusually large elevation (118 m.). The difference between the anomalies for stations on the Tertiary sediments is usually less than 0.5 mgal.

Terrain corrections were applied to all stations by means of the Bullard modification of the Hayford-Bowie method (Swick, 1942) out to a distance of 166.7 km (zone O). It was found possible to prepare contour maps of the terrain corrections for zones J through L and a combined map for zones M, N, and O. In addition up to three separate contour maps were prepared for the changes in each zone's terrain correction with station elevation. Thus by a series of double interpolations it was possible to obtain accurate and mutually consistent values for the gravitational effects of the topography of zones J through O and simultaneously to save a considerable amount of time. The land and near-shore ocean bottom topography was obtained from U.S. Geological Survey topographic maps at scale of 1:20,000, 1:120,000, and 1:240,000. The elevations of oceanic terrain compartments were determined from the U.S. Coast & Geodetic Survey chart 920 and U.S. Naval Oceanographic Office charts 0703N and 0704N. A correction for curvature of the earth was also subtracted from the station values. The range of the complete terrain corrections is from 8 to 12 mgals, most of which is caused by zones from J through O.

Earth tide corrections, amounting to a maximum of 0.3 mgal, have also been applied to all gravity stations. These corrections were obtained from the tabulated values for 1963 published in Geophysical Prospecting, vol. X, Suppl. No. 1, December 1962.

The major sources of inaccuracies are caused by instrument reading errors and drift uncertainties in the observed gravity. It is estimated that the complete Bouguer anomalies are accurate to within about ±0.5 mgal, assuming that the charts of the ocean bottom are reasonably accurate. However, the relative accuracy between nearby stations is much better because of the procedure described above. The smoothness of the detailed gravity profiles is evidence that the relative accuracy of the anomalies is approximately ±0.1 mgal. Hence the features on the gravity map only reflect subsurface mass distributions.

Data Presentation

The accompanying tabulation of print-out results from the U.S. Geological Survey computer lists the principal facts for the gravity stations together with an explanation of each column of the table. The complete Bouguer anomalies for each station were plotted on stable transparent base maps at a scale of 1:20,000 and contoured. Copies of each contoured quadrangle (figures 2 to 13) accompany this report. In addition, each contoured quadrangle was photo-reduced to a scale of 1:60,000 and mosaiced together to fit another base map (figure 14).

After contouring the 1:20,000 quadrangles, the various detailed gravity profiles along roads were plotted (figures 15 to 21) and three profiles across critical portions of the gravity map were selected for detailed computation and analysis (figures 22 to 24). Discussion of these profiles is deferred to a subsequent section of this report.

General Geology

Structurally Puerto Rico forms a broad anticlinorium, the axis of which trends roughly east-west. The project area is on the south flank of this structure. Here an older basement complex of serpentinite and related rocks is overlain by a sequence of interbedded volcanic and sedimentary rocks ranging in age from late Cretaceous to middle Eocene. These rocks are moderately to intensely folded and are cut by numerous normal, transcurrent, and thrust faults (Glover and Mattson, 1960). Locally intruding these rocks in the project area are plutonic igneous rocks ranging in composition from diorite to granodiorite. Unconformably overlying all these rocks are the Oligocene and Miocene rocks of the south coast Tertiary sedimentary basin, the prime concern of this report. All rocks older than the Tertiary sedimentary rocks of the south coast sedimentary basin will be termed basement in this report, although many of these older rocks are sedimentary, rather than igneous or metamorphic. The individual rock units are described in greater detail below.

The oldest known rocks in Puerto Rico are those of the Bermeja Complex of Mattson (1960) which in the project area is almost entirely composed of serpentine together with minor chert and altered mafic igneous rocks. This rock unit forms the cores of anticlines in southwestern Puerto Rico and is unconformably overlain by rocks of Upper Cretaceous (Campanian) age (Pessagno, 1960b). The complex has importance here because gravity surveys in the Mayaguez area of southwestern Puerto Rico (Bromery and Griscom, 1964) have shown that gravity lows ranging in amplitude up to 10 mgal are associated with the serpentinite masses in the anticline cores. A belt of these rocks is found in the northwest corner (Briggs, 1964) of the project area extending southeast from the mountains north of Sabana Grande toward Palomas beneath the basin sediments. A second isolated exposure of the serpentinite (Grossman, 1963) is in the eastern portion of the anticlinal area 1 km west of Central San Francisco where pre-Tertiary rocks are found surrounded by the Oligocene and Miocene sedimentary rocks. The majority of the basement rocks are interbedded volcanic and sedimentary rocks containing a few small masses of intrusive rocks. In the north-eastern portion of the project area these Cretaceous and Eocene rocks are described as follows by Glover (written communication, 1965): "about 90 percent are marine pyroclastic and reworked marine pyroclastic rocks, and 10 percent are subaqueous lavas and limestones." The rocks at the extreme western border of the project area are tuffaceous mudstone and sandstone, limestone, pyroclastic rocks, and both andesitic and basaltic lava flows (Mattson, 1960), the units having an aggregate thickness of at least 4000 meters.

The geology of the sediments and sedimentary rocks of the south coastal plain has been described by Zapp, Bergquist, and Thomas, 1948. More recent information for portions of the area is found in Grossman (1962, 1963), Slodowski (1956), Pessagno (1960a), and unpublished maps of the Rio Descalabrado and Santa Isabel quadrangles by Glover and Mattson and of the Playa de Ponce quadrangle by Glover, Pease and Arnow. Recent unpublished geologic mapping by W. H. Monroe (written communications, 1969 and 1970) indicates that substantial revision is needed in the geology of the middle Tertiary rocks as described by Zapp, Bergquist and Thomas (1948).

The older of the two named rock units, the Juana Diaz Formation, ranges in age from lower Oligocene (Seiglie and Bermudez, 1969; Ruth Todd, unpublished data) through middle Oligocene (Grossman, 1962) and perhaps into the Miocene, depending on the definition of the formation (Monroe, written communication, 1970). The lithology is primarily clastic: sandstone, conglomerate, mudstone, and shale. Thicknesses range from only a few meters to a local maximum of at least 1300 m. at or north of Palomas near Youco (Grossman, 1962) and locally the formation is missing. Initial dip of the conglomerates may cause overestimates of thickness (Glover, written communication, 1965). The log of test well No. 3CPR (table 3) indicates a thickness of about 344 m. of Juana Diaz Formation.

The younger of the Tertiary units is the Ponce Limestone, buff-colored reef limestone and chalk, ranging in age from upper Oligocene to Miocene. The lower portion of the unit may intertongue with part of the Juana Diaz Formation (Monroe, written communication, 1970). Because of faulting, thickness estimates from geologic mapping are uncertain but test wells No. 2CPR (table 2) and No. 3CPR (table 3) indicate that the thickness can locally exceed 260 m.

A considerable thickness of alluvial deposits conceals the Tertiary rocks and their contacts throughout much of the coastal plain east of Ponce where the topographic expression of the Tertiary rocks is relatively low compared to the area west of Ponce. Well data indicate that the thickness of the alluvium locally exceeds 150 m and may in fact be considerably thicker.

Subsurface stratigraphic information for the coastal plain sediments and sedimentary rocks is provided by the logs of the three test wells (tables 1 to 3) drilled by the Kewanee Interamerican Oil Company. The lithologic logs were made by Thomas N. Ambrose, geologist at the drilling sites, and subsequently a paleontological study of the well samples was made by W. Anthony Gordon of Oberlin College. The two sets of data are not always in agreement and some interpretation is necessary.

The structure of the Oligocene and Miocene rocks of the south coastal plain is indicated in figure 26 which is based primarily on unpublished maps by Glover and Mattson east of lat 66°30'W and on unpublished mapping by W. H. Monroe (written communications, 1969 and 1970) west of lat 66°30'W, but also on local mapping by Grossman (1962, 1963). The sediments in general form a south-dipping homocline with dips of 10-30° at the north side of the belt, diminishing to dips of 4-6° at the coast west of Guayanilla. Recent geologic mapping by Monroe indicates that west of Ponce block faulting is very abundant and that the north contact with the basement rocks is generally a fault. Closure on the syncline northwest of Juana Diaz is about 225 m (Zapp, and others, 1948). The fault trending east-west between Guanica and Guayanilla Bay has a dip slip which "is at least several hundred feet and could be as much as a few thousand feet" (Grossman, 1963).

Table 1

Generalized log of test well No. 1CPR

The below data are by T. N. Ambrose. No detailed paleontological data are presently available.

Geologic unit	Depth (feet)	Thickness (feet)	Thickness (meters)
Alluvium (certain fossils suggest most of this may be Tertiary)	0-2995	2995	913
Oligocene and Miocene sedimentary rocks	2995-4270	1275	389
Lower Tertiary or Upper Cretaceous volcanic rocks	4270-7480	3210	979

Table 2

Generalized logs of test well No. 2CPR

Geologic log (T. N. Ambrose)

Geologic unit	Depth (feet)	Thickness (feet)	Thickness (meters)
Alluvium	0-2875	2875	877
Ponce Limestone	2875-3760	885	270
Shale (Cretaceous ?)	3760-4060	300	91
Lower Tertiary or Upper Cretaceous volcanic rocks	4060-4919	859	262

Paleontologic interpretation (W. A. Gordon)

Geologic unit	Depth (feet)	Thickness (feet)	Thickness (meters)
Quaternary	0-500+	>500	>152
Ponce Limestone (upper member)	above 590 to above 740	~150	~46
Ponce Limestone (lower member)	above 740 to above 2890	~2150	~656
Juana Diaz Formation (shale)	above 2890 to above 3790	~900	~274
Pre-Oligocene rocks	above 3790 to 4919	~1129	~344

Table 3

Generalized log of test well No. 3CPR

This log was interpreted by T. N. Ambrose using paleontological data provided by W. A. Gordon

Geologic unit	Depth (feet)	Thickness (feet)	Thickness (meters)
Beach sand	0-80	80	24
Gravel and sand (Quaternary alluvium)	80-110	30	9
Silty limestone (Probably late Tertiary)	110-550	440	134
Reef(?) limestone (calcarenite)	550-860	310	94
Ponce Limestone-upper member	860-1370	510	155
Ponce Limestone-lower member	1370-1720	350	107
Juana Diaz Formation-shales, (the paleontologic contact between the Ponce Limestone and Juana Diaz Formation is in the range 2000-2200 feet)	1720-2848	1128	344
UNCONFORMITY -			
Lower Tertiary or Upper Cretaceous volcanic rocks	2848-4141	1293	394

The geology of Isla Caja de Muertos provides valuable information on the structure of the southernmost portion of the coastal plain. The Provisional Geologic Map of Puerto Rico shows the geology of the island as a central area of basement rocks in fault contact to the north and sedimentary contact to the south with two masses of younger sedimentary rocks "probably equivalent to the Ponce Limestone" (Briggs, 1964). The basement rocks (Glover, written communication, 1965) are "tuffs, tuffaceous plankton-bearing mudstone, and minor intercalations of intraformational conglomerate" and are believed to correlate with basement rocks in the Rio Descalabrado quadrangle. The younger sedimentary rock from the south end of the island is described as follows (U.S. Geological Survey, 1964): "Conglomerate on Isla Caja de Muertos... collected by P. H. Matson contains Eocene larger Foraminifera in pebbles and Oligocene large Foraminifera in the matrix, according to K. N. Sachs, Jr. The conglomerate is probably correlative with some of the Oligocene strata in the coastal plain of southern Puerto Rico. It dips about 35°SE and is overlain unconformably by subhorizontal limestone also believed to be equivalent to a part of the Oligocene and Miocene coastal-plain sequence. This relation indicates that deformation occurred in this area in Oligocene or possibly Miocene time."

Gravity map

The complete Bouguer anomaly map of the project area is shown in Figure 14. This map is superimposed on a base which is the U.S. Geological Survey 1:120,000 map of Puerto Rico enlarged to a scale of 1:60,000. The complete Bouguer gravity anomaly values for the individual stations are shown on the 1:20,000 maps but are omitted from the 1:60,000 map, although the station locations are indicated.

The Bouguer anomaly values range from a low of 82.8 mgals on Cayos Frios at the center of the project area in the Playa de Ponce quadrangle to a high of 137 mgals (Lamont Group station) in the Coamo quadrangle at the northeast corner of the project area. In detail the gravity map is complex but in general the gravity field slopes downward from north to south across the map and then rises again a few milligals on Isla Caja de Muertos at the extreme south edge of the project area. This regional slope southward is caused by a combination of two effects: the increase in thickness of the low density Oligo-Miocene sediments to the south; and a regional gradient resulting from a broad gravity high over the central portion of Puerto Rico, as shown in figure 25, reproduced from Shurbet and Ewing (1956). This gravity map of Puerto Rico (figure 25) also shows the south coast gravity low caused by the low density Oligo-Miocene sediments.

The 1:60,000 gravity map of the Ponce area is (fig. 14) contoured at a 1 mgal contour interval to take advantage of the abundant gravity data along the shore and the detailed north-south traverses. Nevertheless it must be recognized that in certain portions of the area the station density is insufficient to define accurately the location of the 1 mgal contours. When using this gravity map for detailed local interpretations, the available local gravity control for the contours must be considered carefully.

Gravity Interpretation

There are three general classes of rock density variations which may cause the gravity anomalies of Figure 14. The first of these classes is variation in density of the basement rocks. Examination of the gravity field along the northern third of Figure 14 discloses several local gravity features associated with basement rocks. Examples of such features are: the gravity high near Lago Coamo in the southeast corner of the Rio Descalabrado quadrangle, the gravity high at Lago Numero Dos in the center of the Ponce quadrangle, and the gravity high at Penuelas in the Penuelas quadrangle. Another such feature is the gravity low 2 km west of Yauco in the northwest corner of figure 14 associated with the northwest-trending anticlinal mass of serpentinite previously mentioned. This gravity low extends southeast into the area of Oligo-Miocene sediments, and as described in the subsequent discussion on calculated profile I-I' (Figure 22), an attempt has been made to subtract this basement anomaly in order to isolate the gravity effect of the Oligo-Miocene sediments. The gravity high at Lago Coamo has an appreciable effect upon the gravity contours near the north edge of the Tertiary sedimentary basin in this area but this is the only other clearly identifiable gravity anomaly associated with basement rocks. In the subsequent discussion of the gravity anomalies over the Oligo-Miocene sediments, it has been assumed that the anomalies are not caused by density variations within the basement rocks. If this assumption is incorrect, large errors may exist in the interpretation.

The second class of rock density variations is the contrast between the density of the sediments and sedimentary rocks of the coastal plain and the density of the basement rocks. This density contrast is relatively large and, in the belief of the senior author, is the major cause of the variation in gravity anomalies over the coastal plain.

The third class of possible rock density variations occurs within the coastal plain sediments and sedimentary rocks. Such density variations may be both vertical and lateral. The major evidence for such variations is provided by the three test wells (see tables 1, 2, and 3) and to some extent the seismic data, (fig. 27 and 28) if the reflecting horizons indicate a density change. Test well 1CPR indicates 2995 feet of alluvium and 1275 feet of Middle Tertiary sedimentary rocks. Test well 2CPR indicates either 500 feet or 2875 feet of alluvium and, respectively, 3200 feet or 885 feet of Middle Tertiary sedimentary rocks, depending on which interpretation is favored. Test well 3CPR indicates 110 feet of unconsolidated sediments, 750 feet of limestone of uncertain age, and 1988 feet of Middle Tertiary sedimentary rocks.

The data from the wells show that a substantial thickness of alluvial deposits may overlie the Middle Tertiary sedimentary rocks in some areas, especially to the east of long 66°30'W. In addition the data from test well 3CPR can be interpreted to indicate that reef limestones may have been deposited contemporaneously with the alluvial material but to the south ~~of it~~ at or near the former shoreline. If this is true, there may be lateral density variations within the sediments and sedimentary rocks overlying the Middle Tertiary rocks, the higher density material being reef or other marine limestones located to the south of the alluvial sediments. The subsequent discussions will explain why the writers believe that the effects of possible vertical and lateral density changes on the local gravity field are quantitatively less important than the effect of the density contrast between basement rock and the overlying basin deposits.

Information on basement rock densities from southwest Puerto Rico is found in Bromery and Griscom (1964), where an average density of 2.70 g/cm^3 was determined from 29 samples of volcanic and sedimentary rocks. Densities ranged in value from 1.70 to 2.98 and 19 of these values were within the range 2.60 to 2.80. An average density of 2.55 g/cm^3 was also determined from approximately 160 samples of serpentinite. Long detailed gravity profiles in north-central and southwestern Puerto Rico, having a station spacing of about 600 feet across areas of basement rocks other than granitic plutons, are very smooth and show anomalies of only a few mgal. Such results suggest that the average bulk densities of these older volcanic and sedimentary rock units are relatively constant, or vary slowly over large distances.

The density of the Middle Tertiary calcareous rocks is uncertain because of several factors: surface samples are unreliable due to weathering and "case-hardening" by filling of pore-spaces with calcite; fresh quarried samples are often sufficiently unconsolidated that they can be excavated by power shovel; the rocks at greater depth are subject to incipient dolomitization and recrystallization which may increase their density relative to near-surface samples. Six samples from a rather typical Middle Tertiary calcarenite on the north coast (Briggs, 1961) at a depth of approximately 3700 feet ranged in density from 2.20-2.59 and had an average density of 2.40. The material logged as alluvium in wells 1CPR and 2CPR is probably somewhat lower in density than the Middle Tertiary limestones because of increased porosity but the average density is very uncertain. Measurements of densities of well cuttings from the three south coast test wells have not yet been made but will not provide very useful density data with which to interpret the gravity map. Cuttings from relatively porous sedimentary rocks give densities substantially higher than in situ average densities. Cuttings from alluvial material, especially gravels, give densities which have little meaning relative to average alluvium density. Well-logging by various geophysical techniques will ultimately provide the best density information.

In this study, because of the uncertainty concerning rock densities, it seemed best to calculate the average density contrast between the coastal plain rocks and the basement by using the known depth to basement together with the known gravity in the vicinity of the test wells. The calculated density contrast is 0.4 g/cm^3 (0.425 for profile III, figure 24) which means that the average density of the coastal plain rocks is approximately 2.30 g/cm^3, assuming an average density of 2.70 g/cm^3 for the basement rocks. This calculated density contrast is subject to some uncertainty because a regional gradient must first be deduced and subtracted from the gravity data before proceeding with the calculations. The gravity data indicate further that the regional gradient is curved in the eastern portion of the project area, but is probably nearly linear in the western portion. The deduced regional gradients shown on calculated profiles I-I', II-II', and III-III' (Figures 22, 23, and 24) are progressively more uncertain to the south as the distance increases from the exposed basement rocks but the exposed basement on Isla Caja de Muertos provides valuable control.

The average density of 2.3 g/cm^3 calculated for the Tertiary and Quaternary sediments and sedimentary rocks of the coastal plain is reasonable. The near-surface semi-consolidated alluvial deposits when water-saturated may have an average density of less than 2.0 g/cm^3 but some of the more massive limestones in the Ponce Limestone probably have densities in excess of 2.5 g/cm^3 and certain shales of the Juana Diaz Formation when water-saturated may well have densities greater than 2.4 g/cm^3. It seems possible that the Middle Tertiary sedimentary rocks may have an average density as high as 2.40 g/cm^3, in which case the overlying younger material could have an average density as low as 2.25 g/cm^3 in the vicinity of profile III-III' (fig. 24). However, the calculation for probile II-II' (fig. 23) passes through test well 3CPR which penetrated a relatively small thickness of unconsolidated material compared with the relatively large thickness of limestone and shale. Yet for this profile the calculated density contrast is also 0.4 g/cm^3 so that the density of the Tertiary rocks is here probably 2.30 g/cm^3.. The evidence thus favors the interpretation already mentioned, namely that density variations within the Quaternary and Tertiary section are relatively small compared with the density contrast between these rocks and the basement.

From the preceding discussion it can be seen that in this report a gravity high will be interpreted as a local area where the coastal plain rocks are relatively thinner than in adjacent areas and conversely that a gravity low represents a local area where the coastal plain rocks are thicker than in adjacent areas. A steep gravity gradient is interpreted as the location of a zone of rapid thickening of the sedimentary rocks, caused either by deposition against a steep slope or by folding and/or faulting. If the gravity gradient is particularly steep and also linear, it is deduced to be the expression of a fault which offsets the basement-sediment interface. As shown in Figures 22, 23, and 24, it may be possible to calculate the approximate dip of the fault surfaces from the gravity gradients.

Discussion of the Gravity Map and Profiles

In order to obtain a better understanding of the gravity map, three gravity profiles were constructed across suitable portions of the map, and the two-dimensional geologic configuration of the basement surface necessary to produce the observed gravity anomalies was calculated using the iterative computer program developed by M. H. P. Bott. The profiles were constructed approximately normal to the gravity contours and located to pass close to the test wells and inliers of basement rocks in order to provide adequate control for the calculation.

The calculated configuration of the basement surface is a considerable oversimplification of the actual configuration for several reasons. Local minor relief of the basement surface cannot be detected by the method used. Some of the steeply dipping basement-sediment interfaces may in detail be a series of step faults or a combination of faulting and folding. The assumed density distribution is considerably oversimplified and the deduced regional gradients are subject to increasing uncertainty toward the southern end of the profiles. Lastly, the assumption of two-dimensionality is not strictly valid because the anomaly patterns are not entirely linear normal to the profiles. As previously mentioned, it is because of these various uncertainties that no attempts have been made at more refined calculations using threedimensional assumptions. Nevertheless the writers believe that the three calculated profiles (Figures 22, 23, and 24) represent a reasonable, although generalized, approximation of the basement configuration.

Calculated profile I-I' (Figure 22) is located at the west end of the gravity map (Figure 14). This profile passes very close to an inlier of basement rocks which here are serpentinite (Grossman, 1963). The inlier confirms the deduced linear extension to the southeast of the bordering serpentinite mass under the sediments of the coastal plain. This deduction is made on the geologic evidence. The gravity low associated with this serpentinite is thus superimposed upon the gravity field of the coastal plain sediments. An asymmetric gravity minimum of 7.5 mgal is assumed to represent the gravity effect of the serpentinite mass, by analogy with the observed gravity effect on parallel profiles across the mass northwest of the coastal plain sediments, and the minimum has been subtracted from the initial residual gravity profile to give a resulting curve, the residual gravity without the effect of the serpentinite mass. This final profile is assumed to represent only the gravity effect of the coastal plain sediments.

The calculated basement configuration indicates a maximum thickness of about 1250 feet for the sediments of the coastal plain north of the inlier. In this same general area geologic mapping (Grossman, 1962) indicates that the total thickness of sediments may be about 4000 feet. Possible sources of error in the gravity calculation are overestimation of the gravity anomaly caused by the serpentinite and an assumed density contrast (0.4 g/cc^3) which may be too large in this area because the sediments are primarily the Juana Diaz Formation. Nevertheless it is difficult here to reconcile the gravity data with the geologic estimate of sediment thickness. Two inflection points on the profile, respectively 0.5 and 2.0 km north of the inlier, may represent normal faults downdropped on the north side. The first fault probably corresponds with the fault mapped by Grossman (1963) bounding the north side of the inlier. Judging by the gravity data, the throw on these faults can hardly exceed a few hundred feet. Another inflection on the profile is located about 3 km south of the inlier and may represent a small fold but the gravity control is not sufficiently complete in this area (Figure 14 and 22).

Calculated profile II-II' (Figure 23) passes near test well 3CPR in the center of the project area thus providing an opportunity to calculate the regional gradient north of the well. South of the test well the regional gradient must level off somewhere in the southern portion of the project area (Figure 14) because oceanic depths are found only a few km beyond the south end of the profile and here the Bouguer gravity values are rising towards typical oceanic values of about 300 mgal. In addition the regional gradient must level off because basement rocks are exposed on Isla Caja de Muertos. When the regional gradient is assumed to be horizontal, as shown, the calculated gravity profile indicates that basement rocks approach the surface at the south end.

The gravity calculation of profile II-II' indicates that test well 3CPR was drilled on a basement uplift which may be faulted on the south side, judging by the steepness here of the gravity gradient. Basement depth south of this fault is probably a maximum for the project area, reaching depths of at least 6500 feet below sea level. The area of maximum depth lies south of the shoreline where no gravity data are available. The data on Isla Caja de Muertos when projected on to profile II-II' suggest that basement depths between the island and the Puerto Rico south coastline are unlikely to exceed 8000 feet because of the relatively high gravity values on the island, coupled with the basement outcrop.

North of test well 3CPR a small basement depression 4 km east of Playa de Ponce is calculated on profile II-II' to have a maximum depth in excess of 5000 feet. This basin is likely to be somewhat deeper than calculated because it is not truly two-dimensional in plan.

The final calculated profile (Figure 24) is along section III-III' which trends approximately N17E through the delta of Rio Descalabrado (Figure 14). The offshore portion of this profile is rather uncertain because the gravity contours have been inferred from the shore data and the gravity stations on Cayo Berberia. Nevertheless a northwest-trending basement ridge is probably present about 3 km offshore. The southwest margin of this ridge is located at Cayo Berberia where the usually steep gravity gradient suggests a possible fault with the down-thrown side on the southwest (Figure 24). This fault may connect with the similar fault on profile II-II'. The maximum offshore depth to basement is unlikely to exceed 7000 feet on this profile, again using the data on Isla Caja de Muertos as a guide.

Profile III-III' passes between test wells 1CPR and 2CPR and the location of both wells relative to the associated gravity minimum suggests the measured basement depths are maximum for this part of the project area. Accordingly a mean basement depth of 4000 feet was adopted for the calculated profile although a greater depth is possible. The gravity minimum indicates the presence of a small elongate basement depression in this area, again somewhat analogous to the depression on profile II-II'. However, the northeast margin of this basin is marked by a pronounced steep linear gravity gradient, indicating a steeply sloping basement-sediment interface which is presumably a fault. The seismic data (Figures 27 and 28) confirm the existence of this fault.

In addition to the calculated profiles, a series of 13 gravity profiles (Figures 15 to 21) have been constructed from the gravity data collected along the detailed north-south road profiles. These profiles can be used to obtain a better understanding of the gravity map and as a means to obtaining an appreciation of how smoothly the gravity field varies in this area. The smoothness of the profiles suggests that near-surface lateral density variations are in general not present which in turn may imply that near-surface structure has no major faults or folds.

After studying the calculated profiles, it becomes possible to evaluate better the contoured gravity map (Figure 14) of the project area. The results of this evaluation, together with the basement depths from the test wells and calculated profiles, are plotted on the geologic interpretation map (Figure 26). The steep gravity gradients, especially in the eastern third of the project area, are extremely linear and mark the location of a major fault bounding the northeast margin of the Tertiary sedimentary basin. The fault zone appears to be interrupted by a basement feature north of Santa Isabel. This fault parallels a system of major faults of early Tertiary age (Glover and Mattson, 1960; Briggs, 1964) cutting exposed basement rocks along the northeast boundary of the project area and indicates that portions of the fault system were active subsequent to the development of the unconformity between the Eocene volcanic rocks and the Oligocene sediments of the Juana Diaz Formation.

A northeast-trending fault is interpreted to be located near the shore of Bahia de Guayanilla in the western portion of the project area. This fault appears to be the eastern extension of the fault mapped by Grossman (1963) on the north side of the serpentinite inlier and has the same sense of movement, i.e. down on the north side.

The gravity contour map indicates a rather curvilinear pattern of gravity highs and lows which are shown as interpreted basement ridges and troughs on the geologic interpretation map. Trend directions vary from northwest through east-west to southwest. Although these features are shown on the map as ridges and troughs, it is possible that they are associated on one or both sides with faults.

The folds clearly established by geologic mapping are shown on figure 26 and are the syncline at Juana Diaz, the anticline located about 1 km south of the town, the anticline southwest of Penuelas, and the folds west of Central San Francisco. The gravity expression of the features near Juana Diaz is small, amounting to 1 or 2 mgal, but can nevertheless be clearly seen on the gravity map and on profile K-K' (Figure 19).

Although the above-mentioned major gravity features are linear, they clearly vary considerably in amplitude along their trends so that the deepest or shallowest portions of each feature occur in relatively restricted areas. This conclusion is a result of the pattern of somewhat isolated and relatively equidimensional gravity highs and lows. From east to west the following major local gravity highs and lows are evident: a high 2 km south of Santa Isabel, a low at Playa Cortada, a high 2 km west of Pastillo, a low 5 km east of Playa de Ponce, a broad high about 7 km west of Ponce, a low 3 km south of Guayanilla, and a high associated with the basement inliers about 3 km west of Central San Francisco. The gravity highs associated with the known basement high west of Central San Francisco and with Isla Caja de Muertos can be used as additional evidence that basement highs are possible and may be the cause of the gravity highs elsewhere in the project area. By using the regional gradients deduced from the calculated profiles, it is possible to estimate the difference between the gravity anomaly over these basement highs and the amplitude of the regional gradient anomaly at the same place. Then from this residual anomaly a basement depth may be calculated. The residual anomaly for the basement highs south of Santa Isabel and west of Pastillo is estimated to be approximately -10 mgal (i.e. the top of the high is 10 mgal below the regional gradient). The calculated basement depth associated with these two gravity features is approximately 1500-2000 feet, the former feature being perhaps slightly shallower than the latter. More exact calculations seem unwarranted because of the uncertainty in the regional gradients.

The broad gravity high about 7 km west of Ponce is a more puzzling feature. No gravity data are available over the central portion of this high and it is possible that the inferred contours are not entirely correct and that the feature may not be connected with the small local gravity high near the town of Penuelas. The association of the feature with Middle Tertiary sedimentary rocks suggests some cause and effect relationship. The Middle Tertiary sedimentary rocks are well exposed in this area and appear to form a monoclinal structure dipping gently south. The east-west topographic grain in this area confirms the geologic data. It can be noted that the gravity contours rather closely follow around the south margin of this topographically high area and thus also follow the contact between the Tertiary rocks and the overlying Quaternary sediments and sedimentary rocks. It may be that some of this gravity high is caused by a density contrast between the Oligo-Miocene rocks and the Quaternary sediments and sedimentary rocks, but the anomaly has so substantial an amplitude that it must be primarily caused by a basement-Tertiary rock density contrast. In addition, the narrow gravity trough on the northeast side of the high is almost certainly not caused by the alluvium. The association of the anomaly with a regional topographic high suggests that this area may have been uplifted in post-Miocene time relative to adjacent areas of Oligo-Miocene rocks, presumably by means of faulting. A possible location for such a fault (figure 26) on the northeast side of this gravity high is the steep gravity gradient trending northwest from Los Pampanos which is situated 3 km southwest of Ponce. Using the geologic cross-section of Zapp, Bergquist, and Thomas (1948) through this gravity high, the estimated stratigraphic thickness of the Middle Tertiary sedimentary rocks is nearly 6,000 feet at the coastline, yet test well 3CPR on strike 13 km to the east apparently penetrated only 1,988 feet of these rocks and additionally is 15 mgal lower than the corresponding place at the south end of the cross-section 13 km to the west. There are evidently structural complications here in the Middle Tertiary sedimentary rocks and such complications evidently involve duplication by faulting of the stratigraphy in the area of the gravity high west of Ponce. Further evidence bearing on the postulated fault extending northwest from Los Pampanos is provided by Glover (written communication, 1965) who points out that reconnaissance data suggest a major fault in the basement strikes southeast into the Los Pampanos feature. If so, density variations within the basement may explain part or all of the gravity feature or, alternatively, the fault may have been reactivated subsequent to deposition of the Middle Tertiary rocks.

The gravity lows at Playa Cortada and 5 km east of Playa de Ponce have already been described in the section on the calculated gravity profiles. The gravity low 3 km south of Guayanilla has an amplitude of only about -15 mgal relative to the regional gradient and maximum basement depth here will probably not exceed 3,500 feet, especially if some of this minimum is caused by an underlying serpentinite mass.

Discussion of Other Geophysical Data

The most valuable geophysical information complementing the south coast gravity survey is the reflection seismograph survey conducted in 1947 and 1948 by United Geophysical Company, Inc. The results of the interpretation of this survey are contained in a structure contour map, plate III of the report by Denning (1948). A rough copy of plate III is included as Figure 27 in the present report. The results of the 1958 reinterpretation of the seismic data by C. J. Donnally are summarized in two rather similar structure contour maps in his 1958 report. A copy of one of these maps is also included in the present report (figure 28).

A subsequent reevaluation of the seismic survey was made in 1962 by D. R. Mabey of the U.S. Geological Survey (Mabey, written commun., 1963). Mr. Mabey's comments are so important, relative to the interpretation of the gravity survey, that liberal use has been made of quotations from his communication. His overall evaluation of the maps is as follows: "In general the structure indicated on United's contour map of the south area appears to be a reasonable interpretation of the seismic data. However, the contours probably are not on a single horizon. I was unable to duplicate much of the interpretation shown on Donnally's structure maps."

As pointed out by Mabey, none of the structure contour maps give any indication of the degree of reliability of the reflection data for different portions of the maps so that it is not possible to decide upon the relative probability of some of the structures without referring to the original data. On the Donnally Geophysical Company map (Figure 28) only one basement high with closure (feature "B" near Santa Isabel) correlates with a gravity high on Figure 14. There is no gravity evidence to substantiate the interpreted faults on the land portions of the two Donnally maps. The true basement depths at the test wells 1CPR and 2CPR differ by approximately 15 percent from the basement depths indicated on Figure 28. The major contribution of the maps and report of the Donnally Geophysical Company is the recognition of a probable unconformity within the Oligo-Miocene sediments because of abrupt steepening of the dips of reflecting horizons below certain depths on the seismic records. In general the depths indicated on Figure 28 are roughly the same order of magnitude as those deduced from the gravity data but the structure interpreted from the two kinds of geophysical data is dissimilar.

The United Geophysical Company map (Figure 27) is contoured on relatively shallow reflecting horizons which may not everywhere be the same. If, as appears to be indicated by the seismic data, there is an unconformity below the contoured horizons but within the coastal plain sediments, the structures indicated by this map (figure 27) may not all necessarily correspond with the structure deduced from the gravity data for the buried basement surface. In particular, the major northeast-trending anticline shown on Figure 27 north of Santa Isabel is in considerable conflict with the gravity interpretation. However, the gravity high 2 km west of Pastillo, which is believed to represent a basement high at a depth of only 1,500 feet, correlates exactly with a closed structural high interpreted to be a depth of 1300 feet on Figure 27. Elsewhere, the lack of correlation of the seismic interpretation with the gravity interpretation may be caused by the aforementioned intervening unconformity.

Mabey states that in the vicinity of the three test wells there was no evidence of reflections from the top of the basement and no usable reflections within the basement. He further writes that "since all the usable reflections appear to come from above the basement, it should be possible to indirectly map the basement as being slightly below the general level of the deepest reflections." The following interpretive comments by Mabey are based on this approach. The sedimentary section is interpreted to be about 3,000 feet thick 2 km southeast of Salinas and becomes thinner toward the north and east. Mabey further concludes "that along line U-11 east of SP-49 (shotpoint 49) the sedimentary section is generally less than 3,000 feet with the possibility of a local thickening immediately east of Salinas. The thickest section along this line is probably between SP-50 and SP-96 where it is at least 4,000 feet thick. West of SP-97 the section ranges in thickness between 2,500 and 3,500 feet." It can be noted by reference to the gravity map and the geologic interpretation map (Figure 14 and 26) that the above depth estimates are in good agreement with the gravity data. Line U-20 passes north-south through the site of test well 3CPR (basement depth 2,845 feet). Mabey notes the deepest reflections occur north of the well at SP-11 where the sedimentary section may be 3,400 feet thick, suggesting that the well is located on a basement high. Again, the gravity data clearly substantiate this interpretation, as shown by calculated profile II-II' (figure 23).

The southward extension of line U-20 is line W-20. Mabey believes that along this line "the sedimentary section probably thickens southward with the maximum thickness at the south end of about 5,000 to 6,000 feet but perhaps as much as 7,000 feet." Along east-west line W-23 "the sediments probably thicken eastward from about 3,000 feet at the west end of the line to 6,000 to 7,000 feet near SP-28. The 3,500-foot displacement indicated by United (between SP-32 and SP-33) on their structure horizon is a reasonable displacement on the surface of the basement complex. . . . Immediately east of the proposed fault the sediments are probably not more than 3,000 feet thick but thicken generally eastward to between 4,000 to 5,000 feet near SP-51."

Line W-5 coincides with calculated gravity profile III-III' (figure 24) and Mabey's interpretation of this reflection data agrees well with the gravity interpretation considering that the location of the offshore gravity contours is inferred from scanty data. "The sediments appear to thin westward from about 4,000 feet to about 2,500 feet near SP-14 and SP-15 northwest of Cayo Berberia. This thinning may indicate a basement high associated with Cayo Berberia, or it may be the result of the bend in the line. Southwest of this high the section thickens to between 4,000 and 5,000 feet near SP-18 and SP-24 and then thins toward Isla Caja de Muertos."

It is concluded that in general the agreement is good between Mabey's interpretation of the seismic reflection data and this report's interpretation of the gravity data. This agreement tends to produce confidence in the conclusions of both interpretations.

The aeromagnetic survey flown in the Ponce area in 1957 by Canadian Aero Service is included in this report (figure 29) at a reduced scale for the sake of completeness. The area covered by the survey extends only 2 to 5 km south of the edge of the coastal plain and provides relatively little information about the project area. The aeromagnetic data generally indicate a gently south-dipping sediment-basement interface, although there is some evidence for the northernmost of the two normal faults 1 km north of Juana Diaz. At the western border of the magnetic survey strong northwest-trending magnetic lineaments are generated by the basement rocks. These trends parallel the interpreted fault extending northwest from Los Pampanos near Ponce and forming the northeast boundary of the broad gravity high west of Ponce.

The aeromagnetic profiles flown by the U.S. Geological Survey in 1961 are displayed on Figure 30 at a scale of 1:50,000. The numbers on the profiles are location points and these, together with the flight paths, are also shown on the accompanying location map (figure 31), at a scale of 1:60,000. The one-mile spacing of the flight lines was dictated by the original purpose of the survey, a radioactivity survey for the Atomic Energy Commission, and as a result the magnetic data, although very useful, cannot be contoured. No attempt has been made at a complete interpretation of this data, especially insofar as it concerns the variations in basement lithology, but certain interpretative comments follow which specifically relate to the gravity survey and the interpreted configuration of the basement surface. Ultimately the major usefulness of data such as this will be as a guide to detailed geologic mapping of the basement rocks. For the purpose of interpretation, it is assumed that the magnetic anomalies are caused by masses of igneous rocks, here most likely volcanic, which extend to the upper surface of the basement. The method of interpretation used in this section is qualitative only and is based on the principle that, other factors being equal, more deeply buried magnetic masses give rise to magnetic anomalies with longer wavelengths and longer, less steep gradients. In particular, the horizontal length of the steepest gradient of an anomaly is a measure of its depth of burial (distance from the aircraft). It can be easily seen that the central portions of the southern five profiles (lines 35 to 39) are much smoother and flatter than the remaining profiles and that these smooth profiles are the only lines crossing any substantial thickness of the Oligo-Miocene sediments. Lines 35 to 39 have therefore been examined for qualitative evidence bearing on the interpretation of the gravity map. The features noted will be discussed from east to west across the project area. Check-points can be located on figure 31.

At the extreme east end of lines 38 and 39 near checkpoints 37 and 41, respectively, the data indicate basement rocks gradually approach very near the surface about 3 km east of Salinas. This result agrees with the gravity data which indicate the east termination of the coastal plain at the same approximate location. The contact here is probably not a fault.

Line 37 crosses the north border of the Middle Tertiary sediments about 1 km west of checkpoint 08 at a point which is 6 km west of Salinas. The steep magnetic gradient implies a major fault here, with an abrupt change from deeply buried basement on the west to shallow basement east of the fault. A similar fault has already been inferred at this location from the gravity data.

The gravity high south of Santa Isabel is traversed by line 38, in the vicinity of checkpoint 30, and by line 39, near checkpoint 46. There is reasonably good evidence on line 38 that basement is significantly more shallow over this gravity anomaly than on the adjacent portions of the profile. The data of line 39 are not conclusive although a small local magnetic high is present at checkpoint 46.

The gravity high 2 km west of Pastillo is crossed by line 37 between checkpoints 22 and a point 4 km to the east. Again a broad magnetic anomaly indicates relatively shallow depth to magnetic rocks and confirms the interpretation from gravity data that basement is relatively near the surface at the gravity high.

Various magnetic anomalies in the central portions of lines 35, 36, 38, and 39 are caused by man-made structures on the surface of the ground. Lines 35 and 36 cross the city of Ponce near checkpoints 65 and 24, respectively, and the magnetic effects are evident on the profiles. The large anomaly on line 38 3 km west of checkpoint 22 is caused by some industrial effect at the Playa de Ponce docks. Lastly, the anomaly on line 39, halfway between location points 51 and 59 is caused by flying over a ship.

A northeast-trending gravity high parallels the northwest shore of Bahia de Guayanilla. Lines 35 and 36 cross this gravity feature at points 2 km west of checkpoint 74 and 3 km east of checkpoint 12, respectively. At these profile locations are various shallow-depth magnetic anomalies. Although a few of these magnetic features may be industrial, it is felt that some of the anomalies are generated by magnetic basement rocks which are here less deeply buried than on adjacent portions of the profiles. Again both the gravity and magnetic data suggest relatively shallow basement depth at this location.

The inliers of basement rocks west of Central San Francisco are crossed by line 37 where very shallow-depth magnetic anomalies occur between checkpoint 46 and a point 5 km to the west. The shallow-depth anomalies thus extend about 1 km east of the mapped exposure of serpentinite (figure 14).

Conclusions and Recommendations

The objectives of the present gravity survey were to determine the general configuration of the basement surface beneath the Tertiary coastal plain of the south coast and to locate related structures within the overlying sediments which might be favorable for the accumulation of petroleum. These objectives have been substantially attained and the seismic and magnetic data confirm the gravity interpretation. It is clear from the preceding discussions that the gravity method in this area will in general only locate the larger structures. More detailed gravity surveys within small portions of the project area will certainly locate minor gravity features not delineated on the accompanying gravity map (figure 14) but the interpretation of these minor features may be difficult and speculative because of the lack of subsurface information and the absence of adequate density data, particularly from the near-surface alluvial deposits. The uncertainty concerning the regional gradient across the project area is also a serious difficulty that could possibly be overcome by analysis of derivative or residual maps of more detailed gravity data.

If further information is desired concerning the structure and basement configuration of the offshore portions of the coastal plain, it is clear from the present survey that an underwater gravity survey will provide useful information. Further seismic data, both on land and offshore, are also needed to determine structures above and below the unconformity which appears to exist within the Oligo-Miocene rocks.

References

Briggs, R. P., 1961, Geology of Kewanee Interamerican Oil Company test well number 4CPR, northern Puerto Rico, in Oil and gas possibilities of northern Puerto Rico: San Juan, Puerto Rico Mining Comm., p. 1-23.

______1964, Provisional geologic map of Puerto Rico and adjacent islands: U.S. Geol. Survey Misc. Geol. Inv. Map I-392.

Bromery, R. W., and Griscom, Andrew, 1964, A gravity survey in the Mayaguez area of southwest Puerto Rico, in C. A. Burk, ed., A study of serpentinite, the AMSOC core hole near Mayaguez, Puerto Rico: Natl. Acad. Sci. - Natl. Research Council Publ. 1188, p. 61-74.

Denning, W. H., 1948, Report on seismograph survey of Puerto Rico with principal reference to the south coastal area: United Geophysical Company, Inc., for Puerto Rico Industrial Development Company, 17 p.

Donnally, C. J., 1958, Santa Isabel area of Puerto Rico for Maritime Oil Company by Donnally Geophysical Company, 5 p.

Glover, Lynn, 3d, 1961, Preliminary report on the geology of the Coamo quadrangle, Puerto Rico: U.S. Geol. Survey Misc. Geol. Inv. Map I-335.

Glover, Lynn, 3d, and Mattson, P. H., 1960, Successive thrust and transcurrent faulting during the early Tertiary in south-central Puerto Rico: Art. 166, in U.S. Geol. Survey Prof. Paper 400-B, p. B363-B365.

Grossman, I. G., 1962, Stratigraphy and hydrology of the Juana Diaz Formation in the Yauco area, Puerto Rico: Art. 137 in U.S. Geol. Survey Prof. Paper 450-D, p. D62-63.

_____1963, Geology of the Guanica-Guayanilla Bay area, southwestern Puerto Rico: Art. 29 in U.S. Geol. Survey Prof. Paper 475-B, p. B114-B116.

Mattson, P. H., 1960, Geology of the Mayaguez area, Puerto Rico: Geol. Soc. America Bull., v. 71, no. 3, p. 319-362.

Ming, R. E., 1958, Geological Report, oil and gas possibilities of the Santa Isabel prospect, Puerto Rico: for the Maritime Oil Company, 11 p.

Pessagno, E. A., Jr., 1960a, Geology of Ponce-Coamo Area, Puerto Rico: Ph.D. Thesis, Princeton University.

_____1960b, Stratigraphy and micropaleontology of the Cretaceous and lower Tertiary of Puerto Rico: Micropaleontology, v. 6, no. 1, p. 87-110.

Seiglie, G. A., and Bermudez, P. J., 1969, Informe preliminar sobre los foraminiferos del Terciario del sur de Puerto Rico: Caribbean Jour. Sci., v. 9, no. 1-2, p. 67.

Shurbet, G. L., and Ewing, Maurice, 1956, Gravity reconnaissance survey of Puerto Rico: Geol. Soc. America Bull., v. 67, no. 4, p. 511-534.

Slodowski, T. R., 1956, Geology of the Yauco Area, Puerto Rico: Ph.D. Thesis, Princeton University.

Swick, C. H., 1942, Pendulum gravity measurements and isostatic reductions: U.S. Coast & Geodetic Survey, Spec. Pub. No. 232, 82 p.

U.S. Geological Survey, 1964, Geological Survey Research, 1964: U.S. Geol. Survey Prof. Paper 501-A, p. A120.

Zapp, A. D., Bergquist, H. R., and Thomas, C. R., 1948, Tertiary geology of the coastal plains of Puerto Rico: U.S. Geol. Survey Oil & Gas Inv. Prelim. Map 85.

Explanation and footnotes

to Table 4

U.S.G.S. GRAVITY REDUCTION PROGRAM

First line of printout

63 = The year of the gravity survey, 1963

DOWNTOWN PONCE - The U.S.C.&G.S. Ponce pendulum base as reoccupied during the survey (see description in report).

GBV 978627.84 - Gravity base value in mgal

MSV .10445 or .53876 - Meter scale value is .10445 x 10 mgal/dial division for the LaCoste and Romberg Model G gravimeter and .53876 mgal/dial division for the Worden gravimeter.

D1 2.67 - Density used to compute BA1

D2 2.27 - Density used to compute BA2

BY WLR - Submitted by William L. Rambo

Input data

STA - Station number

LAT - Latitude in degrees and minutes (to accuracy of 1/100 minute)

LONG- Longitude in degrees and minutes

E - Elevation in feet

MG/OG- Observed gravity in meter scale divisions relative to the GBV (gravity base value) shown at the top of listing.

Output data

OG - Observed gravity in mgal minus 978000.00 mgal computed from the MSV (meter scale value) relative to GBV as follows:

$$OG = GBV + (MSV)\ (MG)$$

Output data cont'd

FTH - Theoretical gravity at sea level at the station latitude ϕ computed according to the International Gravity Formula:

$$FTH = 978049 \, [1 + .0052884 \sin^2\phi - .0000059 \sin^2 2\phi] \text{ mgal}$$

The actual form used by the datatron is as follows:

$$978049 \, [1 + \sin^2\phi \, (.0052648 + .0000236 \sin^2\phi]$$

FAA - Free-air anomaly computed as follows:

$$FAA = OG - FTH + FAC$$

where free air correction,

$$FAC = (.09411 - .000134 \sin^2\phi)E - .0067(E \times 10^{-8})^2$$

When E, elevation, is expressed in feet, FAC and FAA will be in mgal.

BA1 - Simple Bouguer Anomaly

$$BA_i = FAA - 0.01276 \, \rho_i \, E$$

where ρ_i is the assumed rock density

E is the elevation in feet

CC - Curvature correction computed to an accuracy of 0.1 mgal by the approximation

$$1.74 \sin \frac{E}{4635} \, , \; E < 14{,}000 \text{ feet}$$

TC - Terrain correction: Input data computed for $\rho = 2.67$

Then

$$TC_i = \frac{\rho_i}{2.67} \, TC$$

MT - Modified tidal correction. This is the residual tidal correction not taken into account by the daily meter drift curves.

CBA - Complete Bouguer Anomaly.

$$CBA_i = BA_i - CC + TC_i$$

Footnotes

Page 2

1. Correction of -0.1 SD applied to CBA

2. Correction of +0.2 SD applied to CBA

Page 3

1. Error in sign of MG/OG. CBA only is corrected

Page 4

1. Error in elevation. Should read 527.6 feet. CBA only is corrected.

2. Error in elevation. Should read 575.8 feet. CBA only is corrected.

Page 6

1. Correction of +0.2 SD applied to CBA
2. " " +0.1 SD " " "
3. " " +0.3 SD " " "
4. " " -0.1 SD " " "

Page 7

1. Correction of +0.2 SD applied to CBA
2. " " +0.3 SD " " "

Page 12

1. Latitude error. Should read 17 57.88, FTH=0539.05, FAA=93.93, BA1=93.85, CBA is corrected.

2. Elevation error. Should read 352.7 feet, FAA=130.06, BA1=118.04, CBA is corrected.

Page 14

1. Error in sign of MG/OG. OG=641.37, FAA=104.48, BA1=103.19, CBA is corrected.

Page 14 cont'd

2. Error in sign of MG/OG.
   OG=636.21, FAA=104.80, BA1=100.75
   CBA is corrected.

3. Error in sign of MG/OG.
   OG=634.65, FAA=115.36, BA1=106.31,
   CBA is corrected.

4. Error in sign of MG/OG.
   OG=640.01, FAA=110.01, BA1=105.24,
   CBA is corrected.

Table 4

Principal facts for the gravity data

from the south coast of Puerto Rico

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .53876 D1 2.67 D2 2.27 BY WLR 0410 01

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1201	18 00.78	066 36.85	00051.5	00001.00-	8.77	627.30	0541.61	090.54	088.79	089.05	0.03	-.01		97.52
1202	18 00.45	066 36.79	00037.1	00004.30-	8.82	625.52	0541.31	087.70	086.43	086.62	0.02	-.01		95.22
1203	17 59.88	066 36.90	00027.2	00007.00-	8.92	624.07	0540.81	085.82	084.89	085.03	0.07	-.02		93.78
1204	17 59.88	066 37.28	00012.8	00003.20-	8.96	626.12	0540.81	086.51	086.08	086.14	0.00	-.02		95.02
1205	17 59.25	066 37.15	00010.5	00007.40-	9.15	623.85	0540.26	084.58	084.22	084.28	0.00	-.04		93.33
1206	17 58.95	066 37.28	00004.9	00008.80-	9.29	623.10	0539.99	083.57	083.40	083.43	0.00	-.05		92.64
1208	17 59.47	066 36.22	00017.1	00012.60-	8.93	621.05	0540.45	082.21	081.63	081.71	0.00	-.06		90.50
1209	18 00.92	066 35.72	00060.0	00001.80-	8.64	626.87	0541.73	090.79	088.74	089.05	0.03	-.05		97.30
1210	18 00.52	066 35.55	00047.9	00008.80-	8.67	623.10	0541.38	086.23	084.60	084.84	0.02	-.05		93.20
1211	18 00.20	066 35.36	00035.4	00013.50-	8.68	620.57	0541.09	082.81	081.60	081.78	0.01	-.04		90.23
1212	17 59.56	066 35.33	00012.5	00016.70-	8.80	618.84	0540.53	079.49	079.06	079.12	0.00	-.03		87.83
1213	17 59.67	066 35.70	00019.0	00015.30-	8.83	619.60	0540.63	080.76	080.11	080.21	0.00	-.02		88.92
1214	17 58.25	066 35.37	00000.0	00022.60-	9.27	615.66	0539.38	076.28	076.28	076.28	0.00	-.03		85.46
1215	17 58.81	066 35.42	00004.9	00018.20-	9.03	618.03	0539.87	078.62	078.45	078.48	0.00	-.03		87.45
1216	17 59.07	066 35.73	00010.2	00016.50-	8.98	618.95	0540.10	079.81	079.46	079.52	0.00	-.02		88.42
1217	17 59.86	066 35.12	00019.0	00015.80-	8.70	619.33	0540.80	080.32	079.68	079.77	0.00	-.01		88.37
1218	18 00.05	066 34.83	00021.7	00014.10-	8.62	620.24	0540.96	081.32	080.58	080.69	0.00	-.01		89.19
1219	18 00.68	066 34.53	00020.7	00002.70-	8.44	626.39	0541.52	086.82	086.11	086.22	0.00	+.00		94.55
1220	17 59.80	066 34.32	00008.2	00015.80-	8.58	619.33	0540.74	079.36	079.08	079.12	0.00	.00		87.66
1221	17 58.20	066 34.24	00003.9	00024.10-	9.04	614.86	0539.33	075.89	075.76	075.78	0.00	.01		84.81
1222	17 57.86	066 34.87	00000.0	00027.60-	9.26	612.97	0539.03	073.94	073.94	073.94	0.00	.01		83.21
1224	18 02.20	066 35.34	00115.5	00021.20	8.46	639.26	0542.86	107.27	103.33	103.92	0.05	-.02		111.72
1225	18 03.67	066 36.12	00328.1	00010.70	9.23	633.60	0544.16	120.32	109.14	110.81	0.16	-.02		118.19
1226	18 04.55	066 36.64	00521.6	00009.30-	10.92	622.83	0544.94	126.98	109.20	111.87	0.25	-.03		119.84
1227	18 02.65	066 35.21	00145.3	00024.20	8.46	640.88	0543.26	111.30	106.35	107.09	~~0.1~~ 0.07	-.04		114.70
1228	18 03.73	066 35.41	00295.6	00012.60	8.97	634.63	0544.21	118.24	108.16	109.67	0.14	-.05		116.94
1229	18 04.01	066 35.09	00234.9	00018.60	9.92	637.86	0544.46	115.51	107.50	108.70	0.12	-.05		117.25
1230	18 05.97	066 34.87	00557.1	00007.80-	10.34	623.64	0546.19	129.87	110.89	113.73	0.27	-.07		120.89
1231	18 05.47	066 34.75	00439.3	00003.70	10.83	629.83	0545.75	125.42	110.45	112.69	0.21	-.07		121.00
1232	18 04.95	066 34.56	00361.5	00008.20	11.54	632.26	0545.29	120.99	108.67	110.52	0.17	-.07		119.97
1233	18 02.72	066 34.33	00217.5	00012.70	8.41	634.68	0543.32	111.83	104.42	105.53	0.17	-.06		112.66
1234	18 03.53	066 33.53	00315.0	00013.30	8.33	635.01	0544.03	120.62	109.89	111.49	0.15	-.05		118.02
1235	18 03.88	066 33.70	00313.3	00017.40	8.47	637.21	0544.34	122.35	111.67	113.27	0.15	-.05		119.94
1236	18 03.73	066 33.97	00308.4	00018.10	8.57	637.59	0544.21	122.40	111.89	113.47	0.15	-.05		120.26
1237	18 04.24	066 33.33	00331.4	00013.90	8.73	635.33	0544.66	121.85	110.56	112.25	0.16	-.04		119.09
1238	18 04.30	066 33.54	00309.7	00016.50	8.82	636.73	0544.71	121.16	110.61	112.19	0.15	-.03		119.25
1239	18 04.83	066 33.88	00387.1	00011.30	9.34	633.93	0545.18	125.17	111.98	113.96	0.19	-.02		121.11
1243	18 01.41	066 33.45	00093.5	00004.50	8.27	630.26	0542.16	096.90	093.71	094.19	0.05	.05		101.98
1244	18 01.77	066 33.53	00131.2	00006.40	8.31	631.29	0542.48	101.16	096.69	097.36	0.06	.05		104.99
1245	18 01.64	066 34.12	00144.4	00004.50	8.32	630.26	0542.36	101.48	096.56	097.30	~~0.1~~ 0.07	.05		104.86
1246	18 02.03	066 34.49	00210.0	00004.50	8.43	630.26	0542.71	107.31	100.16	101.23	0.10	.06		108.55
1247	18 02.15	066 34.28	00184.7	00008.30	8.42	632.31	0542.82	106.88	100.58	101.53	~~0.1~~ 0.09	.06		108.97
1248	18 02.23	066 35.02	00137.8	00020.20	8.47	638.72	0542.89	108.80	104.11	104.81	~~0.1~~ 0.06	.07		112.59
1249	18 00.17	066 32.30	00030.8	00003.70-	8.30	625.85	0541.07	087.68	086.63	086.79	0.01	.08		95.00
1250	18 00.58	066 32.31	00043.3	00002.10-	8.21	626.71	0541.43	089.35	087.88	088.10	0.02	.08		96.16

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .53876 D1 2.67 D2 2.27 BY WLR 0410 02

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1252	18 02.77	066 30.67	00129.9	00029.60	8.01	643.79	0543.36	112.65	108.23	108.89	0.06	.07		116.25
1253	18 02.29	066 30.74	00092.2	00022.40	7.99	639.91	0542.94	105.65	102.51	102.98	0.05	.05		110.50
1255	18 03.68	066 30.53	00187.0	00026.60[1]	8.26	642.17	0544.17	115.60	109.23	110.18	~~0.1~~ 0.09	.03		117.38
1256	18 02.82	066 31.70	00203.4	00011.20	8.32	633.87	0543.41	109.60	102.67	103.71	~~0.1~~ 0.09	.02		110.92
1257	18 03.45	066 32.18	00242.8	00015.90	8.19	636.41	0543.96	115.29	107.02	108.26	0.12	.01		115.10
1258	18 03.28	066 32.34	00193.9	00019.20	8.20	638.18	0543.81	112.61	106.01	107.00	~~0.1~~ 0.09	.01		114.13
1259	18 03.59	066 32.62	00242.8	00017.90	8.27	637.48	0544.09	116.24	107.97	109.21	0.12	.00		116.12
1261	18 04.10	066 33.07	00316.3	00013.90	8.52	635.33	0544.54	120.56	109.78	111.39	0.15	.00		118.15
1262	18 03.72	066 33.08	00256.9	00019.20	8.37	638.18	0544.20	118.15	109.40	110.71	0.12	.00		117.65
1263	18 04.72	066 30.04	00246.1	00033.50	8.61	645.89	0545.09	123.96	115.58	116.83	0.12	-.04		124.03
1264	18 05.38	066 30.34	00342.2	00028.90	8.76	643.41	0545.67	129.94	118.28	120.03	0.16	-.05		126.83
1265	18 06.41	066 30.37	00342.5	00036.60	9.43	647.56	0546.58	133.21	121.54	123.29	0.16	-.06		130.75
1267	18 02.04	066 32.11	00110.6	00010.00	8.09	633.23	0542.72	100.92	097.15	097.72	0.04	-.06		105.14
1270	18 01.11	066 30.61	00054.5	00009.20	8.02	632.80	0541.90	096.03	094.18	094.45	0.03	-.02		102.15
1271	17 59.93	066 33.44	00014.8	00012.80[2]-	8.45	620.94	0540.86	081.48	080.97	081.05	0.00	-.06		89.47
1272	17 59.69	066 32.74	00017.4	00009.20-	8.45	622.88	0540.65	083.87	083.28	083.37	0.00	.03		91.76
1274	17 59.67	066 32.25	00023.9	00004.40-	8.42	625.47	0540.63	087.09	086.28	086.40	0.00	.04		94.74
1275	17 59.33	066 32.35	00016.4	00006.40-	8.51	624.39	0540.33	085.61	085.05	085.13	0.00	.04		93.60
1276	17 58.57	066 32.28	00000.0	00013.60[2]-	8.69	620.51	0539.66	080.85	080.85	080.85	0.00	.05		89.70
1279	17 59.06	066 31.17	00000.0	00000.30-	8.46	627.68	0540.09	087.59	087.59	087.59	0.00	.04		96.09
1280	17 59.97	066 30.90	00025.9	00004.00	8.23	630.00	0540.89	091.55	090.66	090.80	0.07	.04		98.92
1281	17 59.92	066 30.47	00023.3	00004.90	8.20	630.48	0540.85	091.82	091.03	091.15	0.00	.04		99.27
1282	17 59.53	066 30.59	00016.4	00005.20	8.29	630.64	0540.50	091.68	091.12	091.20	0.00	.03		99.44
1283	17 59.30	066 30.49	00000.0	00005.00	8.33	630.53	0540.30	090.23	090.23	090.23	0.00	.03		98.59
1284	17 59.90	066 30.28	00015.4	00005.60	8.18	630.86	0540.83	091.48	090.95	091.03	0.00	.03		99.16
1285	17 59.45	066 29.93	00003.3	00006.60	8.24	631.40	0540.43	091.28	091.16	091.18	0.00	.02		99.42
1288	18 02.42	066 36.73	00147.6	00027.60	8.70	642.71	0543.05	113.55	108.52	109.27	~~0.1~~ 0.07	.00		117.15
1289	18 02.41	066 35.86	00183.7	00015.90	8.52	636.41	0543.04	110.65	104.39	105.33	~~0.1~~ 0.08	-.01		112.82
1290	17 59.56	066 37.73	00009.8	00000.60	9.13	628.16	0540.53	088.55	088.22	088.27	0.00	-.02		97.33
1291	17 59.89	066 37.56	00009.8	00001.40	9.00	628.59	0540.82	088.69	088.36	088.41	0.00	-.02		97.34
1292	17 59.07	066 37.76	00000.0	00004.30-	9.29	625.52	0540.10	085.42	085.42	085.42	0.00	-.03		94.68
1293	17 59.04	066 38.19	00000.0	00002.50-	9.40	626.49	0540.07	086.42	086.42	086.42	0.00	-.03		95.79
1294	17 59.81	066 38.11	00017.1	00005.90	9.15	631.02	0540.75	091.88	091.30	091.38	0.00	-.04		100.41
1295	17 59.67	066 38.47	00012.8	00007.50	9.28	631.88	0540.63	092.46	092.02	092.09	0.00	-.05		101.32
1296	17 59.35	066 39.38	00043.3	00005.70	9.67	630.91	0540.35	094.64	093.16	093.39	0.02	-.05		102.76
1297	17 59.08	066 39.65	00027.6	00007.10	9.81	631.67	0540.11	094.16	093.22	093.36	0.01	-.04		102.98
1298	17 59.03	066 42.32	00015.4	00004.90	10.26	630.48	0540.06	091.87	091.34	091.42	0.00	.00		101.60
1300	17 58.16	066 37.08	00003.3	00018.30[1]-	9.56	617.98	0539.30	078.99	078.88	078.90	0.00	.01		88.40
1301	17 57.56	066 38.11	00002.3	00023.30-	10.16	615.29	0538.77	076.74	076.66	076.67	0.00	.00		86.62
1302	17 57.21	066 40.56	00000.0	00019.70-	11.49	617.23	0538.46	078.77	078.77	078.77	0.00	.00		90.26
1303	17 57.34	066 40.95	00000.0	00017.30-	11.24	618.52	0538.58	079.94	079.94	079.94	0.00	-.01		91.17
1304	17 57.72	066 40.50	00000.7	00012.30-	10.60	621.21	0538.91	082.36	082.34	082.34	0.00	-.02		92.92
1305	17 58.34	066 39.75	00001.0	00000.20-	10.00	627.73	0539.46	088.37	088.33	088.34	0.00	-.04		98.2[illegible]
1306	17 58.45	066 39.67	00001.0	00000.30	9.94	628.00	0539.55	088.54	088.51	088.51	0.00	-.04		98.41
1307	17 58.60	066 39.50	00001.0	00000.70	9.85	628.22	0539.69	088.63	088.59	088.60	0.00	-.05		98.37

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .53876 D1 2.67 D2 2.27 BY WLR 0410 03

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1308	17 58.67	066 39.32	00002.6	00000.40	9.80	628.06	0539.75	088.56	088.47	088.48	0.00	-.05		98.22
1309	17 58.78	066 39.17	00003.9	00000.40	9.72	628.06	0539.84	088.58	088.45	088.47	0.00	-.05		98.12
1310	17 58.85	066 39.02	00003.9	00000.60	9.63	628.16	0539.91	088.62	088.49	088.51	0.00	-.05		98.07
1311	17 58.91	066 38.85	00001.6	00000.00	9.57	627.84	0539.96	088.03	087.98	087.99	0.00	-.06		97.49
1312	17 58.96	066 38.67	00001.0	00000.80-	9.50	627.41	0540.00	087.50	087.47	087.47	0.00	-.07		96.90
1313	17 58.98	066 38.51	00001.0	00001.60-	9.48	626.98	0540.02	087.05	087.02	087.03	0.00	-.07		96.43
1314	17 57.95	066 37.13	00002.3	00021.00-	9.68	616.53	0539.11	077.63	077.56	077.57	0.00	-.13		87.11
1315	17 58.09	066 36.57	00001.0	00020.00-	9.48	617.06	0539.24	077.92	077.88	077.89	0.00	-.12		87.24
1316	17 58.19	066 36.52	00001.0	00018.70-	9.44	617.77	0539.32	078.54	078.51	078.51	0.00	-.12		87.83
1317	17 58.25	066 36.37	00000.7	00018.30-	9.38	617.98	0539.38	078.67	078.65	078.65	0.00	-.11		87.92
1318	17 58.28	066 36.21	00001.3	00018.90-	9.35	617.66	0539.40	078.38	078.33	078.34	0.00	-.11		87.57
1319	17 58.27	066 35.84	00001.0	00020.50-	9.27	616.80	0539.39	077.50	077.47	077.47	0.00	-.11		86.63
1320	17 58.33	066 35.67	00001.0	00020.50-	9.23	616.80	0539.45	077.45	077.41	077.42	0.00	-.10		86.54
1321	17 58.11	066 35.19	00001.0	00024.10-	9.20	614.86	0539.25	075.70	075.67	075.67	0.00	-.10		84.77
1322	17 57.86	066 35.13	00001.0	00027.40-	9.29	613.08	0539.03	074.14	074.11	074.11	0.00	-.09		83.31
1323	17 57.69	066 35.37	00001.0	00028.30-	9.41	612.59	0538.89	073.80	073.76	073.77	0.00	-.09		83.08
1324	17 57.96	066 36.82	00001.0	00021.40-	9.62	616.31	0539.12	077.28	077.25	077.25	0.00	-.02		86.85
1325	17 58.43	066 36.93	00001.0	00015.60-	9.40	619.44	0539.54	080.00	079.96	079.97	0.00	.00		89.36
1326	17 58.73	066 37.03	00002.3	00011.90-	9.30	621.43	0539.80	081.85	081.77	081.78	0.00	.00		91.07
1327	17 57.88	066 34.58	00001.0	00028.10-	9.21	612.70	0539.05	073.74	073.71	073.71	0.00	.07		82.99
1328	17 57.98	066 34.46	00001.0	00026.80-	9.16	613.40	0539.14	074.35	074.32	074.33	0.00	.07		83.55
1329	17 58.08	066 34.31	00001.0	00025.90-	9.11	613.89	0539.23	074.76	074.72	074.73	0.00	.07		83.90
1330	17 58.14	066 34.16	00001.0	00024.90-	9.05	614.42	0539.28	075.23	075.20	075.20	0.00	.07		84.32
1331	17 58.17	066 33.98	00001.0	00024.90-	9.02	614.42	0539.31	075.21	075.17	075.18	0.00	.06		84.25
1332	17 58.21	066 33.85	00001.0	00024.40-	8.99	614.69	0539.34	075.44	075.41	075.41	0.00	.05		84.45
1333	17 58.27	066 33.57	00001.0	00022.60-	8.93	615.66	0539.39	076.36	076.33	076.33	0.00	.05		85.31
1334	17 57.88	066 33.18	00000.0	00026.90-	9.00	613.35	0539.05	074.30	074.30	074.30	0.00	.04		83.34
1335	17 57.86	066 33.42	00000.0	00027.90-	9.04	612.81	0539.03	073.78	073.78	073.78	0.00	.03		82.85
1336	17 58.46	066 33.23	00001.0	00019.30-	8.83	617.44	0539.56	077.97	077.94	077.94	0.00	.00		86.77
1337	17 58.55	066 33.01	00001.0	00017.30-	8.78	618.52	0539.64	078.97	078.94	078.94	0.00	.00		87.72
1338	17 58.58	066 32.86	00001.0	00015.90-	8.75	619.27	0539.67	079.70	079.66	079.67	0.00	-.01		88.40
1339	17 58.57	066 32.72	00001.0	00015.50-	8.72	619.49	0539.66	079.93	079.89	079.90	0.00	-.02		88.59
1340	17 58.52	066 32.58	00001.3	00015.60-	8.74	619.44	0539.61	079.95	079.90	079.91	0.00	-.03		88.61
1341	17 58.55	066 32.40	00000.0	00014.20-	8.72	620.19	0539.64	080.55	080.55	080.55	0.00	-.03		89.24
1342	17 58.38	066 33.38	00000.0	00021.20-	8.87	616.42	0539.49	076.93	076.93	076.93	0.00	-.17		85.63
1343	17 58.67	066 32.05	00001.0	00010.70-	8.65	622.08	0539.75	082.43	082.39	082.40	0.00	-.13		90.91
1344	17 58.78	066 31.82	00001.0	00009.00-	8.60	622.99	0539.84	083.24	083.21	083.21	0.00	-.12		91.69
1345	17 58.97	066 31.37	00000.0	00002.90-	8.51	626.28	0540.01	086.27	086.27	086.27	0.00	-.10		94.68
1346	17 59.12	066 31.00	00000.0	00001.20- [1]	8.43	627.19	0540.14	087.05	087.05	087.05	0.00	-.09		96.68
1347	17 59.16	066 30.87	00001.0	00002.10- [1]	8.40	626.71	0540.18	086.63	086.59	086.60	0.00	-.09		97.16
1348	17 59.25	066 30.65	00000.0	00003.40- [1]	8.35	626.01	0540.26	085.75	085.75	085.75	0.00	-.07		97.69
1349	17 58.43	066 43.98	00000.5	00006.20-	10.46	624.50	0539.54	085.01	084.99	085.00	0.00	.13		95.58
1350	17 58.14	066 44.02	00000.5	00008.90-	10.78	623.05	0539.28	083.82	083.80	083.80	0.00	.14		94.72
1351	17 58.12	066 44.93	00000.5	00008.40-	11.10	623.31	0539.26	084.09	084.08	084.08	0.00	.15		95.33
1352	17 58.13	066 45.29	00000.5	00007.60-	11.77	623.75	0539.27	084.53	084.51	084.51	0.00	.14		95.82

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .53876 D1 2.67 D2 2.27 BY WLR 0410

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1353	17 58.62	066 44.95	00000.5	00003.50-	10.37	625.95	0539.70	086.29	086.28	086.28	0.00	.14		96.79
1354	17 58.94	066 45.77	00000.5	00003.20	10.10	629.56	0539.98	089.62	089.61	089.61	0.00	.14		99.85
1355	17 58.67	066 45.40	00000.5	00001.30-	10.33	627.14	0539.75	087.44	087.42	087.43	0.00	.14		97.89
1356	17 58.92	066 45.31	00000.5	00002.00	10.10	628.92	0539.97	089.00	088.98	088.99	0.00	.14		99.22
1357	17 59.12	066 45.23	00000.5	00004.20	9.91	630.10	0540.14	090.00	089.99	089.99	0.00	.14		100.04
1358	17 59.30	066 45.12	00000.5	00005.70	9.74	630.91	0540.30	090.66	090.64	090.64	0.00	.14		100.52
1359	17 59.47	066 44.93	00000.5	00007.30	9.68	631.77	0540.45	091.37	091.35	091.35	0.00	.13		101.16
1360	17 59.18	066 44.25	00001.6	00001.30	9.87	628.54	0540.20	088.49	088.44	088.45	0.00	.13		98.44
1361	17 58.87	066 42.98	00000.5	00000.30	10.06	628.00	0539.92	088.12	088.11	088.11	0.00	.12		98.29
1362	18 00.53	066 45.98	00000.5	00022.90	9.25	640.18	0541.39	098.84	098.82	098.83	0.00	.07		108.14
1363	18 00.48	066 46.20	00000.5	00021.20	9.14	639.26	0541.34	097.97	097.95	097.95	0.00	.08		107.17
1364	18 00.44	066 46.32	00000.5	00020.20	9.12	638.72	0541.31	097.46	097.44	097.45	0.00	.09		106.65
1365	18 00.37	066 46.42	00000.7	00019.00	9.15	638.08	0541.24	096.90	096.88	096.88	0.00	.09		106.12
1366	18 00.28	066 46.52	00000.5	00018.60	9.16	637.86	0541.17	096.74	096.73	096.73	0.00	.10		105.99
1368	17 59.94	066 47.06	00000.5	00015.00	9.31	635.92	0540.87	095.10	095.08	095.09	0.00	.13		104.52
1369	18 00.06	066 46.93	00000.5	00015.90	9.26	636.41	0540.97	095.49	095.47	095.47	0.00	.13		104.86
1370	17 59.86	066 47.18	00000.5	00014.20	9.35	635.49	0540.80	094.74	094.72	094.73	0.00	.12		104.19
1371	17 59.37	066 49.23	00024.6	00009.40	10.04	632.90	0540.36	094.85	094.01	094.14	0.00	.11		104.16
1372	17 57.33	066 50.99	00000.5	00007.40	11.51	631.83	0538.57	093.31	093.29	093.29	0.00	-.05		104.75
1373	17 57.43	066 51.20	00000.0	00007.00	11.42	631.61	0538.66	092.95	092.95	092.95	0.00	-.06		104.31
1374	17 57.47	066 51.44	00000.5	00009.40	11.31	632.90	0538.69	094.26	094.24	094.24	0.00	-.07		105.48
1375	17 58.43	066 52.14	00000.5[1]	00039.70-	12.11	606.45	0539.54	066.96	066.94	066.95	~~0.0~~ 0.26	-.07		110.35[1]
1376	17 58.67	066 51.55	00527.6[2]	00040.90-	12.13	605.80	0539.75	115.70	097.72	100.42	~~0.2~~ 0.28	-.07		112.39[1]
1377	17 58.53	066 51.23	00454.1	00028.30-	11.77	612.59	0539.62	115.70	100.23	102.54	0.22	-.07		111.71
1378	17 57.92	066 50.45	00177.2	00011.50-	11.34	621.64	0539.09	099.23	093.19	094.10	~~0.1~~ 0.08	-.07		104.38
1379	17 58.05	066 50.23	00205.1	00012.80-	11.25	620.94	0539.20	101.04	094.05	095.10	~~0.1~~ 0.09	-.07		105.14
1380	17 59.34	066 30.33	00001.0	00006.20	8.29	631.18	0540.34	090.94	090.90	090.91	0.00	.15		99.34
1381	17 59.38	066 30.18	00004.3	00006.40	8.27	631.29	0540.37	091.32	091.18	091.20	0.00	.15		99.60
1382	17 59.43	066 30.05	00003.3	00006.90	8.25	631.56	0540.42	091.45	091.34	091.36	0.00	.15		99.74
1383	17 59.50	066 29.70	00003.3	00005.40	8.19	630.75	0540.48	090.58	090.47	090.49	0.00	.18		98.84
1384	17 59.54	066 29.42	00003.3	00003.60	8.15	629.78	0540.51	089.58	089.46	089.48	0.00	.19		97.80
1385	17 59.55	066 29.21	00001.0	00002.60	8.13	629.24	0540.52	088.81	088.78	088.78	0.00	.20		97.11
1386	17 59.53	066 29.03	00001.0	00001.40	8.13	628.59	0540.50	088.18	088.15	088.15	0.00	.20		96.48
1387	17 59.47	066 28.77	00001.0	00000.30	8.13	628.00	0540.45	087.64	087.61	087.61	0.00	.19		95.93
1388	17 59.38	066 28.62	00001.0	00000.60-	8.14	627.52	0540.37	087.24	087.21	087.21	0.00	.19		95.54
1389	17 59.47	066 28.43	00002.0	00000.70-	8.13	627.46	0540.45	087.20	087.13	087.14	0.00	.18		95.44
1390	17 59.03	066 27.15	00003.3	00005.20-	8.10	625.04	0540.06	085.29	085.17	085.19	0.00	.14		93.41
1391	17 58.93	066 26.88	00001.0	00004.80-	8.11	625.25	0539.98	085.37	085.33	085.34	0.00	.13		93.57
1392	17 58.42	066 26.31	00001.0	00004.10-	8.22	625.63	0539.53	086.20	086.16	086.17	0.00	.11		94.49
1393	17 56.07	066 27.55	00000.7	00010.70-	9.04	622.08	0537.46	084.68	084.66	084.66	0.00	.05		93.75
1394	17 55.68	066 27.42	00000.7	00015.00-	9.15	619.76	0537.12	082.71	082.68	082.69	0.00	.04		91.87
1395	17 55.52	066 27.43	00000.7	00015.80-	9.19	619.33	0536.98	082.42	082.39	082.40	0.00	.03		91.61
1396	17 55.61	066 27.29	00000.7	00013.90-	9.15	620.35	0537.06	083.36	083.33	083.34	0.00	.03		92.51
1397	17 58.60	066 26.45	00001.0	00004.20-	8.18	625.58	0539.69	085.99	085.95	085.96	0.00	-.03		94.10
1398	17 55.42	066 23.14	00000.7	00000.10-	8.99	627.79	0536.89	090.97	090.94	090.95	0.00	.14		100.07

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT	CBA
1399	17 55.83	066 22.12	00001.0	00001.00	8.81	628.38	0537.25	091.22	091.19	091.20	0.00	.11	100.11
1400	17 55.67	066 21.28	00001.0	00000.90	8.82	628.32	0537.11	091.30	091.27	091.28	0.00	.14	100.23
1401	17 55.88	066 21.12	00001.3	00001.30	8.75	628.54	0537.29	091.37	091.32	091.33	0.00	.19	100.25
1402	17 57.83	066 21.68	00000.7	00009.70	8.15	633.07	0539.01	094.13	094.10	094.11	0.00	.20	102.45
1403	17 57.31	066 22.06	00000.7	00005.70	8.31	630.91	0538.55	092.43	092.40	092.41	0.00	.18	100.89
1404	17 57.01	066 22.67	00000.7	00004.30	8.41	630.16	0538.29	091.94	091.92	091.92	0.00	.17	100.50
1405	17 56.52	066 23.42	00000.0	00006.40	8.64	631.29	0537.86	093.43	093.43	093.43	0.00	.16	102.23
1406	17 57.01	066 23.82	00000.0	00008.80	8.48	632.58	0538.29	094.29	094.29	094.29	0.00	.15	102.92
1407	17 57.68	066 25.72	00001.0	00000.90	8.38	628.32	0538.88	089.54	089.50	089.51	0.00	.10	97.98
1408	17 57.59	066 26.00	00002.0	00001.40-	8.30	627.09	0538.80	088.48	088.41	088.42	0.00	.09	95.80
1409	17 58.28	066 26.24	00002.0	00002.90-	8.26	626.28	0539.40	087.06	087.00	087.01	0.00	.09	95.35
1410	17 55.74	066 19.41	00000.5	00008.30	8.73	632.31	0537.17	095.19	095.17	095.17	0.00	-.04	103.86
1411	17 56.25	066 18.08	00000.5	00021.10	8.56	639.21	0537.62	101.64	101.62	101.62	0.00	-.03	110.15
1412	17 57.14	066 23.93	00000.5	00008.60	8.44	632.47	0538.40	094.12	094.10	094.10	0.00	.00	102.54
1413	17 57.27	066 24.17	00001.6	00007.20	8.42	631.72	0538.52	093.36	093.30	093.31	0.00	.00	101.72
1414	17 57.36	066 24.63	00001.6	00003.30	8.44	629.62	0538.59	091.18	091.12	091.13	0.00	.00	99.56
1415	17 57.58	066 24.84	00004.9	00001.20	8.37	628.49	0538.79	090.16	090.00	090.02	0.00	.02	98.39
1416	17 57.65	066 25.09	00001.6	00000.40	8.36	628.06	0538.85	089.36	089.31	089.31	0.00	.02	97.69
1417	17 58.13	066 26.10	00001.6	00002.20-	8.28	626.65	0539.27	087.53	087.47	087.48	0.00	.03	95.78
1418	17 59.23	066 27.26	00001.6	00004.20-	8.08	625.58	0540.24	085.49	085.44	085.44	0.00	.04	93.56
1419	17 59.41	066 27.42	00001.3	00003.10-	8.06	626.17	0540.40	085.89	085.85	085.86	0.00	.04	93.95
1420	17 59.50	066 27.69	00001.3	00002.20-	8.05	626.65	0540.48	086.29	086.25	086.26	0.00	.05	94.35
1421	17 59.54	066 27.97	00001.3	00001.20-	8.06	627.19	0540.51	086.80	086.75	086.76	0.00	.05	94.86
1422	17 57.27	066 52.80	00001.0	00012.70	11.30	634.68	0538.52	096.26	096.22	096.23	0.00	.03	107.55
1423	17 56.64	066 52.43	00002.0	00001.40	12.00	628.59	0537.96	090.82	090.75	090.76	0.00	.17	102.92
1424	17 56.84	066 51.86	00001.0	00000.30	11.92	628.00	0538.14	089.96	089.92	089.93	0.00	.17	102.01
1425	17 57.17	066 51.80	00003.3	00003.00	11.50	629.46	0538.43	091.34	091.23	091.25	0.00	.16	102.89
1426	17 57.23	066 50.73	00002.0	00001.50	11.72	628.65	0538.48	090.36	090.29	090.30	0.00	.15	102.16
1427	17 57.22	066 50.02	00006.6	00005.60-	11.99	624.82	0538.47	086.97	086.74	086.78	0.00	.14	98.87
1428	17 57.25	066 53.24	00001.0	00016.00	11.36	636.46	0538.50	098.06	098.02	098.03	0.00	.06	109.44
1429	17 57.21	066 53.61	00001.0	00017.60	11.27	637.32	0538.46	098.95	098.92	098.92	0.00	.05	110.24
1430	17 57.09	066 53.88	00003.3	00017.80	11.15	637.43	0538.36	099.38	099.27	099.29	0.00	.05	110.47
1431	17 58.51	066 40.79	00001.3	00002.00	10.37	628.92	0539.61	089.44	089.39	089.40	0.00	.00	99.76
1432	17 58.52	066 41.08	00002.0	00001.80	10.33	628.81	0539.61	089.38	089.32	089.33	0.00	.00	99.65
1433	17 58.60	066 41.38	00001.0	00003.00	10.38	629.46	0539.69	089.87	089.83	089.84	0.00	.00	100.21
1434	17 58.65	066 41.62	00001.3	00003.60	10.55	629.78	0539.73	090.17	090.13	090.14	0.00	.00	100.68
1435	17 58.72	066 41.82	00000.7	00003.80	10.67	629.89	0539.79	090.17	090.14	090.14	0.00	.00	100.81
1436	17 58.78	066 42.04	00001.0	00002.60	11.04	629.24	0539.84	089.49	089.46	089.46	0.00	.00	100.50
1437	17 58.92	066 42.24	00000.7	00004.50	10.50	630.26	0539.97	090.36	090.34	090.34	0.00	.00	100.84
1438	17 59.08	066 42.49	00000.0	00006.30	10.13	631.23	0540.11	091.12	091.12	091.12	0.00	.00	101.25
1439	17 59.12	066 42.70	00000.0	00006.20	10.03	631.18	0540.14	091.04	091.04	091.04	0.00	.00	101.07
1440	17 59.35	066 42.74	00002.6	00007.70	10.07	631.99	0540.35	091.89	091.80	091.81	0.00	.00	101.87
1441	17 59.45	066 42.92	00000.0	00008.60	9.92	632.47	0540.43	092.04	092.04	092.04	0.00	.00	101.96
1442	17 59.53	066 43.02	00000.7	00008.50	9.82	632.42	0540.50	091.98	091.96	091.96	0.00	.00	101.78
1443	17 59.89	066 43.15	00011.8	00012.00	9.97	634.31	0540.82	094.60	094.20	094.26	0.00	.00	104.17

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1444	17 59.53	066 43.23	00000.0	00006.80	9.73	631.50	0540.50	091.00	091.00	091.00	0.00	.00		100.73
1445	17 59.62	066 43.43	00001.0	00007.40	9.67	631.83	0540.58	091.34	091.31	091.31	0.00	.00		100.98
1446	17 59.53	066 44.79	00000.7	00007.70	9.65	631.99	0540.50	091.55	091.53	091.53	0.00	.00		101.18
1278	17 58.90	066 31.51	00000.0	00005.00[1]	8.53	625.15	0539.95	085.20	085.20	085.20	0.00	.05		93.89
590	17 59.75	066 29.83	00005.6	00005.80	8.18	630.96	0540.70	090.79	090.60	090.63	0.00	-.02		98.76
591	17 59.85	066 29.82	00009.7	00005.20	8.15	630.64	0540.79	090.77	090.44	090.49	0.00	-.02		98.57
592	18 00.08	066 29.83	00011.6	00005.60	8.12	630.86	0540.99	090.96	090.57	090.63	0.00	-.03		98.66
593	18 00.29	066 29.81	00014.1	00006.30	8.05	631.23	0541.17	091.38	090.90	090.97	0.00	-.03		98.92
594	18 00.45	066 29.74	00016.4	00006.90	8.02	631.56	0541.31	091.79	091.23	091.31	0.00	-.03		99.22
595	18 00.64	066 29.66	00023.8	00008.00	8.00	632.15	0541.48	092.91	092.10	092.22	0.00	-.03		100.07
596	18 00.79	066 29.75	00029.2	00009.60	8.01	633.01	0541.61	094.14	093.15	093.30	0.01	-.03		101.12
597	18 00.92	066 29.78	00037.7	00010.90	8.02	633.71	0541.73	095.53	094.24	094.44	0.02	-.03		102.21
598	18 01.05	066 29.83	00044.5	00012.60	8.03	634.63	0541.84	096.97	095.46	095.68	0.02	-.03		103.44
599	18 01.15	066 29.98	00052.5	00012.50	8.02	634.57	0541.93	097.58	095.79	096.06	0.03	-.03		103.75
600	18 01.23	066 30.62	00058.2	00013.00	8.02	634.84	0542.00	098.31	096.33	096.63	0.03	-.04		104.28
601	18 01.39	066 30.73	00072.8	00014.60	8.02	635.71	0542.14	100.42	097.94	098.31	0.03	-.04		105.89
602	18 01.59	066 30.82	00094.5	00014.30	8.16	635.54	0542.32	102.11	098.89	099.38	0.05	-.05		106.95
603	18 01.74	066 30.87	00085.5	00017.00	8.44	637.00	0542.45	102.59	099.68	100.12	0.04	-.05		108.03
632	17 58.91	066 33.52	00011.4	00018.90—	8.75	617.66	0539.96	078.77	078.39	078.44	0.00	-.03		87.11
633	17 58.75	066 33.46	00007.7	00019.10—	8.77	617.55	0539.82	078.46	078.20	078.23	0.00	-.03		86.94
634	17 58.64	066 33.42	00006.6	00019.40—	8.80	617.39	0539.72	078.29	078.07	078.10	0.00	-.03		86.84
635	18 01.60	066 32.96	00098.1	00006.30[1]	8.19	631.23	0542.33	098.13	094.79	095.29	0.04	-.09		102.97
636	18 01.74	066 32.94	00110.3	00006.90[2]	8.20	631.56	0542.45	099.49	095.73	096.29	0.05	-.09		103.84
637	18 01.92	066 32.92	00124.0	00007.40	8.18	631.83	0542.61	100.89	096.66	097.30	0.06	-.09		104.69
638	18 02.16	066 32.90	00136.3	00007.60	8.19	631.93	0542.82	101.93	097.29	097.98	~~0.1~~ 0.06	-.09		105.33
639	18 02.21	066 32.88	00146.8	00008.30[3]	8.17	632.31	0542.87	103.26	098.25	099.00	~~0.1~~ 0.07	-.09		106.42
640	18 02.38	066 32.93	00157.5	00009.70	8.20	633.07	0543.02	104.87	099.51	100.31	~~0.1~~ 0.07	.00		107.64
641	18 02.56	066 32.98	00170.8	00011.30[4]	8.19	633.93	0543.18	106.83	101.01	101.88	~~0.1~~ 0.08	-.02		109.05
642	18 02.72	066 32.91	00183.2	00012.50	8.17	634.57	0543.32	108.49	102.25	103.18	~~0.1~~ 0.08	.00		110.34
643	18 02.86	066 32.85	00191.6	00014.20	8.15	635.49	0543.44	110.08	103.55	104.53	~~0.1~~ 0.09	.00		111.61
644	18 02.97	066 32.78	00192.7	00015.70	8.14	636.30	0543.54	110.89	104.33	105.31	~~0.1~~ 0.09	.00		112.38
645	18 03.13	066 32.73	00202.7	00016.00[4]	8.18	636.46	0543.68	111.85	104.95	105.98	0.10	.00		112.98
646	18 03.24	066 32.63	00207.1	00017.10	8.16	637.05	0543.78	112.76	105.70	106.76	0.10	.00		113.76
647	18 03.35	066 32.59	00217.7	00017.40	8.22	637.21	0543.87	113.82	106.40	107.52	0.10	.00		114.52
648	18 03.48	066 32.62	00235.0	00018.10	8.23	637.59	0543.99	115.71	107.71	108.91	0.11	.00		115.83
649	18 03.67	066 32.64	00262.0	00017.20	8.30	637.11	0544.16	117.61	108.68	110.02	0.13	.00		116.85
650	18 03.79	066 32.68	00277.7	00016.60	8.33	636.78	0544.26	118.65	109.19	110.60	0.13	.00		117.39
651	18 03.99	066 32.72	00311.4	00014.90[2]	8.37	635.87	0544.44	120.73	110.12	111.71	0.15	.00		118.39
604	18 01.92	066 30.90	00082.1	00020.60	8.07	638.94	0542.61	104.05	101.26	101.68	0.04	-.05		109.24
605	18 02.03	066 30.93	00089.7	00020.90	8.06	639.10	0542.71	104.83	101.78	102.23	0.04	-.05		109.75
606	18 02.10	066 30.93	00094.4	00021.80	8.03	639.58	0542.77	105.69	102.48	102.96	0.05	-.05		110.41
607	18 02.33	066 30.92	00112.5	00024.70	7.99	641.15	0542.97	108.76	104.93	105.50	0.05	-.06		112.81
608	18 02.41	066 30.92	00117.8	00026.50	7.99	642.12	0543.04	110.16	106.15	106.75	0.06	-.06		114.02
609	18 02.48	066 30.87	00123.1	00031.00	8.01	644.54	0543.11	113.02	108.82	109.45	0.06	-.07		116.70
610	18 02.76	066 30.85	00142.1	00030.10	8.02	644.06	0543.35	114.08	109.24	109.96	0.16	-.07		117.03

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .53876 D1 2.67 D2 2.27 BY WLR 0410 07

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
611	18 02.97	066 30.85	00165.9	00026.70	8.04	642.22	0543.54	114.29	108.64	109.49	~~0.1~~ 0.08	-.07		116.53
612	18 03.13	066 30.85	00169.6	00025.70	8.11	641.69	0543.68	113.97	108.19	109.06	~~0.1~~ 0.08	-.07		116.15
613	18 03.26	066 30.84	00172.3	00025.60	8.12	641.63	0543.80	114.05	108.18	109.06	~~0.1~~ 0.08	-.08		116.14
614	18 03.27	066 30.92	00163.1	00026.50 [1]	8.15	642.12	0543.80	113.66	108.11	108.94	~~0.1~~ 0.08	-.08		116.21
615	18 01.26	066 33.14	00073.2	00002.30 [2]	8.22	629.08	0542.03	093.94	091.44	091.82	0.03	-.08		99.71
616	18 01.42	066 33.04	00076.9	00005.20	8.19	630.64	0542.17	095.71	093.09	093.48	0.04	-.09		101.15
617	18 01.13	066 33.21	00059.4	00001.40	8.23	628.59	0541.91	092.27	090.24	090.54	0.03	-.09		98.35
618	18 01.05	066 33.26	00052.6	00000.70	8.24	628.22	0541.84	091.33	089.53	089.80	0.03	-.08		97.66
619	18 00.86	066 33.34	00043.3	00001.90- [1]	8.27	626.82	0541.68	089.22	087.74	087.96	0.02	-.08		96.02
620	18 00.69	066 33.36	00032.9	00003.40-	8.29	626.01	0541.53	087.58	086.46	086.63	0.01	-.08		94.66
621	18 00.58	066 33.42	00026.0	00004.70-	8.31	625.31	0541.43	086.33	085.44	085.57	0.01	-.08		93.66
622	18 00.44	066 33.43	00022.7	00006.60-	8.33	624.28	0541.31	085.11	084.34	084.45	0.01	-.08		92.58
623	18 00.33	066 33.44	00023.9	00008.50-	8.37	623.26	0541.21	084.30	083.49	083.61	0.01	-.07		91.78
624	18 00.20	066 33.45	00019.5	00009.80-	8.39	622.56	0541.09	083.30	082.64	082.74	0.01	-.07		90.95
625	18 00.03	066 33.45	00017.1	00011.80-	8.42	621.48	0540.95	082.14	081.56	081.65	0.00	-.06		89.92
626	17 59.83	066 33.52	00009.1	00013.10-	8.48	620.78	0540.77	080.87	080.56	080.60	0.00	-.06		88.98
627	17 59.67	066 33.56	00007.1	00014.60-	8.51	619.97	0540.63	080.01	079.77	079.80	0.00	-.05		88.23
628	17 59.51	066 33.59	00006.1	00015.70-	8.58	619.38	0540.49	079.47	079.26	079.29	0.00	-.04		87.80
629	17 59.35	066 33.63	00006.4	00018.00-	8.63	618.14	0540.35	078.40	078.18	078.21	0.00	-.04		86.77
630	17 59.20	066 33.63	00012.1	00018.40-	8.69	617.93	0540.21	078.86	078.44	078.50	0.00	-.04		87.09
631	17 59.04	066 33.56	00010.8	00018.70-	8.72	617.77	0540.07	078.71	078.35	078.40	0.00	-.03		87.04

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
660	18 00.17	066 36.11	00034.8	00058.50-	8.76	621.73	0541.07	083.94	082.75	082.93	0.01	-.07		91.43
661	18 00.08	066 35.97	00035.2	00066.80-	8.76	620.86	0540.99	083.18	081.98	082.16	0.01	-.07		90.66
662	17 59.97	066 36.07	00034.5	00068.90-	8.80	620.64	0540.89	082.99	081.82	082.00	0.01	-.06		90.55
663	17 59.91	066 36.21	00031.0	00065.00-	8.82	621.05	0540.84	083.13	082.07	082.23	0.01	-.06		90.82
664	17 59.71	066 36.22	00022.6	00064.70-	8.88	621.08	0540.66	082.54	081.77	081.89	0.00	-.12		90.53
665	17 59.53	066 36.22	00019.0	00066.50-	8.90	620.89	0540.50	082.17	081.53	081.62	0.00	-.12		90.31
666	17 59.37	066 36.22	00015.6	00069.10-	8.97	620.62	0540.36	081.73	081.19	081.27	0.00	-.12		90.04
667	17 59.22	066 36.23	00013.5	00071.80-	9.01	620.34	0540.23	081.38	080.92	080.99	0.00	-.12		89.81
668	17 59.06	066 36.22	00008.5	00073.70-	9.05	620.14	0540.09	080.85	080.56	080.60	0.00	-.12		89.49
669	17 58.95	066 36.19	00006.0	00075.20-	9.09	619.99	0539.99	080.56	080.36	080.39	0.00	-.12		89.33
670	17 58.80	066 36.16	00004.3	00078.90-	9.15	619.60	0539.86	080.14	080.00	080.02	0.00	-.11		89.04
671	17 58.63	066 36.12	00003.0	00083.80-	9.19	619.09	0539.71	079.66	079.56	079.57	0.00	-.11		88.64
672	17 58.44	066 36.08	00003.3	00093.40-	9.26	618.08	0539.54	078.85	078.73	078.75	0.00	-.11		87.88
673	17 58.26	066 36.04	00001.0	00104.40-	9.33	616.94	0539.39	077.65	077.61	077.62	0.00	-.11		86.83
675	17 59.03	066 31.52	00006.1	00019.20-	8.52	625.83	0540.06	086.34	086.13	086.16	0.00	-.04		94.61
676	17 59.21	066 31.58	00008.1	00005.30-	8.48	627.29	0540.22	087.83	087.55	087.60	0.00	-.03		96.00
677	17 59.25	066 31.72	00009.7	00008.80-	8.46	626.92	0540.26	087.58	087.25	087.29	0.00	-.06		95.65
678	17 59.46	066 31.72	00013.3	00004.40	8.42	628.30	0540.44	089.11	088.66	088.72	0.00	-.07		97.01
679	17 59.64	066 31.72	00016.6	00007.50	8.37	628.62	0540.60	089.58	089.01	089.10	0.00	-.07		97.31
680	17 59.78	066 31.72	00021.9	00003.60	8.34	628.22	0540.72	089.56	088.81	088.92	0.00	-.07		97.08
681	17 59.95	066 31.72	00026.8	00000.60	8.30	627.90	0540.87	089.55	088.63	088.77	0.00	-.08		96.85
682	18 00.04	066 31.72	00029.7	00000.30-	8.29	627.81	0540.95	089.65	088.64	088.79	0.01	-.08		96.84
683	18 00.08	066 31.87	00040.5	00012.80-	8.29	626.50	0540.99	089.32	087.94	088.15	0.02	-.08		96.13
684	18 00.12	066 32.03	00031.3	00010.60-	8.28	626.73	0541.02	088.65	087.58	087.74	0.01	-.09		95.76
685	18 00.19	066 31.90	00032.1	00006.50-	8.26	627.16	0541.09	089.09	088.00	088.17	0.01	.07		96.32
686	18 00.39	066 31.91	00035.9	00003.00-	8.21	627.53	0541.26	089.65	088.42	088.61	0.01	.07		96.69
687	18 00.47	066 31.91	00038.2	00003.30-	8.20	627.50	0541.33	089.76	088.46	088.66	0.01	.08		96.73
688	18 00.62	066 31.86	00041.0	00001.00	8.18	627.94	0541.47	090.33	088.94	089.15	0.02	.08		97.18
689	18 00.75	066 31.81	00044.9	00005.20	8.16	628.38	0541.58	091.03	089.50	089.72	0.02	.08		97.72
690	18 00.91	066 31.76	00050.1	00010.00	8.14	628.88	0541.72	091.87	090.17	090.42	0.02	.09		98.38
691	18 01.08	066 31.71	00056.9	00015.50	8.12	629.46	0541.87	092.94	091.01	091.30	0.03	.09		99.19
692	18 01.21	066 31.66	00061.0	00023.70	8.11	630.32	0541.99	094.07	092.00	092.31	0.03	.09		100.17
693	18 01.38	066 31.61	00062.9	00033.60	8.08	631.35	0542.14	095.13	092.99	093.31	0.03	.09		101.13
694	18 01.49	066 31.55	00066.0	00038.20	8.07	631.83	0542.23	095.81	093.56	093.90	0.03	.09		101.69
695	18 01.60	066 31.54	00069.4	00046.50	8.04	632.70	0542.33	096.90	094.54	094.89	0.03	.09		102.64
696	17 58.99	066 38.47	00001.0	00014.40-	9.45	626.34	0540.03	086.41	086.37	086.38	0.00	.02		95.84
697	17 59.08	066 38.43	00004.7	00008.60-	9.43	626.94	0540.11	087.27	087.11	087.14	0.00	.03		96.57
698	17 59.02	066 38.37	00003.9	00003.40-	9.38	627.48	0540.05	087.79	087.66	087.68	0.00	.03		97.07
699	17 59.24	066 38.36	00004.7	00007.00	9.37	628.57	0540.25	088.76	088.60	088.63	0.00	.03		98.00
700	17 59.38	066 38.38	00007.0	00018.40	9.33	629.76	0540.37	090.05	089.81	089.84	0.00	.04		99.18
701	17 59.50	066 38.39	00009.4	00027.10	9.29	630.67	0540.48	091.08	090.76	090.80	0.00	.04		100.09
702	17 59.62	066 38.40	00013.0	00033.30	9.27	631.32	0540.58	091.96	091.52	091.58	0.00	.04		100.83
703	17 59.81	066 38.54	00019.7	00046.50	9.28	632.70	0540.75	093.80	093.13	093.23	0.00	.05		102.46
704	18 00.00	066 38.53	00023.3	00062.40	9.22	634.36	0540.92	095.63	094.84	094.96	0.00	.05		104.11
705	17 59.98	066 38.68	00028.1	00069.00	9.32	635.05	0540.90	096.79	095.84	095.98	0.01	.04		105.19

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411 — 09

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
706	18 00.12	066 38.67	00031.4	00079.20	9.25	636.11	0541.02	098.04	096.97	097.13	0.01	.04		106.25
707	18 00.26	066 38.65	00037.0	00090.30	9.23	637.27	0541.15	099.60	098.34	098.53	0.02	.04		107.59
708	18 00.43	066 38.64	00044.3	00090.90	9.17	637.33	0541.30	100.20	098.69	098.92	0.02	.04		107.88
709	18 00.53	066 38.43	00046.6	00065.70	9.07	634.70	0541.39	097.70	096.11	096.35	0.02	.04		105.20
710	18 00.67	066 38.37	00048.0	00054.10	9.04	633.49	0541.51	096.50	094.86	095.11	0.02	.03		103.73
711	18 00.80	066 38.33	00053.3	00046.40	9.00	632.69	0541.62	096.08	094.27	094.54	0.02	.03		103.28
712	18 00.97	066 38.35	00060.7	00042.00	9.03	632.23	0541.77	096.17	094.10	094.41	0.03	.03		103.13
713	18 01.09	066 38.28	00062.3	00039.70	9.03	631.99	0541.88	095.97	093.85	094.17	0.03	.03		102.88
715	18 01.36	066 38.47	00079.0	00043.20	9.21	632.35	0542.12	097.67	094.97	095.38	0.04	.02		104.16
716	18 01.56	066 38.46	00096.1	00043.60	9.68	632.39	0542.29	099.14	095.87	096.36	0.05	.02		105.52
717	18 01.76	066 38.51	00100.5	00058.00	9.36	633.90	0542.47	100.89	097.46	097.98	0.05	-.04		106.73
718	18 01.94	066 38.49	00109.0	00073.60	9.52	635.53	0542.63	103.16	099.44	100.00	0.05	-.03		108.88
719	18 02.07	066 38.49	00121.9	00088.80	9.18	637.12	0542.74	105.85	101.69	102.32	0.06	-.04		110.77
720	18 02.14	066 38.51	00125.8	00097.00	9.03	637.97	0542.81	107.00	102.72	103.36	0.06	-.03		111.66
721	17 59.62	066 43.90	00000.0	00033.40	9.65	631.33	0540.58	090.75	090.75	090.75	0.00	.12		100.52
722	17 59.72	066 43.89	00005.6	00044.60	9.54	632.50	0540.67	092.35	092.16	092.19	0.00	.11		101.81
723	17 59.93	066 43.85	00008.1	00052.10	9.48	633.28	0540.86	093.19	092.91	092.95	0.00	.10		102.49
724	18 00.08	066 43.84	00009.2	00062.90	9.48	634.41	0540.99	094.29	093.97	094.02	0.00	.10		103.55
725	18 00.27	066 43.83	00014.7	00080.10	9.41	636.21	0541.16	096.44	095.94	096.01	0.00	.09		105.44
726	18 00.43	066 43.83	00017.9	00095.50	9.31	637.81	0541.30	098.20	097.59	097.68	0.00	-.06		106.84
727	18 00.52	066 43.67	00017.7	00108.50	9.38	639.17	0541.38	099.46	098.86	098.95	0.00	-.06		108.18
728	18 00.69	066 43.62	00023.5	00119.50	9.42	640.32	0541.53	101.00	100.20	100.32	0.00	-.07		109.55
729	18 00.84	066 43.57	00026.7	00132.30	9.50	641.66	0541.66	102.51	101.60	101.74	0.01	-.07		111.02
730	18 01.00	066 43.55	00033.3	00145.50	9.49	643.04	0541.80	104.37	103.24	103.41	0.01	-.07		112.65
731	18 01.16	066 43.54	00040.2	00158.90	9.42	644.44	0541.94	106.28	104.91	105.12	0.02	-.07		114.24
732	18 01.33	066 43.54	00043.8	00170.70	9.42	645.67	0542.09	107.70	106.21	106.43	0.02	-.07		115.54
733	18 01.48	066 43.54	00047.0	00181.50	9.56	646.80	0542.22	109.00	107.40	107.64	0.02	-.07		116.87
734	18 01.68	066 43.58	00053.1	00190.20	9.48	647.71	0542.40	110.31	108.50	108.77	0.03	-.07		117.88
735	18 01.89	066 43.58	00060.9	00194.50	9.60	648.16	0542.59	111.31	109.23	109.54	0.03	-.07		118.73
736	18 02.03	066 43.58	00066.3	00198.20	9.63	648.54	0542.71	112.07	109.81	110.15	0.03	-.07		119.34
737	18 02.19	066 43.52	00070.0	00199.30	10.25	648.66	0542.85	112.40	110.01	110.37	0.03	-.07		120.16
738	18 02.32	066 43.43	00088.0	00199.20	10.20	648.65	0542.96	113.97	110.97	111.42	0.04	-.07		121.06
739	18 02.38	066 43.27	00101.7	00194.80	11.15	648.19	0543.02	114.74	111.28	111.80	0.05	-.06		122.32
740	18 02.51	066 43.13	00099.7	00198.70	10.90	648.59	0543.13	114.84	111.44	111.95	0.05	-.06		122.23
741	18 02.65	066 43.07	00106.9	00213.80	10.21	650.17	0543.26	116.97	113.33	113.88	0.05	-.06		123.93
742	18 02.77	066 43.13	00120.0	00220.00	9.94	650.82	0543.36	118.75	114.66	115.27	0.05	-.06		124.49
743	18 02.93	066 43.17	00128.1	00222.00	9.64	651.03	0543.50	119.58	115.22	115.87	0.06	-.06		124.74
744	18 03.10	066 43.23	00125.5	00227.20	9.66	651.57	0543.65	119.73	115.45	116.09	0.06	-.05		125.00
746	18 02.01	066 47.94	00069.6	00147.60	9.44	643.26	0542.69	107.12	104.75	105.10	0.03	.11		114.27
747	18 01.90	066 47.82	00059.1	00143.60	8.90	642.84	0542.59	105.81	103.79	104.10	0.03	.11		112.77
748	18 01.76	066 47.71	00054.0	00134.60	8.90	641.90	0542.47	104.51	102.67	102.95	0.03	.10		111.64
749	18 01.58	066 47.61	00046.4	00122.60	9.10	640.65	0542.31	102.70	101.12	101.36	0.02	.10		110.30
750	18 01.40	066 47.57	00040.0	00108.50	9.29	639.17	0542.15	100.78	099.42	099.62	0.02	.10		108.79
751	18 01.30	066 47.55	00036.4	00099.40	9.05	638.22	0542.06	099.58	098.34	098.53	0.02	.09		107.46
752	18 01.20	066 47.65	00034.0	00091.80	9.08	637.43	0541.98	098.65	097.49	097.67	0.07	.09		106.65

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT	CBA
753	18 01.02	066 47.66	00027.4	00080.60	9.06	636.26	0541.82	097.02	096.09	096.23	0.01	.08	105.22
754	18 00.86	066 47.64	00023.7	00070.80	9.13	635.24	0541.68	095.79	094.99	095.11	0.00	.08	104.20
755	18 00.70	066 47.59	00021.1	00064.30	9.11	634.56	0541.54	095.01	094.29	094.40	0.00	.07	103.47
756	18 00.56	066 47.54	00017.3	00061.30	9.11	634.24	0541.41	094.46	093.87	093.96	0.00	.07	103.05
757	18 00.38	066 47.48	00011.8	00060.50	9.17	634.16	0541.25	094.02	093.62	093.68	0.00	.07	102.86
758	18 00.27	066 47.37	00007.9	00064.30	9.18	634.56	0541.16	094.15	093.88	093.92	0.00	.07	103.13
759	18 00.08	066 47.21	00002.9	00073.60	9.25	635.53	0540.99	094.81	094.72	094.73	0.00	.06	104.03
760	17 59.97	066 47.05	00001.0	00077.10	9.31	635.89	0540.89	095.09	095.06	095.06	0.00	.05	104.42
761	18 01.00	066 50.43	00075.1	00054.10	9.22	633.49	0541.80	098.76	096.20	096.58	0.03	.03	105.42
762	18 00.93	066 50.61	00069.9	00057.90	9.30	633.89	0541.74	098.73	096.35	096.70	0.03	.03	105.65
763	18 00.82	066 50.73	00070.5	00063.50	9.43	634.47	0541.64	099.46	097.06	097.42	0.03	.02	106.48
764	18 00.65	066 50.71	00066.0	00070.70	9.45	635.22	0541.49	099.94	097.69	098.03	0.03	.02	107.13
765	18 00.48	066 50.71	00084.6	00060.50	9.52	634.16	0541.34	100.78	097.90	098.33	0.04	.02	107.40
766	18 00.37	066 50.65	00064.2	00073.10	10.24	635.48	0541.24	100.28	098.09	098.42	0.03	.01	108.31
767	18 00.19	066 50.53	00064.1	00073.60	10.21	635.53	0541.09	100.48	098.29	098.62	0.03	.01	108.48
768	18 00.01	066 50.49	00048.9	00084.30	10.40	636.65	0540.93	100.32	098.66	098.91	0.02	.01	109.05
769	17 59.86	066 50.54	00049.0	00089.20	10.24	637.16	0540.80	100.98	099.31	099.56	0.02	.00	109.53
770	17 59.72	066 50.52	00043.9	00099.90	10.04	638.27	0540.67	101.73	100.23	100.46	0.02	.00	110.25
771	17 59.56	066 50.50	00039.8	00112.70	10.06	639.61	0540.53	102.82	101.47	101.67	0.02	-.01	111.50
772	17 59.41	066 50.31	00039.0	00117.50	10.30	640.11	0540.40	103.38	102.05	102.25	0.02	-.01	112.32
773	17 59.32	066 50.18	00036.9	00124.20	10.59	640.81	0540.32	103.96	102.71	102.89	0.02	-.02	113.26
774	17 59.34	066 49.98	00031.3	00123.70	10.28	640.76	0540.34	103.37	102.30	102.46	0.01	-.03	112.54
775	17 59.29	066 49.76	00028.3	00108.00	10.16	639.12	0540.29	101.49	100.53	100.67	0.01	-.03	110.65
776	17 59.23	066 49.59	00022.6	00092.50	10.06	637.50	0540.24	099.39	098.62	098.73	0.00	-.03	108.65
777	17 59.17	066 49.43	00017.0	00081.10	10.01	636.31	0540.19	097.72	097.14	097.23	0.00	-.04	107.11
778	17 59.14	066 49.23	00014.9	00064.00	10.03	634.52	0540.16	095.76	095.25	095.33	0.00	-.04	105.24
779	17 58.98	066 49.28	00017.8	00070.20	10.12	635.17	0540.02	096.83	096.22	096.31	0.00	-.04	106.30
780	17 58.94	066 49.13	00010.7	00059.50	10.14	634.05	0539.98	095.07	094.71	094.76	0.00	-.04	104.81
781	17 58.92	066 49.00	00005.9	00053.10	10.14	633.39	0539.97	093.98	093.78	093.81	0.00	-.04	103.98
782	17 58.76	066 48.93	00004.8	00050.10	10.23	633.07	0539.83	093.70	093.53	093.56	0.00	-.04	103.72
783	17 58.60	066 48.86	00005.4	00042.40	10.37	632.27	0539.69	093.09	092.91	092.94	0.00	-.04	103.24
784	17 58.42	066 48.78	00004.5	00030.00	10.55	630.97	0539.53	091.87	091.71	091.74	0.00	-.05	102.21
785	17 58.25	066 48.68	00005.1	00016.50	10.76	629.56	0539.38	090.66	090.49	090.52	0.00	-.05	101.20
786	17 58.09	066 48.58	00002.3	00002.80	10.86	628.13	0539.24	089.11	089.03	089.04	0.00	-.05	99.84
788	17 57.99	066 54.50	00001.7	00162.50	10.27	644.81	0539.15	105.82	105.76	105.77	0.00	.11	116.14
789	17 58.16	066 54.49	00002.9	00161.00	10.16	644.66	0539.30	105.64	105.54	105.55	0.00	.11	115.81
790	17 58.33	066 54.48	00006.1	00156.40	10.03	644.18	0539.45	105.31	105.10	105.13	0.00	.11	115.24
791	17 58.48	066 54.47	00009.4	00155.00	9.92	644.03	0539.58	105.33	105.01	105.06	0.00	.10	115.03
792	17 58.61	066 54.46	00013.9	00148.20	9.84	643.32	0539.69	104.93	104.46	104.53	0.00	.08	114.38
793	17 58.75	066 54.46	00020.7	00143.20	9.73	642.80	0539.82	104.93	104.23	104.33	0.00	.09	114.05
794	17 58.91	066 54.47	00019.0	00145.90	9.61	643.08	0539.96	104.91	104.26	104.36	0.00	.08	113.95
795	17 59.11	065 54.47	00020.5	00151.70	9.52	643.69	0540.13	105.48	104.79	104.89	0.00	.07	114.38
796	17 59.31	066 54.47	00022.1	00159.50	9.38	644.50	0540.31	106.27	105.52	105.63	0.00	.06	114.96
797	17 59.48	066 54.46	00021.9	00154.90	9.25	644.02	0540.46	105.62	104.87	104.99	0.00	.06	114.18
798	17 59.63	066 54.47	00029.7	00152.40	9.27	643.76	0540.59	105.96	104.95	105.10	0.01	.05	114.26

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411 11

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT	CBA
799	17 59.63	066 54.67	00022.0	00155.60	9.12	644.09	0540.59	105.57	104.82	104.93	0.00	.05	113.99
800	17 59.82	066 54.68	00018.1	00155.10	9.04	644.04	0540.76	104.98	104.37	104.46	0.00	.05	113.46
801	17 59.98	066 54.67	00023.8	00156.10	9.05	644.14	0540.90	105.48	104.67	104.79	0.00	.05	113.77
802	18 00.07	066 54.67	00046.6	00146.80	9.00	643.17	0540.98	106.57	104.99	105.23	0.02	.05	114.02
803	18 00.25	066 54.67	00040.8	00160.70	8.87	644.63	0541.14	107.33	105.94	106.15	0.02	.05	114.62
804	18 00.39	066 54.67	00041.1	00167.40	8.76	645.32	0541.26	107.93	106.53	106.74	0.02	.04	115.31
805	18 00.45	066 54.48	00037.1	00174.50	8.76	646.07	0541.31	108.25	106.98	107.17	0.02	.03	115.75
807	18 00.77	066 54.47	00052.0	00187.80	8.68	647.46	0541.60	110.76	108.98	109.25	0.03	.03	117.66
808	18 00.93	066 54.43	00061.4	00186.90	8.67	647.36	0541.74	111.40	109.31	109.62	0.03	.03	117.98
810	18 01.05	066 54.25	00076.8	00178.20	8.69	646.45	0541.84	111.83	109.22	109.61	0.04	.02	117.89
811	18 00.45	066 46.31	00001.0	00106.10	9.14	638.92	0541.31	097.70	097.67	097.67	0.00	.03	106.84
812	18 00.58	066 46.36	00004.0	00104.10	9.09	638.71	0541.43	097.66	097.52	097.54	0.00	.03	106.64
813	18 00.73	066 46.37	00005.9	00107.20	9.08	639.04	0541.56	098.03	097.83	097.86	0.00	.04	106.95
814	18 00.78	066 46.33	00008.9	00109.20	9.05	639.25	0541.61	098.48	098.18	098.22	0.00	.04	107.27
815	18 00.76	066 46.21	00008.7	00112.90	9.12	639.63	0541.59	098.86	098.56	098.61	0.00	.05	107.73
816	18 00.91	066 46.17	00016.4	00115.80	9.07	639.94	0541.72	099.76	099.20	099.29	0.00	.06	108.33
817	18 01.05	066 46.26	00026.1	00109.60	9.19	639.29	0541.84	099.90	099.01	099.15	0.07	.06	108.25
818	18 01.23	066 46.15	00046.9	00103.00	9.26	638.60	0542.00	101.01	099.41	099.65	0.02	.07	108.72
819	18 01.28	066 46.02	00138.8	00054.40	9.46	633.52	0542.05	104.53	099.81	100.51	~~0.1~~ 0.06	.07	109.28
820	18 01.37	066 45.96	00080.9	00100.90	9.19	638.38	0542.13	103.87	101.11	101.52	0.04	.08	110.34
821	18 01.51	066 45.87	00098.8	00100.30	9.19	638.32	0542.25	105.37	102.00	102.51	0.05	.09	111.23
822	18 01.66	066 45.85	00076.2	00124.40	9.30	640.83	0542.38	105.62	103.02	103.41	0.04	.09	112.37
823	18 01.75	066 45.88	00088.5	00118.20	9.57	640.19	0542.46	106.06	103.04	103.49	0.04	.10	112.67
824	18 01.84	066 45.92	00099.0	00117.90	10.11	640.15	0542.54	106.92	103.55	104.06	0.05	.10	113.71
901	17 58.19	066 17.56	00007.2	00167.80	8.13	645.37	0539.32	106.72	106.48	106.51	0.00	.04	114.65
902	17 57.26	066 17.29	00002.0	00177.20	8.33	646.35	0538.51	108.03	107.96	107.97	0.00	.06	116.35
903	17 57.39	066 16.48	00006.6	00208.50	8.33	649.62	0538.62	111.62	111.40	111.43	0.00	.08	119.81
904	17 57.64	066 16.47	00010.5	00202.90	8.28	649.03	0538.84	111.18	110.82	110.87	0.00	.08	119.18
905	17 57.88	066 16.45	00015.7	00198.60	8.23	648.58	0539.05	111.01	110.47	110.55	0.00	.08	118.78
906	17 58.35	066 16.38	00041.7	00206.70	8.16	649.43	0539.47	113.89	112.47	112.68	0.02	.09	120.70
907	17 58.49	066 17.08	00033.5	00179.00	8.13	646.54	0539.59	110.10	108.96	109.13	0.01	.10	117.18
908	17 58.26	066 18.07	00008.2	00156.20	8.12	644.16	0539.39	105.55	105.27	105.31	0.00	.09	113.48
909	17 58.84	066 17.12	00040.0	00198.30	8.06	648.55	0539.90	112.42	111.05	111.26	0.02	.09	119.18
910	17 58.94	066 17.37	00040.0	00192.20	8.06	647.92	0539.98	111.70	110.34	110.54	0.02	.08	118.46
911	17 59.28	066 17.34	00048.9	00233.80	8.00	652.26	0540.28	116.58	114.91	115.16	0.02	.06	122.95
912	17 59.28	066 18.05	00047.9	00247.30	8.03	653.67	0540.28	117.89	116.26	116.51	0.02	.05	124.32
913	17 59.03	066 18.37	00023.0	00207.40	8.06	649.50	0540.06	111.60	110.82	110.93	0.00	.05	118.93
914	17 59.70	066 18.03	00069.6	00259.60	8.15	654.96	0540.65	120.85	118.48	118.84	0.03	.05	126.65
915	17 58.49	066 18.67	00009.2	00164.70	8.08	645.04	0539.59	106.32	106.00	106.05	0.00	.02	114.10
916	17 58.76	066 19.10	00007.5	00175.50	8.06	646.17	0539.83	107.05	106.79	106.83	0.00	.02	114.87
917	17 58.82	066 19.67	00005.2	00162.20	8.03	644.78	0539.88	105.39	105.21	105.24	0.00	.01	113.25
918	17 59.06	066 20.13	00016.4	00156.80	8.02	644.22	0540.09	105.67	105.11	105.20	0.00	.01	113.14
919	17 58.78	066 20.47	00012.5	00122.70	8.02	640.66	0539.84	101.99	101.57	101.63	0.00	.00	109.59
920	18 00.23	066 19.86	00174.9	00187.00	8.24	647.37	0541.12	122.71	116.75	117.64	~~0.1~~ 0.08	.00	124.91
921	18 00.37	066 20.62	00157.8	00185.90	8.05	647.26	0541.24	120.86	115.49	116.29	~~0.1~~ 0.07	.01	123.48

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411

STA	LAT	LONG	E	MG/OG	TC	OG	ETH	FAA	BA1	BA2	CC	MT		CBA
922	17 59.64	066 20.73	00092.2	00180.30	7.97	646.67	0540.60	114.74	111.60	112.07	0.05	.01		119.53
923	17 59.13	066 20.83	00043.6	00125.40	7.98	640.94	0540.15	104.89	103.41	103.63	0.02	.02		111.57
924	17 59.13	066 21.06	00038.7	00119.00	7.99	640.27	0540.15	103.76	102.44	102.64	0.02	.02		110.43
925	17 59.50	066 21.21	00061.4	00145.30	7.99	643.02	0540.48	108.32	106.23	106.54	0.03	.02		114.21
926	17 59.87	066 21.12	00099.4	00201.70	7.99	648.91	0540.80	117.46	114.07	114.58	0.05	.02		122.03
927	18 00.61	066 21.11	00143.7	00191.00	8.12	647.79	0541.46	119.86	114.96	115.69	~~0.1~~ .06	.03		123.05
928	17 59.64	066 21.63	00059.1	00155.30	7.92	644.06	0540.60	109.02	107.01	107.31	0.03	.03		114.93
929	18 00.22	066 22.48	00111.5	00184.10	7.86	647.07	0541.11	116.45	112.65	113.22	0.05	.04		120.50
930	17 59.86	066 22.21	00086.3	00175.40	7.89	646.16	0540.80	113.49	110.55	110.99	0.04	.04		118.44
931	17 59.62	066 22.01	00067.9	00130.80	7.92	641.50	0540.58	107.31	104.99	105.34	0.03	.05		112.93
932	17 59.04	066 21.54	00037.1	00088.60	7.97	637.09	0540.07	100.51	099.24	099.43	0.02	.06		107.25
933	17 58.79	066 21.07	00010.8	00104.80	8.00	638.79	0539.85	099.95	099.59	099.64	0.00	.07		107.66
934	17 58.47	066 21.52	00011.2	00068.40	8.03	634.98	0539.57	096.46	096.08	096.14	0.00	.09		104.20
935	17 58.80	066 21.94	00042.0	00051.90	8.01	633.26	0539.86	097.35	095.92	096.13	0.02	.08		103.99
936	17 59.64	066 22.31	00078.1	00116.70	7.89	640.03	0540.60	106.78	104.12	104.52	0.04	.07		112.04
937	17 59.46	066 22.37	00073.8	00084.10	7.94	636.62	0540.44	103.12	100.61	100.98	0.03	.07		108.59
938	17 59.48	066 22.46	00063.3	00063.20	7.95	634.44	0540.46	099.94	097.78	098.10	0.03	.07		105.77
939	17 58.92	066 22.26	00040.4	00051.70	7.99	633.24	0539.97	097.07	095.70	095.90	0.02	.06		103.73
940	17 58.66	066 22.30	00031.2	00042.60	8.03	632.29	0539.74	095.49	094.43	094.58	0.01	.06		102.51
941	17 58.43	066 22.15	00023.0	00041.70	8.06	632.20	0539.54	094.83	094.05	094.16	0.00	.06		102.17
942	~~17 58.88~~	066 22.03	00002.3	00047.10	8.15	632.76	~~0539.93~~	~~093.04~~	~~092.97~~	~~092.98~~	0.00	.03		102.03
943	17 59.92	066 25.53	00004.9	00018.40	7.95	629.76	0540.85	089.37	089.21	089.23	0.00	.00		97.16
944	17 59.65	066 24.96	00055.8	00018.70	7.95	629.79	0540.61	094.43	092.53	092.81	0.03	.00		100.45
945	17 59.94	066 24.94	00068.9	00064.90	7.89	634.62	0540.87	100.24	097.89	098.24	0.03	.00		105.75
946	18 00.10	066 24.88	00075.5	00105.60	8.02	638.87	0541.01	104.97	102.40	102.78	0.03	.00		110.39
947	18 00.43	066 25.52	00094.8	00054.30	7.91	633.51	0541.30	101.13	097.90	098.39	0.05	.01		105.77
948	18 00.77	066 25.28	00122.0	00090.40	7.92	637.28	0541.60	107.16	103.01	103.63	0.05	.01		110.89
949	18 00.40	066 24.01	00110.2	00161.90	7.90	644.75	0541.27	113.85	110.09	110.66	0.05	.02		117.96
950	17 59.91	066 24.39	00075.5	00079.40	7.91	636.13	0540.84	102.40	099.82	100.21	0.03	.02		107.72
951	17 59.33	066 24.98	00045.9	00007.50-	8.01	627.06	0540.33	091.05	089.49	089.72	0.02	.02		97.50
952	18 00.35	066 27.84	00023.3	00012.40	7.97	629.14	0541.23	090.11	089.31	089.43	0.00	.07		97.35
953	18 00.84	066 27.85	00053.5	00065.00	7.98	634.63	0541.66	098.01	096.18	096.46	0.03	.07		104.20
954	18 01.27	066 27.79	00130.2	00149.60	7.96	643.47	0542.04	113.68	109.25	109.91	0.06	.07		117.22
955	18 00.95	066 26.59	00106.0	00091.40	8.04	637.39	0541.76	105.61	102.00	102.54	0.05	.07		110.06
956	18 00.19	066 26.14	00051.5	00009.20	7.96	628.80	0541.09	092.56	090.81	091.07	0.03	.06		98.80
957	18 02.03	066 25.37	00208.3	00102.80	7.92	638.58	0542.71	115.47	108.38	109.44	0.10	.06		116.26
958	18 02.58	066 26.19	00356.6	00034.90	8.37	631.49	0543.19	121.85	109.70	111.52	0.16	.05		117.96
959	18 02.87	066 25.65	00275.9	00092.60	8.03	637.51	0543.45	120.02	110.62	112.03	0.13	.05		118.57
960	18 03.21	066 25.08	00341.9	00088.90	8.06	637.13	0543.75	125.55	113.90	115.65	0.16	.05		121.85
961	18 03.21	066 24.57	00407.1	00052.40	8.09	633.31	0543.75	127.87	114.00	116.07	0.20	.05		121.94
962	18 03.33	066 23.96	00441.6	00046.90	7.97	632.74	0543.86	130.44	115.39	117.65	0.21	.05		123.20
963	18 03.47	066 23.29	00450.1	00056.30	8.07	633.72	0543.98	132.09	116.76	119.06	0.21	.04		124.56
964	18 03.70	066 23.73	~~00588.9~~ 2	00126.50	8.10	641.05	0544.18	~~152.28~~ 2	~~132.22~~ 2	~~135.22~~ 2	~~0.2~~ .17	.04		126.01
965	18 03.95	066 22.47	00279.9	00181.70	8.44	646.82	0544.40	128.75	119.22	120.65	0.14	.04		127.56
966	18 04.07	066 22.03	00301.2	00185.10	8.09	647.17	0544.51	131.00	120.74	122.28	0.15	.03		128.71

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411 13

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CSA
967	18 03.55	066 22.09	00366.1	00119.80	7.98	640.35	0544.05	130.75	118.28	120.14	0.18	.03		126.11
968	18 02.97	066 21.84	00340.2	00120.90	8.00	640.47	0543.54	128.94	117.35	119.09	0.16	.03		125.78
969	18 02.40	066 21.67	00419.0	00056.80	8.24	633.77	0543.04	130.16	115.89	118.03	0.20	.03		123.92
970	18 01.93	066 22.04	00276.9	00104.30	8.67	638.73	0542.62	122.17	112.73	114.15	0.14	.02		121.76
971	18 01.46	066 22.22	00237.2	00118.50	8.12	640.22	0542.21	120.33	112.25	113.46	0.12	.02		120.24
972	18 00.72	066 23.40	00129.6	00186.90	7.80	647.36	0541.55	118.00	113.59	114.25	0.06	-.01		121.32
973	18 01.62	066 23.11	00190.9	00137.50	7.92	642.20	0542.35	117.82	111.31	112.29	0.1 .09	.00		119.14
974	18 01.03	066 22.66	00180.1	00152.90	7.84	643.81	0541.83	118.93	112.80	113.71	0.1 .08	.00		120.56
975	18 00.94	066 23.03	00168.3	00155.80	7.82	644.11	0541.75	118.20	112.47	113.33	0.1 .08	.01		120.22
976	18 00.61	066 22.79	00142.1	00173.30	7.86	645.94	0541.46	117.86	113.01	113.74	0.1 .06	.01		120.82
977	17 59.80	066 22.73	00095.1	00115.80	7.87	639.94	0540.74	108.15	104.91	105.39	0.05	.03		112.76
978	17 59.52	066 22.87	00085.3	00067.00	7.93	634.84	0540.50	102.37	099.47	099.90	0.07	.03		107.39
979	17 59.32	066 23.47	00072.2	00034.40	7.96	631.43	0540.32	097.91	095.45	095.81	0.03	.03		103.41
980	17 59.13	066 22.50	00055.8	00053.70	7.97	633.45	0540.15	098.55	096.65	096.93	0.03	.03		104.62
981	17 58.50	066 22.60	00029.5	00034.70	8.08	631.46	0539.60	094.64	093.63	093.78	0.01	.02		101.72
982	17 58.87	066 23.37	00059.1	00021.40	8.06	630.08	0539.92	095.72	093.71	094.01	0.03	.02		101.75
983	17 58.34	066 23.36	00036.1	00023.00	8.13	630.24	0539.46	094.18	092.95	093.14	0.02	.02		101.08
984	17 58.03	066 22.54	00018.4	00031.20	8.14	631.10	0539.18	093.65	093.02	093.12	0.00	.02		101.18
985	17 57.98	066 23.07	00023.0	00028.90	8.21	630.86	0539.14	093.88	093.10	093.22	0.00	.01		101.32
986	17 57.98	066 23.70	00030.2	00015.20	8.24	629.43	0539.14	093.13	092.10	092.26	0.01	.01		100.34
987	17 57.60	066 23.54	00019.7	00029.50	8.31	630.92	0538.81	093.97	093.30	093.40	0.00	.03		101.62
988	18 02.18	066 36.31	00141.1	00105.80	8.53	638.89	0542.84	109.33	104.52	105.24	0.1 .06	.03		113.02
989	18 03.22	066 29.85	00271.0	00077.70	8.19	635.96	0543.76	117.70	108.47	109.85	0.14	.10		116.62
990	18 03.11	066 29.38	00256.2	00098.20	8.22	638.10	0543.66	118.55	109.82	111.13	0.12	.10		118.02
991	18 03.19	066 28.86	00356.3	00057.80	8.46	633.88	0543.73	123.67	111.53	113.35	0.17	.10		119.92
992	18 02.92	066 28.31	00330.7	00065.70	8.23	634.70	0543.49	122.32	111.06	112.74	0.16	.10		119.23
993	18 02.73	066 27.63	00289.7	00063.90	8.27	634.51	0543.33	118.44	108.57	110.05	0.14	.09		116.79
994	18 02.65	066 26.93	00429.5	00020.80-	8.45	625.67	0543.26	122.83	108.20	110.39	0.21	.09		116.53
995	18 06.32	066 28.11	00521.6	00078.40	9.21	636.03	0546.50	138.61	120.84	123.50	0.25	.08		129.88
996	18 06.31	066 28.22	00518.4	00078.10	9.23	636.00	0546.49	138.29	120.63	123.27	0.25	.08		129.64
997	18 06.69	066 29.02	00593.8	00049.00	8.97	632.96	0546.83	142.01	121.77	124.81	0.28	.07		130.53
998	18 01.21	066 29.06	00072.8	00076.40	7.98	635.82	0541.99	100.68	098.20	098.58	0.03	-.03		106.12
999	18 01.44	066 29.32	00077.4	00104.50	8.07	638.76	0542.19	103.86	101.22	101.61	0.04	-.04		109.21
1000	18 01.87	066 29.51	00122.0	00127.50	8.07	641.16	0542.57	110.07	105.92	106.54	0.05	-.04		113.90
1001	17 58.52	066 25.01	00032.5	00023.50-	8.18	625.39	0539.61	088.83	087.73	087.89	0.01	-.05		95.85
1002	17 58.00	066 25.13	00016.4	00013.10-	8.30	626.47	0539.16	088.86	088.30	088.38	0.00	-.05		96.55
1003	17 57.67	066 25.42	00001.0	00002.10	8.38	628.06	0538.87	089.29	089.25	089.26	0.00	-.05		97.58
1004	17 58.55	066 25.82	00013.1	00025.20-	8.19	625.21	0539.64	086.80	086.36	086.42	0.00	-.05		94.50
1005	17 57.82	066 25.83	00001.0	00000.20-	8.36	627.82	0539.00	088.91	088.88	088.89	0.00	-.05		97.17
1006	17 59.05	066 25.80	00022.3	00028.40-	8.08	624.87	0540.08	086.89	086.13	086.24	0.00	-.04		94.17
1007	17 59.84	066 26.63	00029.5	00016.90-	7.98	626.07	0540.78	088.07	087.06	087.21	0.01	-.04		94.99
1008	17 59.71	066 27.66	00003.9	00006.20-	8.02	627.19	0540.66	086.89	086.76	086.78	0.00	-.03		94.75
1009	18 01.27	066 52.27	00135.5	00077.00	8.84	635.88	0542.04	106.59	101.98	102.67	0.16	.09		110.85
1010	18 01.37	066 52.74	00140.1	00098.90	8.76	638.17	0542.13	109.23	104.45	105.17	0.16	.10		113.25
1011	18 02.26	066 53.28	00137.8	00106.80	8.85	639.00	0542.91	109.06	104.36	105.06	0.16	.11		113.26

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411 — 14

STA	LAT		LONG		E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1012	18	02.67	066	53.18	00231.6	00050.30	8.70	633.09	0543.27	111.61	103.72	104.90	0.12	.12		112.42
1013	18	02.13	066	54.77	00190.6	00123.00	8.58	640.69	0542.80	115.83	109.33	110.31	~~0.1~~ .09	.14		117.96
1014	18	02.15	066	55.29	00190.3	00144.40	8.53	642.92	0542.82	118.01	111.53	112.50	~~0.1~~ .09	.14		120.11
1015	18	02.28	066	55.88	00190.3	00165.60	8.55	645.14	0542.93	120.12	113.63	114.61	~~0.1~~ .09	.15		122.24
1016	18	02.10	066	56.74	00091.9	00223.30	8.19	651.16	0542.77	117.04	113.91	114.38	0.05	.16		122.21
1017	18	01.67	066	56.26	00068.9	00216.80	8.33	650.48	0542.39	114.57	112.23	112.58	0.03	.17		120.70
1018	18	01.99	066	56.43	00029.5	00201.20	8.41	648.86	0542.67	108.96	107.96	108.11	0.01	.17		116.53
1019	18	01.02	066	57.17	00019.7	00214.70	8.35	650.27	0541.82	110.31	109.64	109.74	0.00	.18		[illegible]
1020	18	00.16	066	57.33	00019.7	00223.40	8.76	651.17	0541.06	111.96	111.29	111.39	0.00	.18		120.23
1021	17	58.82	066	57.59	00078.7	00204.90	9.52	649.24	0539.88	116.77	114.09	114.49	0.04	.17		123.74
1022	17	58.26	066	57.70	00141.1	00155.80	10.13	644.11	0539.39	118.00	113.19	113.91	~~0.1~~ .06	.17		125.43
1023	17	57.84	066	55.89	00001.0	00194.60	10.41	648.17	0539.02	109.25	109.21	109.22	0.00	.15		119.78
1024	17	57.68	066	56.22	00049.2	00165.30	10.49	645.11	0538.88	110.86	109.19	109.44	0.02	.16		119.82
1025	17	56.89	066	56.37	00019.7	00141.50	11.06	642.62	0538.18	106.29	105.62	105.72	0.00	.16		116.84
1026	17	57.71	066	55.07	00001.0	00162.40	10.90	644.80	0538.90	105.99	105.96	105.96	0.00	.15		117.01
1027	17	58.21	066	56.14	00069.6	00167.40	10.21	645.32	0539.34	112.53	110.16	110.51	0.03	.14		120.48
1028	17	58.97	066	55.28	00013.1	00193.50	9.78	648.05	0540.01	109.27	108.83	108.89	0.00	.12		118.73
1029	17	58.55	066	54.86	00008.5	00175.80	9.34	646.20	0539.64	107.36	107.07	107.11	0.00	.12		116.53
1030	18	00.95	066	53.90	00059.1	00181.80	8.80	646.83	0541.76	110.64	108.62	108.92	0.03	.02		117.41
1031	18	00.93	066	53.53	00068.9	00172.10	8.94	645.82	0541.74	110.57	108.22	108.57	0.03	.02		117.15
1032	17	58.14	066	52.69	00472.4	00178.50-	11.81	609.20	0539.28	114.37	098.28	100.69	0.23	.09		109.95
1033	17	57.77	066	54.17	00465.9	00170.20-	14.91	610.06	0538.96	114.94	099.07	101.45	0.23	.11		113.26
1034	17	58.64	066	52.74	00616.8	00259.50-	12.02	600.74	0539.72	119.06	098.04	101.19	0.29	.12		109.89
1035	17	59.00	066	52.61	00534.8	00204.10-	11.54	606.52	0540.04	116.81	098.59	101.31	0.25	.13		110.01
1036	17	59.46	066	53.83	00037.7	00129.50- 1	9.49	~~614.31~~ 1	0540.44	~~077.42~~ 1	~~076.13~~ 1	~~076.32~~ 1	0.02	.14		112.80
1037	18	01.90	066	51.42	00118.8	00080.10- 2	8.73	~~619.47~~ 2	0542.59	~~088.06~~ 2	~~084.01~~ 2	~~084.61~~ 2	0.05	.15		109.58
1038	18	03.82	066	51.73	00265.7	00065.20- 3	10.34	~~621.03~~ 3	0544.29	~~101.74~~ 3	~~092.69~~ 3	~~094.05~~ 3	0.16	.16		110.65
1039	18	02.54	066	51.36	00139.8	00116.50- 4	8.72	~~615.67~~ 4	0543.16	~~085.67~~ 4	~~080.90~~ 4	~~081.62~~ 4	~~0.1~~ .06	.17		114.04
1040	18	03.67	066	52.32	00425.8	00029.10-	8.85	624.80	0544.16	120.71	106.20	108.38	0.20	.16		105.01
1041	18	01.68	066	50.62	00081.4	00086.30	8.89	636.85	0542.40	102.11	099.34	099.75	0.04	.15		108.32
1042	18	02.12	066	50.87	00104.0	00131.00	8.79	641.52	0542.79	108.52	104.98	105.51	0.05	.14		113.86
1043	18	02.31	066	49.64	00193.9	00104.00	9.33	638.70	0542.96	113.99	107.38	108.37	0.10	.14		116.75
1044	18	02.25	066	49.00	00202.4	00080.10	9.68	636.21	0542.90	112.35	105.46	106.49	0.10	.13		115.17
1045	18	02.16	066	48.52	00140.1	00099.10	10.45	638.19	0542.82	108.55	103.78	104.49	~~0.1~~ .06	.12		114.29
1046	18	04.04	066	47.26	00357.6	00091.60	10.10	637.41	0544.48	126.57	114.39	116.22	0.18	.11		124.42
1047	18	04.91	066	47.88	00437.3	00037.20	11.89	631.73	0545.25	127.63	112.73	114.96	0.21	.09		124.50
548	17	57.33	066	24.37	00007.6	00027.00	8.43	630.66	0538.57	092.81	092.55	092.59	0.00	-.06		100.92
549	17	57.48	066	24.35	00012.7	00018.80	8.39	629.80	0538.70	092.29	091.86	091.93	0.00	-.07		100.18
550	17	57.64	066	24.34	00016.9	00010.90	8.33	628.98	0538.84	091.73	091.15	091.24	0.00	-.07		99.41
551	17	57.81	066	24.32	00018.3	00006.50	8.29	628.52	0538.99	091.25	090.63	090.72	0.00	-.07		98.85
552	17	57.96	066	24.31	00018.9	00003.90	8.26	628.25	0539.12	090.91	090.26	090.36	0.00	-.07		98.45
553	17	58.10	066	24.30	00025.0	00001.70-	8.23	627.66	0539.25	090.77	089.92	090.04	0.01	-.06		98.08
554	17	58.27	066	24.25	00031.1	00004.00-	8.19	627.42	0539.39	090.95	089.89	090.05	0.01	-.06		98.01
555	17	58.41	066	24.25	00036.4	00005.40-	8.17	627.28	0539.52	091.19	089.95	090.13	0.02	-.06		98.04
556	17	58.57	066	24.25	00044.8	00007.60-	8.15	627.05	0539.66	091.61	090.08	090.31	0.02	-.05		98.15

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSY .10445 D1 2.67 D2 2.27 BY WLR 0411

STA	LAT		LONG		E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		
557	17	58.74	066	24.23	00055.7	00010.40-	8.11	626.75	0539.81	092.18	090.29	090.57	0.03	-.05		98.52
558	17	58.93	066	24.23	00060.4	00005.90-	8.08	627.22	0539.98	092.93	090.87	091.18	0.03	-.05		98.83
559	17	59.08	066	24.13	00064.0	00002.50	8.05	628.10	0540.11	094.01	091.83	092.16	0.03	-.04		99.81
560	17	59.19	066	24.01	00066.8	00011.90	8.02	629.08	0540.20	095.16	092.89	093.23	0.03	-.04		100.84
561	17	59.27	066	23.93	00070.2	00017.30	7.99	629.65	0540.28	095.98	093.59	093.95	0.03	-.03		101.52
562	17	59.36	066	23.83	00072.1	00025.50	7.98	630.50	0540.35	096.93	094.47	094.84	0.03	-.03		102.38
563	17	59.40	066	23.75	00074.7	00029.20	7.97	630.89	0540.39	097.53	094.99	095.37	0.03	-.03		102.90
564	17	59.43	066	23.66	00077.6	00032.40	7.95	631.22	0540.42	098.11	095.46	095.86	0.04	-.03		103.34
565	17	59.45	066	23.52	00076.5	00038.00	7.94	631.81	0540.43	098.58	095.97	096.36	0.04	-.02		103.85
566	17	59.63	066	23.52	00081.1	00055.10	7.91	633.60	0540.59	100.64	097.88	098.29	0.04	-.02		105.73
567	17	59.77	066	23.48	00089.4	00069.90	7.89	635.14	0540.72	102.84	099.79	100.25	0.04	-.02		107.62
568	18	00.06	066	23.37	00103.3	00114.20	7.87	639.77	0540.97	108.52	105.00	105.53	0.05	-.01		112.81
569	17	59.82	066	23.35	00091.9	00081.50	7.89	636.35	0540.76	104.24	101.11	101.58	0.05	-.01		108.94
570	18	00.05	066	25.81	00059.4	00024.20	7.94	630.37	0540.96	095.00	092.97	093.28	0.03	-.01		100.87
571	17	59.92	066	25.88	00051.8	00007.80-	7.96	627.03	0540.85	091.06	089.29	089.56	0.03	.00		97.22
572	17	59.79	066	25.98	00049.8	00018.90-	7.98	625.87	0540.73	089.82	088.13	088.38	0.02	-.01		95.08
573	17	59.68	066	26.05	00041.3	00022.10-	8.00	625.53	0540.64	088.78	087.37	087.58	0.02	-.01		95.34
574	17	59.51	066	26.17	00032.9	00027.50-	8.02	624.97	0540.49	087.58	086.46	086.63	0.01	-.01		94.46
575	17	59.36	066	26.27	00021.4	00027.60-	8.05	624.96	0540.35	086.62	085.89	086.00	0.00	-.01		93.93
576	17	59.21	066	26.38	00010.6	00025.10-	8.07	625.22	0540.22	086.00	085.63	085.69	0.00	-.01		93.69
577	17	59.06	066	26.49	00005.1	00024.10-	8.07	625.32	0540.09	085.71	085.54	085.56	0.00	-.01		93.60
578	17	58.93	066	26.57	00003.0	00022.70-	8.10	625.47	0539.98	085.78	085.67	085.69	0.00	-.01		93.76
579	17	58.81	066	26.67	00000.7	00021.60-	8.13	625.58	0539.87	085.78	085.75	085.76	0.00	-.01		93.87
580	17	59.52	066	28.22	00001.0	00003.00-	8.09	627.53	0540.50	087.13	087.10	087.10	0.00	.04		95.23
581	17	59.67	066	28.22	00004.9	00002.20-	8.08	627.61	0540.63	087.44	087.28	087.30	0.00	.05		95.41
582	17	59.84	066	28.22	00009.0	00002.00-	8.04	627.63	0540.78	087.70	087.39	087.44	0.00	.05		95.48
583	17	59.99	066	28.23	00014.3	00000.10-	8.02	627.83	0540.91	088.27	087.78	087.85	0.00	.05		95.85
584	18	00.17	066	28.18	00016.0	00006.80	7.99	628.55	0541.07	088.99	088.44	088.52	0.00	.06		96.49
585	18	00.38	066	28.17	00028.9	00014.40	7.98	629.34	0541.25	090.81	089.82	089.97	0.01	.06		97.85
586	18	00.43	066	28.32	00033.8	00014.60	7.92	629.36	0541.30	091.24	090.09	090.26	0.01	.06		98.11
587	18	00.57	066	28.29	00041.9	00024.50	7.96	630.40	0541.42	092.92	091.49	091.71	0.02	.06		99.49
588	18	00.72	066	28.27	00047.1	00038.70	7.97	631.88	0541.55	094.76	093.15	093.39	0.02	.07		101.17
652	18	01.14	066	36.48	00066.2	00017.20	8.66	629.64	0541.92	093.95	091.69	092.03	0.03	-.10		100.22
653	18	01.13	066	36.25	00058.4	00020.00	8.63	629.93	0541.91	093.51	091.52	091.82	0.03	-.10		100.02
654	18	01.00	066	36.28	00052.9	00009.10	8.63	628.79	0541.80	091.97	090.17	090.44	0.03	-.09		98.68
655	18	00.90	066	36.28	00051.0	00001.40-	8.66	627.69	0541.71	090.78	089.04	089.30	0.03	-.09		97.58
656	18	00.87	066	36.09	00056.0	00010.10-	8.69	626.79	0541.69	090.37	088.47	088.75	0.03	-.08		97.03
657	18	00.68	066	36.10	00051.8	00029.00-	8.67	624.81	0541.52	088.17	086.40	086.67	0.03	-.09		94.95
658	18	00.46	066	36.14	00046.0	00046.00-	8.72	623.04	0541.32	086.05	084.48	084.71	0.02	-.08		93.10
659	18	00.31	066	36.25	00040.8	00051.40-	8.77	622.47	0541.19	085.12	083.73	083.94	0.02	-.07		92.41
1048	18	05.82	066	47.74	00590.9	00054.80-	13.91	622.12	0546.06	131.66	111.53	114.55	0.28	.08		125.24
1049	18	00.62	066	48.01	00017.7	00058.40	9.35	633.94	0541.47	094.14	093.54	093.63	0.00	.05		102.94
1050	18	01.23	066	46.90	00059.1	00079.60	9.22	636.15	0542.00	099.71	097.69	098.00	0.03	.02		106.90
1051	18	00.65	066	45.86	00009.8	00118.40	9.76	640.21	0541.49	099.64	099.31	099.36	0.00	.10		107.17
1052	18	00.32	066	45.48	00046.9	00083.10	9.56	636.52	0541.20	099.73	098.14	098.37	0.02	.11		107.77

PUERTORICO PONCEBASIN 63 DOWNTOWN PONCE GBV 978627.84 MSV .10445 D1 2.67 D2 2.27 BY WLR 0411

STA	LAT	LONG	E	MG/OG	TC	OG	FTH	FAA	BA1	BA2	CC	MT		CBA
1053	18 00.52	066 44.28	00023.9	00098.30	9.41	638.11	0541.38	098.98	098.17	098.29	0.00	.11		107.69
1054	18 03.93	066 43.68	00246.1	00137.20	10.16	642.17	0544.39	120.94	112.56	113.81	0.12	.12		[illegible]
1055	18 04.52	066 43.81	00341.5	00080.20	12.33	636.22	0544.91	123.45	111.81	113.55	0.16	.13		124.11
1056	18 04.23	066 39.96	00413.4	00038.10	9.55	631.82	0544.65	126.07	111.98	114.09	0.20	.13		[illegible]
1057	18 04.32	066 39.05	00415.7	00032.50	10.18	631.23	0544.73	125.61	111.45	113.57	0.20	.12		121.55
1058	18 05.10	066 39.25	00613.2	00070.70-	12.04	620.46	0545.42	132.74	111.85	114.98	0.29	.11		123.71
1059	18 02.56	066 38.68	00171.6	00122.10	9.09	640.59	0543.18	113.56	107.71	108.59	~~0.1~~ .08	.10		116.82
1060	18 00.94	066 38.82	00065.3	00059.60	9.13	634.07	0541.75	098.47	096.24	096.58	0.03	.09		105.43
1061	18 00.77	066 38.01	00044.6	00030.40	9.01	631.02	0541.60	093.62	092.10	092.33	0.02	.08		101.17
1062	18 00.54	066 37.61	00024.6	00017.40	8.89	629.66	0541.39	090.58	089.74	089.87	0.00	.07		[illegible]
1063	17 58.16	066 40.28	00000.0	00016.30-	10.24	626.14	0539.30	086.84	086.84	086.84	0.00	.05		[illegible]
1064	17 58.34	066 40.61	00001.3	00008.80-	10.25	626.92	0539.46	087.59	087.54	087.55	0.00	.04		[illegible]
160	17 53.22	066 31.72	2.0		12.35	613.81	534.97	79.83	79.76		0.00			92.11
161	17 54.06	066 31.22	1.0		11.08	613.69	535.71	78.07	78.04		0.00			87.12