



**Environmental
Protection**

Natural Gas Drilling

January 20th, 2012



❖ Supply 1 billion gallons of water per day to 9 million New Yorkers

- 19 storage reservoirs and 3 controlled lakes
- 550,000 water quality tests per year
- 295 miles of aqueduct and tunnels
- 7,000 miles of water mains
- 56 shaft sites; 500 pressure regulators; 3 pump stations
- 109,000 fire hydrants

❖ Treat 1.3 billion gallons of wastewater per day

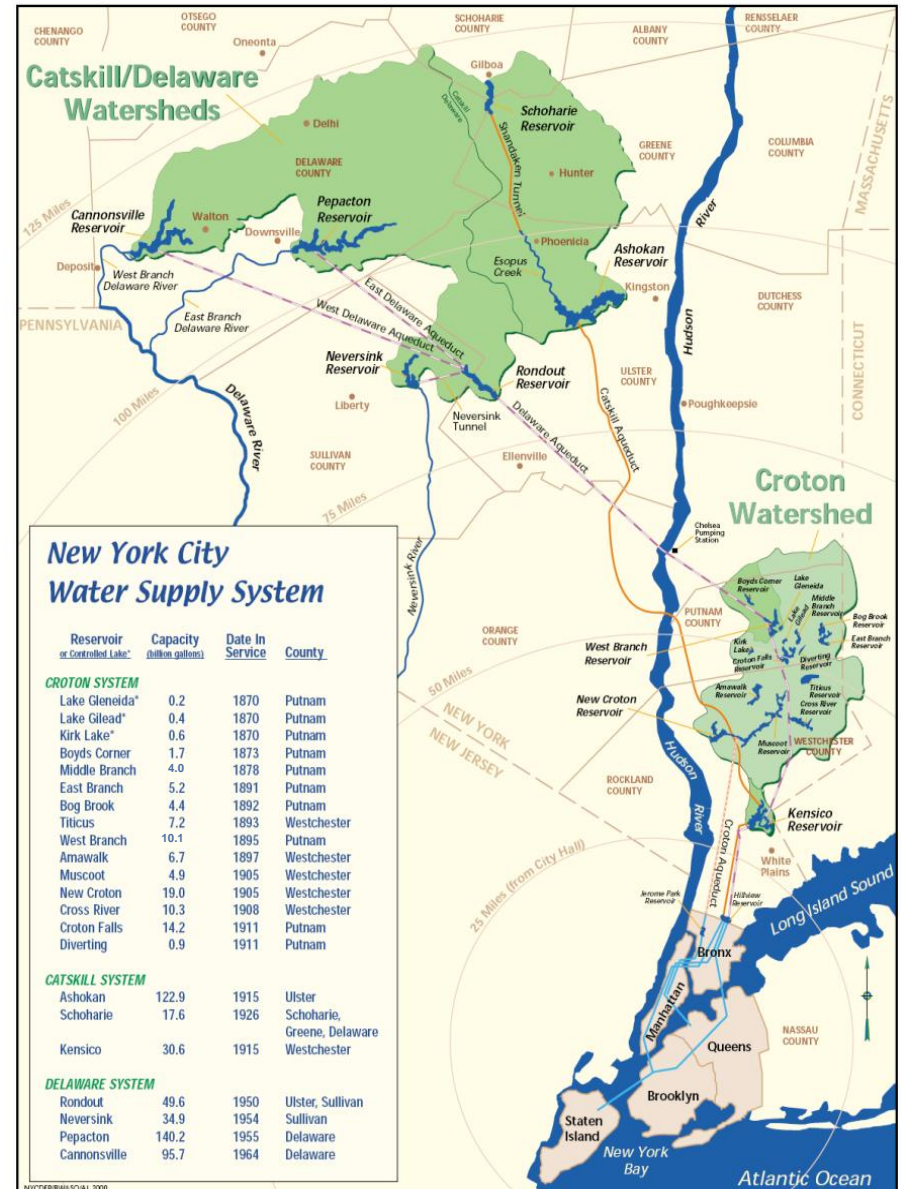
- 14 In-city treatment plants; 7 upstate
- 7,400 miles of sewer: 3,337 miles of combined, 2,271 separated
- 157,000 street segments of sewer
- 490 regulators (104 telemetered), 95 pump stations
- 144,000 catch basins

❖ \$14 billion in active construction & design projects

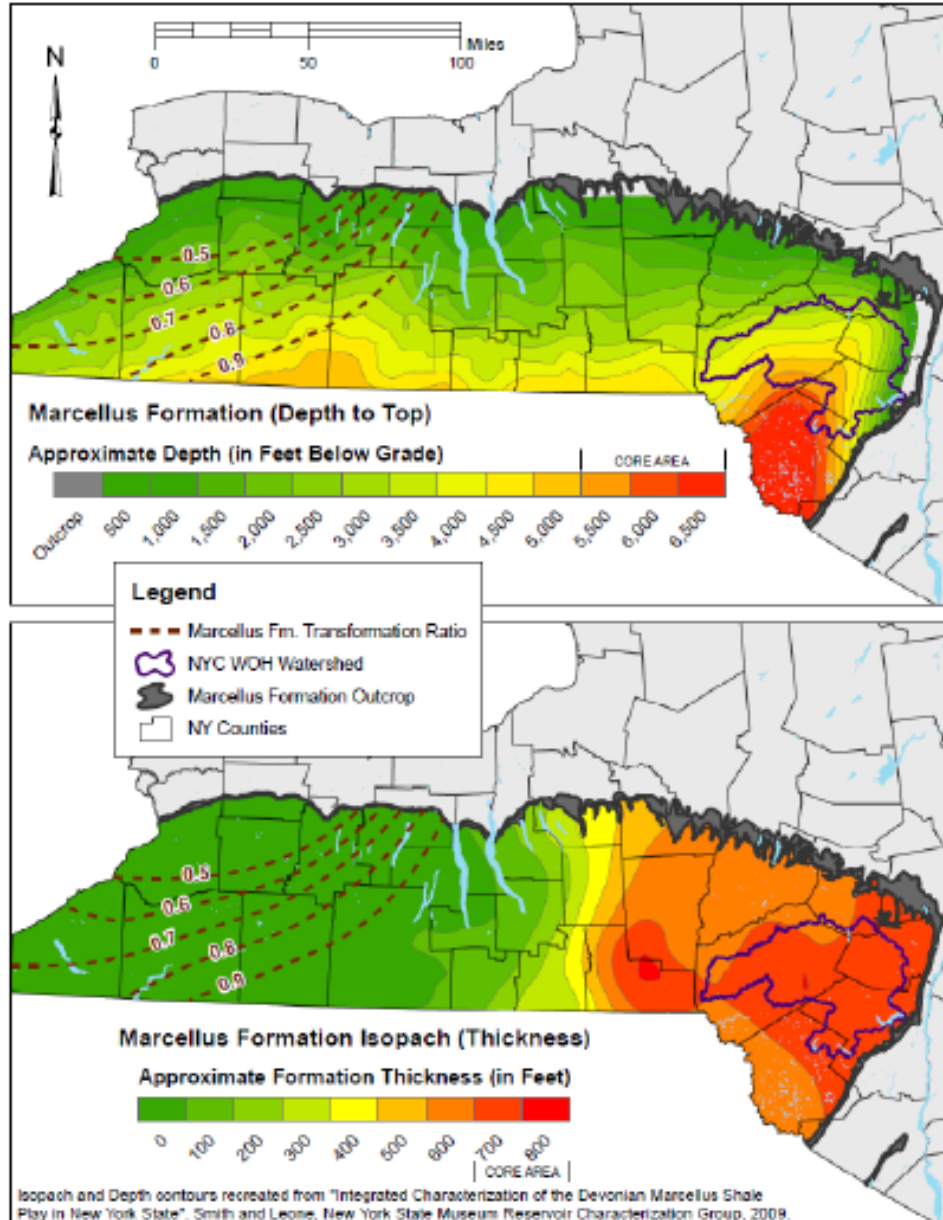
❖ Air Quality, Hazmat, Emergency Response, & Noise

Deputy Commissioner Paul Rush, PE

- ❖ Primary water source is three upstate reservoir systems: Croton (10%), Catskill (40%) and Delaware Systems (50%)
 - 19 reservoirs and three controlled lakes
 - 580 billion gallons of collecting and storage capacity
- ❖ Responsible for compliance with drinking water quality standards and Filtration Avoidance Determination
- ❖ Operate 7 upstate wastewater treatment plants
- ❖ Maintain upstate infrastructure

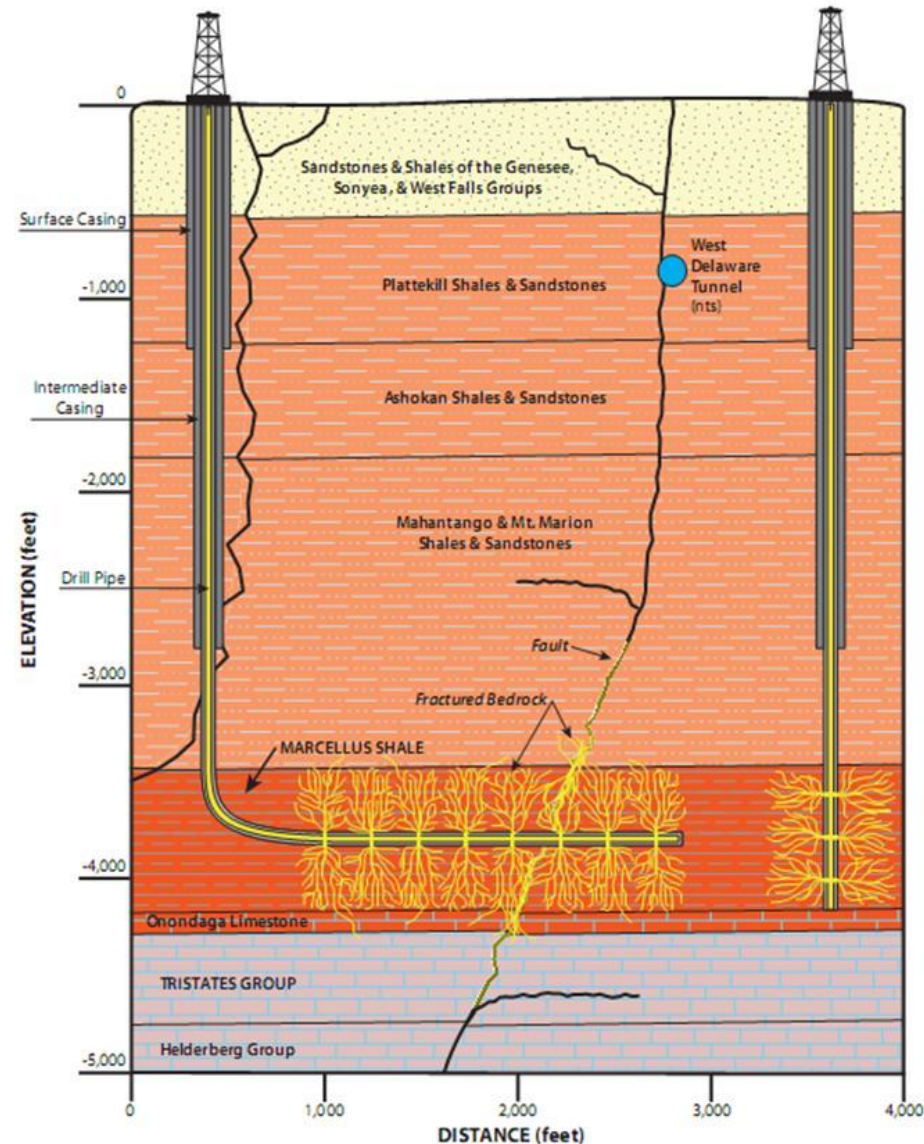


Marcellus Shale Underlies NYC's WHO Watershed

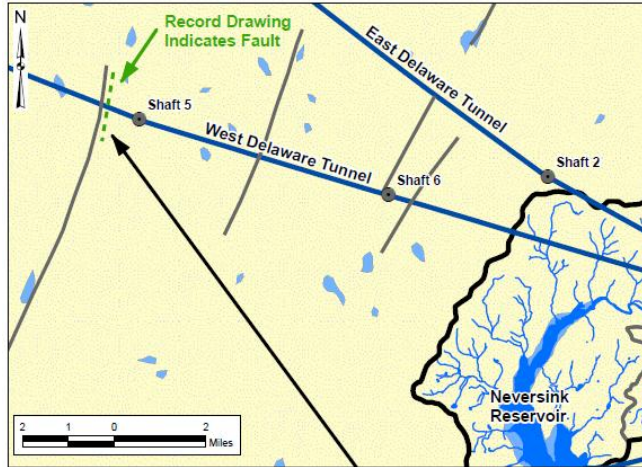


- ❖ NYCDEP identified significant risks to the City's watershed and infrastructure.
 - "Industrialization" of the watershed
 - Infrastructure Risks and Subsurface Migration
 - Water Quality
 - Surface Spills
 - Water Withdrawals
 - Wastewater Treatment and Disposal
- ❖ All of these posed potential impacts which could jeopardize our Filtration Avoidance Determination
- ❖ The State's RDSGEIS addressed many of the City's concerns by concluding that HVHF was not compatible with unfiltered water supply systems.

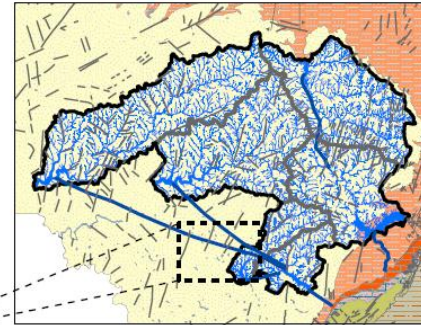
- ❖ Risk of structural compromise or contamination due to pre-existing fractures and faults that may be influenced by fracking
- ❖ Tunnels were designed to keep water in, not to withstand external pressures
- ❖ Recent evidence that HVHF can induce small earthquakes.



Risk to Infrastructure



Tunnel at this location is approximately 800' below grade
Marcellus Formation occurs approximately 4,500' below tunnel

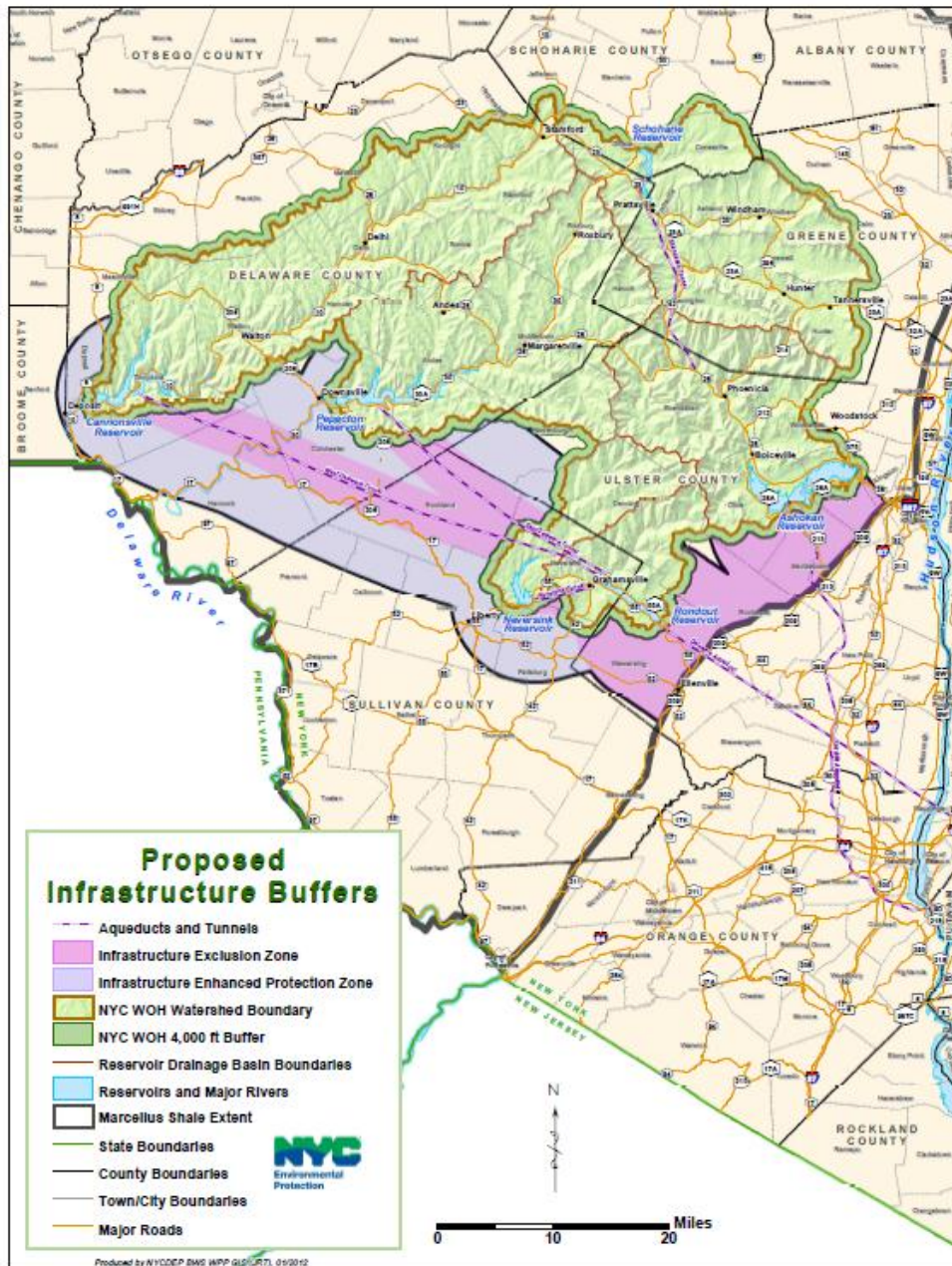


- Legend**
- Tunnel Shaft
 - Linear Feature
 - Tunnel

- LEGEND**
- GSS GRAY SANDSTONE
 - RSS RED SANDSTONE
 - GSH GRAY SHALE
 - RSH RED SHALE
 - COL CONGLOMERATE
 - ST STRIKE
 - D D.P

T U N	PLAN							
	SECTION							
STATION		1455	1456	1457	1458	1459	1460	1461
SLOPE		-0.0833%						
KIND OF ROCK		GSS, TRACE GSH.	GSS	GSS	GSS	GSS	GSS AND THIN GSH LENSES.	
BEDDING - THICKNESS		THIN TO MEDIUM, FAIRLY HORIZONTAL.	THIN TO MEDIUM, HORIZONTAL.	THIN TO MEDIUM, FAIRLY HORIZONTAL.	THIN TO THICK, D. UP TO 5' S.W. TO HORIZONTAL.	THIN AT ROOF, MOSTLY THICK BELOW D.S'E, VICINITY +70.	THIN TO THICK, FAIRLY HORIZONTAL.	
JOINTS		NONE	NONE	SERIES: +80 TO 1458, ST 50°-85° L, D. 85° N.W. SPACING: 1'-15'. WET. SOME ROOF DRIPPING, 1457+75 TO 1458, LESS THAN 1/4 G.R.M.	SERIES: 1458+15 TO +40, ST 45° L-85° R, D. 80° N.W. - 95° SPACING: 1'-18" ABOUT 1 G.R.M. AT FAULT. JOINTS WET VICINITY 1458.	NONE	NONE	
WATER SUPPORT		NONE	NONE	BOLTS - STRAPS	BOLTS - STRAPS	BOLTS - STRAPS	BOLTS - STRAPS	
OVERBREAKAGE		NONE	NONE	NONE	AT RIBS OF CRUSH ZONE 1'-2' ON SOUTH WALL.	NONE	NONE	
ROCK QUALITY		VERY GOOD.	VERY GOOD.	GOOD	POOR	GOOD	GOOD	
GUNITE		NONE	NONE	NONE	NONE	NONE	NONE	
NOTES		SOME GSS APPEARS BANDED WITH GSH.	FLAT ROOF.		FAULT WITH CRUSH ZONE 1458+20 TO +25. NT 80° L. D. 80° N.W.	FLAT, FLAGSTONE-LIKE ROOF.	CROSS-BEDDING AT AT ROOF, D.S'-10° S.E.	

NYCDEP's Current Position



- ❖ Include in the Final RDGEIS a buffer zone around critical aqueducts of 7 miles.
- ❖ Include a 2 mile no drill buffer around other tunnels and an enhanced site review of 7 miles.