

PAS

Backwater Flooding and Recreation Study

Nitro, West Virginia



Prepared by:
The USACE, Huntington District

In partnership with:
The City of Nitro



**US Army Corps
of Engineers**
Huntington District



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Introduction

Program Authority

Specific authority for the Planning Assistance to States (PAS) program originates in Section 22 of the Water Resources Development Act (WRDA) of 1974 (Public Law 93-251), as amended. Section 208 of the WRDA of 1992 (Public Law 102-580), amended WRDA of 1974 to include Native American Indian tribes as equivalent to a state.

Program/Study Overview

The Corps of Engineers (COE) has general authority to provide states with technical assistance to support the planning of comprehensive water and related land resource development projects. The need for planning assistance is determined by individual states and eligible Native American Indian tribes. Every year, each state and eligible tribe provides the COE with requests for studies under the Planning Assistance to States (PAS) program. Subsequently, the COE accommodates as many studies as possible within the programs funding allotment. It typically takes 2 to 3 years to secure funding for the studies. PAS studies are only prepared to the planning level of detail and do not include detailed design data for project construction. The studies generally involve the analysis of existing data suitable for planning level purposes, although some data collection is often necessary.

The City of Nitro (City) has requested the COE's assistance in the preparation of a written report documenting the evaluation of issues related to an area of backwater flooding along the Kanawha River, and the subsequent recommendations to address these issues. In order to proceed with the study, the City and COE entered into a cost sharing agreement. Per the PAS program guidelines, the City is required to provide 50 percent of the total study costs. *(See Appendix-A for the Cost Sharing Agreement, with associated Scope of Services and Study Cost Estimate)*

Study Area

The PAS study area is located in Kanawha County, West Virginia within the City of Nitro. The site is approximately 3 acres in size and meanders through a residential neighborhood between Elm and Hickory Streets to the north and south, DuPont Avenue to the east, and the Kanawha River to the west. Although the majority of the study evaluation will be conducted within this area, planning considerations extend beyond these limits in order to evaluate the backwater area within the larger context of the surrounding community and drainage area.

Study Goal and Objectives

In order to provide the City with an initial scope of work and cost estimate for the study, a preliminary set of goals and objectives were developed. This initial set provided the basis for which the study agreement between the City and COE was signed. Study goals and objectives were further reviewed and refined during the study kick-off meeting and are as follows.

Study Goal:

To identify the cause of backwater flooding and provide recommendations that address identified backwater issues. In addition, to provide a recreational site plan that illustrates the potential for future recreational development of specified backwater areas.

Study Objectives:

- To identify the cause of flooding in backwater area.
- To identify issues related to flooding of the backwater area.
- To evaluate flood frequencies, elevations, and durations in order to assess impacts to surrounding properties.
- To identify and evaluate site constraints and opportunities as they relate to the issues identified.
- To develop recommendations which address the identified issues.
- To develop a recreational site plan for specified backwater areas.

Key Study Issues

The first step in any planning process is to identify the key study issues. This step provides focus and direction for all subsequent planning steps. As such a study kick-off meeting was held on April 15th, 2013 at the Mayor's office. Representatives from the COE, City and community were in attendance. *(A list of those in attendance and a summary of discussion details can be found in the meeting minutes which are attached as Appendix-B)* During the meeting the following key issues were identified for further evaluation throughout the study.

Flooding Issues

- Property Damage
- Trash and Debris
- Pests (mosquitoes, snakes, rats, etc)

Safety Issues

- Backwater Channel Crossings
- Pest Related (disease, bites)
- Circulation Conflicts and Hazards

Social Issues (quality of life issues)

- Community Cohesion/Connectivity
- Public Gathering Spaces
- Recreational Opportunities

Subsequent meetings were held to further discuss and evaluate key study issues. During these meetings, City representatives and community residents were presented with study information and subsequently asked to provide input. The input received was evaluated by the COE team and developed into a set of core community values. These core community values provided the foundation from which the study concepts and recommendations were ultimately based. Study concepts were presented to the public during a community meeting held at the site on

Thursday, September 5, 2013 at 6:00 pm. Input from the community was collected and further evaluated for incorporation into the plans. *(A list of those in attendance, meeting minutes, and a summary of the public meeting comments are attached as Appendix-C)*

Section 1- Community Values

Generally speaking what concerns a community and how they characterize and rank “issues” relates strongly to their set of individual or collective “values”. Individual and collective values form the societal and cultural baseline against which we judge or evaluate the quality, correctness or “fairness” of living conditions, events, or sometimes other individuals. The issues and concerns that arose from the public involvement portion of this study clearly express the individual and community values important to the residents of Nitro who participated.

Core Community Values

The following is a summary of the core community values that were expressed by residents of the community and Nitro's City representatives. Two overall community values emerged as a result of these public discussions: 1) *Public Safety and Security*, and 2) *Quality of Life*. Each is expanded upon below.

1) **Public Safety and Security**

The words safety and security are often used interchangeably. However, each word has its own distinct meaning. For the purpose of this report they are defined as follows:

Safety can be described in terms of conflicts and hazards:

- Safety conflicts occur as the result of physical interaction between two or more incompatible elements or uses, creating the potential for harm (vehicular vs. pedestrian circulation).
- Safety hazards typically refer to unsafe elements or conditions (unsafe structures, unkempt conditions, broken site features).

Security is often defined in terms of risks – risks to life and/or property. Security risk is measured by the potential for abuse, which may be real or perceived, and has ability to affect human behavior. Abuses can include violent crime, vandalism, or other illegal activities. Certain social and physical attributes of an area, such as visual and physical isolation, lack of law enforcement presence, insufficient lighting, lack of community involvement, poor community perception and other social factors, can lead to an increased potential for abuse.

With regard to the backwater area, there are multiple factors contributing to the community's safety and security concerns. The following is a list of the safety and security concerns related to the backwater site and surrounding area.

Backwater Safety Conflicts:

- Within the study area there is a lack of consistency in the separation of pedestrian (sidewalks) and vehicular (roads) circulation. Missing sections of sidewalk create potential situations where pedestrian and vehicular conflict can occur.

- The backwater area is closely surrounded with residential homes. As such there is an inherent physical conflict between the inhabitants of each (people/children/pets versus mosquitoes/snakes/rats). The potential for animal/insect bites and transmission of disease is increased as the distance between the competing land uses lessens. This is also true with the relationship between adjacent property elevations and the backwater area. The lower the property elevation the more potential for floodwater conflict resulting in property damage.

Backwater Safety Hazards:

- Cracked and broken sidewalks creating trip hazards.
- Trash (ie. sharp or other potentially dangerous items deposited during flood events) that can create both a direct risk for physical human harm and an indirect risk from potential disease transmission.
- Makeshift backwater channel crossing (located in Area-1) that creates an unintended potential for harm in certain situations (children trying to cross during high water events).

Backwater Security Issues:

- Lack of pedestrian circulation in conjunction with dense vegetation in and around the backwater area physically and visually isolates the site from view of the community. This is an area of concern for parents whose children are attracted to, and like to play in this naturalized area.
- Dead end streets and low light conditions have the potential to create conditions perceived as threatening or illegal in nature.

2) Quality of Life

Quality of life is a broad term used when evaluating the general well-being of individuals or societies. These evaluations generally attempt to measure the “quality” of a given area through a combination of subjective life satisfaction surveys and objective measures of wealth, physical health, leisure time, divorce rates, crime rates and infrastructure. Other evaluation measures include employment, the built environment, mental health, education, recreation, and social belonging. These evaluative studies try to quantify individual or societal satisfaction or happiness. However, they are often data driven, and don’t address many of the relationships, both tangible and intangible, that exist between the measures being evaluated and the elements of the environment in which people live.

Recreation is an elemental component of human life. The very word “re-creation” explains the regenerative powers of play and re-creating our minds and bodies in everyday life. The institution of parks and playgrounds nationwide, and those parks especially located in urban areas, provide a respite from the tensions and stresses of urban living and working. In addition to preserving and conserving forested terrain in

urban centers that absorb pollutants and CO₂ from the air; these “islands” provide permeable soils for groundwater recharge and a comfortable meeting place for urban residents. Numerous social events, cultural and holiday festivals, family picnics, sports and social gatherings are held at the nation’s urban parks. Cities with a well-planned and maintained park system are frequently cited as the most sought after for their high “quality-of-life” ratings. It is that “quality of life” measure that attracts commercial and industrial enterprises to locate where their employees can re-create themselves.

Although the backwater area in Nitro may not be on the scale of other national and regional parks, its unique location situated within the heart of the residential community, lends to its ability to provide social gathering space in which the community can socialize, relax and recreate. As such, this study is focused on ways to transform a perceived negative space within the community into a positive community attribute. The study will not focus on data results, but rather on the relationships that exist between people and the environment in which they live. Through this process the study ultimately seeks to recommend a mix of physical changes and management strategies with a focus on enhancing the backwater area. These enhancements are meant to improve the relationship between the backwater area and the surrounding community by providing opportunities for a “better quality of life”.

Section 2- Site Inventory and Analysis

Site Inventory

Site inventory is the collection of natural and cultural information, which taken in combination, composes the overall character of a site. There are generally two components to a site inventory; base map preparation and information gathering. The level of detail required for each varies according to the level of detailed planning to be performed.

- **Base Map Preparation-** The master plan is a conceptual study, intended as a guide for the identification of future improvement projects, thus the required detail level for base map preparation is relatively low. As such, aerial photography overlaid with 1' contour information was used in the preparation of the base map for this study. When proposed site improvements move from the conceptual design stage to the detailed design stage, a greater level of base map detail and accuracy may be required. More detailed mapping may include field surveys and as built drawings.
- **Information Gathering-** The second part of the site inventory deals with information gathering. Serving as the basis for all other discussion within the study, relevant and reliable information is critical to the study success. Early in the study process, the project team identified critical information needs and the means for obtaining it. A series of initial team meetings between the COE and City of Nitro representatives produced a project goal, set of 6 study objectives, and a list of key information contacts. A series of formal and informal stakeholder meetings were subsequently conducted to obtain the critical information identified by the team. Information collected included City of Nitro storm water mapping and County property parcel information, and other field data. This data was added to the base mapping and used throughout the study analysis.

Backwater Site Description

The Nitro backwater site generally consists of three distinct but connected areas. A small additional portion of backwater area exists beyond the main area and is disconnected from the main portion by the intersection of Dupont Avenue and Hickory Street. Each of the four distinctive backwater areas are illustrated in the following exhibit and briefly described in a narrative below.

Exhibit-1
Map of Backwater Areas



1) Backwater Area-1

The portion of the backwater site generally located between the Kanawha River and the Fir Street right-of-way (ROW). It is an area consisting of a defined narrow channel with steep side slopes. Water that backs into this area is quickly released back to the Kanawha as river levels recede. Larger items of trash and debris are able to enter this initial area during rise in river levels and often remain trapped on the banks as water levels slowly recede. Smaller items such as bags and bottles often remain trapped in the dense vegetation of the steep side slopes. Approximately half of this total area is below the Ordinary High Water Level (OHWL) of 571 feet. There is a manmade pedestrian crossing structure located within this area near where the Kanawha Avenue ROW crosses the channel. The structure is made of stacked tires/rocks and a culvert pipe. The structure appears to partially impede or slow the flow of water/sediment/trash back into the Kanawha following a backwater event.

Two City storm drain lines discharge into this area (one on its upper end and one on the lower). Both appear to drain fairly small areas.

2) Backwater Area-2

The portion of the site primarily located between the Fir Street ROW and the Gum Street ROW. It can be generally characterized as consisting of a wide, flat bottom area with a

very narrow (24") and shallow (6"-8" in most locations) channel. Water in the channel generally appears to be stagnant, except during storm events. Stagnation is due to the lack of elevation change within this area. The channel is reported to stay wet year round, probably as a result of a very shallow water table which was observed at or near the surface during field observation. The water table is the depth below the surface at which void spaces in soil and rocks remains saturated with water. This water is known as groundwater. Groundwater travels within these voids beneath the surface. The natural discharge of groundwater back to the surface can occur as springs or seeps and often forms wetland areas.

One City storm drain line discharges into this area near its upstream end. It is the largest of the three observed discharging into the backwater area.

The entirety of the flat bottom area is densely vegetated and considered to be a good quality wetland, however several relatively small areas near the disturbed edges have been colonized by Japanese Knotweed (*Polygonum cuspidatum* or *Fallopia japonica*), which is an invasive species.

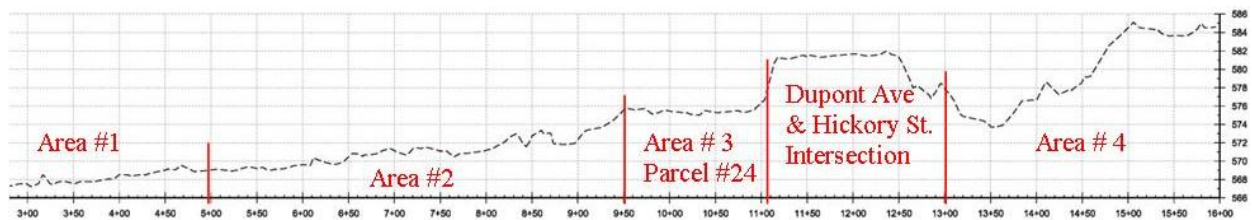
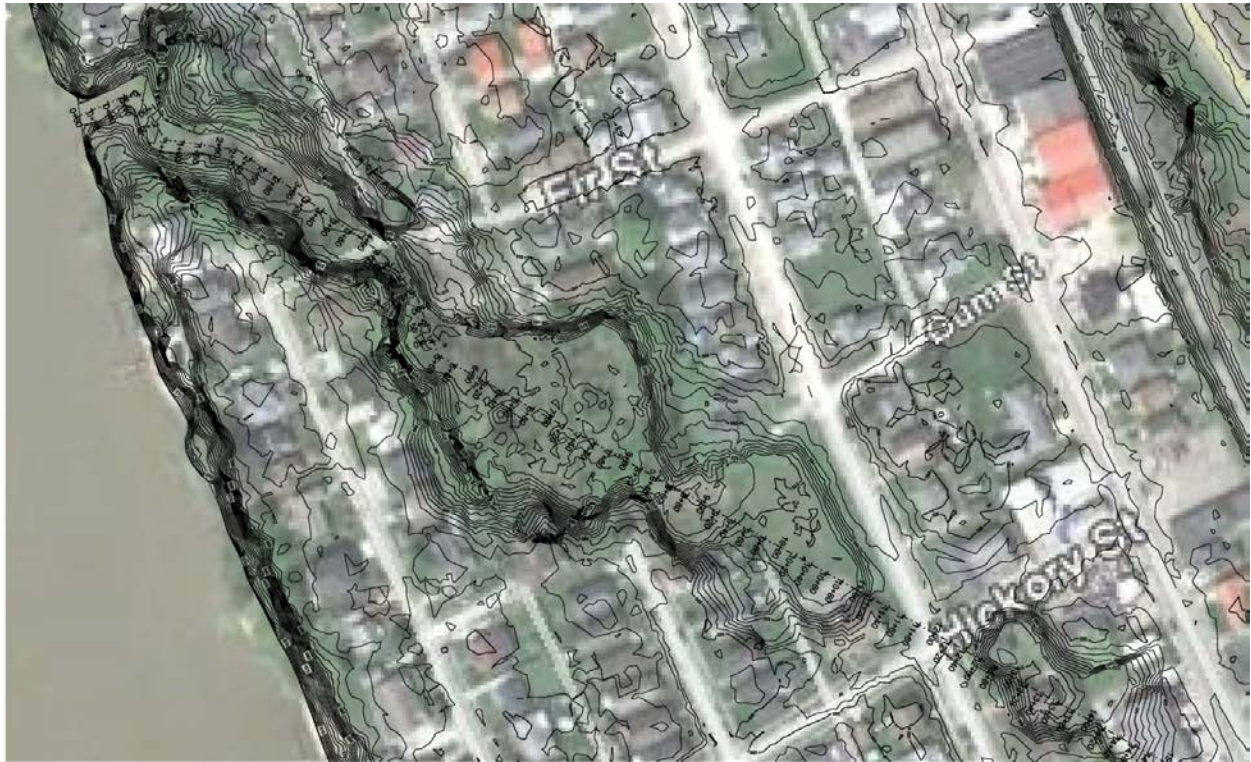
3) Backwater Area-3

Generally made up of parcel 24 (owned by the City), and the adjacent street and alley ROW's. The majority of the area consists of flat grassy lawn. It is higher in elevation than the first two areas and is above the elevation of the three existing storm water discharge points. The area is mostly dry during the year and is infrequently inundated by rising river levels. Just beyond the alley ROW, (within parcel 39 and 40) the ground drops off slightly and becomes wetter, an indication of groundwater near the surface in this area.

4) Backwater Area-4

Generally located within parcels 4, 5 and 6. This area is disconnected from the other three areas by the intersection of Dupont Avenue and Hickory Street and appears to possess groundwater, most likely the result of infiltration of inland rain water traveling along the old tributary channel bed and resurfacing as a spring. The area also receives a portion of overland runoff and drainage from neighboring residential and commercial lots. Based on its relative elevation, it is assumed that the water table may be near the surface.... meaning that the void spaces in the soil/rock just below the surface are constantly saturated with water. Movement of water through these voids is slow and as a result, any additional water added to the area (rain, overland runoff, etc.) tends to pool up. Based on field observation following the public meeting, there appears to be no other apparent means for water to escape the area (ie. swale, drain, or culvert pipe). Currently, water is being pumped to street level where it drains into the City storm system. Without pumping it is assumed the water would very gradually make its escape below Area-3 and into Area-2 via underground means. However, this is a relatively slow process that could be further compounded during periods of river backup.

Exhibit-2
General Plan and Profile of Backwater Areas



Site Analysis

Site analysis is a tool, used to evaluate the natural and cultural elements which compose the overall character of the site. When shown together on a plan, relationships between site elements and site usage begin to be revealed. Studying these relationships brings understanding to the key site issues that affect the planning and development of future improvements. The culmination of all the analysis provides the basis for future decision making.

This study was split into four main analyses, designed to address the most significant issues in respect to the expressed community values, overall project constraints, and study objectives.

These analyses include the following:

- Circulation Analysis
- Property Parcel Analysis
- Utility Analysis (Storm Drainage and Street Lighting)

- Flood Impact Analysis

The findings of each analysis will help to determine the physical structuring and organizing of future development. The following analyses are broken down and discussed by their related issues. General observations are included for each issue. A list of overall project opportunities and constraints are provided at the end of the section.

- 1) Circulation Analysis

Vehicular and pedestrian circulation is an important component of this planning study. Some aspects of circulation that were evaluated include: vehicular and pedestrian access, separation of pedestrian and vehicular traffic, parking, ADA accessibility, and connectivity. An understanding of the relationships between these is critical to providing recommendations for safe and effective circulation. As such, a circulation map has been developed for the study area and surrounding neighborhood. It has been included as [\(Exhibit-3\)](#) and graphically represents information presented in the following narrative descriptions.

Existing Conditions:

The study area (backwater area) is located within a residential community, one block from Main Avenue. Main Avenue is the primary vehicular route within the neighborhood itself. The majority of the surrounding neighborhood, including Main Avenue, is separated from Route 25 (regional connector route) by railroad tracks. Railroad crossings which connect Main Avenue to Route 25 exist at the following streets: Lock, Kapok, Walker, and Center. Center Street is the southernmost crossing and provides access onto the Nitro/St. Albans Bridge. Main Avenue terminates at the intersection with Boundary Street, one block North of Lock Street. At this point, access to Nitro High School and City Park involves a jog around the apartment complex: half block west on Boundary Street, one block north on Broadway Avenue, half block east on 11th Street, and then north onto Park Avenue. The distance between City Park/High School and the study area is approximately one mile.

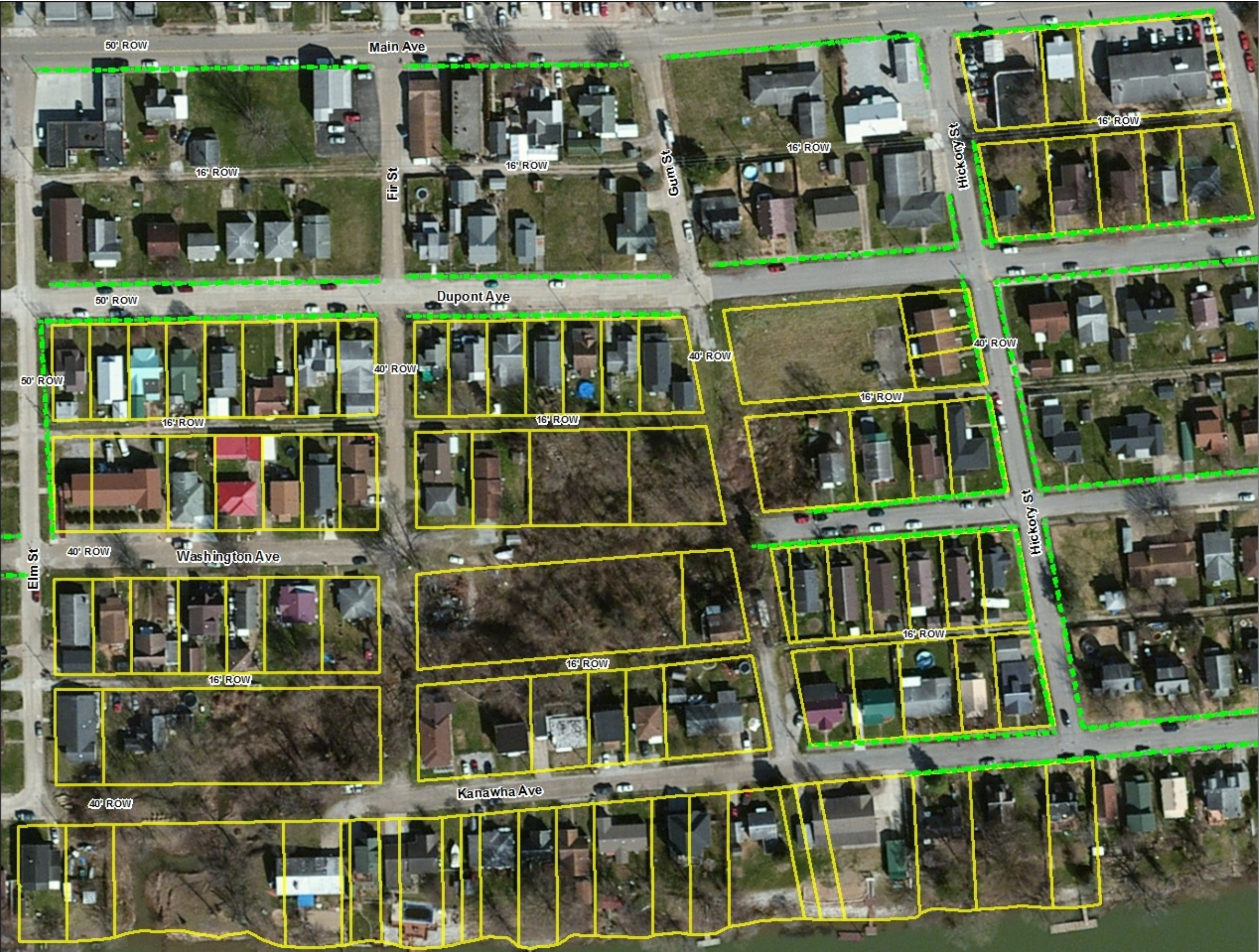
Main Avenue consists of a mix between commercial and residential properties. A sidewalk parallels the western edge of Main Avenue for its entirety. The walk is in fair to good condition with some areas in need of repair or replacement. The study area begins a block west of Main Avenue (on Dupont Avenue) between Hickory and Gum Streets and stretches an additional two blocks north and west to Elm Street where it intersects with the Kanawha River. No sidewalks exist on any of the streets (Elm, Fir, Gum, Hickory) that connect Main Avenue to Dupont Avenue within the study area. Hickory Street does have some sidewalk, however due to commercial parking needs, much of the walk is missing or in disrepair. Other sidewalk exists within and around the study area but is somewhat inconsistent in occurrence. The conditions of these sidewalks vary, from good and fair in some areas, to poor in others. In places where continuous sidewalks exist from block to block there is often

a disconnect at the corners where the walks stop short of the roadway and no ADA accessibility is provided.

Residential parking within the study area generally occurs in driveways with access from the street or by alley. However, due to the lack and/or length of existing driveways there is a good amount of on street parking as well.

Observations:

- Backwater area cuts off pedestrian and vehicular circulation creating series of dead end circulation routes.
- On street parking is common.
- In general, there is fairly good vehicular and pedestrian connectivity between the study area and surrounding community.
- The termination of Main Avenue at the apartment complex creates a perceived disconnect between the City Park/High School portion of the community and the remainder. This is also true for the portion of the community split by the backwater area. Pedestrian and vehicular circulation severed within the three block backwater area has produced a series of dead end streets, alleys, and sidewalks.
- The extensive sidewalk system within the neighborhood provides good separation between pedestrian and vehicular circulation, however is in need of some improvements and upgrades.
- Inconsistency in the occurrence of sidewalks, combined with various surface/slope issues, prevents much of the pedestrian circulation system from being considered ADA accessible.
- A strong pedestrian connection between Main Avenue and the study area does not currently exist.



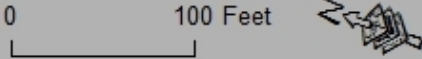
US Army Corps
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Circulation Analysis

Nitro Backwater
Flooding and
Recreation
Study

Circulation

- Existing Sidewalks
- Property Parcel Lines
- ROW - Street and Alley
Right-of-Way
Dimensions



2) Property Parcel Analysis

A property parcel map and corresponding parcel data sheet was developed for the study area and has been included as (Exhibit-4). Mapping and deed information for development of the exhibit was obtained from Kanawha County and overlaid onto aerial photography. Property parcels surrounding the backwater area were numbered on the map and keyed into the corresponding deed information. The City of Nitro owns the property parcel labeled as number 24 on the exhibit. The City also owns street and alley Right-of-Way (ROW) as shown and dimensioned on the exhibit.

Existing Conditions:

The City owned property parcel (number 24 on the exhibit) measures approximately 100'x180' or (0.42 acres). The parcel consists of grass with no trees and is generally bowl shaped with elevated borders along Dupont Ave. and the Gum St. right of way. The southern end is bordered by a three unit townhouse complex. The western side of the site is bordered by an alley ROW, beyond which the elevation begins to slope downward into the wetter portions of the backwater area. Although not currently developed, City owned road and alley ROW criss-cross the backwater area.

All other property within the backwater area is privately owned. It consists largely of residential properties, most of which is single unit, with a small mix of multi-unit apartment and townhouse. Business and Church properties also exist within the area. Residential lots are generally maintained to the top slope of the backwater area beyond which steep and wet conditions makes maintenance difficult.

Observations:

Parcel # 24 (owned by City)

- Parcel 24 is located in the upper elevations of the backwater area making it less prone to flooding. The property is not suited for residential construction as it is mostly within the 10 year flood event elevation, however it could be utilized for recreational development.
- Parcel 24 is very visible from adjacent streets and residential units, and is partially lit at night via adjacent street lighting.
- Parcel 24 is naturally separated from vehicular traffic on bordering Dupont Avenue as a result of significant elevation change.
- Parcel 24 lacks sidewalk along the border of Dupont Avenue creating a pedestrian disconnect and potential conflict with vehicular traffic.

Street and Alley ROW (owned by City)

- Portions of ROW being utilized by residents for parking and storage.
- Portions of ROW used by City for installation of underground storm drainage system.
- ROWs exist at both of the narrow points in the backwater area.

Other Parcels

- No structures exist on parcels 37, 38, 50, and 52.
- Apartment complex at the corner of Dupont Avenue and Hickory Street has been converted to individual ownership as three separate townhouse units, parcels 25, 26, and 27.
- Based on a comparison of street addresses to ownership addresses, parcels number 2, 3, 4, 9, 11, 20, 22, 23, 27, 33, 44, 47, 61, 62, 63, 64, and 82 may be rental properties.
- Based on County information at the time it was collected, parcels 52, 61, and 62 appear to be owned by holding companies.

Exhibit-4 Property Parcel Analysis



Parcel Information Sheet

Parcel	Owner	Address
1	NEASE RICHARD A & LORINDA	808 MAIN AVE, NITRO, WV 25143
2	TUCKER RACHEL A	124 RIVERVIEW DR, ST. ALBANS, WV 25177
3	NEASE RICHARD A & LORINDA	2624 POCA RIVER RD N, NITRO, WV 25143
4	ARAY CHARLES A & DONNA J	906 9TH ST, NITRO, WV 25143
5	CARRIER JAMES G & JUANITA	803 DUPONT AVE, NITRO, WV 25143
6	HODGES ROBIN M	805 DUPONT AVE, NITRO, WV 25143
7	MILAM DONALD R SR	807 DUPONT AVE, NITRO, WV 25143
8	COOK PATRICIA & BRENDA LIFE STEVEN R & NOEL G COOK	809 DUPONT AVE, NITRO, WV 25143
9	HOBLITZELL REGE E	65 DEERCROSSING LN, CHARLESTON, WV 25320
10	WILLIAMS CHARLES E & JUANITA	504 DUPONT AVE, NITRO, WV 25143
11	SOLIZ JUAN GARCIA & JUAN MANUEL GARCIA	RT 1 BOX 110B, POCA, WV 25159
12	BUCKLAND CLETUS G & CAROLYN F	508 DUPONT AVE, NITRO, WV 25143
13	CRITES BARBARA L & DELBERT R	510 DUPONT AVE, NITRO, WV 25143
14	DICKERSON DARRELL G & MARY S	512 DUPONT AVE, NITRO, WV 25143
15	COUNTS KAREY D	514 DUPONT AVE, NITRO, WV 25143
16	BURDETTE CARL & LINDA G HARTLEY	516 DUPONT AVE, NITRO, WV 25143

17	DAYHALL JACQUELINE C/O WENDY PETERS	602 DUPONT AVE, NITRO, WV 25143
18	WHITE WILLIAM J JR	604 DUPONT AVE, NITRO, WV 25143
19	CHAPMAN JOHN E	606 SUPONT AVE, NITRO, WV 25143
20	BUCKLEN ARTHUR L & CAROLYN SUE	6 CENTRAL AVE, ST ALBANS, WV 25177
21	LAVERTY KIMBERLY H & JOHN D	610 DUPONT AVE, NITRO, WV 25143
22	MCKINNEY RALPH E JR	PO BOX 611, POCA, WV 25159
23	DIEHL EARL K & CAROL I	152 MAIN AVE, NITRO, WV 25143
24	SIMPSON SAMUEL L & REBECCA L	1116 11TH ST, NITRO, WV 25143
25	GODBEY ROBERT A & DEBRA R	205 HICKORY ST, NITRO, WV 25143
26	BROWN SHIRLEY H	1333 W 13TH ST, NITRO, WV 25143
27	HICKMAN WILLIAM T	197 SPRUCE LN, POCA, WV 25159
28	UNITED BAPTIST CH OF NITRO	NITRO, WV 25143
29	EAST NITRO UNITED BAPTIST CHURCH	NITRO, WV 25143
30	VANCE ERIKA R	505 WASHINGTON AVE, NITRO, WV 25143
31	RAWLINGS CHRISTOPHER D	507 WASHINGTON AVE, NITRO, WV 25143
32	MILLER JAMIN	509 WASHINGTON AVE, NITRO, WV 25143
33	GILLESPIE ALICE L & ROBERT L JR	206 S FIRST AVE, NITRO, WV 25143
34	CURRY TAMMY	513 WASHINGTON AVE, NITRO, WV 25143

35	RAYNES JUDITH ANN & SHAWNNA RAYNES BOWELS & ETAL	603 WASHINGTON AVE, NITRO, WV 25143
36	JOHNSON HERBERT N	603 WASHINGTON AVE, NITRO, WV 25143
37	KELLEY LT & ATETTA A	RT 3 BOX 190, HURRICANCE, WV 25526
38	DIEHL EARL K & CAROL I	152 MAIN ST, NITRO, WV, 25143
39	LOCKHART KATHERINE & KAY ETAL C/O DAPHNE HAPNEY	703 WASHINGTON AVE, NITRO, WV 25143
40	THOMAS GENE W & SANDRA T LYONS	705 WASHINGTON AVE, NITRO, WV 25143
41	HOLTSCLOW JAMES A & VICKI C	707 WASHINGTON AVE, NITRO, WV 25143
42	GANDEE DOLAS & REBECCA	709 WASHINGTON AVE, NITRO, WV 25143
43	DUNN RAYMOND L	502 WASHINGTON AVE, NITRO, WV 25143
44	SMITH DENISE L	3425 PASTURE VIEW CT, CHARLOTTE, NC 28269
45	REED SHARON K	506 WASHINGTON, AVE, NITRO, WV 25143
46	LOVEJOY ROBERT P & PAMELA J	508 WASHINGTON AVE, NITRO, WV 25143
47	CAMPBELL JAMES K	1462 CROSS CREEK RD, BUFFALO, WV 25033
48	HARRIS EULAH	512 WASHINGTON AVE, NITRO, WV 25143
49	SNYDER DONALD E III & DANIELLE	514 WASHINGTON AVE, NITRO, WV 25143
50	ATKINSON DEBRA L LIFE & SHAWNNA R WILKINSON REM	601 WASHINGTON AVE, NITRO, WV 25143

51	COON ROBERT D	611 1/2 KANAWHA AVE, NITRO, WV 25143
52	LAND RECOVERY MANAGEMENT C/O JEFFREY D KEENEY	PO BOX 495, ONA, WV 25545
53	BROWN PAUL E & PHYLLIS J	702 WASHINGTON AVE, NITRO, WV 25143
54	RAYNES EDWARD L & JUDITY A	704 WASHINGTON AVE, NITRO, WV 25143
55	REYNOLDS ANNA	706 WASHINGTON AVE, NITRO, WV 25143
56	GILLESPIE JOHN R & MAXINE E	708 WASHINGTON AVE, NITRO, WV 25143
57	REYNOLDS JACQUELYN L	710 WASHINGTON AVE, NITRO, WV 25143
58	WHITE JOYCE A & WILLIAM R	712 WASHINGTON AVE, NITRO, WV 25143
59	LANGLO PATRICIA M	503 ELM ST, NITRO, WV 25143
60	COLEMAN DARYL M JR & JULIE	506 KANAWHA AVE, NITRO, WV 25143
61	TEAYS HOLDINGS LLC	PO BOX 85, TEAYS, WV 25569
62	TEAYS HOLDINGS LLC	PO BOX 85, TEAYS, WV 25569
63	OWENS JAMES P	104 SCOTT LN, SCOTT DEPOT, WV 25560
64	GIBSON STEVEN H & LINDA L	1428 SATTES CIR, NITRO, WV 25143
65	DILLMAN GERALD DOUGLAS	611 KANAWHA AVE, NITRO, WV 25143
66	HYRE TAMARA K	701 KANAWHA AVE, NITRO, WV 25143
67	FRANCISCO SANDRA K	703 KANAWHA AVE, NITRO, WV 25143
68	LAWRENCE L DAVID & KIMBERLY L	705 KANAWHA AVE, NITRO, WV 25143

69	CHAPMAN ROBERT E	707 KANAWHA AVE, NITRO, WV 25143
70	GANDEE BOYD V-LIFE & PATRICIA GANDEE MICKEL—REM	709 KANAWHA AVE, NITRO, WV 25143
71	MARTIN THOMAS & JANET S	416 KANAWHA AVE, NITRO, WV 25143
72	MARTIN THOMAS A & JANET S	416 KANAWHA AVE, NITRO, WV 25143
73	BAILEY MICHAEL W & KELLY A	502 KANAWHA AVE, NITRO, WV 25142
74	BAILEY MICHAEL W & KELLY A	502 KANAWHA AVE, NITRO, WV 25142
75	MCCLANAHAN BARRY SCOTT & JULLIE	504 KANAWHA AVE, NITRO, WV 25143
76	MCCLANAHAN BARRY SCOTT & JULLIE	504 KANAWHA AVE, NITRO, WV 25143
77	STEWART DAVID G & SANDRA J	600 KANAWHA AVE, NITRO, WV 25143
78	STEWART DAVID G & SANDRA J	600 KANAWHA AVE, NITRO, WV 25143
79	STEWART DAVID G & SANDRA J	600 KANAWHA AVE, NITRO, WV 25143
80	HICKS JAMES COLEN & MARY LOUISE	602 KANAWHA AVE, NITRO, WV 25143
81	HICKS JAMES COLEN	602 KANAWHA AVE, NITRO, WV 25143
82	MILLER DANA A & LISA	6 PINWOOD CIR, ST ALBANS, WV 25177
83	TUCKER DORIS E	606 KANAWHA AVE, NITRO, WV 25143
84	PENNINGTON TRACY R & KENNETH	608 KANAWHA AVE, NITRO, WV 25143
85	MEDVICK THOMAS J & WENDY A	610 KANAWHA AVE, NITRO, WV 25143
86	MEDVICK THOMAS J & WENDY A	610 KANAWHA AVE, NITRO, WV 25143

87	VANCE BERTA	612 KANAWHA AVE, NITRO, WV 25143
88	VANCE BERTA	612 KANAWHA AVE, NITRO, WV 25143
89	ARMSTRONG LARENCE K & CYNTHIA P	702 KANAWHA AVE N, NITRO, WV 25143
90	ARMSTRONG LARENCE K & CYNTHIA P	702 KANAWHA AVE N, NITRO, WV 25143
91	VANCE REGINA	706 KANAWHA AVE, NITRO, WV 25143
92	JORDAN JAMES V & NANCY J	708 KANAWHA AVE, NITRO, WV 25143
93	DRENNAN MELISSA J & ERIC	710 KANAWHA AVE, NITRO, WV 25143

3) Utility Analysis (Storm Water and Street Lighting)

An inventory of the existing storm drainage and street lighting has been performed within and around the study area. Findings have been graphically depicted and are included as [\(Exhibit-5\)](#). Information provided in the exhibit was obtained from the Nitro Public Works District Office and through on-site observation. Data collected was overlaid onto aerial photography.

Existing Conditions:

The City of Nitro Public Works District maintains the system of drains and pipes that receive and transport storm water to the backwater area where it is discharged.

There are three separate storm water discharge points in the backwater area which drain a total area of approximately 20 acres.

Discharge Point #1- discharges at a concrete headwall located near the intersection of the Gum Street and the alley in the lower north-west corner of the City owned property (parcel 24). Discharge from this line is collected from inlets at the intersection of Washington~Elm, Dupont~Elm, and along the alley between Dupont and Main Avenues. It is the largest of the areas being discharged into the backwater site.

Discharge Point #2- discharges in the Fir Street ROW near its intersection with the Washington~Kanawha Avenue alley ROW. Discharge from this line is collected from inlets along a portion of Fir Street and at the intersection of Fir~Washington.

Discharge Point #3- discharges in the Kanawha Avenue ROW near its intersection with Elm Street. Discharge from this line is collected from inlets along a small portion of Kanawha Avenue.

Street lighting in and around the backwater area is via cobra head fixtures affixed to utility poles. Utility poles were located through field investigation and marked on the exhibit. The symbol "L" indicates a pole with a light, while a "T" indicates those poles with a transformer.

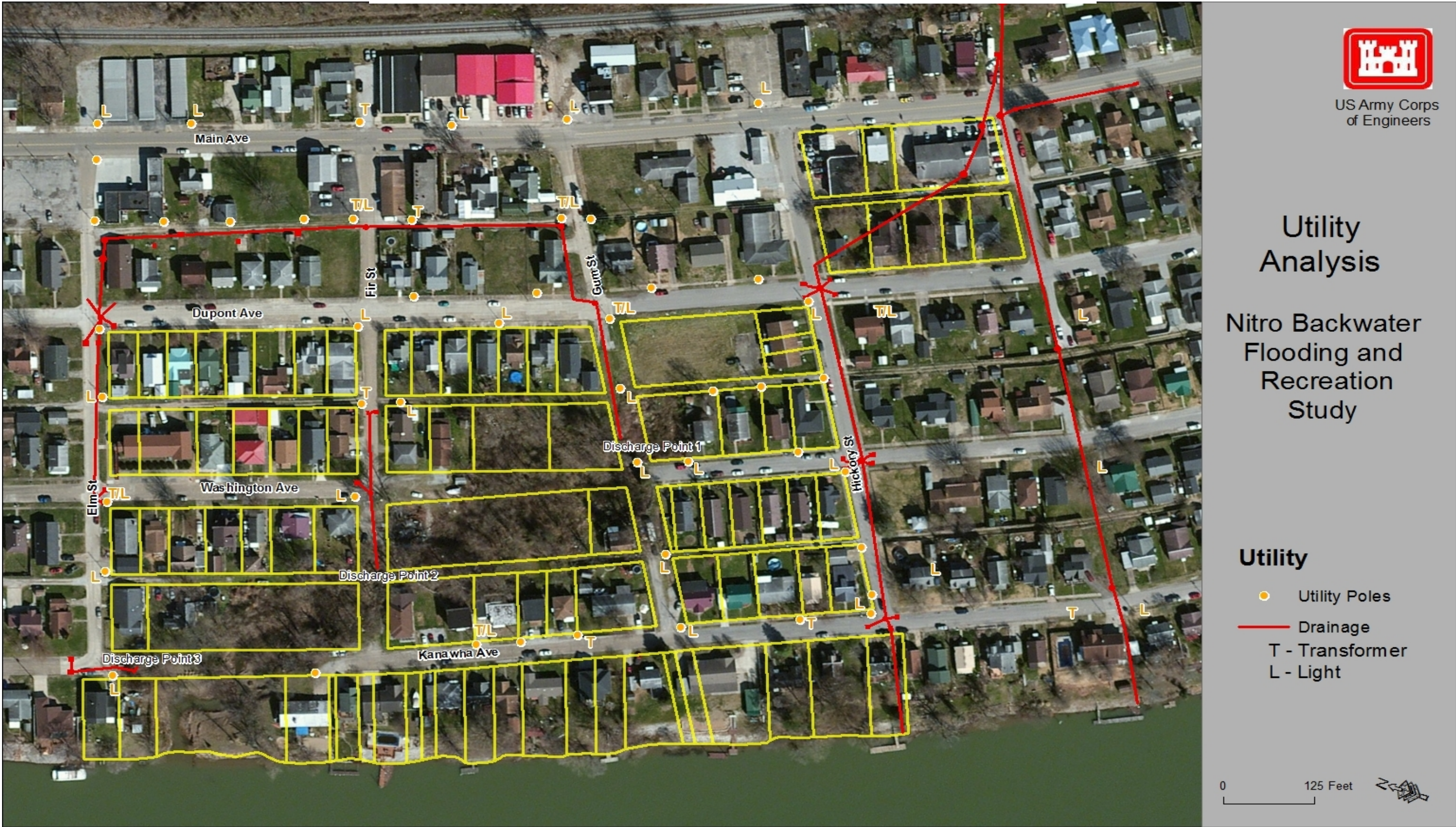
Observations:

- The City owned property parcel is not directly impacted by discharge from discharge point #1, however the physical location of the pipe may be a consideration if development of the area requires earthwork. This may also be a consideration should development requiring earthwork take place near discharge point #2.
- The total surface area being drained and discharged into the backwater area is approximately 20 acres.
- Upon general observation it appears parcels 4, 5, and 6 receive water via a ground water source and overland from adjacent property runoff. Based on field observation coupled with the low elevation of the site, it is presumed that the

water table may be very close to the surface in this area. Other than its natural underground means, there appears to be no other outlet for water that accumulates in these parcels.

- Multiple overhead service lines extending from the utility pole located at the intersection of Gum Street and Dupont Avenue may become an aesthetic issue in the development of the property. These lines feed the house and apartment north of the site. It may be possible to relocate some or all of the residential feeder lines to the pole in the alley.
- Existing street lighting is spotty around the backwater area.

Exhibit-5 Utility Analysis
(Storm Water & Street Lighting)



4) Flood Impact Analysis

A flood event map was developed for the study area and has been included as [\(Exhibit-6\)](#). Information for development of the exhibit was generated using existing COE Laser Imaging Detection and Ranging (LIDAR) data combined with data from USGS. Once the data was processed, flood event and contour information was generated and overlaid onto aerial photography.

Existing Conditions:

Each year fluctuations in Kanawha River levels cause water to back into adjacent low lying areas known as embayments. These areas serve as natural retention/storage; holding water until the river has a chance to subside. Without these areas, storm water would have to collect in other low lying areas. A flooding problem arises when these low lying areas have been developed.

The backwater embayment area in Nitro is one such retention/storage area and appears to be the remnants of an old tributary of the Kanawha River. Currently, most of the upper reaches of this tributary appear to have been buried, leaving only the portion visible today. This remaining portion, known as the backwater area, continues to receive storm water in one of four ways: 1) through overland runoff, 2) via the City storm water system, 3) by way of ground water, (ie. underground means), and 4) via inundation from a rise in the Kanawha River level. The latter of the four is mainly responsible for high water events, while ground water is the main contributor to the areas continual wetness.

Characteristics of the Backwater Area:

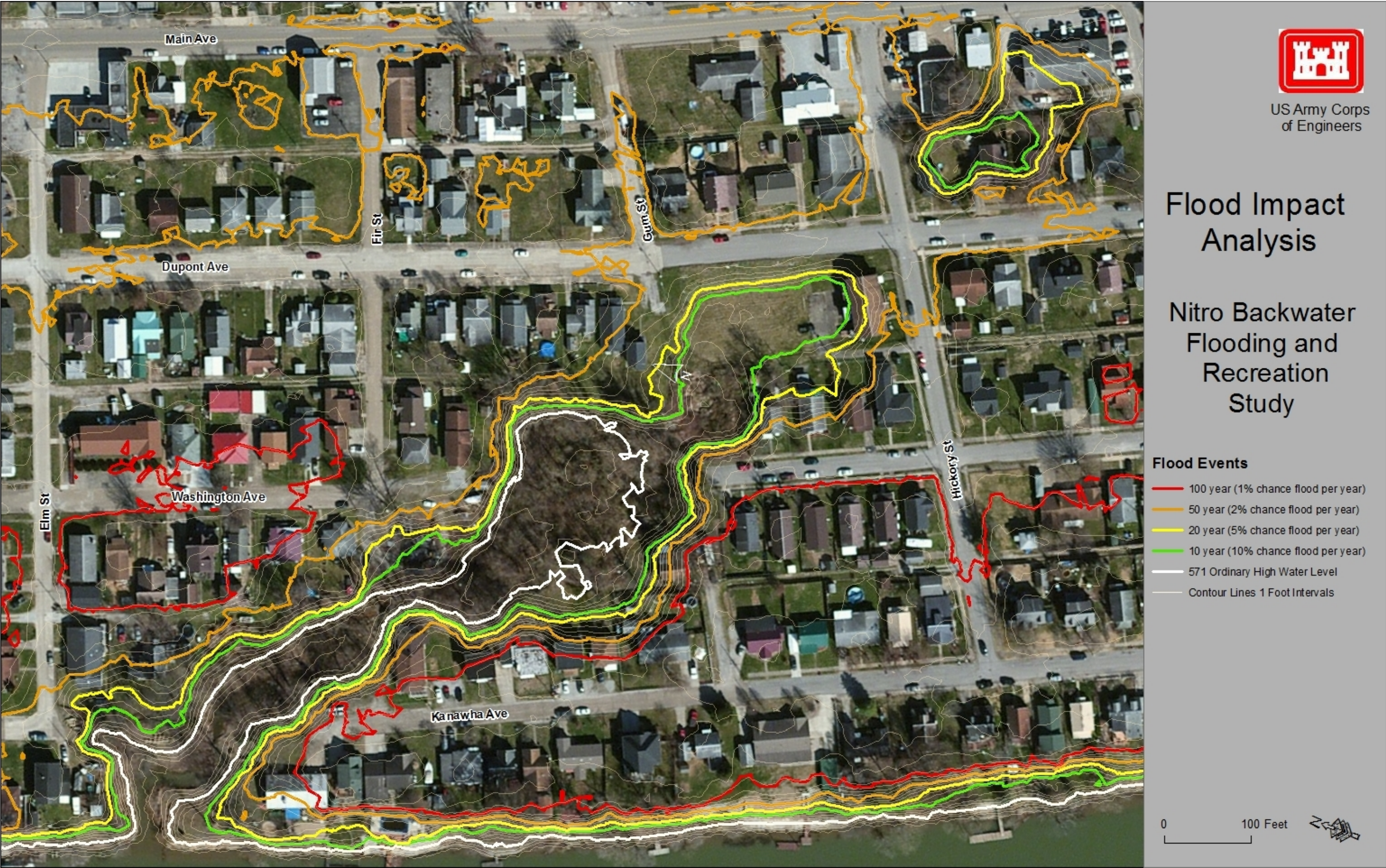
The backwater study area is located along the right descending bank of the Kanawha River, approximately 45.2 miles from its mouth.

In addition to being a backwater area of the Kanawha River, the majority of the areas bottomland is made up of wetland. A wetland is defined as an area that is inundated or saturated for a period long enough to support a dominance of plants adapted for wet conditions. Three criteria must be met for an area to be considered a wetland: 1) the presence of hydric soil, 2) the presence of hydrophytic vegetation, and 3) the presence or evidence of hydrology (water). Wetlands are delineated using the *1987 Wetland Delineation Manual* (Environmental Laboratory, 1987) by the U.S. Army Corps of Engineers and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region (Version 2), April 2012*. Wetlands considered waters of the U.S. are regulated by section 404 of the Clean Water Act.

Field investigations performed in September of 2013 indicate that the bottomland areas of areas identified as Area-1 and Area-2, retain water year-round. During the investigation the water table was observed at or near the surface of the ground elevation. Soils were generally grey and dark grey in color indicating the soils have

been inundated or saturated for many years. Vegetation that is dependant and tolerant of wet conditions were dominant within the area.

The elevation along the top slope of the backwater embayment area generally follows the 20 year flood event line, meaning there is a 5% chance each year that water will rise to this elevation. The top of the backwater area is closely ringed by residential housing, some of which appear to be within the 20-50 year flood event elevation and many others within the 50-100 year flood event elevation.



Observations:

- The cause of inundation (high water events) within the majority of the backwater area and the adjacent residential properties can primarily be attributed to the rise in elevation of the Kanawha River. The situation can be further exacerbated, but to a minor extent, by the additional influx of water from inland sources.
- Multiple inundation cycles over the years have deposited large amounts of sediment within the backwater area. The inability of the area to “self-flush” has lead to the creation of a large flat bottomland area (illustrated later in report as Area-B) consisting of a main channel (narrow 24”, shallow 6-8”, flat, windy) and numerous other smaller drainages.
- Stagnant water was observed in the channel (Area- B) during site investigations and was attributed to the lack of elevation change. The presence of water reported in the channel year-round can be attributed to ground water and the presence of a very shallow water table.
- Trash and debris deposited in the backwater area from the Kanawha during high water events disrupts the flow of receding water back to the Kanawha providing greater potential for ponding of water and subsequent breeding of mosquitoes.
- Over the years, sediment buildup along the bank of the Kanawha has formed a naturally elevated area (berm) adjacent to the bank. Houses developed atop the bermed area are generally above the 100 year flood event elevation. However, inconsistencies in the berm height and the composition of subgrade material along the bank do not prohibit river water from penetrating into the interior areas of the residential neighborhood which exist at lower elevations.
- The majority of the backwaters bottomland (Area-1 and Area-2) is made up of wetlands which are regulated by Section 404 of the Clean Water Act. Placement of material within these areas requires a Department of the Army permit.
- Activities within the backwater areas below the OHWL of 571 are regulated by Section 10 of the Rivers and Harbors Act and may require a permit.
- The plant community within the backwater area is diverse with many trees. Trees and plants provide valuable habitat for a variety of wildlife species, help to improve water quality, provide stability to slopes, and take up excess moisture. Consideration and planning should be given to avoiding and preserving as many trees and native plants as practicable.

Summary of Analyses (Site Opportunities and Constraints)

The following is a list of overall site opportunities and site constraints that were identified as a result of the information gathering and site analysis portion of the study. The identification of site opportunities and constraints help guide decision making and are particularly helpful in determining the feasibility and acceptability of various alternatives and recommendations.

- Due to the inconsistency in bank elevations and the nature of subgrade material along the Kanawha River; preventing water from backing/penetrating/infiltrating into low lying areas of the residential interior would be a significant challenge from the standpoint of

cost, property ownership, permitting, maintenance, technical, effectiveness, and socially acceptability.

- There appears to be the potential for reducing many of the undesirable aspects of the backwater area through the combination of management and development strategies. However the ability to prevent property damage to adjacent homes due to flooding from a rise in the Kanawha River is not feasible for the reasons listed above.
- Due to very little change in elevation, a high water table, frequent inundation/sediment deposition, low velocity/quantity flows, and the inability of the channel to “self flush”; channel dredging appears to be an ineffective means for reducing undesirable impacts related to flooding in the backwater area. From a standpoint of cost, permitting, and logistics; extensive dredging requiring large equipment would not be practical.
- City owned property within the backwater area provides potential for improving pedestrian access/circulation in and around the site.
- The elevation of the backwater area (majority below the 20 year flood event stage) makes residential development impractical. However, the relative infrequency of flooding in certain City owned portions of the backwater area provides a suitable environment for recreational development.
- Relocation of existing site utilities (utility poles, overhead utility lines, underground storm sewers) may be necessary should recreational development occur.

Section 3- Conceptual Development

Conceptual development begins as an idea for a solution which addresses some, or all, of the identified issues/concerns. Potential solutions become the preliminary study alternatives. The merits of each preliminary alternative are measured by their feasibility and acceptability. Many of the preliminary alternatives are discarded during this initial evaluation stage. Those that make it through this initial screening process are further refined and developed through the conceptual planning process.

Preliminary Backwater Alternatives

Three alternatives for reducing negative impacts associated with the backwater area were identified for this study.

The three alternatives are as follows:

1. Fill in the backwater area.
2. Install levee and pump station at mouth of the backwater area.
3. Enhance the existing backwater area utilizing a mixed management and development approach.

A preliminary list of pros and cons for each alternative were developed by the COE and presented for discussion during a meeting at the Nitro Council Chambers on May 9, 2013. Those in attendance at the May 9th meeting included the following: representatives from the COE (Dan Bock, Brian Ball, and Mike McComas), representatives from the City of Nitro (Dave Casebolt- Mayor, AJ Hill- Public Works Director, Rita Cox- Recorder, and Laurie Elkins), representatives from the community (Daryl Coleman) and David Iverson with WOWK-Media.

During the meeting discussions it was determined that Alternative 1 and 2 were infeasible. Factors for the decision included cost, maintenance, effectiveness of solution to reduce flood related impacts, property ownership issues, permitting issues, liability, and technical feasibility. It was determined by the City that Alternative # 3 could provided a feasible solution, addressing many of the issues and concerns expressed by the community. As such, the COE was directed to focus the remaining study efforts toward the refinement and development of this alternative.

Selected Alternative

The alternative selected for reducing unwanted backwater impacts employs a two-fold approach consisting of both backwater management strategies and physical development.

Management strategies for the backwater area are mainly geared toward reducing the presence of unwanted pests and trash in the portion of the backwater area experiencing frequent inundation from a rise in the Kanawha River level. They generally consist of clean-up/maintenance type tasks that are not complex in nature but can be labor intensive. Implementation of these strategies is contingent on the support of the community and may involve the creation of a community task force.

Development concepts for the backwater area are geared toward reducing safety/security concerns as well as providing community enhancement. It is anticipated that some

Section 4- Conceptual Site Plan

The conceptual site plan is the culmination of all prior planning efforts from which a plan is formed, and serves as the illustrative guide for future site improvements. The plan itself is a graphic representation of conceptual ideas which have been transformed, through the conceptual planning process, into elements and spaces arranged together on paper. This type of plan is effective as a promotional tool, as an information bridge between changes in administrations, and as a means for identifying and attracting funding sources.

Backwater Site Plan

The site plan below is the product of careful evaluation (analysis) and consideration of project goals/objectives, key community values, site conditions, project opportunities and project constraints. The study recommendations that follow include strategies for both the management and development of the area.

**Exhibit-8
Backwater Site Plan**



Backwater Management and Development Strategies/Recommendations

1. Form a “Friends of the Backwater” community group to help organize activities and events related to the clean-up, maintenance, and development of the backwater area. The success of the plan is dependent on strong community support and even stronger community involvement.
2. Utilize available grant opportunities to maximize cash resources. *(Refer to Appendix-D for information regarding potential funding/grant opportunities)*
3. Consider local industry/business as potential source for building material and labor. Utilizing local talent builds community pride and sense of ownership in the development and maintenance of public improvements.
4. Communicate regularly with residents who live and own property in the backwater area. Consider creating pamphlets to provide residents with information regarding mosquito and invasive species control. *(Refer to Appendix-F for Japanese Knotweed Control Plan and Appendix-F for Mosquito Control Plan)*
5. Provide residents with information regarding federally regulated backwater activities (activities that require a permit). *(Refer to Appendix-E for information regarding Federal Regulations and Permit Information)*
6. Notify and obtain permission from property owners prior the start of clean-up and maintenance efforts.
7. Perform an initial trash and vegetative clean-up of the backwater site. All trash should be removed and disposed of properly. Dead trees and limbs (standing or fallen) should be removed if deemed a public safety hazard. Otherwise, standing and fallen dead trees provide good habitat for wildlife. Large trees around the perimeter of the site and on slopes should be selectively limbed up (lower branches trimmed off) to allow better visibility into the area. Otherwise, trees and shrubs provide slope stabilization and absorb large quantities of excess water. The flat bottomland portions (Area-2) of the backwater area consist of high quality wetlands. It is recommended that these areas be cleared of trash and any debris that may restrict the stream channel. Otherwise it is recommended that these areas remain as is, or be enhanced with additional wetland plantings.
8. Begin a program to eradicate the invasive Japanese Knotweed stands that exist within the backwater area. This involves a combination of cutting and herbicide application twice a year. Control of the knotweed will allow native species to become established, creating a healthier working wetland area. *(Refer to Appendix-F for Japanese Knotweed Control Plan)*

9. Begin a mosquito larva control program aimed at reducing the number of mosquitoes that reach an adult stage. Enroll in the State mosquito surveillance program which will provide the City with accurate information on existing backwater mosquito species and their potential for carrying disease, preferred breeding sites, existing population densities, and treatment recommendations. ([Refer to Appendix-G for Mosquito Control Plan](#))
10. Develop a regular backwater maintenance schedule to include trash clean-up and vegetative control.
11. Consider the purchase of specific properties within, or adjacent to, the backwater embayment when they become available for sale. Consider purchasing properties that experience repeated flooding (property damage). In addition, consider purchasing properties that allow additional space for trail expansion and/or improvement, provide space for on-site parking, and allow additional opportunities for residents to recreate and socialize. Undeveloped and undevelopable properties should also be considered.
12. Improve pedestrian circulation and ADA accessibility within, and adjacent to, the backwater area. Construct new sidewalks in locations where they are currently absent. Repair or replace sidewalks that pose a pedestrian hazard or do not meet ADA guidelines. Develop strong pedestrian connections between Main Avenue (business) and proposed park area of Dupont Avenue (recreation). Prioritize the Gum Street connection as it terminates at the proposed location for the new park entrance.
13. Remove the dam/pedestrian channel crossing structure located in Area-1. Keep existing channel clear of obstructions. ([Refer to Appendix-E for potential permit requirements](#))
14. Consider obtaining the services of site engineering/design firm to aid in the development of detailed construction drawings based on conceptual park plan.
15. Construct pedestrian bridges and ADA accessible trails where shown in plan. Pre-fabricated pedestrian bridges are available for purchase from multiple manufacturers, however are traditionally more expensive than on site construction methods. Design engineering services may be necessary to provide a detailed design for the bridge and its foundations, to determine appropriate bridge span, to develop a field survey and provide geotechnical services, and to provide detailed site design.
16. Consider obtaining additional site engineering services to determine the feasibility of connecting Area-4 into the existing City storm drain system. A more detailed survey of existing storm pipe elevations/locations and detailed design plans would be required to determine feasibility. Detailed design is beyond the scope and Federal Authority of this study effort.

17. Consider the use of interpretive signage along backwater trails and pedestrian bridges that inform users about the many benefits provided by the backwater area. (ie. flood water storage, water quality, wetland/riparian habitat, etc). Flora and fauna identification signage as well as trail distance markers would also provide interest for trail users.
18. Consider community trail signage program to help connect existing pool/park and school facilities on (street), with the existing boat launch area (street) and proposed backwater recreation and trails area.

Taken together, these recommendations focus on reducing the various impacts/community concerns associated with the flooding of the area. Specific recommendations aim to reduce hazards and conflicts associated with pedestrian and vehicular circulation, reduce undesirable pest populations, increase community involvement, increase community awareness as to the social and environmental value of the backwater area, increase ADA accessibility, provide safe crossing of the backwater channel, improve community connectivity, and enhance “quality of life” through recreational development. Implementation of the recommendations should also provide secondary benefits by attracting new business investment and increase property values. Additionally the increase in public use, improved site visibility, and increased neighborhood patrols associated with recreational facilities are factors often cited as being responsible for a decrease in illegal activities.

Recreational Planning

Recreation plays a direct role in the overall “livability” and economic stability of an area. Recreation addresses the social, physical and mental needs of humans by providing opportunities for physical and social interaction. Recreational planning within the backwater area comes as the direct result of input from the City of Nitro. The plan to develop recreation within the backwater area was largely supported by the residents who participated in the public input portion of the study.

During this study effort the City received ownership of the property labeled as parcel #24. The decision to develop the property for recreation illustrates the City’s continued commitment to invest in the area by providing residents with the opportunity for a better “quality of life”.

Recreation can generally be separated into two main categories: *active recreation*, and *passive recreation*, each of which is discussed below.

1) Active Recreation

The term active recreation is generally used when referring to activities that involve a facility (field/court), equipment, or developed infrastructure to allow a specific activity to take place. These activities normally require more physical exertion and usually involve more than one participant. These activities typically address the social and physical needs of humans. Examples of active recreation would include team sports, hiking, jogging, active play, etc. Facilities to support such activities would include open play areas, play equipment, fields, courts, and trails.

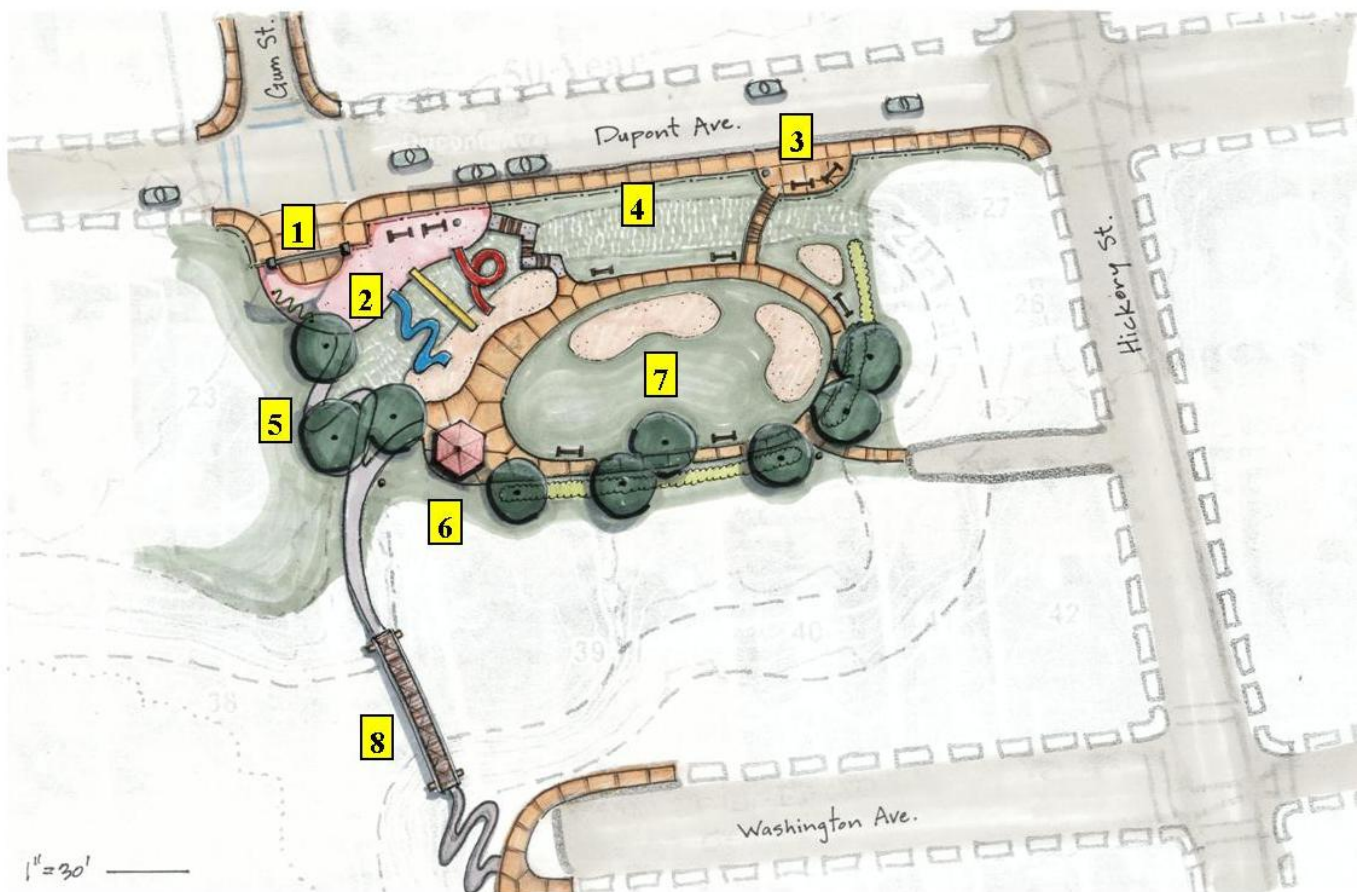
2) Passive Recreation

The term passive recreation generally pertains to less intensive types of recreation which typically address the social and mental needs of humans. These usually involve activities or events that are less organized, and are more individual or small group oriented. Participation in these activities generally requires less physical exertion, and is geared more toward the pursuit of social interaction, pleasure, and relaxation. Some examples of passive recreation include: people watching, picnicking, walking, watching river traffic, bird watching and wildlife viewing.

Community Park Plan

The opportunity to develop park facilities arose during this study effort when the City received ownership of the property labeled as parcel #24. The park concept illustrated below is the direct result of input from the City of Nitro and was largely supported the residents who participated in the public input portion of the study.

**Exhibit-9
Community Park Plan**



Park Features

Recommendations for the development of a community park within the backwater area are based on consideration of project goals/objectives, community values and input, site conditions, project opportunities and project constraints. The resulting plan consists of site features which

allow opportunities for both active and passive recreation. Proposed site features are described below and keyed into the plan above.

1. Main Entrance Plaza- proposed entry plaza with overhead park entry/identification sign. Plaza should accommodate occasional use by maintenance vehicles and tie into adjacent sidewalks via ADA acceptable standards.
2. Upper Play Area- comprises the area adjacent to the main entrance plaza. The selection of appropriate play surface material is dependent on the type of play equipment selected for the area. Site amenities shown in the plan include: benches, a bike rack, and trash receptacles. Flags, information kiosk, water fountain, shade structures, and other items may also be appropriate. Proposed play equipment consists of a series of embankment slides that take advantage of the sites natural topography. Also illustrated is a set of wood timber steps which allows children to traverse the slope between the upper and lower park levels.
3. Upper Overlook- this small park overlook is intended as a place for socialization or “people watching” and is shown in the plan to include benches and a trash receptacle. The plaza provides a secondary means of park ingress and egress from Dupont Avenue via a set of concrete steps.
4. Upper Sidewalk- concrete curb and sidewalk, 6 feet in width, located directly adjacent to Dupont Avenue. The plan proposes a 4 foot tall, black, aluminum, ornamental picket fence to be installed along the park side edge of the walk. Fence is indented to help visually define the park while providing a safety barrier between the road and proposed park play areas.
5. Lower Park/Trail Access- proposed access from the upper park entrance to the lower park area is via ADA accessible path with a surface of concrete or asphalt pavement. The path serves to connect park visitors to the lower park commons; as well as the proposed pedestrian bridge and associated system of neighborhood walks and backwater trails.
6. Picnic Gazebo- situated in the lower park area is to serve as a small group gathering place for picnics or other similar activities. The gazebo illustrated is approximately 20'x20' (400 square feet) in size. The gazebo could be of various shapes, colors, and architectural styles as determined appropriate for the area.
7. Park Commons- is the hub of park activity consisting of an oval walking path, open lawn play area, multiple areas for play equipment, and bench seating. The area also consists of hedge and tree plantings intended to help define the limits of the park and provide visual separation from adjacent residents.

8. Pedestrian Bridge- to provide access from the park to the larger system of existing and proposed sidewalks and trails. The plan illustrates a bridge that is approximately 60 feet in length and 8 feet wide. An actual field survey and detailed design plan would be required to determine the exact length of bridge needed.

Preliminary Cost Opinion

The following is a preliminary opinion of costs for the propose park. Quantities provided are based on the preliminary concept plan and are for the purpose of submitting applications for funding. Allowances provided for site elements (ie. play equipment, play surface, and entry sign) are provided for planning purposes. Actual park costs may vary significantly based on the future development of detail design plans and the final selection of site equipment, site material, site accessories, construction methods, and other factors.

PRELIMINARY COST OPINION

Community Park Items

<u>Item Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
Minor Demolition	LS	1	\$5,000.00	\$5,000.00
Minor Earthwork	LS	1	\$10,000.00	\$10,000.00
Integral Concrete Curb and Sidewalk (6' wide)	LF	280	\$100.00	\$28,000.00
Ornamental Picket Fence (4' ht. black aluminum)	LF	300	\$60.00	\$18,000.00
Concrete Steps (15 steps, 5' wide, w/cheekwalls & handrails)	LS	1	\$6,000.00	\$6,000.00
Play Surface (undetermined)	ALLOWANCE	1	\$20,000.00	\$20,000.00
Concrete Paving (4" thick with 4" stone base)	SF	4600	\$15.00	\$69,000.00
Asphalt Paving (6' wide trail)	SF	900	\$10.00	\$9,000.00
Park Entry Sign (undetermined)	ALLOWANCE	1	\$8,000.00	\$8,000.00
Picnic Shelter/Gazebo (20'x20')	SF	400	\$100.00	\$40,000.00
Park Benches	EA	9	\$2,000.00	\$18,000.00
Trash Receptacles	EA	4	\$750.00	\$3,000.00
Bicycle Rack	EA	1	\$1,500.00	\$1,500.00
Play Equipment (undetermined)	ALLOWANCE	1	\$50,000.00	\$50,000.00
Landscaping (trees, shrubs/hedges, seeding, etc)	LS	1	\$10,000.00	\$10,000.00
Minor Drainage and Utilities	LS	1	\$10,000.00	\$10,000.00

Subtotal **\$305,500.00**

<u>Other Costs</u>	<u>Percentage of Subtotal</u>	
Detailed Design & Engineering (bid documents, survey, geotech)	10%	\$30,550.00
Mobilization	5%	\$15,275.00
B&O Tax	2%	\$6,110.00
Insurance/Bonding	2%	\$6,110.00

Subtotal **\$58,045.00**

Total Cost **\$363,545.00**

Other Items of Note

Prefabricated Pedestrian Bridges (60' long, 8' wide) with engineering and foundations	EA	2	\$120,000.00	\$240,000.00
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Unit Abbreviations

LS	Lump Sum
LF	Lineal Feet
SF	Square Feet
EA	Each

Summary

The success of community design is dependent on the understanding and effective organization of inter-related design elements, natural processes, and social behaviors. By taking a comprehensive planning approach, grounded in the principles of design, this study provides a solid foundation or “framework”, from which the intended design outcomes can be achieved. Deviations from the design “framework” without careful consideration to relationships between design elements, natural processes, and social behavior can affect the design composition as a whole and lead to undesirable or dysfunctional outcomes.

Despite its current condition, the backwater area possesses many of the fundamental qualities for becoming a great community asset. Its location, natural character and walk-ability create the potential to provide opportunities for recreation, socialization, and relaxation. All combined, the backwater area has the potential to become the social centerpiece (urban oasis) of the community.

This master plan study is an effort to unlock the potential of the backwater area by establishing a vision for the area as a whole and integrating it into the overall fabric of the community. The plan takes advantage of qualities inherent to the site and develops them into opportunities that best meet the goals and objectives of the study. Improving the connections between the recreational opportunities of the backwater area and surrounding residents/businesses is a key step in building and sustaining a vibrant town atmosphere. Attaining the positive benefits associated with these links is dependent on two things: 1) the support of the community and 2) the funding necessary to make needed changes. The following section identifies some potential sources for construction funding.

Conclusion

The recommendations of this study are the product of a close partnership between the Corps of Engineers, City of Nitro, and residents of the community. It is the first step in the enhancement of the backwater area and reflects a commitment by the City to provide the community with opportunities for a better “quality of life”. By investing in the future of the area, the City is making a conscious effort to not only provide solutions for reducing the negative impacts of backwater flooding, but to also provide opportunities for recreation through the development of a community park and walking trails.

This planning study represents a vision for the future of the backwater area and surrounding community and serves as a guide for future management and development improvements. As such, the plan seeks to identify improvements that take advantage of recreational opportunities associated with City owned property and the opportunities provided by the natural characteristics of the backwater area.

The backwater area is uniquely situated to serve as an “urban oasis” to its neighboring residents. In Nitro’s industrial/residential environment where community green space is scarce, the calming appeal of a natural landscape is an attractive draw of people. The natural lure of backwater area is apparent to the kids that currently play there. With the support of the community and a little hard work, the area possesses the qualities to be equally appealing for others in the community. The inherent walk-ability between the backwater area, business sector, and residential housing positions the area as a daily destination for employees and residents alike. Through the implementation of the plan, the backwater area has the potential to become a neighborhood gathering place with the natural, physical, and social qualities to meet the needs and desires of the entire community.

Appendices

- Appendix A Cost Sharing Agreement
- Appendix B Kick-Off Meeting Minutes
- Appendix C Public Meeting Minutes
- Appendix D Potential Funding/Grant Sources
- Appendix E Federal Regulations and Permit Information
- Appendix F Japanese Knotweed Control Plan
- Appendix G Mosquito Control Plan

Appendix A

Cost Sharing Agreement

COST SHARING AGREEMENT
FOR
PLANNING ASSISTANCE BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS
AND
THE CITY OF NITRO, WEST VIRGINIA

THIS AGREEMENT, entered into this 1ST day of February, 2013, by and between the United States of America (hereinafter called the "Government"), represented by the District Engineer executing this Agreement, and the City of Nitro, West Virginia (hereinafter called the "Sponsor").

WITNESSETH, that

WHEREAS, the Congress has authorized the Corps of Engineers in section 22 of the Water Resources Development Act of 1974 (Public Law 93-251) as amended to assist the States in the preparation of comprehensive plans for the development, utilization and conservation of water and related land resources; and

Whereas, Section 319 of the Water Resources Development Act of 1990 (Public Law 101-640) authorized the Government to collect from non-Federal entities fees for the purpose of recovering fifty (50) percent of the cost of the program; and,

WHEREAS, the Sponsor has reviewed the State's comprehensive water plans and identified the need for the planning assistance as described in a Scope of Services incorporated into this agreement as Appendix A; and

WHEREAS, the Sponsor has the authority and capability to furnish the cooperation hereinafter set forth and is willing to participate in study cost-sharing and financing in accordance with the terms of this agreement;

NOW THEREFORE, the parties agree as follows:

1. The Government, using funds contributed by the Sponsor and appropriated by the Congress, shall expeditiously prosecute and complete the Study, estimated to be completed within twelve (12) months, substantially in compliance with the Scope of Services attached as Appendix A (**Nitro, WV- Backwater Site- Backwater flooding and Recreation Study**), and in conformity with applicable Federal laws and regulations and mutually acceptable standards of engineering practice.

2. The Government and the Sponsor shall contribute fifty (50) percent and fifty (50) percent, respectively, of all study costs, the total cost of which is currently estimated to be \$43,000, as specified in the study cost estimate attached as Appendix B. The Sponsor may receive in-kind credit for planning assistance services provided at Sponsor expense, in an amount up to (50) percent of Sponsors total contribution. The Sponsor agrees to provide the amount of \$21,500 (50 percent of the total estimated study cost). Requirements for In-kind credit are attached as Appendix C. Prior to any work being performed under this agreement, the Sponsor agrees to provide a cashier or certified check in the amount of \$21,500 made payable to FAO, USAED, (Huntington District).

3. No Federal funds may be used to meet the local Sponsor's share of study costs under this Agreement unless the expenditure of such funds is expressly authorized by statute as verified by the granting agency.

4. Before any Party to the Agreement may bring suit in any court concerning any issue relating to this Agreement, such Party must first seek in good faith to resolve the issue through negotiation or another form of nonbinding alternate dispute resolution mutually acceptable to the Parties.

5. In the event that any one or more of the provisions of this Agreement is found to be invalid, illegal, or unenforceable, by a court of competent jurisdiction, the validity of the remaining provisions shall not in any way be affected or impaired and shall continue in effect until the Agreement is completed.

6. This Agreement shall become effective upon the signature of both Parties.

For the Sponsor:

For the Corps:

By: Dave Casebat

By: Steven T. McGugan
Steven T. McGugan
Colonel, Corps of Engineers
Commanding

Title: MAYOR

Title: District Engineer

Date: Feb 1st, 2013

Date: 13 March 2013

Approved as to Form:

By: _____

Title: _____

Date: _____

Appendix- A
Nitro, WV- Backwater Site
Backwater Flooding and Recreation Study

Planning Assistance to States (PAS)
Scope of Services
October, 2012

I. INTRODUCTION

The Corps of Engineers (COE) is pleased to present you with this scope of services for the preparation of the following Planning Assistance to States (PAS) study. The work activities described within this scope were developed to evaluate and provide recommendations for reducing impacts related to backwater flooding issues. The completed study will serve as a guide for the implementation of recommendations to aid in the reduction of flood impacts while providing opportunity for increased community recreation. As a part of the overall study, the COE will develop a conceptual plan for recreational use of specified backwater areas. We look forward to a successful partnering on this project and other future endeavors.

II. CORPS OF ENGINEERS RESPONSIBILITIES

The purpose of this section is to address the portion of work to be provided by the COE. The proposed planning effort has been broken down into the specific tasks as follows.

Task 1: Study Initiation

Upon signing of an agreement, the COE will prepare a Project Management Plan (PMP). The PMP outlines the roles and responsibilities of those working on the study. It also contains schedule information, a communication plan, safety plan, and review plan, as well as other processes that are to be followed during the preparation of the study.

The COE, in coordination with the Sponsor (City of Nitro), will participate in an initial programming (kick-off) meeting. The purpose of this meeting is to: 1) review the scope of services, PAS funding guidelines, schedule, and the PMP; 2) identify information needs and means, project Stakeholders, and program elements; and 3) discuss project expectations. In addition, the COE will present preliminary study objectives for review and comment.

The COE, in coordination with the City, will participate in Stakeholder meetings with persons, agencies, businesses, and organizations identified during the “kick-off” meeting. The purpose of these meetings is to identify and discuss pertinent issues and concerns related to the study. It is anticipated that a portion of the discussion will involve the delineation of the study area, identification of recreational needs, and the recognition of study opportunities/constraints that are significant to the planning effort. In addition, preliminary study objectives will be further discussed, developed, and refined as needed.

The COE, in coordination with the City, will participate in an initial public input meeting. The intent of the meeting is to gather public input on issues such as public access, public safety, and

recreational need/desire. Ideas and concerns will be documented for consideration in the planning and achievement of the study objectives.

Task 2: Information Gathering and Base Map Preparation

The COE will gather available project data as needed for the study. The COE will utilize this existing information, (records, maps, drawings, surveys, etc.) to create a preliminary base map for the project. No additional field surveying work is included in this scope.

Task 3: Site Inventory

The COE will conduct a visual inventory of the study area. This will include a walkthrough of the study area to identify the following: 1) additional site items of significance; 2) potential planning constraints and/or concerns; and 3) potential operation and maintenance issues. The COE will add any appropriate discoveries to the base map.

Task 4: Site Analyses

The COE will perform site analyses (evaluations) for issues/elements as needed to achieve the study goal and objectives. It is anticipated that a flood evaluation, real estate review, and recreational analysis will be required. These analyses will aid in determining the most appropriate recommendations for backwater issues, as well as the suitability of specific backwater areas for recreational development. A summary of each analysis including a list of recommendations/conclusions will be provided in the final study report.

Task 5: Spatial Diagramming and Simple Line Sketches

Spatial diagrams and simple line sketches will be developed as needed to illustrate alternatives, communicate concepts, and demonstrate relationships between elements.

Task 6: Recreational Site Plan

Based on feedback from the previous tasks, the COE will develop a recreational site plan for the specified study area. The plan will be conceptual in nature, illustrating the general locations, sizes, and shapes of proposed program elements. At a minimum, the plan will illustrate the relationship of program elements to each other, adjacent facilities, and local/regional connectors. Considerations in the planning of recreational elements will include:

- existing physical and natural site features
- pedestrian and vehicular access/circulation
- public safety and security
- aesthetics and views
- ADA accessibility
- flood impacts
- operation and maintenance
- recreational need and desire

A draft plan will be presented to the City for review and consideration. Final revisions will be made to address City comments, as appropriate. The COE will produce and submit a final plan in the form of a color rendering.

Task 7: Study Review, Write-Up, and Assembly

The COE will prepare a bound final report with applicable plans, exhibits, etc., summarizing the analyses, recommendations and conclusions of the study.

III. SPONSOR'S RESPONSIBILITIES

As a partner in the project, the Sponsor shares in the work and responsibility necessary to achieve a successful project. A portion of the Sponsor's responsibility is provided in the form of funding and in kind services. A second, and just as important part, is achieved through close coordination and communication throughout the planning process. The following list of items constitutes a portion of the Sponsor's responsibilities.

- 1) Meeting Coordination and Attendance
 - Scheduling and facilitation
 - Public advertisement (as necessary)
 - Preparation and circulation of agendas and meeting minutes
 - Coordination with media outlets
 - Active involvement and productive input
 - Identification and contact of appropriate Stakeholders (including resource agencies)
 - Program development (aid in developing goals, objectives, specific program elements)
 - Timely reviews and approvals
- 2) Information Gathering
 - Identification/collection of pertinent project information (maps, drawings, studies, etc.)
 - Records research (underground utilities, etc)
- 3) Other Potential Expenses
 - Materials and Equipment
 - Travel
 - Advertisements
 - Reservations for community workshops/meetings
 - Postage

IV. DELIVERABLES

The COE will deliver one (1) color rendered presentation drawing of the recreational site plan, and two (2) bound hardcopies of the final study report with all applicable drawings and exhibits. In addition, electronic versions of all deliverables will be provided to the City.

**Nitro, WV PAS Study
Kanawha River Backwater Site
Backwater Flooding and Recreation Study**

Appendix B- Study Cost Estimate

Task 1: STUDY INITIATION	
Subtotal	\$10,000.00
Task 2: INFORMATION GATHERING AND BASE MAP PREPARATION	
Subtotal	\$3,700.00
Task 3: SITE INVENTORY	
Subtotal	\$3,700.00
Task 4: SITE ANALYSIS	
Subtotal	\$6,000.00
Task 5: SPATIAL DIAGRAMMING AND SIMPLE LINE SKETCHES	
Subtotal	\$3,600.00
Task 6: RECREATIONAL SITE PLAN	
Subtotal	\$6,000.00
Task 7: STUDY REVIEW, WRITE-UP, AND ASSEMBLY	
Subtotal	\$8,000.00
SUBTOTAL	
USACE (labor and travel)	\$41,000.00
COST SHARE SUMMARY	
Cash Amount (USACE- \$21,500 / Nitro- \$19,500)	\$41,000.00
Assumed Inkind Service Amount (Nitro - \$2,000)	\$2,000.00
TOTAL STUDY ESTIMATE	\$43,000.00

Appendix- C
Planning Assistance to States (PAS)
Sponsor Provided In-kind Products/Services

As a partner in the study effort, the Sponsor shares in the work and responsibility necessary to achieve a successful outcome. As such, a portion of the Sponsor's contributions may be provided in the form in-kind services. The following is general guidance for in-kind services per Engineering Regulation (ER) 1105-2-100, Appendix G, Amendment #2, dated 24 Sept. 2007.

In-Kind Products and/or Services

In-kind products and/or services for PAS studies may be accepted for up to one-half of the Sponsor's share of the PAS study cost and may be provided at any time subsequent to execution of the cost share agreement.

Eligible Parties

Work-in-kind may only be provided by the non-Federal project Sponsor and can be accomplished by the staff of the non-Federal Sponsor or by contract administered by the non-Federal Sponsor.

Requirements

The dollar value of the in-kind effort will be established prior to the initiation of the in-kind effort. The value will be negotiated, based on a detailed government estimate and Sponsor proposal, between the Federal Government and the non-Federal Sponsor, applying applicable Federal regulations, including OMB Circular A-87. The non-Federal Sponsor will comply with applicable Federal and state laws and regulations. Efforts credited as work-in-kind will be subject to audit and if the actual costs are less than the negotiated amount, the value of the credit will be reduced accordingly.

Limits

Credit for work-in-kind may not result in any reimbursement of the non-Federal Sponsor.

At the request of the Sponsor a copy of OMB Circular A-87 will be provided. The circular further establishes principles and standards for determining allowable in-kind credit costs and documentation requirements.

Appendix B

Kick-Off Meeting Minutes

Meeting Minutes

Nitro PAS- Backwater Site

Kick-Off Meeting
10:00 am, Monday, April 15, 2013
Nitro Mayor's Office

The meeting consisted of representatives from the COE (Dan Bock and Brian Ball), representatives from the City of Nitro (Dave Casebolt- Mayor, AJ Hill- Public Works Director, Ron King- Fire Marshal/Building Inspector, and Rita Cox- Recorder), and representatives from the community (Daryl M Coleman JR. and Julie A. Coleman). A meeting agenda, along with copies of the scope of work, and initial study goal and objectives were distributed to attendees.

Dan Bock began the meeting with a brief review of the scope of services, PAS funding guidelines (in-kind services), schedule, and the Project Management Plan (PMP). The study process (tasks) and study expectations (deliverables) were also reviewed. The City indicated they will keep track of City employee labor for credit as in-kind services. It is anticipated that the total in-kind credit for the study will not exceed \$2,000. During review of the PMP the Mayor appointed AJ Hill (Public Works Director) as a POC for the City.

The initial project goal and objectives were then reviewed and discussed. They were generally accepted by all with no refinements to be made at this point. The Mayor asked that the COE consider the identification of potential construction funding sources as an objective of the study. The COE agreed that this would be included as part of the study effort.

Dan Bock then asked the City and community representatives for input as to potential study issues and concerns. Flooding related concerns included property damage to adjacent structures, high mosquito populations due to poor drainage/standing water, trash deposited during backwater flooding, and public safety associated with makeshift pedestrian crossing of the flooded area. Other backwater discussions included unkempt understory vegetation, invasive species, and habitat for unwanted pests (snakes, rats, etc).

Also discussed was the lack of community connectivity/cohesion created by the disconnection of roads and walkways as a result of the backwater area. This lead to some open discussion related to the potential connecting of various broken circulation links. Providing opportunities for public recreation in backwater areas otherwise not suited for residential development was also discussed.

Two preliminary alternatives for addressing the backwater issues were discussed and will be evaluated further. The first entailed the filling of the backwater area. The second consisted of a multifold approach entailing the development of a future City acquisition plan, potential recreation/trail plan, and recommendations for reducing other flood related issues. Some pros and cons of each alternative were discussed. The COE will provide a formalized list of pros and

cons for further evaluation and discussion. It is understood that the identification and better understanding of the flooding cause(s) may dictate the appropriate course of study.

Next Steps

- 1) To evaluate and better understand the source/cause of flooding. (COE)
- 2) To develop a list of project stakeholders; ie adjacent land owners including contact information. (City)
- 3) To gather information for the creation of a study base map. (COE)
- 4) To develop pros and cons for initial alternatives. (COE)

Once the next steps are completed it will be necessary to schedule a follow-up team meeting with the City to discuss preliminary findings and determine best path forward.

The meeting was adjourned.

Following the meeting Dan and Brian met with Ron King who provided PDFs of tax parcel maps obtained through digital courthouse. In addition, we met with AJ Hill to review City storm drainage maps. Following lunch we (Dan and Brian) walked the site to locate and determine size of drainage outlets within the backwater area and get a general feel for the site character and surrounding neighborhood.

Appendix C

Public Meeting Minutes

Meeting Minutes

Nitro PAS- Backwater Site

6:00 pm, Monday, September 5, 2013

The meeting consisted of representatives from the COE (Dan Bock, Brian Ball, and Ashley Stephens), representatives from the City of Nitro (Dave Casebolt- Mayor, AJ Hill- Public Works Director, Rita Cox- Recorder, Rene Graves-Planning Commission, Tom Waldorf-Planning Commission, and Andy Shamblin- Councilman), and representatives from the community (see Attachment 1: Meeting Sign-In Sheet). A list of study goals and objectives, key study issues and concerns, comment cards, and exhibits of the backwater area and park concept were distributed to attendees.

Mayor Dave Casebolt introduced Dan Bock who began the meeting with a brief overview of the PAS program, study goals/objectives, and key study issues/concerns. This was followed with a presentation of the proposed improvements preliminarily planned for the backwater area. Exhibits were utilized to illustrate study plans and show areas for proposed management and development activities. Following the presentation the meeting was opened up for questions and further community input/comment in regard to the preliminary plans.

As a follow-up to a question, Dan Bock explained that planned backwater improvements would not prevent future flood damage resulting from the rise, “backing up”, of the Kanawha River. It was further explained that several alternatives geared toward preventing the Kanawha from backing into these low lying properties (many within the 20 yr to 50 yr. flood event zones) were explored and deemed as infeasible for a host of reasons. However, it was also explained that many of the other concerns expressed by the public and related to inundation of the backwater area (safety, pests, aesthetics, etc.) could be addressed through a series of management and development actions.

There was a lot of positive response to the proposed addition of a park within the City owned parcel number 24. However, several surrounding neighbors expressed some concern about potential night time noise and loitering. Some discussion occurred among residents who thought that this could be controlled by not providing park lighting, specifying a park closing time, and increasing police patrols in the area. They also felt that some recreational activities may not be appropriate for the site and further discussion as to what would be acceptable would need to take place between residents and the City.

In response to additional questions, Dan Bock reiterated that the COE, through the PAS program, was only authorized to provide a conceptual level study effort and that any construction costs to implement recommendations are the responsibility of the City. However, as part of the study effort the COE would provide the City with a list of potential funding sources and contact information. The plans and recommendations provided in the study report could then be used by the City to help seek funding from these various sources.

Some residents expressed concern regarding the lack of maintenance directed toward the vegetation in the backwater area and the increase in nuisance pest issues (mosquitoes, rats, raccoons, snakes, other critters) it has created. Dan Bock responded by saying there would be a mosquito control plan included in the final study report. In addition, there would be recommendations for maintaining the backwater vegetation and keeping an open channel to allow water to more easily retreat back into the Kanawha as levels receded.

The COE also indicated that most of the property within the backwater area is privately owned and as such is currently up to owners to maintain. The report would recommend that the City work with those residents to help maintain these difficult areas.

The Mayor closed the meeting by expressing the City's support for the implementation of study recommendations. He also expressed the City's commitment to obtaining additional funding to be used toward future construction and maintenance efforts in the backwater area.

The meeting was adjourned.

NITRO BACKWATER MEETING SIGN-IN SHEET

Name	Address	Phone/Email
Peggy Poe	103 Dupont Ave	755-4702
Kim/David Lawrence	705 Kanawha Ave	304-206-6396
Amanda & Tom McDonald	601 Kanawha Ave	304 807 2036
Sandy Hutchinson	907 Du Pont Ave	382-3243
Rebecca Gardee	709 Wash Ave Nitro	419-4387

NAME	ADDRESS	PHONE
Tom Medvick	610 Kanawha Ave	755-1174
Jim Carrier	803 Dupont Av	755-2977
René Graves	Planning Commission	543-8255
Beverly Smith	408 Dupont Ave	590 7476
Arnie + Julie Gago	504 Kanawha Ave.	755-6153 561-5946
Rita Cox	506 Main Ave.	437-4380 755-0707
Jim Riffle	806 Dupont Ave.	304-610-2925
Alan Bucklen	608 Dupont Ave	304-755-0307
Jason White	604 Dupont Ave	304-553-3313
DAVE CASEBOAT	1529W 15th St	304-419-3322
Barbara Crites	510 Dupont Ave	304-755-5743
Joan Wysog	401 Wash Ave	304-755-7551

NITRO BACKWATER MEETING SIGN-IN SHEET

Name	Address	Phone/Email
KERMIT THOMPSON	3953 39th ST, NITRO	755-4469
Theresa White	416 Kan Nitro	755-5190
Mindy Shumbe	107 Walker St.	533-9766
Margaret Hudson	105 Kanawha Ave. So., Nitro	727-6732
JOHN MONTGOMERY	214 BROOKHAVEN DR, NITRO	776-6458
Tom WARDER	1425 W. 14TH ST	755-5843
Norman Williams	800 DuPont Ave	755-4946
Trish McHINNEY	612 DuPont Avenue	755-1536
Neal Ruge	614 Dupont Ave	533-9593
Bryan Roberts	709 Dupont Ave	550-2785
Jeanne Robert	709 Dupont Ave	550-2786
Bob Gorbey	205 Hickory St	807-3505
Kim Laverly	610 Dupont Ave	304-395-2340
Ashley Jones	606 Dupont Avenue	304-395-1209
Herbert Johnson	603 Washington Ave	304-545-2029
Amanda Johnson	603 Washington Ave	304-993-2052
LES HAYZLETT	601 WASH Ave	304-955-2046
Larry Lacy	603 Dugard Ave	304 755 3629
Paul E Brown	702 WASHINGTON AV	304-753-3251
Sue Brown	702 Wash. Ave.	304 755 3751
Jackie Reynolds	710 Washing Ave.	304 -755-1276
David Dorsey	703 Wash. Ave.	

Nitro Backwater Meeting Comments

Name	Address	Comments
Sandra Hutchinson	907 Dupont Ave,	Way Wonderful Idea!
Alan Bucklen	608 Dupont Ave	I am all for a cleanup and recreation site in the area discussed
Rene Graves	Planning Commission	While the neighborhood beautification is important for Nitro, the clean-up needs to happen first, Info for funding the clean-up + channelization, as well as bridges for pedestrians should
Bill Javins	1122 Main Ave	Love the plans. We need recreation in this area!
Jeanne & Bryan Roberts	709 Dupont Ave	No basketball courts! If park is built are police going to be available and take care of the drug dealers that will hang there after dark? Love the park idea
Bob Godbey	205 Hickory St.	Fixing the flooding problems is great, but the park will be bad for three families maybe more who work shift work. Why weren't we asked if we wanted it? Ooops, your not fixing the
Kermit Thompson	3953 39 th St	This is a wonderful plan to take care of this flooding and swamp area. This area can be made beautiful and useful for the City. Please continue this plan for the future
James Carrier	803 Dupont Ave	Flooding and drainage are the top problems.
John Montgomery	214 Brookhaven Dr. Nitro City Council	I support the program.
Kelly Bailey	502 Kanawha Ave	We have lived on (at the mouth of river) the Backwater for 14 years. We have received permits from the Corps to open the backwater up. The Backwater at this time was 3ft above river level. Since we cut it back out the level dropped. Now we keep it as cleaned out as we can but we cannot afford to do it all. No one but one city councilman came and picked up tires we pulled out about 6 years ago. That's the community effort. The rest just complain about the area and don't do anything.
Tom Waldorf	1425 W. 14 th St. City Planning	Good plan if community gets involved.
Beverly Smith	408 DuPont	I'm mostly here to learn what the plan is. I like the idea of a park and slides. I heard comment about cleaning up and putting better walk ways and bridges. I really like that
Allen & Peggy Poe	703 Dupont Ave	Love to see it done. Playground great.
Julie Craig	504 Kanawha Ave	Supportive of the project. Consider the cleanup of the backwater, the overgrown foliage a priority. Concerned about "volunteers" doing work. I've volunteered for many projects-but I love at the backwater and I'm not going (over) in that area. I don't live right beside proposed park area but I understand the concerns of those who do. Make it a picnic type park, no basketball courts, maybe slides/swings.

Name	Address	Comments
Larry Lacy	603 Dupont Ave	I think its just going to create problems with hoodlums hanging out in the area, a waste of money. I'm not for it. I have never seen it flood myself. Mosquitoes not bad.
Andy Shamblin	107 Walker St. Nitro City Councilman	Good plan, Great work. Hope to proceed immediately.

Appendix D

Potential Funding/Grant Sources

Appendix-E provides information in regard to various funding/grant programs that may be available to the City of Nitro. Programs have been categorized by funding agency below.

West Virginia Department of Transportation (WVDOT)

In 1991, Congress initiated a number of reimbursable grant programs, designed to enhance America's "Livable Communities" through the Intermodal Surface Transportation Efficiency Act (ISTEA) and continued by the Transportation Equity Act for the 21st Century (TEA-21).

http://www.transportation.wv.gov/highways/programplanning/planning/grant_administration/Pages/default.aspx

Recreational Trails Program

The Recreational Trails Program is available for the construction, upgrade or maintenance of both motorized and non-motorized recreational trails. This, too, is an 80% federal, 20% local reimbursement program that may recognize "in-kind" matches for the local share.

Ryan Burns, Program Coordinator

Phone: 304 558-9297

Fax: 304 558-3783

Transportation Alternatives Program

The Transportation Alternatives Program (TAP) has been a popular funding source for local community development. This is an 80% federal, 20% local reimbursement grant program for non-traditional transportation related projects. Examples include railway depot restoration, pedestrian and bicycle facilities and rail trails. This and other grant programs have also become part of West Virginia's Federal-aid transportation program since passage of the original ISTEA in 1991.

Rebecca Davison, Program Coordinator

Phone: 304 558-9600

Fax: 304 558-3783

US Department of Agriculture (USDA), National Resources Conservation Service (NRCS)

Conservation Technical Assistance (CTA)

The purpose of the program is to assist land-users, communities, units of state and local government, and other federal agencies in planning and implementing conservation systems. The purpose of the conservation systems are to reduce erosion, improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitat, improve air quality, improve pasture and reduce flooding, and improve woodlands.

http://www.wv.nrcs.usda.gov/programs/cta/cta_12/cta.html

Louis Aspey, ASTC-Operations

Phone: 304-284-7544

Email: Louis.Aspey@wv.usda.gov**Emergency Watershed Protection Program (EWPP)**

The purpose of the Emergency Watershed Protection Program (EWPP) program is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. The EWP program relies on federal funding, which has been limited in recent years.

<http://www.wv.nrcs.usda.gov/programs/ewp/ewp09.html>**Ron Wigal, Environmental Specialist**

Phone: 304-284-7566

Email: Ron.Wigal@wv.usda.gov**Norm Bailey, Resource Conservationist**

Phone: 304-284-7585

Email: Norm.Bailey@wv.usda.gov**Wildlife Habitat Incentive Program (WHIP)**

The Wildlife Habitat Incentive Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP, NRCS provides both technical and financial assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed. A typical contract may consist of such practices as the installation of warm season grasses, forest openings, use exclusion and establishment of grasses and legumes.

http://www.wv.nrcs.usda.gov/programs/whip/whip_13/whip.html**Bill O'Donnell, ASTC-Programs**

Phone: 304-284-7543

Email: bill.odonnell@wv.usda.gov**Wetland Reserve Program (WRP)**

The Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The USDA Natural Resources Conservation Service (NRCS) provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection

The program offers landowners three options: permanent easements, 30-year easements, and restoration cost-share agreements of a minimum 10-year duration.

WRP aims at restoring wetlands that have been impacted through agricultural activities while improving wildlife habitat for waterfowl. This has been accomplished through the restoration of hydrology and vegetation using measures such as: installation of small shallow impoundments, ditch plugs, removing subsurface drainage, tree planting and livestock exclusion.

http://www.wv.nrcs.usda.gov/programs/WRP/wrp_13/wrp.html

Bill O'Donnell, ASTC-Programs

Phone: 304-284-7543

Email: bill.odonnell@wv.usda.gov

Federal Emergency Management Agency (FEMA)

Flood Mitigation Assistance Programs

The Flood Mitigation Assistance (FMA) program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under NFIP.

<http://www.fema.gov/flood-mitigation-assistance-program>

<http://www.dhsem.wv.gov/Grants/Pages/default.aspx>

WV Department of Environmental Protection (WVDEP)

Litter Control Grant Program

The Litter Control Grant is a matching fund that assists municipalities and county government agencies with community cleanup and litter enforcement projects. Funding is provided for this grant through litter fines imposed on those who violate state litter laws. The maximum amount of funding for a Litter Control Grant is \$3,000 and the cycle runs from July 1 through June 30. Applications must be postmarked by no later than May 31 to be considered for the following grant period.

<http://www.dep.wv.gov/dlr/reap/grantprograms/Pages/default.aspx>

Outdoor Wildlife Learning Sites (OWLS)

The OWLS Program provides grants of up to \$2,000 to any public or private school for the creation of outdoor learning sites at or near school grounds. The purpose of the program is to bring children into a learning environment that includes wildlife species as part of their own ecosystem. OWLS projects are varied and include creating nature trails, butterfly and

hummingbird gardens, the creation of wetlands or ponds, planting warm season grasses, as well as creating nest boxes and other habitats for wildlife. The planning of each project is based on the idea of creating habitat for non-game wildlife.

Fostering stewardship and awareness, OWLS have the capability of teaching ecology and conservation to children, assisting them in their future roles in an ecologically aware society. The multidisciplinary approach of the project provides hands on experiences that children may not get elsewhere, enhancing creative learning, as well as community involvement that nurture ecological literacy. The deadline for submitting OWLS proposals is November 1 of each year.

<http://www.wvdnr.gov/Wildlife/OWLS.shtm>

Cooperative Research Grant

The Cooperative Research Grant Program provides funding for projects that benefit the state's non-game wildlife, botanical resources or fungi. The grant guidance document on the website gives a brief overview of the program and the application process. Priority is given to projects that address the population status or natural history of West Virginia species of concern as named in the WV Wildlife Conservation Action Plan. The WV rare species list and grant application booklet provide a list of species and/or projects that are a priority to the Wildlife Diversity Unit.

<http://www.wvdnr.gov/Wildlife/ResCoopGrant.shtm>

Cooperative Education/Management Grant

The Cooperative Education/Management Grant Program provides funding for a variety of projects, ranging from habitat improvement to the publication of books. Each project should be diverse and innovative. Projects must benefit non-game wildlife or botanical resources in some aspect of education, conservation, species protection, habitat management or a combination of these categories. The grant guidance document on the website gives a brief overview of the program and the application process. The WV rare species list and grant application booklet provide a list of species and/or projects that are a priority to the Wildlife Diversity Unit.

<http://www.wvdnr.gov/Wildlife/ResCoopGrant.shtm>

Tire Collection Event

Each year, the Pollution Prevention and Open Dump (PPOD) Program conducts tire collection events across the state. At least one collection event is held in each county. During these events, individuals with proof of WV residency can dispose of ten tires in a safe way. PPOD is also responsible for the removal of tires pile located across the state.

<http://www.dep.wv.gov/dlr/reap/tires/Pages/default.aspx>

Miscellaneous Others

Bikes Belong Grant

The Bikes Belong Coalition

<http://www.bikesbelong.org/grants/apply-for-a-grant/who-can-apply/#sthash.pptbwo7B.dpuf>

Rahall Transportation Institute (RTI)

RTI's strives to enhance and improve lands that provide recreational, aesthetic, alternate transportation and educational opportunities for motorized and non-motorized users. Services include: trail inventory and mapping, trail contracting, trail layout and design, construction oversight, training and instructional classes. RTI does not provide funding.

<http://www.wvregion3.org/>

<http://www.njrati.org/programs/trails/>

Appendix E

Federal Regulations and Permit Information

Waters of the United States

Since the backwater area is an embayment of the Kanawha River and a wetland, certain activities that impact the area may require a Permit from the U.S. Army Corps of Engineers. You should contact the Corps of Engineers, Regulatory Division at (304) 399-5710 for specific permitting requirements.

Two federal authorities are applicable for this area:

- 1) Section 10 of the Rivers and Harbors Act of 1899 requires a Department of the Army (DA) permit be obtained for any work in, on, over or under a Section 10 (navigable) water of the United States (U.S.). The Kanawha River and the backwater area below the elevation of 571 feet is considered a Section 10 water and is subject to Section 10 requirements. Therefore, if any structures or work are proposed within this backwater area a Section 10 permit may be required.
- 2) Section 404 of the Clean Water Act requires a (DA) permit be obtained prior to the discharge of dredged or fill material into waters of the U.S., including wetlands. A water of the U.S. is defined as waters which are, were, or may be used to transport foreign or interstate commerce, tributaries of those streams and adjacent wetlands. There are very few streams or wetlands that are not waters of the U.S. If you propose an activity that would result in the discharge (placement) of material in a potential water of the U.S., it is best to contact the U.S. Army Corps of Engineers, Regulatory Division for information on obtaining a DA permit for the activity.

Please note, even temporary fill material requires a permit.

Anticipated development actions:

Development of trails, boardwalks, and pedestrian bridges- such activities within the backwater area may require a permit from the Corps of Engineers (dependant on size of disturbance, location, etc). Construction activities of this nature typically meet the terms and conditions for a Nationwide Permit (Number-14 for linear transportation projects which includes trail development) as published in the February 21, 2012, Federal Register (77 FR 10184). As such, the Corps of Engineers should be provided a pre-construction notification for the proposed work in accordance with General Condition Number-31.

Removal of the makeshift channel crossing in Area-1- this activity would likely meet the terms and conditions of a Nationwide Permit (number 18 for minor discharges). The material that is removed should be disposed of properly (landfill or other acceptable location), and not placed into a waterway or a wetland. As such, the Corps of Engineers should be provided a pre-construction notification for the proposed work in accordance with General Condition number 31.

Construction of Community Park- this proposed construction activity (with the exception of the pedestrian bridge and associated trail beyond the alley ROW) is located outside of the areas

regulated by the COE. This does not eliminate the need to obtain an National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit from the State and other applicable building permits.

The following backwater activities generally do not require a permit:

- Mowing of the area by weed eater or lawn mower. Do not use equipment such as a bobcat, dozer or other equipment to conduct mechanized land clearing. If equipment is needed that would disturb the ground consult the COE for permit requirements.
- Tree/limb removal by chain saw or other means that does not disturb the ground within the wetland area. Consult the COE if heavy equipment is needed.
- Trash and debris cleanup (without the use of heavy equipment)

The following backwater activities generally require a permit:

- Discharge (placement) of dredged and/or fill material (ie. earth, rock, concrete, etc.)
- Excavation or dredging of the soil or ground
- Disturbance of the ground to include leveling or grading
- Mechanized land clearing activities
- Construction activities

The regulatory authority of the Corps of Engineers is limited to waters of the U.S. Within the backwater area this includes the area below the 571 elevation and areas meeting the criteria for wetlands.

Other Federal, state, and/or local permits may be required prior to the start of certain activities. Contact the West Virginia Division of Natural Resources Office of Land and Streams at (304) 558-3225 to determine if a Stream Activity Permit is required for your project.

Appendix F

Japanese Knotweed Control Plan

Facts about Japanese Knotweed (*Polygonum cuspidatum* or *Fallopia cuspidatum*)

- A non-native invasive plant species. This is a rapidly growing plant that will shade out native and desirable plants.
- It grows in clumps reaching heights of 3-10 feet. The stout, hollow stems are reddish brown and the nodes are swollen giving them a bamboo-like appearance. Leaves are alternate and egg-shaped narrowing to a point at the tip. The plant flowers in August – September. The plant spreads primarily by its extensive rhizomes (underground roots) creating dense thickets.
- The plant requires high light and is not usually found under forested canopies. The species occupies a wide variety of habitats in many soil types and a range of moisture conditions. It is most common along roadsides and on stream banks.
- It was introduced from Asia as an ornamental in the late 19th century because of its unusual bamboo-like growth habit. It is widely distributed in the U.S.

Removal and Control of Japanese Knotweed:

Cutting the knotweed only removes the aboveground portion and only serves to stimulate the below ground rhizome. The most effective approach is to control the knotweed through a combination of cutting and herbicide application. Some sources indicate at least three consecutive years of cutting and herbicide application is necessary to eliminate the knotweed.

A herbicide with the active ingredient as glyphosate that is safe around water is recommended. Glyphosate is a non-restrictive use herbicide. Anyone can purchase and use it in accordance with manufacturer's directions. The key to effective herbicide use is the correct dosage or percent active ingredient.

To remove the knotweed, cut the shoots a few inches above the ground surface then spray immediately with the recommended herbicide on the cut shoots. If the spray is applied within a few minutes of cutting, the plant will take up the herbicide into its system. Use caution to not over-spray the area since the herbicide is not selective, it will kill other plants. After spraying, wait 7 days before disturbing or cutting the area to give the herbicide time to move below ground. It is likely the plant will re-grow. At that time you can repeat the process of cutting and spraying or you may spray the herbicide on the leaves if the plant is not too large at that time. Using the method of spraying the plant's leaves often results in over-spraying and damage to non-target plants so one should use caution. Two treatments would likely be necessary in the

spring and fall of each year. Consecutive years of treatment should be expected (generally three years).

It is important to monitor the area for re-growth of the Japanese knotweed because it can re-grow from rhizomes that have not been fully killed up to three years after treatments. Generally, the older the stand of knotweed, the more difficult it can be to kill. Therefore, it is best to remove the knotweed as soon as practicable.



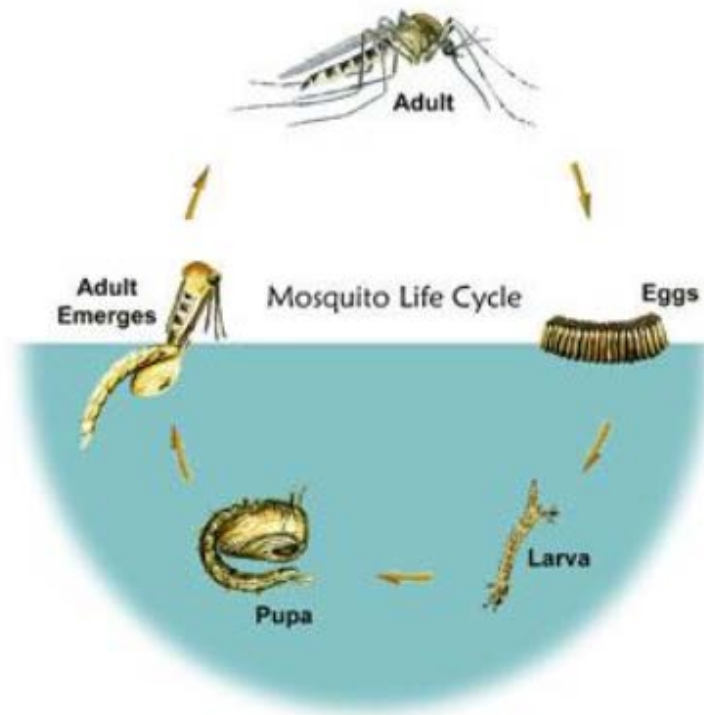
Photo from: www.fs.usda.gov

Appendix G

Mosquito Control Plan

Mosquito Management

Unfortunately, there is no easy solution for controlling mosquitoes. However, the best way to help control mosquitoes is to kill the larval stage. The life of the mosquito begins in the water as a larva after it hatches from an egg. Under ideal conditions, mosquitoes only need about seven days of standing water to go from the egg to the adult stage.



Source: USEPA website : <http://www2.epa.gov/mosquitocontrol>

An important part of mosquito control is making sure that mosquitoes don't have a place to complete their development. It is important to monitor standing water sources by doing the following:

- Get rid of standing water in rain gutters, old tires, buckets, plastic covers, toys or any other container where mosquitoes can breed
- Empty and change the water in bird baths, fountains, wading pools, rain barrels and potted plant trays at least once a week to eliminate potential mosquito habitats
- Drain temporary pools of water
- Keep swimming pool water treated and circulating

For areas of water that cannot be drained (backwater area), the most effective method of mosquito control is to target the larval stage of development through the application a biological

control agent. Biological larvicides: *Bacillus thuringiensis* var. *israelensis* (Bti) or *Bacillus sphaericus* (Bs) are recommended. Since Bti and Bs insecticidal proteins are only activated within the mid-gut of mosquitoes and biting fly larvae, these bio-pesticides are safe for humans, fish and other animals. Bti and Bs can be purchased as doughnut shaped rings or in granular form at local garden centers. These biological larvicides provide one month of mosquito larvae control. High organic matter in the water and active water flow will reduce the efficiency of Bti and Bs. It is most effective to target the mosquito larvae during times when the mosquitoes are prevalent (warmer months generally April - September). The West Virginia Department of Health and Human Resources Mosquito Surveillance Program can identify mosquito species composition, mosquito breeding sites, mosquito abundance, and human disease infection rate in the mosquito population at the site during late spring through early autumn.

Plan of Action:

- Remove sources of breeding grounds such as old tires, buckets, plastic covers or toys
- Inspect areas regularly to identify any potential areas for mosquitoes to lay their eggs
- Target the larval stage of the mosquitoes. During the warmer months, place Bti rings or granular product within standing water areas in accordance with application rates from the manufacturer. The Bti rings can be placed within the standing water of the backwater area. Since these are shaped like a doughnut they can be secured with biodegradable twine and/or stakes so that they do not float away during water fluctuations.
- Bti treatments can be targeted for the warmer months when mosquitoes are more prevalent.
- Bti rings and granular products are available at garden centers and can be placed safely by volunteers as often as needed in accordance with manufacturer's directions.
- The State has a surveillance program for mosquitoes, and the City may consider enrollment. For enrollment and information, contact Mr. Eric Dotseth, West Virginia State Public Health Entomologist. The State can provide assistance with identification of the mosquito species composition, mosquito breeding sites, mosquito abundance, and human disease infection rate in the mosquito population at the site.

Sources of information concerning the control mosquitoes:

West Virginia Department of Health and Human Resources (304) 558-5358

West Virginia Department of Health and Human Resources Office of Epidemiology and Prevention Services Mosquito-Borne Diseases website:

<http://www.dhhr.wv.gov/oeps/disease/Zoonosis/Mosquito/Pages/default.aspx>

Eric Dotseth, West Virginia State Public Health Entomologist (304) 356-4020

USEPA website: <http://www2.epa.gov/mosquitocontrol>

West Virginia Extension Office, Agriculture Agent Mr. John Porter (304) 720-9887