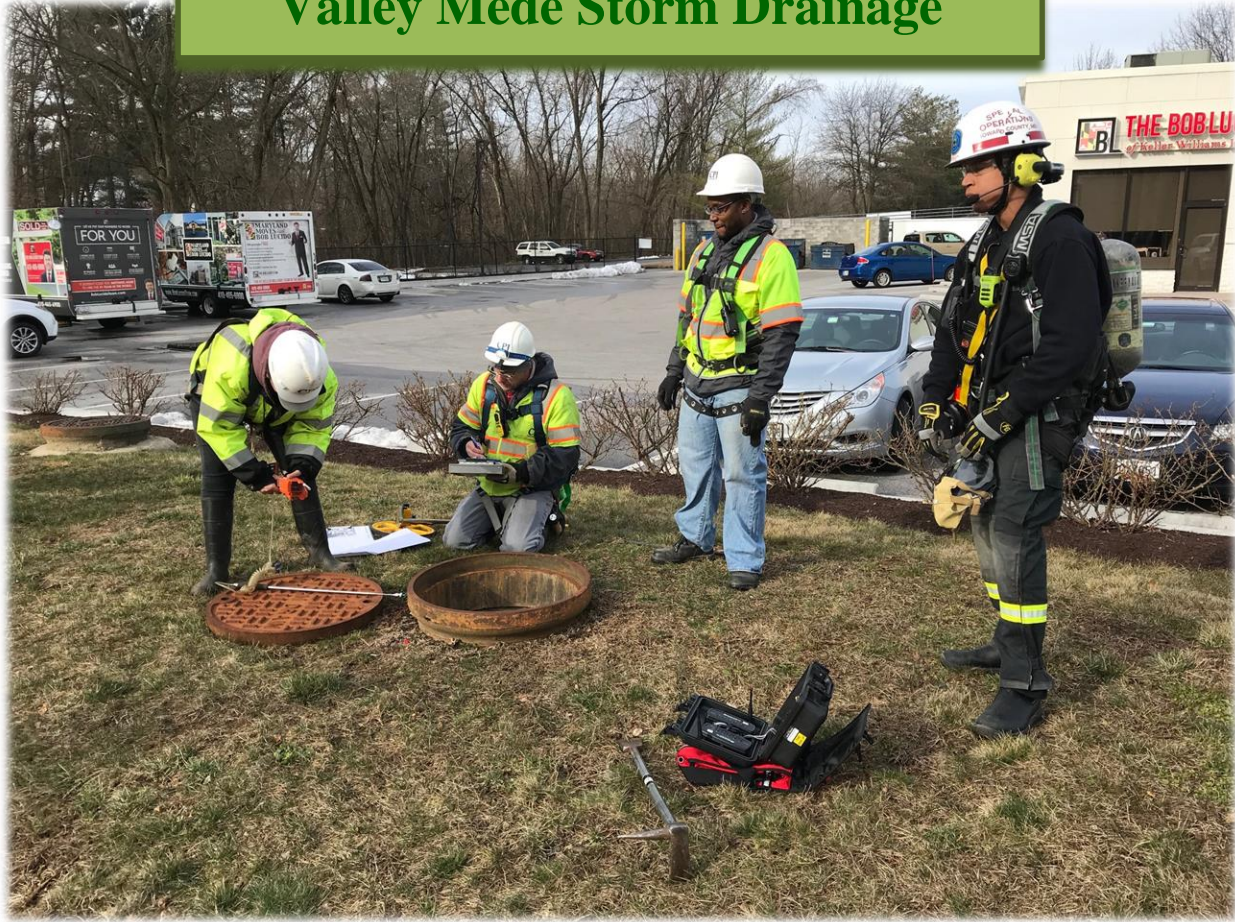


Valley Mede Storm Drainage



Inspection Report April 20, 2017 FINAL

Prepared by:

Charles P. Johnson & Associates, Inc.
Environmental Division
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Gaithersburg, MD 20878
301.208.9573



For:

Christine Lowe P.E.
Howard County Government
Stormwater Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, MD 21046-3143
cslowe@howardcountymd.gov
410-313-0522



Memorandum

To: Christine Lowe, P.E.

Organization: Howard County SWM Division

From: John Spry

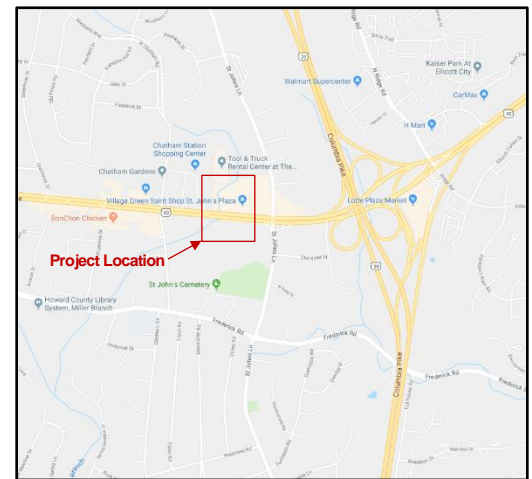
CPJ Job Number: 2014-1505-131 Task 300-000

Date: 4/20/2018

Re: Valley Mede Storm Drain Investigation

Background and Description of Project Area

Charles P. Johnson and Associates, Inc. (CPJ) was contacted on 11/16/2017 by the Howard County (HCSMD) Bureau of Environmental Services, Stormwater Management Division, to investigate approximately 1,600 linear feet of underground storm drain pipe and culvert in the vicinity of St. John's Plaza in Ellicott City, MD (See vicinity map). CPJ's understanding is that this drainage system was one of many identified during the severe flooding event on July 30, 2016 when as much as six inches of rain was recorded in a two-hour period. CPJ was asked to inspect this system and identify any issues, such as; structural, maintenance, performance issues, etc.. Specifically there was a concern that internal pipe failures or blockages might be reducing the capacity of the system. CPJ was provided with a copy of the County's GIS data showing the assumed location of inlets, pipes, and manholes as well as available as-built plans that were found for the associated properties.



Vicinity Map

The system serves as a conduit for drainage under MD Route 40 and adjacent retail businesses. As shown on the overview map (Appendix A-1) the system begins on the north side of St. John's Plaza as a perennial tributary to Plumtree Branch in the Little Patuxent River Watershed. It is collected at a concrete headwall and travels under the plaza in a 60" Reinforced Concrete Pipe (RCP). It continues under MD Route 40 through a 72" peaked box culvert where it transitions to an 84" Corrugated Metal Pipe (CMP). It then continues under the parking lots of several retail shops on the south side of Maryland Route 40 before exiting to an open stream channel.

Safety protocols

Due to the limited egress and possibility of unfavorable atmospheric conditions, the system was identified by CPJ as a permit required confined space as defined by the Occupational Safety and Health Administration (OSHA), Standard 29 CFR 1910.146 and an entry permit was filed and maintained by CPJ (see appendix). Further, due to the possibility of unknown significant structural failures, CPJ coordinated with the Howard County Department of Fire and Rescue Services, Bureau of Emergency Services (HCFRS) for a Job Hazard Analysis (see Appendix A-5) and notification of entry. Due to the unique nature of the project, HCFRS requested to be onsite and participate in the entry for safety and training purposes. CPJ inspection staff met with HCFRS onsite once and HCSMD staff on onsite twice prior to the inspection to orient everyone with the site and understand the roles and responsibilities of all parties.

Field investigation

The investigation was conducted under the terms and conditions of CPJ and Howard County's Mutual Agreement of Service Contract #4400002370 and was performed using CPJ's standardized "SWM Underground Inspections Procedures".

CPJ conducted an initial site visit on 11/27/2017 to evaluate site conditions, locate potential access points, and identify any potential problems. Additional site visits were conducted on 12/04/2017 and 02/08/2018 with Howard County Stormwater Management and Fire and Rescue staff. The initial date of inspection was set for March 21, 2018 but postponed to March 27 due to weather (snow).

CPJ's field inspection staff was comprised of two three-person inspection teams. Each inspection team included a team leader responsible for identification, measurement, and photo documentation, a scribe responsible for tracking progress through the system and making hard copy notes of the issues identified and the photos taken, and a third inspector responsible for maintaining radio contact with the above ground attendants during the inspection. During the underground inspections, the non-entry team was responsible for attending to entry and egress as well as securing open manholes.

Based on the length of the pipe and the limited egress points a decision was made to perform the inspection in two separate phases. Team One conducted the first phase of the inspection, starting from the downstream headwall and progressing up the 84" CMP then through the box culvert under MD Route 40 and then returning back through the box culvert and exiting at the location identified on the overview map as Manhole #3. Upon completion, the team remobilized and Team 2 conducted Phase II of the inspection beginning at the upstream headwall and progressing down the 60" RCP then under MD Route 40 and exiting through Manhole #3, the same manhole used for the Phase I inspection.

Inspection Findings

Copies of the full inspection notes and findings as well as photos with descriptions are found in Appendices A-3 and A-4. Summaries of the inspector's findings are shown below.

Surface Inspection Findings (See photos, Appendix D 001-024)

During the site reconnaissance visits and full site inspection on March 27 CPJ inspection staff made note of the following items:

1. One additional manhole was found that is not picked up in the County's existing GIS. The manhole is located in the St. John's Plaza and is identified in CPJ overview map as MANHOLE #2.
2. The Manhole identified on the overview map as MANHOLE #5 was cracked and unable to be opened by CPJ staff. Howard County Public Works was alerted prior to the inspection and was able to open the manhole, with property owner permission, so it would be accessible if needed, however the manhole was not replaced.
3. The main inlet has considerable debris in the immediate vicinity and within the floodplain.
4. There is a large screened headwall and 21" CMP pipe to the rear of St. John's plaza that is identified on the overview map as INLET C. There is also considerable trash and debris in the vicinity of this inlet.
5. There are indications in the parking lot of 9235 Baltimore National Pike (Sherwin Williams) of settling along the length of the assumed location of the storm drain.

Entry One Findings – 84" Corrugated Metal Pipe and 72" box culvert. (See photos, Appendix D 025-078)

The inspection team did not find any significant structural, maintenance, or performance issues during the inspection of the 84" CMP pipes or the box culvert. However, the following items were noted by the inspectors:

1. Minor amounts of sediment had accumulated along the length of the invert of the pipe varying in depth from approximately 4"-12".

2. The pipe section between MANHOLE 4 and MANHOLE 5 appears to be the oldest in the system and has lost much of its protective material. There are specific locations along this pipe that show minor corrosion, damage, and deformity.
3. The GIS data shows a lateral drain pipe entering the system from the north at STATION 4+43. No pipe was found at this location, however there was evidence that a lateral pipe did enter at this location at one time but was removed.
4. A small debris field was located at STATION 6+68 and continued to STATION 7+00. The debris consisted primarily of 12"-18" diameter riprap and was 4' to 6' wide. This is just downstream of MANHOLE 4 on the overview map.

Entry Two Findings – 60" Reinforced Concrete Pipe (See photos, Appendix D 079-115)

The inspection team did not find any significant structural, maintenance, or performance issues during the inspection of the 60" RCP. However, the following items were noted by the inspectors:

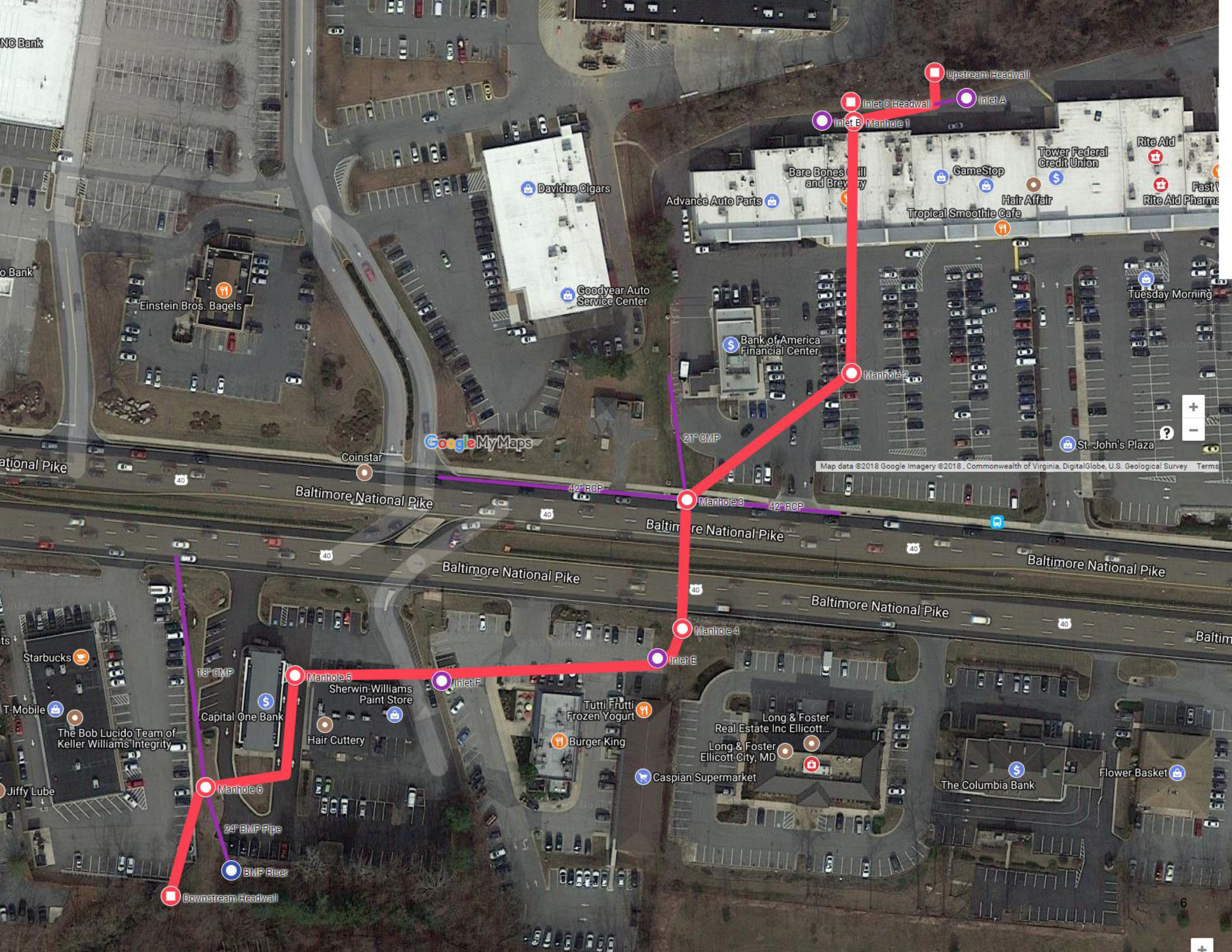
1. A single branch approximately 3" in a diameter and 8' in length created a small backwater at MANHOLE 1. The inspection crew was unable to remove or break the branch. CPJ crews returned on April 19, 2018 and removed the branch and debris from this location.
2. Debris and invert corrosion was noted at the infall from INLET C.
3. A previously unidentified 15" CMP pipe infall at MANHOLE 2 was discovered but appears to be abandoned and grouted full.

List of Appendices

- A-1. Overview Aerial Maps
- A-2. GPS Coordinates of field located above ground structures
- A-3. Field Notes by measured station
- A-4. Inspection photos with short descriptions
- A-5. Safety Forms

Valley Mede Storm Drain
OVERVIEW MAPS
A-1





Valley Mede Storm Drain
GPS COORDINATES
A-2

GPS Coordinates for Above Ground Structures			Column1	Column2
Description			Northing	Easting
Upstream Headwall			39.27846	-76.82792
Inlet A			39.27839	-76.82781
Inlet B			39.27833	-76.82831
Inlet C Headwall			39.27838	-76.82821
Manhole 1			39.27829	-76.82828
Manhole 2			39.27766	-76.82808
Manhole 3			39.27734	-76.82877
Inlet D			39.27731	-76.82885
Manhole 4			39.27702	-76.82878
Inlet E			39.27688	-76.82885
Inlet F			39.27684	-76.82961
Manhole 5			39.27685	-76.83013
Manhole 6			39.27655	-76.8304
Downstream Headwall			39.27626	-76.83056
BMP Riser			39.27633	-76.83035

Valley Mede Storm Drain
FIELD NOTES

A-3

Valley Mede Pipe Inspection

Entry 1

March 27, 2018

Entry Team: John Spry, Boyd Church, Jim Fetchu

Attendants: Holly Santa Ana, German Cortez, Brandon Freeman

Station	Notes	Photo	Description
0+50	Joints and invert in good condition	025	Overview
50-100	First turn at 94 ft.	026	Minor sediment blockage to manhole
100-150	Manhole located at 119ft.	027	Right side of manhole, CMP inlet, 24 in.
150-200	Minor sediment and minor for a bulge at 160 ft.	028	24 in. CMP looking up pipe
200-250	No issues	029	Left side of manhole, 18 in. CMP infall
250-300	Manhole at 291 ft., minor sediment	030	Looking up 18 in. infall
300-350	Pipe damage, soil and water infiltration at 314ft	031	Overview looking up 84 in. CMP
350-400	Pipe damage at 353 ft., minor pipe damage at 359 ft., minor pipe deformity at 378ft.	032	Loss of protective material, minor corrosion, 122 ft.
400-450	Masonry manhole at 426 ft., pipe damage at 440 ft., pipe joint damage at 433 ft., pipe damage and corrosion at 440 ft., manhole at 443 ft., 15 in. RCP at 443 ft. on right side of manhole no pipe on left side of manhole (previous repair evident)	033	Pipe deformity at 160 ft.
500-550	Minor corrosion at 462 ft., right turn at 488 ft.	034	Minor infiltration at turn at 197 ft.
550-600	No issues	035	Protrusion and pipe damage at 228 ft.
600-650	No issues	036	Manhole at 291 ft.
650-700	No issues	037	Overview at 300 ft.
700-750	Left turn at 654 ft., 15 in. RCP on left at 668 ft., sharp left turn at 686 ft., rock and debris 18 in. deep from 668 ft. to 700 ft. water depth 10 in.	038	Pipe damage, soil and water infiltration at 314 ft.
750-800	712 ft. 15 in. RCP on right. manhole at 717 ft. some infiltration.	039	Measurement of pipe damage at 314 ft., abandoned inlet
800-850	10 in. CMP at 12 o'clock, hole in joint at 777 ft. manhole 2 at 844 ft. 42 in., 21 in. CMP has corrosion at invert on left side of manhole	040	Pipe damage at 353 ft.
		041	Pipe damage at 359 ft.
		042	Bulge/deformity
		043	Minor infiltration, typical, 400 ft.
		044-045	2 shots of manhole structure
		046-048	3 shots of pipe damage
		049-052	4 shots of pipe damage at 440 ft.
		053-054	2 photos of 15" RCP inlet
		055	Overview, minor corrosion on pipe
		056--057	2 shots of 15 in. RCP at 668 ft.
		058-061	Rock and debris overview at 700 ft.
		062-063	15 in. RCP at 712 ft.
		064	Overview of manhole at 717 ft.
		065	Manhole interface with box culvert, minor infiltration
		066	Overview, box culvert
		067	Detail of manhole interface with box culvert
		068-069	10 in. CMP at 775 ft.
		070-071	2 shots of hole at 777 ft.
		072	Manhole 3, unknown inlet with cover
		073-074	Manhole 3, 42" RCP lateral inlet from west
		075	Manhole 3, 60" RCP main looking upstream
		076-077	Manhole 3, 21" CMP inlet from north

Valley Mede Pipe Inspection

Entry 2

March 27, 2018

Entry Team: Holly Santa Ana, German Cortez, Brandon Freeman
Attendants: John Spry, Boyd Church, Jim Fetchu

Station	Notes	Photo	Description
0+00	Crew entered at headwall, Station 0+00 beginning at the junction a shown in photo 082.	079	Just outside of Entry 3 looking downstream to the 60" RCP culvert.
0+80	MINOR BLOCKAGE, Depth of flow upstream of blockage is 7", see photo 085.	080	A 21" RCP pipe coming in from the left at the pipe junction. The pipe has some wearing and reinforcement is exposed.
0+90 LEFT TURN	Left turn occurred at Station 0+90, see photo 086.	081	Close up of exposed reinforcement on 21" RCP.
0+98	MINOR INFILTRATION and BLOCKAGE, See photos 087-094	082	Station 0+00 looking downstream into 60" RCP culvert.
2+04	MINOR INFILTRATION and SPALLING, see photos 099-101	083	Station 0+40, minor calcification on the wall.
3+00	MINOR SPALLING AND CALCIFICATION, see photo 103	084	Photo at Station 0+50 looking downstream into 60" RCP culvert.
3+37	Right turn occurred at Station 3+37, see photo 26.	085	Photo at Station 0+80 looking downstream at blockage consisting of a log, trash and other minor debris.
3+41	Manhole junction, abandoned 15" CMP lateral, see photos 105-108	086	Photo at Station 0+90 close up of log lodged in pipe.
5+34	Manhole junction	087	Photo at Station 0+98 shows infiltration at joint where concrete meets masonry.
EXIT	Crew exited at Manhole to south of MD Route 40.	088	Photo at Station 0+98 shows infiltration at joint where concrete meets masonry and pipe invert corrosion.
		089	Photo at Station 0+98, manhole junction looking upstream into CMP coming in. There is minor debris in the pipe.
		090	Photo at Station 0+98, manhole junction measuring CMP in. (Pipe D = 48")
		091	Photo at Station 0+98, manhole junction pipe corrosion at the invert.
		092	Photo at Station 0+98, manhole junction blockage.
		093	Photo at Station 0+98, infiltration at manhole junction.
		094	Photo at Station 0+98, infiltration at pipe connection with manhole.
		095	Photo at Station 1+00, looking downstream.
		096	Photo at Station 1+15, spalling at pipe joint.
		097	Photo at Station 1+50, looking downstream.
		098	Photo at Station 1+50, pipe joint.
		099	Photo at Station 2+04, infiltration at pipe joint.
		100	Photo at Station 2+04, looking downstream.
		101	Photo at Station 2+04, spalling at pipe joint.
		102	Photo at Station 2+50
		103	Photo at Station 3+00 Spalling at pipe joint and some calcification along pipe walls.
		104	Photo at Station 3+37 Manhole junction overview.
		105	Photo at Station 3+41 15" CMP in at left side of manhole, sedimentation in pipe
		106	Photo at Station 3+41 Infiltration and calcification in manhole junction.
		107	Photo at Station 3+41 Infiltration and calcification in manhole junction.
		108	Photo at Station 3+41 Exposed rebar in 60" RCP Culvert out of manhole junction.
		109	Photo at Station 3+45 Downstream shot of minor spalling
		110	Photo at Station 3+50 Looking downstream
		111	Photo at Station 4+00 Looking downstream
		112	Photo at Station 4+50 Looking downstream
		113	Photo at Station 5+00 Looking downstream
		114	Photo at Station 5+23 Manhole 2

			115	Photo at Station 5+34 End Looking downstream into box culvert under Baltimore National Parkway.
			116	Photo at Station 0+90 overview of log lodged in pipe.
			117	Photo at Station 0+90 lower portion of log lodged in pipe.
			118	Photo at Station 0+90 upper portion of log lodged in pipe.
			119	Photo at Station 0+90 overview of after log was removed from pipe.
			120	Photo at Station 0+90 overview of lower section after log was removed from pipe.
			121	Photo at Station 0+90 overview of upper section after log was removed from pipe.

Valley Mede Storm Drain
INSPECTION PHOTOS
A-4



001.staging and mobilization area



002.manhole 6



003.manhole 6 entry prep



004.manhole 2



005.manhole 2 air sampling



006.surface at manhole 2



007.surface at inlet A



008.surface at manhole 1



009.headwall C



010.inlet C



011.manhole 3



012.manhole 4



013.surface at inlet



014.surface at manhole 5



015.staging and mobilization area



016.surface downstream manhole 4



017.stream at upstream headwall



018.upstream headwall



019.manhole 1



020.surface downstream manhole 4



021.surface at inlet near manhole 4



022.downstream headwall



023.manhole 3



024.manhole 3 access

Entry 1 photos 025-078



025.entry 1.station 0+00 to 0+94



026.entry 1.station 1+19.manhole 6



027.entry 1.station 1+19.24 inch CMP inlet



028.entry 1.station 1+19.24 inch CMP inlet pipe



029.entry 1.station 1+19.18 inch CMP inlet



030.entry 1.station 1+19.18 inch CMP inlet pipe



031.entry 1.station 1+19.84 inch CMP pipe



032.entry 1.station 1+22.loss of protective material.corrosion



033.entry 1.station 1 +60.pipe deformity



034.entry 1.station 1+97.infiltration



035.entry 1.station 2+28.pipe damage



036.entry 1.station 2+91.manhole



037.entry 1.station 3+00.overview



038.entry 1.station 3+14.pipe damage.soil water infiltration



039.entry 1.station 3+14.pipe damage.soil water infiltration



040.entry 1.station 3+53.pipe damage



041.entry 1.station 3+59.pipe damage



042.entry 1.station 3+59.bulge deformity



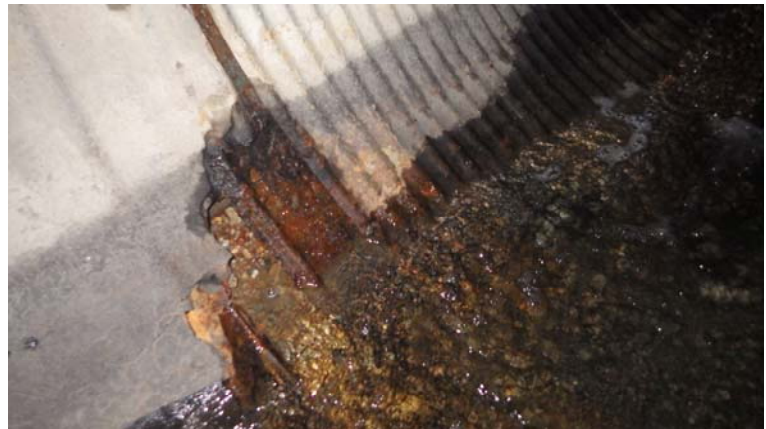
043.entry 1.station 4+00 infiltration continuous



044.entry 1.station 4+26 manhole



045.entry 1.station 4+26 masonry manhole structure



046.entry 1.station 4+33 joint damage soil water infiltration



047.entry 1.station 4+33 joint damage soil water infiltration



048.entry 1.station 4+33 joint damage soil water infiltration



049.entry 1.station 4+40.pipe damage corrosion



050.entry 1.station 4+40.pipe damage corrosion



051.entry 1.station 4+40.pipe damage corrosion



052.entry 1.station 4+40.pipe damage corrosion



053.entry 1.station 4+43.15 inch RCP inlet



054.entry 1.station 4+43.15 inch RCP inlet



055.entry 1.station 6+00.overview



056.entry 1.station 6+68.15 inch RCP inlet



057.entry 1.station 6+68.15 inch RCP inlet



058.entry 1.station 7+00.rocks debris



059.entry 1.station 7+00.rocks debris



060.entry 1.station 7+00.rocks debris



061.entry 1.station 7+00.rocks debris



062.entry 1.station 7+12.15 inch RCP inlet



063.entry 1.station 7+12.15 inch RCP inlet



064.entry 1.station 7+17.manhole 4



065.entry 1.station 7+17.manhole 4 fracture infiltration



066.entry 1.station 7+17.6 x 6 box culvert



067.entry 1.station 7+17.manhole 4 fracture infiltration



068.entry 1.station 7+75.10 CMP inlet at 1200



069.entry 1.station 7+75.10 CMP inlet at 1200



070.entry 1.station 7+77.hole



071.entry 1.station 7+77.hole



072.entry 1.station 8+44.manhole 3 unknown inlet



073.entry 1.station 8+44.manhole 3 42 inch RCP inlet



074.entry 1.station 8+44.manhole 3 42 inch RCP inlet



075.entry 1.station 8+44.manhole 3 60 inch RCP inlet



076.entry 1.station 8+44.manhole 3 21inch CMP inlet



077.entry 1.station 8+44.manhole 3 21inch CMP inlet



078.entry 1.station 8+44.manhole 3 east 42 inch RCP inlet



079.entry 2.60 inch RCP



080.entry 2.21 inch RCP inlet



081.entry 2.21 inch RCP.exposed metal



082.entry 2.station 0+00



083.entry 2.station 0+40.calcification



084.entry 2.station 0+50



085.entry 2.station 0+80.log trash debris



086.entry 2.station 0+90.log in pipe



087.entry 2.station 0+98.infiltration



088.entry 2.station 0+98.infiltration at joint



089.entry 2.station 0+98.CMP inlet.debris



090.entry 2.station 0+98.manhole junction



091.entry 2.station 0+98.manhole junction corrosion



092.entry 2.station 0+98.manhole junction debris



093.entry 2.station 0+98.manhole junction infiltration



094.entry 2.station 0+98.manhole junction infiltration



095.entry 2.station 1+00



096.entry 2.station 1+15.spalling



097.entry 2.station 1+50



098.entry 2.station 1+50.joint



099.entry 2.station 2+04.infiltration



100.entry 2.station 2+04



101.entry 2.station 2+04.spalling at joint



102.entry 2.station 2+50



103.entry 2.station 3+00.spalling calcification



104.entry 2.station 3+37.manhole junction



105.entry 2.station 3+41.15 inch CMP sediment



106.entry 2.station 3+41.infiltration calcification



107.entry 2.station 3+41.infiltration calcification



108.entry 2.station 3+41.60inch RCP exposed metal



109.entry 2.station 3+45.minor spalling



110.entry 2.station 3+50



111.entry 2.station 4+00



112.entry 2.station 4+50



113.entry 2.station 5+00



114.entry 2.station 5+23 manhole 3



115.entry 2.station 5+34.6 x 6 box culvert



116.entry 2.station 0+90.overview before removal



117.entry 2.station 0+90.lower portion before removal



118.entry 2.station 0+90.upper portion before removal



119.entry 2.station 0+90.overview after removal



120.entry 2.station 0+90.lower portion after removal



121.entry 2.station 0+90.upper portion after removal

Valley Mede Storm Drain
SAFETY FORMS
A-5

JOB HAZARD ANALYSIS	JOB: Howard County Task 24	DATE: 3/27/18	Page <u>1</u> of <u>2</u> pages	<input checked="" type="checkbox"/> NEW <input type="checkbox"/> REVISED
Instructions on Reverse Side	Title: Pipe Survey Survey of 54" RCP – 84" CMP and Box Culvert Approximately 1,600 LF of total pipe	Supervisor: CSE Supervisor – John Spry	Analyzed By: John Spry, James Fetchu, Holly Santa Anna, Hoang Ta, Ewald Schwarzenegger	
Organization: Charles P Johnson Associates, Inc. OFFICE: Gaithersburg Office		Approved by: James Fetchu & Ewald Schwarzenegger		
Recommended Personal Protective Equipment: 1) hardhats, 2) gloves, 3) steel toe water boots, 4) safety glasses, 5) dust masks (if desired), 6) full body harness, 7) air monitor (Team Leader, Attendant and spotter at extraction point).				
SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE		
Team I – Accessing downstream outfall – 84" CMP	Falls, trips, rocks, downed trees, slippery rocks in stream, steep banks	Obtain proper footing, be careful of loose surface (leaves, branches, rocks, etc.), and establish proper footing in the stream (Riprap) and at outfall before entering.		
Team I - Accessing Box Culvert and 84" CMP via MH 2	Toxic atmosphere, depth greater than four feet, flowing water, slippery pipe invert, falls, trips	Monitor air as per CSE program, use of fall protection, harnesses, as per CSE program, caution on steps while climbing, continually maintain tension on cable while climbing down MH steps		
Team II – Accessing upstream inlet – 54" RCP	Falls, trips, rocks, slippery rocks in stream, steep banks	Obtain proper footing, be careful of loose surface (leaves, branches, rocks, etc.), do not walk on downed trees or tree branches, and establish proper footing in the stream and at outfall before entering.		
Team I & II – Enter Pipe	Toxic atmosphere, sloped walking surface, flowing water, slippery invert	Monitor air as per CSE program (15 min. before entering), gain proper footing on entering, monitor extraction point and entry point continuously, team leader to wear air monitor,		
Team I & II – Inspect Pipe	Toxic atmosphere, sloped walking surface, flowing water, slippery pipe invert, deteriorated pipe invert, cramps, muscle spasms	Monitor air as per CSE program, gain proper footing during inspection, monitor extraction point continuously (aboveground team), team leader (#1) to wear air monitor and probe invert when advancing in pipe, Team member #3 maintains radio communication with above ground team and Rescue Team as per work plan, Head lamps, and flashlights. For cramps, perform stretching exercises prior to entry, properly hydrate before entering, carry water with you, stretch out where possible and rest.		
Team I – Exiting Pipe	Toxic atmosphere, sloped walking surface, flowing water, slippery pipe invert, deteriorated pipe invert cramps,	Monitor air as per CSE program, gain proper footing during inspection, monitor entry and extraction point continuously (aboveground team), team leader (#1) to wear air monitor and probe invert when advancing in		

Note: Steel toe boots may not be necessary for the pipe inspection since hip waders may be required.

CPJA – 1/2018

Revision

Team I – Exiting Pipe (continued)	muscle spasms	pipe, Team member #3 maintain radio communication with above ground team and Rescue Team as per work plan, Head lamps, and flashlights. For cramps, perform stretching exercises prior to entry, properly hydrate before entering, carry water with you, stretch out where possible and rest.
Team I & II extraction from MH 2 at end of inspection	Toxic atmosphere, depth greater than four feet, flowing water, slippery pipe invert, falls, trips, cramps, muscle spasms	Monitor air as per CSE program, use of fall protection, harnesses, as per CSE program, caution on steps while climbing, continually maintain tension on cable while climbing up MH steps. For cramps, perform stretching exercises prior to entry, properly hydrate before entering, carry water with you, stretch out where possible and rest.
EXERCISES	EXERCISES	EXERCISES
Name	Position - Title	Signature
John Spry	Team I – CSE Supervisor - Team Leader – Chief Inspector - #1	
Hoang Ta (Jim Fetchu alternate)	Team I-Inspector #2	
Boyd Church	Team I – Inspector - #3	
Holly Santa Anna	Team II – Team Leader – Inspector #1	
Brandon Freeman	Team II – Inspector #2	
German Cortes	Team II-Inspector #3	
James Fetchu	Alternate	

Note: Steel toe boots may not be necessary for the pipe inspection since hip waders may be required.

CPJ PERMIT REQUIRED CONFINED SPACE ENTRY FOR UNDERGROUND FACILITIES

TEAM MEMBERS: ENTRY OFFICER: HOLLY Santa Ana
 ENTRANT: John Spry, Jim Fatche, Boyd Church
 ATTENDANT/SAFETY MONITOR Holly Santa Ana, German Cortez, Brandon Freeman
 DATE: 3/27/18 PERMIT DURATION: 24hrs CURRENT TIME 9:00
 LOCATION: (Address & Location on site) Route 44, 9245 Bolinger Noland Pk
 TYPE: Oil-Grit Chamber Manhole Underground Facility Other (explain) Pipe Survey 64" CM?
 PURPOSE OF ENTRY: Inspection Other (explain) _____

ATMOSPHERE TEST TO BE TAKEN:

Action Limits	Time	Reading	Time	Reading	Time	Reading	Time	Reading
% Oxygen-19.5% + 23%	9:02	21.1						
10% of LEL								
CO 50 PPM								
H ₂ S 25 PPM								
Organic Vapors								
CO2 500 PPM								

PERSON TAKING READINGS:

INSTRUMENTS USED: H. Santa Ana MX4 - Ventis Multi-gas air monitor

HAZARDOUS ATMOSPHERES? NO YES DESCRIBE

- NOTE READING EVERY 2 HOURS IN EACH FACILITY
- AIR MONITOR TO RUN CONTINUOUSLY DURING ENTRY
- IF ALARM ON AIR MONITOR SOUNDS AT ANY TIME WHILE TESTING AIR, EVACUATE IMMEDIATELY

PHYSICAL HAZARDS (identify): Limited Egress Falling Materials Low Overhead
Bottom Liquid Mechanical Equipment Footings Slippery surface Heat
 Other (explain) _____

VEHICLE/PEOPLE CONTROL: GUARD BARRIERS TAPE PYLONS/CONES
 RADIO: YES NO

INSPECTION OF FALL PROTECTION EQUIPMENT:

EMERGENCY PLAN: Continuous atmospheric testing. If alarm sounds, entrant should evacuate immediately.

If entrant is hurt or is not responding to attendee, call emergency confined space rescuer or 911.

SPECIAL REQUIREMENTS O₂ tanks (3) PRR

CONDITIONS OF PERMIT:

- Valid confined space entry permit posted-visible in plain sight. (✓)
- Personal protective equipment available and used (hard hat, safety glasses, gloves, etc.) (✓)
- All members know how to use fall protection equipment and it is being used. (✓)
- Two-way radio and mobile phone available and tested. (✓)
- All members know not to leave site when entrant is inside and how to report emergency (dial 911) (✓)
- Attendants/safety monitor know(s) NOT TO ENTER CONFINED SPACE FOR ANY REASON. (✓)
- All members know location of first aid equipment. (✓)
- If applicable, all members know how to operate forced air ventilation and self contained breathing apparatus. (✓)

Attendant's Signature (date)

ENTRANT (prior to entry) (date)

ENTRY SUPERVISOR

(date)

2RS 4/3/18 reviewed

CPJ PERMIT REQUIRED CONFINED SPACE ENTRY FOR UNDERGROUND FACILITIES

TEAM MEMBERS: ENTRY OFFICER: J. Spry
 ENTRANT: H. Santana, G. Cortes, B. Freeman
 ATTENDANT/SAFETY MONITOR: J. Spry, B. Chufin, J. Fetchu
 DATE: 3/27/18 PERMIT DURATION: 24hr CURRENT TIME: 11:15
 LOCATION: (Address & Location on site) Valley Metro
 TYPE: Oil-Grit Chamber Manhole Underground Facility Other (explain) 54" RCP
 PURPOSE OF ENTRY: Inspection Other (explain) ARR

ATMOSPHERE TEST TO BE TAKEN:

Action Limits	Time	Reading	Time	Reading	Time	Reading	Time	Reading
% Oxygen-19.5% + 23%	11:15	21.1						
10% of LEL		0						
CO 50 PPM		0						
H ₂ S 25 PPM		0						
Organic Vapors								
CO2 500 PPM								

PERSON TAKING READINGS: John Spry

INSTRUMENTS USED: MX4 - Ventis Multi-gas air monitor

HAZARDOUS ATMOSPHERES? NO YES DESCRIBE

- NOTE READING EVERY 2 HOURS IN EACH FACILITY
- AIR MONITOR TO RUN CONTINUOUSLY DURING ENTRY
- IF ALARM ON AIR MONITOR SOUNDS AT ANY TIME WHILE TESTING AIR, EVACUATE IMMEDIATELY

PHYSICAL HAZARDS (identify): Limited Egress Falling Materials Low Overhead
Bottom Liquid Mechanical Equipment Footing Slippery surface Heat
 Other (explain) Length of Inspection ARR

VEHICLE/PEOPLE CONTROL: GUARD BARRIERS TAPE PYLONS/CONES
 RADIO: YES NO

INSPECTION OF FALL PROTECTION EQUIPMENT: ✓

EMERGENCY PLAN: Continuous atmospheric testing. If alarm sounds, entrant should evacuate immediately.

If entrant is hurt or is not responding to attendee, call emergency confined space rescuer or 911.

SPECIAL REQUIREMENTS O2 Tanks (3) ARR

CONDITIONS OF PERMIT:

- Valid confined space entry permit posted-visible in plain sight. (✓)
- Personal protective equipment available and used (hard hat, safety glasses, gloves, etc.) (✓)
- All members know how to use fall protection equipment and it is being used. (✓)
- Two-way radio and mobile phone available and tested. (✓)
- All members know not to leave site when entrant is inside and how to report emergency (dial 911) (✓)
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- If applicable, all members know how to operate forced air ventilation and self contained breathing apparatus. (✓)

Attendant's Signature (date)

3/27/18
ARR

ENTRANT (prior to entry) (date)

3/27/18
ARR

ENTRY SUPERVISOR

(date)

3/27/18
ARR

ARR 4/3/18 reviewed