TOWN OF BLADES PUBLIC WELLS SAMPLING WORK PLAN

Blades, Delaware

Prepared For
USEPA Region 3
1650 Arch Street
Philadelphia, PA 19109-2029

Prepared By
DNREC-SIRS
391 Lukens Drive
New Castle, DE 19720-2774

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Prepared by:
Stephanie Gordon
Environmental Scientist
Site Investigation and Restoration Section
Department of Natural Resources and
Environmental Control
391 Lukens Drive, New Castle, DE 19720

Reviewed and Approved by:
Qazi Salahuddin
Environmental Program Manager
Site Investigation and Restoration Section
Department of Natural Resources and
Environmental Control
391 Lukens Drive, New Castle, DE 19720

1.0 INTRODUCTION

The Delaware Department of Natural Resources and Environmental Control - Site Investigation and Restoration Section (DNREC-SIRS), under a cooperative agreement with the United States Environmental Protection Agency (EPA), has developed this work plan to sample the Town of Blades public drinking water supply wells, located in Blades, Sussex County, Delaware (Figure 1).

2.0 PURPOSE AND BACKGROUND

Perfluorooctanoic sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are man-made organic chemicals commonly used in repellants for stains, water, oil, and grease. They are considered emerging contaminants however commercial and consumer products containing PFOS and PFOA were first introduced in the 1950s. In May 2016, EPA established a lifetime health advisory level (HAL) of 0.07 micrograms per liter (ug/l) for PFOS, PFOA, or combined PFOS/PFOA. Poly- and perfluoroalkyl substances (PFAS), which include PFOS and PFOA, have been commonly used in firefighting foam, adhesives, textile coatings, metal plating etc.

Due to the close proximity of two current/former metal plating facilities to the Town of Blades public drinking water supply wells, DNREC-SIRS is planning to sample the public wells to determine if the water has been impacted by contamination. Metal plating operations are a potential source of PFAS and chromium. Therefore, the Town of Blades public wells will be sampled for PFAS, including PFOS and PFOA, hexavalent chromium, total chromium, and volatile organic compounds (VOCs). A pre-CERCLA screening will be performed to determine whether the site should be entered into EPA's Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) for further investigation.

The Town of Blades has three public drinking water supply wells which draw water from the unconfined Columbia aquifer. Well #1 (permit #40024) is screened from 66 – 96 feet below ground surface (ft bgs). Well #2 (permit #40025) is also screened from 66 – 96 ft bgs. Both Well #1 and #2 were constructed in 1978. Well #3 (permit #248353) is screened from 65 – 90 ft bgs and was constructed in 2014. According the 2002 Source Water Assessment of the Public Water Supply Wells for Town of Blades by the DNREC-Source Water Assessment and Protection Program, the town serves a population of approximately 1,000 people and has approximately 320 service connections.

Potential sources of contamination near the wells include the Peninsula Plating Site (DE-0287) and the Procino Plating Site (DE-0344) (Figure 2). The Peninsula Plating Site is located on the property adjacent to the Town of Blades public water supply wells. The Site was previously used in part as a metal plating company which closed in 1995. The Procino Plating Site is located approximately 0.25 miles south of the Town of Blades public water supply wells. Operations at the Site have included ornamental plating with copper, nickel and chrome; silver and nickel plating for commercial and military use; and fabrication and hard chrome plating of griddle tops. Additional potential sources of contamination in the area include underground storage tank facilities, hazardous waste generating facilities and others.

3.0 SAMPLING AND ANALYSIS

DNREC-SIRS proposes to collect raw water samples directly from a sampling port located on each of the wells. Prior to sample collection, DNREC-SIRS will purge the wells for approximately 10 to 15 minutes to ensure that the samples are representative of groundwater in the aquifer.

The VOC water sample will be collected first in vials preserved with hydrochloric acid (HCl). The PFAS water sample will be collected second in 250 mL high density polyethylene containers. Finally, the hexavalent chromium water sample and total chromium water sample will be collected. All bottles will be placed in coolers with ice for transportation to the laboratory. Due to the short holding time for the hexavalent chromium analysis, the laboratory pick up will be expedited.

Since PFAS may be present in sampling equipment and other common consumer products, extra precaution must be taken to prevent introduction of these contaminants to the groundwater samples. Refer to Table 1 for a list of prohibited and acceptable items to be used during sampling of PFAS.

The water samples collected from wells including the QA/QC samples will be submitted to the DNREC Division of Water laboratory and/or Test America, Inc. for analysis. All water samples, including the QA/QC samples, will be analyzed for PFAS by USEPA Method 537 Modified, VOCs by USEPA Method 8260, hexavalent chromium by USEPA Method 7196, and total chromium by USEPA Method 6020.

4.0 QUALITY ASSURANCE / QUALITY CONTROL

Field sampling and sample handling will adhere to the procedures as specified in the State of Delaware Site Inspection Quality Assurance Project Plan (QAPP). Sampling equipment will be decontaminated between sampling locations using procedures outlined in the Quality Assurance Project Plan. Sterile disposable sampling equipment will be utilized where applicable.

The QA/QC sample program also requires that samples be collected to evaluate the quality of field sampling practices and equipment decontamination practices. The following samples will be collected during the sampling period: Trip Blanks, Field Duplicates, Laboratory Duplicates, and Field Rinsate Blanks.

Trip Blanks consist of four-forty milliliter glass vials filled with distilled water and sealed with a Teflon lined cap. Trip blanks are used to evaluate the potential for cross contamination of site samples from contamination sources outside the sampling area. Trip blanks are filled with distilled water prior to sampling, sealed, transported to the sampling site and returned to the laboratory without reopening for analysis. Trip blanks are analyzed for volatile organic compounds (VOC) only. **One trip blank will be included with each cooler containing VOC samples.**

Field duplicates consist of an actual sample for which twice as much volume as necessary has been collected. Aliquots of this volume are then distributed in two sets of sample containers and submitted to the laboratory as two separate samples. Field duplicates are used to assess the consistency of sampling homogeneity and laboratory analytical consistency. **One field duplicate will be collected during this sampling event.**

Laboratory duplicates (also referred to as Matrix Spike/Matrix Spike Duplicate [MS/MSD]) represent a sample location in which twice the normal sample volume is collected. The purpose of the laboratory duplicate is to provide the analytical laboratory with a sample which can also serve to calibrate analytical machinery. The laboratory duplicate is normally spiked with a known concentration of chemical and this sample is used to calibrate the instrument. **One MS/MSD will be collected during this sampling event.**

Field Rinsate blanks consist of pouring demonstrated Analyte-free distilled water over decontaminated sampling equipment as a check that the decontamination procedure was adequately performed and that there was no cross contamination of samples. Analysis of Rinsate blanks is performed for all analytes of interest. **One field rinsate blank will be collected during this sampling event.**

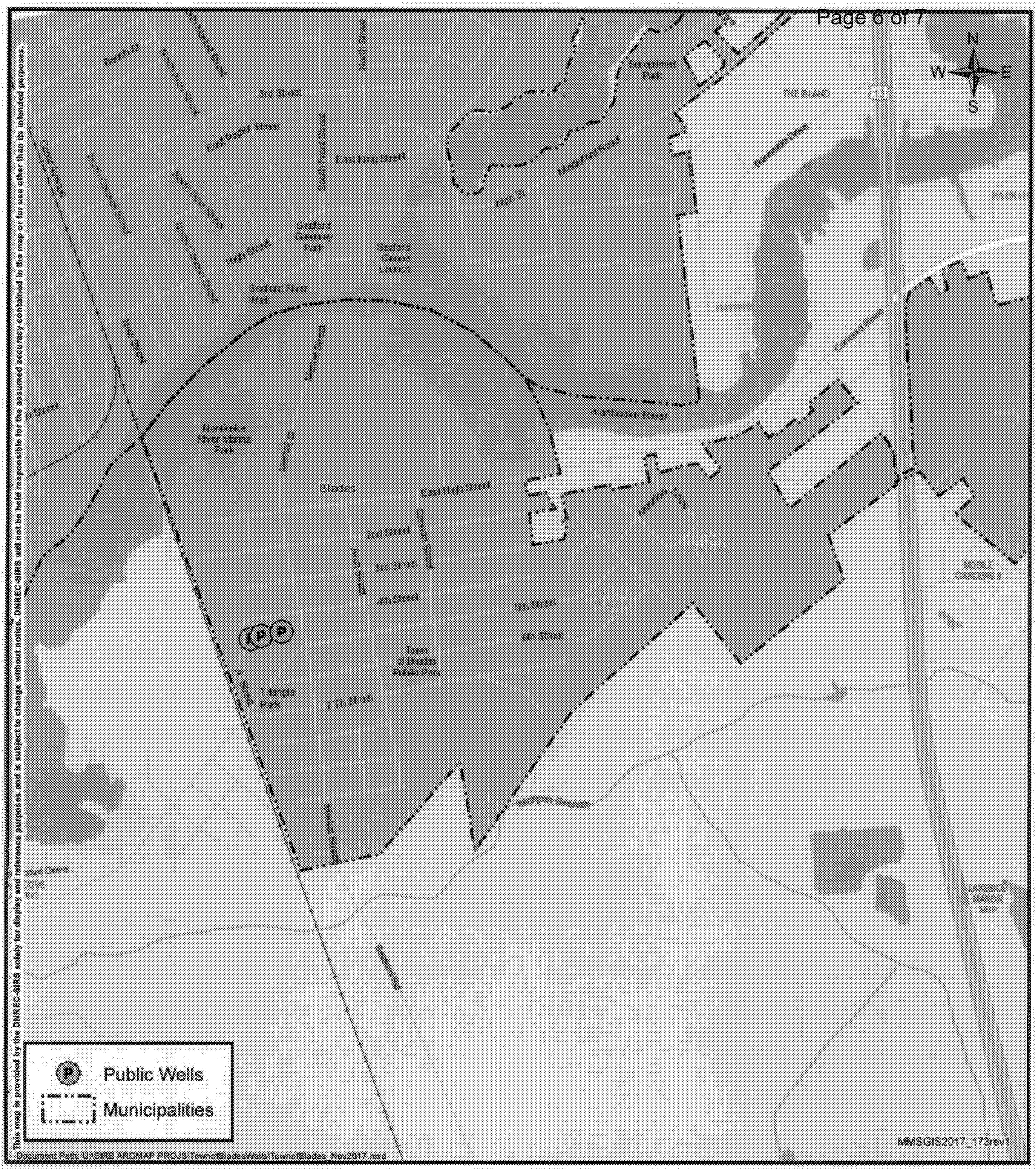
Validation of the analytical data results will be performed by DNREC's Analytical Chemist.

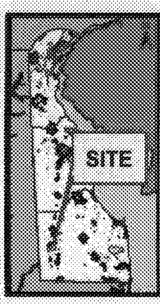
5.0 REPORTING

After sampling activities are completed, DNREC-SIRS will prepare a letter report summarizing the results. Based on these results, EPA and DNREC-SIRS will determine whether further action is needed.

Table 1. List of Prohibited and Acceptable Items during Sampling of PFAS

Prohibited Items	Acceptable Items
Sampling Equipment containing the following materials:	
Polytetrafluoroethylene (PTFE)	Stainless steel
Teflon ®	Acetate
Low-density polyethylene (LDPE)	Silicone
	High-density polyethylene (HDPE)
	Polypropylene
Non-Sampling Field Equipment	
Waterproof field books	Non-waterproof loose-leaf paper
Plastic clipboards, binders, or spiral hard cover notebooks which may be coated	Masonite or aluminum clipboards
Sharpies ® or similar indelible markers	Ball-point pens or pencils
Post-it ® notes	
Field Clothing and Protective Gear	
New clothing and clothes treated for stain resistance	Wash clothes several times before use during sampling
Avoid using fabric softener	Wear clothes made from natural fibers such as cotton
Water-resistant clothing and shoes	Rain gear made from polyurethane or wax-coated materials
Avoid using cosmetics, shampoos, moisturizers or similar items on the morning of sampling	Sunscreen and insect repellant with 100% natural ingredients
Tyvek ®	Wear nitrile gloves at all times and change gloves often during sampling
Avoid contact with car upholstery treated with PFAS	
Sample Containers and Shipping	
Glass sample containers	Lab-supplied plastic containers, such as polypropylene or HDPE
Teflon ®-lined caps	Unlined polypropylene screw caps
Blue Ice ®	Regular Ice
Shipping tape used to secure coolers may contain PFAS. Avoid touching samples with tape.	
Decontamination	
Decon 90	Alconox ®
Food and Drink	
Do not handle pre-wrapped food, such as candy bars, granola bars, microwave popcorn, etc., in sampling area	Wash hands thoroughly after handling fast food, snacks, or other items that may contain PFAS





Data Sources: Basemap [FirstMAP]; Municipal Boundaries [FirstMap]; Well Locations [DNREC]

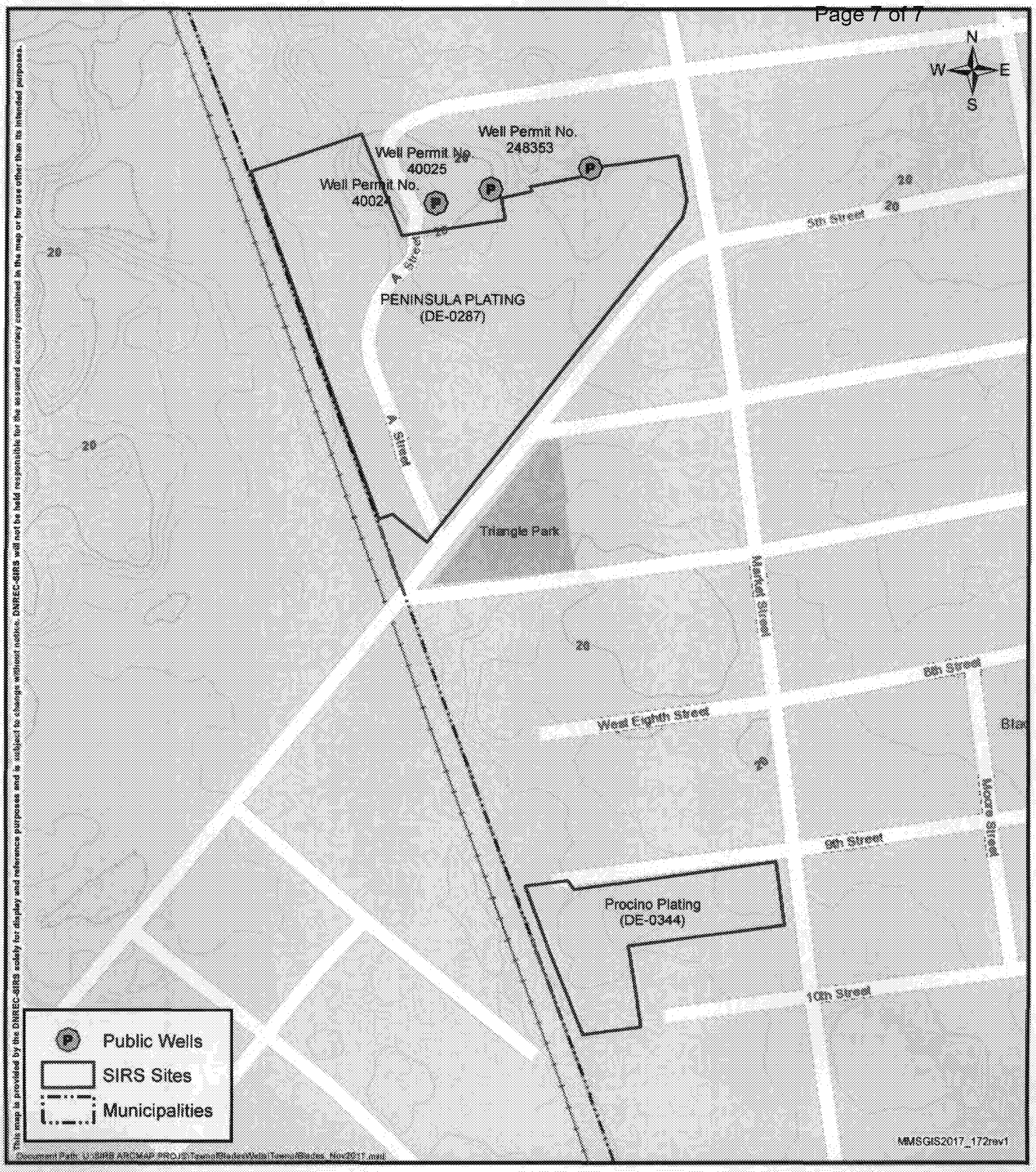
DNREC-SIRB
391 LUKENS DR.
NEW CASTLE, DE

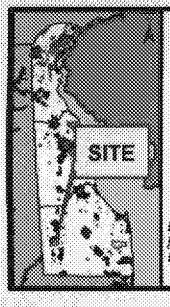
0 500 1,000 2,000 Feet

1:12,000 1 inch = 1,000 feet

FIGURE 1
TOWN OF BLADES PUBLIC WELLS
PUBLIC WELL LOCATION MAP

BLADES, DELAWARE





Data Sources: SIRS Sites [DNREC], Basemap [FirstMAP], Municipal Boundaries [FirstMap], Well Locations [DNREC]

0 100 200 400 Feet

1:2,400 1 inch = 200 feet

FIGURE 2
TOWN OF BLADES PUBLIC WELLS
WELL LOCATION NEAR SIRS PLATING SITES MAP
BLADES, DELAWARE