

# Using Technology to Address Challenges in the Field



# Water Quality Inspection and Enforcement Program



Outfall  
Inspections



Facility  
Inspections



Illicit Discharge  
Investigations



Emergency  
Response

# The Goal

1. Eliminate multiple databases for inspectors
2. Make all inspection data geospatial
3. Streamline the inspection process
4. Minimize or Eliminate Paper Forms
5. Utilize inspection data more effectively

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GOVERNMENT OF THE DISTRICT OF COLUMBIA  
DEPARTMENT OF THE ENVIRONMENT  
Natural Resources Administration  
Water Quality Division, Planning and Enforcement Branch

DISTRICT DEPARTMENT OF THE ENVIRONMENT

Auto Facility Inspection Form

Date: 11/17/04 Time: 11:17 AM Inspectors: JF/JE Facility ID: [blank]  
Address: 2040 West Virginia Ave NE  
City: Anacostia Phone: 202.664.2239

Section A

1 Has the facility been visited by enforcement officials from the District of Columbia or Federal Government in the last ninety (90) days?  
Yes  No

If yes, by who: [blank]

2 Facility Licenses  
Occupancy  Master Business License   
License Number [blank] License Number [blank]  
Expiration Date [blank] Expiration Date [blank]

3 How does the facility clean shop and surrounding area?  
Dry  Methods  Uses Water  Other   
Other: [blank]

4 Does the facility generate wastewater? Yes  No   
If no, skip to question 11

6 Does the facility pre-treat wastewater prior to discharge (oil/water separation in a pre-treatment pond)? Yes  No

7 Does the facility sample and analyze wastewater discharge? Yes  No

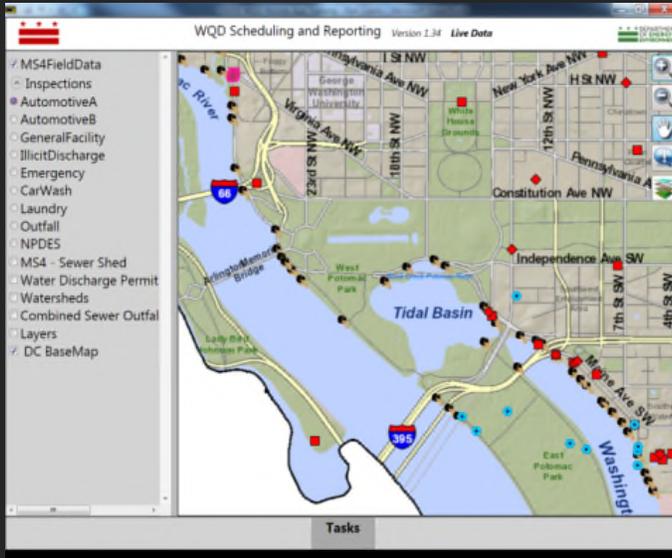
8 Is there any wastewater generated by the pre-treatment system? Yes  No   
If yes, please describe: [blank]

9 Is the wastewater hazardous? Yes  No   
If yes, are local discharge permits being met? Yes  No

10 Where is the wastewater being discharged? [blank]

Does the facility generate or store hazardous waste? Yes  No   
If yes, does the facility have any licenses or permits from the Government? Yes  No   
Does the facility take precautions to prevent fluids (oil, grease, solvents) from entering floor drains? Yes  No

# The Project



- Build a new database
  - Migrate existing data
- Develop Custom Software
- Configure out of the box software (ArcGIS mobile)
- Hardware Procurement
- Train Inspectors

Total: \$189,872



# A (*very*) Brief History

- July, 2009 → DOEE applies for Multimedia State and Tribal Assistance Grant funding from EPA (\$116,000)
- 2009-2012 → Delays in funding, DOEE secured additional funds
- May 2012 → Project Launched
- October 4, 2012 → Anticipated Completion
- 2012-2015 → DOEE implements database, continues to fix bugs. Spends local funds for a programmer to finish the project
- September, 2015 → Software fully functional deployed into field

# Hardware



Trimble Yuma:  
Rugged Tablet  
Display: 7"

OS: Windows 7

Processor: 1.6 GHz Intel Atom Z530

Memory: 1GB (DDR2)

Weight: 2.62 lbs

Cost (at time): \$3,712

Getac T800

Rugged Tablet

Display: 8.1"

OS: Windows 7/Windows 8

Processor: 2.16 GHz Intel Pentium N3530

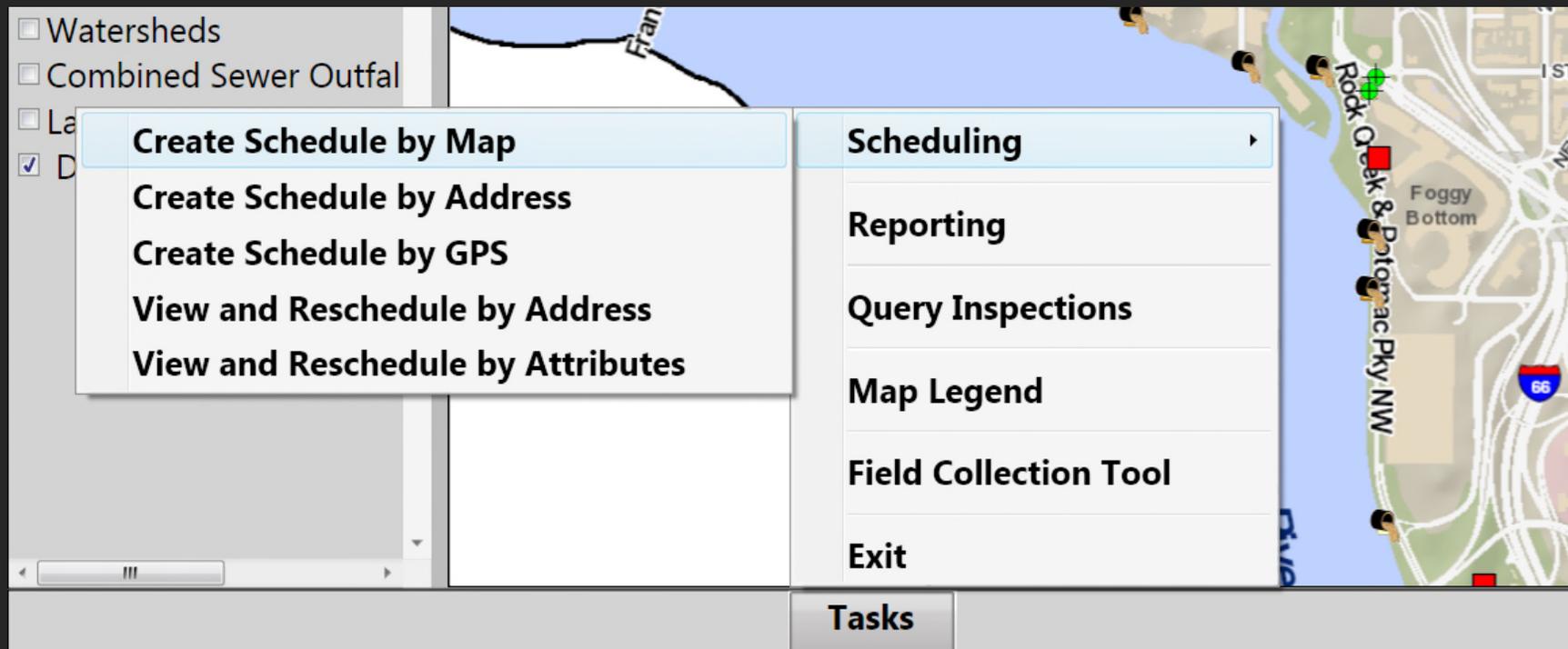
Memory: 4GB RAM (DDR3)

Weight: 1.94 lbs

Cost: \$2,150

# Workflow

- Scheduling (office or field)
  - With/Without address
  - Inspector notifications
- Inspector creates work list
- Data Collection (perform inspection)
- Data Synchronization
- Reinspection (if necessary)
- Reporting



# Bird's Eye View of the Inspector Work List

ArcGIS Mobile - WQDSR\_01\_1

## View Work List

Manage features in the work list

Features: (7)

- 1130  
Original  
Outfall
- 2195  
Original  
Outfall
- 3004  
Original  
Outfall
- Doug Curtis NPS**  
Original  
Illicit\_Discharge
- DPW DC Impound Lot  
Original  
General\_Facility
- ghirmay berhe  
Original  
Illicit\_Discharge
- MPD Boat Maintenance Yard  
Original  
General\_Facility

1.5 km

Map

Attributes

Attachment

Back

Menu

2:12 PM

**Remove All From List**

**Sort Features**

**Filter Features**

- By Name**
- By Feature Type**
- By Edit State**
- By Distance**
- Ascending**
- Descending**

# Data Input Screen

ArcGIS Mobile - WQDSR\_01\_1

**Edit Attributes**  
Click an attribute to edit its value

<b>Outfall ID</b>	N/A	>
<b>Illicit Discharge ID</b>	160330	>
<b>Address</b>	Pierce Mill	>
<b>Watershed</b>	Rock Creek	>
<b>Schedule ID</b>	26783	>
<b>Reporting entity</b>	Referral from Federal Government Agency	>
<b>Reporting individual</b>	Doug Curtis, National Park Service	>

Cancel Ok

2:17 PM

# Benefits



- Better Data
  - Accessibility
  - Reliability
  - Functionality
- Time savings
- Improved Planning
- Enhanced Investigations

# Investigations by Sewershed

ArcGIS Mobile - WQDSR\_01\_1

**View Work List**  
Manage features in the work list

Features: (8)

- 1130  
Original  
Outfall
- 2195  
Original  
Outfall
- 3004  
Original  
Outfall
- Anacostia River  
Original  
MS4 - Sewer Shed
- Doug Curtis NPS  
Modified  
Illicit\_Discharge
- DPW DC Impound Lot  
Original  
General\_Facility
- ghirmay berhe  
Original  
Illicit\_Discharge
- MPD Boat Maintenance Yard  
Original  
General\_Facility

Map navigation controls: +, -, Home, Back, Attributes, Attachment

Scale: 300 m

Map labels: Franklin St NE, Brentwood Rd NE, New York Ave NE, Adams St, Irving St, Hamlin St, Grand St, 13th St NE, 20th St, 21st St, 22nd St, 23rd St, 24th St, 25th St, 26th St, 27th St, 28th St, 29th St, 30th St, 31st St, 32nd St, 33rd St, 34th St, 35th St, 36th St, 37th St, 38th St, 39th St, 40th St, 41st St, 42nd St, 43rd St, 44th St, 45th St, 46th St, 47th St, 48th St, 49th St, 50th St, 51st St, 52nd St, 53rd St, 54th St, 55th St, 56th St, 57th St, 58th St, 59th St, 60th St, 61st St, 62nd St, 63rd St, 64th St, 65th St, 66th St, 67th St, 68th St, 69th St, 70th St, 71st St, 72nd St, 73rd St, 74th St, 75th St, 76th St, 77th St, 78th St, 79th St, 80th St, 81st St, 82nd St, 83rd St, 84th St, 85th St, 86th St, 87th St, 88th St, 89th St, 90th St, 91st St, 92nd St, 93rd St, 94th St, 95th St, 96th St, 97th St, 98th St, 99th St, 100th St

Map controls: Back, Menu

System tray: Windows taskbar icons, 2:20 PM

# Lessons Learned

- Software before hardware
- Clear and concise communication with software engineers and IT staff
- Onboarding and training staff
  - Ensure a functional application before implementing training
- Procurement
  - Limited opportunities and bids.
  - Management of contractors.

# Future Adaptations

- Geospatially adaptable to other water programs in the region/country
- Dataset is in a SQL Server
  - Will remain functional in the case of a software migration or updates
- Emergency/Disaster Response Applications
- Modifications to database schema would require updates to application
- Additions to the database are easier than subtractions
- A 'coder' would be needed to adapt the scheduler application for different medias or applications.

# Contact Information

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