REPETITIVE LOSS AREA ANALYSIS #3
City of New Orleans • Broadmoor Neighborhood

December 1, 2006
University of New Orleans
Center for Hazards Assessment, Response and Technology (CHART)

http://floodhelp.uno.edu

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Acknowledgements:

The compilation of this report was managed by Sarah Stack, MPA, a CHART Research Associate and a Doctoral Student of Urban Studies in the School of Urban Studies at the University of New Orleans. Contributing to this report were the New Orleans Department of Safety and Permits; The Broadmoor Improvement Association; and Brown, Cunningham, and Gannuch.

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Repetitive Loss Area Analysis

City of New Orleans – Broadmoor Neighborhood

Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>The Area</td>
<td>1</td>
</tr>
<tr>
<td>Process</td>
<td>3</td>
</tr>
<tr>
<td>Neighborhood Notification</td>
<td>5</td>
</tr>
<tr>
<td>Data Collection</td>
<td>5</td>
</tr>
<tr>
<td>Flood Insurance Data</td>
<td>5</td>
</tr>
<tr>
<td>Flood Insurance Rate Map</td>
<td>6</td>
</tr>
<tr>
<td>Orleans Parish Hazard Mitigation Plan</td>
<td>7</td>
</tr>
<tr>
<td>Drainage Studies</td>
<td>7</td>
</tr>
<tr>
<td>1992 Reconnaissance Study</td>
<td>9</td>
</tr>
<tr>
<td>SELA Project</td>
<td>10</td>
</tr>
<tr>
<td>Post Authorization Changes</td>
<td>11</td>
</tr>
<tr>
<td>Rainfall and Flood Claims Data</td>
<td>13</td>
</tr>
<tr>
<td>Property Owners</td>
<td>14</td>
</tr>
<tr>
<td>On-site Survey</td>
<td>15</td>
</tr>
<tr>
<td>Problem Statement</td>
<td>17</td>
</tr>
<tr>
<td>Mitigation Measures</td>
<td>18</td>
</tr>
<tr>
<td>Acquisition</td>
<td>19</td>
</tr>
<tr>
<td>Elevation</td>
<td>19</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>20</td>
</tr>
<tr>
<td>Barriers</td>
<td>20</td>
</tr>
<tr>
<td>Dry Floodproofing</td>
<td>20</td>
</tr>
<tr>
<td>Wet Floodproofing</td>
<td>20</td>
</tr>
<tr>
<td>Information Specific to Raised Basement Houses</td>
<td>21</td>
</tr>
<tr>
<td>Flood Insurance</td>
<td>21</td>
</tr>
<tr>
<td>Cost</td>
<td>22</td>
</tr>
<tr>
<td>Funding Sources</td>
<td>22</td>
</tr>
<tr>
<td>Coordination</td>
<td>23</td>
</tr>
<tr>
<td>Findings</td>
<td>24</td>
</tr>
<tr>
<td>Recommendations</td>
<td>24</td>
</tr>
<tr>
<td>References</td>
<td>26</td>
</tr>
<tr>
<td>Appendix A – Letter from the City of New Orleans</td>
<td>27</td>
</tr>
<tr>
<td>Appendix B – Data Sheet</td>
<td>28</td>
</tr>
<tr>
<td>Appendix C – Letter from the Broadmoor Improvement Association</td>
<td>29</td>
</tr>
<tr>
<td>Appendix D – Funding Table</td>
<td>30</td>
</tr>
</tbody>
</table>
Repetitive Loss Area Analysis
List of Abbreviations /Acronyms

FEMA – Federal Emergency Management Agency

CHART – Center for Hazards Assessment, Response and Technology at the University of New Orleans

RL – Repetitive Loss Property

NFIP – National Flood Insurance Program

GIS – Geographic Information Systems

FIRM – Flood Insurance Rate Map: Flood Insurance Rate Map. An official map of a community, on which FEMA has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to the community.

DFIRM – Digital Flood Insurance Rate Map

SFHA – Special Flood Hazard Area: The base floodplain delineated on a FIRM. The SFHA is mapped as a Zone A. In coastal situations, Zone V. The SFHA may or may not encompass all of a community’s flood problems.

BFE – Base Flood Elevation: The elevation of the crest of the base flood or 100-year flood.

ABFE – Advisory Base Flood Elevation: Three feet above the highest adjacent grade of a structure. This advisory was issued by FEMA following Hurricane Katrina to use as a guide for rebuilding homeowners until the new FIRM is released.

SELA – Southeast Louisiana Urban Flood Control Project

PAC – Post Authorization Changes: additional drainage projects that were approved at the same time as the SELA projects.

ICC – Increased Cost of Compliance: see page 22.

LRA – Louisiana Recovery Authority

Corps – U. S. Army Corps of Engineers
Repetitive Loss Area Analysis

Orleans Parish – Broadmoor Area

Background

The National Flood Insurance Program (NFIP) is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable level. It has a particular problem with repetitive loss properties, which are estimated to cost $200 million per year in flood insurance claim payments. Repetitive loss properties represent only 1 percent of all flood insurance policies, yet historically they account for nearly one-third of the claim payments (over $4.5 billion to date). Mitigation of these repetitive loss properties will reduce the overall costs to the NFIP as well as to individual homeowners.

The University of New Orleans’ Center for Hazards Assessment, Response and Technology (UNO – CHART) received a special grant from FEMA to collate data and analyze the repetitive loss areas in Louisiana. Using geographic information system (GIS) and flood insurance claims data, repetitive loss areas and properties are being prioritized for attention and analysis. In selected locations, UNO is reviewing whether flood control projects have been constructed or are planned that will stop the repetitive flooding.

UNO conducted an “area analysis” case study in the Broadmoor neighborhood. An area analysis follows new FEMA guidelines to determine the suitability of the buildings for acquisition, elevation, or other retrofitting flood protection measure. This report summarizes the area analysis conducted for the Broadmoor repetitive loss study area.

The Area: The Broadmoor repetitive loss study area is an urban neighborhood in Orleans Parish. It is located in the Uptown Area of New Orleans, on the east bank of the Mississippi River. It lies almost in the direct center of the City, excluding the New Orleans East ‘finger like’ area. New Orleans is located near the Gulf of Mexico and is surrounded by water on three sides: Lake Pontchartrain to the North, the Mississippi River to the South, and Lake Borgne to the
East. There is also an intricate network of canals and bayous, which connect to Lake Pontchartrain and the Mississippi River, throughout the city.

The Broadmoor case study focused on a sample portion of Broadmoor. The study area is a four block area bordered by S. Miro St., Napoleon Ave., S. Johnson St., and Upperline St. See the map on page 4.

Prior to being selected as an analysis area, a group of Broadmoor residents inquired to FEMA about being deemed “mitigated” due to a large drainage project that was completed in the area in 2002. Being considered as mitigated by FEMA could lower flood insurance rates, decrease the 100-year flood elevation, and/or lessen elevation requirements. FEMA directed the residents to UNO-CHART. After exchanging information with residents and assessing the flooding situation in the neighborhood, it was decided that Broadmoor qualified as an area analysis study area. The City of New Orleans approved the neighborhood for the study.

Broadmoor, as one of the lowest points in New Orleans, sits below sea level and relies on large pumps and drainage canals to keep the area from flooding. Broadmoor has suffered repetitive flooding over the years because the land is low, flat and poorly drained. This neighborhood was once a 12 acre lake on the ‘backside’ of the original city. It had to be drained in order for development to occur in the late 1800s. The majority of the development in the neighborhood occurred in the 1920s.(gnocdc.org)

After trying to create an effective drainage system in New Orleans for 150 years, in 1895, the city implemented a comprehensive drainage plan. This plan was to protect citizens from floods, reclaim swampy sections of the city for development, and to create a sanitary sewerage system. Prior to this plan the drainage canals and the sewerage canals were one and the same. The plan incorporated 95 miles of canals and a pumping system with 8 pumping stations. One such pumping station was located at the corner of S. Broad St. and Melpomene, Pumping Station #1. In the Broadmoor area, the plan called for canals along Claiborne Ave, Napoleon Ave., Toledano St. and Washington Ave.

Construction on Pumping Station #1 began in 1899 and was completed in 1902. Although the drainage plan was extensive, it was not enough to prevent yearly floods. In response to this problem, Albert Baldwin Wood designed a large capacity screw pump, the largest and most powerful pump to date. Two of these pumps were placed in each of the eight pumping stations. This system of pumps and canals drained the area that is now occupied by the Broadmoor neighborhood.

Development in the neighborhood began along Napoleon and Claiborne Avenues, and Toledano and Broad Streets. During 1903 and 1930 a 250-block neighborhood was created. (R. Christopher Goodwin and Associates Reconnaissance Study of Broadmoor)

Over the years the drainage has been improved, however the area is still an historical repetitive loss area. In 2005, the levees that protect New Orleans broke during and immediately after Hurricane Katrina, which caused substantial flooding throughout the
City, including Broadmoor. The study area within Broadmoor chosen for analysis was done so because of the housing diversity and the concentration of severe repetitive loss properties.

Broadmoor has many raised basement houses, a style distinctive to New Orleans. Twenty-five (44%) of the 57 properties in the study area are of the raised basement style. The raised basement homes in the Broadmoor study were built because the area was known to flood. The first floor of a raised basement home, which sits at grade, was intended strictly for storage or as a garage, and often times had a dirt floor. The second, and sometimes third, floors of this style of house were built as the living space. Over the years people turned their first floor basements into living space or small rental units. Many of the houses on the FEMA Repetitive Loss list are on this list because their raised basements flood.

A section of Broadmoor has been named to the National Register of Historic Places because of its high concentration of historical structures. The entire study area for this case falls within the boundaries of the historic district. Because of this historical designation, homeowners must take extra considerations when undertaking a mitigation project so that the designation is maintained. If a mitigation project relies on any Federal funding source, a section 106 review would be triggered to determine if there will be any adverse effects on the property or any neighboring properties. (phone conversation with Patty Gay, Preservation Resource Center)

**Process:** This area analysis follows a FEMA prescribed five step process:

1. Advise all the property owners in the repetitive loss area that the analysis will be conducted.
2. Collect data on each building and determine the cause(s) of the repetitive flood damage.
3. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.
4. Contact agencies or organizations that may have plans that could affect the cause or impacts of the flooding.
5. Document the findings, including a map showing all parcels in the area.
Broadmoor Neighborhood Analysis Area
New Orleans, Louisiana
Neighborhood Notification

The first step in the area analysis process was to advise the neighborhood about the project. On June 19, 2006 the City of New Orleans Department of Safety and Permits sent a letter to the homeowners in the study area introducing them to the project. Included with the letter was a data sheet that residents were asked to complete and return to CHART. Following the City’s letter, UNO – CHART project team members met with several members of the Broadmoor Improvement Association on June 27, 2006 to review the project’s objectives and approach. The Association provided a great deal of support, particularly in publicizing the project and its findings. On June 28, 2006, the Broadmoor Improvement Association drafted an additional letter to residents about the project. Both letters and the data sheet can be found in the appendices.

A Broadmoor community meeting was held by UNO-CHART team members on November 6, 2006. The draft copy of this report was presented. Residents were encouraged to comment within two weeks on this draft. Approximately 40 residents attended this meeting, and many stayed afterward to ask more specific questions of the UNO-CHART team.

Data Collection

The second step in the analysis process was to collect relevant data on the problem and the properties exposed to flooding. Six sources of information were used for this:

- flood insurance data;
- flood insurance rate map;
- Orleans Parish Hazard Mitigation Plan;
- drainage studies;
- property owners;
- on-site surveying.

**Flood insurance data:** The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claim data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this report does not identify the repetitive loss properties or include claims information for any individual property.
The Broadmoor study area was selected for analysis because the neighborhood has a high concentration of repetitive flood loss properties. Of the 57 homes in the study area, 35 are listed on FEMA’s repetitive loss list. About twenty are expected to qualify as severe repetitive loss properties. In total, the homeowners for the 35 repetitive loss properties have received $5,794,236.05 in paid flood claims since 1978. The average number of claims for the repetitive loss properties is about 6. On average, each of the repetitive loss properties has received $165,549.60 in flood claims. The maximum amount that has been paid to one RL building is $401,807.31; and the minimum is $2714.58. The table at the left shows the dates and number of flood claims paid on repetitive loss properties in the study area.

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Flood Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-May-78</td>
<td>11</td>
</tr>
<tr>
<td>13-Apr-80</td>
<td>16</td>
</tr>
<tr>
<td>10-Jun-81</td>
<td>17</td>
</tr>
<tr>
<td>25-Apr-82</td>
<td>8</td>
</tr>
<tr>
<td>7-Apr-83</td>
<td>24</td>
</tr>
<tr>
<td>2-Apr-88</td>
<td>13</td>
</tr>
<tr>
<td>10-Jun-91</td>
<td>21</td>
</tr>
<tr>
<td>17-Feb-92</td>
<td>7</td>
</tr>
<tr>
<td>9-May-94</td>
<td>9</td>
</tr>
<tr>
<td>8-May-95</td>
<td>27</td>
</tr>
<tr>
<td>11-Sep-98</td>
<td>22</td>
</tr>
<tr>
<td>29-Aug-05</td>
<td>24</td>
</tr>
</tbody>
</table>

Twenty-three of the 25 (92%) raised basement houses in the study area are repetitive loss properties. These repetitive loss raised basement houses have collected a total of $3,744,873.58 in flood claims since 1978. The average claim amount is $162,820.58, and the average number of claims per repetitive loss raised basement house is between 6 and 7.

It is likely that the data in this section have understated the flooding problem for several reasons:

- The Study only looked at the 35 properties that had repetitive flood insurance claims where data were readily available;
- NFIP data only show flood losses since 1978, therefore previous flooding problems were not examined;
- Some property owners have under reported their flooding incidences because they were concerned that numerous and costly claims could increase their flood insurance rates.

**FIRM:** The FEMA Flood Insurance Rate Map (FIRM) shows the study area completely within the 100-year floodplain and designated as an A8 Zone. According to the FIRM, the base flood elevation (BFE), also known as the 100-year flood level, is 1.5 feet above sea level. Flood zone A8 is a high risk flood zone, located in a special flood hazard area (SFHA). Properties located in an AE or A1 – A30 flood zone have a 1% chance, annually, of flooding, and a 26% chance of flooding over the life of a 30-year mortgage. (www.floodsmart.gov) Advisory Base Flood Elevations (ABFEs) were issued by FEMA after Hurricane Katrina. The ABFE is either the current BFE or three feet above the highest adjacent grade, whichever is higher. In Broadmoor, the current BFE is higher for most structures.

FEMA is in the process of updating the 1984 FIRMs. New FIRMs and BFEs will be released once the levees are certified, which could be years. There have been extensive improvements in drainage since the 1984 FIRMs were created. According to a Sewerage and Water Board press release dated June 7, 2004, these changes could lead to reduced
flood insurance premiums in some areas. However, the press release is careful to add that updated results should be ‘in hand’ before drawing conclusions about rates or “other floodplain issues”. (Sewerage and Water Board press release, June 7, 2004)

Additionally, the extensive drainage work could result in a lowered BFE for the Broadmoor neighborhood indicating a lower flood risk for the area.

Understanding Elevations: In several places, this report refers to elevation above or below sea level. “Sea level” is a national base for measuring how high things are. Things get confusing in the New Orleans area because inside the levees, the ground has subsided over time to a level below sea level.

Floodplain construction regulations are designed to protect new and substantially improved buildings from the base, or 100-year flood. They do this by requiring the lowest floor to be above the base flood elevation. The base flood elevation is abbreviated as “BFE” and is measured in feet above or below sea level, depending on the location. In the example to the left, the ground has settled to four feet below sea level. Therefore, if a house is surveyed at 1.4 NAVD, it is actually at 1.6 NGVD, above the base flood elevation.

Orleans Parish Hazard Mitigation Plan: The hazard mitigation plan for Orleans Parish was completed in December 2005, following Hurricane Katrina. The plan addresses, among other hazards, flooding, hurricanes, and levee failure. According to the plan, New Orleans is most vulnerable to flooding compared to other disasters, both natural and manmade. It notes that most flooding occurs during the months of June, July and August due to an increase in tropical moisture (hurricane season) and that 69% of the structures in Orleans parish lie within the 100-year floodplain as mapped by FEMA in 1984.

Drainage Studies: The Orleans Parish drainage system is composed of a network of subsurface piping that connects to open and enclosed canals, and manually controlled pumping stations. Levees that surround Orleans Parish provide protection from hurricanes and high Mississippi River stages. Therefore, all rain that falls inside the city’s protection must be pumped out. A map of the pumping stations throughout New Orleans is found on the next page. Pumping Station #1 pumps Broadmoor.
Broadmoor lies in area OE16C of sub basin OE16. This sub basin is generally bounded on the north by Washington Avenue, Pontchartrain Expressway and US Highway 90; on the east by Interstate-10; and on the south and west by Claiborne Ave., Audubon Blvd., and a portion of Carrollton Avenue, from Fontainebleau Drive to Washington Avenue. The area, approximately 5,770 acres, pumps to Pumping Station #1. The area is highlighted on the map on the next page.
Canals throughout New Orleans can either be above ground, open canals; or underground, enclosed canals. The canals range in size between 5ft. by 13ft. and 28ft. by 13ft. Located at the intersection of Broad Street and Martin Luther King Boulevard, Pumping Station #1 lifts flow from sub basin OE16 into one of two outlet canals. The Washington / Palmetto Canal carries flow to Pumping Station #6, while the Broad Street Canal carries flow to Pumping Station #2.

This section reviews two drainage reports issued by the U.S. Army Corps of Engineers: the 1992 Reconnaissance Study and the 2002 Post Authorization Change (PAC) report.

1992 Reconnaissance Study: The purpose of this study was to determine the need for the Southeast Louisiana Urban Flood Control Project (SELA) project. However, the flood of 1995 was the actual impetus for Congress to authorize SELA. According to the 1992 reconnaissance report, planned improvements include enlarging the underground Broad Street Canal from South Lopez St. to Pumping Station #1. This report also recommends enlarging the underground Napoleon and Nashville Avenue Canals from Claiborne Avenue to Broad Street, and the General Taylor Canal from Willow to Broad Streets. Enlarging these canals would alleviate much flooding in Broadmoor. The benefits of these improvements are assumed to accumulate incrementally as the projects are completed. At the time that the report was published, improvements had been completed for the Washington/ Palmetto Canal, and in the 17th Street Canal between Pumping
Station #1 and Pumping Station #6. These improvements have enhanced conveyance in the canals.

**SELA Project:** The SELA project was authorized by Congress in 1996. Its purpose is to improve rainwater drainage in Orleans, Jefferson, and St. Tammany Parishes through pumping station and channel improvements. These improvements support each parish’s master drainage plan and typically provide flood protection against the 10-year flood, and reduce damage from flood events larger than the 10-year flood. (U.S. Army Corps of Engineers SELA Project fact Sheet)

In Orleans Parish, the U.S. Army Corps of Engineers and the Sewerage and Water Board cost share the SELA projects. 75% of the project cost is covered by the Federal source, and the remaining 25% is the responsibility of the local entity. Projects in Orleans Parish are located in the Uptown/Hollygrove area, the People’s Triangle area, and in the Dwyer Road area. These locations are indicated on the map on page 11. The Uptown/Hollygrove improvements directly affect the Broadmoor repetitive loss case study area. Specific improvements originally authorized for this area include:

- a new pump installed at Pumping Station #1; (Sewerage and Water Board of New Orleans website)
- the installation of two large underground canals along side of an existing one on Napoleon Avenue, from S. Claiborne Ave to S. Broad St.;
- excavating the existing discharge basin leading to Pumping Station #6;
- improving culverts along Nashville Ave from S. Johnson St. to Fontainebleau Dr.; and General Taylor Ave. from Willow St. to S. Broad St. (2002 Post Authorization Change report)

Modifications to the authorized improvements included:

- adjusting the Napoleon Ave project to only encompass the area from S. Claiborne Ave. to Fontainebleau Dr.;
- removing the canals along Nashville Ave. and General Taylor Ave. from the plan. (2002 PAC Report)

The new pump installation at Pumping Station #1 was completed in July 2001, and the Napoleon Avenue canals were completed in September of 2002. (Sewerage and Water Board of New Orleans website)
Post Authorization Changes: Additional drainage projects, called Post Authorization Changes (PACs) were approved by Congress with the original authorization for the SELA project in 1996. This authorization was not for specific projects; rather it was for future post-SELA projects.

The PAC report investigates the feasibility of additional new canals to be constructed in the following locations:

- Jefferson Ave. from Constance St. and S. Claiborne Ave.,
- Napoleon Ave. from Constance St. and S. Claiborne Ave.,
- Louisiana Ave. from Constance St. and S. Claiborne Ave.,
- S. Claiborne Ave. from General Taylor Ave. and Louisiana Ave.,
- S. Claiborne Ave from Lowerline St. and Monticello St.,
- Prytania St. from Nashville Ave to Jefferson Ave. (2002 PAC report)

The SELA project called for large underground canals along Napoleon Ave. These canals, completed in 2002, improved the surface drainage in the Broadmoor neighborhood. However, the reason for these large canals was so that they could handle the increased flow resulting from the PACs. Therefore the benefit that Broadmoor now sees as a result of SELA will be diminished once the PACs are in place. The following
The table illustrates the 100-year flood elevations calculated by the U.S. Army Corps of Engineers for the Broadmoor neighborhood pre-SELA, with SELA, and with the PACs.

<table>
<thead>
<tr>
<th></th>
<th>Pre-SELA</th>
<th>With SELA</th>
<th>With PACs</th>
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</table>

*These elevations assume that all secondary and tertiary surface drainage infrastructure is properly sized and not clogged.*

In comparing the pre-SELA 100-year flood elevation to the 100-year elevation with the PACs in place, the Broadmoor area will only see about a 4 inch decrease in the 100-year flood elevation. While the PACs have been authorized, at this time it is unknown when they will be completed.

The PAC projects are presently in the U.S. Army Corps of Engineers design phase. The Corps has not yet determined an estimated date for the start of construction. In order to proceed into the construction phase, all needed funding must be secured. This includes the 25% match to be paid by the City. This match is required by the same Congressional Act that authorized the SELA and PAC projects. Given New Orleans’ reduced population and tax base, it is doubtful that the City will be able to meet the required 25% match in the near future.
Rainfall Data and Flood Claims Data: In May of 1995 there was substantial flooding all throughout the New Orleans area. A storm dropped as much as 19 inches of rain in less than eight hours in some parts of New Orleans. The Mayor declared a state of emergency for Orleans Parish. Broadmoor received 13.8 inches of rain. ((1995, May 10). Gauging the Rain: How Seven Parishes Fared During Monday Night’s Torrential Rains. The Times Picayune, Retrieved September 25, 2006, from Lexis Nexis.) 27 of the 35 repetitive loss property owners in the study area filed flood claims for the May 1995 flood. In September of 1998, Tropical Storm Frances dropped 12.43 inches of rain on Broadmoor. 22 of the 35 Repetitive Loss property owners in the study area filed flood claims. Since 1998, there have been no flood claims filed by any of the repetitive loss homeowners in the study area, until Hurricane Katrina. (floodhelp.uno.edu) Following the completion of the Broadmoor area SELA projects, there were several instances where the Broadmoor area received between 4 inches and 17 inches of rain.

The table to the right shows the heavy rainfall events in Broadmoor (at least 4 inches of rain) and the corresponding number of flood claims by repetitive loss property owners within the study area. The Broadmoor rainfall gauge is located at Pumping Station #1 on Broad St. This table demonstrates clearly that following the rain event on September 11, 1998 there were no flood claims by repetitive loss property owners in Broadmoor until the levees broke in 2005 as a result of Hurricane Katrina. Between the last flood claim in 1998 and the completion of the SELA project in 2002, there were three rain events each dropping at least 6 inches of rain with no flood claims resulting. This is because effects of SELA were starting to materialize as the larger canals were constructed. Tropical Storm Isidore dropped 17 inches of rain in Broadmoor following the completion of the SELA project in 2002, and there were no flood claims from repetitive loss properties within the study area. (Sewerage and Water Board rainfall records, floodhelp.uno.edu)

When Hurricane Katrina made landfall during the early morning hours of August 29, 2005, the pumps at Pumping Station #1 worked to keep the houses in Broadmoor from flooding, until the levees broke. The following photographs were taken by a Broadmoor resident at the corner of Jefferson Avenue and South Tonti Street on the morning of
August 29, 2005 after the storm passed, the afternoon of the same day, and the following morning. These photographs clearly show that once the storm had passed on the morning of August 29, 2005, water was in the streets but not inside of most Broadmoor homes. By the afternoon of the same day, the streets were dry. The flood water from the levee breaks proved to be too much for the pumps to handle and flooded most of the city, including Broadmoor.

Property Owners: As previously mentioned, the letter to Broadmoor residents from the City of New Orleans included a data sheet. Copies of the notice and data sheet are included in the appendices. The back side of the data sheet included UNO – CHART’s address and a stamp. After completing the form, the respondent was instructed to fold the sheet and return it by mail.

Of the 57 letters which were sent, 14 were returned undeliverable. A total of 43 letters were delivered of which 17 people responded, many with detailed notes about their flooding history. This 39% return rate is considered excellent for this type of data collection, indicating a high degree of interest in flooding and flood protection in the neighborhood. The results are summarized in the table on page 14.
# Data Sheet Results

<table>
<thead>
<tr>
<th>Total Respondents</th>
<th>17</th>
</tr>
</thead>
</table>

1. In what year did you move into the home at this address? 1950s – 1, 1960s – 1, 1970s – 1, 1980s – 3, 1990s – 4, 2000s – 7

2. What type of foundation does your house have? Raised Basement – 12, Crawlspace – 4, Slab – 1

3. If you have a raised basement, is it finished and occupied? Yes – 6, No – 6, No Answer – 5

4. Has the property been flooded or had a water problem? Yes – 15, No – 2


6. Deepest water depth over first floor or basement floor. <1 ft – 2, 1.5-2 ft – 0, 2.5-4 ft – 1, 4.5-6 ft – 3, 6.5-8 ft - 7

7. Longest time water stayed up. Unknown – 3, <1 day – 1, 1-7 days – 2, 8-14 days – 8, 15+ days - 1

8. Cause of flooding Storm sewer backup – 5, clogged/undersized drainage ditch – 5, pump station overloaded – 14, pump station shut down – 7, sanitary sewer backup – 1, standing water next to house – 1, drainage from nearby properties – 3, Hurricane Katrina – 1, levee break - 9

9. Protective measures taken. 10 of 17 homeowners have taken at least one protective measure. Moved utilities/contents to a higher level – 9, regraded yard to keep water away from building – 1, installed drains/pipes to improve drainage – 3, waterproofed the outside walls – 2, depended on SELA project - 1

10. Number of respondents interested in pursuing protective measures. 15 of 17 respondents are interested in pursuing protective measures.

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**On-site survey:** The UNO team shot elevations for each house in the study area. During the week of June 26, 2006, a survey crew from UNO – CHART visited each property in the subdivision. The following information was recorded for each of the 57 properties:

- Whether or not the property was occupied
- Type of foundation
- Condition of foundation
- Type of structure
- Condition of structure
- Number of stories
- Estimate of the height of the lowest floor above grade
- Estimate of the height of the grade above street level
- Presence of appurtenant structures
- A photograph was taken of each house

The following table is a summary of the data collected by the CHART team.

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<tr>
<th>Data from Neighborhood Survey by CHART Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupancy*</td>
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<tr>
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<tr>
<td>Vacant</td>
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<tr>
<td>Undeterminable</td>
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<tr>
<td>Use**</td>
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<tr>
<td>Single Family</td>
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<tr>
<td>Multi Family</td>
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<tr>
<td>Foundation</td>
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<tr>
<td>Piles/Piers</td>
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<tr>
<td>Elevated Basement</td>
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<tr>
<td>Crawlspace with adequate vents</td>
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<tr>
<td>Crawlspace without adequate vents</td>
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<tr>
<td>Slab</td>
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<tr>
<td>Condition of Foundation</td>
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<tr>
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<tr>
<td>Fair</td>
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<tr>
<td>Poor</td>
</tr>
<tr>
<td>Type of Structure</td>
</tr>
<tr>
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<tr>
<td>Masonry</td>
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<tr>
<td>Combination Wood Frame-Masonry</td>
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<td>Condition of Structure</td>
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<tr>
<td>2</td>
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<tr>
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<td>5+ ft.</td>
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<td>1-2 ft.</td>
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<tr>
<td>2-3 ft.</td>
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<tr>
<td>3-4 ft.</td>
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</tbody>
</table>

*properties with FEMA trailers on the lot were assumed occupied
**some properties with raised basement apartments may have been counted as single family homes due to difficulty of detection
***Houses with elevated basements were counted as 2 stories if the basement looks as if it is living space, otherwise the structure is considered 1 story.
Problem Statement:

- Broadmoor lies in one of the lowest points in the City and relies on a system of canals and pumps to keep the area dry.
- All structures are positioned in flood zone A8, which is in the 100-year floodplain.
- The base flood elevation (100-year) is 1.5 feet above sea level. The highest adjacent grade measurements in the study area fall between 7.7 feet below sea level and 2.4 feet below sea level. The first floor elevations in the study area fall between 8.0 feet below sea level and 1.4 feet above sea level.
- As of September 18, 2006 a total of $5,794,236.05 has been paid to repetitive loss homeowners in the study area.
- 60% (or 35) of the 57 properties in the study area are repetitive loss structures.
- The SELA project in the Broadmoor area was completed in September 2002, however there are remaining projects yet to be completed throughout the sub-basin where Broadmoor sits.
- Between May 1978 and September 1998, there were 11 flooding incidents that merited between 8 and 27 flood claims from the repetitive loss homeowners in the Broadmoor study group.
- Residents report pump overload, pump shutdown, storm sewer backup, clogged or undersized drainage ditches, and the Katrina levee break as causes of flooding.
- 10 of the 17 respondents have taken at least one protective measure. 15 of the 17 respondents are interested in protective measures.
Mitigation Measures

The third step in the area analysis procedure is to review alternative approaches to protect the properties from future flood damage. Eight approaches were analyzed:

1. Buying out and clearing additional properties in the hazardous area
2. Elevating the houses above the 100-year flood level
3. Reconstruction
4. Constructing small levees or floodwalls around one or more houses
5. Dry floodproofing
6. Wet floodproofing
7. Purchasing flood insurance
8. Drainage improvements – will not be discussed in this section. See the previous discussion on drainage.

Each approach has its pros and cons. Most of these measures are considered “nonstructural” approaches, which are usually recommended when structural approaches, such as drainage improvements, are not feasible. All of these measurements except for flood insurance require a permit.

It is important to note that some of these mitigation options (floodwalls, dry floodproofing and wet floodproofing) will not protect against another levee break, as was seen as a result of Hurricane Katrina. These options will help protect against the smaller repetitive flooding caused by rainwater, and, in some cases, against the 100-year flood event. An acquisition or elevating a house to the water line following Katrina will protect against a levee break.

While this section proposes different alternative mitigation approaches, there are instances when a property owner’s freedom of choice is limited. Chapter 78 of New Orleans’ Code of Ordinances prescribes minimum requirements for land use and control measures for flood-prone areas of the City. Section 78-40 defines substantial improvement as “any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started, or if the structure has been damaged and is being restored, before the damage occurred.”

Section 78-132(1) requires that “New construction and substantial improvement of any residential structure shall have the lowest floor (including basement), elevated to or above the base flood elevation.” Therefore, elevation as a mitigation measure is required by law for those buildings that were substantially damaged by Hurricane Katrina or any other cause.
**Acquisition:** This measure involves buying one or more properties and clearing the site. If FEMA funds are to be used, three requirements will apply:

1. The applicant for FEMA funds must demonstrate that the benefits exceed the costs, using FEMA’s benefit/cost software.
2. The owner must be a willing seller.
3. The parcel would be deeded to the City which agrees to keep it as open space such as a park. It would then be the City’s responsibility to keep the grass cut and trash picked up in the space.

At this time the City is not interested in purchasing properties for open space, therefore this mitigation measure is not likely to be a viable option for homeowners.

**Elevation:** Raising the structure above the flood level is generally viewed as the best flood protection measure short of removing the building from the floodplain. Most of the cost to elevate a building is in the preparation and foundation construction. Because of this, raising the structure to the 100-year flood level costs relatively little more than raising to the 10-year level.

FEMA will only fund a project in a regulatory floodplain that goes to at least the base (100-year) flood elevation, or to the most current advisory base flood elevation. For the New Orleans area, the advisory flood level is either the current base flood elevation (BFE), which was determined in 1984, or three feet above the highest adjacent grade, whichever is higher. Every house in the Broadmoor study area has a lowest floor elevation that is below the current BFE. Even in raised basement homes where the raised basement appeared to be used as storage only, the raised first floor of living space was below BFE. The first floor elevations range from -8.0 ft. to 1.4 ft. The current BFE, which is 1.5 ft. in Broadmoor, is higher than three feet above the highest adjacent grade. Therefore Broadmoor homeowners will most likely have to meet their current BFE rather than simply elevating 3 feet higher than the highest adjacent grade. In order to find out what the actual elevation of a home is, the homeowner must have an elevation survey done.

Elevation is usually cost-effective for buildings on piers or crawlspaces because it is easiest to get lifting equipment under the floor and disruption of the habitable part of the house is minimal. There are 28 houses on either pier or crawl space foundation in the study area, none are above the ABFE. One property in the study area is currently undergoing an elevation to approximately 7 feet above grade.
**Reconstruction:** This mitigation measure means actually demolishing the structure and rebuilding it at or above BFE. It is usually only funded if elevation is cost prohibitive or not possible because the structure is not physically able to withstand the elevation process. New houses are built comparable to the previous house in size. The new size cannot exceed the original size plus an additional 10%. Reconstruction, by its nature will contribute to the destruction of the historical integrity of Broadmoor because it entails demolishing a structure in an historic district.

**Barriers:** Small floodwalls could be constructed around one or more properties. Such barriers are not recommended for flood depths greater than three feet. Levees and berms are not appropriate for an urban neighborhood such as Broadmoor, as there is not enough room to construct an earthen barrier. Small floodwalls are more appropriate for an urban setting, but in most cases there is not enough room on the lots for walls around a house.

Another concern is the permeability of the soil. Permeable soil will allow floodwaters to seep under the barrier. This is a particular problem when floodwaters stay up for a long time. The soil type found in the majority of the study area is sandy and loamy alluvial. Sandy soil is the most permeable type of soil. Therefore, these soil types are not appropriate for constructing a barrier.

**Dry Floodproofing:** This measure is intended to prevent floodwaters from entering a building. Walls are coated with waterproofing compounds or plastic sheeting. Openings (doors, windows, and vents) are closed, either permanently, with removable shields, or with sandbags. Because it employs the building itself as part of the barrier to the passage of floodwaters, dry floodproofing is generally only recommended for buildings with slab foundations. In Broadmoor, this technique can be used in raised basement homes because the “basement” sits on a slab. Even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than 3 feet over the floor because water pressure on the structure can collapse the walls and/or buckle the floor. Protecting to the ABFE is not necessary if the home was not substantially damaged following a previous flood.

**Wet Floodproofing:** This approach to flood mitigation is appropriate for garages and raised basement homes. The wet floodproofing approach allows water to enter the building. However, everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are
used instead of wooden studs and gypsum wallboard. The furnace and water heater are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

Wet floodproofing has one advantage over the other approaches: no matter how little is done, flood damage is reduced. Thousands of dollars in damage can be prevented by simply moving furniture and electrical appliances upstairs. The major disadvantage of wet floodproofing is that the owner loses the use of the living space below the flood protection level. While the area can still be used, there should be no carpeting, furniture, insulation, and other materials subject to water damage that cannot be removed in time. This may not be a problem where the basement homes have flooded before and the owners have opted to not refinish them.

*Information specific to raised basement homes:* A wet floodproofed raised basement home can be considered an elevated building under the floodplain building requirements. In other words, rather than physically elevating the structure to the ABFE, the first floor (the “basement”) can be converted to a wet floodproofed area. The old second floor would be considered the new lowest floor for code purposes if it is at or above the BFE. According to the elevations shot by the UNO-CHART team, approximately 50% of the raised basement houses in the study area have second floors that are at or above BFE. In order to see if a house is eligible for this approach to meet code requirements, a more accurate survey should be conducted to verify the floor elevations. As previously mentioned elevating the lowest floor of living space above BFE is only *required* for those houses that are substantially damaged.

The approach can greatly reduce the cost to the homeowner of meeting the code requirement for repairing a substantially damaged house. However, the owner would lose the use of the first floor as a finished living area or rental unit. The floodplain regulations require that the floodable area be used only for parking, access, and storage and any finished structural parts (such as wallboard) and the contents located below the “new” first floor are not insurable.

**Flood Insurance:** A flood insurance policy covers surface flooding from the overflow of inland or tidal waters or from stormwater runoff. Although not a mitigation measure that reduces property damage from a flood, a National Flood Insurance Program policy has the following advantages:

- A policy will cover damage caused by rising water. It is an excellent “backup” for an elevation project or floodproofing where the flood is higher than the protection level.
- The repetitive, shallow, flooding is unlikely to reach conditions severe enough for a disaster declaration. Therefore, flood insurance may be the only source of assistance to help owners of damaged property pay for cleanup and repairs.
- A policy is always in effect once the 30-day waiting period following the purchase of the policy is over. There is no need for the homeowner to be home to put door or window barriers in place, as is the case for a dry floodproofed home.
- Coverage is available for contents of a home as well as for the structure.
- Renters can buy contents coverage, even if the building owner does not buy coverage for the structure itself.

**Cost:** The table to the right shows the rates for a policy with $150,000 coverage on the building. Most of the houses in the Broadmoor area were constructed before January 1, 1975, and are considered “pre-FIRM” buildings, eligible for the “subsidized” flood insurance premium rates.

The table shows that a post-FIRM building is subject to actuarial rates. Under the City’s floodplain management regulations, a post-FIRM home must be elevated above the 100-year or base flood elevation (“BFE”). A substantially damaged or substantially improved building must also meet the post-FIRM construction requirements. The example flood insurance premium would be $500 less than the “subsidized” pre-FIRM premium. If a pre-FIRM house was elevated, it would be able to take advantage of the much lower post-FIRM rates.

**Funding Sources:** There are several possible sources of funding for mitigation projects:

*FEMA programs:* Most of the FEMA programs provide 75% of the cost of a project. The owner is expected to fund the other 25%. Each program has different Congressional authorization and slightly different rules. For example, some are not allowed to fund reconstruction projects.

The most active program currently is the Hazard Mitigation Grant Program. Orleans Parish has focused on mitigating severe repetitive loss properties and is offering three mitigation measures: acquisition, elevation, and reconstruction. The City of New Orleans Information Technology Department is currently administering the applications process for the Parish.

*Flood insurance:* There is a special funding provision in the NFIP for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building’s flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims
must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact the City.

Coverage under the ICC does have limitations:
  • It covers only damage caused by a flood;
  • The building’s flood insurance policy must have been in effect during the flood;
  • ICC payments are limited to $30,000 per structure;
  • Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator; and
  • The Structure must be located in a SFHA.

*Louisiana Recovery Authority:* LRA grants of up to $30,000 can be used to help elevate a house, even if it was not substantially damaged. A separate program provides up to $7,500 for “individual mitigation measures,” including installing a backflow valve and elevating utilities such as an air conditioning unit, washer, dryer, water heater, furnace, or electrical panel.

In order to be eligible for LRA money, a homeowner must have owned and occupied the home as a primary residence prior to August 29, 2005 if affected by Hurricane Katrina, or September 24, 2005 if affected by Hurricane Rita. The homeowner must have registered with FEMA and have had FEMA categorize the home as ‘destroyed’, having suffered ‘major’, or ‘severe’ damage. The home must be a single or double unit structure. Homeowners who were required to carry flood or hazard insurance but chose not to are eligible; however, they will incur a 30% penalty. To apply for these funds, individuals first have to register with the Louisiana Recovery Authority, and then fill out an application. For more information on the LRA go to www.lra.louisiana.gov, or call 1-888-762-3252.

See Appendix D for more information on funding sources

**Coordination**

There are many different agencies and organizations that could participate in a flood mitigation project for the Broadmoor study area. The following were contacted by the UNO-CHART team:
  • The City of New Orleans Safety and Permits Department
  • The US Army Corps of Engineers, New Orleans District, was contacted to discern the status of the SELA projects in the area
  • The Broadmoor Improvement Association
  • The Preservation Resource Center
  • New Orleans Sewerage and Water Board
  • Montgomery-Watson, Engineering Firm (Drainage and SELA info)
  • Brown Cunningham and Gannuch, Engineering Firm (Drainage and SELA info)
  • FEMA and the LRA were contacted regarding their latest grant program rules
Findings

Properties in the Broadmoor repetitive loss area are subject to two types of flooding: shallow repetitive drainage problems and deeper flooding from pump station or levee failure or overtopping. There are different approaches that can mitigate damage from these kinds of flooding.

Recent drainage improvements by the City and SELA have already reduced the recurrence of the shallow repetitive drainage flooding. The SELA project in Broadmoor has been completed since September 2002, however PAC projects have not yet begun. Reports from the U.S. Army Corps of Engineers show that the benefits that Broadmoor is presently experiencing from SELA will be diminished once the PAC projects are completed. These structural projects will not prevent the deeper flooding from pump station or levee failure, nor can they be expected to be foolproof. The nonstructural mitigation measures for Broadmoor residents are justified because shallow flooding may still occur if the storm sewers become clogged or the pumps fail to operate.

This report reviews several different nonstructural mitigation alternatives. Each has advantages and disadvantages which are listed in the table on the next page. Elevation of the structure, acquisition, or reconstruction are the only options if the building is substantially damaged. Barriers and dry floodproofing can be effective against shallow flooding, but are the least appropriate mitigation measures for Broadmoor because the lots are too small for barriers and neither measure will protect against flooding greater than three feet.

If the lowest floor of a raised basement home is wet floodproofed and converted into a storage area or garage, the house is effectively elevated and protected from water up to the second floor. If the second floor is above the base flood elevation, such a conversion can bring the building into compliance with the substantial damage regulations, significantly reduce the flood insurance premiums, preserve the structure’s architectural appearance, and return the building to its original use. ICC funds can be used for this type of raised basement conversion, as can the LRA $30,000 mitigation grant.

The advantages and disadvantages of the six nonstructural mitigation approaches are summarized in the table on page 25.

Recommendations:

1. Property owners should review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situations.

2. Property owners should obtain and keep a flood insurance policy on their homes.

3. Property owners interested in an elevation or reconstruction project or in wet floodproofing their raised basements should contact the City of New Orleans Department of Safety and Permits.
4. The City should establish an office to provide technical assistance to property owners interested in pursuing a flood protection project on their own and help in applying for mitigation funding when eligible.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition</td>
<td>• 100% flood protection; • FEMA mitigation funds available for some properties.</td>
<td>• High cost; • Need source of non-FEMA cost share; • need interested public agency to take over the land; • there may be problems with demolishing homes in a National Historic District.</td>
</tr>
<tr>
<td>Elevation</td>
<td>• More secure flood protection; • flood insurance rate reduction; • FEMA mitigation funds available for some properties.</td>
<td>• High cost; • need source of non-FEMA cost share; • Care needed to preserve character.</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>• More secure flood protection; • flood insurance rate reduction; • FEMA mitigation funds available for some properties.</td>
<td>• High cost; • need source of non-FEMA cost share; • Demolishes historic building in an historic district.</td>
</tr>
<tr>
<td>Barriers</td>
<td>• Effective for shallow flooding.</td>
<td>• subject to seepage if water stays up for a long time; • not appropriate for lots that are subject to deeper flooding; • soils in Broadmoor are inappropriate for the construction of barriers.</td>
</tr>
<tr>
<td>Dry Floodproofing</td>
<td>• Low cost; • effective for shallow flooding on slab foundations and raised basements.</td>
<td>• subject to seepage if water stays up for a long time; • not allowed for substantially damaged homes.</td>
</tr>
<tr>
<td>Wet Floodproofing</td>
<td>• Low cost; • effective for raised basement homes not using the basement as living space.</td>
<td>• Only appropriate for basements and garages; • owners lose finished basements, or rental units; • not allowed for substantially damaged homes.</td>
</tr>
</tbody>
</table>
References

- CRS Coordinator’s Manual, FEMA-15, 2005
- Flood Insurance Data provided by FEMA, May 2006
- Flood Insurance Rate Map for Orleans Parish, FEMA, 1984
- Orleans Parish Hazard Mitigation Plan, December 2005
- Orleans Parish Code of Ordinances
- Protecting Building Utilities from Flood Damage, FEMA-348, 2000
- Reducing Damage from Localized Flooding – A Guide for Communities. FEMA-511, 2005
- Rainfall data from the New Orleans Sewerage and Water Board
- [www.gnocdc.org](http://www.gnocdc.org)
- R. Christopher Goodwin and Associates Reconnaissance Study of Broadmoor
- Phone conversation with Preservation Resource Center, October 2006
- [www.floodsmart.gov](http://www.floodsmart.gov)
- 1992 Reconnaissance Study by the U. S Army Corps of Engineers
Appendix A

DEPARTMENT OF SAFETY AND PERMITS

CITY OF NEW ORLEANS

C. RAY NAGIN
MAYOR

MICHAEL CENTINEO
DIRECTOR

June 19, 2006

Broadmoor Resident
XXXX
New Orleans, LA 70125

RE: City of New Orleans Repetitive Flooding Project

Dear Broadmoor Resident:

The City of New Orleans is reviewing ways to reduce some of our repetitive flooding problems. Your property at XXXX is located in a part of the Broadmoor subdivision that has tentatively been designated a target repetitive flood area.

As part of this project, a team from the University of New Orleans' Center for Hazards Assessment, Response and Technology (CHART) is preparing an "area analysis" for the target area. Information specific to your property needs to be collected in order to determine what, if anything, can be done to protect homes in the area from flooding. UNO/CHART staff will be in the area during the day later in June, collecting general information from the street, such as the type of foundation and walls for each home. They will not need to go into your house, but they may need to walk around it and go to the front door to survey the elevation of the first floor.

This work would be greatly improved with additional data that you might be able to provide. Attached is a data sheet that we hope you will complete and return by June 30, 2006. After you fill the form out, please fold it up, tape it, and mail it to the address on the flip side. A stamp has been provided.

After the analysis is completed, some preliminary recommendations will be developed. Later in the summer, we will invite you to a meeting with us and the UNO/CHART team to review the findings.

If you have any questions about this project, please feel free to call Michael Centineo of the City of New Orleans Safety & Permits Office at 504-658-7206 or Alessandra Jerolleman at UNO/CHART, at 504/304-2000, ext. 20212.

Thank you for your assistance in helping us to complete this project.

Sincerely,

Michael Centineo
Director

Attachment
Appendix B

Broadmoor Repetitive Flooding Analysis
Flood Protection Data Sheet

Name: ____________________________________________

Property address: ____________________________, New Orleans, LA 70125

1. In what year did you move into the home at this address? ______________

2. What type of foundation does your house have? □ Slab □ Crawlspace □ Raised basement

3. If you have a raised basement, is it finished and occupied? □ Yes □ No

4. Has the property ever been flooded or had a water problem? □ Yes □ No (if “no,” please complete items 8 – 11)

5. In what year(s) did it flood? __________________________________________

6. What was the deepest that the water got?
   □ Over basement floor: ______________ deep
   □ Over first floor: ______________ deep
   □ In yard only: ______________ deep
   □ Water kept out of house or building by sandbagging or other protective measure

7. What was the longest time that the water stayed up in the house? ___ hours or ___ days

8. What do you feel was the cause of your flooding? Check all that affect your building.
   □ Storm sewer backup
   □ Clogged/undersized drainage ditch
   □ Pump station overloaded
   □ Pump station shut down
   □ Sanitary sewer backup
   □ Standing water next to house
   □ Drainage from nearby properties
   □ Other: __________________________________________

9. Have you taken any flood protection measures on your property?
   □ Moved utilities/contents to a higher level
   □ Regraded yard to keep water away from building
   □ Installed drains or pipes to improved drainage
   □ Sandbagged when water threatened
   □ Elevated all or parts of the building
   □ Waterproofed the outside walls
   □ Built a wall to keep water away
   □ Other: __________________________________________

10. Did any of the measures checked in item 8 work? If so, which ones? If not, do you know why
    they didn’t work?

11. Do you have Flood Insurance? □ Yes □ No

12. Are you interested in pursuing measures to protect the property from flooding?
    □ Yes □ No If yes, please include your full mailing address.

~~ Please return this data sheet by June 30. ~~~
Appendix C

June 28, 2006

Dear Broadmoor Neighbor,

Your home has been selected for a unique study. The University of New Orleans's Center for Hazard Assessment, Response and Technology (CHART), though a federal grant, is examining flood prevention and mitigation on a neighborhood-wide basis in Orleans Parish. A small segment of Broadmoor has been chosen as the sole site in the city for this study. Your cooperation in the study is requested.

The "area analysis" will focus the homes in a six block area of Broadmoor bounded by Napoleon Avenue, South Miro Street, Upperline Street, and South Johnson Street. The objective of the analysis is to recommend flooding mitigation measures for the neighborhood, based on its unique characteristics. In Broadmoor, these include its wide variety of architectural styles, its recent drainage improvements through the SELA program, its historic district, and its high density of repetitively flooded properties. The study will examine the effectiveness of the SELA construction and will recommend further measures to homeowners and the city to prevent future flood insurance claims. A completed UNO/CHART area analysis for the Maplewood subdivision on the Westbank is available at http://floodhelp.uno.edu. While the buildings and flood hazards in Maplewood are different, Broadmoor's report will cover similar topics.

On Thursday, June 28, the analysis researchers will visit each house to collect elevation and other information on the structure. They will need to go up to the doorways to survey floor and grade elevations, but they will not have to go inside and you do not have to be present. At the conclusion of the study, this individualized elevation information will be provided to you at no cost. While it is not an official elevation assessment by a registered engineer, it can give you a very good indication of where your house sits relative to federal flood elevation guidelines. The researchers will also request that you fill out a single page data sheet about your home's flooding history and measures you or previous owners may have taken to minimize damage. Please complete the data sheet. The study's results will be more accurate if more people respond. Comments will be solicited on a draft of the analysis at an open neighborhood meeting.

This study is an important first step in providing a technical basis for those changes, so it is fully supported by the BIA board and committees. BIA asks that you please support the researchers' work. For more information, feel free to contact either myself at (504) 722-6102 or the lead researcher, Alessandra Jerollemann, at UNO/CHART, at (504) 914-6648 or agazzo@uno.edu. Thank you for your cooperation in this important effort.

LaToya Cantrell, President
### Appendix D
#### Mitigation Funding

<table>
<thead>
<tr>
<th>Who is the money for</th>
<th>Hazard Mitigation Grant Program (HMGP)</th>
<th>Flood mitigation Assistance (FMA)</th>
<th>Pre-Disaster Mitigation (PDM)</th>
<th>Repetitive Flood Claims (RFC)</th>
<th>Severe Repetitive Loss (SRL)</th>
<th>Louisiana Recovery Authority (LRA)</th>
<th>Increased Cost of Compliance (ICC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners of severe repetitive loss properties currently insured under the NFIP</td>
<td>NFIP policy holders</td>
<td>NFIP policy holders</td>
<td>NFIP policy holders with at least one flood claim</td>
<td>Owners of severe repetitive loss properties currently insured by the NFIP</td>
<td>All Louisiana homeowners affected by hurricanes Katrina or Rita</td>
<td>All NFIP policy holders with the ICC rider</td>
<td></td>
</tr>
</tbody>
</table>

#### Type of projects

<table>
<thead>
<tr>
<th>Project Type</th>
<th>(1) voluntary acquisition</th>
<th>(2) demolition*</th>
<th>(3) relocation of structure*</th>
<th>(4) elevation</th>
<th>(5) dry flood proofing non residential structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual mitigation Measures:</td>
<td>(1) voluntary acquisition*</td>
<td>(2) demolition*</td>
<td>(3) relocation of the structure*</td>
<td>(4) elevation</td>
<td>(5) floodproofing</td>
</tr>
<tr>
<td>Projects that will bring a substantially damaged home into current code compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum amount available per household</th>
<th>For elevation: no maximum; for reconstruction: $150,000 (post Katrina only)</th>
<th>Contact the State</th>
<th>Contact the State</th>
<th>Contact the State</th>
<th>Contact the State</th>
<th>Contact the State</th>
<th>Contact the State</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7500 for individual mitigation measures; $30,000 for elevation projects</td>
<td>$30,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>how much the homeowner has to pay</th>
<th>25%</th>
<th>25%</th>
<th>25%</th>
<th>0%</th>
<th>25%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>depends on the project**</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How does the homeowner apply</th>
<th>Contact the City/Parish</th>
<th>Contact the City/Parish</th>
<th>Contact the City/Parish</th>
<th>Contact the City/Parish</th>
<th>Contact the City/Parish</th>
<th>Contact LRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Flood Insurance underwriter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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* The lot must be deed restricted as open space

**If the project costs more than the allotted amount, then the homeowner must pay the remainder of the total project cost.