



**NATIONAL POLLUTANT DISCHARGE ELIMINATION
SYSTEM (NPDES) PHASE II, Regulated Small Municipal
Separate Storm Sewer Systems (MS4)**

PERMIT APPLICATION (NOTICE OF INTENT)

MUNICIPIO DE JUANA DIAZ

P.O. Box 1409

Juana Díaz, P.R. 00795-1409

U.S. ENVIRONMENTAL PROTECTION AGENCY -REGION II

CARIBBEAN ENVIRONMENTAL PROTECTION DIVISION

Centro Europa Building, Suite 417

1492 Ponce de Leon Avenue

San Juan, Puerto Rico 00907-4127

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1.0 NPDES (Notice of Intent) Permit Application

1.1 Background

In 1972, Congress amended the Federal Water Pollution Control Act, commonly referred as the Clean water Act (CWA) to prohibit the discharge of any pollutant to waters of the United States from point sources unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Initial efforts under the NPDES program focused on reducing pollutants in discharges of industrial process wastewater and municipal sewage. As pollution control measures have been implemented, it has become evident that diffuse sources or non-point sources are also contributors of water quality degradation. In 1990, the US Environmental Protection Agency (USEPA) promulgated rules establishing Phase I of the NPDES storm water program. The Phase I program for MS4s requires operators of "medium" and "large" MS4s, that is, those that generally serve populations of 100,000 or greater, to implement a storm water management program as a means to control polluted discharges from these MS4s. USEPA published the Storm Water Phase II Rule on December 9, 1999. As outlined in these regulations the Municipality of Juan Diaz is required to submit an application for permit coverage.

The urbanized and rural areas of the Municipality of Juana Diaz, as well as the City itself, are required to apply for NPDES municipal storm water discharge permits. In order to assure that the quality of storm water discharges from our municipal storm sewer system is managed to the maximum extent practicable, the Municipality of Juana Díaz is in the process of developing and implementing a Storm Water Management Program that includes best management practices, public education and storm water monitoring.

The U.S. Environmental Protection Agency has not delegated the NPDES permitting program to the Puerto Rico Environmental Quality Board (PREQB). Thus, USEPA Region 2 has issued a general NPDES permit for Small Municipal Separate Storm for Puerto Rico as of November 6, 2006.

1.2 Municipal Storm Water Sewer System

The Municipality of Juan Díaz has a territorial extension of 277.23 square kilometers (107.04 sq mi), of which 120.93 square kilometers (46.75 sq mi) are water bodies. According to the 2000 Census, its population is 50,531 inhabitants¹ with population density of 838.1 per square mile of land area.

Juana Díaz is located on the Southern Coastal Plain region at NAD 83 latitude 18° 03' 11" north and longitude 66° 30' 21" west. The city is bordered by Ponce to the west; Jayuya, Villalba and Ciales to the north; Coamo and Santa Isabel to the east; and the Caribbean Sea to the south. The geographical region is part of the southern coastal plains and semi-arid southern hills, situated on a geological fault. There is very little rain. Topographical features include valleys, plains, and coasts.

The main access to Juana Diaz is through State Road PR-14, PR-52 and the PR-149. The municipality is composed of 16 wards; Amuelas, Callabo, Capitanejo, Cintrona, Collores, Emajagual, Guayabal, Jacaguas, Juana Díaz Pueblo, Lomas, Río Cañas Abajo, Río Cañas Arriba, Sabana Llana, and Tijeras wards. Figure 1 shows a map with Juana Díaz site including their wards. Table 1 includes population density by ward as defined by the 2000 US Census.

¹ Based Census 2000 Population, Housing Units, Area and Density Summary, Juan Diaz, Puerto Rico
<http://factfinder.census.gov>

Table 1: Population Density By Ward

Ward	Population	Land Area [square mile]	Population Density Per [sq. mi.] of land area
Amuelas	4,056	2.34	1,733.20
Callabo	2,206	2.11	1,044.00
Capitanejo	5,328	3.20	1,664.70
Cintrona	2,309	6.91	334.30
Collores	2,161	10.51	205.60
Emajagual	3	1.98	1.50
Guayabal	5,774	5.59	1,033.50
Jacaguas	4,522	3.25	1,391.9
Juana Díaz Pueblo	4,555	0.51	8,975.70
Lomas	1,358	0.75	1,812.00
Rio Cañas Abajo	2,323	11.20	68.30
Rio Cañas Arriba	2,332	4.20	554.90
Sabana Llana	7,964	3.32	2,401.40
Tijeras	5,640	4.43	1,272.10

EPA has developed a set of digitized maps for each urbanized area as defined by the 2000 US Census. These maps are intended to assist authorized states (and EPA Regional Offices for unauthorized states) as they develop their Phase II municipal programs and permits. Municipalities will also find these maps useful as they outline the area that will require coverage under an NPDES permit and development and implementation of a Stormwater Pollution Prevention Plan. The Bureau of the Census determines urbanized areas (UA) by applying a detailed set of published UA criteria (see 55 FR 42592, October 22, 1990) to the latest decennial census data. Although the full UA definition is complex, the Bureau of the Census' general definition of a UA, based on population and population density. An urbanized area is a land area comprising one or more places — central place(s) — and the adjacent densely settled surrounding area — urban fringe — that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile. Figure 2 shows the Juana Díaz urbanized area as defined by the 2000 Census.

The Municipality of Juana Díaz operates a municipal separate storm water sewer system located in Juana Díaz, Puerto Rico that includes the urban area and rural areas within the municipality. The Juana Díaz municipal separate storm water sewer system is interconnected with the storm water sewer system operated and maintained by the Puerto Rico Department of Transportation and Public Works and that of the Highway and Transportation Authority.

A preliminary survey was conducted in the municipality of Juana Díaz to evaluate the urbanized area as defined by the 2000 US Census see Figure 2. The methodology used in this preliminary survey includes the evaluation of aerial photography image (Google Earth Image), site visit to take reference point data with a manual global positioning system gadget, and interviews with local residents and staff of Juana Díaz Municipal administration. Figure 3 shows a map of the discharge point data taken in the Juana Díaz municipality.

1.3 Hydrology

Four main waterways cross the municipality of Juana Díaz; the Descalabrado, Cañas, Guayo and Jacaguas Rivers. A dam was constructed on the Jacaguas River to create the Guayabal reservoir, between Juana Díaz and Villalba. The main tributary of the Jacaguas is the Toa Vaca River (Villalba), on which a dam has also been built. There are other water bodies including Ponceña and La Torre lakes and several creeks tributary to the main watercourses. Figure 4 shows a map with Juana Díaz hydrology relevant to this work. A brief discussion of the characteristic of each river is provided below.

- **Descalabrado River:** This River is born in Pedro García ward in the municipality of Coamo at an elevation of 529.7 meters above mean sea

level. This River locate at the east bound defines the geography boundary limits between the municipalities of Juana Díaz, Coamo and Santa Isabel. Its length is 24.8 kilometers and its watershed covers an area of 23.3 square miles. The urbanized area of the municipality of Juana Díaz as defined by the 2000 US Census does not have a significant discharge in this River.

- **Río Cañas River:** The Cañas River is born in Guayabal ward at an elevation of 1,246 feet (380 meters) above sea level, runs through the municipality, and empties into the sea at Pastillo Point. Its length is 11.9 kilometers and its watershed covers an area of 6.43 square miles.
- **Jacaguas River:** This River is born between Vacas y Hato Puerco Arriba wards in the municipality of Villalba at an elevation of 640 meters above mean sea level. The Rivers runs through the municipality and discharges to the Caribbean Sea at Capitanejo ward. Its approximate length is 38.5 kilometers and its watershed covers an area of 59.9 square miles. Among its tributaries are several creeks like Guanábano, Chorrera, Jagüeyes, de los Güiros, Maolaya, Achiote and Cuesta Pasto. A dam was constructed on the Jacaguas River to create the Guayabal reservoir, between Juana Díaz and Villalba.
- **Guayo River:** This River springs from Collores ward at an elevation of 1050 meters above mean sea level. The Rivers runs through the municipality and discharges to the Inabon River, which runs trough the municipality of Ponce. Its approximate length is 16.2 kilometers and its watershed covers an area of 14.94 square miles.

1.4 Activities Subject to NPDES Permit Applicability

Municipal separate storm water sewer system located within the territorial boundaries of Juana Díaz, Puerto Rico.

1.5 Name, Mailing Address, and Location of Facility for which the Application is Submitted

Municipio de Juana Díaz
P.O. Box 1409
Juana Díaz, P.R. 00795-1409

1.6 NPDES (MS4s) Program Point of Contact Municipality of Juana Díaz

Municipio de Juana Díaz
Attn: Hon. Ramón Hernández Torres, Mayor
P.O. Box 1409
Juana Díaz, P.R. 00795-1409
Telephone: (787) 259-210; Fax: (787) 259-2216

1.7 Standard Industrial Classification (SIC) Code

Standard Industrial Classification (SIC) Code for the Municipality of Juana Díaz is 9199.

1.8 Operators Name, Mailing Address, Telephone, Ownership Status, and as Federal, State, Local, Tribal or Other Public Entity

Municipio de Juana Díaz
P.O. Box 1409
Juana Díaz, P.R. 00795-1409

2.0 Permits or Construction Approvals Received or Applied Under the Following Programs

Construction permits are regulated by the Commonwealth of Puerto Rico Administration of Permits and Regulations (ARPE by its Spanish acronym); Resource Conservation and Recovery Act permit program is administered jointly by the Puerto Rico Environmental Quality Board and the US Environmental Protection Agency Region 2; the Water Quality Act NPDES permit program is administered by the US Environmental Protection Agency Region 2; the Clean Air Act and the Underground Injection Control permit programs are administered by the Puerto Rico Environmental Quality Board; the Safe Drinking Water Act is administered by the Puerto Rico Department of Health; and Section 404 and Section 10 of the Water Quality Act are managed by the US Army Corps of Engineers and the US Environmental Protection Agency.

2.1 Resource Conservation And Recovery Act

As part of the implementation phase the Municipality of Juana Díaz will verify which facilities are subject to the Resource Conservation And Recovery Act permit requirements and copy of the permits will be provided when required.

2.2 Underground Injection Control Under the Safe Drinking Water Act

The municipality of Juana Díaz operates a number of facilities subject to UIC permits. However, at this time the permit information is not available. As part of the implementation phase the Municipality will verify which facilities are subject to UIC permitting requirements and obtain copies of the permits.

2.3 NPDES Program under the Clean Water Act

Table 2 summarized the NPDES permit issue for several construction projects in Juana Díaz municipality.

Table 2: NPDES Permit Issue in Juana Díaz Municipality.

Tracking Number	Operator	Project Name
PRR10B548	Leafar Construction Inc	Bridge Over Río Canas
PRR10BL41	Skanska Energy Service, Llc	Gasoducto del Sur
PRR10B652	Longo de Puerto Rico	Transmission Line (Water)
PRR10BF42	Ismael Meléndez Rivera	Rehabilitation Of Pavement
PRR10BH68	Coratex Construction, Inc	Sanitary Sewer Syst.Santa Marta
PRR10BJ71	Puerto Rico Electric Power Aut	Gasoducto del Sur
PRR10B982	Caribe General Constructors	Coliseo Municipal Juana Díaz
PRR10B395	Ferrovial Agroman	Improvements Road Pr149phase2
PRR10BC15	Aut. de Acueductos Y Alcantarillado	Juana Díaz Aqueduct System
PRR10BH64	Aut. de Acueductos Y Alcantarillado	Improvements to Water Supply System for Pastillito Community

2.4 Non-Attainment Program under the Clean Air Act

None issued.

**2.5 National Emissions Standards for Hazardous Air Pollutants
Preconstruction Approvals under the Clean Air Act**

None issued.

**2.6 Ocean Dumping Permits under the Marine Protection Research and
Sanctuaries Act**

None issued.

2.7 Dredge or Fill Permits under Section 404 of the Clean Water

The municipality of Juana Díaz does not have a list of projects that require dredge or fill permit at this time. As part of the implementation phase the Municipality will verify which projects are subject to dredge or fill permit and will obtain copies of the permits if applicable.

2.8 Puerto Rico Environmental Quality Board

As part of the implementation phase the Municipality of Juana Díaz will verify which facilities are subject to the Puerto Rico Environmental Quality Board permit requirements and copy of the permits will be provided when required.

2.9 Puerto Rico Aqueducts Sewer Authority (PRASA)

As part of the implementation phase the Municipality of Juana Díaz will verify which facilities are subject to PRASA permit requirements and copy of the permits will be provided when required.

2.10 Puerto Rico Department of Natural Resources and the Environment

As part of the implementation phase the Municipality of Juana Díaz will verify which facilities are subject to the Puerto Rico Department of Natural Resources and the Environment permit requirements and copy of the permits will be provided when required.

2.11 Puerto Rico Planning Board

Table 3 summarized the Puerto Rico Planning Board permitting accomplished in the Municipality of Juana Díaz for several projects.

Table 3: Puerto Rico Planning Board Permitting.

Ward	Project Name	Description	Record Number
Amuelas	Estación de Bomba	Parque de Bombas de 6,475 p.c. en predio de 3.22 cds. en zona R-1	1995640439JGU
Amuelas	Club Cívico	Ubicación y transacción de proyecto institucional casa club del veterano en finca de 4.1555 cuerdas.	1999641233JGUT
Amuelas	Centro cultural	Consulta para la ubicación de proyecto institucional-educativo centro teatral educativo para las bellas artes de 26,983.68 pies cuadrados, en finca de 4.00 cuerdas, zonificada p.	2002640992JGU
Bo. Pueblo	Estacionamiento	Consulta para la ubicación de proyecto comercial de estacionamiento en finca de 0.492 cuerdas.	2002640717JGU
Callabo	Centro Cultural	Ubicación de institucional de centro cultural de 3,500 pies cuadrados en finca de 4.9050 cuerdas.	1999640895JGU
Capitanejo	Parque Recreación Activa	Ubicación parque de pelota en 23,582 metros cuadrados de 6 cuerdas, zonificadas R-0	1989640036JGUP
Capitanejo	Adquisición de Terrenos	Adquisición de terr. Para un parque de pelota en finca de 6.00 cdas. Zona Rural	1989640104JGTP
Capitanejo	Centro de Rehabilitación	Ubicación de proyecto institucional de 16,000 pies cuadrados en finca de 1.58 cuerdas.	1998641097JGU

Table 3: Puerto Rico Planning Board Permitting Continuation.

Ward	Project Name	Description	Record Number
Guayabal	Residencial, Solares	Ubicación para proyecto de 29 solares de 350 metros cuadrados en finca de 4.32 cuerdas.	2001640387JGU
Lomas	Museo	Consulta para la transacción y ubicación de proyecto institucional educativo de museo en finca de 0.5188 cuerdas.	2002640591JGUT
Lomas	Oficinas Gubernamentales	Consulta para la transacción y ubicación de proyecto institucional de 11,258 pies cuadrados en finca de 1.5 cuerdas.	2003640457JGUT
Río Cañas Abajo	Granja Avícola	Ubicación para granja avícola y porcina de 41,000 pc. de construcción en finca de 1227.34201 cds.	1995640663JGU
Río Cañas Arriba	Vertedero Domestico	Consulta de ubicación para un vertedero de relleno sanitario municipal en una finca de 30.00 cuerdas	1985640583JGU
Tijeras	Campo Atlético	C.u. construcción piscina Olímpica con gradas, lockers y are a administrativa y adquisición predio de 5.4464 cdas.	1994641154JGUT
Tijeras	Parque Recreación Activa	Ubicación de complejo de tenis y gimnasio en finca de 15.0133 cuerdas	1997640617JGU

3.0 Storm Water Sewer Map

Figure 4 is a map depicting the geographical extension of the Municipality of Juana Díaz and the main water bodies within the municipal boundaries. At the present time, the municipality lacks the information and resources needed to develop a detail storm sewer map for the municipal operated MS4. As part of the implementation phase of the NPDES it is the intention of the Municipality of Juana Díaz to develop such map. However, the development of this map will be accomplished in several stages as funding and financial assistance allow. When accomplished each stage of this map, it

will be submitted, along with the storm water management program updated. It is anticipated that at a minimum the map will include information related to:

- Municipal owned and operated roads storm sewer systems interconnected with the Municipal Storm Sewer System.
- State owned and operated roads storm sewer systems interconnected with the Municipal Storm Sewer System.
- Water Filtration Plants Owned and Operated by the Puerto Rico Aqueduct and Sewer Authority (PRASA), including intakes and outfalls. Whenever located in the urbanized area or within 1 mile radius outside of the urbanized area.
- Waste Water Treatment Plants Owned and Operated by the Puerto Rico Aqueduct and Sewer Authority, including outfalls. Whenever located in the urbanized area or within 1 mile radius outside of the urbanized area.
- Hazardous Waste Treatment, Storage and Disposal Facilities. Whenever located in the urbanized area or within 1 mile radius outside of the urbanized area.
- Non-Hazardous Solid Waste Treatment, Storage and Disposal Facilities. Whenever located in the urbanized area or within 1 mile radius outside of the urbanized area.
- NPDES permitted industrial facilities interconnected with the Municipal Storm Sewer System.
- NPDES permitted industrial facilities discharging to a surface water body.
- Commercial Facilities (Regulated under the PRASA Pretreatment Program) interconnected with the Municipal Storm Sewer System or discharging to a surface water body. Whenever located in the urbanized area or within 1 mile radius outside of the urbanized area.
- Municipal Storm Sewer System, including outfall locations.

3.1 Description of the Municipal Storm Water Sewer System

The Municipality of Juana Díaz Storm Water Sewer System (MS4s) in the urban areas in general consist of a series of catch basins, typically located within the right-of-way of municipal and state roads, interconnected by underground concrete or PVC pipes which finally discharge to the Caribbean Sea. In the rural areas the Municipal MS4s system typically consists of a series of interconnected open channel culverts, which run parallel to municipal and state roads, and usually discharge to a surface water body.

Interconnected to the Municipal MS4s system are the storm water sewer systems owned and operated by the Puerto Rico Department of Public Works and Transportation and the Puerto Rico Highway and Transportation Authority. Also, interconnected to the Municipal MS4s system are the discharges from NPDES (Stormwater) permitted facilities.

As the Municipality of Juana Díaz implements the proposed Storm Management Plan a more accurate description (capacity, operation, etc.) of the Municipal MS4s system can be provided.

The Municipal Public Works Department is responsible for the operation and Maintenance of the Storm Sewer Water System facilities in the Municipality of Juana Díaz. The principal responsibility of the Department is to perform a preventive maintenance program to provide quality service for the citizens. The Department offers services such as open channel cleaning, catch basin clean up and open trash dumping sites elimination. Street sweeping, roadside vegetation maintenance, and other related services are also rendered.

3.2 Estimated Square Mileage Served by the MS4 System

The estimated square mileage served by the MS4; System is 16.6. However, it must be noted that a more accurate estimate can be provided as the Municipality implements the proposed Storm Management Plan.

3.3 Evaluation of the Existing Municipal Storm Water Sewer System

A preliminary survey was performed in the municipality of Juana Díaz to evaluate the urbanized area as defined by the 2000 US Census see Figure 2. The methodology used in this preliminary survey includes the evaluation of aerial photography image (Google Earth Image), site visit to take reference point data with a manual global positioning system gadget, and interviews with local residents and staff of Juana Díaz Municipal administration. Figure 3 shows a map of the discharge point data taken in the Juana Díaz municipality. Table 4 includes the population density per square mile of land area for wards with figures above 1,000. The data is given in a descending order and the main water bodies receiving the water runoff are listed

Table 4: Population Density By Ward with Figures above 1,000

Ward	Water Body Receiving Runoff	Population Density Per [sq. mi.] of land area
Juana Díaz Pueblo	Jacaguas River	8,975.70
Sabana Llana	Jacaguas River	2,401.40
Lomas	Jacaguas River	1,812.00
Amuelas	Guanabano Creek Tributary to Jacaguas River	1,733.20
Capitanejo	Jacaguas River	1,664.70
Jacaguas	Jacaguas And Guayo Rivers	1,391.9
Tijeras	Guanabano Creek Tributary to Jacaguas River	1,272.10
Callabo	Guayo River	1,044.00
Guayabal	Jacaguas River	1,033.50

From table 4 it may be observed that from nine (9) wards with population density above 1,000 per square mile of land area eight (8) discharge to the Jacaguas River or one of its tributary. Of the three wards with greater population density: Juana Díaz Pueblo, Sabana Llana and Lomas. Only two of them lies inside the urbanized area as define by the 2000 Census see Figure 2. However, Sabana Llana ward is within the one (1) mile radius extension outside the urbanized area required by EPA.

Juana Díaz Pueblo ward with the greater population density its serve by a storm water system which capacity has been compromise as the urban part of the city has being developed. This fact results in an increase in storm water runoff.

4.0 Proposed Storm Water Management Plan

Operators of regulated MS4s are required to develop a Stormwater management plan (SWMP) that includes measurable goals and to implement needed Stormwater management controls (BMPs). The process of developing a plan, implementing the plan, and evaluating the plan is a dynamic, iterative process that helps move communities toward achievement of their goals.

The SWMP will be developed to meet the regulatory requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II Rule and to assist the municipality in maintaining and improving the municipality drainage facilities which include pipelines, structures, basins, ditches, swales, ponds, under drains and drainage wells, to ensure that they perform to design capacity and that all receiving bodies meet state and federal standards for water quality. It will also be an important tool for use in the day-to-day operations and as a public reference document. Along with regulatory issues,

this plan will addresses protection of property from flooding and erosion, identifies health and safety issues related to water resources, and will make recommendations for the preservation of environmental and aesthetic benefits to the community.

Through the use of field observations, results of past and future studies, hydrologic/hydraulic computer modeling, and input from Municipality staff and a proposed Citizens Advisory Committee, the plan will identify existing problems and potential future problems within the municipality (UA) as defined by the Us Census. A combination of regulatory requirements, public education, increased maintenance activities, and capital improvements will be recommended to solve identified problems. The major plan elements include the following

- Development of a proposed storm water ordinance that, among other things, establishes minimum requirements for new development and redevelopment, prohibits illicit discharges into surface waters, and requires maintenance of privately owned storm water facilities.
- Development of public education opportunities to inform the community of water quality issues, and, specifically, the new ordinance and its requirements.
- Develop a Storm Water Assistance Program, to assist businesses and persons in their efforts to comply with NPDES storm water regulations and will educate citizens about storm water runoff and associated concerns.
- Hydrologic and hydraulic computer modeling analysis of the major drainage basins in the Municipality (UA) as defined by the US Census to simulate existing flows, project future flows, and evaluate system requirements.
- Analysis of localized flooding and water quality problems and solutions, and development of a prioritized list of recommended drainage system improvements.

- Development of a Capital Improvements Program.
- Development of a Maintenance and Operations Program.
- Development of a Public Education Program.
- Development of a Compliance Management: Program to among other things, monitor illicit discharges into surface waters, storm water discharges associated with industrial activity and construction sites.
- Description of the overall program costs.

The proposed SWMP will focus initially on a system inventory and analysis of drainage and water quality issues followed by a 5 years capital improvement program, a facilities maintenance program, and a comprehensive storm and surface water code and policy. As envisioned, The SWMP will address the drainage network base map, hydrologic and hydraulic analysis and modeling, if required, for the principal surface water bodies (creeks and rivers), environmental and water quality issues, capital improvement program, storm water facilities maintenance program and a comprehensive Storm Water Management Code and Policy.

5.0 Proposed Work Plan

Under the direction of the Permitting Office or designated administrative official, a work plan will developed at the beginning of each year based on priorities. Semiannual meetings will hold to update all partnership members and Citizens Advisory Committee on the status of the planned activities. A written annual report shall be prepared and distributed at the end of each year.

The proposed SWMP shall be accomplished in several phases as funding become available. It was previously state that from nine (9) wards with population density above 1,000 per square mile of land area eight (8) discharge to the Jacaguas River or one of its tributary. Of the three wards

with greater population density: Juana Díaz Pueblo, Sabana Llana and Lomas. Only two of them lies inside the urbanized area as defined by the 2000 Census see Figure 2. However, Sabana Llana ward is within the one (1) mile radius extension outside the urbanized area required by EPA. Juana Díaz Pueblo ward with the greater population density is served by a storm water system which capacity has been compromised as the urban part of the city has been developed. This fact results in an increase in storm water runoff. Taking into consideration these findings an area that includes Juana Díaz Pueblo wards and its near by areas has been selected to be worked in the initial stage of the SWMP.

Figure 5 shows the location of point 6 identified as Jacaguas River Outfall (18.004945N, 66.51027W) where the existing storm water system in Juana Díaz Pueblo ward actually discharges. Figure 6 outlines the urban watershed to be studied in the initial stage of the SWMP. The area of the watershed is 0.4969 square mile approximately.

6.0 Description of the Measurable Goals for the Best Management Practices to be Implemented

Operators of regulated small MS4s are required to design their programs to:

- Reduce the discharge of pollutant to the “maximum extent practicable” (MEP);
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the Clean Water Act.

Implementation of the MEP standard will typically require the development and implementation of BMPs and the achievement of measurable goals to satisfy each of the six minimum control measures.

The Phase II Rule defines a small MS4 stormwater management program as a program comprising six elements that, when implemented in concert, are expected to result in significant reductions of pollutants discharged into receiving waterbodies. The six MS4 program elements, termed “minimum control measures, MCM” are outlined below.

- **Public Education and Outreach:** Distributing educational materials and performing outreach to inform citizens about the impacts polluted stormwater runoff discharges can have on water quality.
- **Public Participation/Involvement:** Providing opportunities for citizens to participate in program development and implementation, including effectively publicizing public hearings and/or encouraging citizen representatives on a stormwater management panel.
- **Illicit Discharge Detection and Elimination:** Developing and implementing a plan to detect and eliminate illicit discharges to the storm sewer system (includes developing a system map and informing the community about hazards associated with illegal discharges and improper disposal of waste).
- **Construction Site Runoff Control:** Developing, implementing, and enforcing an erosion and sediment control program for construction activities that disturb 1 or more acres of land (controls could include silt fences and temporary stormwater detention ponds).
- **Post-Construction Runoff Control:** Developing, implementing, and enforcing a program to address discharges of post-construction stormwater runoff from new development and redevelopment areas. Applicable controls could include preventative actions such as protecting sensitive areas (e.g., wetlands) or the use of structural BMPs such as grassed swales or porous pavement.
- **Pollution Prevention/Good Housekeeping:** Developing and implementing a program with the goal of preventing or reducing pollutant runoff from municipal operations. The program must include municipal

staff training on pollution prevention measures and techniques (e.g., regular street sweeping, reduction in the use of pesticides or frequent catch-basin cleaning).

6.1 Public Education and Outreach

Public Education and Outreach minimum control measure, is one of six measures an operator of a Phase II-regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) stormwater permit. This section outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them.

An informed and knowledgeable community is crucial to the success of a stormwater management program since it helps to ensure the following:

- Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important.
- Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

To satisfy this minimum control measure, the operator of a regulated small MS4 needs to:

- Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on local waterbodies and the steps that can be taken to reduce stormwater pollution; and

- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Three main action areas are important for successful implementation of a public education and outreach program.

- **Forming Partnerships:** Operators of regulated small MS4s are encouraged to utilize partnerships with other governmental entities to fulfill this minimum control measure's requirements. It is generally more cost-effective to use an existing program, or to develop a new regional or statewide education program, than to have numerous operators developing their own local programs. Operators also are encouraged to seek assistance from nongovernmental organizations (e.g., environmental, civic, and industrial organizations), since many already have educational materials and perform outreach activities.
- **Using Educational Materials and Strategies:** Operators of regulated small MS4s may use stormwater educational information provided by their State, EPA Region, or environmental, public interest, or trade organizations instead of developing their own materials. Operators should strive to make their materials and activities relevant to local situations and issues, and incorporate a variety of strategies to ensure maximum coverage. Some examples include:
 - o Brochures or fact sheets for general public and specific audiences.
 - o Recreational guides to educate groups such as climbers, fishermen, and campers.
 - o Alternative information sources, such as web sites, bumper stickers, refrigerator magnets, and posters for public vehicles.
 - o Educational programs for school-age children.
 - o Storm drain stenciling of storm drains with messages such as "Do Not Dump - Drains Directly to River".

- o Stormwater hotlines for information and for citizen reporting of polluters.
- **Reaching Diverse Audiences:** The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children.

6.1.1 Storm Water Related Public Service Announcements

Develop, produce, and air 30-second radio-based storm water-related public service announcement (PSA) segments to increase the public awareness of the storm water pollution issues within the area.

Measurable Goal(s) -The development of the storm water-related segments; and the number of segments radioed each year.

6.1.2 Educational Involvement/Partnerships/Outreach with the Schools

Develop or used an existing educational program to reduce the storm water pollutants.

Measurable Goal(s) - A minimum of 50% of all grade school children will be educated every two years on storm water pollution issues.

6.1.3 Educational Outreach to Community Homeowners on Lawn Care

The Municipality, in partnership with local commercial entities, and area university extension services, will plan, design, and develop a regional

lawn care education and outreach program highlighting storm water runoff issues.

Measurable Goal(s) -Sponsor an annual lawn care seminar in cooperation with commercial entities; monitor the number of partnerships established with local lawn care businesses, suppliers, and retail stores; and monitor the number of property owners that attended training workshops for lawn and garden care.

6.1.4 Storm Water Web Page

The Municipality shall develop a storm water web page associated with its existing web site.

Measurable Goal(s) –The number of visits to the storm water web page.

6.1.5 Storm Water Pamphlets, Booklets, and Flyers

Develop storm water pamphlets, booklets, and flyers in partnership with the U. S. Environmental Protection Agency (EPA) and State Agencies, intended to solicit interest in a specific storm water event or activity or to promote storm water education and positive behaviors.

Measurable Goal(s) - A list compiled of target audiences and possible activities for each; number of materials created and distributed; the number of events attended with displays; and the number of people at an event who saw the display (signed the guest book) or took a pamphlet/booklet.

6.1.6 Implementation Schedule for MCM 1

- **Year 1:** Develop educational pamphlets, booklets, and flyers; develop a storm water Web site; develop and produce the PSA Water Spots series; and hold the annual public meeting on the SWMP.
- **Year 2:** Expand the partnership with the schools; develop the lawn maintenance program; continue educational programs at local schools; Newsletters at the web site; and hold the annual public meeting.
- **Year 3:** Continue educational programs at local schools; continue the lawn maintenance program; Newsletters at the web site; and hold the annual public meeting.
- **Year 4:** Continue the lawn maintenance program; continue educational programs at local schools; Newsletters at the web site; and hold the annual public meeting.
- **Year 5:** Continue educational programs at local schools; Newsletters at the web site; and hold the annual public meeting

6.2 Public Participation Involvement

Public Participation/Involvement minimum control measure, one of six measures the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This section outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them.

The public can provide valuable input and assistance to a regulated small MS4's municipal stormwater management program and, therefore, it is suggested that the public be given opportunities to play an active role in both the development and implementation of the program. An active and involved

community is crucial to the success of a stormwater management program because it allows for:

- Broader public support since citizens who participate in the development and decision making process are partially responsible for the program and, therefore, may be less likely to raise legal challenges to the program and more likely to take an active role in its implementation.
- Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased sources in the form of citizen volunteers.
- A broader base of expertise and economic benefits since the community can be a valuable, and free, intellectual resource.
- A conduit to other programs as citizens involved in the stormwater program development process provides important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a stormwater program on a watershed basis, as encouraged by EPA.

6.2.1 Storm Drain Stenciling Program

The municipal separate storm sewer systems (MS4) shall implement a community program to label storm drains.

Measurable Goals -The number or percentage of storm drains stenciled; and the number of stenciling volunteers.

6.2.2 Annual Cleanup

Promote an annual spring cleanup that will directly involve citizens in water pollution prevention and create awareness that most storms drains discharge untreated waters directly into the river and ocean.

Measurable Goals -The number of stream cleanups; the number of cleanup groups or participants; the quantity of trash and recyclables that were removed by the cleanup; and the number of stream miles cleaned.

6.2.3 Volunteers Monitoring Program

Develop a volunteer monitoring program during the storm water permit term that will allow to track water quality changes over time.

Measurable Goals - The number of volunteers participating in monitoring program; the frequency of monitoring in the watershed; and the number of volunteer monitoring training sessions held.

6.2.4 Adopt-A-Park

Develop a volunteer Adopt-A-Park program as a public outreach tool and shall allow participation by any group or organization within the community.

Measurable Goals -Track the number of participants in Adopt-A-Park program; and record the quantity of trash and debris removed by Adopt-A-Park volunteers.

6.2.5 Support of Local Organization(s)

Support a local organization that incorporates the ideas and resources of local governments, citizens, nonprofit environmental groups, and local educational entities to promote the importance of the resources and its benefits to the community.

Measurable Goals -The number of volunteers attracted to the watershed organization; and the number of action taken as a result of the watershed organization.

6.2.6 Community Hotline

Develop the scope of a community hotline to answer specific storm water questions and identify problems or incidents related to storm water management practices.

Measurable Goals -The number of calls received by hotlines, and the number of problems or incidents identified and remedied as a result of hotline calls.

6.2.7 Implementation Schedule for MCM 2

- **Year 1:** Implement a baseline community attitude survey; Start a storm drain stenciling campaign; Develop the annual cleanup program; and support volunteer monitoring programs; and hold the annual public meeting.
- **Year 2:** Consider final recommendations of the public input; implement the storm water hotline; continue the annual cleanup program; continue storm drain stenciling; support volunteer monitoring; and hold the annual public meeting.
- **Year 3:** Continue the annual spring city cleanup program; continue storm drain stenciling; support volunteer monitoring; and hold the annual public meeting.
- **Year 4:** Implement the Adopt-A-Park program; continue the annual cleanup program; continue storm drain stenciling; Support volunteer monitoring; and hold the annual public meeting.

- **Year 5:** Perform the follow-up community survey; continue the city cleanup program; support volunteer monitoring; continue the Adopt-A-Park program; continue with storm drain stenciling; and hold the annual public meeting.

6.3 Illicit Discharge Detection and Elimination

Illicit Discharge Detection and Elimination, one of six measures the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This section outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them.

Federal regulations define an illicit discharge as “...any discharge to an MS4 that is not composed entirely of stormwater...” with some exceptions. These exceptions include discharges from NPDES-permitted industrial sources and discharges from fire-fighting activities. Illicit discharges (see Table 5) are considered “illicit” because MS4s are not designed to accept, process, or discharge such non-stormwater wastes.

Table 5: Sources of Illicit Discharges

Sanitary wastewater
Effluent from septic tanks
Car wash wastewater
Improper oil disposal
Radiator flushing disposal
Laundry wastewater
Spills from roadway accidents
Improper disposal of household toxics

Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked

sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

Recognizing the adverse effects illicit discharges can have on receiving waters, the Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement and enforce an illicit discharge detection and elimination program. The program must include the following:

- A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;
- Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State, or local law) on non-stormwater discharges into the MS4, and appropriate enforcement procedures and actions;
- A plan to detect and address non-stormwater discharges, including illegal dumping, into the MS4;
- The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste; and
- The determination of appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

The illicit discharge detection and elimination program does not need to address the following categories of non-stormwater discharges or flows

unless the operator of the regulated small MS4 identifies them as significant contributors of pollutants to its MS4:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration
- Uncontaminated pumped ground water
- Discharges from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Street wash water

The objective of the illicit discharge detection and elimination minimum control measure is to have regulated small MS4 operators gain a thorough awareness of their systems. This awareness allows them to determine the types and sources of illicit discharges entering their system; and establish the legal, technical, and educational means needed to eliminate these discharges.

6.3.1 Storm Sewer System Map

Develop a storm sewer system map. The storm sewer system map is meant to demonstrate a basic awareness of the intake and discharge areas of the system. It is needed to help determine the extent of discharged dry weather flows, the possible sources of the dry weather flows, and the particular waterbodies these flows may be affecting. An existing map, such as a topographical map, on which the location of major pipes and outfalls can be clearly presented, demonstrates such awareness. EPA recommends collecting all existing information on outfall locations (e.g., review city records, drainage maps, storm drain maps), and then conducting field surveys to verify locations.

Measurable Goals -The linear feet of conveyances recorded; the number of structural pollution control devices counted; the number of discharge points recorded.

6.3.2 Implement Regulations to Enforce Nonstorm Water Discharges

Prohibit nonstorm water discharges into the storm sewer system through ordinances and resolutions, and develop and implement actions required to enforce these regulations. EPA recognizes that some permittees may have limited authority under State, or local law to establish and enforce an ordinance or other regulatory mechanism prohibiting illicit discharges. In such a case, the permittee is encouraged to use existing states laws, programs or regulations.

Measurable Goals -The number of ordinances and resolutions passed; the number of penalties enforced upon the participants of illegal dumps; the number of building codes developed to prohibit connections; the number of potential connection sites inventoried.

6.3.3 Educational Outreach

The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste and ways to detect and eliminate illicit discharges.

Measurable Goals -The number of flyer; posters, or other public education tools distributed; the number of illegal dump;; reported by citizens; the number of locations determined to be prime areas for illegal dumping; the number of illegal dump cleanups completed; the number of illicit connections reported by business employees; the number of illicit connections found, repaired or replaced; the number of unwarranted connections reported, found repaired or replaced.

6.3.4 Program to Detect, Identify, and Eliminate Illicit Discharges

Develop a program to detect and identify illicit discharges of nonstorm water flows and when detected as significant contributors of pollutants, develop a plan to control and eliminate the contributors to the storm sewer system.

Measurable Goals -Inventory conducted; the number of field tests conducted in high-risk areas; the number of illicit connections reported; the number of survey responses indicating a possible illicit connection; the number of illicit connections found; the number of illicit connections repaired or replaced.

6.3.5 Program to Detect, Identify, and Eliminate Illegal Dumping

Through ordinances and resolutions, prohibit illegal disposal of waste in an unpermitted area or into a storm drain system and develop and implement the actions required to enforce these regulations.

Measurable Goals -The number of ordinances and resolutions passed; the number of penalties enforced upon the participants of illegal dumps; the number of building codes developed to prohibit dumping sites; the number of illegal dumps reported by citizens; the number of new dump sites inspected; the number of illegal dump sites cleaned up; the number of flyers, posters, or other public education tools distributed or programs started; the number of new ordinances developed for enforcement of the dump site inspection.

6.3.6 Program to Detect, Identify, and Eliminate Wastewater Connection to the Storm Drain System

Through ordinances and resolutions, the Municipality shall prohibit unwarranted connection of a wastewater system to a storm drain system and shall develop and implement all procedures, programs, and actions required to appropriately enforce these regulations. Emphasis shall be placed on nonresidential facilities (industrial or business) primarily during building and reconstruction activities.

Measurable Goals -The number of unwarranted connections reported by citizens and/or business employees; the number of unwarranted connections found; the number of unwarranted connections repaired or replaced; the number of flyers, posters, or other public education tools distributed or programs started; the number of new ordinances developed

for enforcement of the unwarranted connections; the number of survey responses indicating possible unwarranted connections.

6.3.7 Program to Detect, and Eliminate Sanitary Sewer Overflows

Develop a program to establish and enforce policies for designing, screening, and maintaining the sanitary sewer system.

Measurable Goals -The frequency of routine maintenance activities; the number of overflows reported; the number of overflow causes that were identified during inspections; the number of sites repaired.

6.3.8 Program to Detect, and Eliminate Failing Septic Systems

Develop a program to detect and eliminate failing septic systems; and develop and implement the actions required to enforce proper detection and sizing, maintenance, and postconstruction inspection considerations of the septic system.

Measurable Goals -The number of routine maintenance and inspection activities; the number of field tests and screen tests conducted; the number of postconstruction inspections conducted; the number of scheduled pump-outs conducted and sites repaired; an inventory of tanks and when they were last serviced.

6.3.9 Implementation Schedule for MCM 3

- **Year 1:** Start the storm water map survey; and begin the educational training program.

- **Year 2:** Continue the storm water map; begin writing enforcement ordinances; continue the educational training program; and begin surveys for illicit discharge.
- **Year 3:** Continue the storm sewer map and complete the enforcement ordinance writing; continue the educational program; and continue surveys for illicit discharges.
- **Year 4:** Complete the storm water map survey. Continue the educational program and surveys for illicit discharges.
- **Year 5:** Continue the educational program and surveys for illicit discharges.

6.4 Construction Site Runoff Control

Construction Site Runoff Control, one of six measures the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This section outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy this requirement.

Polluted stormwater runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Sediment is usually the main pollutant of concern. According to the 2000 National Water Quality Inventory, States report that sedimentation is one of the most widespread pollutants affecting assessed rivers and streams, second only to pathogens (bacteria). Sources of sedimentation include agriculture, urban runoff, construction, and forestry. Sediment runoff rates from construction sites, however, are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forestlands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting

siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to the impacted watercourses.

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in stormwater runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The small MS4 operator is required to:

- Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites.
- Have procedures for site plan review of construction plans that consider potential water quality impacts.
- Have procedures for site inspection and enforcement of control measures.
- Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism).
- Establish procedures for the receipt and consideration of information submitted by the public.
- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

6.4.1 Ordinances or Other Regulatory Mechanisms

Develop ordinances or other regulatory mechanisms to require erosion and sedimentation controls for polluted runoff from construction sites with a land disturbance of greater than or equal to one acre. Because there may be limitations on regulatory legal authority, the small MS4 operator is required to satisfy this minimum control measure only to the maximum extent practicable and allowable under State, or local law.

Measurable Goals -Whether or not ordinances were developed for the following construction issues: special construction entrances, the development of the requiring certification, all regulations are followed for material storage, disposal, etc., and address construction site runoff control.

6.4.2 General Construction Site Waste Controls

Develop and begin implementation of a program to control and eliminate construction site waste that may impact storm water runoff.

Measurable Goals - The frequency of inspection and maintenance activities; whether or not construction vehicles are regularly inspected; the numbers of vehicle wash areas on-site; and the number of construction sites with designated vehicle maintenance and washing areas

6.4.3 Information Submitted by the Public

Develop procedures for the receipt, tracking, and consideration of public inquiries, concerns, and information submitted regarding local construction activities.

Measurable Goals - Number of noncompliance reports received; number of construction site inspector follow-ups; number of valid noncompliance reports; number of stop-work notices or Notices of Termination (NOTs); number of documented acknowledgments and considerations of the information submitted.

6.4.4 Construction Site Inspection and Enforcement

Develop the procedures for construction site best management practices (BMPs) inspections and the enforcement of installed erosion and sedimentation control measures.

Measurable Goals -The number of inspected sites; the frequency of inspection and maintenance of BMPs; the number of failed storm water BMPs; the number of BMPs reported to be in need of repair; whether or not an inventory of inspection and maintenance activities was created and is regularly maintained; and the number of enforcement actions taken.

6.4.5 Implementation Schedule for MCM 4

- **Year 1:** Develop ordinance or other regulatory mechanisms; begin developing procedures for information submitted by the public.
- **Year 2:** Implement the ordinance; develop procedures for construction site inspections; begin enforcement of the ordinance; consider public information submitted.
- **Year 3:** Complete the enforcement ordinance writing; continue construction site inspections; consider public information submitted.
- **Year 4:** Continue to increase ordinance enforcement; continue construction site inspections; consider public information submitted.
- **Year 5:** Fulfill maximum compliance with the ordinance; continue construction site inspections; consider public information submitted.

6.5 Post-Construction Runoff Control

Post-Construction Runoff Control minimum control measure, one of six measures that the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater

management program in order to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This section outlines the Phase II Final Rule requirements for post-construction runoff control and offers some general guidance on how to satisfy those requirements.

Post-construction stormwater management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly affect receiving waterbodies. There are generally two forms of substantial impacts of post-construction runoff.

The first is caused by an increase in the type and quantity of pollutants in stormwater runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans.

The second kind of post-construction runoff impact occurs by increasing the quantity of water delivered to the waterbody during storms. Increased impervious surfaces (e.g., parking lots, driveways, and rooftops) interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include stream bank scouring and downstream flooding, which often lead to a loss of aquatic life and damage to property.

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in post-

construction runoff to their MS4 from new development and redevelopment projects that result in the land disturbance of greater than or equal to 1 acre. The small MS4 operator is required to:

- Develop and implement strategies, which include a combination of structural and/or non-structural best management practices (BMPs).
- Have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls to the extent allowable under State, or local law.
- Ensure adequate long-term operation and maintenance of controls.
- Determine the appropriate best management practices and measurable goals for this minimum control measure.

6.5.1 Non-Structural BMPs Planning Procedures

Runoff problems can be addressed efficiently with sound planning procedures. Local master plans, comprehensive plans, and zoning ordinances can promote improved water quality in many ways, such as guiding the growth of a community away from sensitive areas to areas that can support it without compromising water quality.

Measurable Goals – Whether or not ordinances were developed to promote improvement in water quality. Percent complete of planning procedures implemented or developed.

6.5.2 Structural BMPs Stormwater Retention/Detention

Retention or detention BMPs control stormwater by gathering runoff in wet ponds, dry basins, or multichamber catch basins and slowly releasing it to receiving waters or drainage systems. These practices can be designed to

both control stormwater volume and settle out particulates for pollutant removal.

Measurable Goals – The number of new dry/wet ponds installed.

6.5.3 Structural BMPs Infiltration Measures

Infiltration BMPs are designed to facilitate the percolation of runoff through the soil to ground water, and, thereby, result in reduced stormwater runoff quantity and reduced mobilization of pollutants. Examples include infiltration basins/trenches, dry wells, and porous pavement

Measurable Goal -The amount of new porous pavement added or replaced and the number of new development sites that use porous pavement. The number of new-grassed swales installed and acres drained by grassed swales.

6.5.4 Implementation Schedule for MCM 5

- **Year 1:** Begin development of the strategies for structural and nonstructural BMPs.
- **Year:** Implement the strategies for the BMPs; implement the ordinances and construction standards for the BMP development.
- **Year 3:** Reduce the percent of new impervious surfaces associated with new development projects.
- **Year 4:** Continue enforcement of ordinances and implementation of the BMPs; ensure the adequacy of the long-term operation and maintenance of the BMPs.
- **Year 5:** Improved clarity and reduced sedimentation of local water bodies.

6.6 Pollution Prevention/Good Housekeeping for Municipal Operations

Pollution Prevention/Good Housekeeping for Municipal Operations minimum control measure, one of six measures the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its storm water management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This section outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them.

The Pollution Prevention/Good Housekeeping for municipal operations minimum control measure is a key element of the small MS4 stormwater management program. This measure requires the small MS4 operator to examine and subsequently alter their own actions to help ensure a reduction in the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems.

While this measure is meant primarily to improve or protect receiving water quality by altering municipal or facility operations, it also can result in a cost savings for the small MS4 operator, since proper and timely maintenance of storm sewer systems can help avoid repair costs from damage caused by age and neglect. Compliance with this measure requires an operator of a regulated small MS4 to:

- Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system.

- Include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator can use training materials that are available from EPA, their State or relevant organizations.
- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

6.6.1 Automobile Maintenance

The Municipality of Juana Díaz will pursue the establishment of a program of targeted outreach and training for businesses and municipal fleets (public works, school buses, fire, police, and parks) involved in automobile maintenance about practices that control pollutants and reduce storm water impacts. Automotive maintenance facilities are considered to be storm water "hot spots" where significant loads of hydrocarbons, trace metals, and other pollutants may affect the quality of storm water runoff. Some of the waste types generated at automobile maintenance include the following:

- Solvents (paints and paint thinners)
- Antifreeze
- Brake fluid and brake lining
- Batteries
- Motor oils
- Fuels (gasoline, diesel, kerosene)
- Lubricating grease.

Fluid spills and improper disposal of materials result in pollutants, heavy metals, and toxic materials entering ground and surface water supplies, creating public health and environmental risks. Alteration of practices involving the cleanup and storage of automotive fluids and cleaning of vehicle parts can help reduce the influence of automotive maintenance practices on storm water runoff and local water supplies.

The most effective way to minimize the impacts of automotive maintenance generated waste is by preventing its production. A pollution prevention program, starting with the municipality's Public Works Department, seeking to reduce liquid discharges to sewer and storm drains from automotive maintenance will stress techniques that allow facilities to run a dry shop. Spills should be cleaned up immediately, and water should not be used for clean up whenever possible.

Other methods will be implemented as part of this plan to help prevent or reduce the discharge of pollutants from vehicle maintenance. Table 6 lists some of the measures that would be implemented to reduce vehicle maintenance and repair impacts. Many of these practices apply also to business owners and to residents who maintain their own vehicles. These practices will be applied mainly to maintaining Juana Díaz's municipal fleets, including school buses, public works, fire, police, parks, and other types of municipal fleets.

Table 6: Recommendations for reducing the storm water impacts of automotive maintenance.

Waste Reduction	➤ The number of solvents used should be kept to a minimum to make recycling easier and to reduce hazardous waste management cost. ➤ Do all liquid cleaning at a centralized station to ensure that solvents and residues stay in one area.
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	➤ Locate drip pans and draining boards to direct solvents back into solvent sink or holding tank for reuse.
Using Safer Alternatives	➤ Use non-hazardous cleaners when possible. ➤ Replace chlorinated organic solvents with non-chlorinated ones like kerosene or mineral spirits. ➤ Recycled products such as engines, oil, transmission fluid, antifreeze, and hydraulic fluid can be purchased to support the market of recycled products.
Spill Clean Up	➤ Use as little water as possible to clean spills, leaks, and drips. ➤ Rags should be used to clean small spills, dry absorbent material for larger spills, and a mop for general cleanup.
Parts Cleaning	➤ Use detergent-based or water-based cleaning systems instead of organic solvent degreasers.
Good Housekeeping	Employee training and public outreach are necessary to reinforce proper disposal practices. ➤ Conduct maintenance work such as fluid changes indoors. ➤ Update facility schematics to accurately reflect all plumbing connections. ➤ Parked vehicles should be monitored closely for leaks and pans placed under any leaks to collect the fluids for proper disposal or recycling. ➤ Promptly transfer used fluids to recycling drums or hazardous waste containers. ➤ Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets. ➤ Obtain and use drain mats to cover drains in the event of a spill. ➤ Store cracked batteries in leak-proof secondary containers.

Through the use of structural and nonstructural BMPs, the municipality would be able to reduce concentrations of lead, oil, and grease to levels approaching USEPA benchmarks.

6.6.2 Parking Lot and Street Cleaning

This management measure involves employing pavement-cleaning practices such as street sweeping on a regular basis to minimize pollutant export to receiving waters. These cleaning practices are designed to remove from road and parking lot surfaces sediment debris and other pollutants that are a potential source of pollution impacting urban waterways.

The Municipality of Juana Díaz currently engages in daily street sweeping activities in the urban center using brooms, shovels and other nonmechanical devices. Street sweeping is practiced in most urban areas, often as an aesthetic practice to remove sediment buildup and large debris from curb gutters. The frequency and intensity of rainfall for a region are also key variables in determining how streets need to be swept to obtain desired removal efficiency. Other factors that affect a street sweeper's ability to reduce non-point pollution include the condition of the street, its geographical location, the operator's skill, and the presence of parked cars.

The Municipality will implement an aggressive program for the sweeping of parking lots. This is also employed as a nonstructural management practice for industrial sites. This sweeping involves using brooms to remove small quantities of dry chemicals and solids from areas that are exposed to rainfall or storm water runoff. While the effectiveness of this practice at pollutant removal is unknown, the sweeping and proper

disposal of materials is a reasonably inexpensive method of pollution prevention that requires no special training or equipment.

A benefit of high-efficiency street sweeping is that by capturing pollutants before they are made soluble by rainwater, the need for structural storm water control measures might be reduced. Structural controls often require costly added measures, such as adding filters to remove some of these pollutants and requiring regular manpower to change-out filters. Street sweepers that can show a significant level of sediment removal efficiency may prove to be more cost-effective than certain structural controls, especially in more urbanized areas with greater areas of pavement.

6.6.3 Storm Drain System Cleaning

Storm drain systems and catch basins need to be cleaned regularly. The Municipality of Juana Díaz will implement a periodic Storm Drain System and catch basins cleanup schedule. Routine cleaning would reduce the amount of pollutants, trash, and debris both in the storm drain system and in receiving waters. Clogged drains and storm drain inlets can cause the drains to overflow, leading to increased erosion. The program will take place once a year before the heavy rain season to ensure an efficient handling of rainwater during peak precipitation periods. The program may include periodic inspections to detect the need for isolated cleaning activities that may be needed in discreet sections of the storm drain network.

Potential benefits of this program would include increased dissolved oxygen, reduced levels of bacteria, and support of in-stream habitat. Areas with relatively flat grades or low flows should be given special

attention because they rarely achieve high enough flows to flush themselves.

In the preliminary survey investigation conducted, it was observed that Juana Díaz Pueblo ward have several catch basins that conveys and discharges runoff to an outfall in Jacaguas River see Figure 5. During the development of the stormwater management plan (SWMP) further field investigations will be carried out to identify additional catch basins within the MS4.

6.6.4 Septic System Controls

Septic system source control refers to the use of outreach programs to educate homeowners about the proper operation and maintenance of their septic systems to reduce the likelihood of failure.

Septic systems are designed to treat wastewater by separating solids from liquids and then draining the liquid into the ground. Sewage flows into the tank where settling and bacterial decomposition of larger particles takes place, while treated liquid filters into the soil. When system failures occur, untreated wastewater and sewage can be introduced into ground water or nearby streams and water bodies.

Pollution prevention practices are designed to restrict pollutant and nutrient loads from improperly functioning septic systems from entering local water sources. These loadings occur for a number of reasons, including improper site selection, inadequate installation, or system operation failures: As many as 75 percent of all system failures have been attributed to hydraulic overloading. Failures may also occur due to lapses in the regular inspection and maintenance that are required to ensure proper operation during the design life of the septic system. Homeowners

may be unaware of the age of their system and whether preemptive planning is necessary before the system fails.

The Municipality will implement an outreach program regarding septic systems controls for large lot development in rural areas that are not served by sewer. When septic systems are used for wastewater treatment, there is a need for educational outreach and training to avoid system failures for owners of both new and existing systems.

At the state level, the PR Environmental Quality Board (EQB) regulates the construction, operation and closure of septic systems. The Municipality will implement a comprehensive management program aimed at helping enforce EQB rulings with regards to this issue. An onsite wastewater management program can reduce water quality degradation and save the municipal government and homeowner's time and money, as well as better tracking of the performance of routine maintenance practices. This comprehensive plan would be administered by the municipality's Environmental Affairs Department.

Public outreach and training are vital elements in the control of septic system failure. Many of the problems associated with improper septic system functioning may be attributed to a lack of homeowner knowledge of operation and maintenance of the system. Educational materials for homeowners and training courses for installers and inspectors will be provided by the municipal government that would reduce the incidence of failure.

Failing septic systems have been linked to water quality problems in streams, lakes, shellfish beds, and coastal areas. Improvements in system operation and maintenance should be a strong element in watershed plans for those areas where septic systems are used for

wastewater treatment. Public education and outreach regarding septic system operation and maintenance can be assumed to produce some positive effect on water quality. To better determine whether pollution prevention outreach is being effective, residential surveys should be part of any program seeking to educate residents on septic systems and their influence on water quality.

6.6.5 Material Management Recycling

The municipality of Juana Díaz currently engages in several recycling programs, which will be further evaluated during the development of the stormwater management plan (SWMP).

6.6.6 Hazardous Material Management

Failure to properly store hazardous materials dramatically increases the probability that they will end up in local waterways. Many people have hazardous chemicals stored throughout their homes, especially in garages and storage sheds. Practices such as covering hazardous materials or even storing them properly, can have dramatic impacts.

The Municipality will enforce both EPA and EQB guidelines with regards to the handling of this type of materials at all its facilities. A number of management considerations for hazardous materials would be proposed as follows:

- Ensuring sufficient aisle space to provide access for inspections and to improve the ease of material transport.
- Storing materials well away from high-traffic areas to reduce the likelihood of accidents that might cause spills or damage to drums, bags, or containers.

- Stacking containers in accordance with the manufacturer's directions to avoid damaging the container or the product itself.
- Storing containers on pallets or equivalent structures. This facilitates inspection for leaks and prevents the containers from coming into contact with wet floors, which can cause corrosion. This consideration also reduces the incidence of damage by pests (insects, rodents, etc.).
- Delegating the responsibility for management of hazardous materials to personnel trained and experienced in hazardous substance management.

Covering hazardous materials and areas where such materials are handled reduces potential contact with storm water and wind. Storage areas, outdoor material deposits, loading and unloading areas, and raw materials should all be covered or enclosed. Priority should be given to locations of the most hazardous substances.

Maintenance of hazardous material storage areas consists mostly of inspection and employee training. The municipality's Office of Environmental Affairs with the support of EQB would carry out employee training. Storage spaces and containers should be routinely inspected for leaks, signs of cracks or deterioration, or any other signs of release.

Improved storage of hazardous materials is effective at reducing contamination of storm water runoff and receiving waters if proper storage and maintenance techniques are used.

6.6.7 Spill Prevention and Control

Spill response and prevention plans should clearly state measures to stop the source of a spill, contain the spill, clean up the spill, dispose of

contaminated materials, and train personnel to prevent and control future spills.

On July 17th, 2002, EPA issued a final rule amending the Oil Pollution Prevention regulation promulgated under the authority of the Federal Water Pollution Control Act (Clean Water Act). This rule addresses requirements for Spill Prevention Control and Countermeasure Plans (SPCC Plans), among other issues. The new SPCC rule addresses these revisions and became effective August 16, 2002. The Spill Prevention, Control, and Countermeasure (SPCC) rule can be found in Title 40 of the Code of Federal Regulations (CFR), Part 112 (Oil Pollution Prevention).

Spill prevention and control plans are applicable to construction sites where hazardous wastes are stored or used and are regulated by USEPA. Hazardous wastes include pesticides, paints, cleaners, petroleum products, fertilizers, and solvents.

The Municipality will identify potential spill or source areas, such as loading and unloading, storage, and processing areas, places where dust or particulate matter is generated, and areas designated for waste disposal. Also, spill potential should be evaluated for stationary facilities, including manufacturing areas, warehouses, service stations, parking lots, and access roads. The Municipality will adhere to the stipulations set forth in the Oil Pollution Prevention regulation on all facilities deemed necessary by the Department of Environmental Affairs.

A spill prevention and control plan can be highly effective at reducing the risk of surface and ground water contamination. However, the plan's effectiveness is enhanced by worker training, availability of materials and equipment for cleanup, and extra time spent by management to ensure that procedures are followed.

6.6.8 Used Oil Recycling

Used motor oil is a hazardous waste because it contains heavy metals picked up from the engine during use. Motor oil is recyclable because it becomes dirty from use, rather than actually wearing out. However, as motor oil is toxic to humans, wildlife, and plants, it should be disposed of at a local recycling or disposal facility. Before disposal, used motor oil should be stored in a plastic or metal container with a secure lid, rather than dumped in a landfill or down the drain. Containers that previously stored household chemicals, such as bleach, gasoline, paint, or solvents should not be used. Used motor oil should also never be mixed with other substances such as antifreeze, pesticides, or paint stripper.

Used motor oil is recycled in a number of different ways. Used motor oil can be re-refined into lubricating oils that meet the same standards as virgin/new oil. All of these methods of recycling help to conserve valuable energy resources.

At the local level, the EQB has set forth a number of regulations for the recycling of used oil under Rule Number 5717, Rule for the Handling of Non-Hazardous Waste. The Municipality will take on the responsibility of enforcing this ruling at all its facilities.

When enforcing oil-recycling programs, the Municipality would provide the public with the proper informational resources. Programs would encourage the public to contact local service stations, municipal governments, the county government office, or the local environmental or health departments, if they are unsure where to safely dispose of their oil.

Recycling used motor oil is beneficial to the environment, the public health, and the economy. If oil is improperly disposed of in landfills, ditches, or waterways or dumped on the ground or down storm sewers, it can migrate into surface and ground water. It takes only one gallon of oil to contaminate one million gallons of drinking water (USEPA, 2000). This same oil can also seriously harm aquatic plants and animals. Submerged vegetation is especially affected by oil because the oil blocks sunlight from entering the water and hinders photosynthesis.

Recycling used motor oil is also beneficial in protecting public health. As oil circulates through a car's engine, it collects rust, dirt, metal particles, and a variety of contaminants. Engine heat can also break down oil additives, producing acids and a number of other substances. Exhaust gases and antifreeze can also leak into oil when the engine is in use. When any of these substances mix with oil, the toxicity of oil is greatly increased. Then, if oil is disposed of improperly and enters the water or air, public health can be seriously threatened. Recycling used motor oil is also beneficial to the economy. Oil is a valuable resource that can be re-refined and reused in combustion engines. As oil is a non-renewable resource, it will become increasingly more difficult to find new reserves in the future. Therefore, recycling will provide time to develop alternative fuels and lessen dependence on foreign oil suppliers.

6.6.9 Implementation Schedule for MCM 6

- **Year 1:** Start training of key employees; Plan & procedures in place for storm drain and catch basin maintenance. Plan will include strategy for identifying additional catch basins for cleanup and maintenance. Plan & procedures in place for parking lots & street sweeping.

- **Year 2:** Complete training of key employees and Plan & procedures in place for storm drain and catch basin maintenance. Plan & procedures in place for parking lots & street sweeping.
- **Year 3:** Automobile & septic system public outreach programs completed. Municipal procedures in place for hazardous material management and Municipal procedures in place for spill prevention control.
- **Year 4:** Municipal procedures in place for used oil recycling.
- **Year 5:** Automobile & septic system public outreach programs implemented

7.0 Person Responsible For Implementing or Coordinating the Applicant's Storm Water Management Program

Municipio de Juana Díaz

Attn: Hon. Ramón Hernández Torres, Mayor

P.O. Box 1409

Juana Díaz, P.R. 00795-1409

Telephone: (787) 259-210; Fax: (787) 259-2216

8.0 Conclusion

The BMPs and measurable goals for the six minimum control measures required by the EPA have been presented within the body of this report. The recommended course of action was created as an outline of the activities the municipality should plan for and budget for in the next five years to reduce the pollution effect on the urban area storm water runoff. These activities may be modified and adapted, as the EPA may deem necessary.

The implementation of the Storm Water Program will be the primary focus of the new Department of Environmental Affairs to be created by the

Municipality. The responsibilities of the tasks described in this report will be distributed between the personnel of this department at the municipality's discretion.

It is through the submittal of this working plan and the municipality's commitment to implement the actions mentioned herein that the Municipality of Juana Díaz requests the awarding of the NPDES Phase II Individual Permit for their Juana Díaz MS4.

9.0 Signatories To Permit Application and Reports

9.1 Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designated to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Hon. Ramón Hernández Torres,
Mayor

Date:

FIGURES











