



ENVIRONMENTAL JUSTICE REPORT



Improvements to PR-2, PR-2R and San Juan St.
La Vita Intersection, Km. 153.90
Mayaguez Pueblo Ward
Mayaguez, PR 00681 & 00682

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TABLE OF CONTENTS

LIST OF FIGURES.....	ii
1.0 INTRODUCTION.....	1
1.1 Definition of Environmental Justice.....	1
1.2 Legal and Regulatory Authority.....	2
1.3 Environmental Justice Report and Environmental Impact.....	3
2.0 ANALYSIS OF ENVIRONMENTAL JUSTICE IMPACTS.....	5
2.1 Affected Area.....	5
2.2 Minority Population.....	6
2.3 Low-Income Population.....	7
2.4 Population Age.....	8
2.5 Population Density.....	9
2.6 Environmental Factors.....	10
3.0 CONCLUSIONS.....	14
4.0 REFERENCES.....	15

TABLES

- Table 1 - Surrounding Neighbors
- Table 2 - 2010 Hispanic or Latino Population
- Table 3 - Median Household Income and Poverty Ratio
- Table 4 - Population Distribution by Age, 2010
- Table 5 - Population and Housing Density, 2010

LIST OF FIGURES

- Figure 1 Location and Topographic Quadrangle
- Figure 2 Map of Alternative 6 – Proposed Project
- Figure 3 Aerial Photograph from 2017
- Figure 4 Low-Income Percentage - Municipality of Mayaguez
- Figure 5 Under 5 and Over 64 Percentage - Municipality of Mayaguez
- Figure 6 Population Density, 2010 US Census - Municipality of Mayaguez

1.0 INTRODUCTION

This study has been prepared to evaluate the environmental justice issues associated with the proposed improvements to PR-2 and PR-2R, University of Puerto Rico-Mayaguez Campus (RUM for its initials in Spanish), San Juan Street, La Vita Intersection, at Kilometer 153.9, inside the Mayaguez Urbana Ward, inside the Municipality of Mayaguez, Puerto Rico, see **Figure 1** Location and Topographic Quadrangle. Mayaguez is the seventh largest Municipality of Puerto Rico.

The Environmental Quality Board (EQB) requires the preparation of an analysis of aspects of environmental justice, including a discussion of the following parameters: population distribution by ethnic groups and population distribution by socioeconomic parameters.

The United States Census Bureau (U.S. Census) is part of the United States Department of Commerce. The most recent U.S. Census was completed in 2010, which is the main source of data used in this Environmental Justice Report.

For the preparation of this analysis, population data and various databases were researched and obtained from the U.S. Census, the Census Office of the Puerto Rico Planning Board (PRPB), United States Environmental Protection Agency (EPA), including the EPA's Environmental Justice Screen (EJScreen).

1.1 Definition of Environmental Justice

The term *Environmental Justice* has been defined by the EPA's Office of Environmental Justice as:

The fair treatment and meaningful involvement of all people regardless of race, color, nationality, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Fair treatment means that no group of persons, including a racial, ethnic or socioeconomic group, will bear an unequal burden of negative environmental impact because of an industrial, municipal and commercial operation or the execution of any federal, state or local program or policy. The aim of fair treatment is not to transfer risks between populations, but to identify potentially high and adverse effects and to identify alternatives that can mitigate these effects.

Significant involvement means that:

- 1) Potentially affected residents of a community have an appropriate opportunity to participate in the decisions of any proposed activity that affects their environment and / or their health;
- 2) The contribution of the public can influence the decision of the regulatory agency;
- 3) The concerns of all involved participants will be considered in the decision-making process; and
- 4) Decision makers will seek and facilitate the involvement of those potentially affected.

In short, environmental justice is the goal to reach for all communities and people across the nation. Environmental Justice can be achieved when everyone, regardless of race, culture, or income, enjoys a sense of protection towards the risks to the environment and health, and are able to participate in the decision-making process.

1.2 Legal and Regulatory Authority

Executive Order 12898 of February 11, 1994, main objective is to ensure that "*each federal agency includes achieving environmental justice as part of its mission by appropriate identification and treatment of effects on human health or the environment that are disproportionately high or adverse in their programs, policies and activities in minority and low-income populations ...*".

This Environmental Justice Report was prepared to assist the Puerto Rico Department of Transportation (DTOP for its initials in Spanish) and the Puerto Rico Highway and Transportation Authority (ACT for its initials in Spanish).

This study was prepared following the Environmental Justice Guidance from EPA's National Environmental Policy Act (NEPA).

This included: The identification of areas where actions could disproportionately and adversely affect human health and the environment of minorities or low-income communities. During the review of the SIX (6) alternatives of this proposed project, the presence of minority and low-income communities was identified and a determination was completed to see if these communities would suffer adverse effects on human health or the environment due to this project.

The effects of the proposed action will often vary depending on the distance the community is from the place of action and the type of effect created by the action, for example, air or water pollution, or an increase in traffic congestion. The effects on the community should be discussed in terms of reasonable increases from the proposed action.

1.3 Environmental Justice Report and Environmental Impact

In preparing this Environmental Justice Report for this project, the first step taken was a selection of environmental justice concerns. This section describes the two-step selection process.

The first step in identifying possible environmental justice concerns is an analysis to determine whether there is a low-income or minority population. If there is no low-income or minority population, then these populations are not adversely affected. In this case, low-income populations exist, thereby necessitating going to the second step.

The second step included initiating the analysis to: identify and evaluate potentially disproportionately high and adverse environmental or health effects; promoting public participation to gain a more complete understanding of potential environmental justice issues; and the development of alternatives and potential mitigation options, if necessary.

Section 2.0 discusses the analysis of the potential environmental justice impacts.

2.0 ANALYSIS OF THE ENVIRONMENTAL JUSTICE IMPACTS

2.1 Affected Area

One of the most important tasks in the development of an environmental justice study is the identification of the affected area. This is the basis for the identification of minority and low-income communities.

For purposes of this report, the affected community is defined as *Barrio Mayaguez Urbana* (or Mayaguez Urbana Ward), along PR-2 and PR-2R from approximately Kilometer 52 to 54 (Km. 52.0 to Km. 54.0).

According to the U.S. Census, the Municipality of Mayaguez occupies an area of approximately 274.08 square miles. Mayaguez is composed of 77.65 square miles of land and 196.44 miles of water area. The Mayaguez Urbana Ward is composed of 20.95 square miles of land and 2.20 miles of water area.

The PR-2, PR-2R and San Juan Street Improvement Project includes the La Vita Intersection in front of UPR-RUM. There are currently SIX (6) alternatives for this project. The current preferred version is Alternative 6.

Figure 2 shows a map of Alternative 6, marking the area of the project Proposed Project.

Figure 3 presents a 2017 aerial photo indicating surrounding industrial, commercial, and residential areas including various urbanizations (Urb.).

Table 1 below lists the surrounding institutional, industrial, commercial, and residential areas.

Table 1 – Surrounding Neighbors

Direction	Surrounding Neighbors
North	<i>Condominio El Castillo and Mansiones de España</i>
North-east	Urb. Mayaguez Terrace and The Mayaguez Resort & Casino
South-east	Mayaguez Town Center, Puma SS, <i>Compañía Cervecera de PR</i> , & UPR-RUM
South-west	Public Housing Mar & Sol; Urb. La Rivera, & Ensanches Ramírez, University Plaza; and the Dr. Pedro Perea Fajardo Vocational School

2.2 Minority Population

The affected community is located within the Commonwealth of Puerto Rico, which is a predominantly Hispanic territory of the United States. According to the 2010 Census, approximately 98% of Puerto Rico's population is Spanish-speaking and of Hispanic origin. Most non-Spanish speakers are Caucasian from the United States or Europe and tend to work and live in the higher income areas in San Juan.

In the area under study there are no concentrated areas of non-Hispanic minority populations. As defined in the justice guides, this affected area has a unique circumstance where a minority group constitutes the majority population. Since this minority group is the majority population through the Commonwealth of Puerto Rico, it can be concluded that there are no minority populations within the affected area.

Table 2 includes ethnic data for the Municipality of Mayaguez and Mayaguez Urbana Ward compared with the Municipality of San Juan and the Island of Puerto Rico.

Table 2 - 2010 Hispanic or Latino Population

Area	Total Population	Hispanic or Latino Population	Percent
Mayaguez	89,080	88,132	98.9
Mayaguez Zona Urbana	70,463	69,731	99.0
San Juan	395,326	388,186	98.2
Puerto Rico	3,725,789	3,547,288	95.2

2.3 Low-Income Population

The U.S. Census has identified poverty thresholds for the United States. The median family income in Puerto Rico was \$19,350, based on the U. S. Census, 2011 to 2015 American Community Survey (ACS), five (5) year estimates.

Demographic reports from the Municipality of Mayaguez indicate that 51.1% individuals are below the poverty line, while the average for Puerto Rico is 45.5 %. For the Mayaguez Urbana Ward the percent of individuals living below the poverty line is a little higher at 53.3 %.

Table 3 shows the average annual income and percent of low-income households.

Table 3 - Median Annual Household Income & Poverty Ratio (2015 estimate)

Area	Median Household Income	Percent of Individuals living below the poverty Line
Mayaguez	\$14,871	51.1
Mayaguez Urbana Ward	\$14,095	53.3
San Juan	\$21,243	42.3
Puerto Rico	\$19,350	45.5

These data show that the average income of the residents of Mayaguez Urbana Ward is slightly below the average income for the Municipality of Mayaguez. **Figure 4** shows the low-income percentages for Mayaguez. *Therefore, the Municipality of Mayaguez and the Mayaguez Urbana Ward are below the median household income and have a higher percentage of people living under the poverty line when compared with the entire Island of Puerto Rico.*

2.4 Population Age

The elderly population and children are more susceptible to risks when taking into account the health conditions of the elderly and the potential exposure of the young population. In addition, the immaturity of children's immune system makes them more susceptible to the effects of toxic substances.

According to data obtained from the US Census, the 65 and over population for Puerto Rico is 1.7%, while the population of children under the age of five (5) is 6%.

The percentages for the Municipality of Mayaguez and Mayaguez Urbana Ward are very similar, ranging for the 65 and over, from 2.1% to 2.3%, while the population of children under the age of five (5) ranges from 5.1% to 5.2%. The Mayaguez numbers show a slightly higher number of elderly, but a slightly lower number of younger children when compared with the Island of Puerto Rico data. Basically however, the numbers comparable.

Table 4 presents the 2010 U.S. Census data regarding this segment of the vulnerable population analyzed.

Table 4 - Population Distribution by Age, 2010

Area	Total Population	Population Less than 5 years old.	Population Greater than 65 Years old
Mayaguez	89,080	4,626	1,906
Mayaguez Urbana Ward	70,436	3,622	1,632
San Juan	395,326	22,660	10,545
Puerto Rico	3,725,789	224,756	62,596

Figure 5 shows the under-five (5) years old and over 64 years old percentages for Mayaguez.

For these reasons, it is understood that the project will not disproportionately affect groups at ages that would represent an elevated risk.

2.5 Population Density

High population densities mixed with industrial sites and pollutants typical of urban areas can cause a greater effect than individually. This is especially true if an industry is located in a densely populated area.

The proposed project is located in the Municipality of Mayaguez, inside the Mayaguez Urbana Ward which could be considered a densely populated area. However, the proposed project, including its SIX (6) alternatives, does not contribute the same and an industrial site would in the same area.

The average population density for the island of Puerto Rico is 1,088.2 people per square mile, according to the 2010 Census. The highest population density exists in the Municipality of San Juan with 8,262.3 people per square mile and the lowest in the Island Municipality of Culebra with 156.4 people per square mile.

However, the population density for the Municipality of Mayaguez is 1,147.3 people per square mile of land, while the population density for the Mayaguez Urbana Ward is 3,362.8. This represents a high population density of about 4,899.5 per square mile of land, but less than the population density of San Juan.

Figure 6 illustrates the Population Density for the Municipality of Mayaguez from the 2010 US Census.

Based on this data, it can be concluded that the population density of the affected area is not high when compared to the density of the Municipality of San Juan, and is relatively comparable to the density for the Island of Puerto Rico, as seen on **Table 5 – Population and Housing Density, 2010**.

Table 5 – Population & Housing Density, 2010

Area	Population (Density per Sq. Mile of Land)	Housing Units (Density per Sq. Mile of Land)
Mayaguez	1,147.3	551.5
Mayaguez Urbana Ward	3,362.8	1,653.3
San Juan	8,262.3	4,178.2
Puerto Rico	1,088.2	478.1

Therefore, this project is not expected to negatively affect areas with high population concentrations.

2.6 Environmental Factors

There are three (3) areas that were investigated regarding environmental factors. The first being air emissions, the second being noise and the third being industrial or other type of environmental handlers and/or dischargers of pollutants or potential contaminants.

No significant impacts were identified to the proposed project related to vacant lots or brownfields.

One of the potential impacts that the proposed project could have on residential areas close to it are air emissions. Currently, the EQB operates an Air Quality Station #59 that was located at *Nenadich* Street in 2016, but is in the process of moving to UPR-RUM in 2017. This station monitors particulate matter (PM) at 2.5 microns (PM_{2.5}).

An ozone monitor was also just recently added in 2017, at the new UPR-RUM Station, however, there is no data publically available yet. The other air pollution parameters that include: lead, sulfates, nitrates and carbon monoxide are sampled at other stations on the island, but not in Mayaguez.

Twenty-four (24) hour average, maximum value recorded in 2014 was a PM_{2.5} of 10.2 micrograms per cubic meter (µg/m³). The result is below the EPA's National Ambient Air Quality Standards (NAAQS). To help understand this number, a PM_{2.5} over 35 µg/m³ would be considered un-healthy for sensitive groups. For example, a sensitive group would include the less than five (5) years old and the over 65 year's old age groups.

No significant change in concentration of pollutants is expected due to this projects construction or implementation. The areas surrounding the project will not be negatively impacted.

Another possible impact of the project on the surrounding areas is the noise level. Current noise levels will be temporarily exceeded during the construction phase of the project

The Mayaguez Urbana Ward would be impacted the most because the proposed project that includes the improvement of PR-2 and PR-2R goes right through the middle of the Mayaguez Urbana Ward.

During the operation stage, noise levels will return to current levels since the project is already located in a major highway area which noise levels will not be significantly impacted or changed by the improvements to PR-2 and PR-2R.

Compañía Cervecera de Puerto Rico (formerly known as *Cervecería India*) is located along the south-eastern portion of the project, south of UPR-RUM, just north of the *Rio Yaguez*. This is an industrial facility that has a Title V Air Emission Permit making it a major source of air pollution in the area. This regulated facility also manages hazardous materials and discharges waste water and storm water, under permit, to the *Rio Yaguez*.

There are two (2) malls in the immediate vicinity of the proposed project. The first is the University Plaza located immediately south-west of PR-2, just north of the UPR-RUM. University Plaza has several fast food restaurants and a Walgreens which also manages hazardous materials. The University Plaza marginal road will be directly affected, for the better, by this project. The second mall is Mayaguez Town Center (also known as the Mayaguez Shopping Center) located between PR-2 and PR-2R, just south of UPR-RUM.

There are two (2) schools that are next to the proposed project. They include UPR-RUM located at the center of the proposed project, which has managed various hazardous materials and the Dr. Pedro Perea Fajardo Vocational High School, located at PR-2 and Llorens Torres Street, south-west of UPR-RUM.

The following residential and tourist areas that are naturally influenced by the proposed project have been examined. They include: Urb. Mayaguez Terrace; the Mayaguez Resort & Casino; La Rivera; Ensanches Ramírez; Residences - Mar y Sol Public Housing Project; *Condominio El Castillo* and *Mansiones de España*.

As part of this Environmental Justice Report, the potential environmental impacts of the SIX (6) alternatives of the proposed project have been evaluated.

The SIX (6) alternatives have the same alignment however, their geometry varies at intersections and in extension of elevations. Based on this we are clarifying that for our Environmental Justice Report takes account of the impact of the SIX (6) proposed alternatives.

This review has been completed in an environmentally responsible way to help minimize potential negative environmental impacts of the area and thus avoid a disproportionate impact to low-income or densely populated areas.

3.0 CONCLUSIONS

Based on the analysis of the affected area, population age, minority and low-income populations or environmental factors, this Environmental Justice Report has reached the following conclusions:

Within the project area there are no concentrated populations of minorities, so there are no areas "where actions can have disproportionately high and adverse effects on health and the environment in minority communities."

The element of this project that involves land use occurs specifically at the proposed locations and are not expected to negatively affect any of the low-income areas, susceptible population ranges or have an effect on the density of the population.

There are no construction activities that would directly impact the low-income areas. The improvement of PR-2 is expected to help alleviate traffic flow, traffic congestion and easier access to the public use, institutional, residential and commercial areas in the immediate vicinity and in the surrounding area of the SIX (6) alternatives of the proposed project.

As a result of this Environmental Justice Report, no significant negative environmental factors were identified.

Based on these findings, there are no areas "where actions can have disproportionately high and adverse effects on health and the environment in low-income communities."

Based on this information and the analysis conducted as part of this Environmental Justice Report, there is no need to develop additional analysis of environmental justice issues for this project.

4.0 REFERENCES

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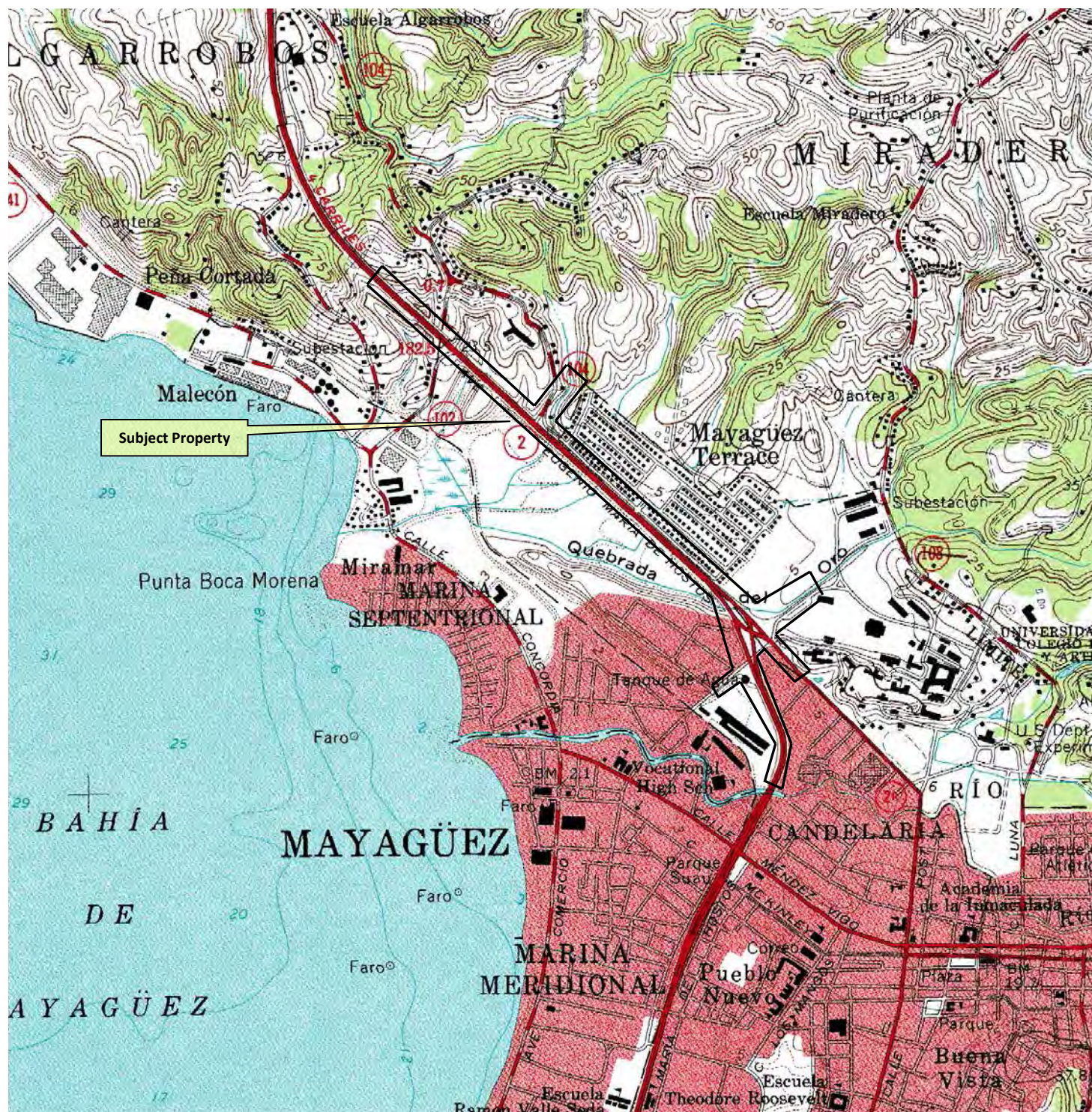
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Figures



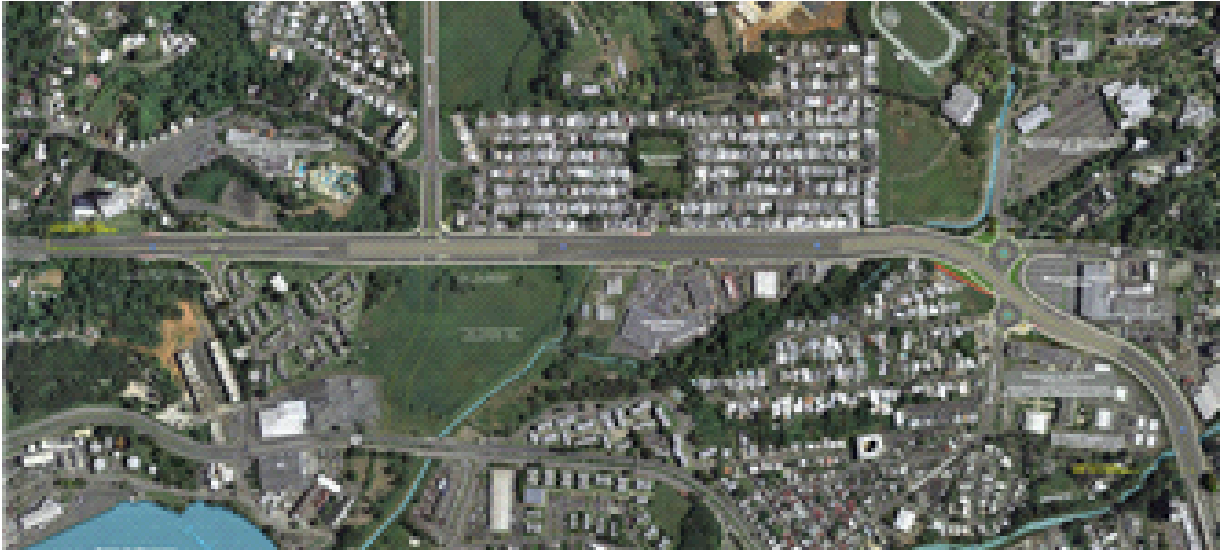
Topographic Map

Reference: USGS Mayaguez Quadrangle, 1964.

FIGURE 1



RAF Environmental Consultants



Project Layout - Alternative 6

Reference: ACT & PRHTA, Schematic

FIGURE 2



RAF Environmental Consultants



ACT Improvements to PR-2

La Vita & San Juan St.
1-27-2017



Legend

- Academia Inmaculada Concepcion Secundaria
- Brazo Gitano Franco
- CE-RUM2 OBSERVATION WELL MAYAGUEZ (
- Cervecera de Puerto Rico
- Feature 7
- Hotel Mayaguez Resort and Casino
- Mayaguez Resort & Casino
- Mayagüez Zoo
- Parada de Trolley
- Puerto Rico
- Ramirez Agrait - Vista Verde
- Sector Trastalleres
- U.S Customs Mayaguez Puerto Rico
- Walgreens

Google earth

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© 2017 Europa Technologies

3000 ft

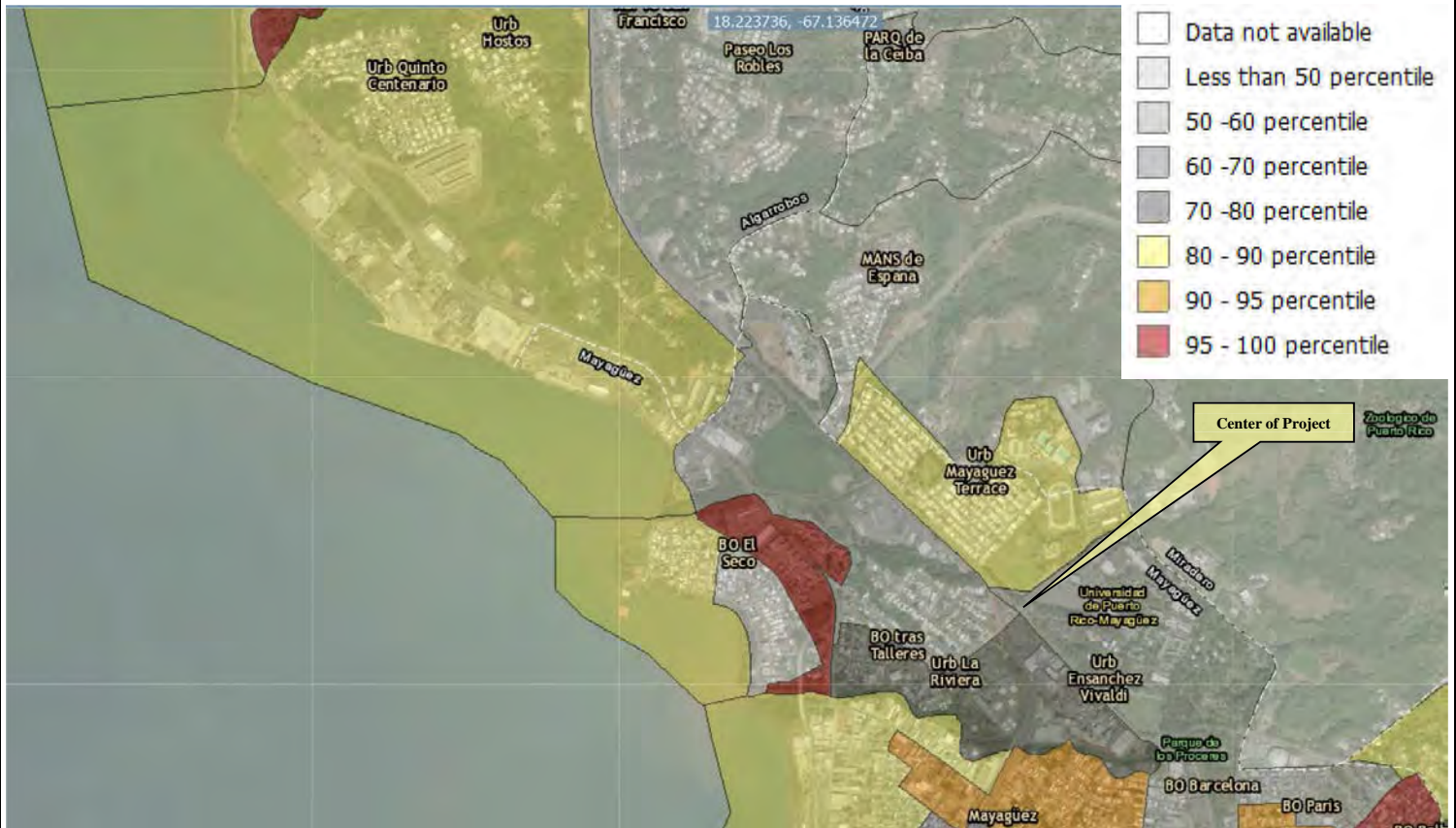
Aerial Photo – January 2017

Reference: Google Earth, July 2017.

FIGURE 3



RAF Environmental Consultants



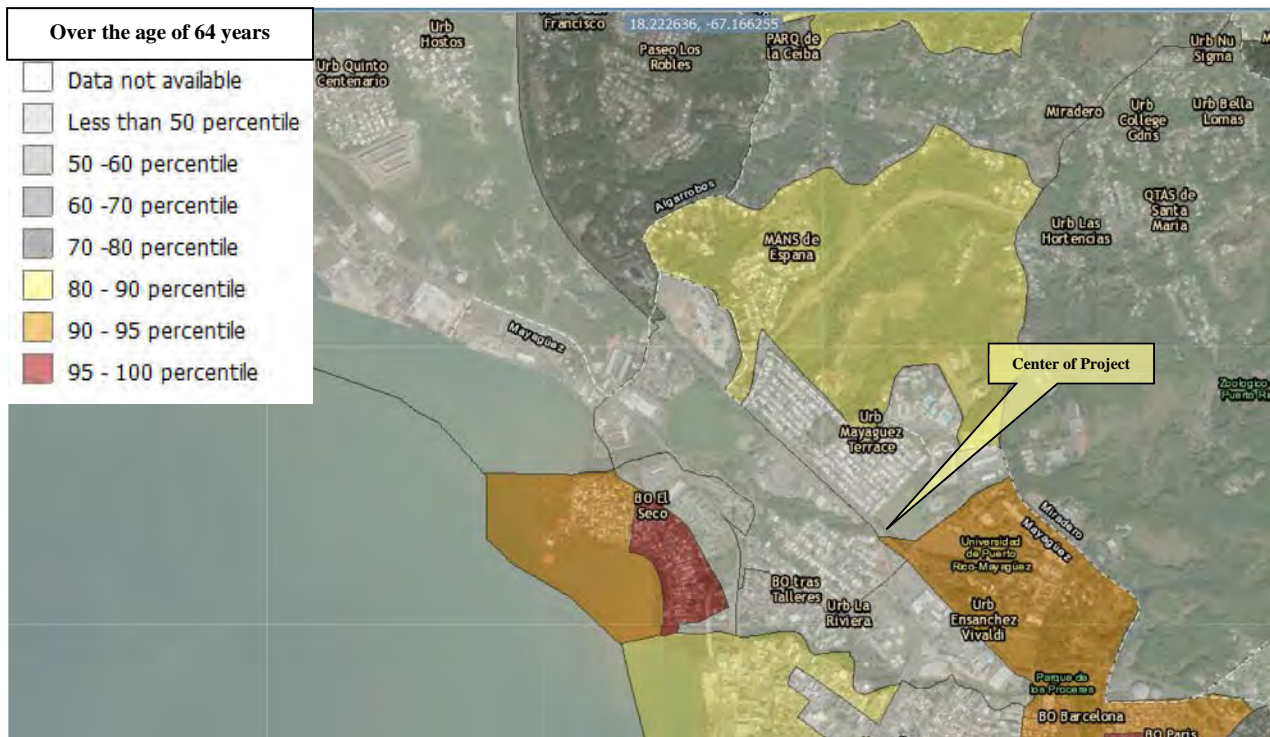
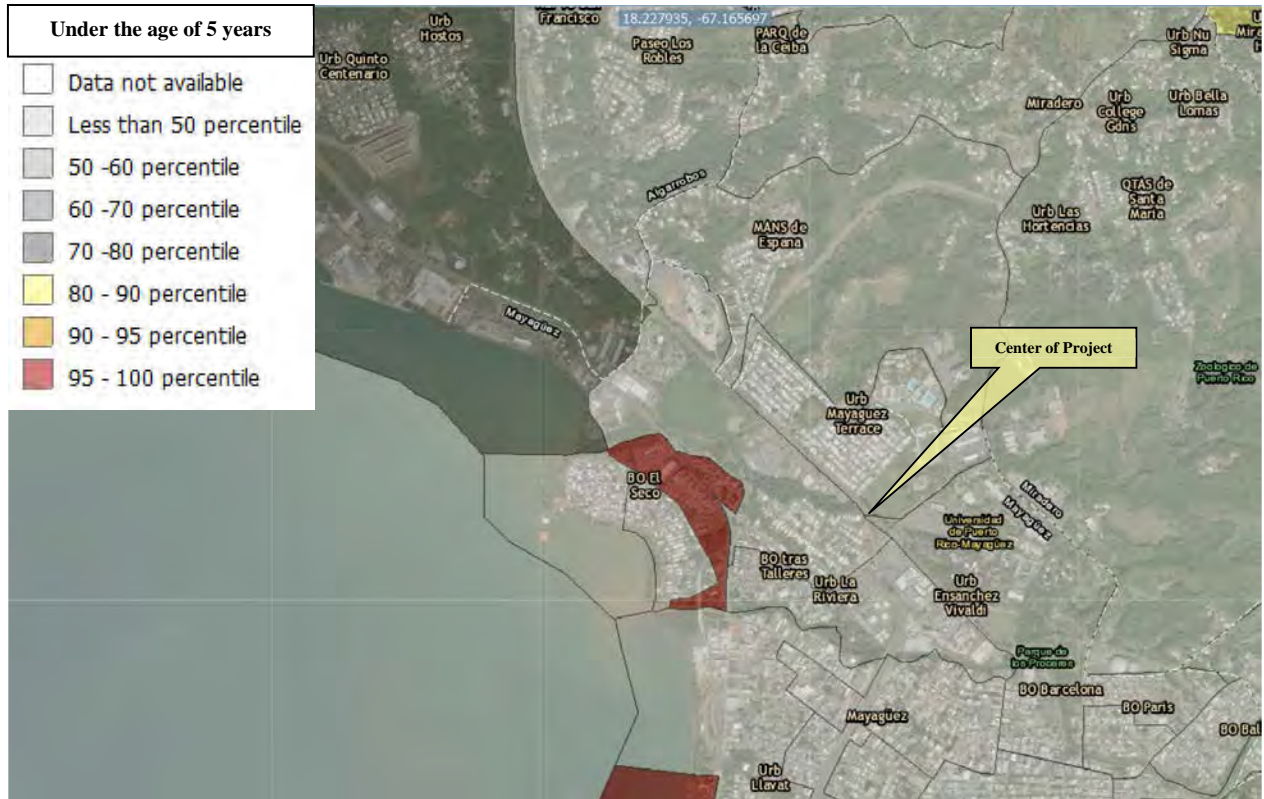
Low Income Percentage


Reference: EJScreen, July 2017.

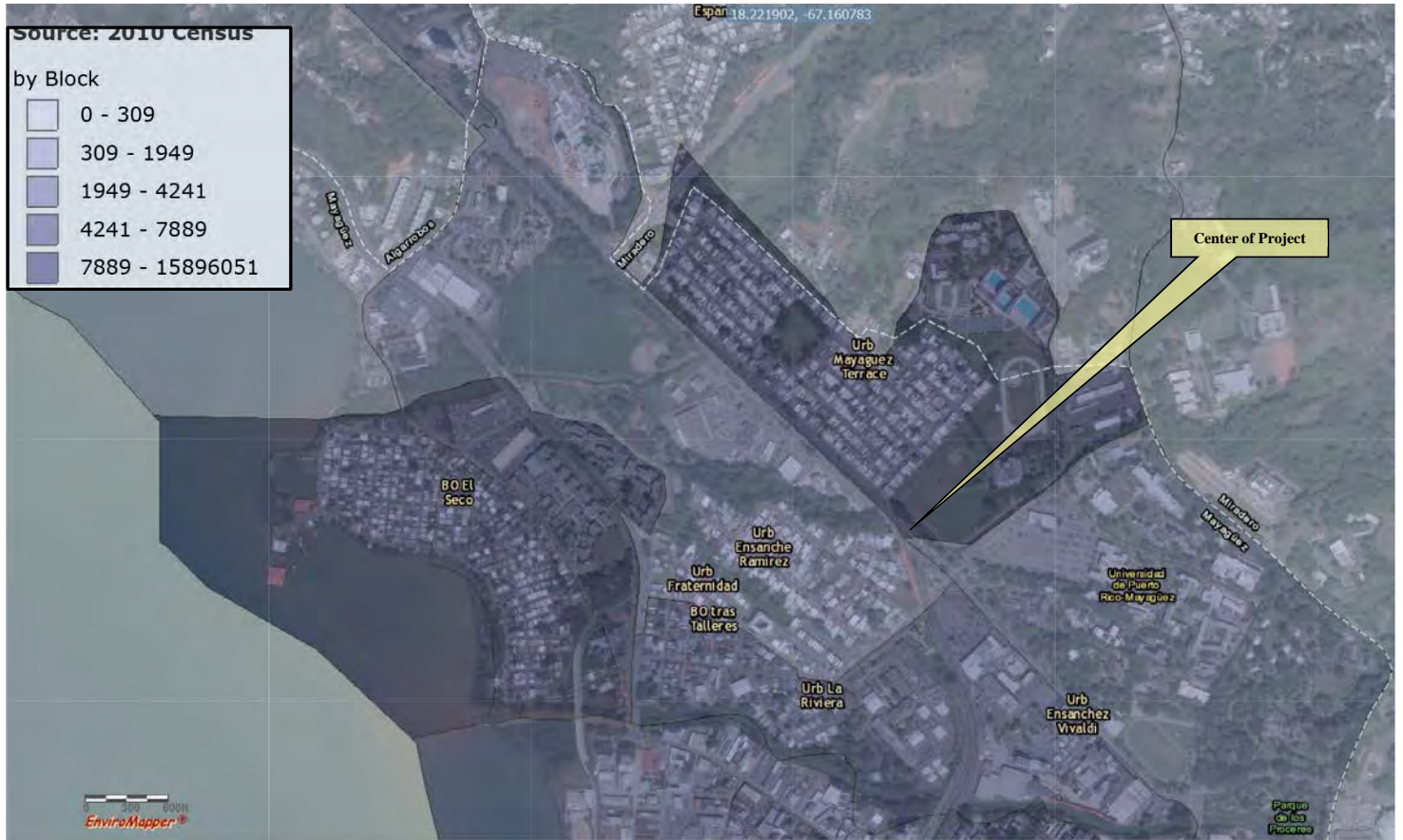
FIGURE 4




RAF Environmental Consultants



Under 5 & Over 64 years	FIGURE 5	 RAF Environmental Consultants
Reference: EJScreen, July 2017.		



<p>Population Density - 2010 US Census (per sq. mile)</p>	<p>FIGURE 6</p>	 RAF Environmental Consultants
<p>Reference: EJScreen, July 2017.</p>		