August 23, 2019

Final
Regional Air Deposition Study Work Plan
for the Village of Hoosick Falls

I, Daniel P. Reilly, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

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VILLAGE OF HOOSICK FALLS, NEW YORK

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LIST OF ACRONYMS AND ABBREVIATIONS

AIO	All In One
bgs	below ground surface
CSM	Conceptual Site Model
CV	Coefficient of variation
EDD	Electronic Data Deliverable
NYSDEC	New York State Department of Environmental Conservation
PAH	polynuclear aromatic hydrocarbons
PFAS	per- and polyfluoroalkyl substances
PTFE	polytetrafluoroethylene
PWS	Personal Weather Station
PFOA	perfluorooctanoic acid
ppb	parts per billion
TOC	total organic carbon
USEPA	United States Environmental Protection Agency
VOC	volatile organic compounds

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

The New York State Department of Environmental Conservation (NYSDEC) has requested a regional air deposition study in the Hoosick Falls area to evaluate the potential for per- and polyfluoroalkyl substances (PFAS), and specifically perfluorooctanoic acid (PFOA), to be dispersed in the environment through the air deposition pathway. This Regional Air Deposition Study Work Plan (Work Plan) has been prepared to address this request. Given that there are several facilities associated with numerous owners and operators in the Hoosick Falls area which utilized PFAS-containing material, this Work Plan is not associated with any single facility or party. This study will be used to supplement and inform investigations for multiple NYSDEC Class 2 and/or Class P sites in the Hoosick Falls area.

This Work Plan has been prepared in accordance with NYSDEC Order on Consent and Administrative Settlement between Saint-Gobain Performance Plastics, Honeywell International (the Companies), and NYSDEC (Index No. CO 4-20160212-18), dated June 3, 2016, and DER-10 – Technical Guidance for Site Investigation and Remediation.

1.2 Work Plan Format

This Work Plan has been prepared to provide a background on the Hoosick Falls area and the conceptual site model (CSM) for air deposition (remainder of Section 1), a review of existing shallow soil data (Section 2), a proposed scope of work for additional data collection (Section 3), and a summary of how data collected as part of this Work Plan will be evaluated (Section 4). Overall, the objective of the data collection and evaluation efforts described in this Work Plan is to determine if potential impacts from PFAS air deposition are observable and consistent with an air deposition CSM in representative surface soils in the Hoosick Falls area. Additionally, this Work Plan is designed to prioritize the initial phases of field activities to expedite the onset of soil sample collection and analysis.

1.3 Study Area Background and Physical Setting

The Village of Hoosick Falls (the Village), which is approximately centered in the Town of Hoosick, is situated in northeastern Rensselaer County, New York (Figure 1). The Village is divided by the Hoosic River, which flows generally south to north in the region. Approximately three-quarters of the Village lies east of the Hoosic River. Ground surface elevations are generally lowest (approximately 450 feet above mean sea level) near the river and increase with distance away from the river and out of the river valley, with

more than 500 feet of difference between the river and the surrounding uplands (Figure 2).

The Village was founded in 1927 and the area has a history of manufacturing since the late 1800s. Several facilities in the Hoosick Falls area reportedly utilized PFAS-containing material in certain of their historical manufacturing processes (see Figure 3). Products manufactured in the Hoosick Falls area include: plastics, polytetrafluoroethylene (PTFE) tape and parts, flexible films, foils, flexible laminates, circuit board materials, coated fabrics, specialty papers, fiber composite materials, and a variety of PTFE coated products.

PFAS-related investigations are ongoing and at various stages at a number of manufacturing facilities in Hoosick Falls (NYSDEC, 2019). The manufacturing processes used to apply PTFE coatings potentially generated PFAS emissions during sintering or drying of the PTFE. Several facilities, including the John Street Site, McCaffrey Street Site, Liberty Street Site, and Interface Solutions sites are understood to have applied PTFE coatings at certain times based on review of publicly available site documents and information. The operational timeline for these facilities varies, but certain PTFE coating processes in Hoosick Falls may have begun as early as the late 1950's and continued beyond 2000. The phasing out of PFOA production in the United States began in 2006 (USEPA, 2017).

Other facilities being investigated for PFAS in Hoosick Falls (NYSDEC, 2019), include the River Road Site, Mechanic Street Site, First Street Site and the Church Street Site.

In addition to the manufacturing facilities (Figure 3), other potential sources for release of PFAS to the environment in the area include:
the municipal water supply prior to installation of a granular activated carbon filtration system in 2016;
private septic systems receiving municipal water prior to installation of the aforementioned filtration system;
the municipal sewer system which transmitted sewage from industrial facilities and residences in the Village;
water pumped from private wells with concentrations of PFAS and private septic systems at locations with such wells;
the Village landfill, which received waste containing PFAS from industrial sources and or consumer products for many years (TRC, 2019);

general consumer usage of products for which PFAS is/was a component; and areas of unregulated dumping (both known and unknown).

Beyond Hoosick Falls, PFAS have been used in the manufacture of many commercial materials for industrial and consumer use, including stain-resistant carpeting/furniture/upholstery, non-stick cookware, food package coatings, aqueous fire-fighting foams (AFFFs), moisture-resistant breathable fabrics, concrete and rock sealants, electrical capacitors, dyes, paints and coatings, batteries, photographic films, printing inks, herbicide and pesticide formulations, car wash surfactants, and as a vapor suppressor in metal plating processes (Kissa, 2001; 3M, 1999; Knepper and Langue, 2012). These substances are ubiquitous in most households and consequently are found in municipal waste streams and in most landfills (Busch et al., 2009; MPCA, 2009). They have also been found in biosolids (in part from municipal sewer sludge, e.g. Sepulvado et al., 2011) used as amendments to soil in agricultural and landscaping applications, including gravel pit reclamation (NEBRA, 2014).

1.4 Air Deposition Conceptual Site Model

The pattern and magnitude of air deposition resulting from industrial emissions are primarily dependent on emission rates through time, the relative size distribution of particles emitted, meteorological conditions (wind speed and direction, atmospheric stability) during the time of emissions, and several other factors that would influence air transport away from any particular facility (e.g., emission source characteristics, including emission height, building downwash effects, vegetation, and topography) (USEPA, 1992).

Given that there are multiple potential industrial sources of PFAS with operational and air emission histories that are not fully understood, the initial air deposition CSM for this study is based on a general, rather than site-specific, understanding of the pathway. Air dispersion modeling is often used to evaluate air deposition but would not be appropriate in this case due to the high uncertainty in the emission history (and other factors described above) associated with multiple potential sources and data gaps regarding operational histories.

Ambient air monitoring and modeling around a manufacturing facility (Barton et al., 2006; Barton et al., 2010) have shown that PFOA, for example, is present in very small particulate matter (60% of particles < 0.3 μm and < 6% of the particles > 4μm) and is not present in the gas phase. Greater deposition of PFAS is anticipated near an air emission

source as a result of larger particles settling out of the air column in closer proximity to the source than smaller particles. In addition, more particles are deposited closer to a facility during low wind conditions. Therefore, a central component of the initial air deposition CSM for this study is that PFAS mass deposition generally decreases with distance from an air emission source and is greatest in the prevailing downwind direction relative to other directions.

Based on the distribution of air deposition predicted by the air deposition CSM, higher concentrations of PFAS are anticipated in soils closer to facilities that had PFAS emissions and downwind of those facilities in the prevailing wind direction. Topographic features may cause increases in air deposition rates relative to adjacent areas, and existing data suggest that PFOA concentrations in the environment may vary across short distances. However, "hot spots" (i.e., identifiable, localized areas of anomalously high concentrations) are not anticipated from air deposition processes.

The carbon-fluorine bond found in PFAS is one of the strongest bonds in organic chemistry and results in high thermal stability, high chemical stability and resistance to degradation for many PFAS (ITRC, 2018b). Data regarding physical and chemical properties of PFAS are scarce, highly variable, based on modeling rather than direct measurements and is based on acidic forms of PFAS not present in the environment (ITRC, 2018b). However, PFOA and other PFAS commonly detected in Hoosick are understood to be highly soluble in water, adsorb poorly to materials with low organic content, mobile in groundwater, and persistent in the environment (ITRC, 2018a).

2.0 EXISTING DATA EVALUATION

In response to the NYSDEC request for an air deposition study and in preparation of this Work Plan, existing data were evaluated. As described in subsequent sections, the data evaluated include publicly available meteorological data and existing soil data from several PFAS-related investigations in the Hoosick Falls area.

2.1 Meteorological Data

As discussed above, the pattern and magnitude of air deposition is dependent on factors including wind conditions (speed and direction) at the time of release. Therefore, meteorological data representative of conditions within the Village will aid in refining the air deposition CSM.

As noted in Section 1.2, the Village is located in the Hoosic River valley with topographic relief of greater than 500 feet in the area. The closest weather stations within the National Weather Service network are nearby airports (e.g., Albany, NY or Bennington, VT). These weather stations are not within the Hoosic River valley and potentially not representative of the area. As discussed in Section 3.2, a weather station was established in December 2018 on the roof top of the McCaffrey Street facility. Weather data have been continuously monitored and recorded since the installation of the station.

Recently, companies like Weather Underground (www.weatherunderground.com) also began certifying and publishing local personal weather station (PWS) data for public use. Weather Underground aggregates and archives information from the National Weather Service and over 250,000 PWSs. A search of the Weather Underground information revealed historical (2016-2018) data from three PWSs within approximately 4 miles of Hoosick Falls. The locations of the nearby PWSs from which data were acquired for this study are shown on Figure 4.

Wind roses are a graphic tool that provide a concise view of how wind speed and directions are distributed through time at a location. Annual wind roses were generated for the Perry's Orchard and Southwest Hoosick PWSs using 2016, 2017 and 2018 data; additionally, 2017 and 2018 data were available and utilized for the Eagle Bridge PWS (Attachment A). Based on these wind roses, prevailing winds in the Hoosick Falls area generally originate between the west-northwest and the southwest, resulting in prevailing wind blowing to the east-southeast and the northeast. Specifically, the PWSs at SW Hoosick Falls and Perry's Orchard's showed wind directions from the west and

west-northwest, while Eagle Bridge showed lighter wind speeds from the west and southwest. Preliminary data from the weather station installed at McCaffrey street demonstrates a predominant wind direction from the west-northwest (Attachment A and Section 3.2).

2.2 Soil Data

PFAS compounds are not naturally occurring but are frequently detected in environmental media world-wide, including regions unknown to be proximate to industries producing or utilizing PFAS. To evaluate data obtained from the study detailed in this work plan, a background study to determine upgradient concentrations of PFAS in soil may be proposed and performed.

As discussed above, PFAS air emissions and deposition, if occurring in the Hoosick Falls area, likely occurred from various sources from 1955 onward. Deposition onto various media (e.g., surface soil, sediment, and surface water) may have occurred. However, the initial evaluation of existing analytical data was focused on soils, as samples of other media introduce effects from additional potential pathways (e.g., surface water runoff and infiltration, surface water flow/interaction with groundwater) and are therefore considered less representative of potential air deposition than soils in the unsaturated zone.

2.2.1 Existing Soil Data: Background

The existing soil data set evaluated includes 1,259 samples collected as part of four site investigations performed by the Companies and investigations in the Hoosick Falls area performed by NYSDEC and the United States Environmental Protection Agency (USEPA). The samples are summarized by data source and depth interval in Table 1. Many of the samples, especially those from the site investigations, were analyzed for several analytical parameters including PFAS and, in some cases, other parameters including volatile organic compounds (VOCs), metals, total organic carbon (TOC), pH, and polynuclear aromatic hydrocarbons (PAHs).

For discussions herein, soil samples collected within one foot below ground surface (bgs) that begin at the ground surface are referred to as surface soil samples (example: 0-2 or 0-6 inches bgs). Soil samples collected within one foot bgs, but beginning some distance below the surface (e.g., 2-12 inches bgs) are referred to as near surface soil samples. Samples with bottom depths deeper than one foot bgs, regardless of starting depth, are referred to as sub-surface. Specific samples that would not be representative of a potential

air deposition pathway were also excluded from the evaluation, including samples collected below buildings, in potential waste areas, and along roof drip lines. Remaining samples were grouped by investigation location.

2.2.2 Existing Soil Data: Purposes

These soil samples were collected for a variety of purposes, including site investigations or evaluation of suspected dumping sites. As shown on Figure 5, the majority of these samples were collected within the Village and densely clustered near sites under investigation. Detected PFAS concentrations may be a result of many pathways or sources (e.g., areas on or near industrial facilities, sewer lines, septic systems, and areas subject to flooding from the Hoosic River and tributaries, areas with fill or soil amendments, or areas irrigated with municipal water). These sample locations may also be in areas disturbed (i.e., tilled) or filled (i.e., public or private development projects) during periods of possible air deposition, which could reduce the samples representativeness of the air deposition pathway.

With the exception of the USEPA samples at the athletic field south of Barton Avenue and public park areas along Water Works Road (Figure 5), none of the existing soil samples were collected to evaluate air deposition specifically (USEPA, 2016a). However, the samples collected by USEPA have many of the same limitations on their representativeness of air deposition described above (e.g., nearby manufacturing facilities, potential land disturbance, samples analyzed for PFAS only). Therefore, the applicability of the existing data set in evaluating the air deposition pathway will be revisited after the data described in this Work Plan are collected.

2.2.3 Existing Soil Data: Statistics

Summary statistics for each of the 21 PFAS were calculated for concentrations in the surface, near surface and sub-surface soils by investigation location subgroup. The summary statistics calculated include number of samples, number of detections, minimum, maximum, arithmetic mean, median, and quartiles (25^{th} and 75^{th} percentiles). The summary statistics for PFAS concentrations by investigation location subgroup are presented in Table 2 and as box-and-whisker plots in Attachment B. Note that mean, median, 75^{th} percentile and box-and-whisker plots are only presented where detection frequencies were greater than or equal 50% and the total number of detections was at least five.

PFOA is the most frequently detected PFAS in this existing soil data set (Table 2). The median PFOA concentrations for the different investigation areas range from 0.98 to 3.5 ppb for surface soil, 0.38 to 8 ppb for near surface soil, and 0.36 to 2.8 ppb for sub-surface soil (Table 2). The arithmetic mean PFOA concentrations range from 1.2 to 6.2 ppb for surface soil, 1.3 to 8.4 ppb for near surface soil, and 0.65 to 4.7 ppb for sub-surface soil (Table 2).

The retention of PFOA and other PFAS in soil has been shown to be controlled primarily by adsorption onto organic matter, specifically organic carbon (Zareitalabad et al., 2013). Also, a positive correlation with TOC and PFOA concentrations in soil has been documented and indicates retention of PFOA by organic materials in soil (Ferrey et al., 2012). Thus, PFOA deposited on soil with higher TOC concentrations may be expected to be retained at a higher rate. Therefore, the use of TOC-normalized PFOA data (i.e., PFOA concentrations divided by TOC concentrations) would be expected to demonstrate lower variability in comparison to non-normalized PFOA data. This relationship will be evaluated in soil data generated as a part of this work plan (Section 4.0).

2.3 Additional Data Needs

Based on the evaluations of existing information, the following data needs have been identified to further evaluate potential regional air deposition in the Hoosick Falls area, and serve as the basis for the scope of work proposed in Section 3:

- meteorological data from a weather station located within the Village; and
- a soil sampling program designed to include the following:
    - collection of surface soil, near surface soil, and sub-surface soil samples;
    - sampling locations in undisturbed areas, away from potential PFAS sources (e.g., manufacturing facilities, unregulated dumping areas, and areas served by municipal water).; and
    - analysis of TOC given its potential correlation with retention of PFOA and other PFAS in soils.

3.0 PROPOSED ADDITIONAL DATA COLLECTION

As stated in Section 1.3, a generic air deposition CSM suggests that PFAS impacts will be greater closer to a source and also downwind of the source in the prevailing wind direction. The distribution or pattern of deposition generated by air deposition is expected to potentially be regional in scale.

Based on the challenges associated with designing a sampling program to focus on the potential air deposition pathway, a phased approach to this study is proposed. It is anticipated that this will be an iterative process wherein data evaluation in each investigative phase is followed by CSM refinement along with additional data collection/evaluation as needed in consultation with NYSDEC. As described below, the initial sampling design is focused on the representativeness of sampling locations.

3.1 Initial Air Deposition Study Objective

The objective of the work described in this Work Plan:

- Determine if potential impacts from PFAS air deposition are observable and consistent with an air deposition CSM in representative soils surrounding the Village of Hoosick Falls.

Using samples arranged around the Village, the initial investigation seeks to determine if higher PFAS concentrations are observable in the prevailing downwind direction. The observability of impacts via the sampling design described herein will be informative of any additional study or sampling design.

3.2 Weather Station

In order to gather meteorological data that are representative of conditions within the Village, a MetOne, All In One (AIO) Sonic Weather Sensor (model: AIO-2) was purchased along with a precipitation gauge (model: 360). The station was installed on a tripod atop the roof of the McCaffrey Street facility in accordance with the manufacturer's manual (Attachment C). The station was installed on November 13, 2018, and began recording meteorological data (including ambient air temperature, relative humidity, wind direction, wind speed, barometric pressure and precipitation) shortly thereafter. The AIO-2 and precipitation sensor record continuously and transmit data every 15 minutes. To provide an initial evaluation of the meteorological conditions at this station, a wind rose plot displaying data from December 24, 2018 to June 20, 2019 was generated,

included in Attachment A, and demonstrates a predominant wind direction from the west-northwest.

The Operation and Maintenance Plan of this weather station, including inspections and audit procedures, is included in Attachment C. With installation of this weather station, an annual data set from within the Village will be available near the end of 2019.

3.3 Proposed Shallow Soil Sampling

Several sampling designs (e.g., simple random and systematic/grid) were considered in developing this Work Plan. The focus of the initial phase of this study is testing for the regional pattern (i.e., higher PFAS concentrations are observable in the prevailing downwind direction) around an area with multiple potential emission sources that is anticipated, if present, based on the generic air deposition CSM. Random and systematic grid sampling designs are useful in searching for localized areas of anomalously high concentrations (i.e., "hot spots" indicating localized sources) and determining where contamination is present. For example, a systematic sampling grid across an entire property would be useful if the location of a former underground storage tank is unknown. In this instance, the grid spacing would need to be smaller than the area of contamination expected from such a source. However, other approaches are more appropriate for potential deposition producing regional-scale spatial patterns of concentration variations. These regional-scale spatial patterns, if present, should be observable in the distribution of average PFAS concentrations in samples from carefully vetted locations in the region.

In order to evaluate potential regional impacts, the sampling program has been designed to provide data representative of the regional-scale processes affecting air deposition; otherwise, regional-scale deposition patterns may be obscured.

The proposed initial soil sampling described herein is based on stratified and gridded sampling designs (USEPA, 2002). The proposed initial effort described in this Work Plan is summarized as follows:

- An area surrounding the Village is divided into 16 strata (sectors) on a radial grid.
- Discrete soil sampling will be employed within each sector. The target number of samples per sector is between two and six per sector, but the final number of samples, and each location will be determined through ground-level reconnaissance performed by the companies in consultation with NYSDEC staff.

- Soil samples will be collected from three intervals (0-2 inches bgs, 2-12 inches bgs, and 12-24 inches bgs).

After samples are collected from all 16 sectors surrounding the Village (as described in Section 3.3.3), the resulting data set would reasonably capture any observable differences in deposition in the leeward and windward sides of the Village. Additional details on the proposed shallow soil sampling program are described in the following sections.

3.3.1 Sample Sectors

Stratified sampling takes advantage of prior information and the initial CSM to designate non-overlapping strata (or sectors) that are relatively similar with respect to a given variable (USEPA, 2002). For this initial study and as described below, the sectors are designated radially based on distance and direction from the potential sources. Given the number and various types of potential sources for PFAS in the Hoosick Falls area (see Section 1.2), PFAS in samples collected within the Village limits may be representative of several different pathways (including but not limited to air deposition). Therefore, the area initially proposed for investigation within this Work Plan is roughly 1,000-3,000 feet beyond the Village. A boundary for the proposed study area was created that is the outermost of the following features: the Village boundary, properties on municipal water supply and known or suspected PFAS sources outside of the Village. A 1,000-foot and 3,000-foot buffered line was then extended around this boundary as the inner and outer distance for the initial sampling area (Figure 6). This establishes sample locations in an area to assess potential regional PFAS emission sources while reducing the likelihood that samples may represent other non-air deposition sources.

Grid sampling is commonly used in environmental investigation, often in conjunction with other sampling designs and ensures that samples are taken at relatively regular intervals (USEPA, 2002). For this initial study, a radial grid was chosen to ensure spatial coverage around the Village (Figure 6). Since the spatial patterns anticipated are at a regional scale, a regionally scaled grid (outside of potential source areas) is seen as appropriate for the objective of this initial study. This initial sampling area is divided into a geometric radial grid with 16 sectors to correlate with the display of wind conditions by direction on a wind rose. For example, sector 5 correlates with east (downwind from a prevailing westerly wind) and sector 11 correlates with southwest (Figure 6). It is noted that the buffered sampling area described above creates sectors of unequal area; however, the distribution of undisturbed areas and logistics of access to private property precludes full gridding and sample coverage sectors on this regional

scale. Therefore, the initial sampling effort is designed to identify representative locations in a given direction and at a given distance interval (1,000 to 3,000 feet) beyond potential sources. Sample location selection and the sampling methods described below further address representativeness.

3.3.2 Sample Location Selection

The selection of proposed surface soil sampling locations within each radial sector is being guided by historical aerial image review, property records review, visual inspection of site conditions such as topography, and NYSDEC's input on other PFAS-related information in its possession. The goal is to identify locations that meet the criteria listed below:

- Undisturbed (not cultivated, farmed, filled or manicured) for the past 60 years;
- No indication or evidence of dumping/nearby source;
- Outside of floodplain or wetland;
- Sufficient soil thickness available for sample (avoiding bedrock outcrops and areas of shallow bedrock); and
- Clear land ownership and ability to obtain access from owner.

In consultation with the NYSDEC, sampling locations have been preliminarily identified in each of the 16 sectors (Figure 6). A figure for each of the sectors and preliminary/proposed sampling locations has been included as Attachment D. These figures provide recent and historical aerial images, topographic contours, and parcel boundaries. Historical information is being gathered and reviewed and visual site inspections from public rights of way will also be completed to further vet each sample location. Visual inspection of sites shall be completed under the oversight of NYSDEC. If potential sample areas have moderate to steep slopes, preference will be given to Village-facing slopes and areas located roughly mid-slope based on typically observed air deposition patterns. If there are limited Village-facing slopes, locations on slopes that do not face the Village will be discussed with NYSDEC. These potential sampling locations are being provided to NYSDEC for consideration and discussion. Final sample locations will be determined in the field at the directive of NYSDEC personnel.

Upon NYSDEC approval, attempts to obtain access will be initiated for all sampling locations. A minimum of three good-faith attempts (e.g., in-person visits, letters, phone calls, and/or electronic communications) to contact landowners and obtain access will be made. If three good-faith attempts do not yield contact or permission for access, then

NYSDEC assistance will be sought. In the event that access to sample locations cannot be obtained, additional discussion with NYSDEC will be necessary.

3.3.3 Sampling Methods

Soil samples collected from each location as a part of this initial study will be collected from 0 to 2 inches bgs (beginning below any vegetative cover), 2-12 inches bgs and 12-24 inches bgs at the direction of NYSDEC and in accordance with an approved QAPP[1]. Each sample location will be surveyed and flagged prior to sample collection. A stainless steel hand auger will be used to collect each specified sample interval. Each of these samples will be homogenized independently in accordance with USEPA guidance (USEPA, 2014) and submitted for laboratory analysis. Quality control sampling (including duplicates and blanks), investigation derived waste management, decontamination procedures, and data validation will be completed in accordance with an approved Field Sampling Plan (FSP) and QAPP[1]. Following data validation, analytical results will be provided to NYSDEC in the required Electronic Data Deliverable (EDD) format.

3.3.4 Laboratory Analysis

All soil samples collected as a part of this initial study will be submitted for laboratory analysis for PFAS[2], TOC, and pH in accordance with the approved QAPP[1]. At the direction of NYSDEC, duplicate soil samples from each of the soil sampling locations and sample depth intervals will be collected during the investigation in laboratory provided containers. These samples will be shipped to the laboratory and placed "on-hold". Within two weeks of receipt of the unvalidated analytical results for all of the soil samples collected as indicated in Section 3.3.3, an interim submittal consisting of summary data tables and figures will be prepared depicting at a minimum the analytical results (i.e., PFAS, TOC and pH) and field data (i.e., soil type and surveyed coordinates) for each sample and submitted to NYSDEC. At this time, a sub-set of 25 percent of the total number of samples collected, or a minimum of 45 samples, will be selected in consultation with NYSDEC and analyzed using Synthetic Precipitation Leaching Procedure (SPLP) extraction via SW-846 Test Method 1312. The SPLP extract will then be analyzed via Method 537.1 for NYSDEC's most recently-adopted list of PFAS compounds at the time samples are collected, currently 21 substances. Note that these SPLP samples may be

[1] Work to be completed in accordance with the approved FSP and QAPP for the McCaffrey Street Site (CTM, 2016) or most recently approved/revised plans for the McCaffrey Street Site at the time of sampling.
[2] The list of PFAS analytes for sampling under this plan will reference, and be consistent with the most recent list of PFAS compounds specified by NYSDEC at the time of sample collection.

analyzed outside of the analytical holding time and reporting of SPLP results will indicate which extraction fluid was utilized for SPLP analysis. The remaining on-hold samples will be retained by the laboratory for 6 months.

4.0 DATA EVALUATION

The data collection efforts described in this Work Plan will result in a meteorological data set representative of the conditions within and near the Village, and a soil data set appropriate for use in evaluating potential regional air deposition. These data will be evaluated to (1) assess the nature of PFAS concentrations in representative soils around the Village and (2) assess whether there is an observable regional distribution of PFAS in representative surface soils (i.e., higher PFAS concentrations in the prevailing downwind direction), consistent with the generic air deposition CSM.

Data will be evaluated and assessed, using methods potentially including, but not limited to:

- Visual data summaries (e.g., boxplots, histograms, maps, quantile-quantile plots);
- Comparison among data sets collected in different sectors (e.g., ANOVA);
- Comparison of ranges and data distributions among sectors (e.g., F-test, interquartile range, CV, Kolmogorov-Smirnov test);
- Geostatistical analysis (e.g., variograms) to evaluate spatial relationships; and
- Various descriptive statistics (e.g., CV, upper tolerance limits, upper confidence limits).

The above evaluations may be completed both for PFAS results and TOC-normalized PFAS results, however only non-normalized data will be submitted NYSDEC in the required EDD format. The existing soil data discussed in Section 2 will be compared to, and if appropriate, combined with the newly collected data.

Subsequent work may include further surface soil sampling (e.g., additional locations within the initial sectors, additional sectors nearer to and/or further from the Village, sampling of other media, or sampling to determine regional background). Consideration of additional objectives and/or additional sampling may be necessary as the study progresses.

5.0 SCHEDULE AND REPORTING

At the time of submittal of this work plan, evaluation and selection of sample locations, as described in Section 3.3.2, is under way. Based on discussions with NYSDEC, initiation of access agreements may begin while the work plan is under NYSDEC review in order to mitigate any potential schedule delays. Sampling will be completed as soon as possible however, it is preferred that sampling be conducted during one to two mobilizations, rather than sampling location-by-location as access is granted.

As stated 3.3.4, an interim data deliverable will be provided to NYSDEC within two weeks of receiving all of the unvalidated analytical data for purposes of SPLP sample selection. Validated analytical data from this work will be shared with NYSDEC as an EDD in a format compliant with NYSDEC's environmental information management system, EQuIS. The detailed evaluation of the data, and conclusions and recommendations, will be included in a report submitted to NYSDEC no later than 60 days following validation of all samples. Any deviations from this work plan will be discussed with NYSDEC as soon as practical.

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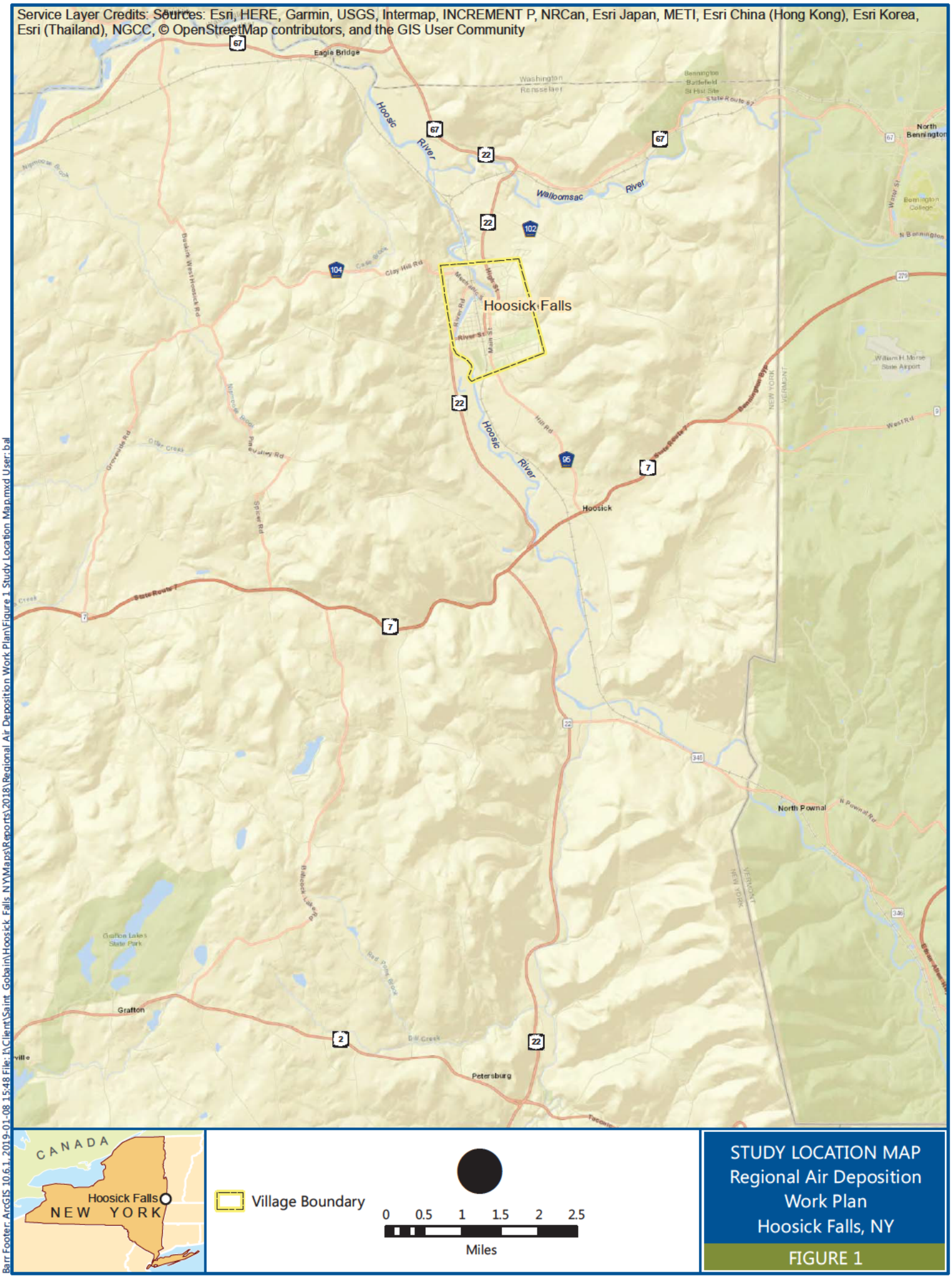
FIGURES



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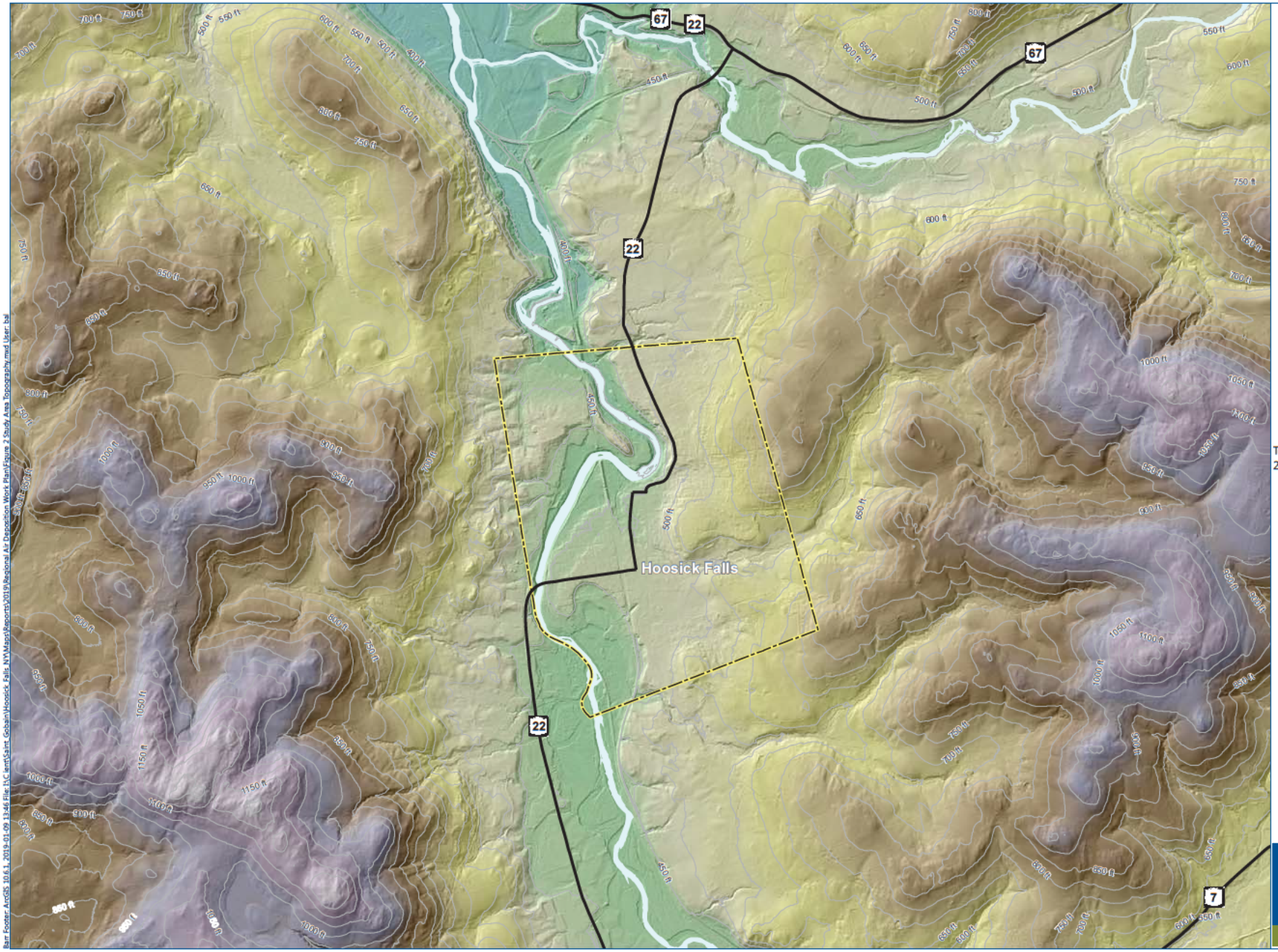


Hoosick Falls Village Limits

50 ft Elevation Contour

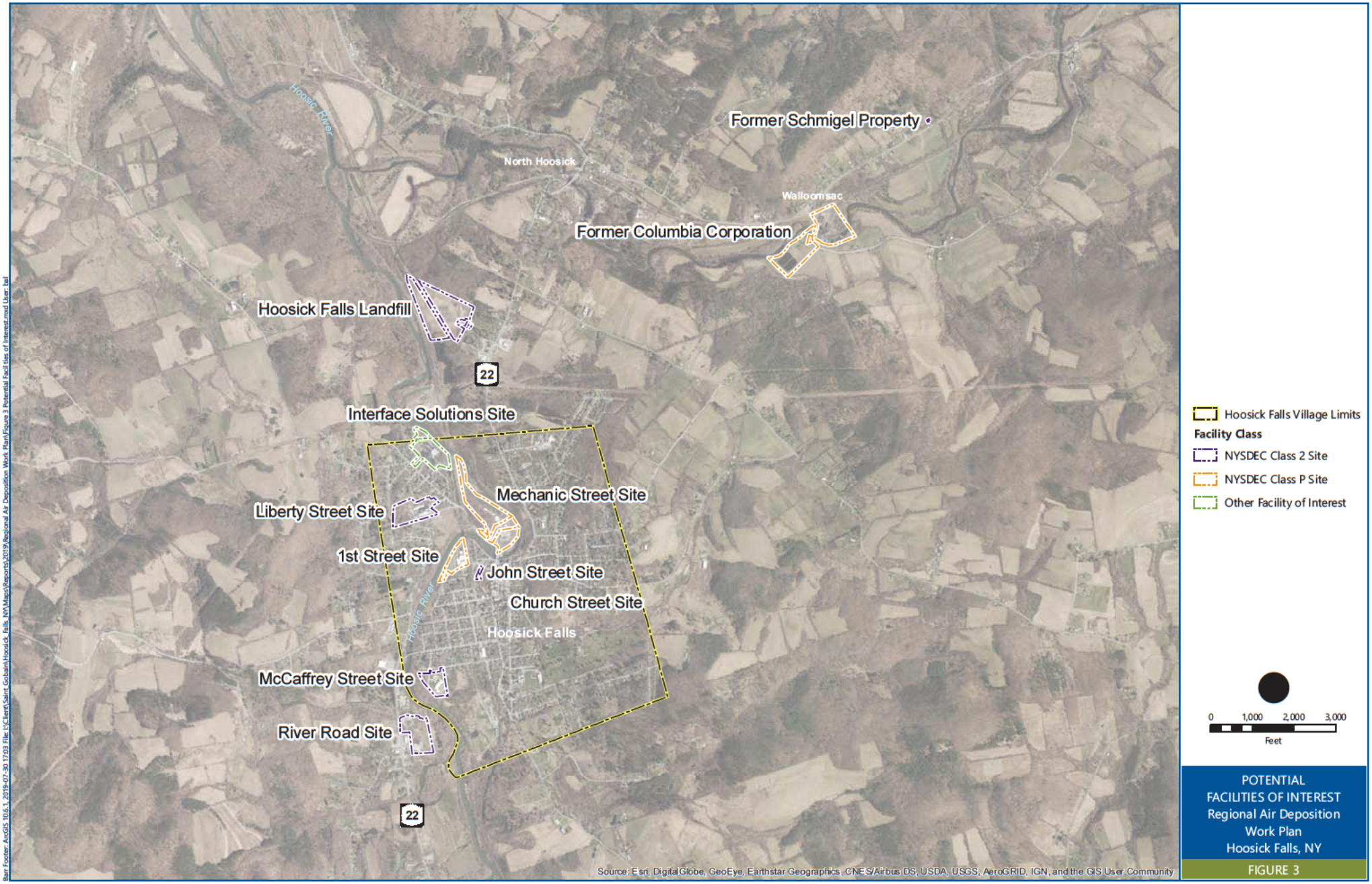
Topography: Rensselaer-HoosickRiver 2010 Data Collection, State of New York

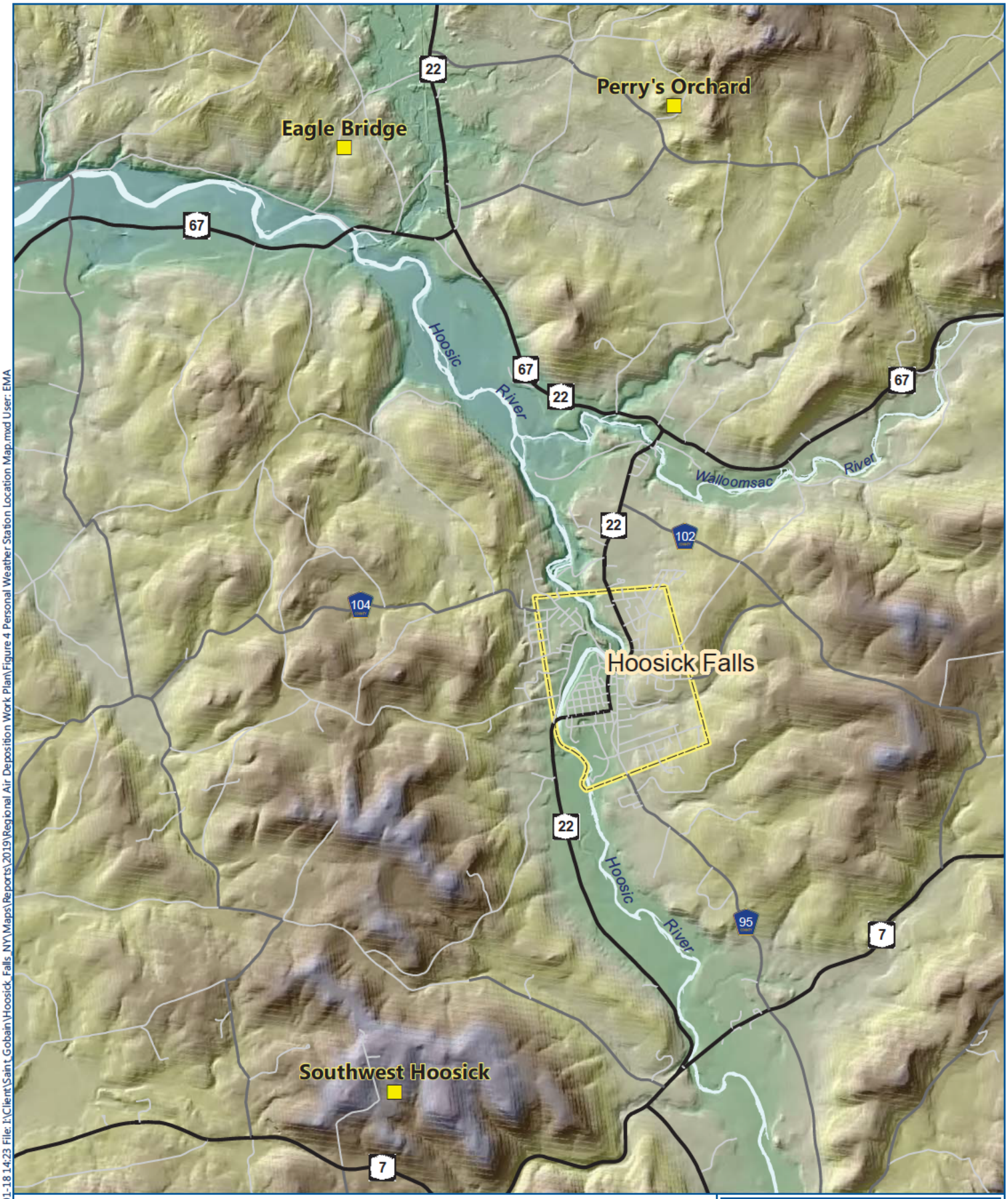
0 1,000 2,000 3,000

Feet

STUDY AREA TOPOGRAPHY
Regional Air Deposition
Work Plan
Hoosick Falls, NY

FIGURE 2





Personal Weather Station (PWS) Location and Name (Source: Weather Underground)

Village Boundary

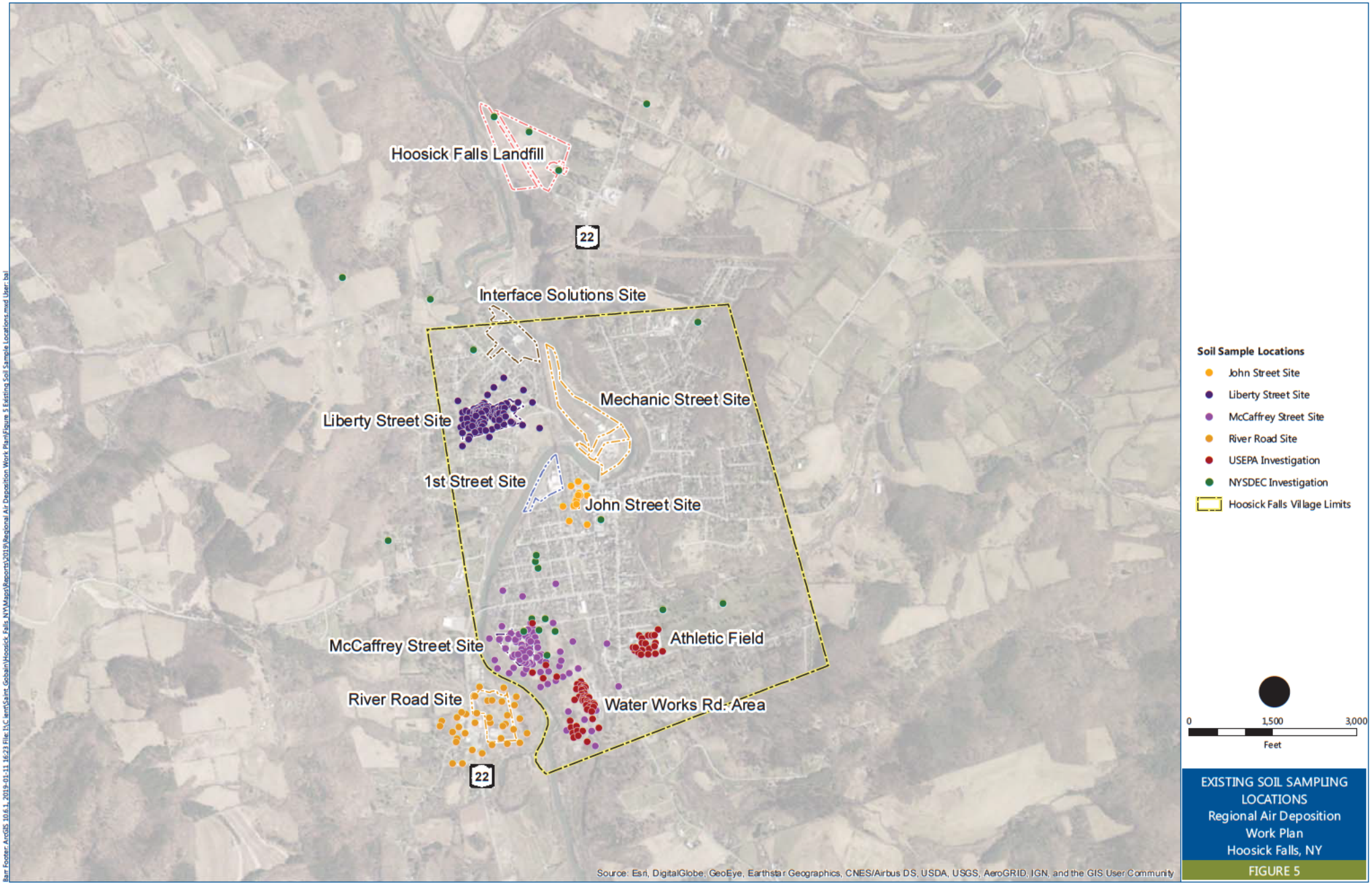
0 0.5 1 1.5

Miles

PERSONAL WEATHER STATION LOCATION MAP
Regional Air Deposition Work Plan
Hoosick Falls, NY

FIGURE 4

Barr Footer: ArcGIS 10.6, 2019-01-18 14:23 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2019\Regional Air Deposition Work Plan\Figure 4 Personal Weather Station Location Map.mxd User: EMA


Hoosick Falls Landfill
22
Interface Solutions Site
Mechanic Street Site
Liberty Street Site
1st Street Site
John Street Site
McCaffrey Street Site
Athletic Field
River Road Site
Water Works Rd. Area
22
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Soil Sample Locations
John Street Site
Liberty Street Site
McCaffrey Street Site
River Road Site
USEPA Investigation
NYSDEC Investigation
Hoosick Falls Village Limits
0
1,500
3,000
Feet
EXISTING SOIL SAMPLING LOCATIONS
Regional Air Deposition Work Plan
Hoosick Falls, NY
FIGURE 5

Proposed Soil Sampling Location

Soil Sampling Sector Boundary

Village Water Supply Area*

*Based on information contained within Parcel data provided by Rensselaer County in January 2018.

Note: Exact sampling locations to be determined based on land usage, disturbance, and site access.

0 1,000 2,000 3,000

Feet

PROPOSED SOIL SAMPLING SECTORS
Regional Air Deposition Work Plan
Hoosick Falls, NY

FIGURE 6

TABLES 1 & 2

Table 1: Summary of Existing Soil Samples Evaluated

Regional Air Deposition Study Work Plan

Village of Hoosick Falls, New York

Sample Location / Investigation	Surface Soil[1]	Near Surface Soil[2]	Sub-Surface Soil[3]
John Street Site[a]	8	11	101
River Road Site[a]	34	35	47
McCaffrey Street Site[b]	76	76	270
Liberty Street Site[c]	80	52	242
USEPA Investigations[d]	70	70	22
Hoosick Falls Landfill[e]	5	0	8
NYSDEC Investigations[f]	46	0	6
Total	319	244	696

1 - Samples with starting depth equal to 0 ft bgs and ending depth ≤ 1ft.

2 - Samples with starting depth greater than 0 ft bgs and ending depth ≤ 1ft.

3- Samples with ending depth > 1ft.

a- (ERM, 2017a) and (ERM, 2017b)

b- (C.T. Male, 2018a)

c- (C.T. Male, 2018b)

d- (USEPA, 2016b), (USEPA, 2016c), (USEPA, 2016d) and (USEPA, 2016e)

e-

f- (NYSDEC, 2018b), (TRC, 2019)

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	6-2 Fluorotelomer sulfonate (6-2 FTS) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	12	0	--	--	--	--	--	--

Investigation Location Subgroup	8-2 Fluorotelomer sulfonate (8-2 FTS) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	12	0	--	--	--	--	--	--

Investigation Location Subgroup	n-Ethyl perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	12	0	--	--	--	--	--	--

Investigation Location Subgroup	n-Methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	12	0	--	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorobutane sulfonate (PFBS) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	0	--	--	--	--	--	--
McCaffrey Street On-Site*	19	0	--	--	--	--	--	--
McCaffrey Street Off-Site	35	0	--	--	--	--	--	--
Liberty Street On-Site*	26	0	--	--	--	--	--	--
Liberty Street Off-Site	15	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	28	0	--	--	--	--	--	--
Total (All Samples)	225	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluorobutanoic acid (PFBA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	2	0.27	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	5	2	0.27	--	--	--	--	--
Total (All Samples)	19	4	0.27	--	--	--	--	--

Investigation Location Subgroup	Perfluorodecane sulfonate (PFDS) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	4	0.21	--	--	--	--	--
Waterworks Road Area[USEPA]	34	5	0.11	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	69	9	0.21	--	--	--	--	--

Investigation Location Subgroup	Perfluorodecanoic acid (PFDA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	2	0.41	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	1	2.2	--	--	--	--	--
River Road Off-Site	23	2	0.66	--	--	--	--	--
McCaffrey Street On-Site*	19	9	3.6	--	--	--	--	--
McCaffrey Street Off-Site	35	20	1.6	--	0.26	0.4	0.5	--
Liberty Street On-Site*	26	2	0.65	--	--	--	--	--
Liberty Street Off-Site	15	2	0.5	--	--	--	--	--
Athletic Field[USEPA]	21	16	0.55	--	0.16	0.21	0.21	0.15
Waterworks Road Area[USEPA]	34	15	0.46	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	5	0.27	0.06	0 076	0.0032	0.087	0.073
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	197	74	3.6	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorododecanoic acid (PFDoA / PFDoDA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	1	1.1	--	--	--	--	--
McCaffrey Street On-Site*	19	2	2.1	--	--	--	--	--
McCaffrey Street Off-Site	35	9	0.85	--	--	--	--	--
Liberty Street On-Site*	26	0	--	--	--	--	--	--
Liberty Street Off-Site	15	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	5	0.23	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	197	17	2.1	--	--	--	--	--

Investigation Location Subgroup	Perfluoroheptane sulfonate (PFHpS) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	14	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluoroheptanoic acid (PFHpA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	2	0.88	--	--	--	--	--
McCaffrey Street On-Site*	19	1	0.44	--	--	--	--	--
McCaffrey Street Off-Site	35	4	2.00	--	--	--	--	--
Liberty Street On-Site*	26	0	--	--	--	--	--	--
Liberty Street Off-Site	15	2	1.40	--	--	--	--	--
Athletic Field[USEPA]	21	7	0.58	--	--	--	--	--
Waterworks Road Area[USEPA]	34	2	0.14	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	4	0.26	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	28	1	0.3	--	--	--	--	--
Total (All Samples)	225	23	2.00	--	--	--	--	--

Investigation Location Subgroup	Perfluorohexane sulfonate (PFHxS) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	0	--	--	--	--	--	--
McCaffrey Street On-Site*	19	0	--	--	--	--	--	--
McCaffrey Street Off-Site	35	0	--	--	--	--	--	--
Liberty Street On-Site*	26	0	--	--	--	--	--	--
Liberty Street Off-Site	15	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	28	0	--	--	--	--	--	--
Total (All Samples)	225	0	--	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorohexanoic acid (PFHxA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	3	0.31	--	--	--	--	--
McCaffrey Street On-Site*	19	9	1.5	--	--	--	--	--
McCaffrey Street Off-Site	35	10	0.69	--	--	--	--	--
Liberty Street On-Site*	26	4	0.64	--	--	--	--	--
Liberty Street Off-Site	15	1	1.40	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	1	0.87	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	197	28	1.50	--	--	--	--	--

Investigation Location Subgroup	Perfluorononanoic acid (PFNA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	1	0.32	--	--	--	--	--
River Road Off-Site	23	5	0.36	--	--	--	--	--
McCaffrey Street On-Site*	19	7	0.72	--	--	--	--	--
McCaffrey Street Off-Site	35	19	0.50	--	0.13	0.2	0.3	
Liberty Street On-Site*	26	2	0.61	--	--	--	--	--
Liberty Street Off-Site	15	1	0.39	--	--	--	--	--
Athletic Field[USEPA]	21	18	0.74	--	0.28	0.28	0.33	0.17
Waterworks Road Area[USEPA]	34	14	0.34	--	--	--	--	--
	5	4	0.42	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	28	3	0.39	--	--	--	--	--
Total (All Samples)	225	74	0.74	--	--	--	--	--

Investigation Location Subgroup	Perfluorooctanesulfonamide (PFOSA / FOSA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	14	0	--	--	--	--	--	--

Investigation Location Subgroup	PFOS Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	1	0.77	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	5	2	--	--	--	--	--
River Road Off-Site	23	5	6.3	--	--	--	--	--
McCaffrey Street On-Site*	19	5	3.3	--	--	--	--	--
McCaffrey Street Off-Site	35	26	2.60	--	0.72	0.9	1.3	--
Liberty Street On-Site*	26	6	5.4	--	--	--	--	--
Liberty Street Off-Site	15	8	4.40	--	0.59	1.0	1.2	--
Athletic Field[USEPA]	21	21	3.2	0.13	1.2	1.27	1.50	0.78
Waterworks Road Area[USEPA]	48	31	5.4	--	0.43	0.8	1.1	--
Hoosick Falls Landfill[TRC]	5	4	2.9	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	31	24	9.2	--	0.57	1.5	1.9	0.2
Total (All Samples)	242	136	9.20	--	0.59	0.97	1.2	0.27

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	PFOA Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	3	6.8	--	--	--	--	--
John Street Off-Site	4	2	2.6	--	--	--	--	--
River Road On-Site	11	11	12	0.42	0.98	1.9	1.2	0.59
River Road Off-Site	23	19	5.5	--	1.8	2.2	3.3	0.69
McCaffrey Street On-Site*	19	19	11	0.36	3.3	3.8	5.6	1.10
McCaffrey Street Off-Site	35	32	9.30	--	3.2	2.8	4.1	0.68
Liberty Street On-Site*	26	25	17	--	3.5	5.0	7.3	1.50
Liberty Street Off-Site	15	13	33	--	2.3	5.3	6.2	0.38
Athletic Field[USEPA]	21	21	20	0.31	2.6	6.2	9.70	1.70
Waterworks Road Area[USEPA]	46	38	12	--	1.2	2.0	2.5	0.45
Hoosick Falls Landfill[TRC]	5	5	14	0.53	1.7	3.9	2 9	0.56
Hoosick Falls Area[NYSDEC]	31	29	8.1	--	1.3	2.0	3.1	0.63
Total (All Samples)	240	217	33.00	--	1.7	3.2	3.9	0.69

Investigation Location Subgroup	Perfluoropentanoic acid (PFPeA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	4	0.74	--	--	--	--	--
Waterworks Road Area[USEPA]	34	4	2.8	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	69	8	2.80	--	--	--	--	--

Investigation Location Subgroup	Perfluorotetradecanoic acid (PFTA / PFTeDA / PFTeA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	1	1.4	--	--	--	--	--
McCaffrey Street On-Site*	19	2	1	--	--	--	--	--
McCaffrey Street Off-Site	35	3	0.44	--	--	--	--	--
Liberty Street On-Site*	26	0	--	--	--	--	--	--
Liberty Street Off-Site	15	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	142	6	1.40	--	--	--	--	--

Investigation Location Subgroup	Perfluorotridecanoic acid (PFTrDA / PFTriA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	0	--	--	--	--	--	--
McCaffrey Street On-Site*	19	2	1.4	--	--	--	--	--
McCaffrey Street Off-Site	35	4	0.52	--	--	--	--	--
Liberty Street On-Site*	26	0	--	--	--	--	--	--
Liberty Street Off-Site	15	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	142	6	1.40	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluoroundecanoic acid (PFUnA / PFUnDA) Surface Soil[1]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	4	0	--	--	--	--	--	--
John Street Off-Site	4	0	--	--	--	--	--	--
River Road On-Site	11	0	--	--	--	--	--	--
River Road Off-Site	23	1	0.46	--	--	--	--	--
McCaffrey Street On-Site*	19	7	1.7	--	--	--	--	--
McCaffrey Street Off-Site	35	13	1.70	--	--	--	--	--
Liberty Street On-Site*	26	1	0.41	--	--	--	--	--
Liberty Street Off-Site	15	1	0	--	--	--	--	--
Athletic Field[USEPA]	21	2	0.56	--	--	--	--	--
Waterworks Road Area[USEPA]	34	2	1.4	--	--	--	--	--
Hoosick Falls Landfill[TRC]	5	4	0.48	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	0	--	--	--	--	--	--	--
Total (All Samples)	197	31	1.70	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	6-2 Fluorotelomer sulfonate (6-2 FTS) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Investigation Location Subgroup	8-2 Fluorotelomer sulfonate (8-2 FTS) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Investigation Location Subgroup	n-Ethyl perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Investigation Location Subgroup	n-Methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorobutane sulfonate (PFBS) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	0	--	--	--	--	--	--
McCaffrey Street On-Site*	19	0	--	--	--	--	--	--
McCaffrey Street Off-Site	35	0	--	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	1	0.27	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	1	0.27	--	--	--	--	--

Investigation Location Subgroup	Perfluorobutanoic acid (PFBA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluorodecane sulfonate (PFDS) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	3	0.18	--	--	--	--	--
Waterworks Road Area[USEPA]	34	31	0.28	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	64	34	0.28	--	--	--	--	--

Investigation Location Subgroup	Perfluorodecanoic acid (PFDA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	1	0.6	--	--	--	--	--
John Street Off-Site	6	1	0.34	--	--	--	--	--
River Road On-Site	12	1	2.1	--	--	--	--	--
River Road Off-Site	23	1	0.73	--	--	--	--	--
McCaffrey Street On-Site*	19	10	2.4		0.28	0.47	0.43	
McCaffrey Street Off-Site	35	9	0.65	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	5	0.32	--	--	--	--	--
Waterworks Road Area[USEPA]	34	9	0.38	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	37	2.4	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorododecanoic acid (PFDoA / PFDoDA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	1	0.9	--	--	--	--	--
McCaffrey Street On-Site*	19	1	0.92	--	--	--	--	--
McCaffrey Street Off-Site	35	1	0.34	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	1	0.32	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	4	0.92	--	--	--	--	--

Investigation Location Subgroup	Perfluoroheptane sulfonate (PFHpS) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluoroheptanoic acid (PFHpA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	3	0.82	--	--	--	--	--
McCaffrey Street On-Site*	19	1	0.61	--	--	--	--	--
McCaffrey Street Off-Site	35	5	0.47	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	12	0.93	--	0.26	0.34	0.31	--
Waterworks Road Area[USEPA]	34	8	0.27	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	29	0.93	--	--	--	--	--

Investigation Location Subgroup	Perfluorohexane sulfonate (PFHxS) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	0	--	--	--	--	--	--
McCaffrey Street On-Site*	19	0	--	--	--	--	--	--
McCaffrey Street Off-Site	35	0	--	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	1	0.16	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	1	0.16	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorohexanoic acid (PFHxA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	2	0.41	--	--	--	--	--
River Road Off-Site	23	7	0.9	--	--	--	--	--
McCaffrey Street On-Site*	19	8	1.5	--	--	--	--	--
McCaffrey Street Off-Site	35	13	0.73	--	--	--	--	--
Liberty Street On-Site*	11	2	0.78	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	3	1.7	--	--	--	--	--
Waterworks Road Area[USEPA]	34	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	35	1.70	--	--	--	--	--

Investigation Location Subgroup	Perfluorononanoic acid (PFNA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	1	0.23	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	1	0.49	--	--	--	--	--
McCaffrey Street On-Site*	19	5	0.34	--	--	--	--	--
McCaffrey Street Off-Site	35	14	0.50	--	--	--	--	--
Liberty Street On-Site*	11	1	0.37	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	17	0.46	--	0.14	0.17	0.18	0.13
Waterworks Road Area[USEPA]	34	16	0.36	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	55	0.50	--	--	--	--	--

Investigation Location Subgroup	Perfluorooctanesulfonamide (PFOSA / FOSA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	0	--	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	0	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	9	0	--	--	--	--	--	--

Investigation Location Subgroup	PFOS Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	2	1.3	--	--	--	--	--
River Road On-Site	12	4	1.4	--	--	--	--	--
River Road Off-Site	23	3	3.5	--	--	--	--	--
McCaffrey Street On-Site*	19	2	1.8	--	--	--	--	--
McCaffrey Street Off-Site	35	24	2.60	--	0.59	0.8	1.0	--
Liberty Street On-Site*	11	3	3.9	--	--	--	--	--
Liberty Street Off-Site	12	7	1.40	--	0.36	0.6	0.6	--
Athletic Field[USEPA]	21	21	1.7	0.16	0.63	0.77	1.00	0.50
Waterworks Road Area[USEPA]	48	40	6.9	--	0.53	0.9	1.1	0.4
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	192	106	6.90	--	0.52	0.73	0.83	

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	PFOA Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	4	5	--	--	--	--	--
John Street Off-Site	6	4	1.8	--	--	--	--	--
River Road On-Site	12	11	7.5	--	1.4	3.0	4.1	1.10
River Road Off-Site	23	21	16	--	1.7	3.2	4.1	0.58
McCaffrey Street On-Site*	19	19	21	0.45	3.3	4.3	5.4	1.10
McCaffrey Street Off-Site	35	35	9.60	0.22	3.5	3.4	4.9	0.74
Liberty Street On-Site*	11	9	10	--	3.4	4.4	9.5	0.36
Liberty Street Off-Site	12	11	5	--	0.83	1.3	1.4	0.26
Athletic Field[USEPA]	21	21	21	1.3	8	8.37	11.00	4.10
Waterworks Road Area[USEPA]	47	45	12	--	2.1	3.0	4.1	0.93
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	191	180	21	--	2.8	3.69	5	0.92

Investigation Location Subgroup	Perfluoropentanoic acid (PFPeA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	--	--	--	--	--	--	--	--
John Street Off-Site	--	--	--	--	--	--	--	--
River Road On-Site	--	--	--	--	--	--	--	--
River Road Off-Site	--	--	--	--	--	--	--	--
McCaffrey Street On-Site*	--	--	--	--	--	--	--	--
McCaffrey Street Off-Site	--	--	--	--	--	--	--	--
Liberty Street On-Site*	--	--	--	--	--	--	--	--
Liberty Street Off-Site	9	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	6	0.55	--	--	--	--	--
Waterworks Road Area[USEPA]	34	5	0.5	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	64	11	0.55	--	--	--	--	--

Investigation Location Subgroup	Perfluorotetradecanoic acid (PFTA / PFTeDA / PFTeA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	1	1.8	--	--	--	--	--
McCaffrey Street On-Site*	19	1	0.48	--	--	--	--	--
McCaffrey Street Off-Site	35	0	--	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	--	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	--	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	123	2	1.80	--	--	--	--	--

Investigation Location Subgroup	Perfluorotridecanoic acid (PFTrDA / PFTriA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	1	1.3	--	--	--	--	--
McCaffrey Street On-Site*	19	0	--	--	--	--	--	--
McCaffrey Street Off-Site	35	0	--	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	--	--	--	--	--	--	--	--
Waterworks Road Area[USEPA]	--	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	123	1	1.30	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluoroundecanoic acid (PFUnA / PFUnDA) Near-Surface Soil[2]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	5	0	--	--	--	--	--	--
John Street Off-Site	6	0	--	--	--	--	--	--
River Road On-Site	12	0	--	--	--	--	--	--
River Road Off-Site	23	1	0.64	--	--	--	--	--
McCaffrey Street On-Site*	19	1	0.75	--	--	--	--	--
McCaffrey Street Off-Site	35	2	0.49	--	--	--	--	--
Liberty Street On-Site*	11	0	--	--	--	--	--	--
Liberty Street Off-Site	12	0	--	--	--	--	--	--
Athletic Field[USEPA]	21	0	--	--	--	--	--	--
Waterworks Road Area[USEPA]	34	2	1.1	--	--	--	--	--
Hoosick Falls Landfill[TRC]	no samples collected							
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	178	6	1.10	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	6-2 Fluorotelomer sulfonate (6-2 FTS) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	1	0.19	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	65	1	0.19	--	--	--	--	--

Investigation Location Subgroup	8-2 Fluorotelomer sulfonate (8-2 FTS) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	0	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	65	0	--	--	--	--	--	--

Investigation Location Subgroup	n-Ethyl perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	4	0.48	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	65	4	0.48	--	--	--	--	--

Investigation Location Subgroup	n-Methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	4	0.18	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	3	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	65	4	0.18	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorobutane sulfonate (PFBS) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	0	--	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	1	0.62	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	0	--	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	1	0.62	--	--	--	--	--

Investigation Location Subgroup	Perfluorobutanoic acid (PFBA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	0	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	70	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluorodecane sulfonate (PFDS) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	0	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	1	0.21	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	84	1	0 21	--	--	--	--	--

Investigation Location Subgroup	Perfluorodecanoic acid (PFDA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	22	0.67	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	1	0.29	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	1	0.53	--	--	--	--	--
McCaffrey Street Off-Site	200	3	0.71	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	27	0.71	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorododecanoic acid (PFDoA / PFDoDA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	0	--	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	0	--	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluoroheptane sulfonate (PFHpS) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	0	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	--	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	70	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluoroheptanoic acid (PFHpA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	12	0.42	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	1	0.37	--	--	--	--	--
Liberty Street On-Site*	72	1	0.42	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	14	0.42	--	--	--	--	--

Investigation Location Subgroup	Perfluorohexane sulfonate (PFHxS) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	8	0.4	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	1	1.3	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	0	--	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	1	1.1	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	10	1 30	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluorohexanoic acid (PFHxA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	0	--	--	--	--	--	--
John Street Off-Site	10	1	0.27	--	--	--	--	--
River Road On-Site	19	2	0.56	--	--	--	--	--
River Road Off-Site	28	3	0.32	--	--	--	--	--
McCaffrey Street On-Site*	31	2	0.34	--	--	--	--	--
McCaffrey Street Off-Site	200	21	0.59	--	--	--	--	--
Liberty Street On-Site*	72	5	0.37	--	--	--	--	--
Liberty Street Off-Site	67	1	0.44	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	35	0 59	--	--	--	--	--

Investigation Location Subgroup	Perfluorononanoic acid (PFNA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	16	0.43	--	--	--	--	--
John Street Off-Site	10	1	0.26	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	4	0.64	--	--	--	--	--
McCaffrey Street Off-Site	200	6	0.51	--	--	--	--	--
Liberty Street On-Site*	72	2	0.16	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	523	29	0.64	--	--	--	--	--

Investigation Location Subgroup	Perfluorooctanesulfonamide (PFOSA / FOSA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	4	0.26	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	70	4	0 26	--	--	--	--	--

Investigation Location Subgroup	PFOS Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	1	0.25	--	--	--	--	--
John Street Off-Site	10	1	38	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	1	0.74	--	--	--	--	--
McCaffrey Street On-Site*	31	1	0.38	--	--	--	--	--
McCaffrey Street Off-Site	200	2	0.76	--	--	--	--	--
Liberty Street On-Site*	72	3	2.9	--	--	--	--	--
Liberty Street Off-Site	67	4	0.59	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	18	3	5.1	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	527	16	38.00	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	PFOA Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	49	21	--	0.87	2.4	2.4	--
John Street Off-Site	10	6	5.1	--	0.36	1.0	0.5	--
River Road On-Site	19	13	4.1	--	0.68	1.3	1.9	--
River Road Off-Site	28	21	5.5	--	0.68	1.1	1.4	0.37
McCaffrey Street On-Site*	31	25	18	--	2.8	4.2	5.8	0.65
McCaffrey Street Off-Site	200	162	120.00	--	0.84	4.7	3.1	0.32
Liberty Street On-Site*	72	52	12	--	1.3	2.5	2.9	--
Liberty Street Off-Site	67	37	22	--	0.36	1.2	0.9	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	17	13	7.1	--	1.1	1.8	2.5	0.64
Hoosick Falls Landfill[TRC]	8	8	1.6	0.23	0.36	0.655	0.745	0.32
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	526	386	120	--	0.79	3 01	2.4	--

Investigation Location Subgroup	Perfluoropentanoic acid (PFPeA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	62	0	--	--	--	--	--	--
John Street Off-Site	0	--	--	--	--	--	--	--
River Road On-Site	0	--	--	--	--	--	--	--
River Road Off-Site	0	--	--	--	--	--	--	--
McCaffrey Street On-Site*	0	--	--	--	--	--	--	--
McCaffrey Street Off-Site	0	--	--	--	--	--	--	--
Liberty Street On-Site*	0	--	--	--	--	--	--	--
Liberty Street Off-Site	0	--	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	14	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	84	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluorotetradecanoic acid (PFTA / PFTeDA / PFTeA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	0	--	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	0	--	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	509	0	--	--	--	--	--	--

Investigation Location Subgroup	Perfluorotridecanoic acid (PFTrDA / PFTriA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	16	0.33	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	0	--	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	0	--	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	509	16	0 33	--	--	--	--	--

Table 2: PFAS Summary Statistics for Available Soil Samples
Regional Air Deposition Study Work Plan
Village of Hoosick Falls, New York

Investigation Location Subgroup	Perfluoroundecanoic acid (PFUnA / PFUnDA) Sub-Surface Soil[3]							
	# of Samples	# of Detections	Maximum	Minimum	Median	Arithmetic Mean	75th Percentile	25th Percentile
John Street On-Site	74	4	0.37	--	--	--	--	--
John Street Off-Site	10	0	--	--	--	--	--	--
River Road On-Site	19	0	--	--	--	--	--	--
River Road Off-Site	28	0	--	--	--	--	--	--
McCaffrey Street On-Site*	31	0	--	--	--	--	--	--
McCaffrey Street Off-Site	200	0	--	--	--	--	--	--
Liberty Street On-Site*	72	0	--	--	--	--	--	--
Liberty Street Off-Site	67	0	--	--	--	--	--	--
Athletic Field[USEPA]	no samples collected							
Waterworks Road Area[USEPA]	13	0	--	--	--	--	--	--
Hoosick Falls Landfill[TRC]	8	0	--	--	--	--	--	--
Hoosick Falls Area[NYSDEC]	no samples collected							
Total (All Samples)	522	4	0 37	--	--	--	--	--

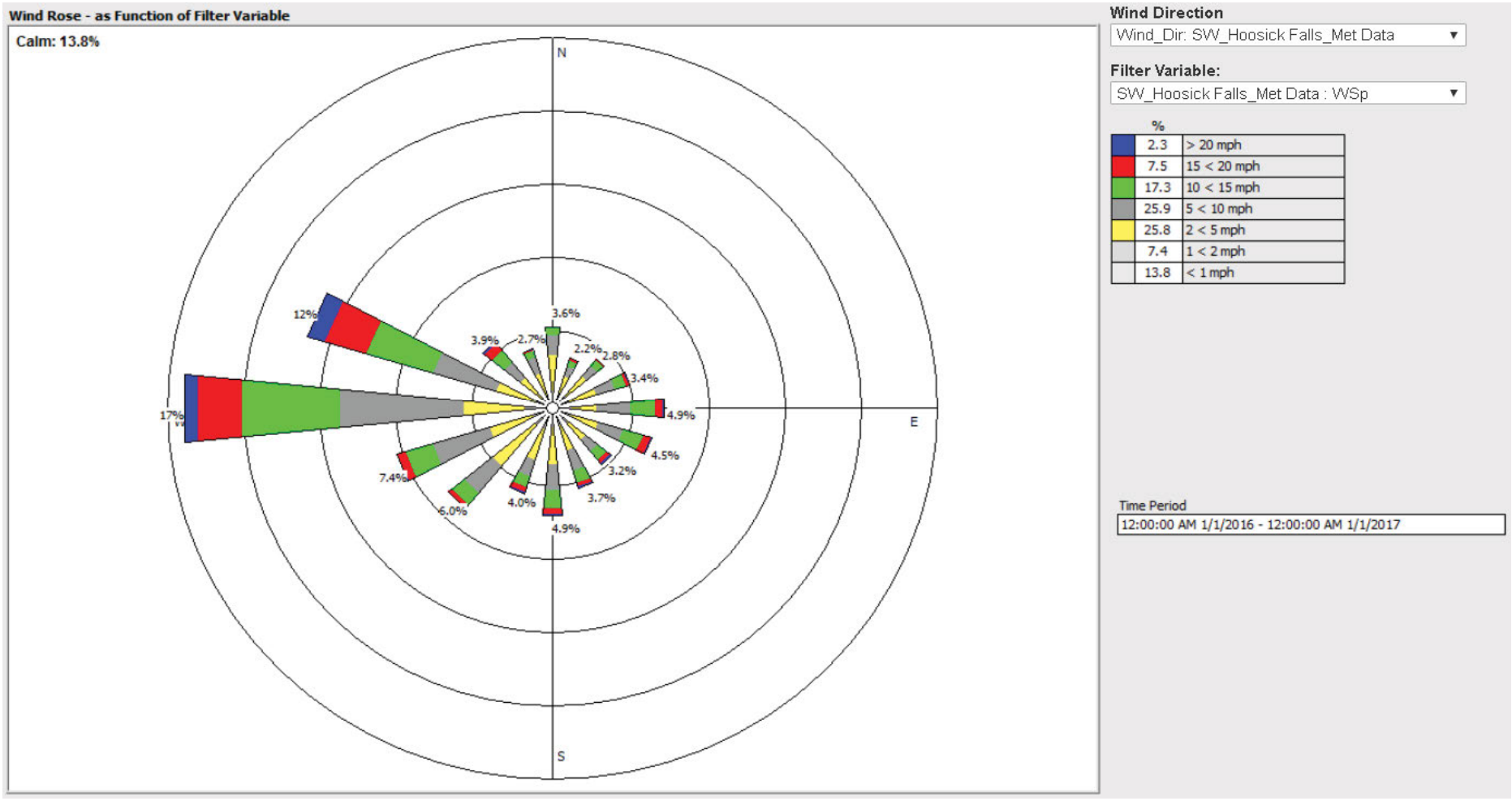
All values are given in parts per billion (ppb).
1 - Samples with starting depth equal to 0 ft bgs and ending depth≤ 1ft.
2 - Samples with starting depth greater than 0 ft bgs and ending depth≤ 1ft.
3 - Samples with starting depth greater than 1 ft bgs.
** - Excludes samples collected below buildings, in potential waste areas or along roof drip lines.*

USEPA - Samples collected and data provided by the United States Environmental Protection Agency.
NYSDEC - Samples collected and data provided by the New York State Department of Environmental Conservation.
TRC - Samples collected and data provided by TRC (2019)

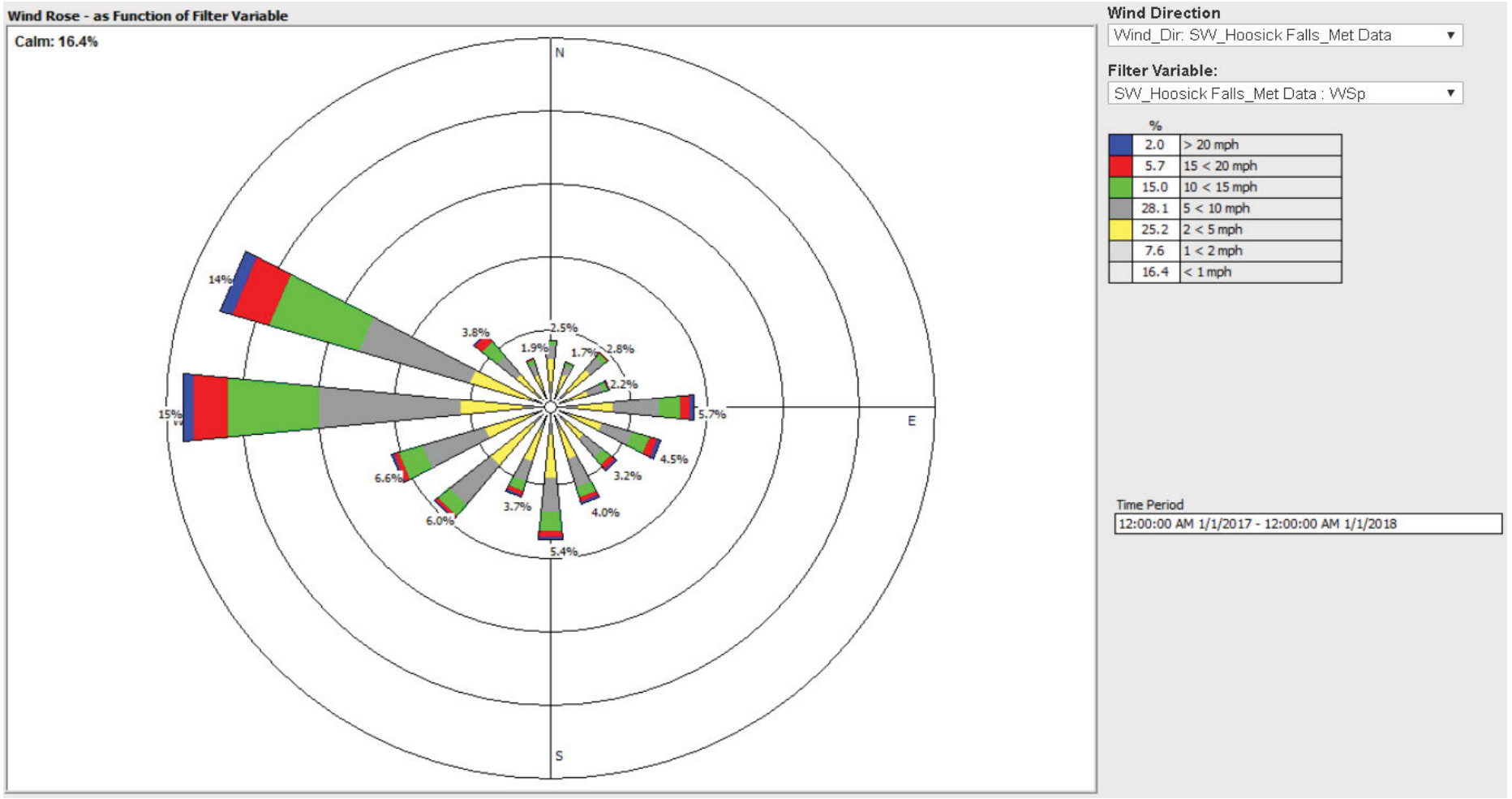
Maximum: Highest detected concentration
Summary statistics calculated using Kaplan-Meier estimation method
Mean, median, and 75th percentile calculated if detection frequency was ≥ 50% and at least 5 detections
25 h percen ile calculated if at least 75% of samples were measured above detection limits
Minimum calculated only if all samples were measured above detection limits

ATTACHMENT A
WIND ROSES

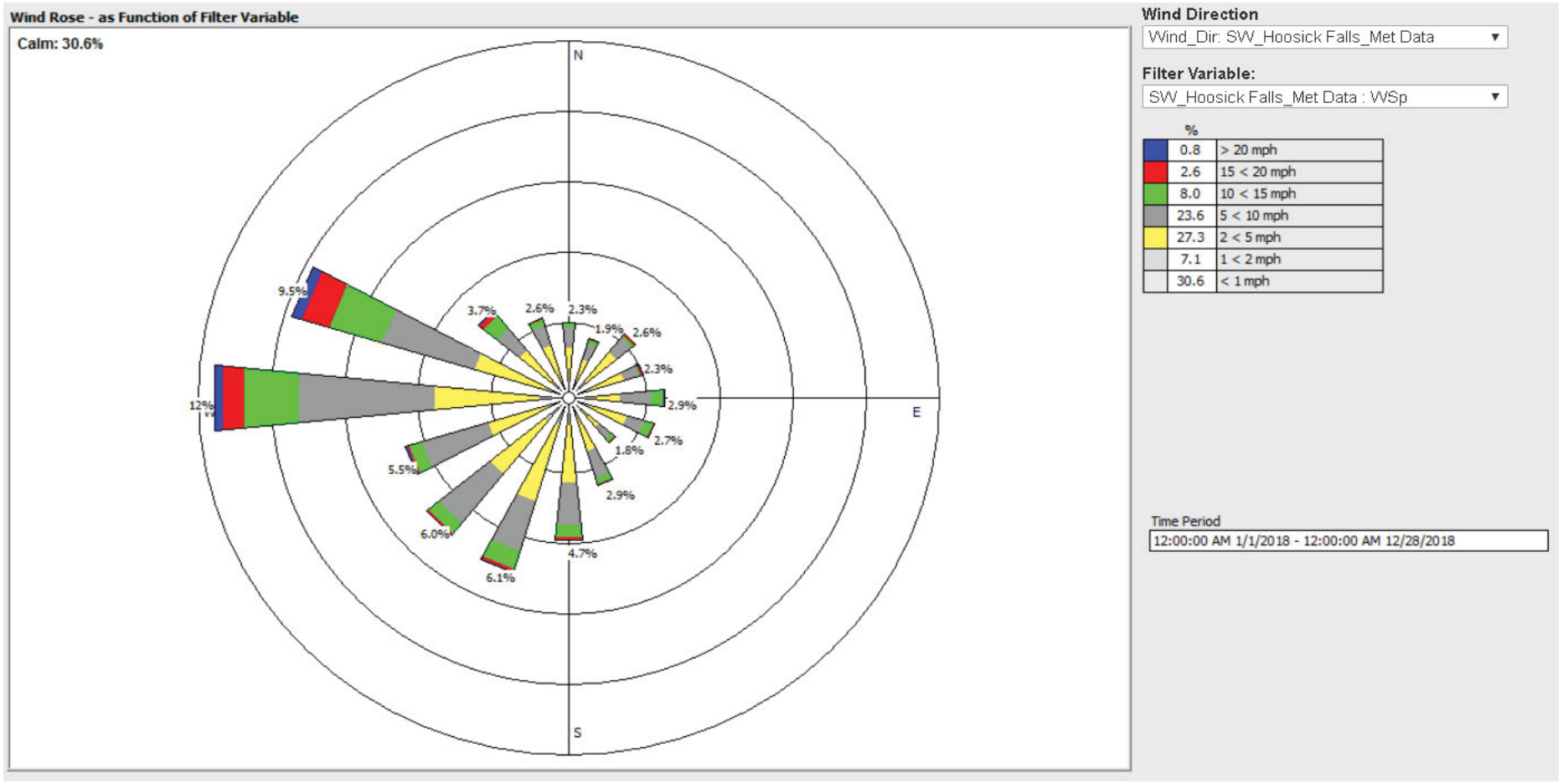
2016 SW Hoosick Falls Wind Rose



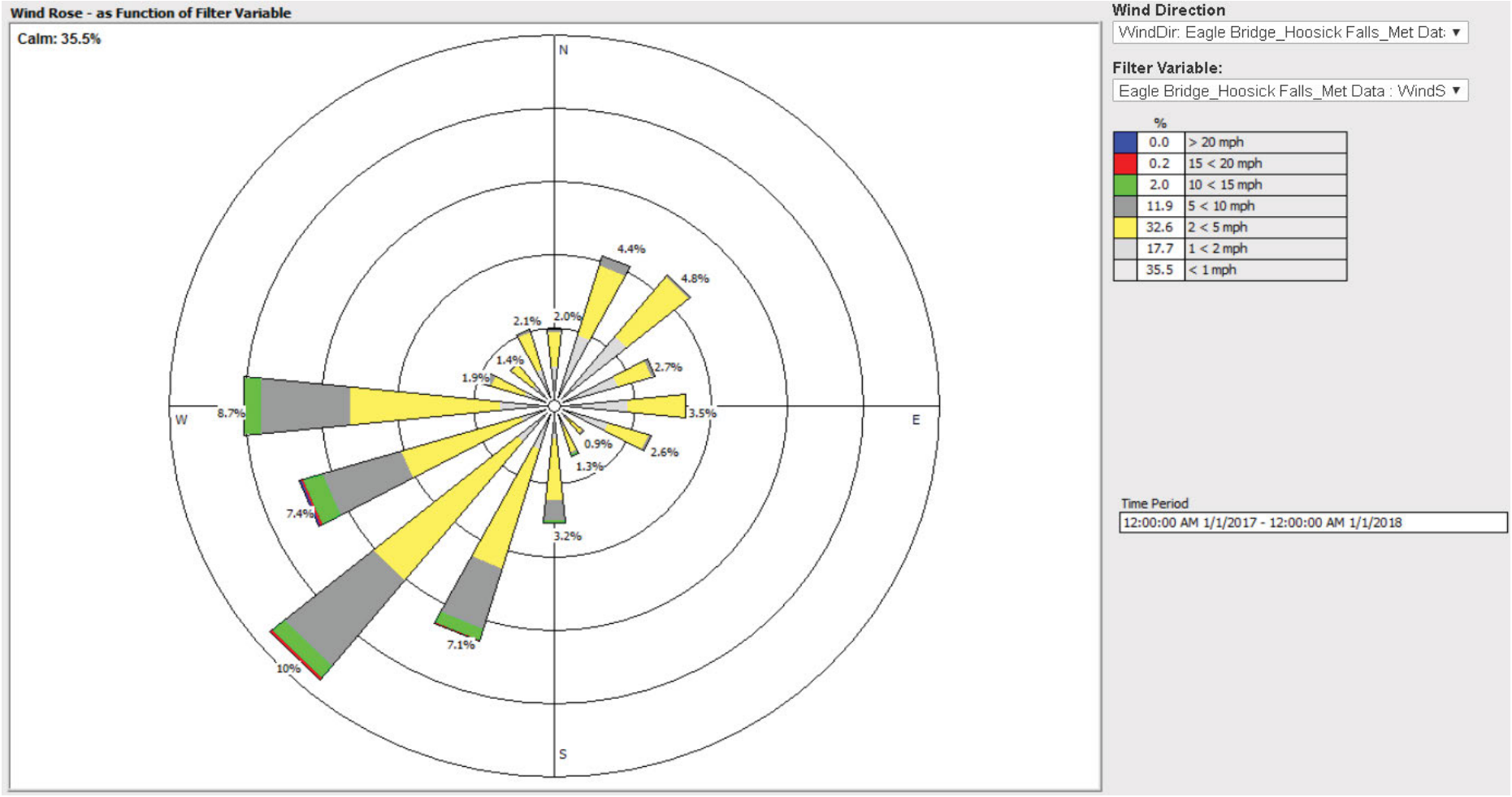
2017 SW Hoosick Falls Wind Rose



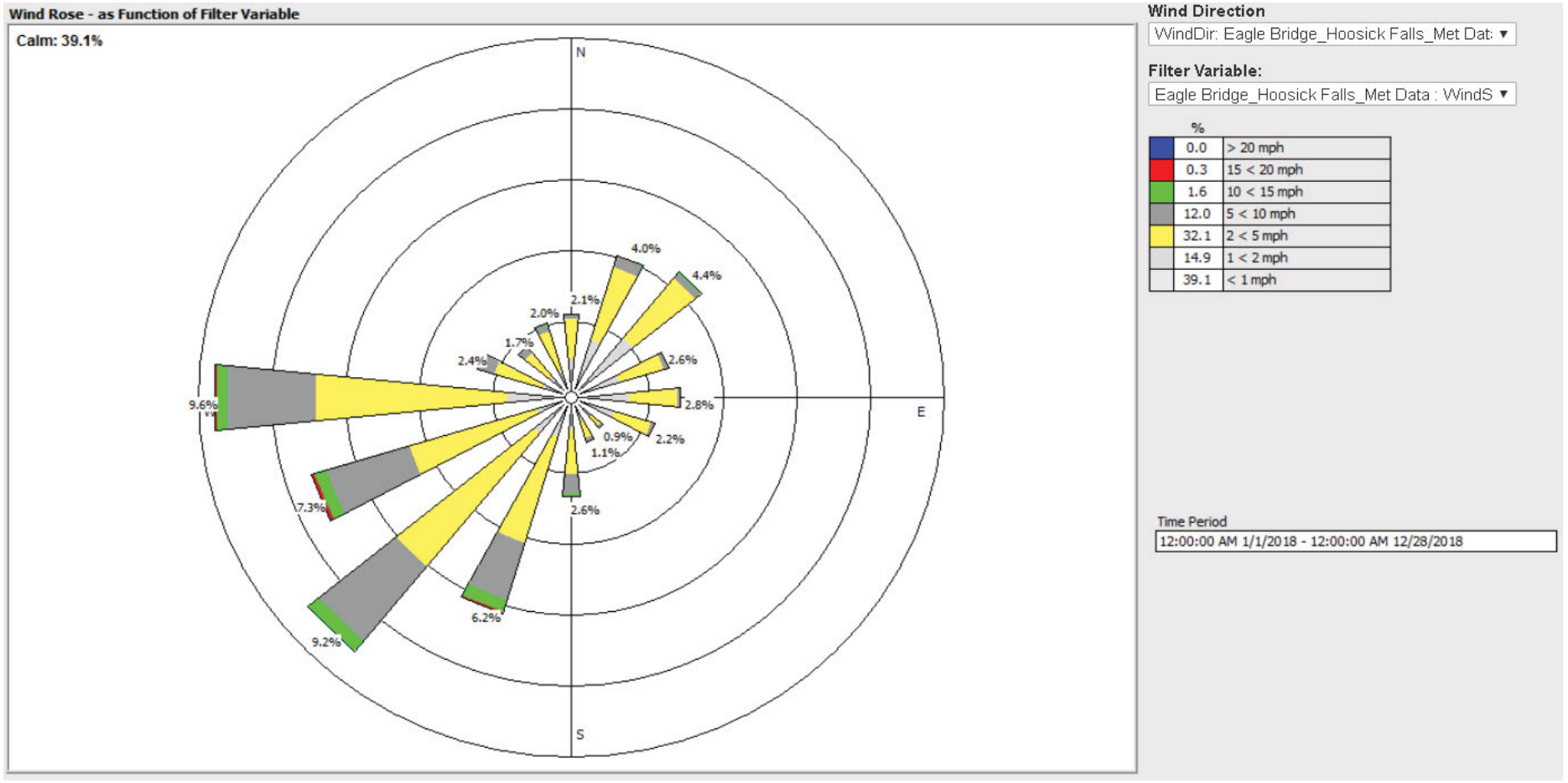
2018 SW Hoosick Falls Wind Rose



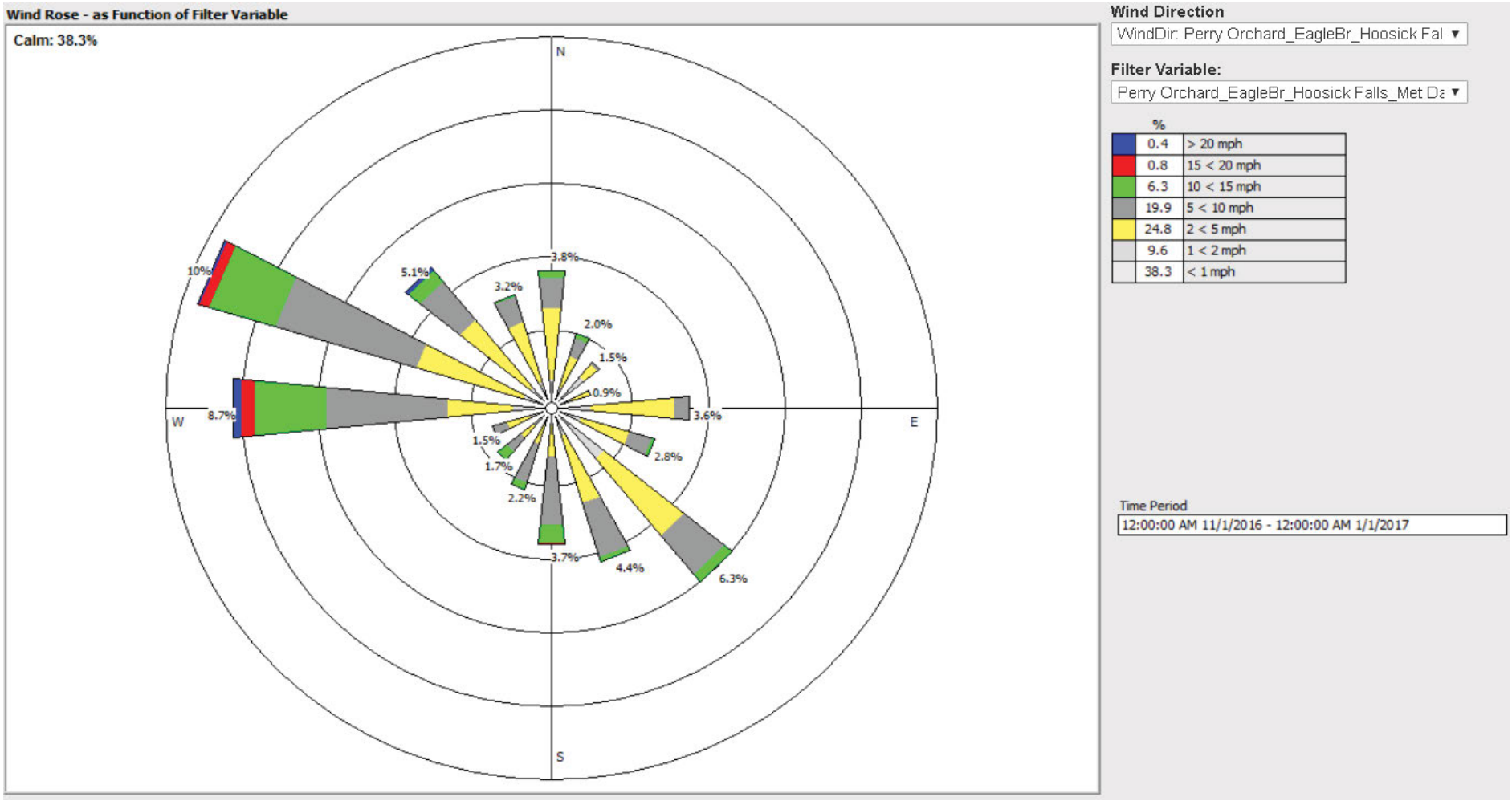
2017 Eagle Bridge Wind Rose



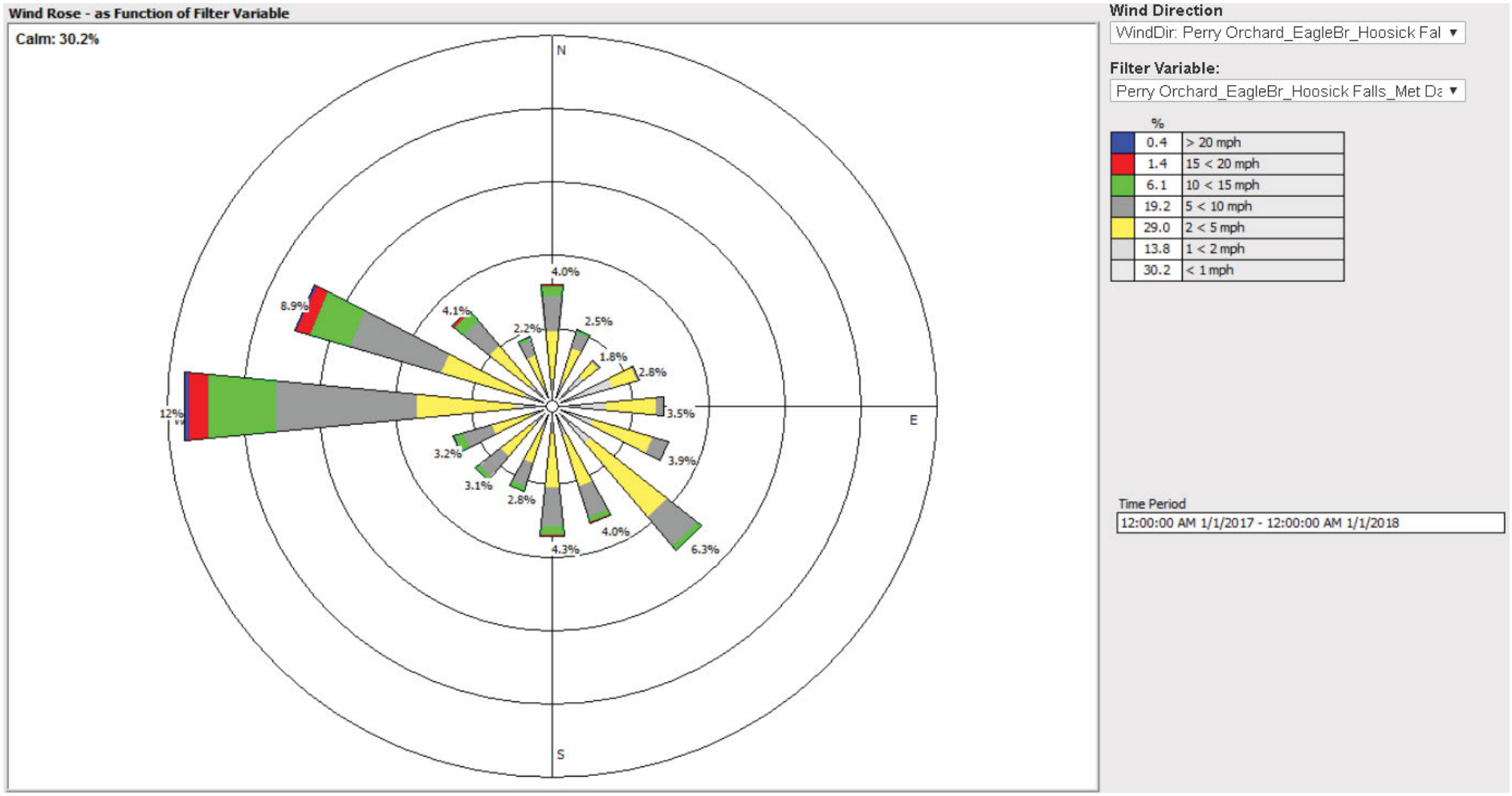
2018 Eagle Bridge Wind Rose



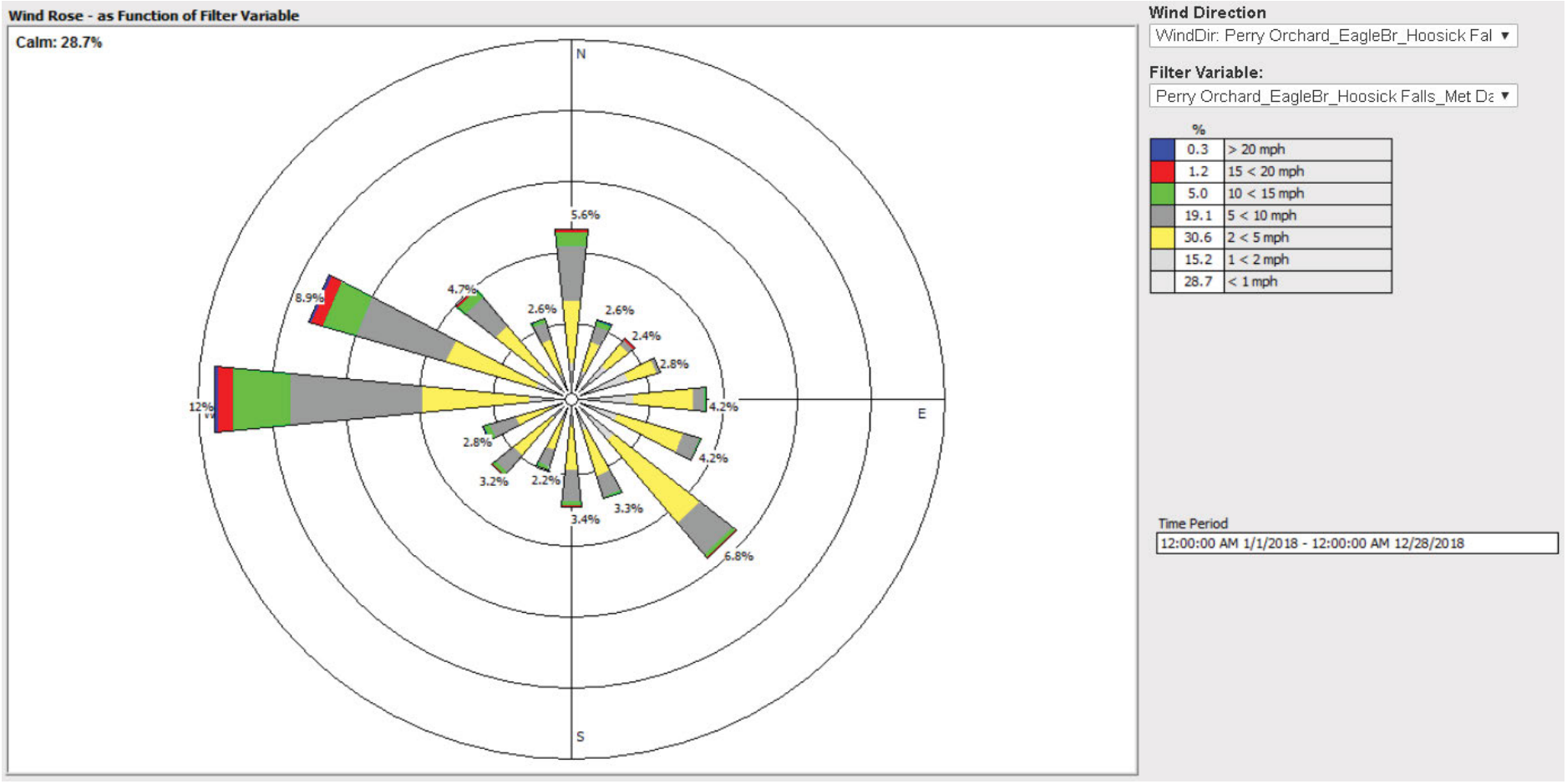
2016 Perry's Orchard Wind Rose



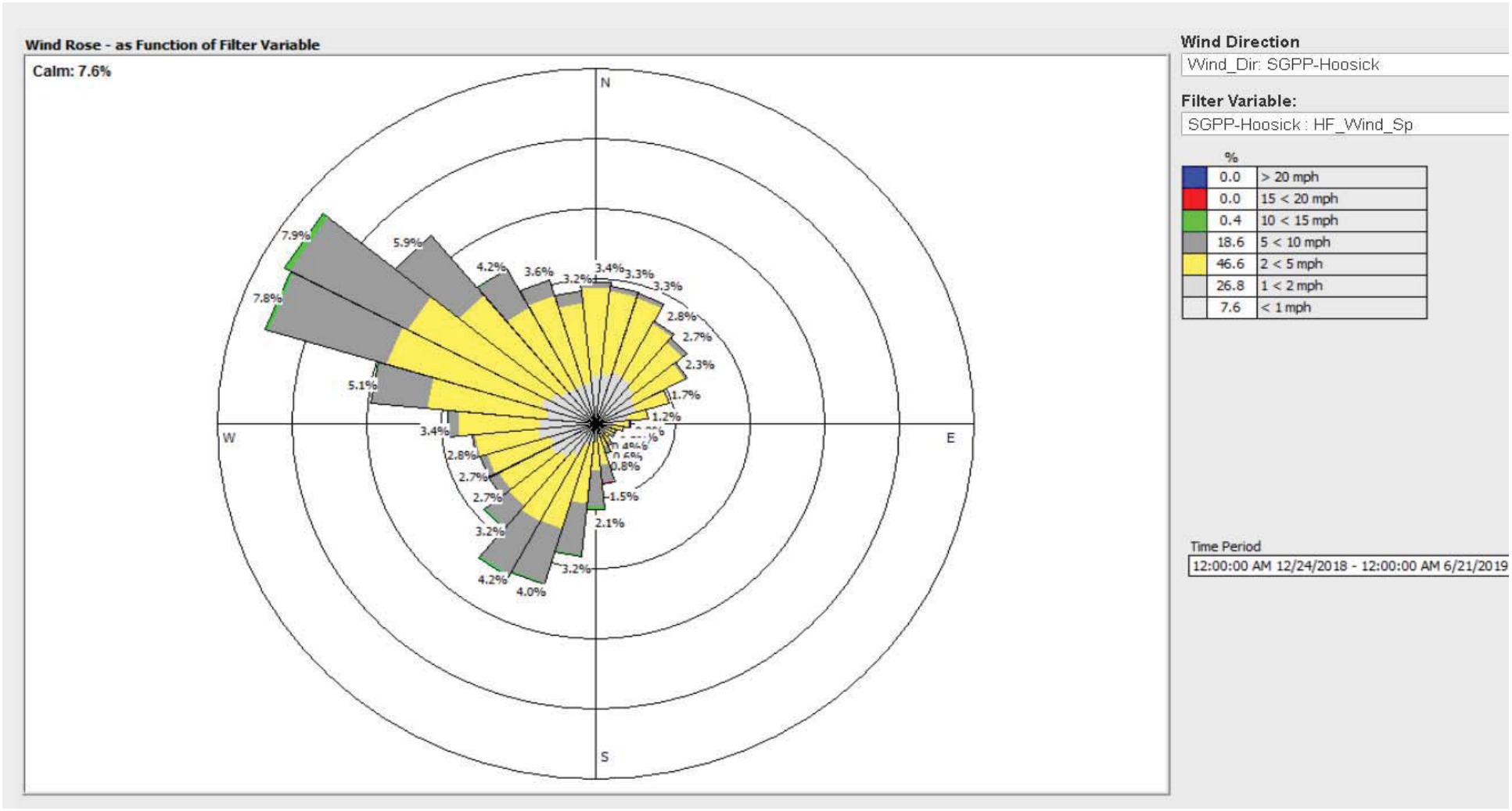
2017 Perry's Orchard Wind Rose



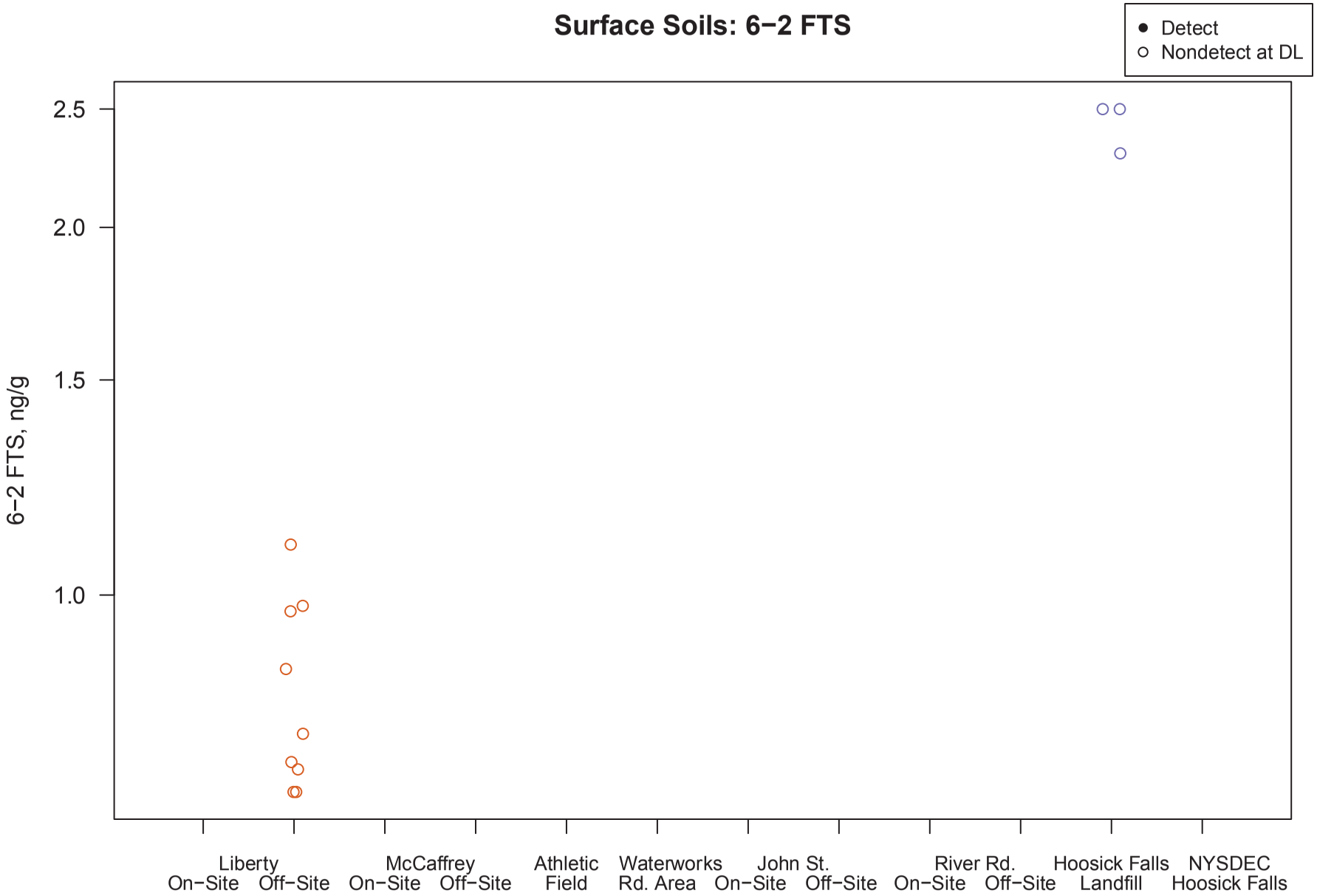
2018 Perry's Orchard Wind Rose

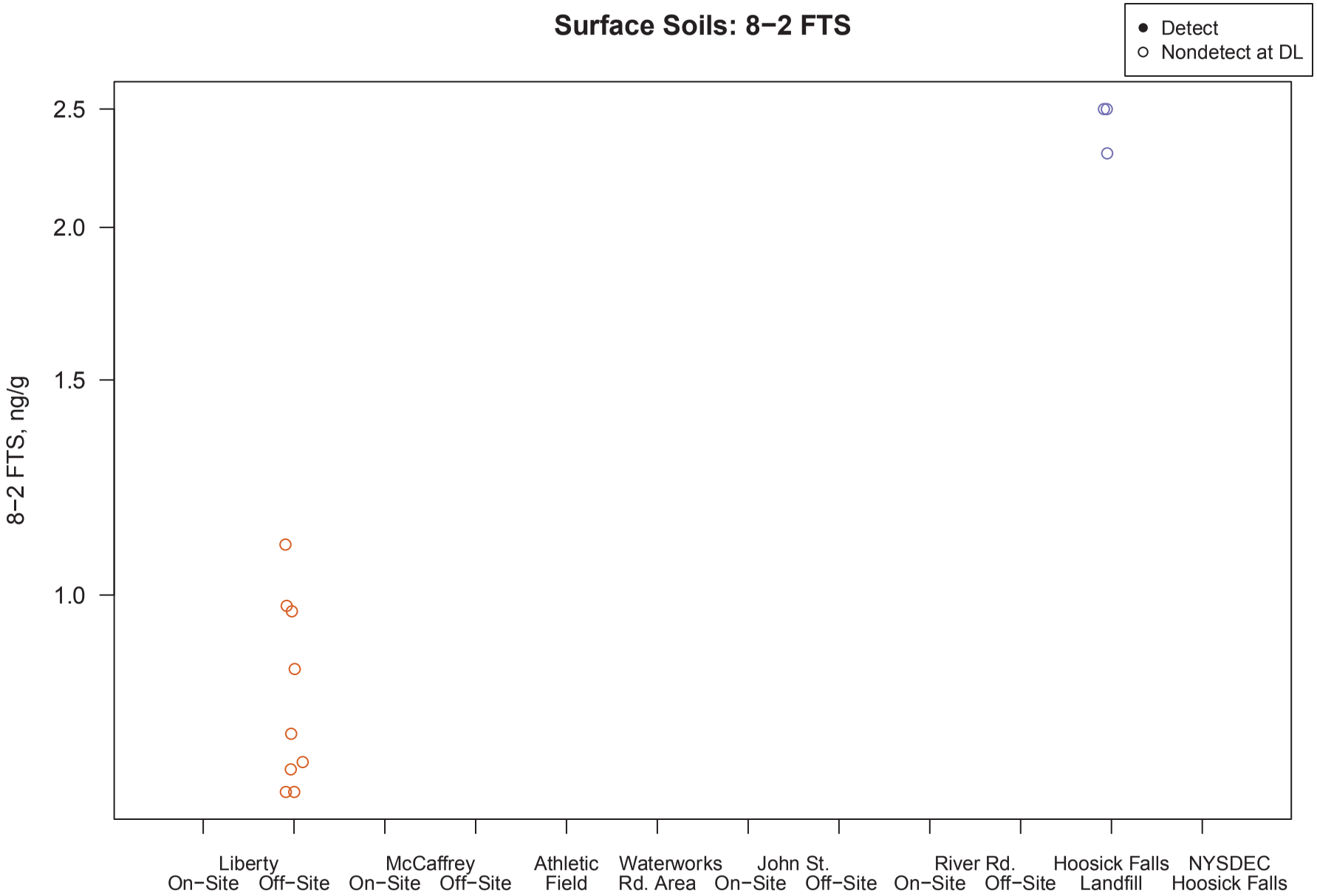


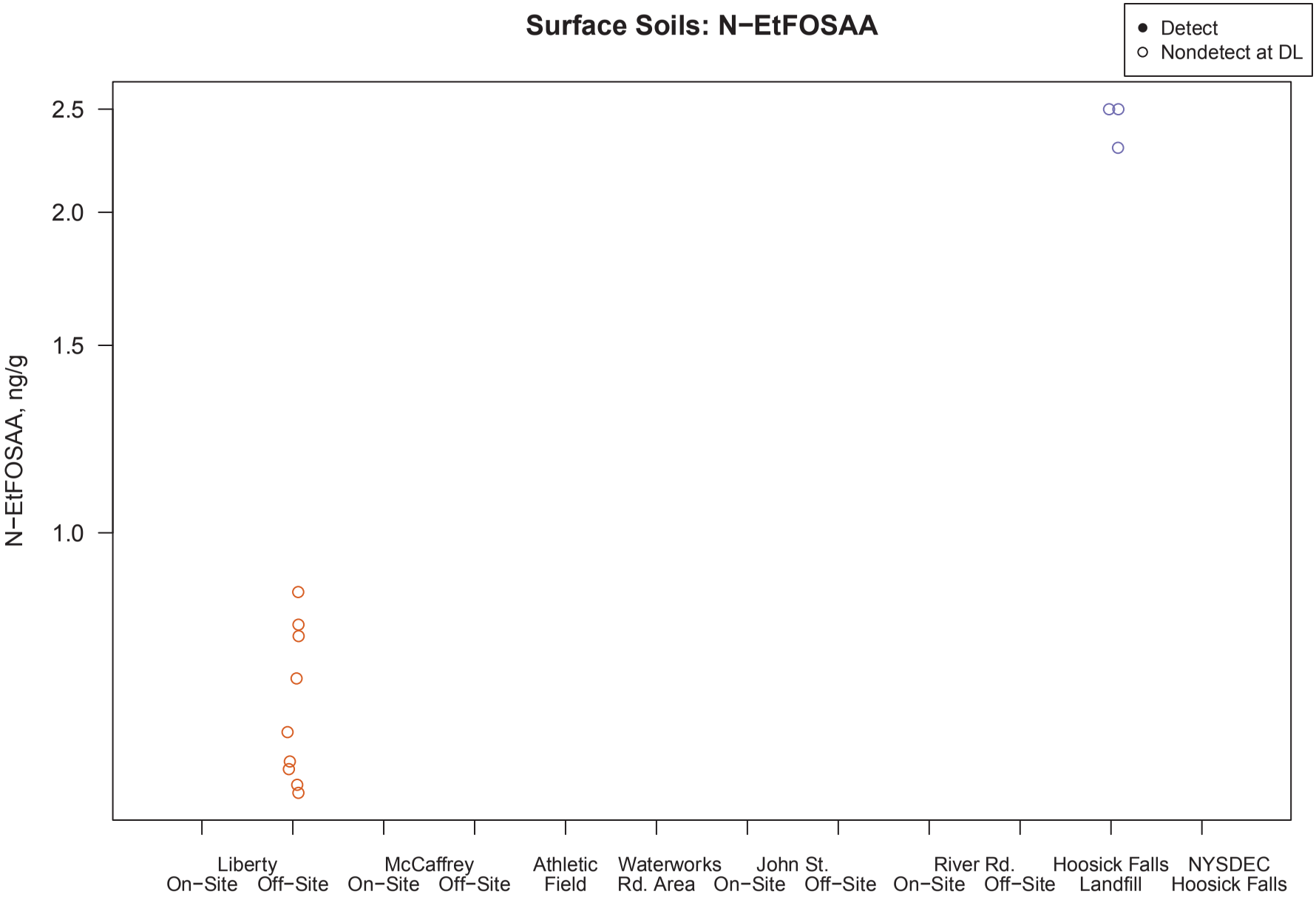
McCaffrey Street Hoosick Falls Met Station Wind Rose (12/24/18 - 6/20/19)

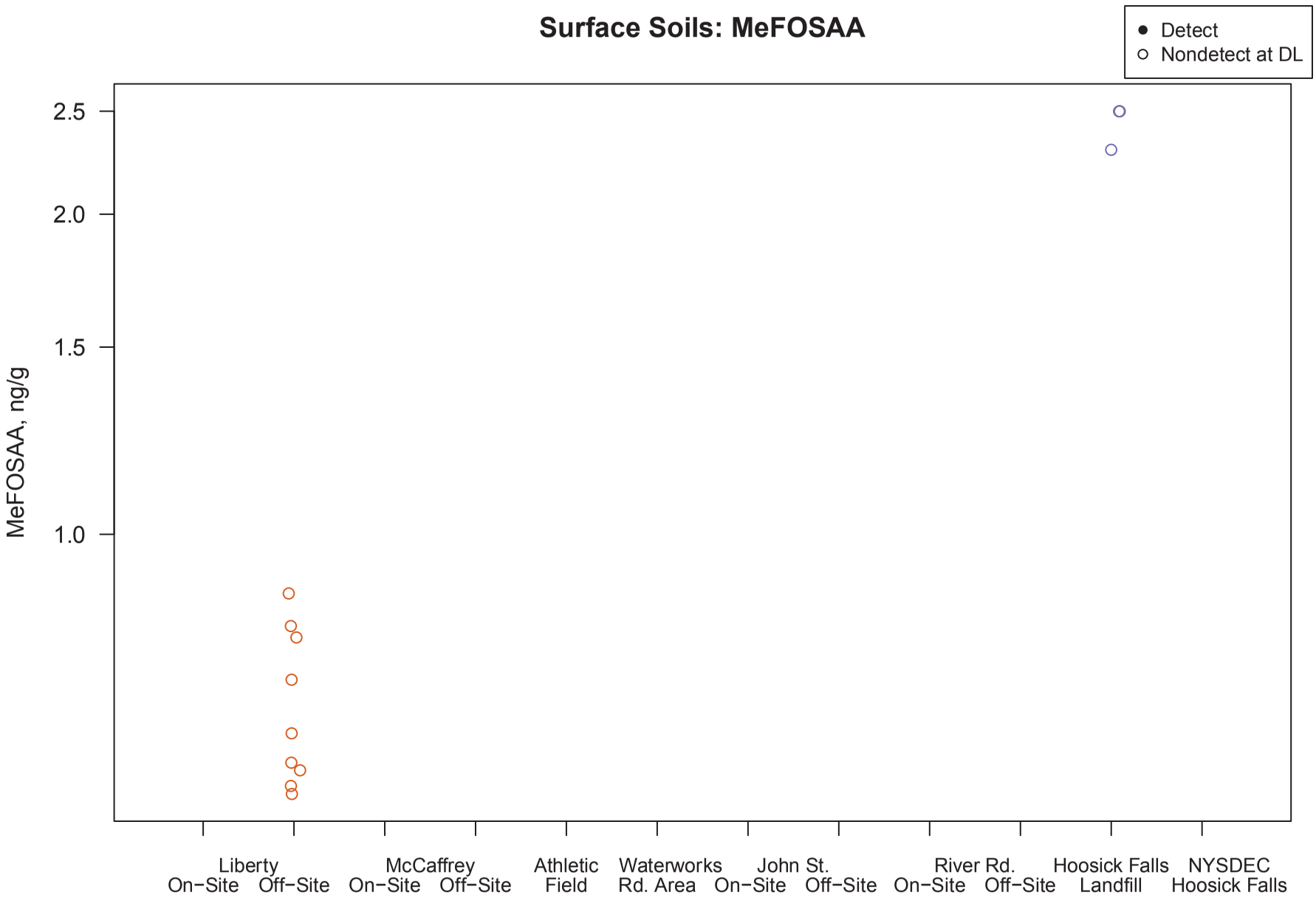


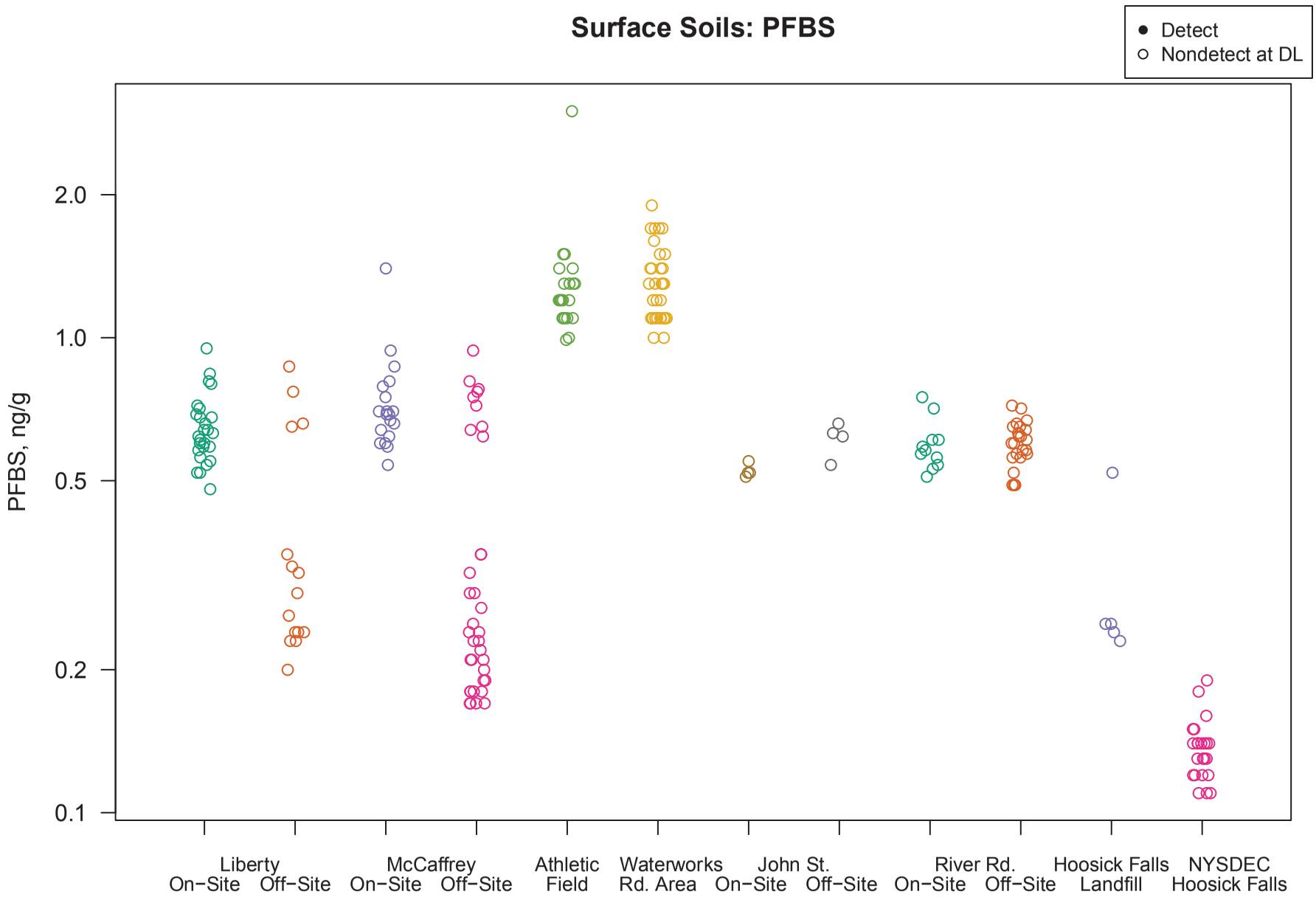
ATTACHMENT B
BOX and WHISKER PLOT FOR EXISTING SOIL DATA

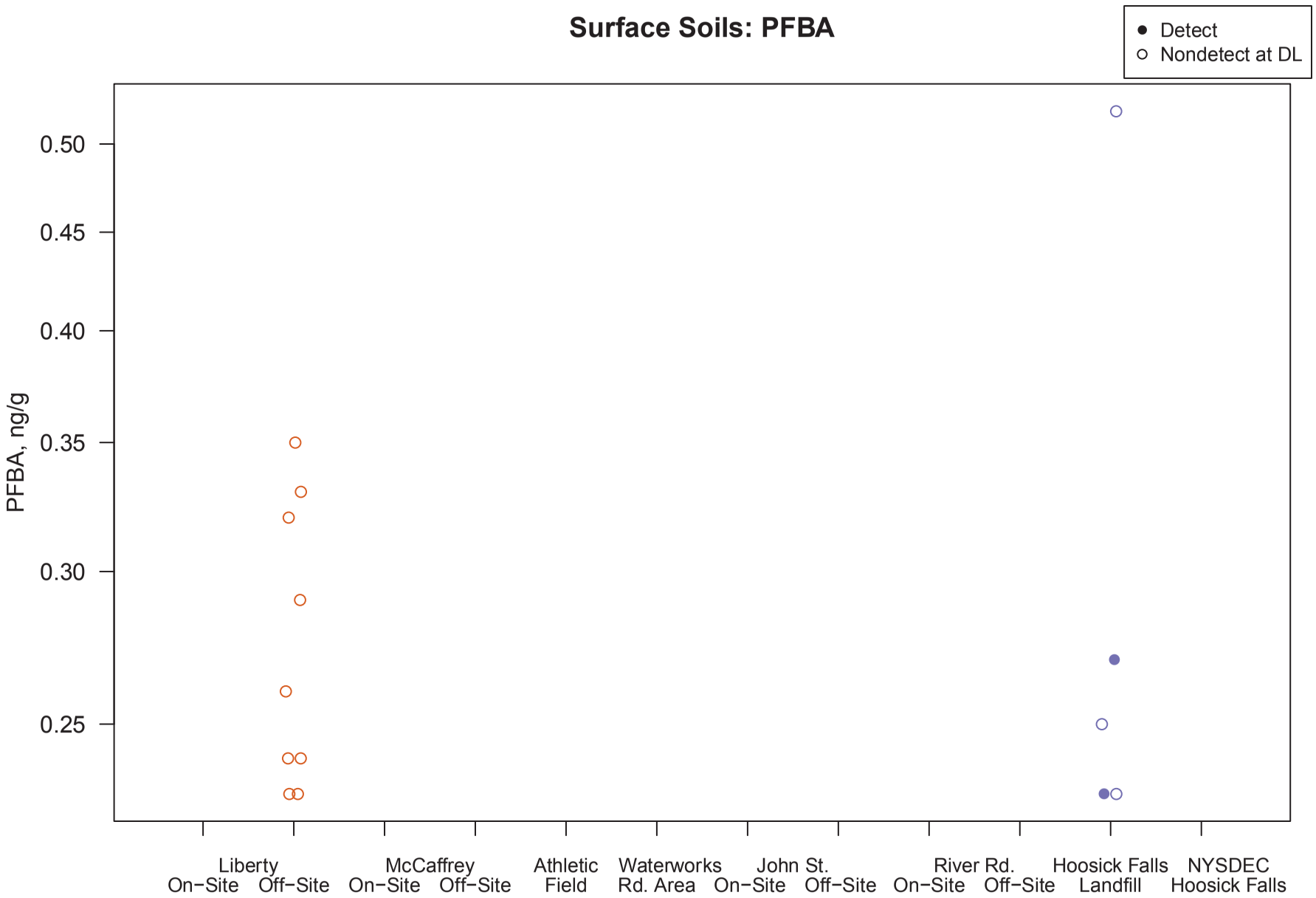

Surface Soils: 6−2 FTS
Detect
Nondetect at DL
6−2 FTS, ng/g
2.5
2.0
1.5
1.0
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

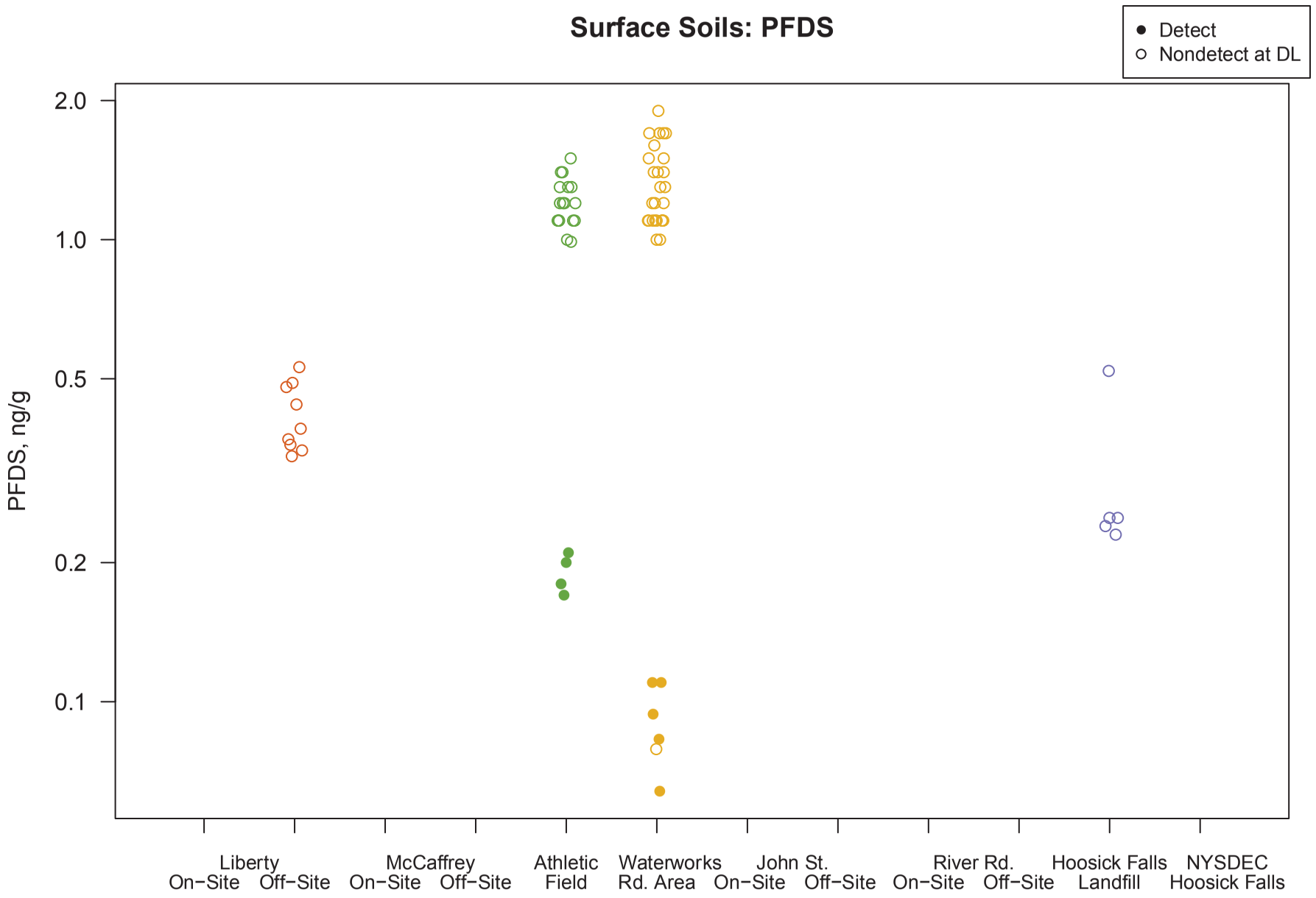

Surface Soils: 8−2 FTS
Detect
Nondetect at DL
8−2 FTS, ng/g
2.5
2.0
1.5
1.0
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

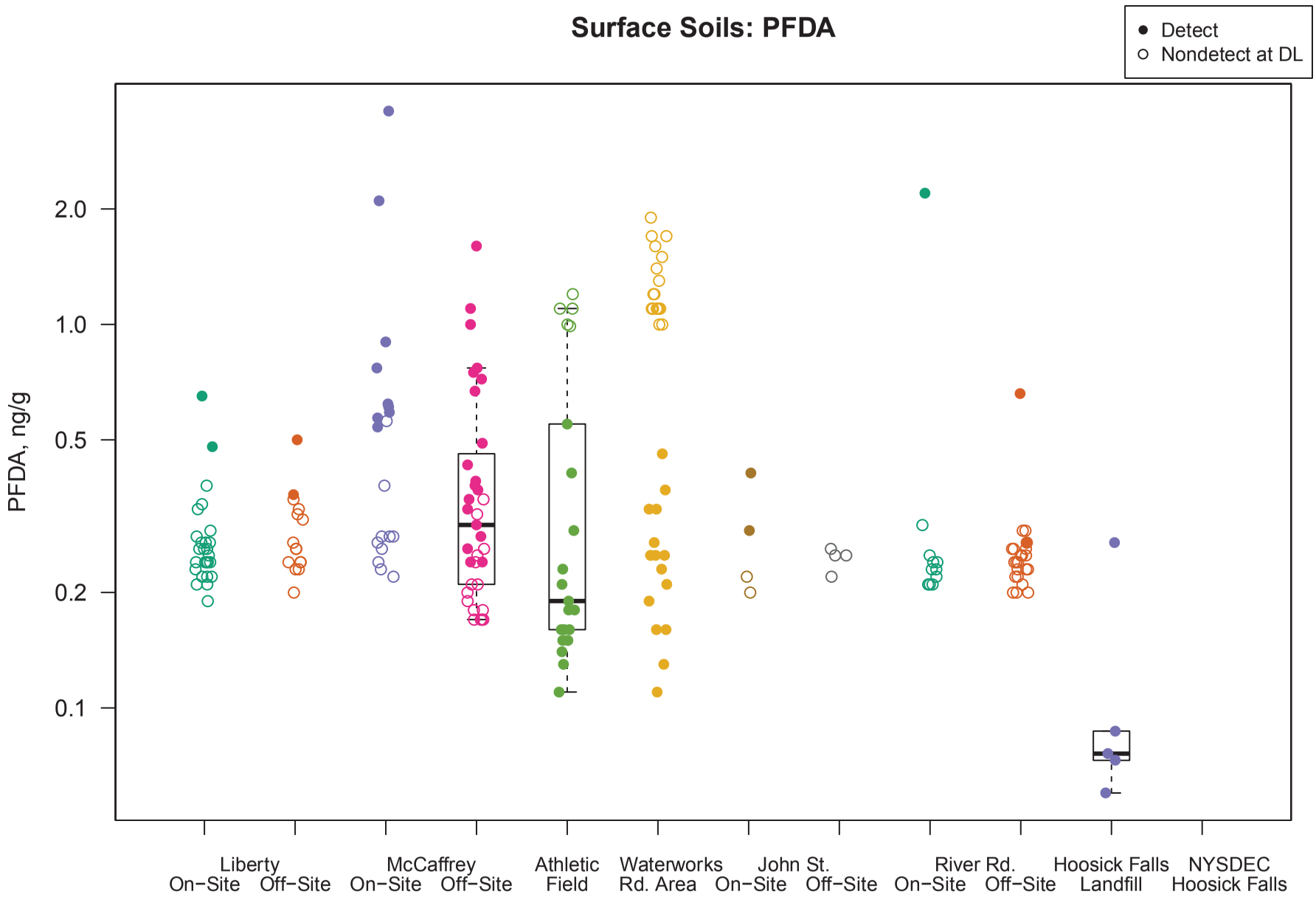

Surface Soils: N−EtFOSAA
Detect
Nondetect at DL
N−EtFOSAA, ng/g
2.5
2.0
1.5
1.0
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

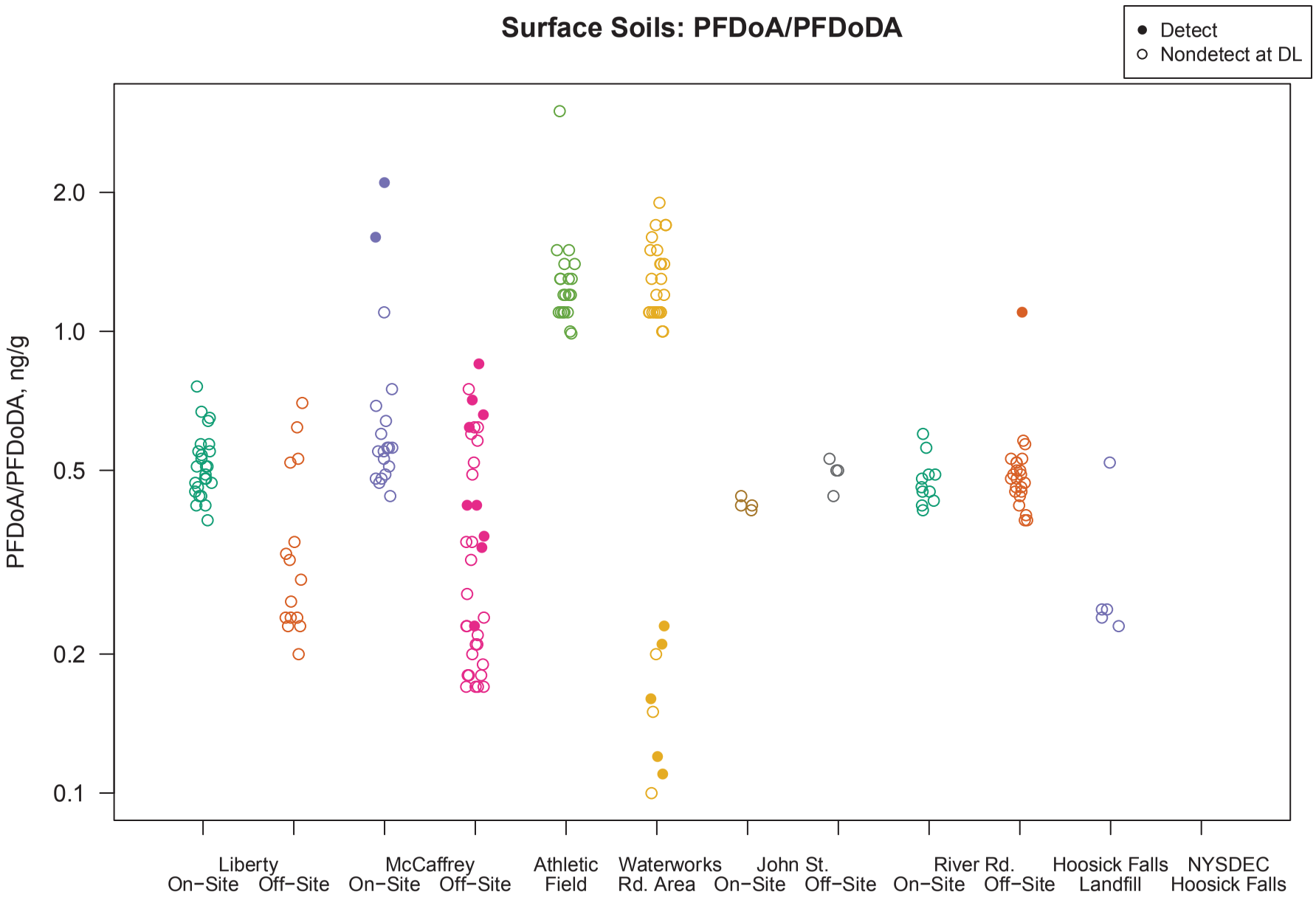

Surface Soils: MeFOSAA
Detect
Nondetect at DL
MeFOSAA, ng/g
2.5
2.0
1.5
1.0
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

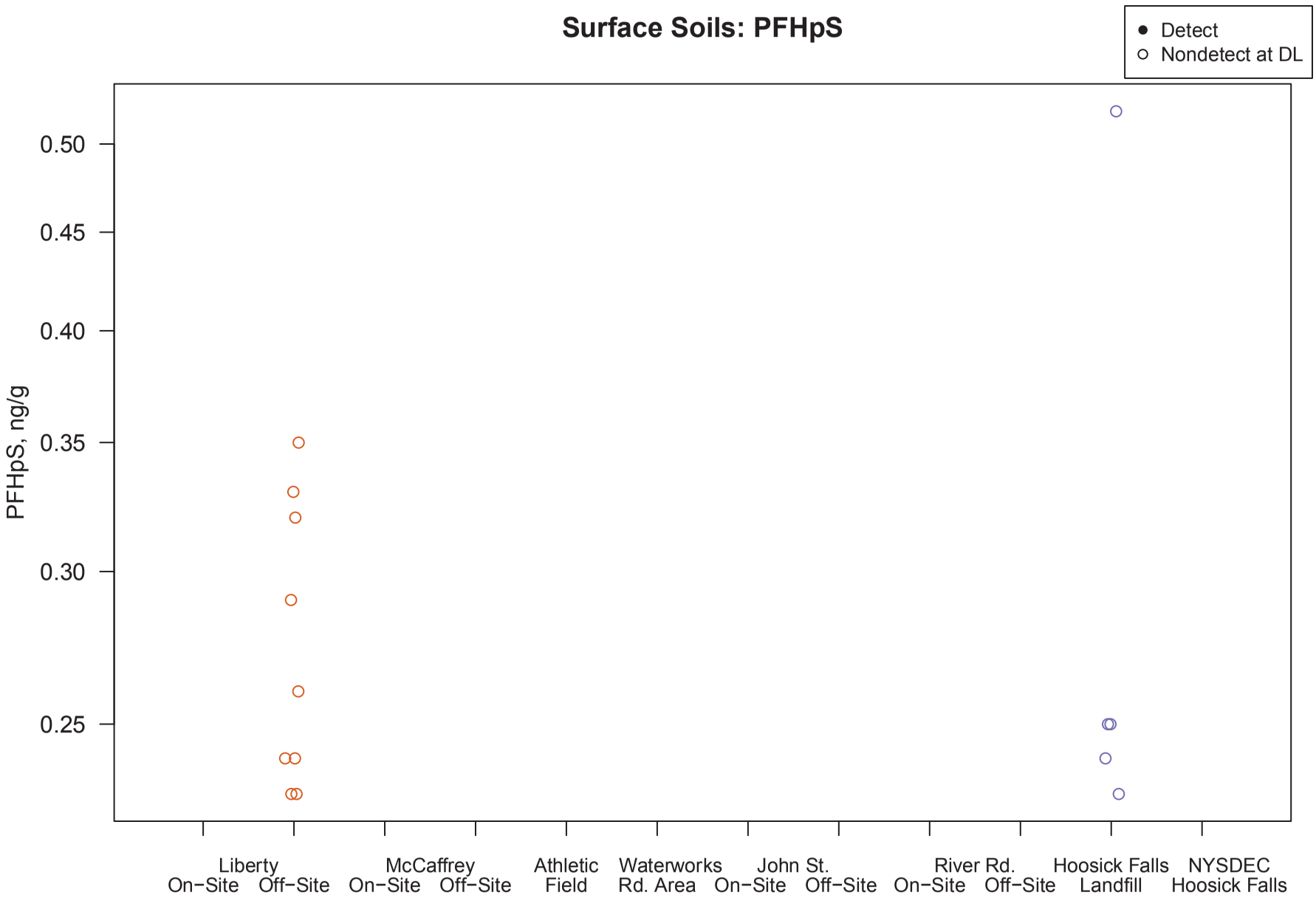

Surface Soils: PFBS
Detect
Nondetect at DL
PFBS, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

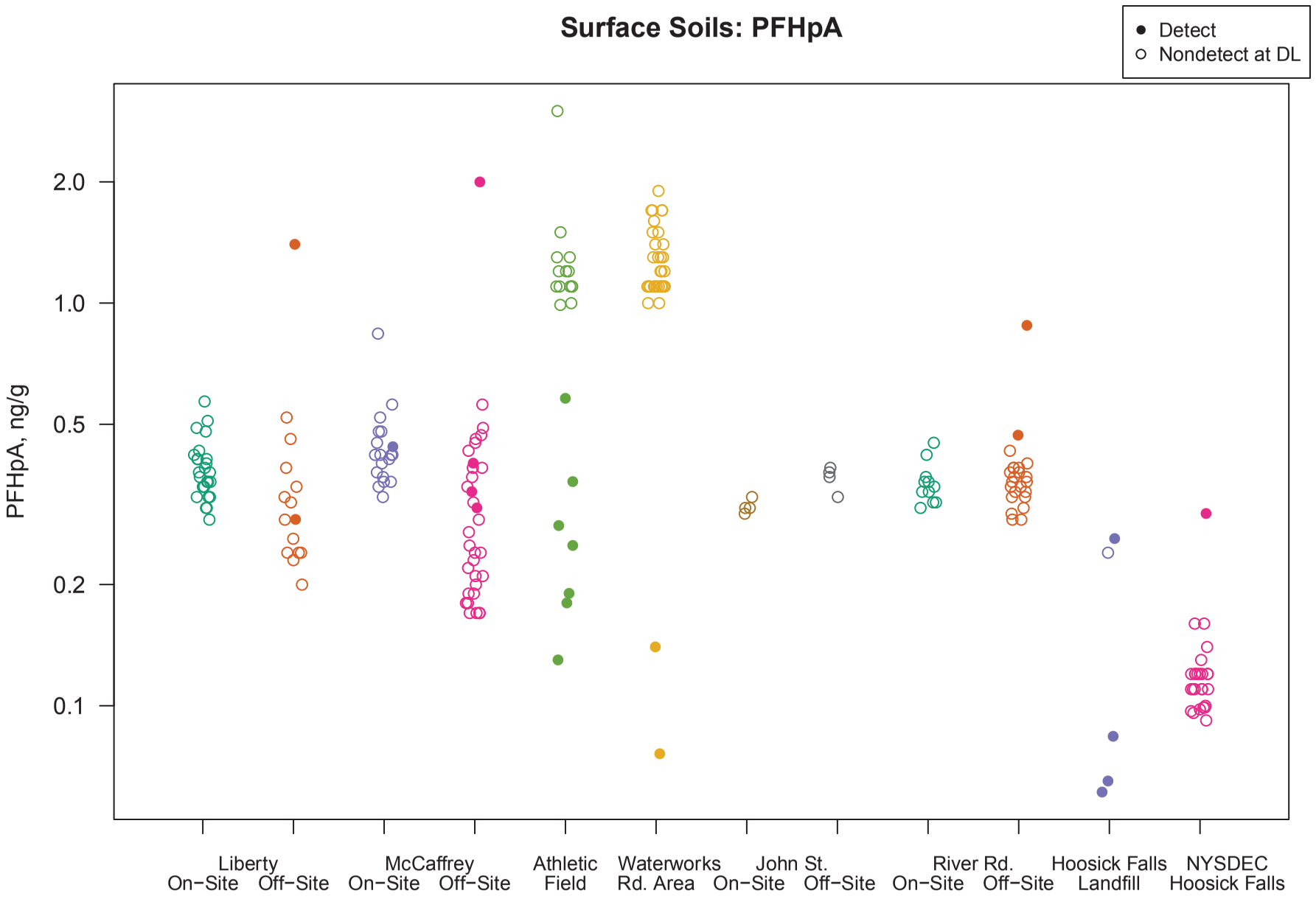

Surface Soils: PFBA
Detect
Nondetect at DL
PFBA, ng/g
0.50
0.45
0.40
0.35
0.30
0.25
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

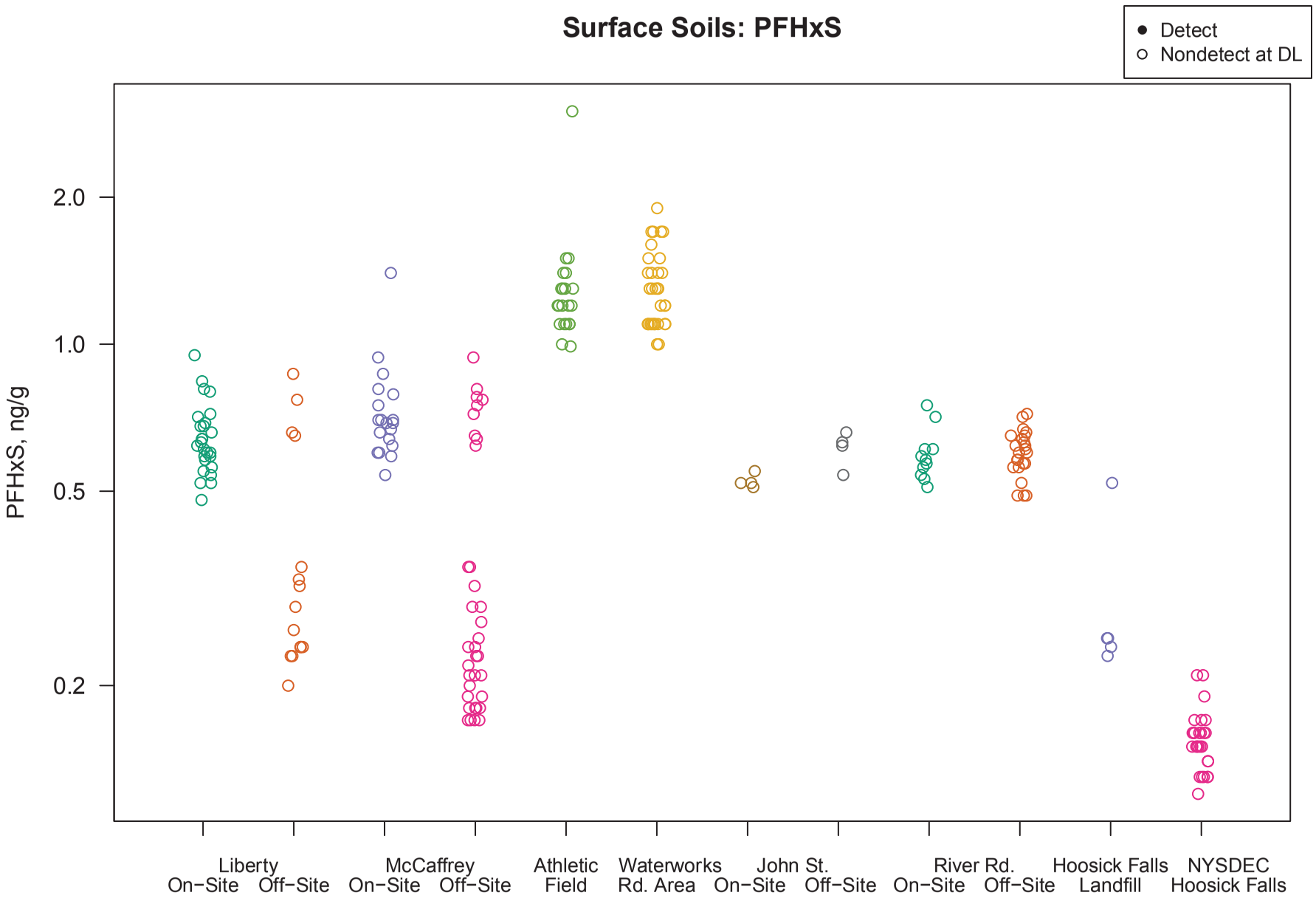

Surface Soils: PFDS
Detect
Nondetect at DL
PFDS, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty On-Site
Liberty Off-Site
McCaffrey On-Site
McCaffrey Off-Site
Athletic Field
Waterworks Rd. Area
John St. On-Site
John St. Off-Site
River Rd. On-Site
River Rd. Off-Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

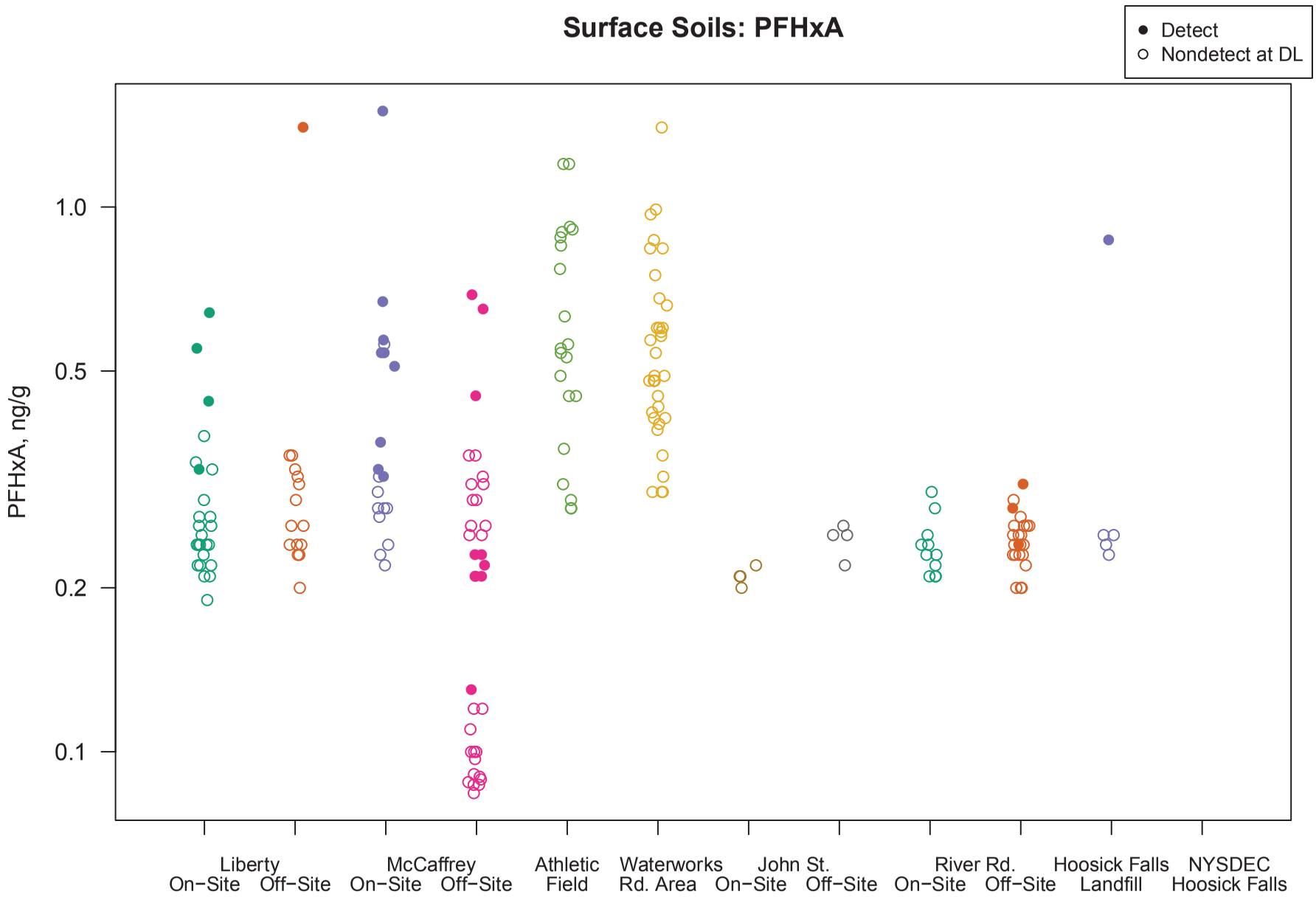

Surface Soils: PFDA
Detect
Nondetect at DL
PFDA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

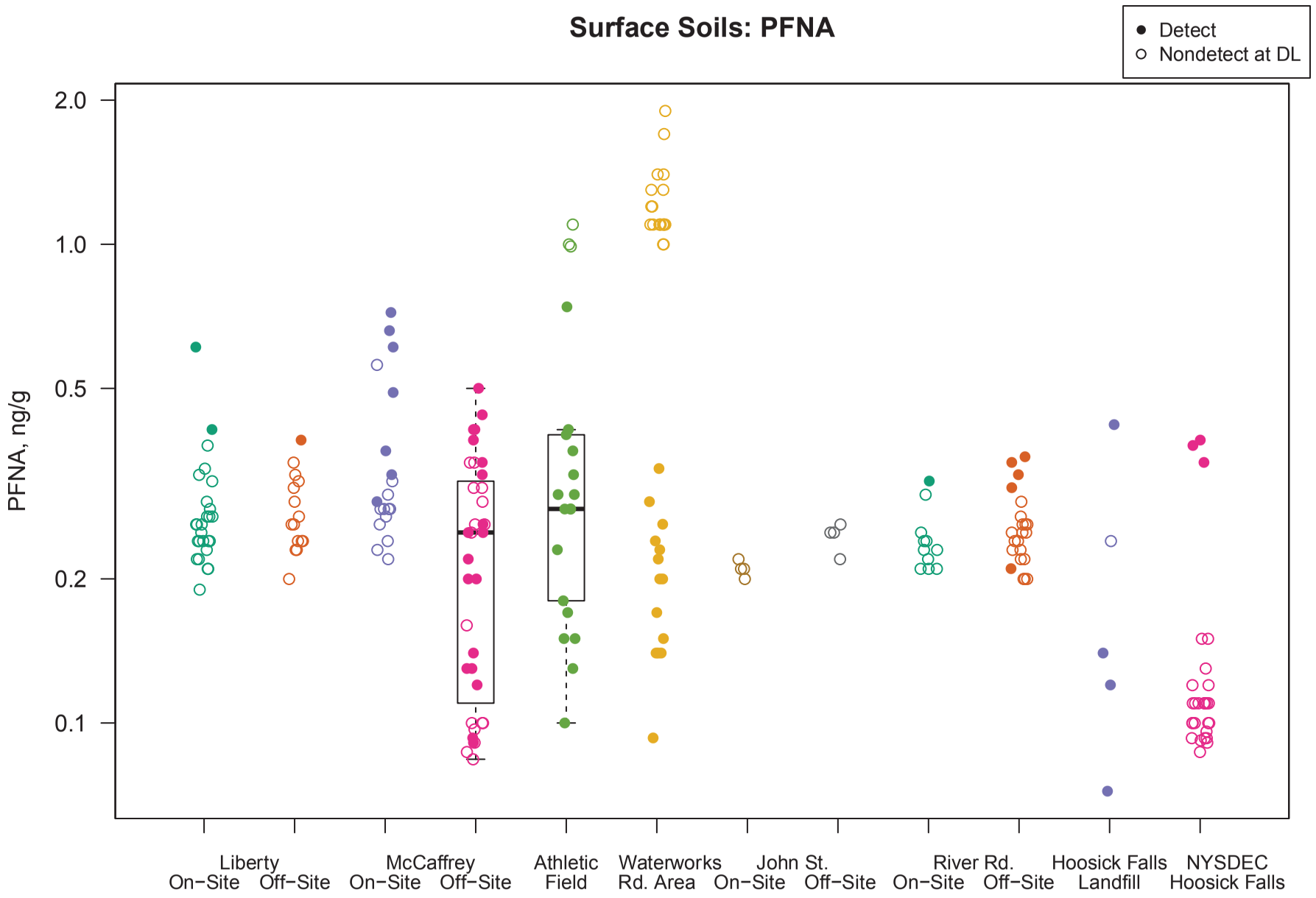

Surface Soils: PFDoA/PFDoDA
Detect
Nondetect at DL
PFDoA/PFDoDA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

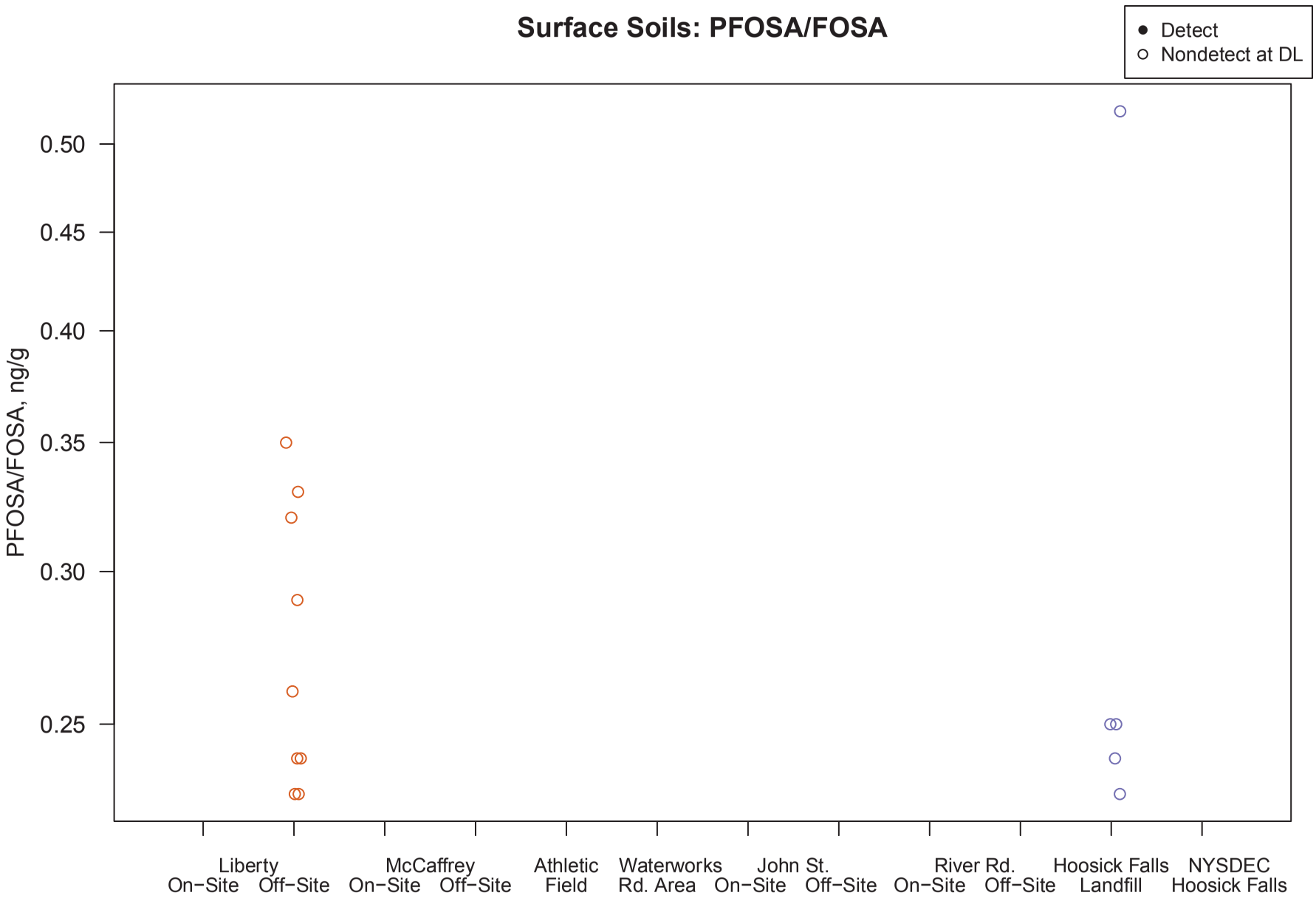

Surface Soils: PFHpS
Detect
Nondetect at DL
PFHpS, ng/g
0.50
0.45
0.40
0.35
0.30
0.25
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

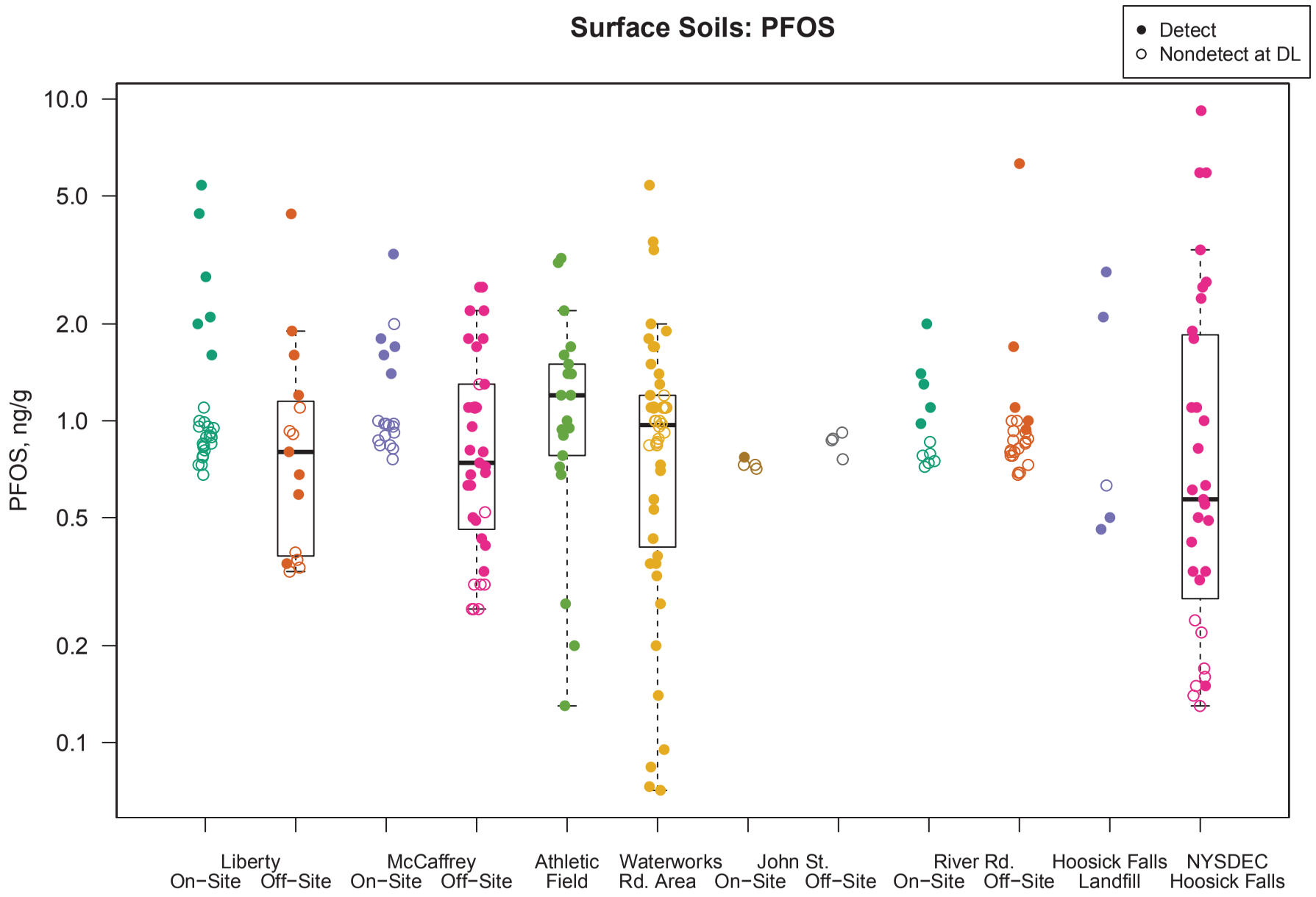

Surface Soils: PFHpA
Detect
Nondetect at DL
PFHpA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

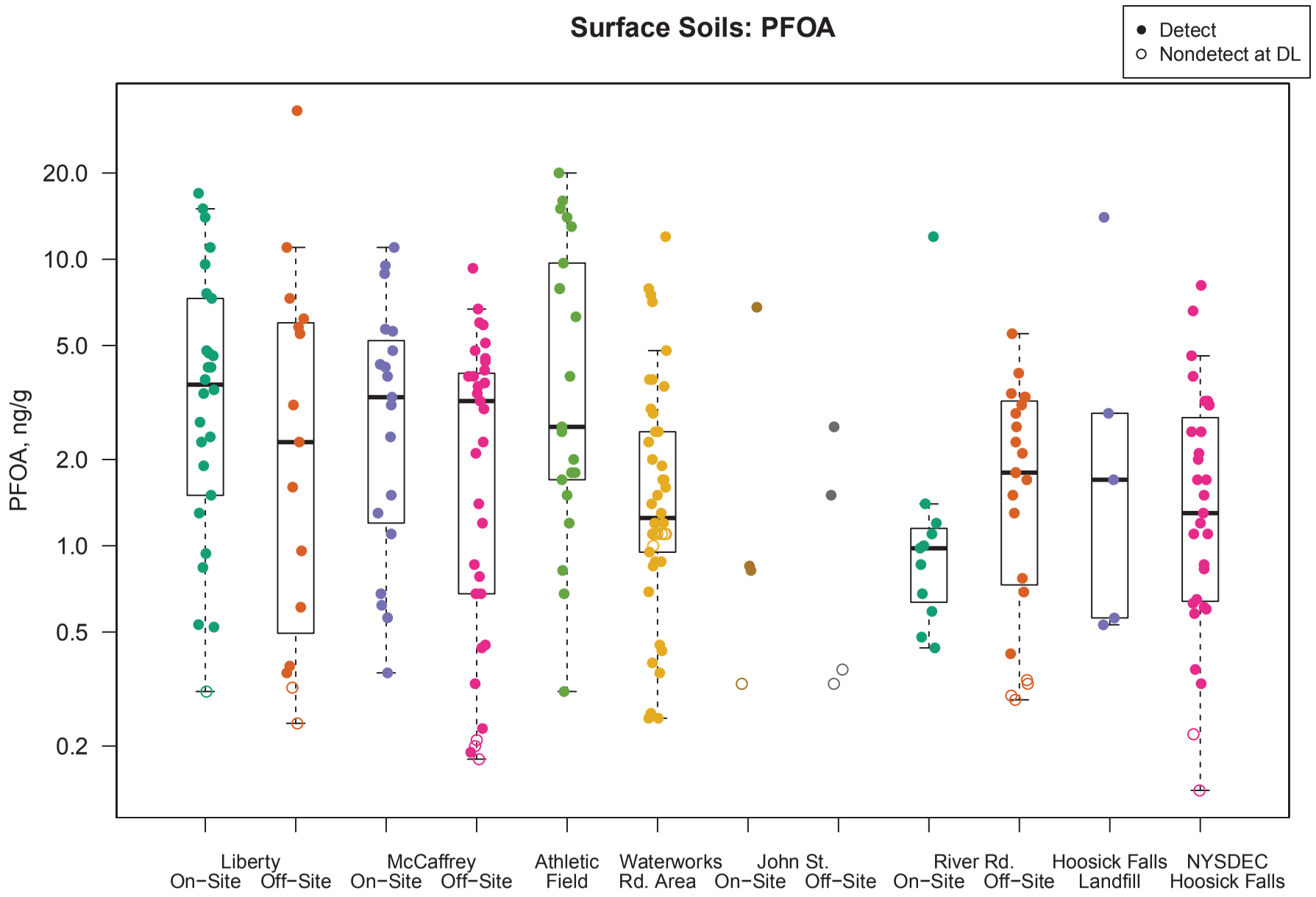

Surface Soils: PFHxS
Detect
Nondetect at DL
PFHxS, ng/g
2.0
1.0
0.5
0.2
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

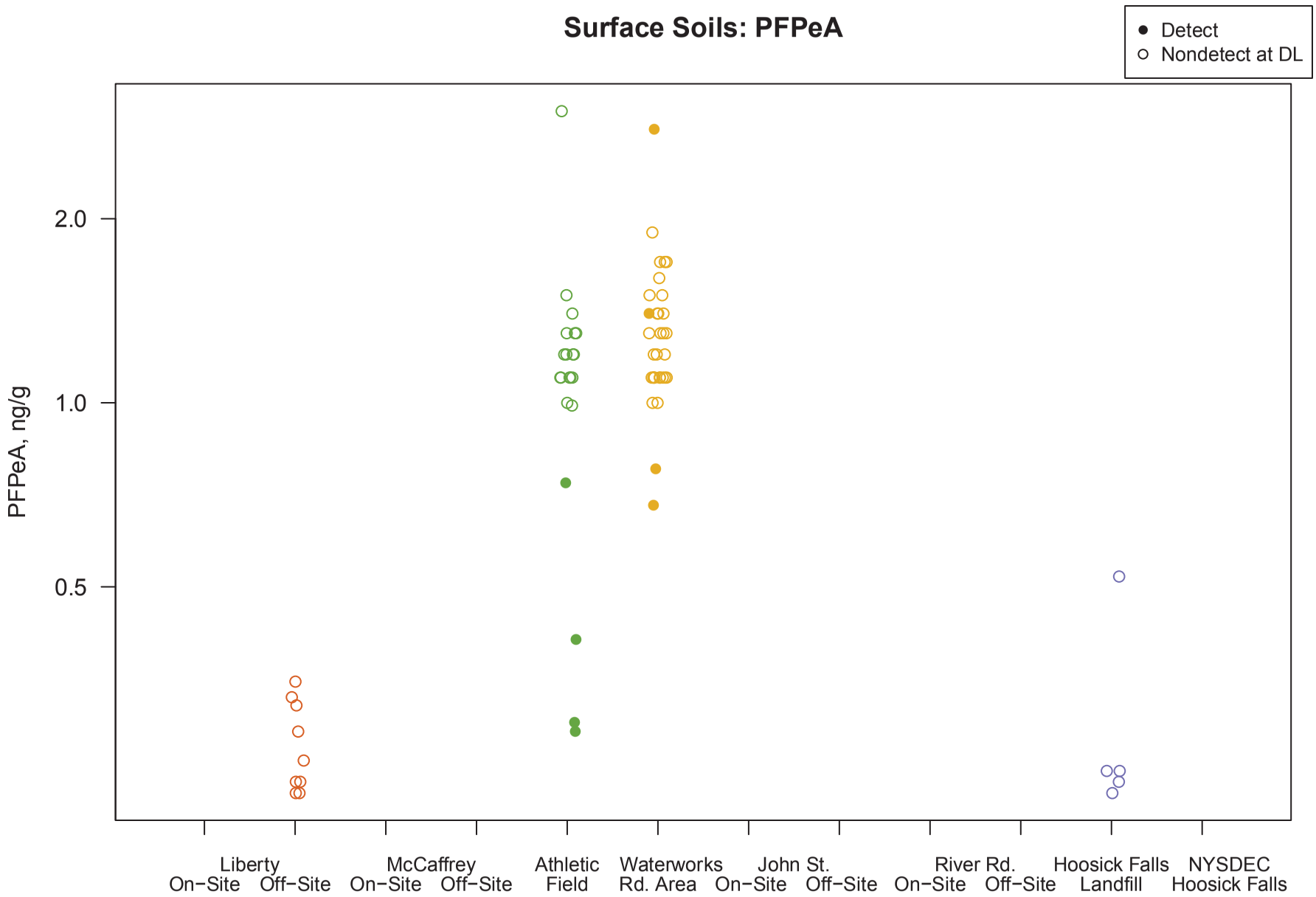

Surface Soils: PFHxA
Detect
Nondetect at DL
PFHxA, ng/g
1.0
0.5
0.2
0.1
Liberty On-Site
Liberty Off-Site
McCaffrey On-Site
McCaffrey Off-Site
Athletic Field
Waterworks Rd. Area
John St. On-Site
John St. Off-Site
River Rd. On-Site
River Rd. Off-Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

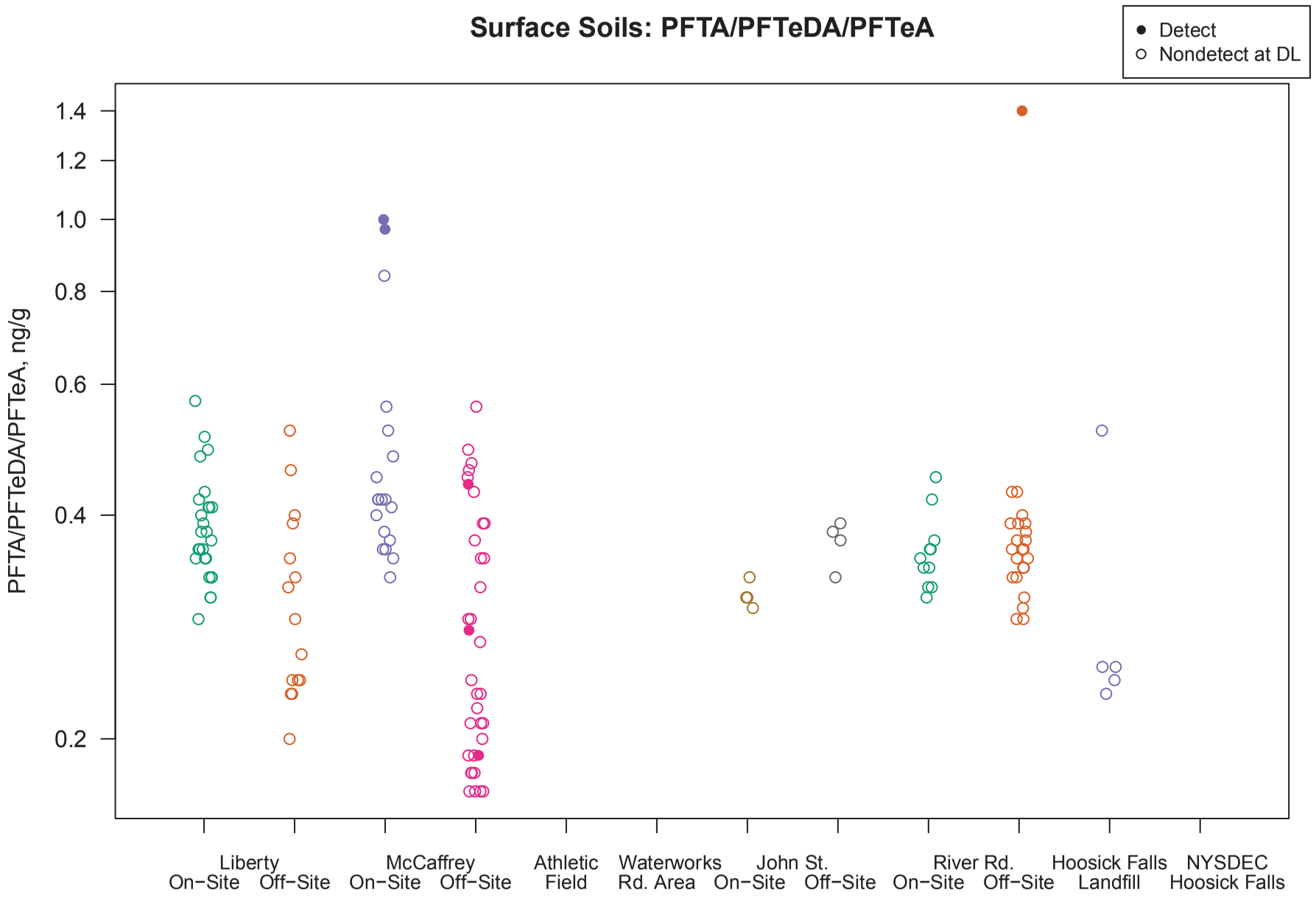

Surface Soils: PFNA
Detect
Nondetect at DL
PFNA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

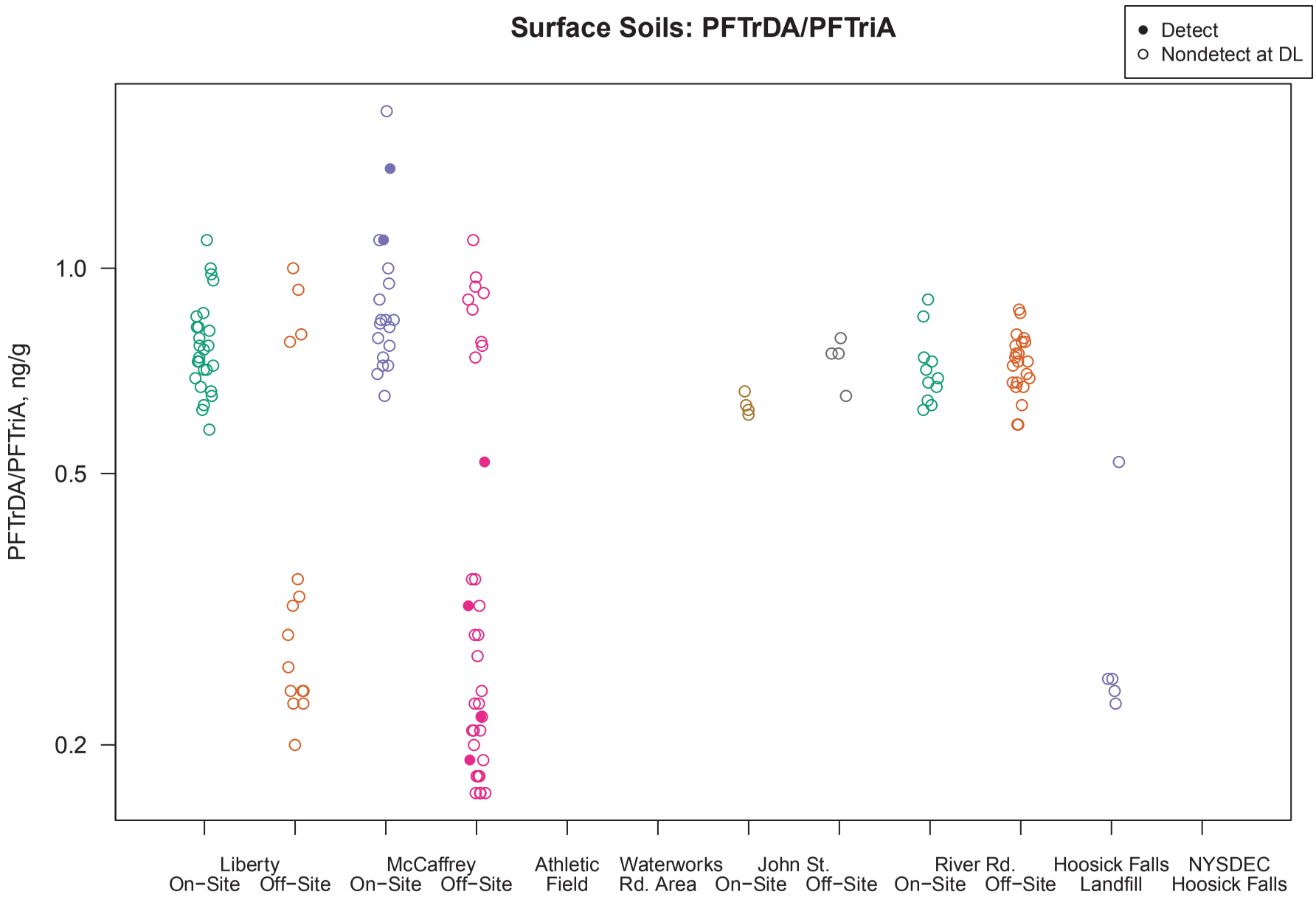

Surface Soils: PFOSA/FOSA
Detect
Nondetect at DL
PFOSA/FOSA, ng/g
0.50
0.45
0.40
0.35
0.30
0.25
Liberty On-Site
Liberty Off-Site
McCaffrey On-Site
McCaffrey Off-Site
Athletic Field
Waterworks Rd. Area
John St. On-Site
John St. Off-Site
River Rd. On-Site
River Rd. Off-Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

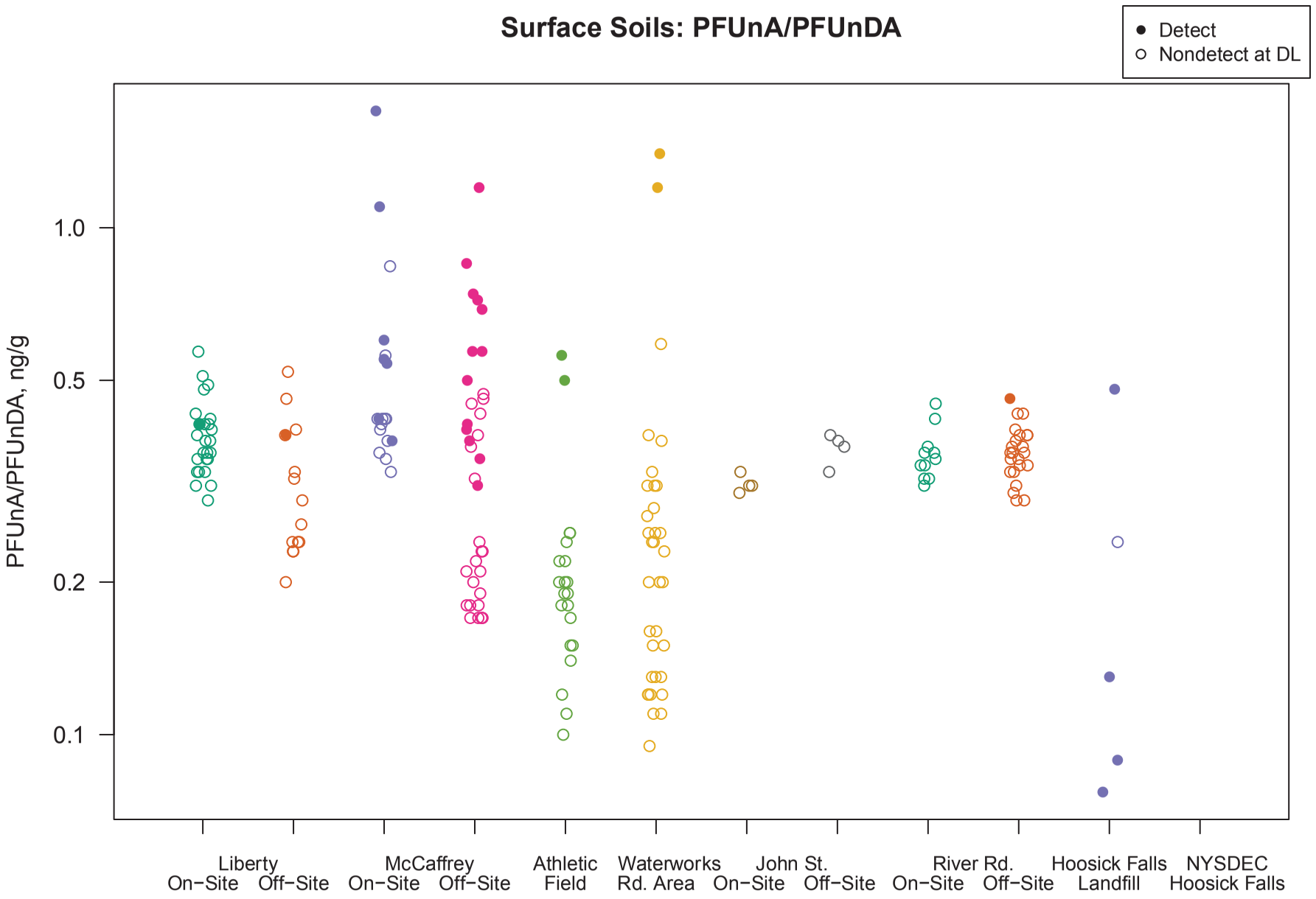

Surface Soils: PFOS
Detect
Nondetect at DL
PFOS, ng/g
10.0
5.0
2.0
1.0
0.5
0.2
0.1
Liberty On-Site
Liberty Off-Site
McCaffrey On-Site
McCaffrey Off-Site
Athletic Field
Waterworks Rd. Area
John St. On-Site
John St. Off-Site
River Rd. On-Site
River Rd. Off-Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

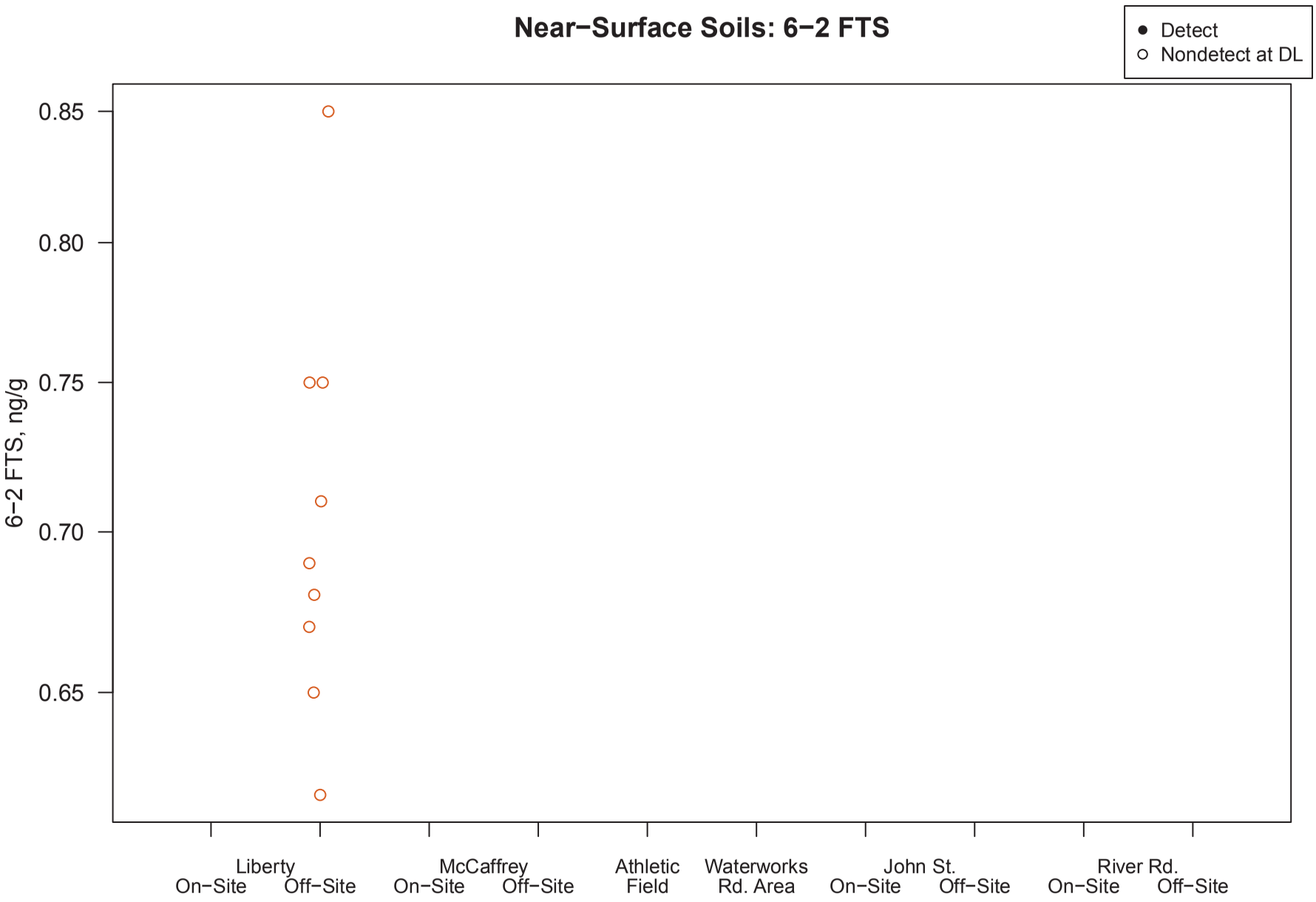

Surface Soils: PFOA
Detect
Nondetect at DL
PFOA, ng/g
20.0
10.0
5.0
2.0
1.0
0.5
0.2
Liberty On-Site
Liberty Off-Site
McCaffrey On-Site
McCaffrey Off-Site
Athletic Field
Waterworks Rd. Area
John St. On-Site
John St. Off-Site
River Rd. On-Site
River Rd. Off-Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

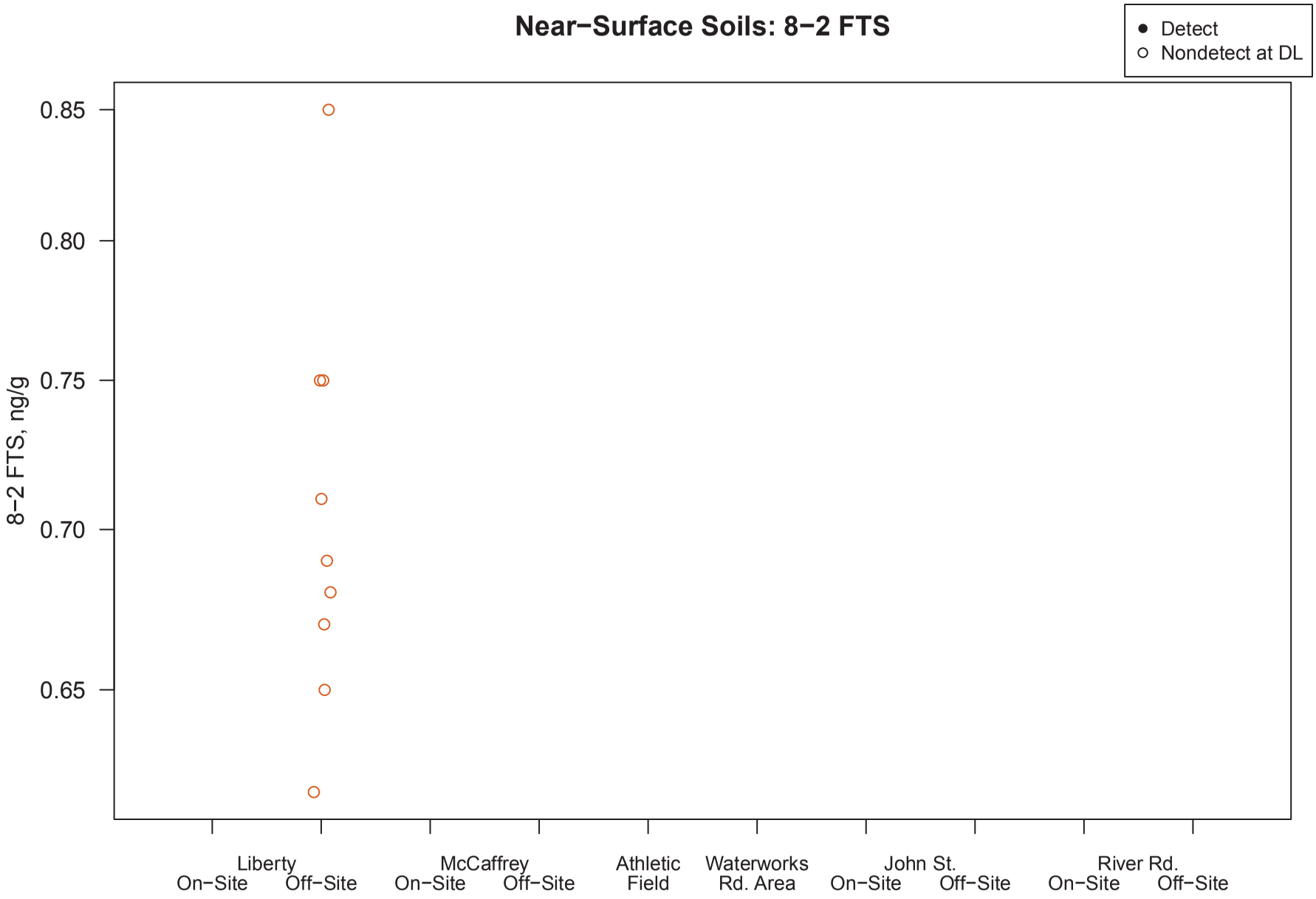

Surface Soils: PFPeA
Detect
Nondetect at DL
PFPeA, ng/g
2.0
1.0
0.5
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

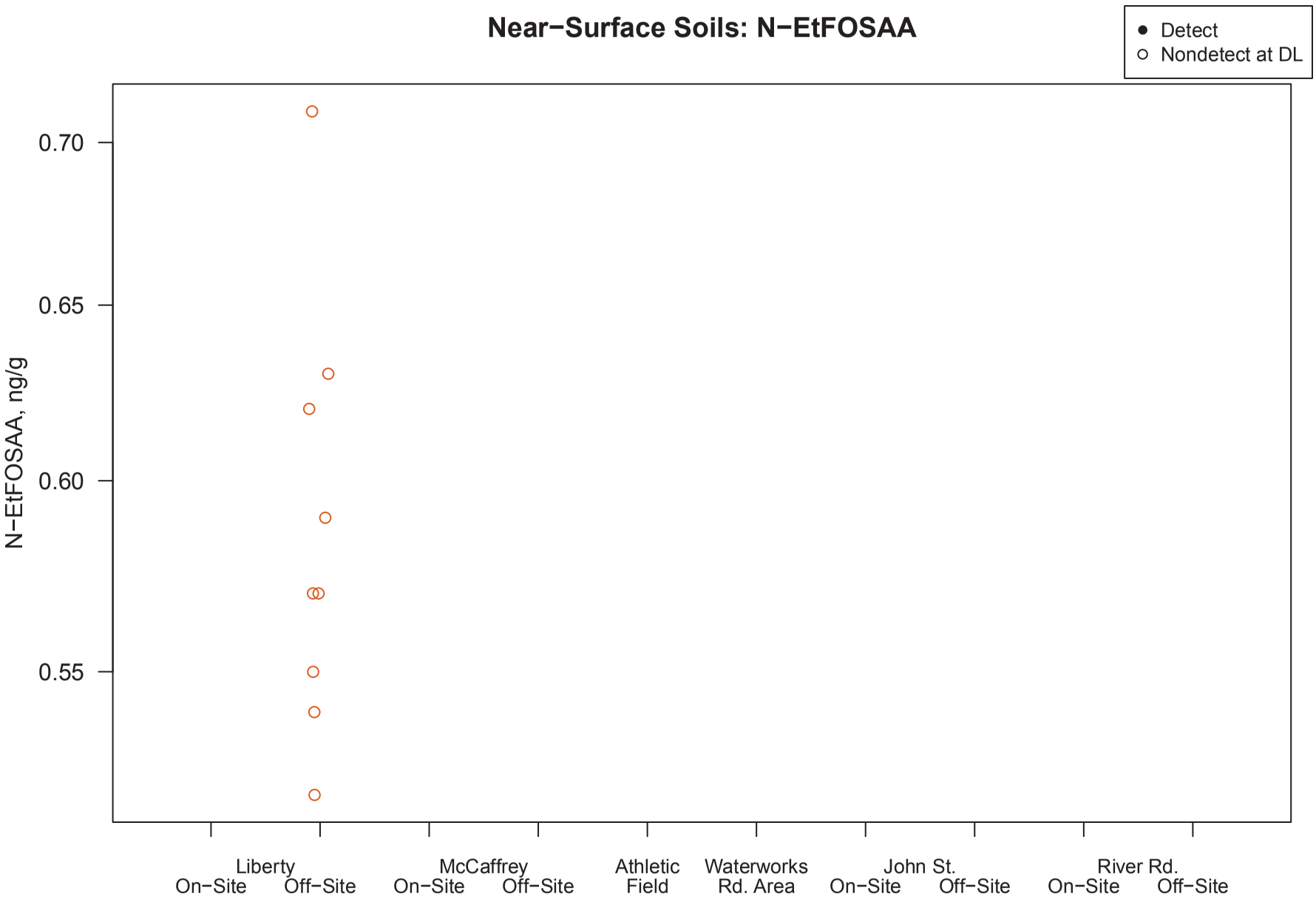

Surface Soils: PFTA/PFTeDA/PFTeA
Detect
Nondetect at DL
PFTA/PFTeDA/PFTeA, ng/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

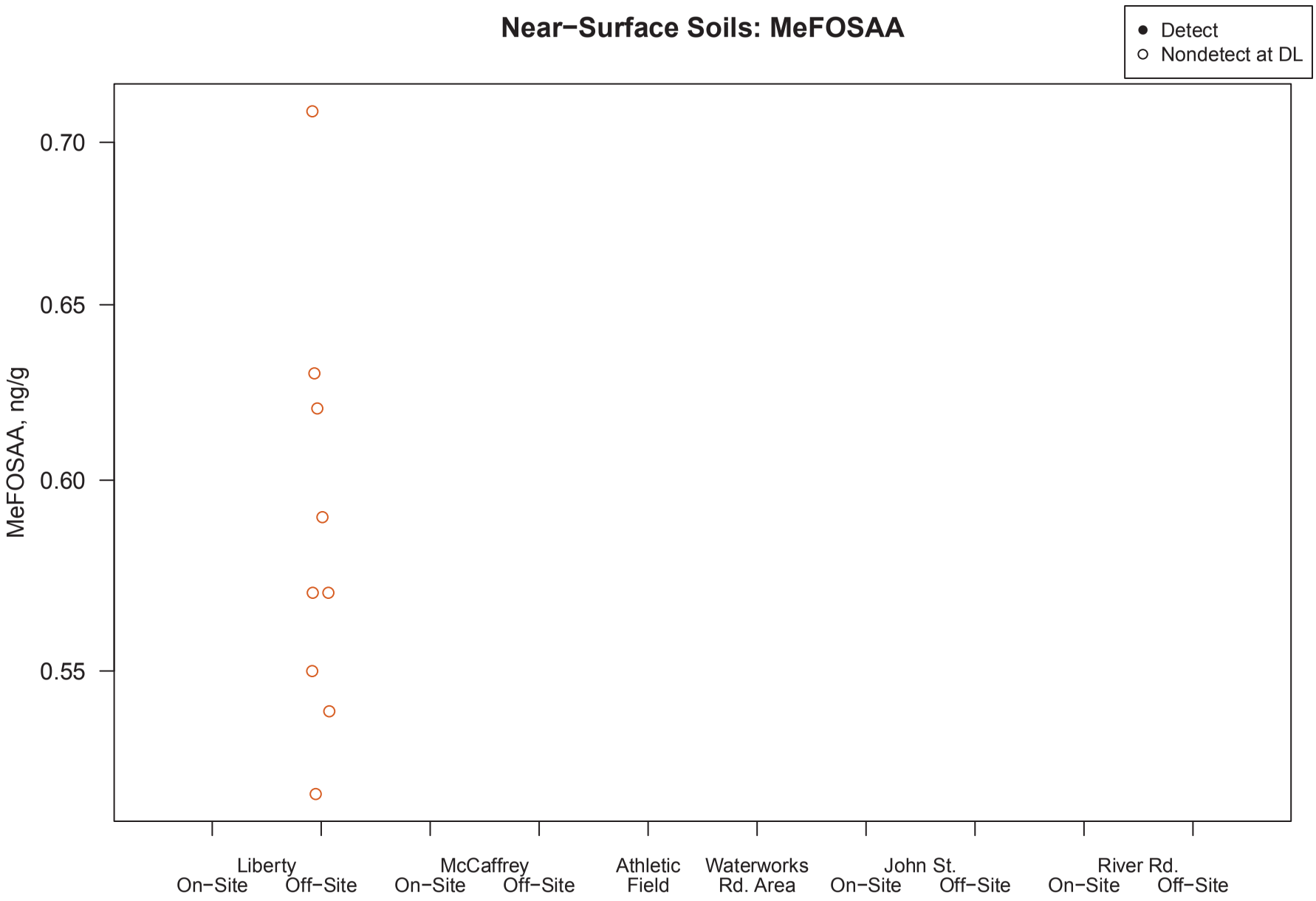

Surface Soils: PFTrDA/PFTriA
Detect
Nondetect at DL
PFTrDA/PFTriA, ng/g
1.0
0.5
0.2
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

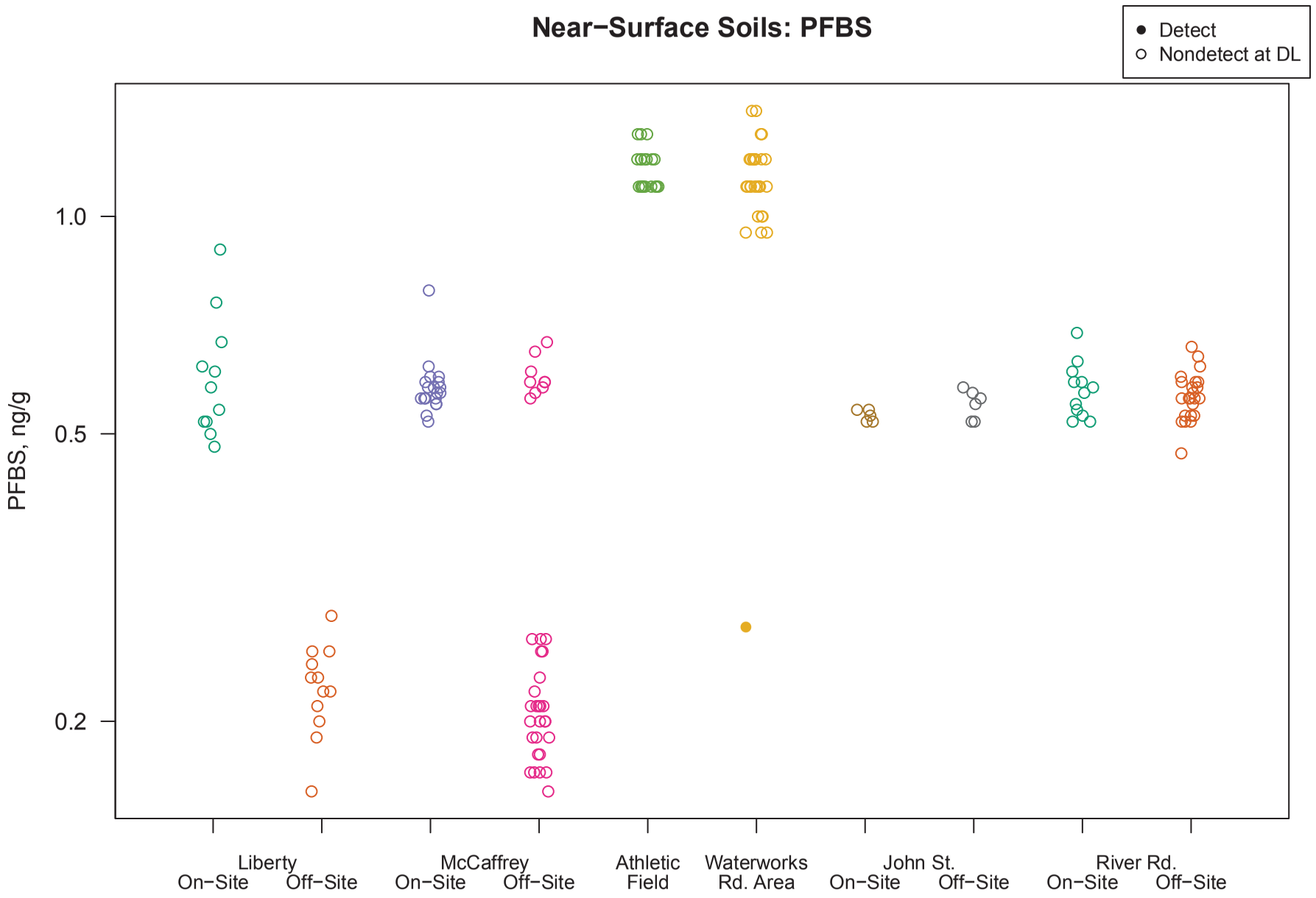

Surface Soils: PFUnA/PFUnDA
Detect
Nondetect at DL
PFUnA/PFUnDA, ng/g
1.0
0.5
0.2
0.1
Liberty On−Site
Liberty Off−Site
McCaffrey On−Site
McCaffrey Off−Site
Athletic Field
Waterworks Rd. Area
John St. On−Site
John St. Off−Site
River Rd. On−Site
River Rd. Off−Site
Hoosick Falls Landfill
NYSDEC Hoosick Falls

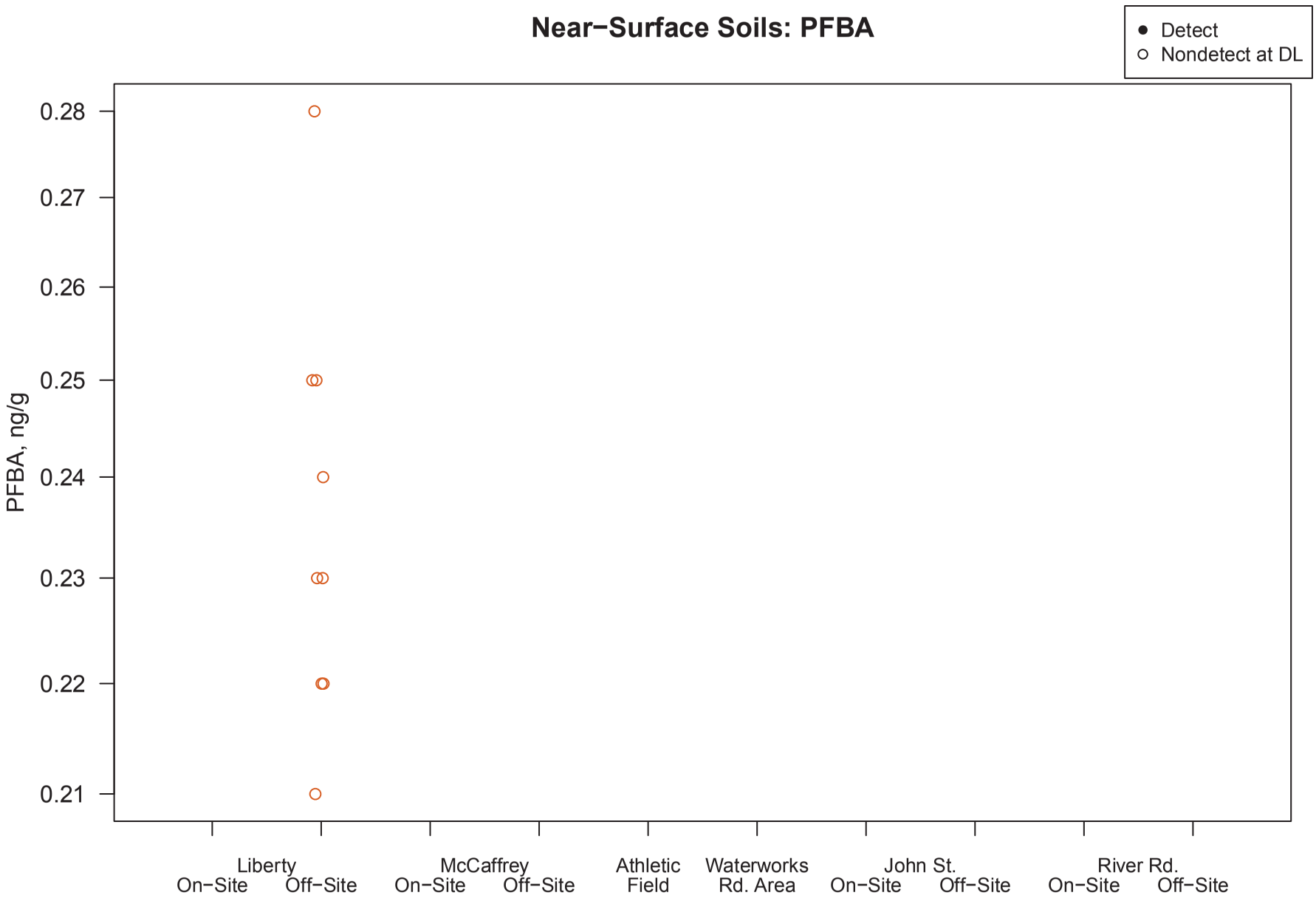

Near−Surface Soils: 6−2 FTS
Detect
Nondetect at DL
6−2 FTS, ng/g
0.85
0.80
0.75
0.70
0.65
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

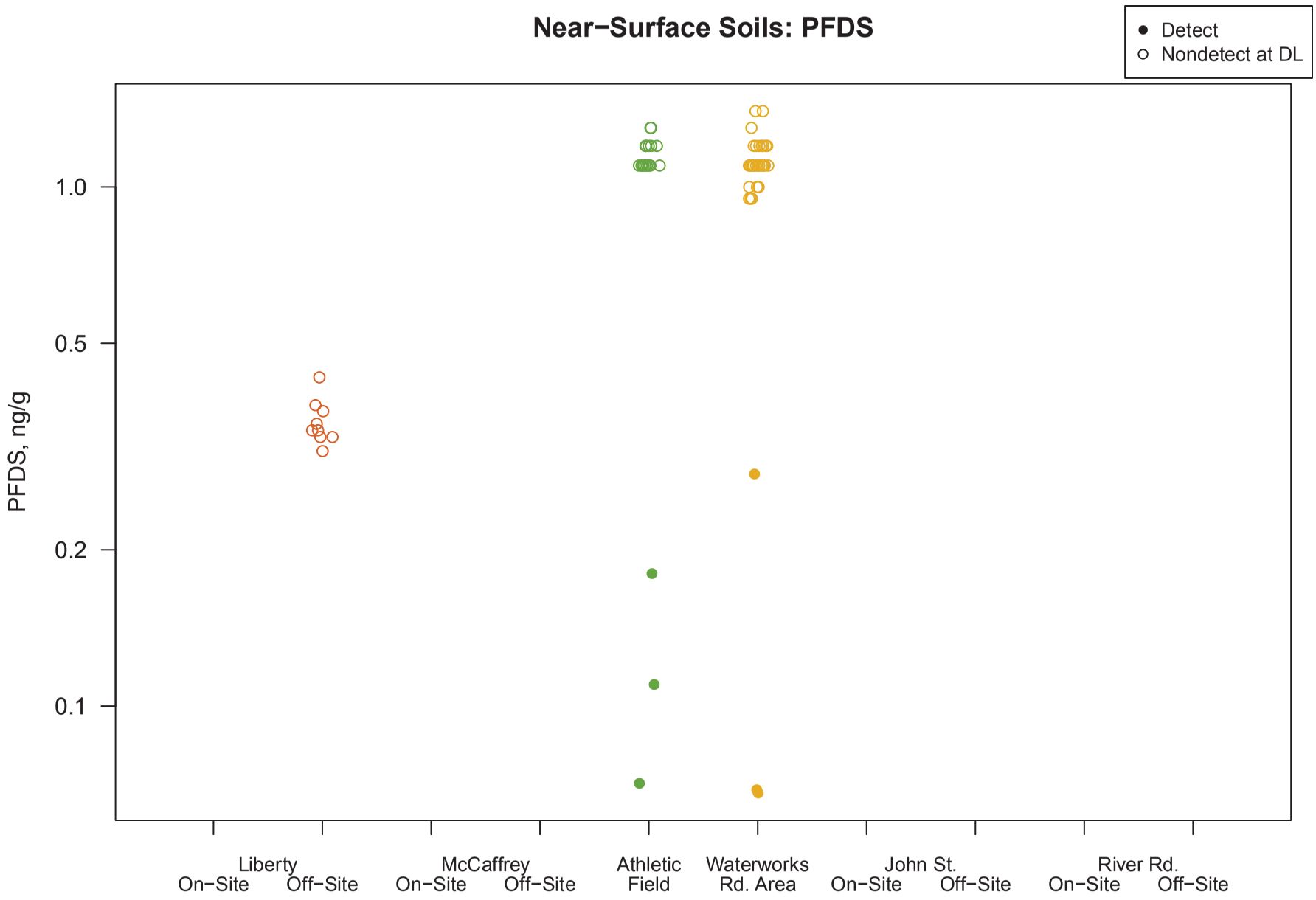

Near−Surface Soils: 8−2 FTS
Detect
Nondetect at DL
8−2 FTS, ng/g
0.85
0.80
0.75
0.70
0.65
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

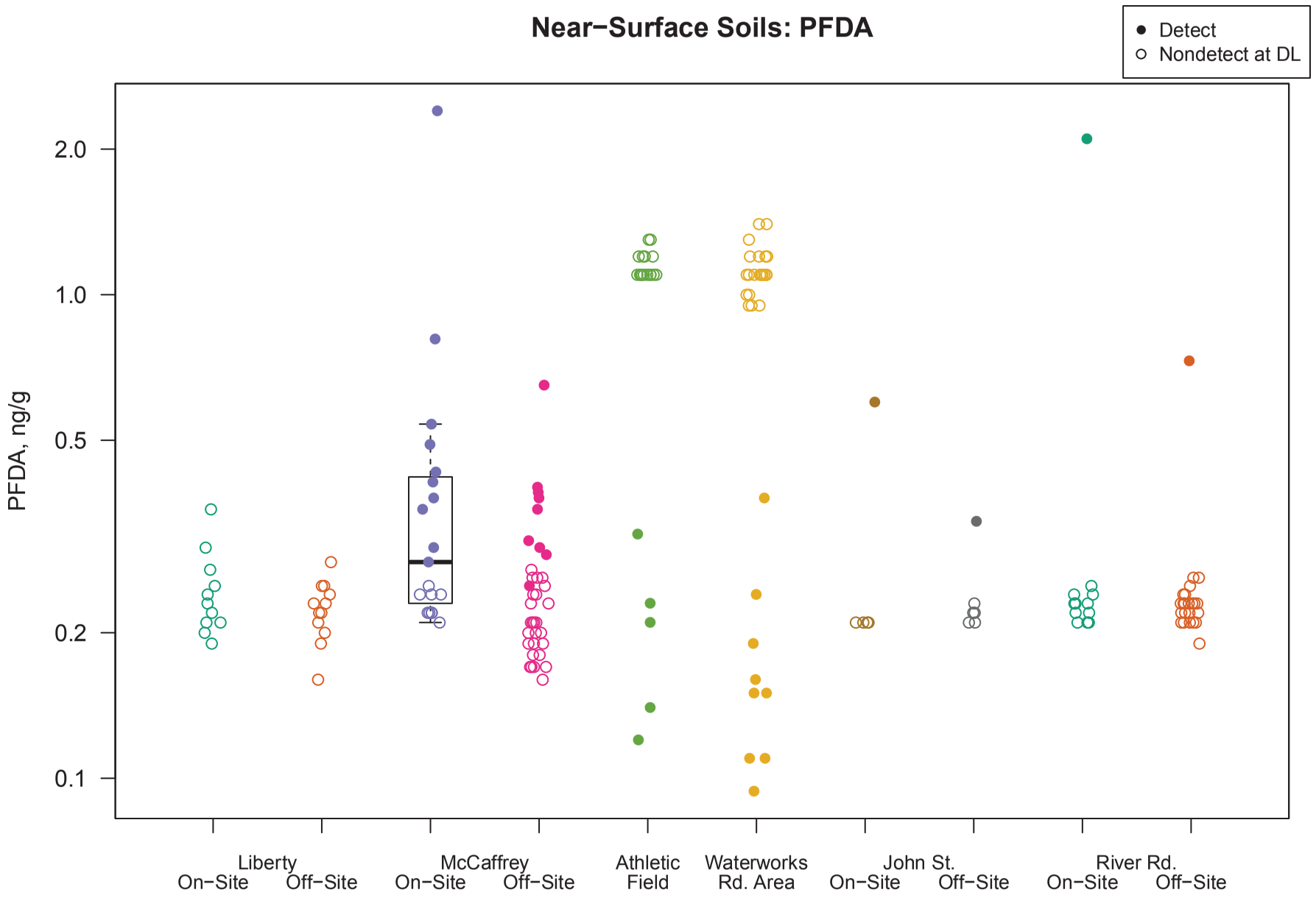

Near−Surface Soils: N−EtFOSAA
Detect
Nondetect at DL
N−EtFOSAA, ng/g
0.70
0.65
0.60
0.55
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

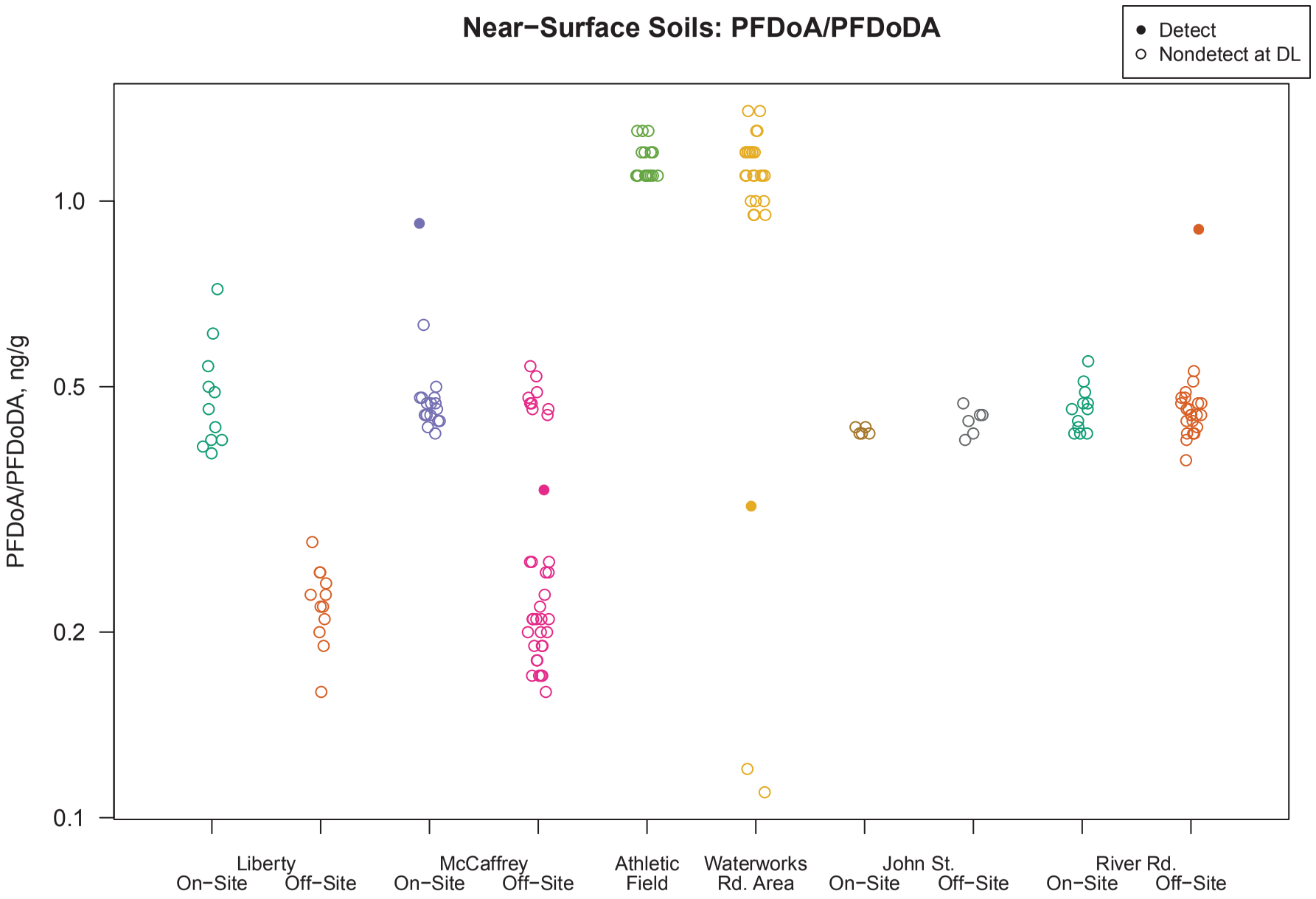

Near−Surface Soils: MeFOSAA
Detect
Nondetect at DL
MeFOSAA, ng/g
0.70
0.65
0.60
0.55
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

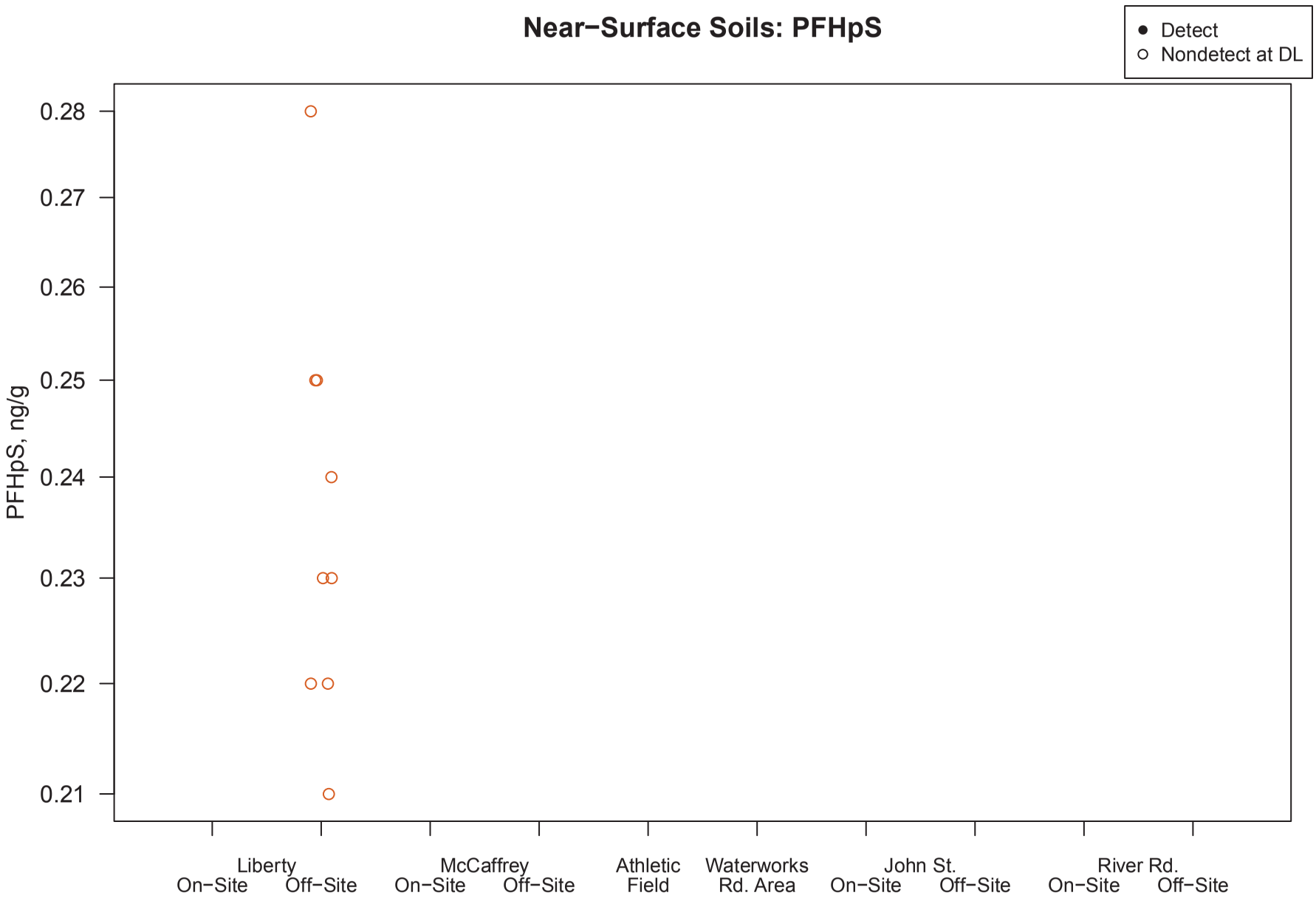

Near−Surface Soils: PFBS
Detect
Nondetect at DL
PFBS, ng/g
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

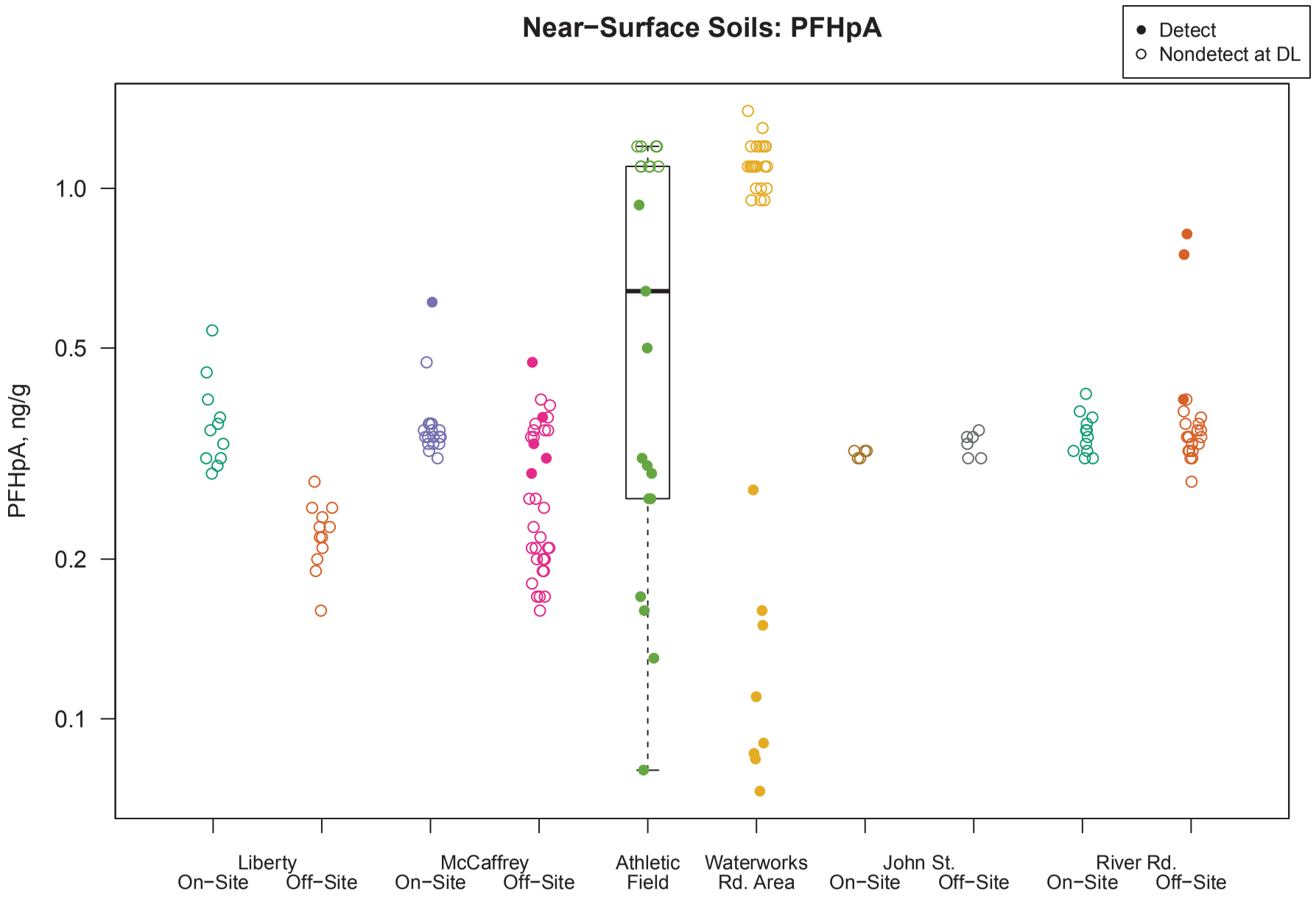

Near−Surface Soils: PFBA
Detect
Nondetect at DL
PFBA, ng/g
0.28
0.27
0.26
0.25
0.24
0.23
0.22
0.21
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

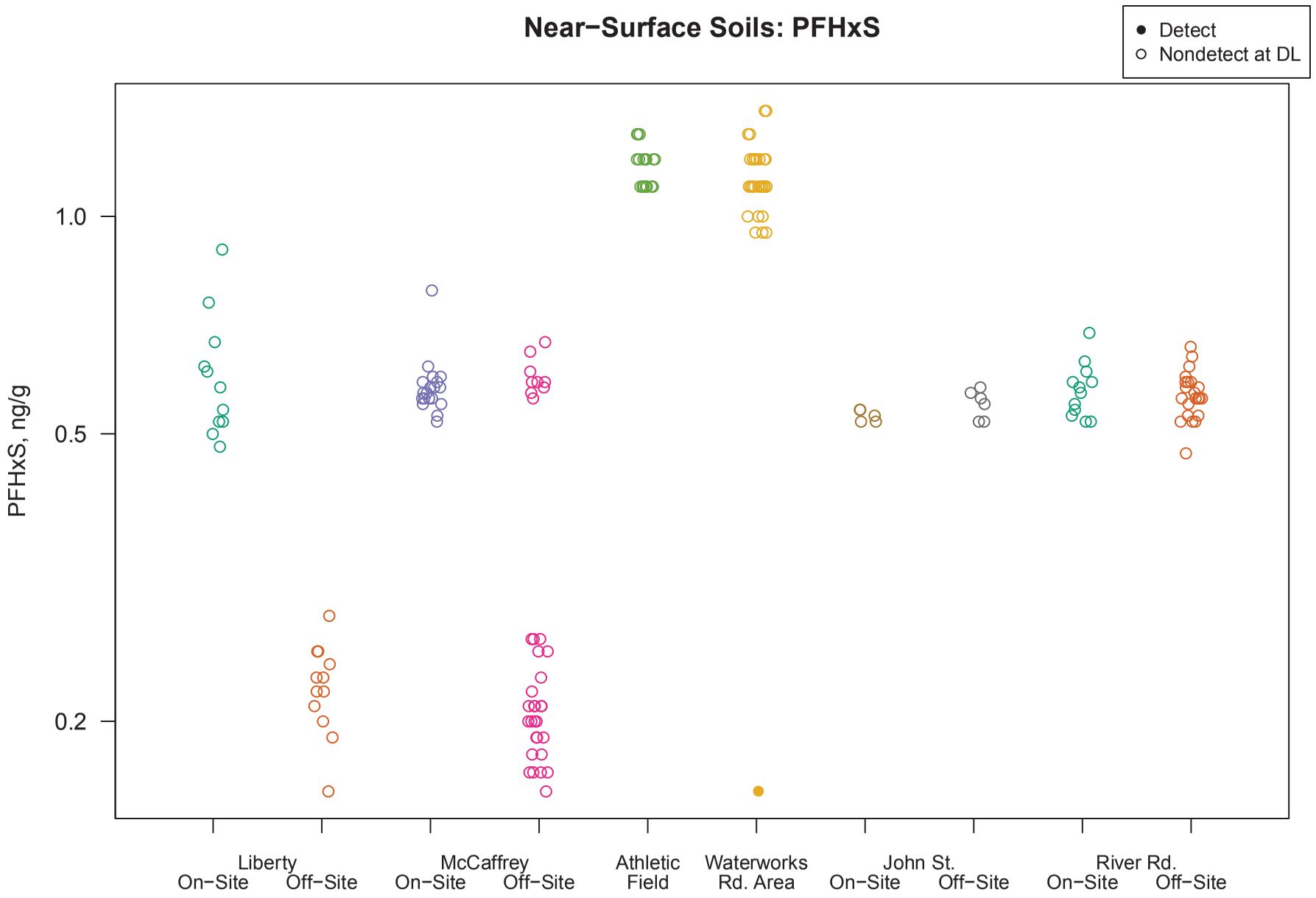

Near−Surface Soils: PFDS
Detect
Nondetect at DL
PFDS, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

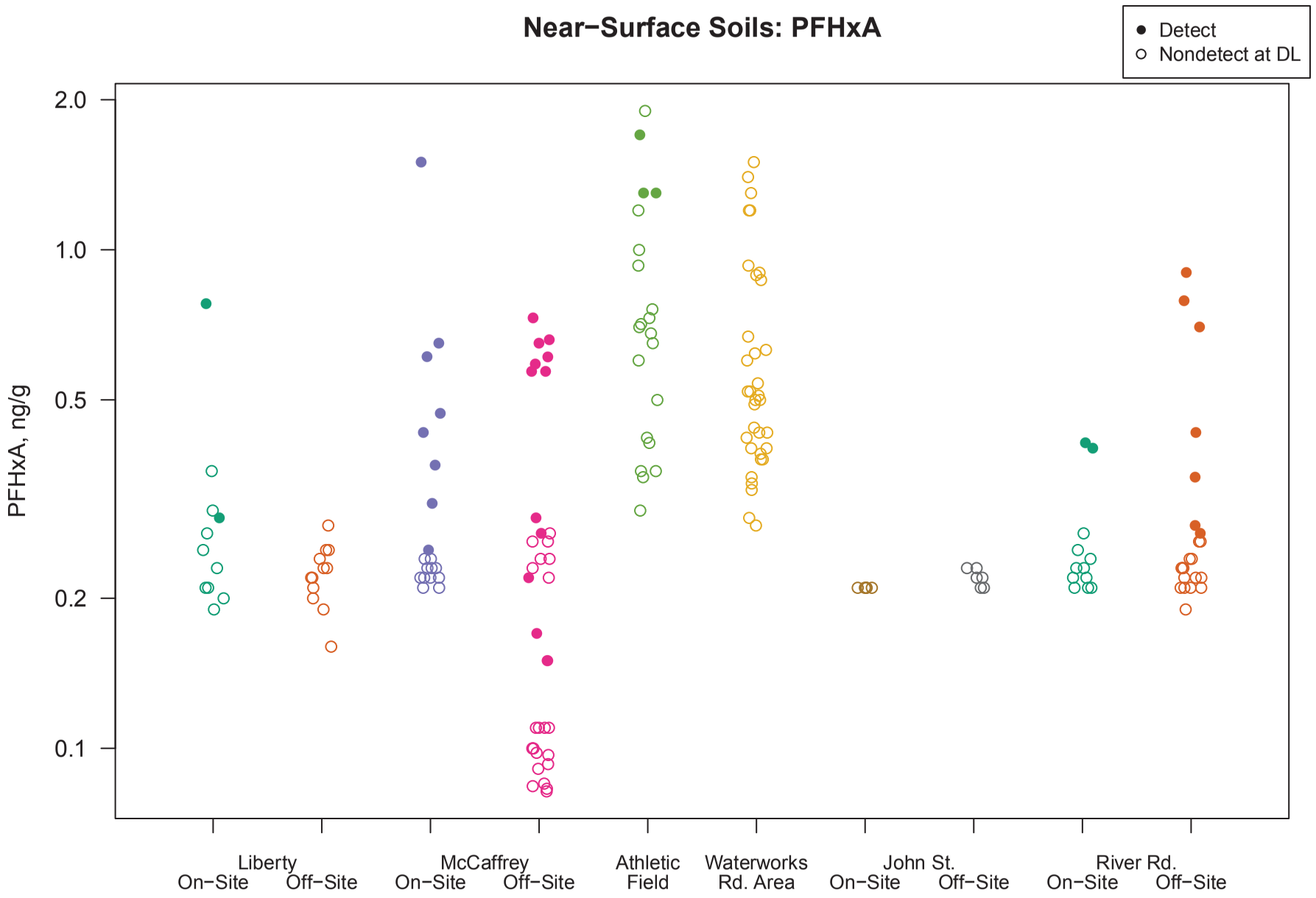

Near−Surface Soils: PFDA
Detect
Nondetect at DL
PFDA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

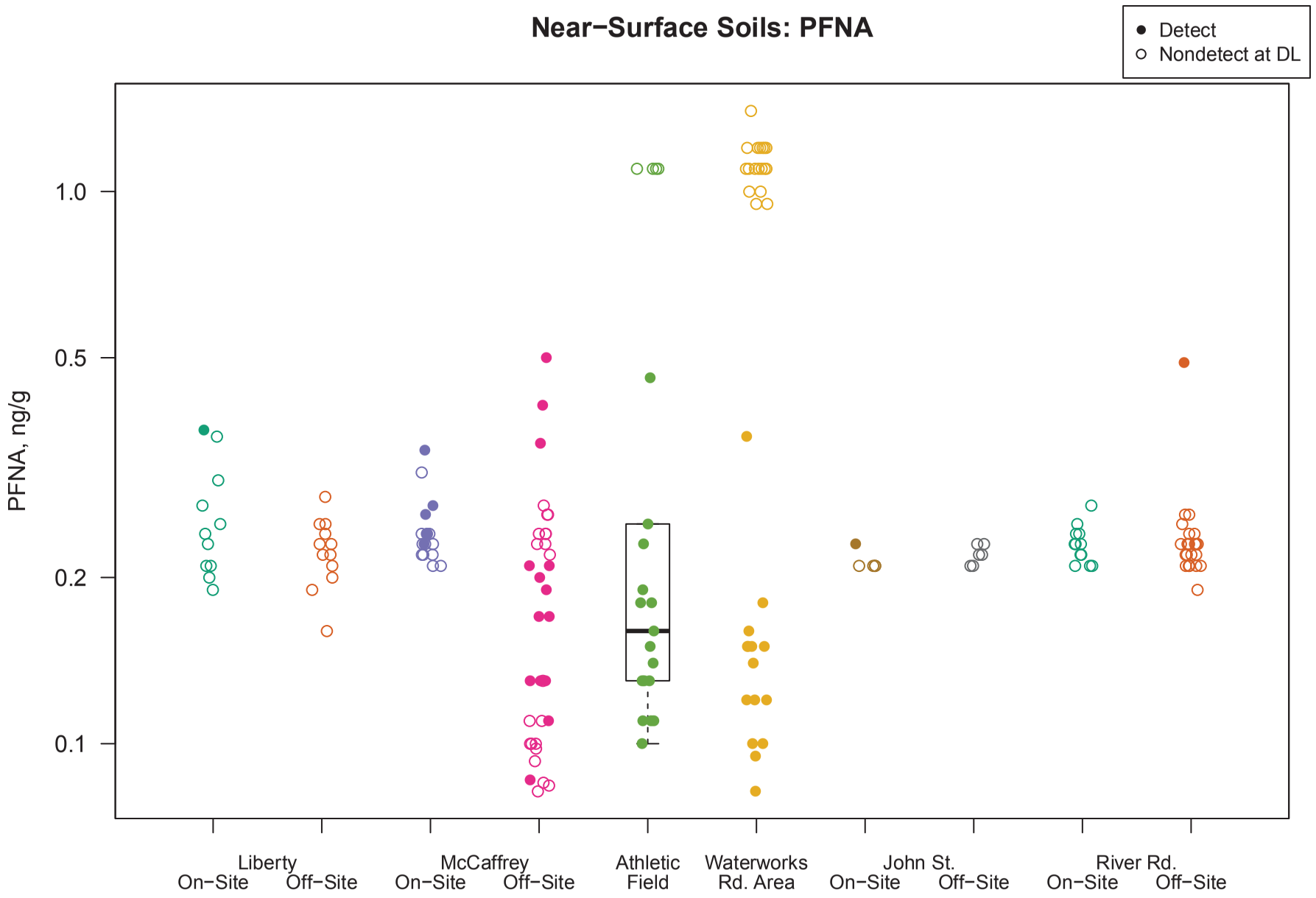

Near−Surface Soils: PFDoA/PFDoDA
Detect
Nondetect at DL
PFDoA/PFDoDA, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

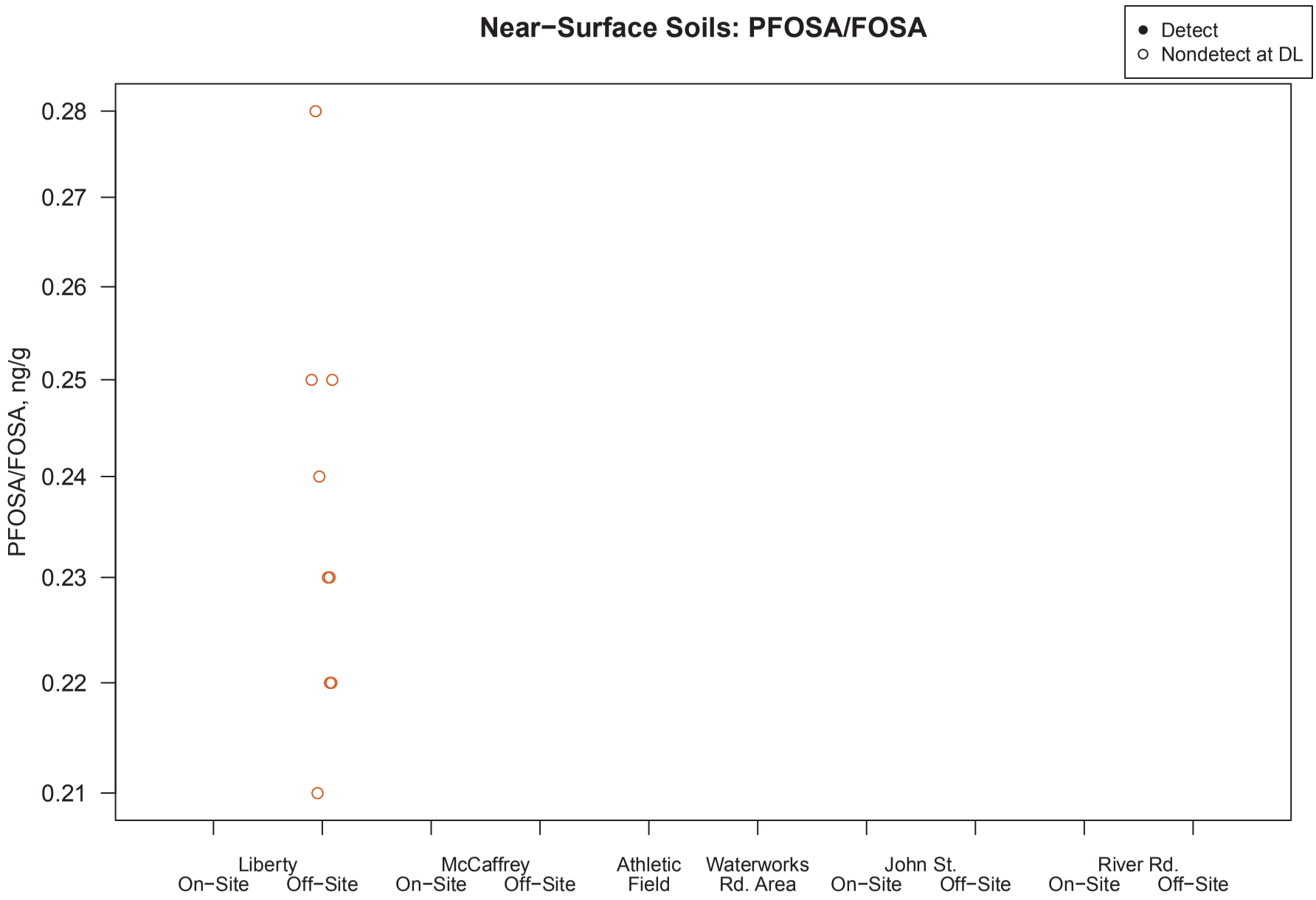

Near−Surface Soils: PFHpS
Detect
Nondetect at DL
PFHpS, ng/g
0.28
0.27
0.26
0.25
0.24
0.23
0.22
0.21
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

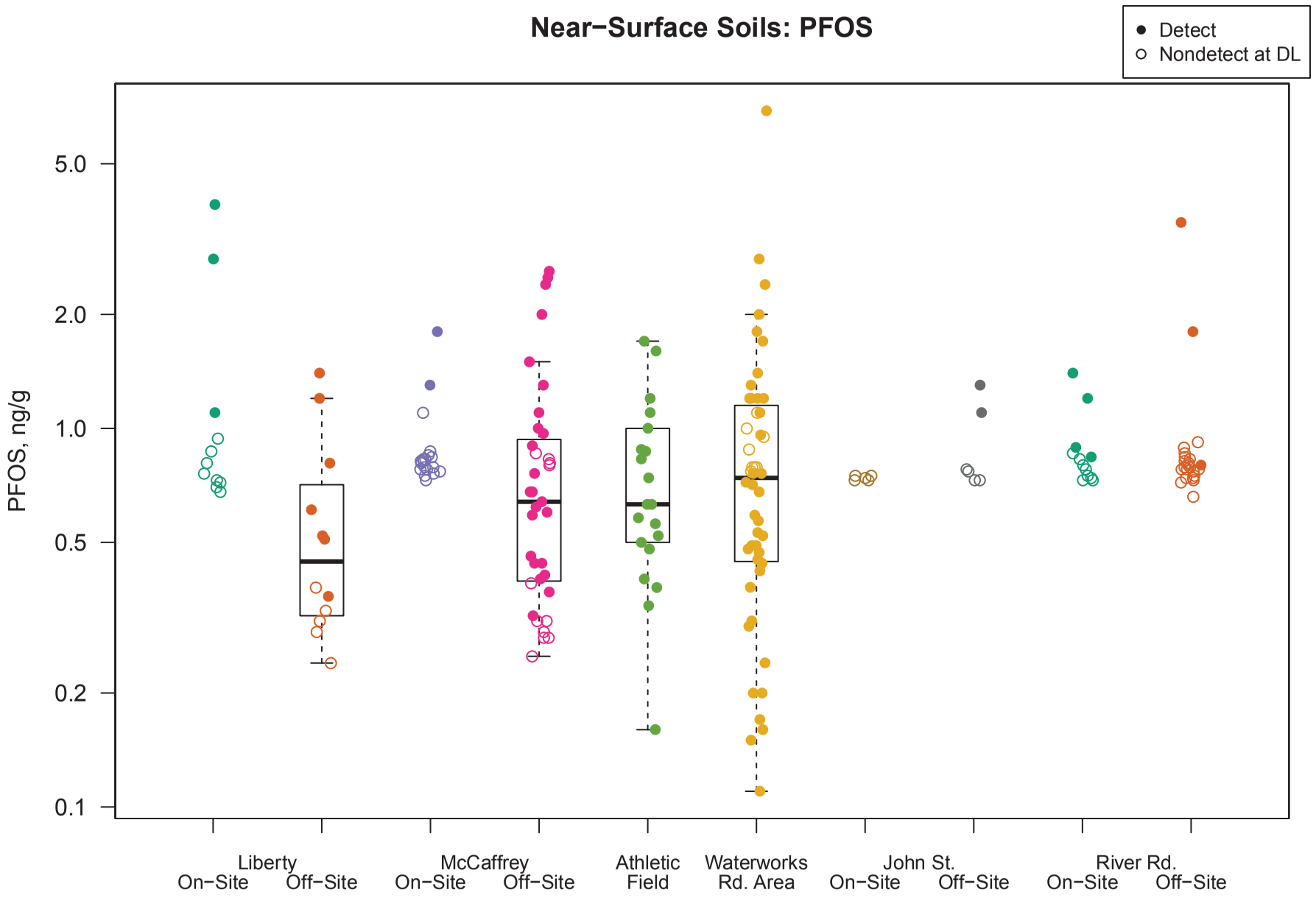

Near−Surface Soils: PFHpA
Detect
Nondetect at DL
PFHpA, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

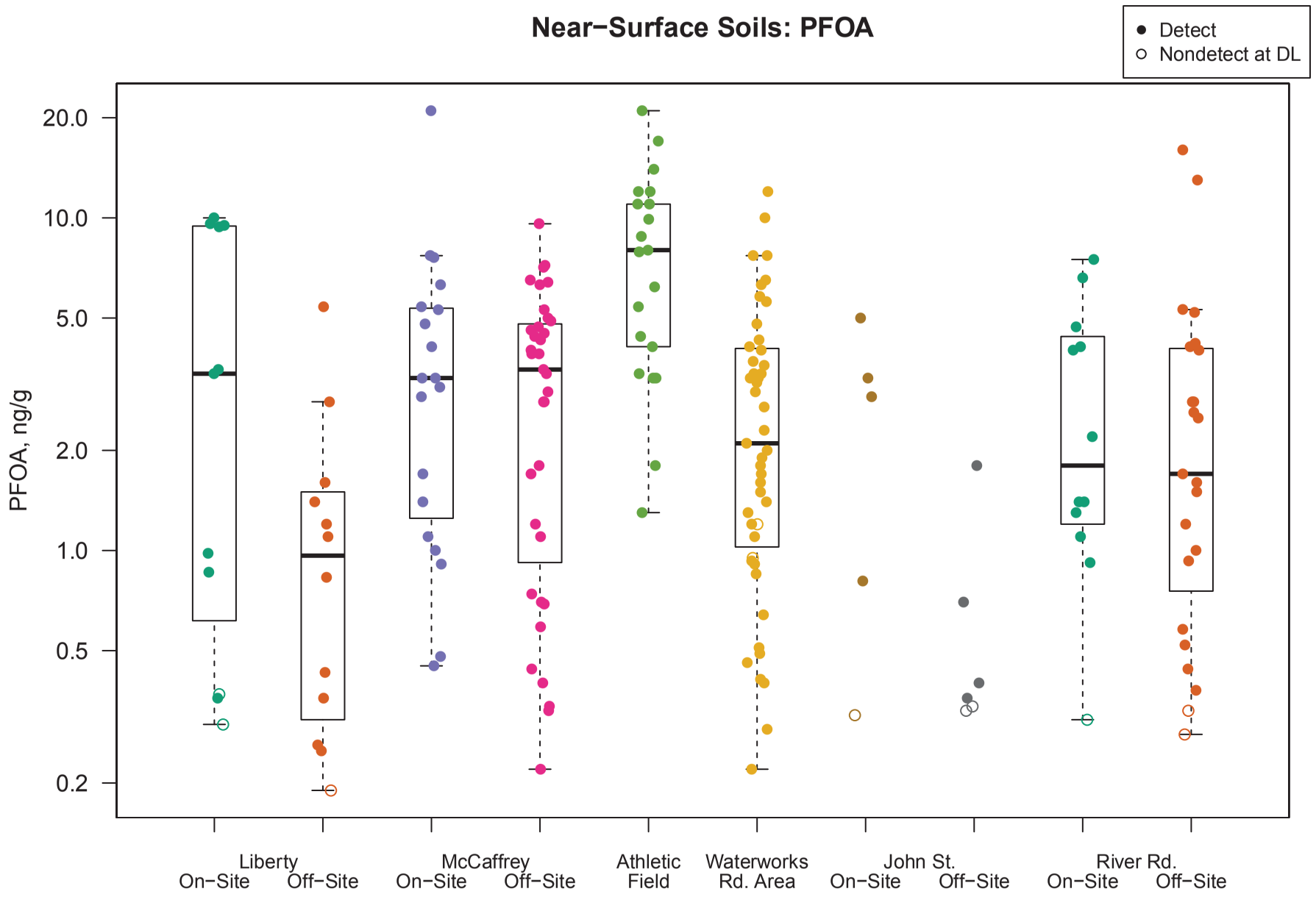

Near−Surface Soils: PFHxS
Detect
Nondetect at DL
PFHxS, ng/g
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

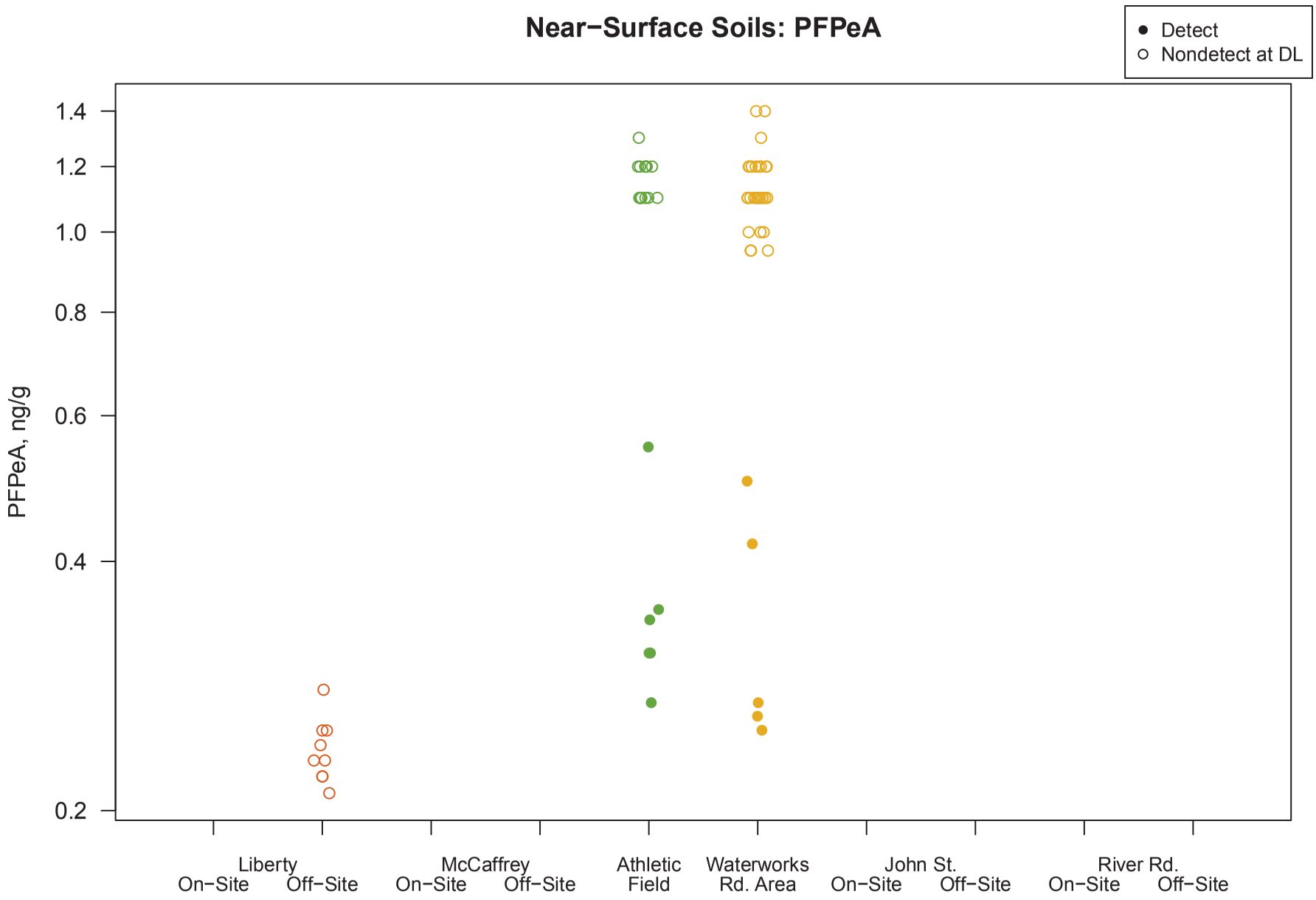

Near−Surface Soils: PFHxA
Detect
Nondetect at DL
PFHxA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

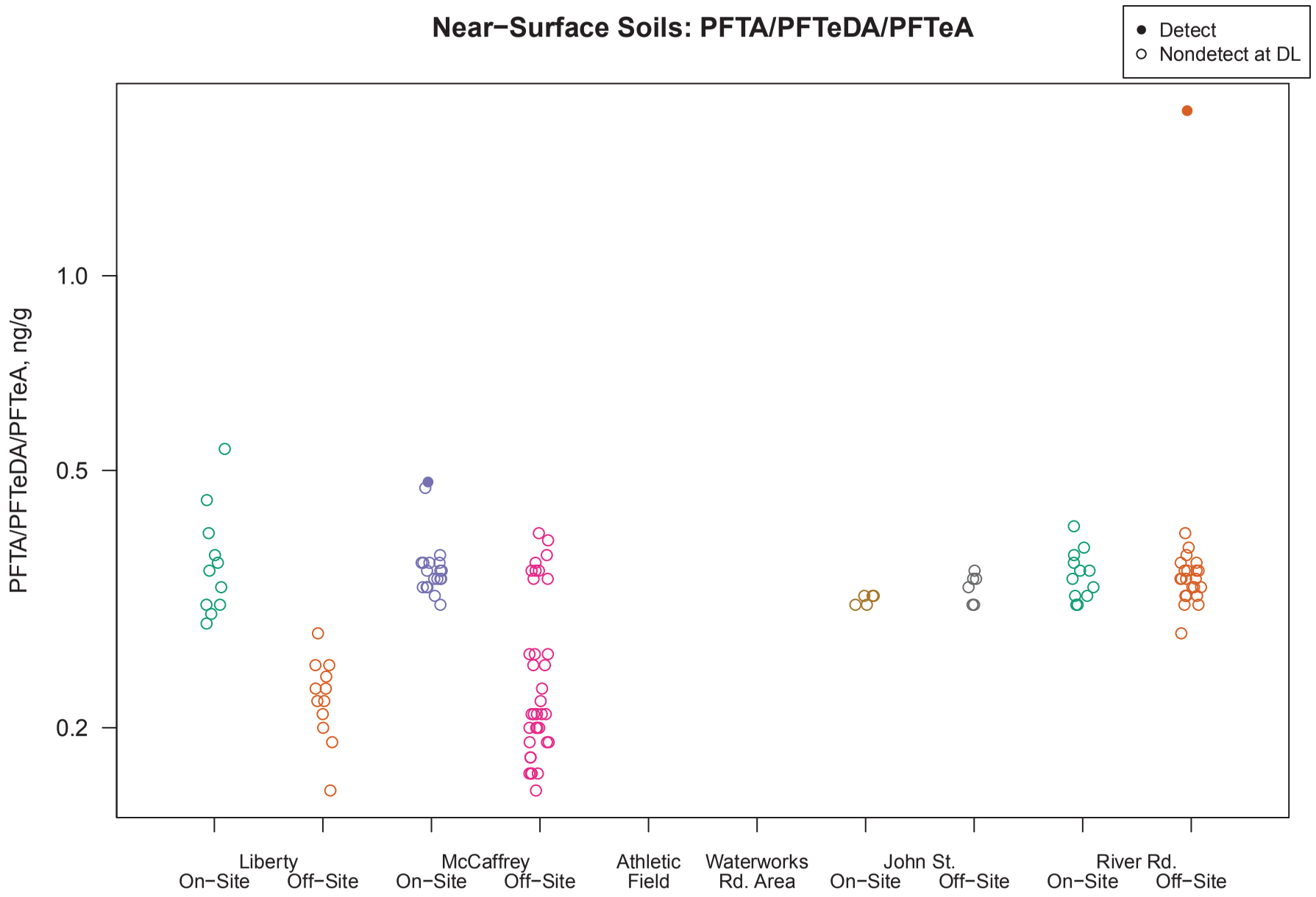

Near−Surface Soils: PFNA
Detect
Nondetect at DL
PFNA, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

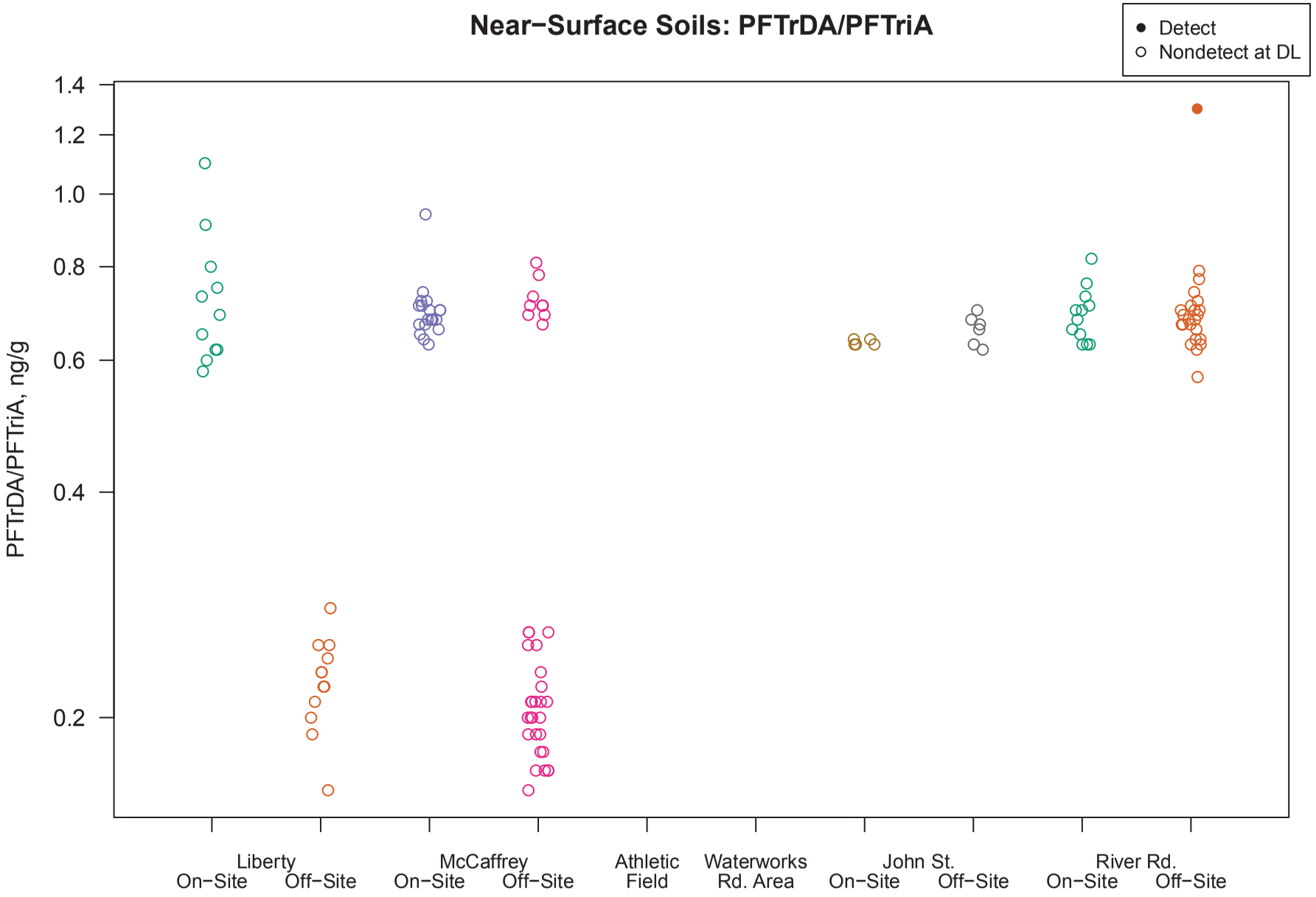

Near−Surface Soils: PFOSA/FOSA
Detect
Nondetect at DL
PFOSA/FOSA, ng/g
0.28
0.27
0.26
0.25
0.24
0.23
0.22
0.21
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

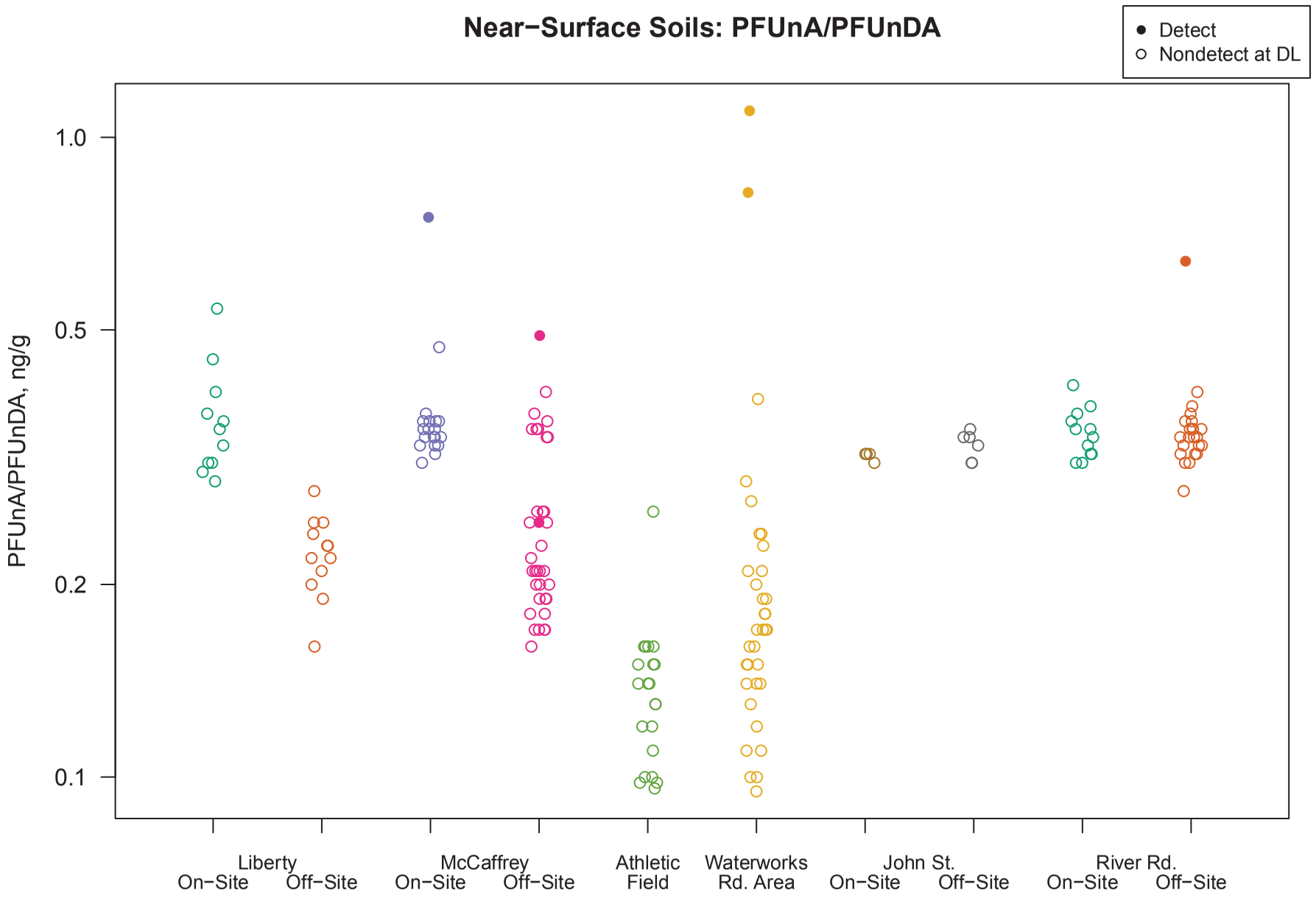

Near−Surface Soils: PFOS
Detect
Nondetect at DL
PFOS, ng/g
5.0
2.0
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

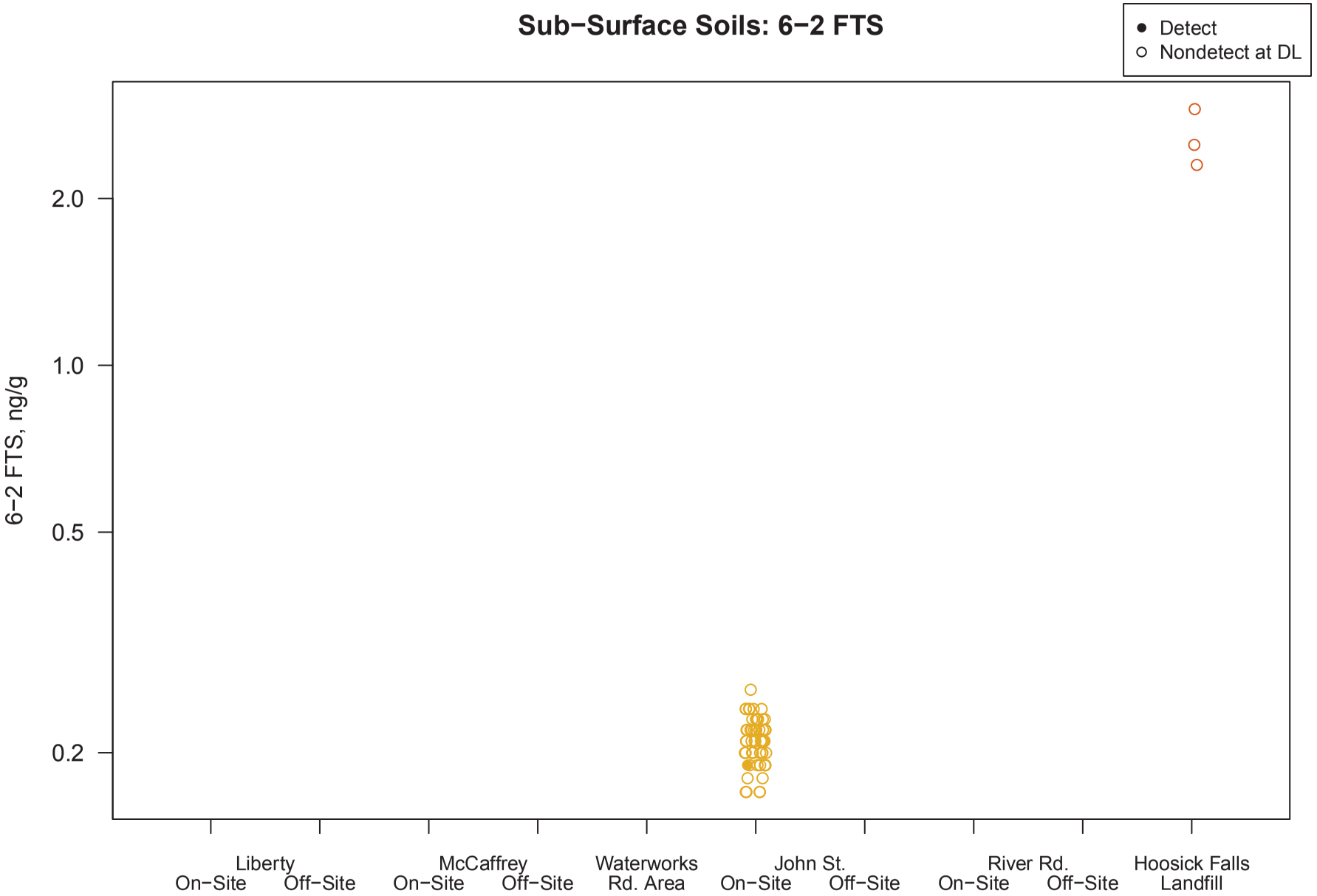

Near−Surface Soils: PFOA
Detect
Nondetect at DL
PFOA, ng/g
20.0
10.0
5.0
2.0
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

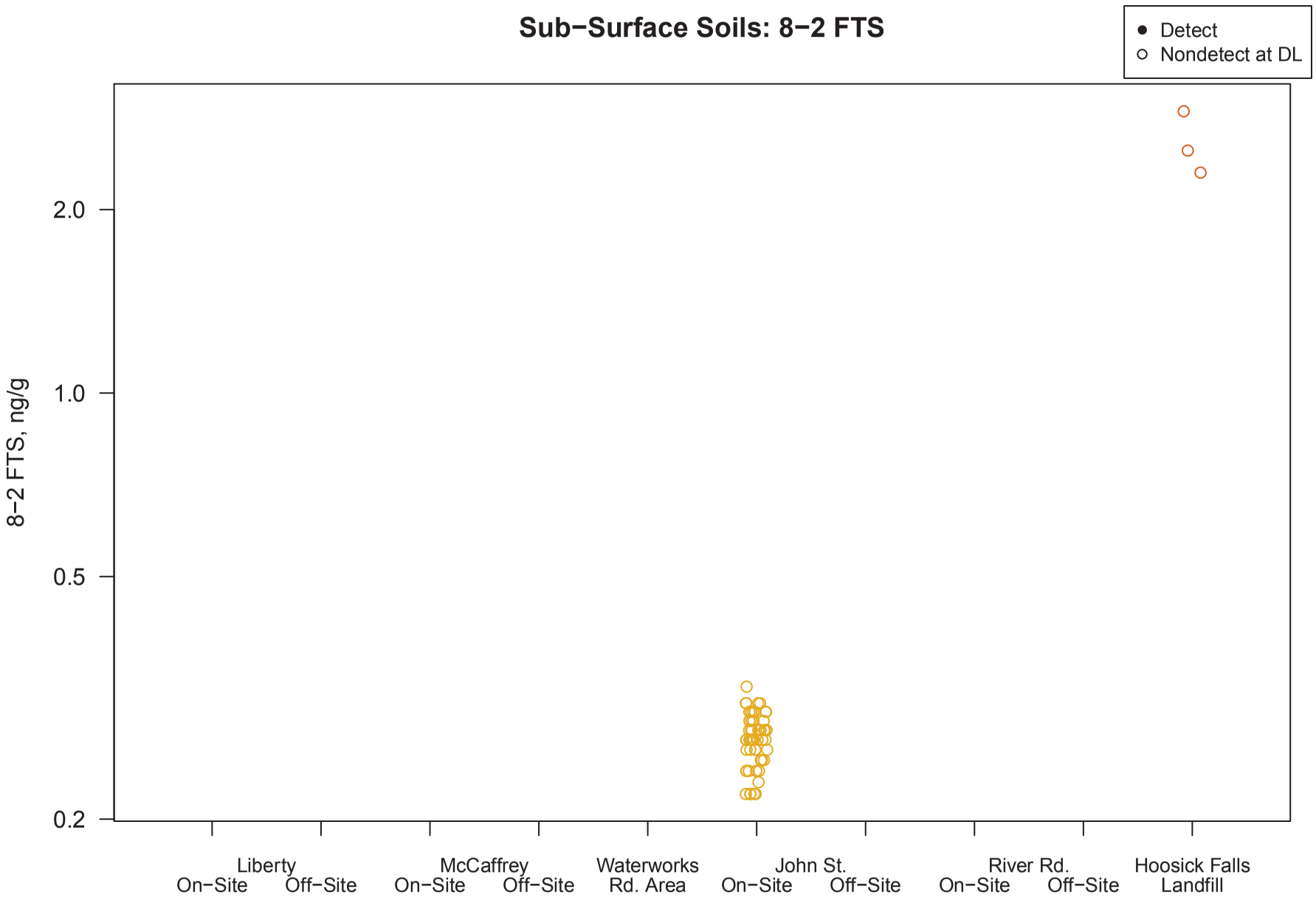

Near−Surface Soils: PFPeA
Detect
Nondetect at DL
PFPeA, ng/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site

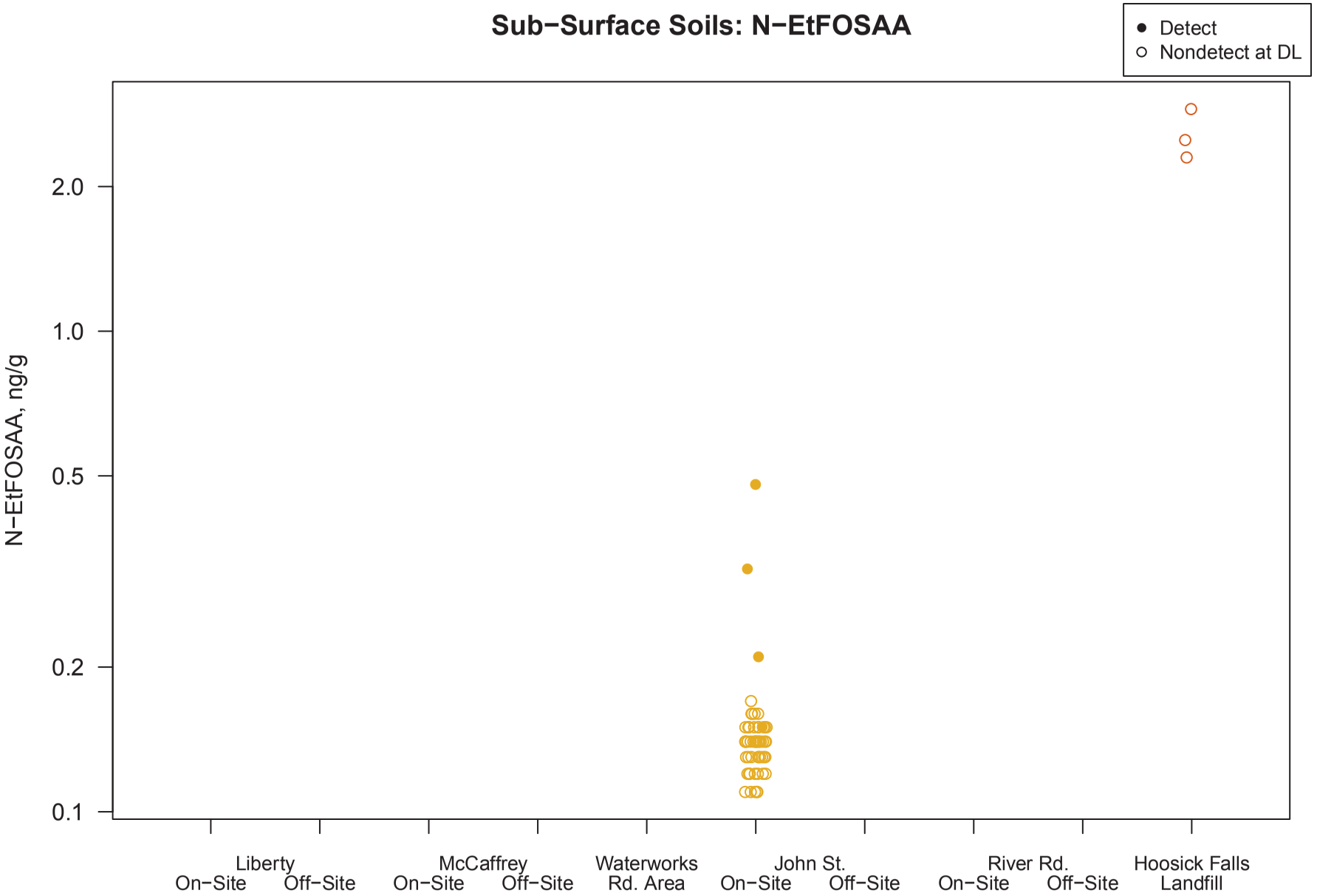

Near−Surface Soils: PFTA/PFTeDA/PFTeA
Detect
Nondetect at DL
PFTA/PFTeDA/PFTeA, ng/g
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site


Near−Surface Soils: PFTrDA/PFTriA
Detect
Nondetect at DL
PFTrDA/PFTriA, ng/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site


Near−Surface Soils: PFUnA/PFUnDA
Detect
Nondetect at DL
PFUnA/PFUnDA, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Athletic
Field
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site


Sub−Surface Soils: 6−2 FTS
Detect
Nondetect at DL
6−2 FTS, ng/g
2.0
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: 8−2 FTS
Detect
Nondetect at DL
8−2 FTS, ng/g
2.0
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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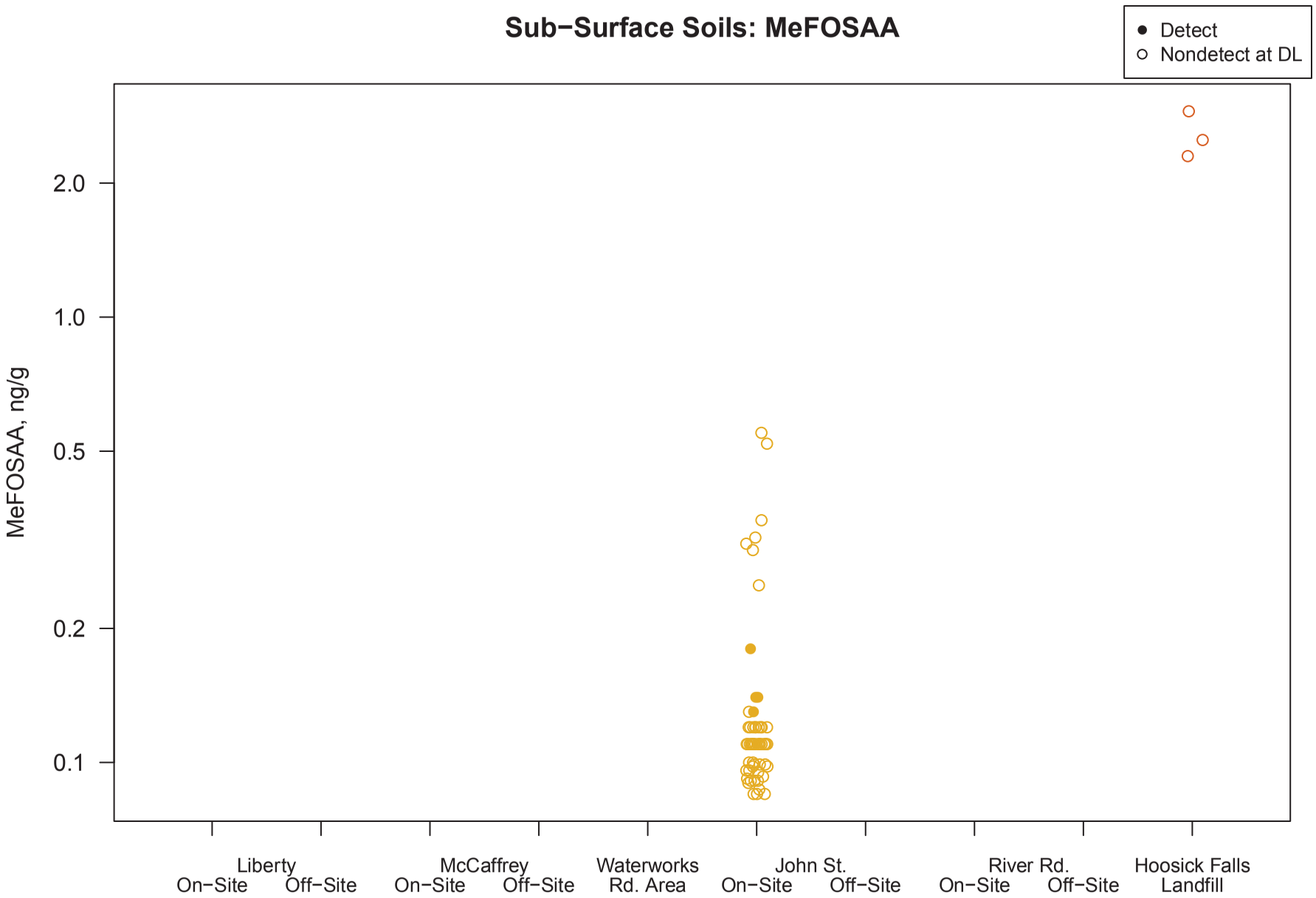
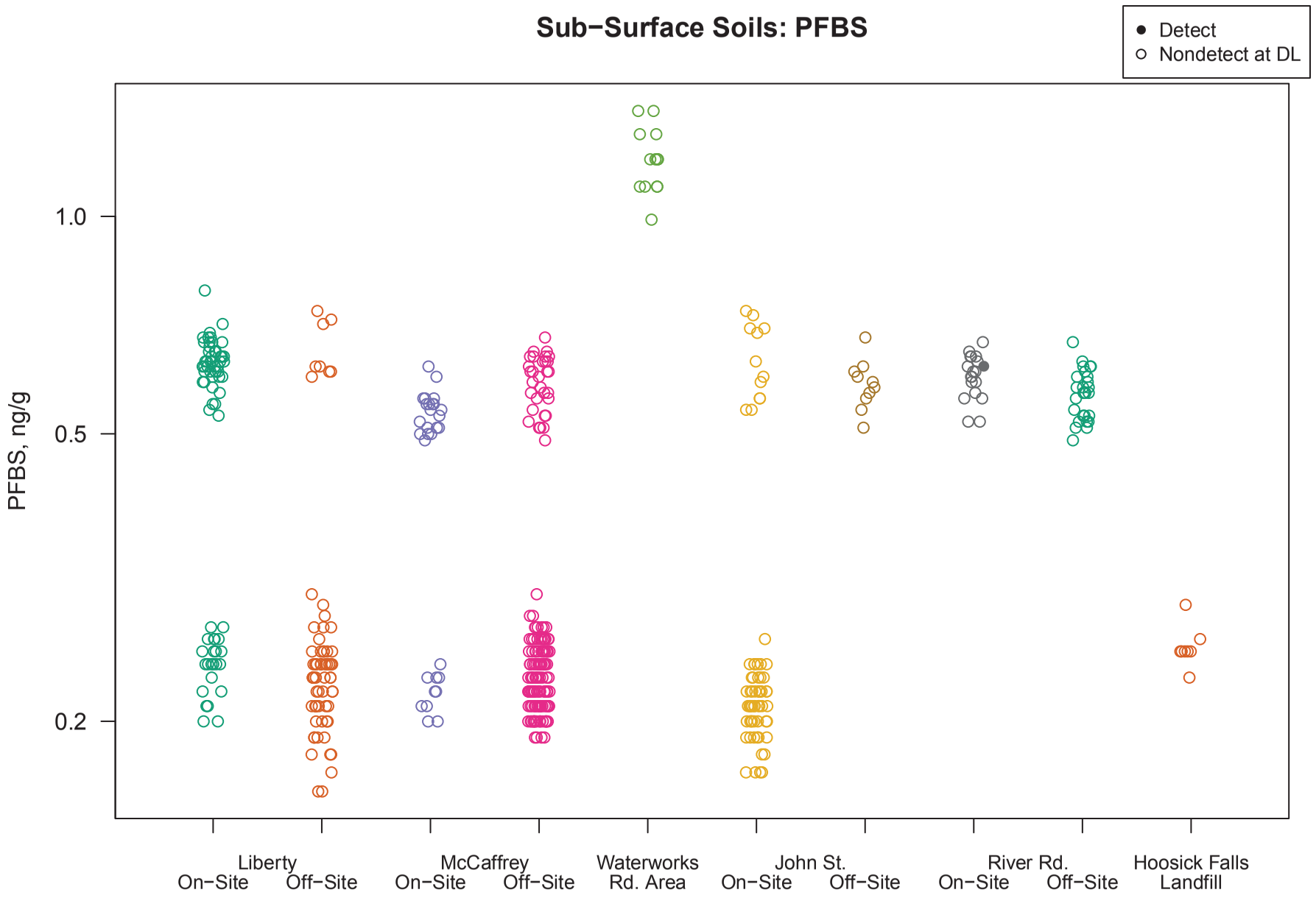
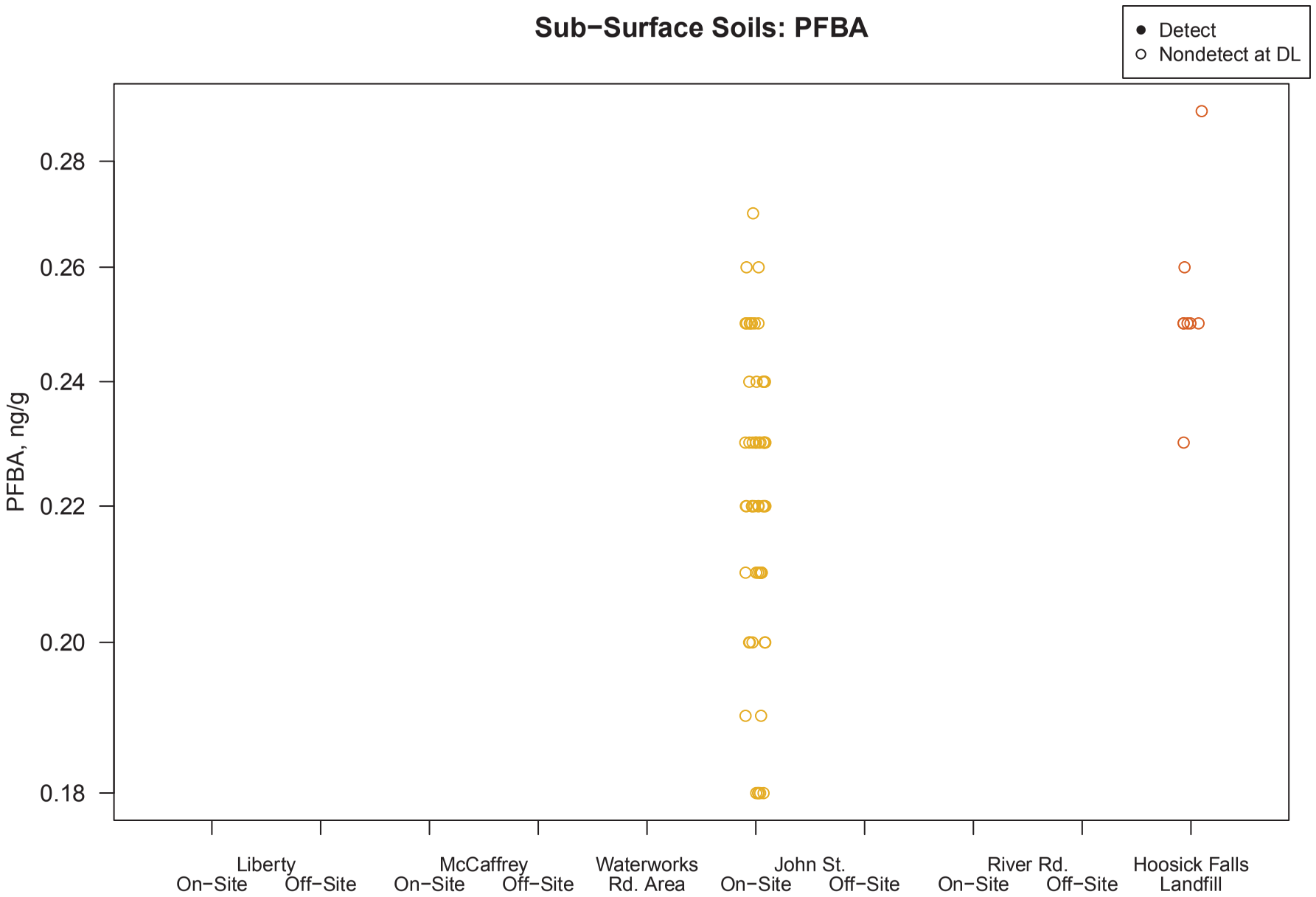
Detect
Nondetect at DL
N−EtFOSAA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: MeFOSAA
Detect
Nondetect at DL
MeFOSAA, ng/g
2.0
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: PFBS
Detect
Nondetect at DL
PFBS, ng/g
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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Detect
Nondetect at DL
PFBA, ng/g
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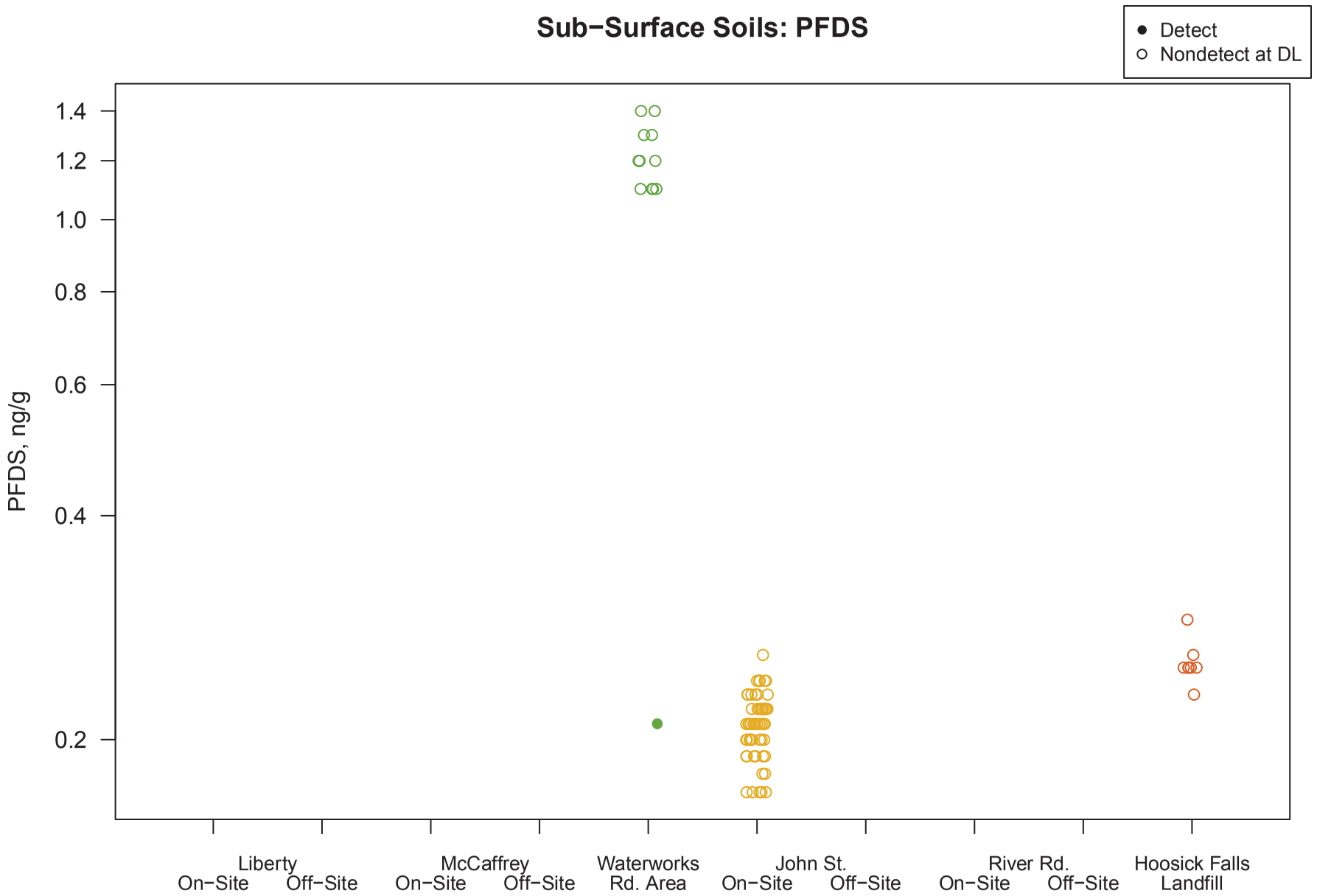
0.26
0.24
0.22
0.20
0.18
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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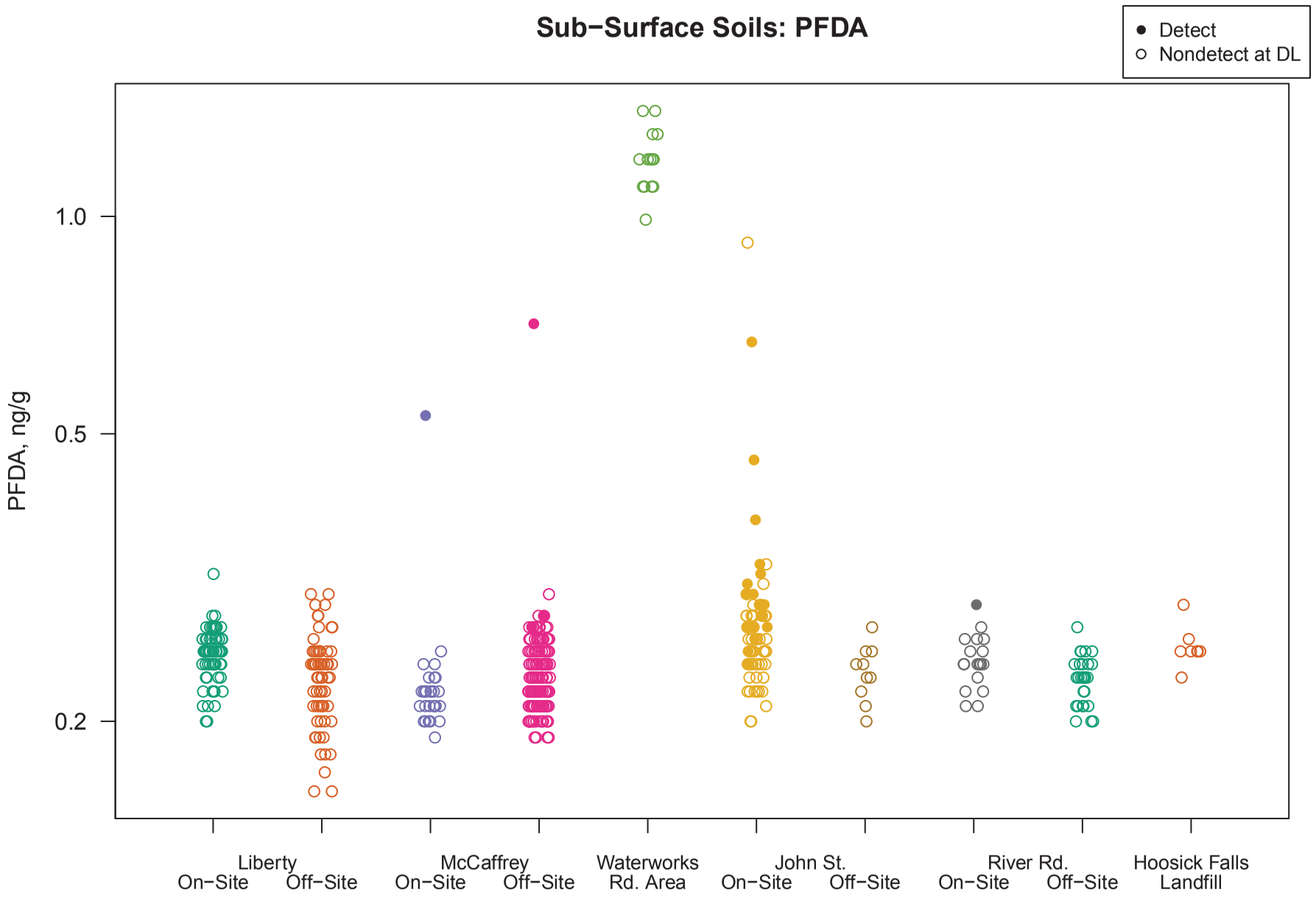
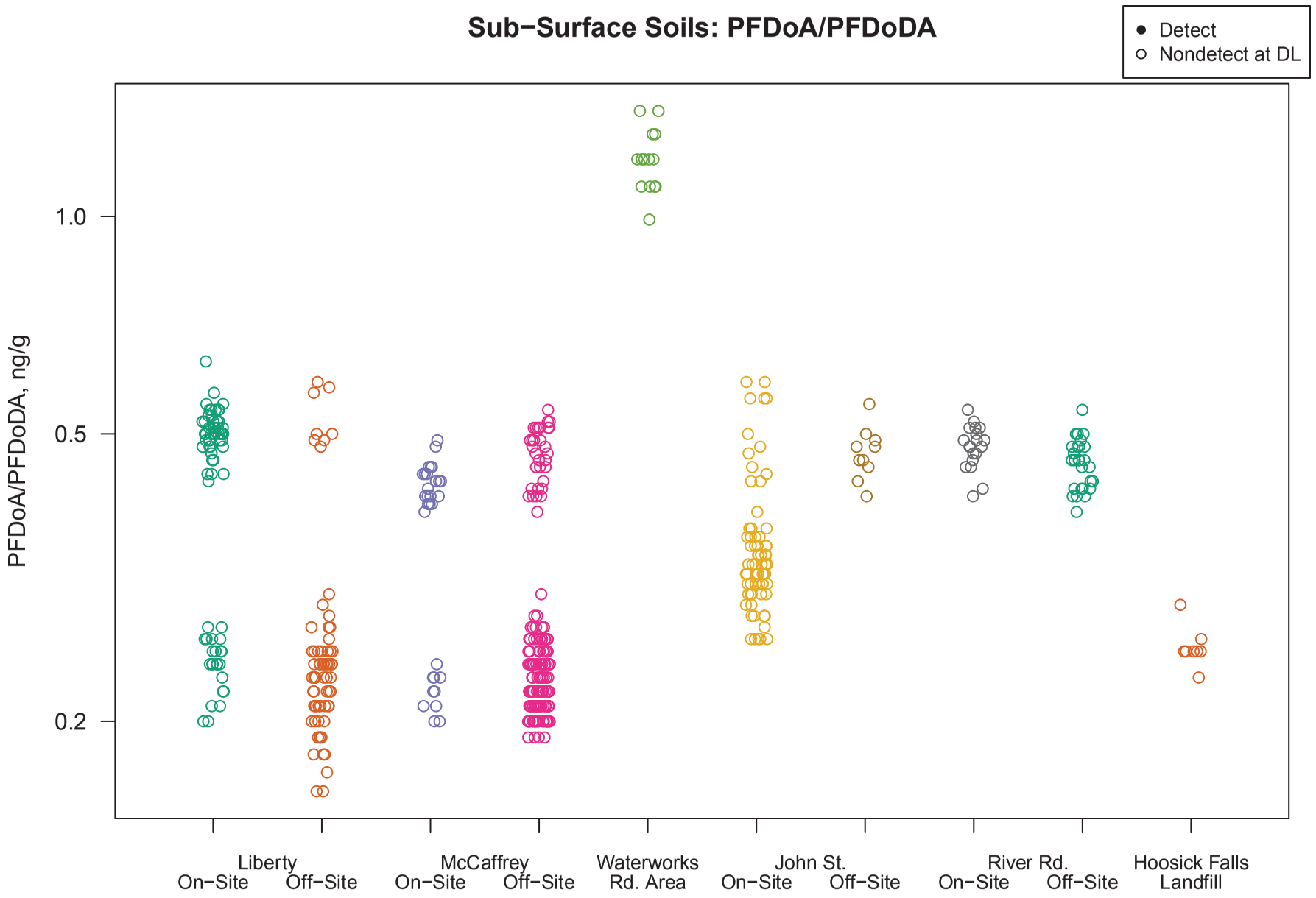
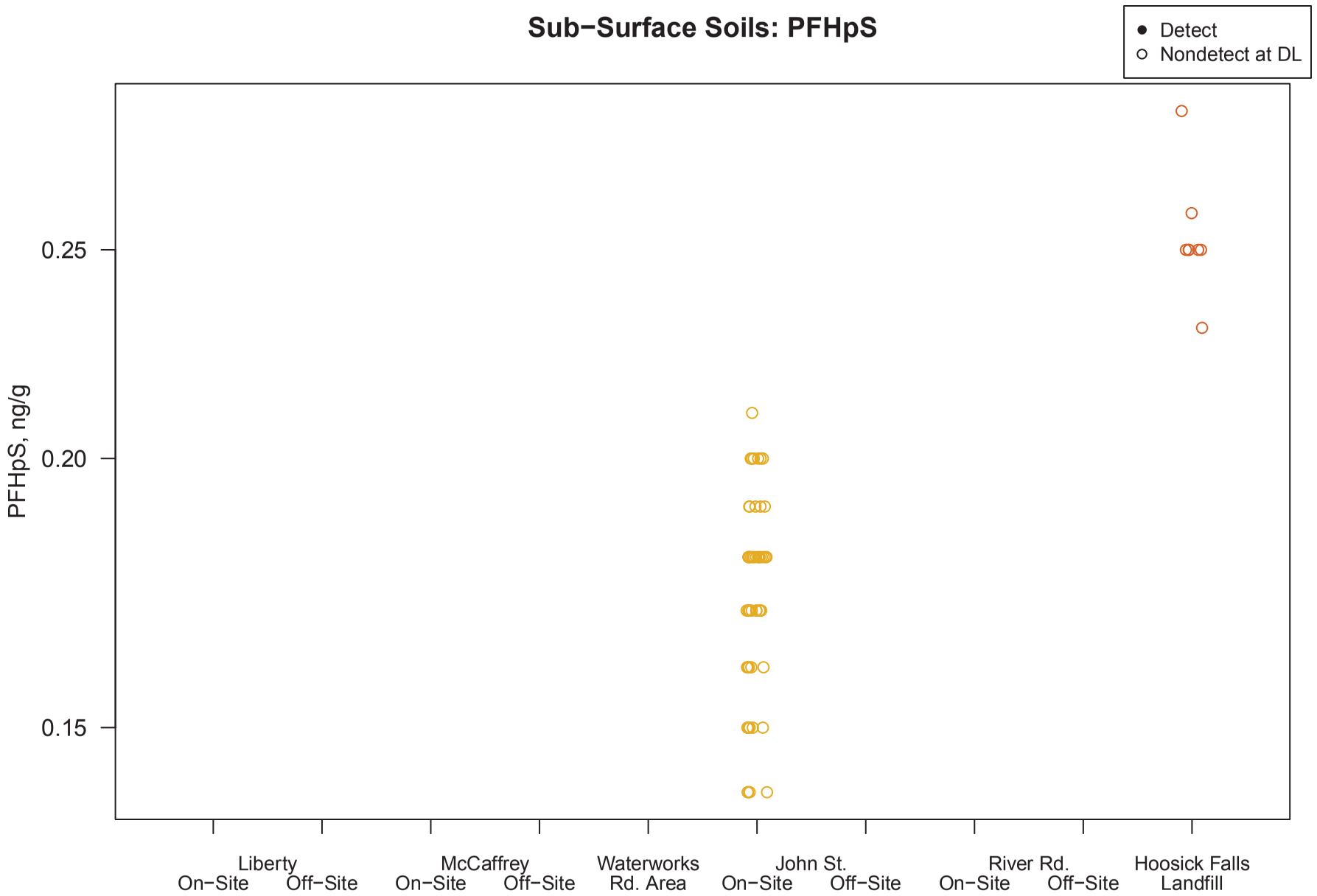
Detect
Nondetect at DL
PFDS, ng/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: PFDA
Detect
Nondetect at DL
PFDA, ng/g
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: PFDoA/PFDoDA
Detect
Nondetect at DL
PFDoA/PFDoDA, ng/g
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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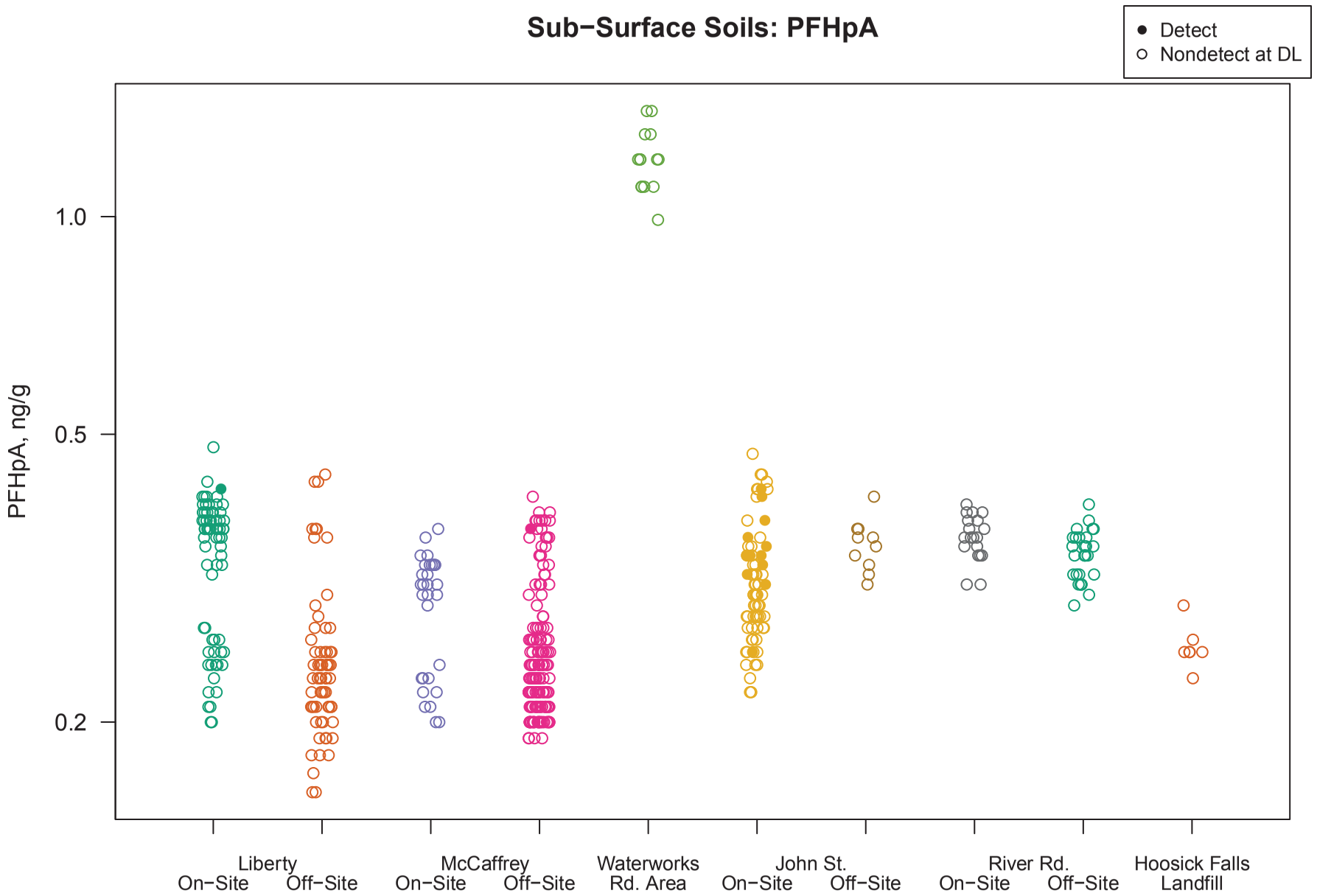
Detect
Nondetect at DL
PFHpS, ng/g
0.25
0.20
0.15
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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Detect
Nondetect at DL
PFHpA, ng/g
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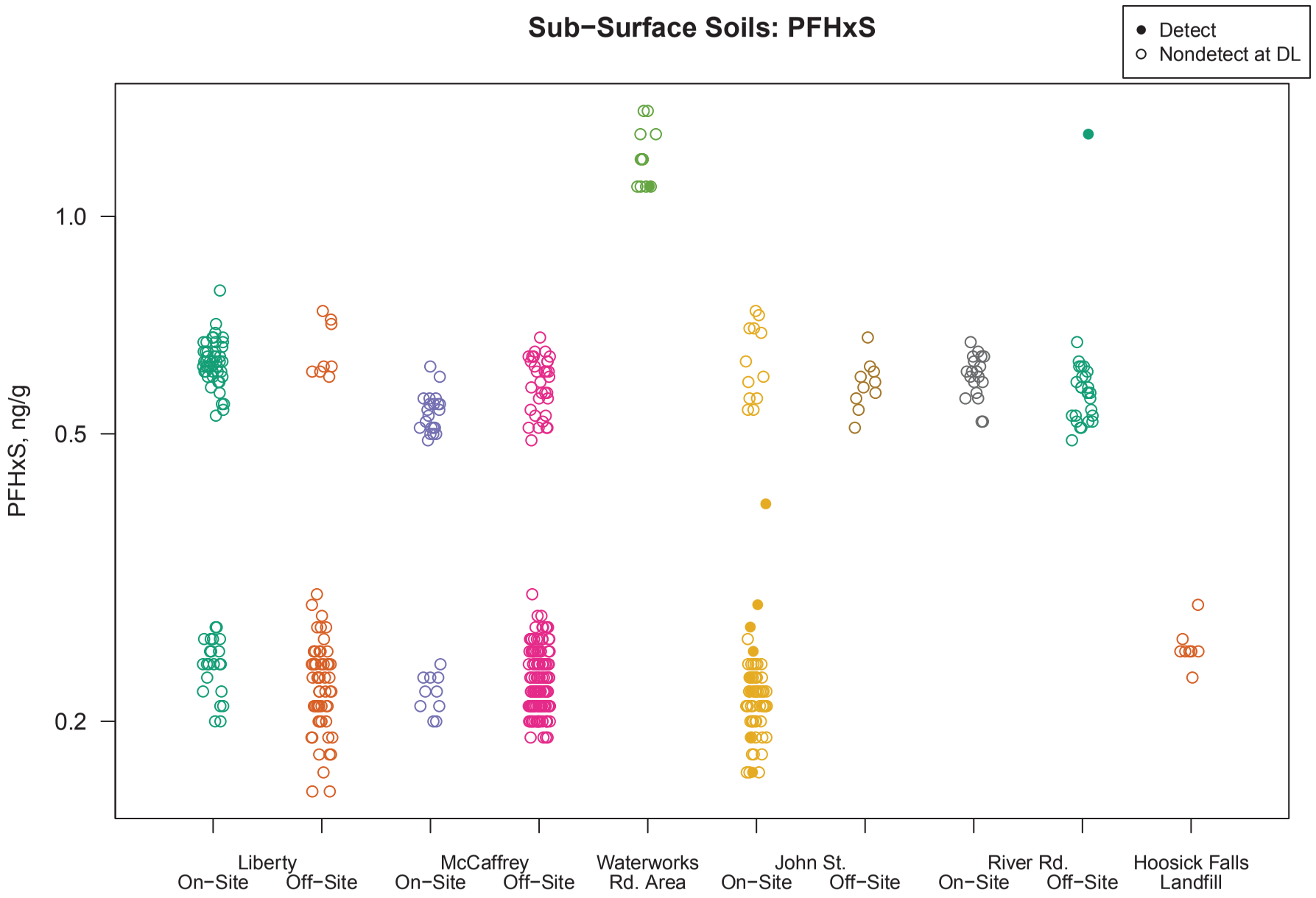
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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Detect
Nondetect at DL
PFHxS, ng/g
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0.5
0.2
Liberty
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Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
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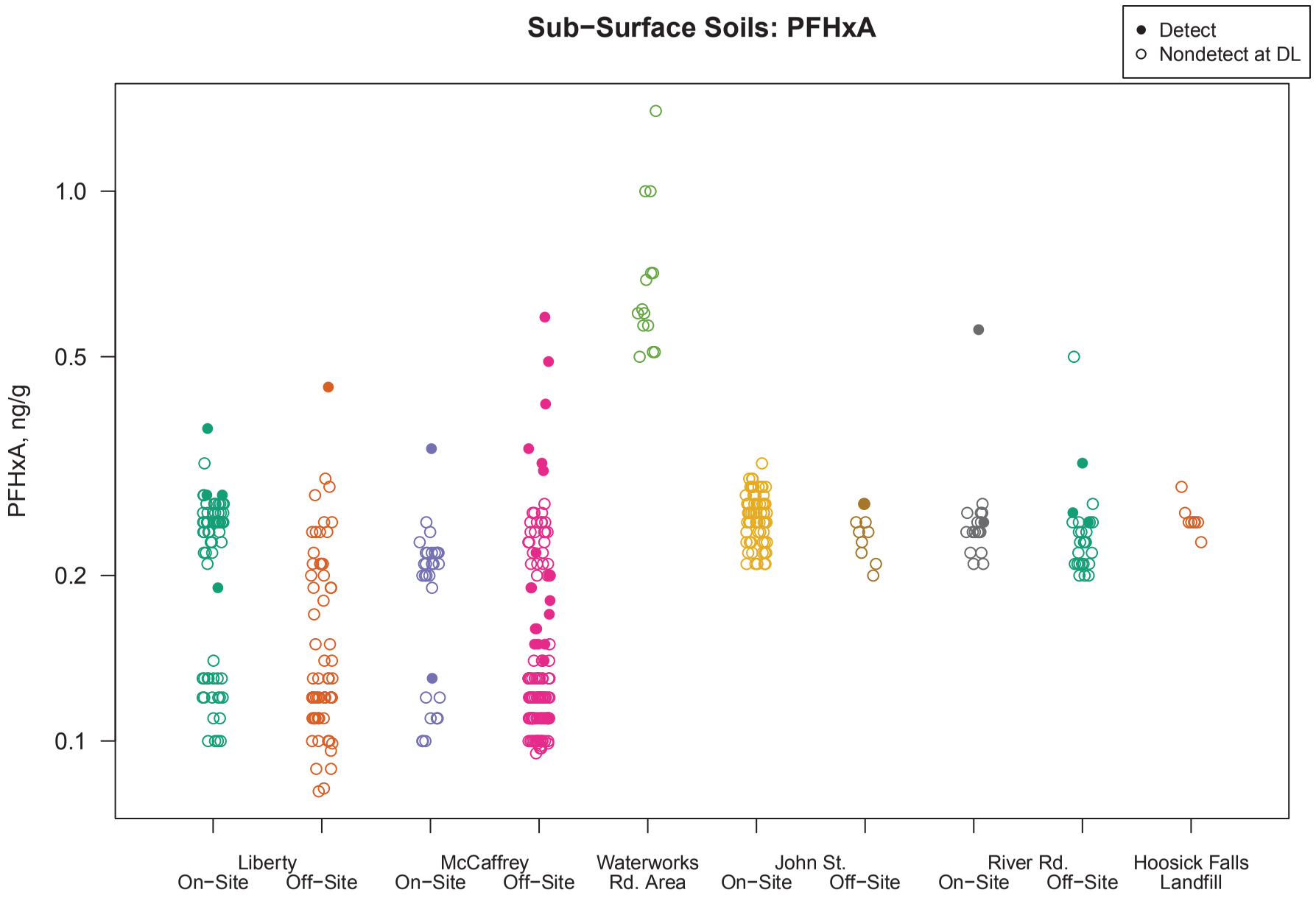
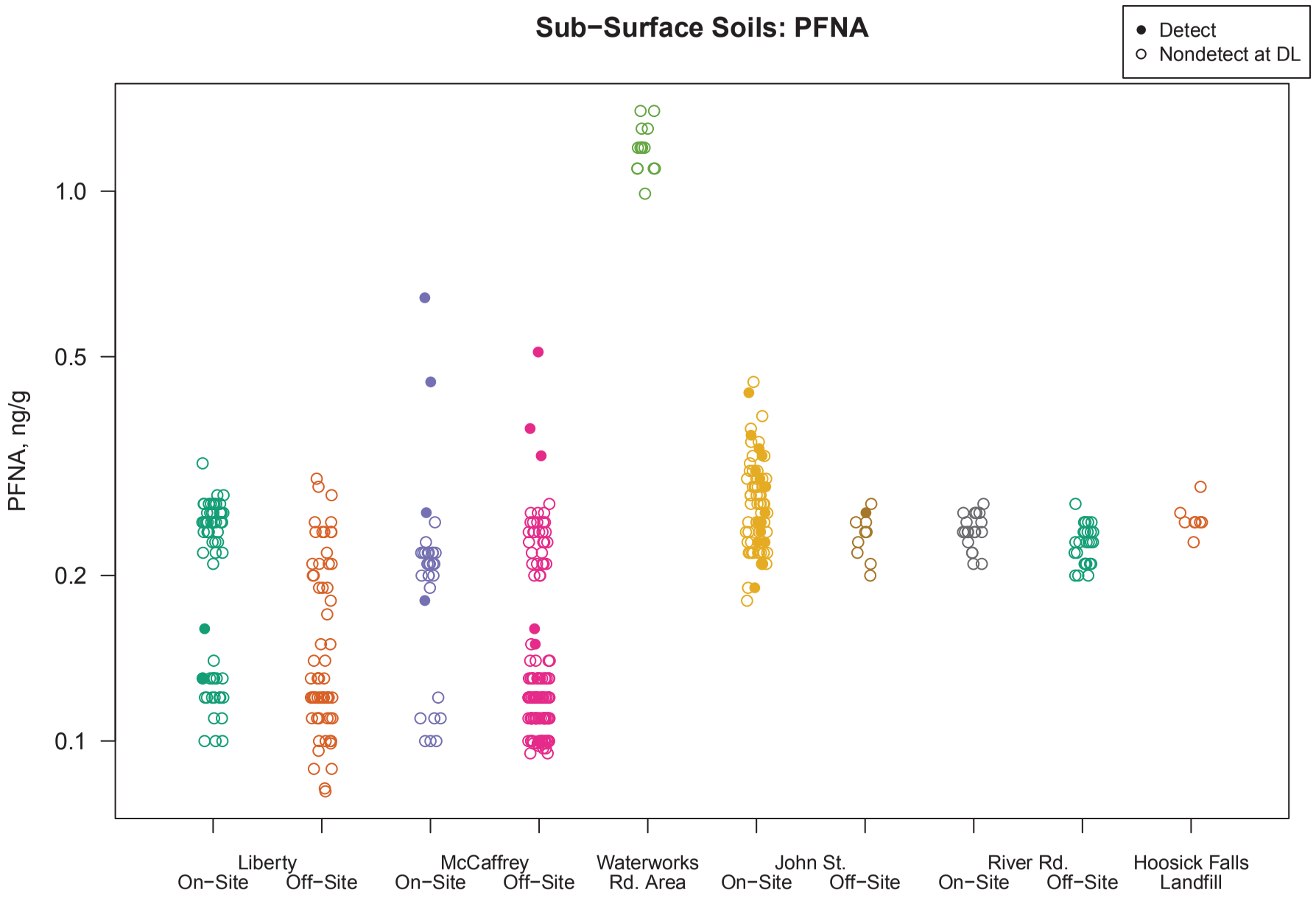
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: PFHxA
Detect
Nondetect at DL
PFHxA, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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Detect
Nondetect at DL
PFNA, ng/g
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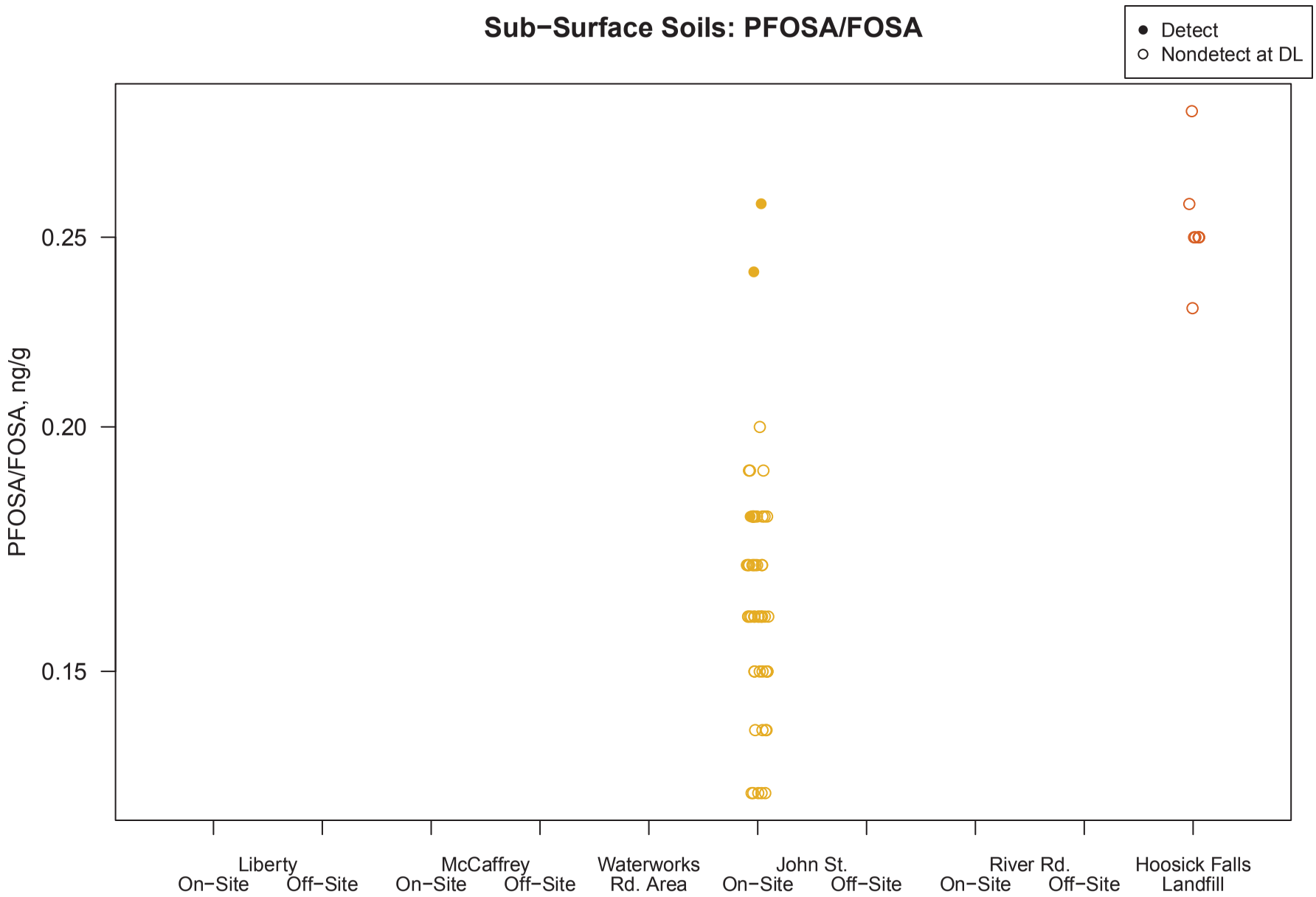
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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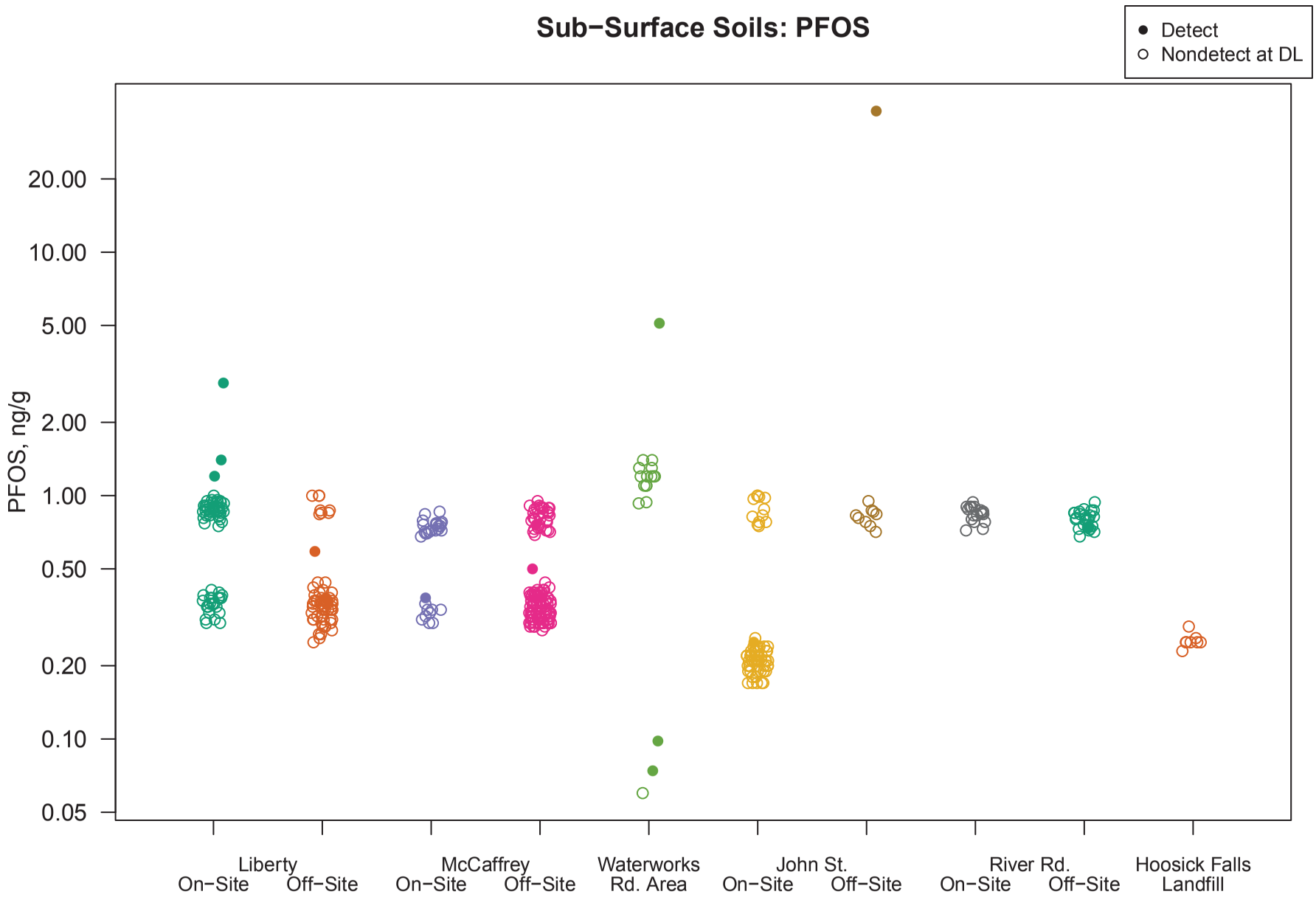
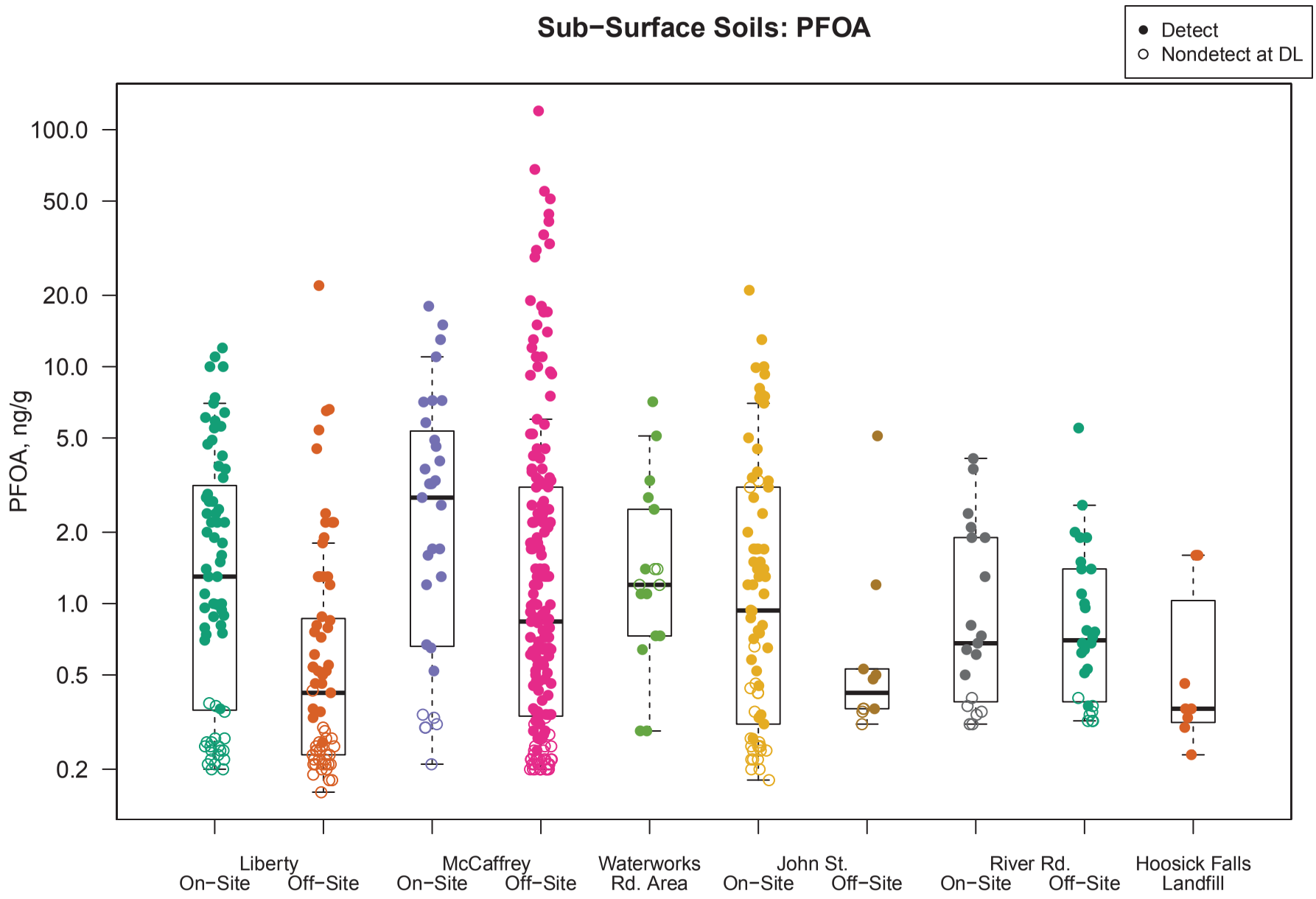
Detect
Nondetect at DL
PFOSA/FOSA, ng/g
0.25
0.20
0.15
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill


Sub−Surface Soils: PFOS
Detect
Nondetect at DL
PFOS, ng/g
20.00
10.00
5.00
2.00
1.00
0.50
0.20
0.10
0.05
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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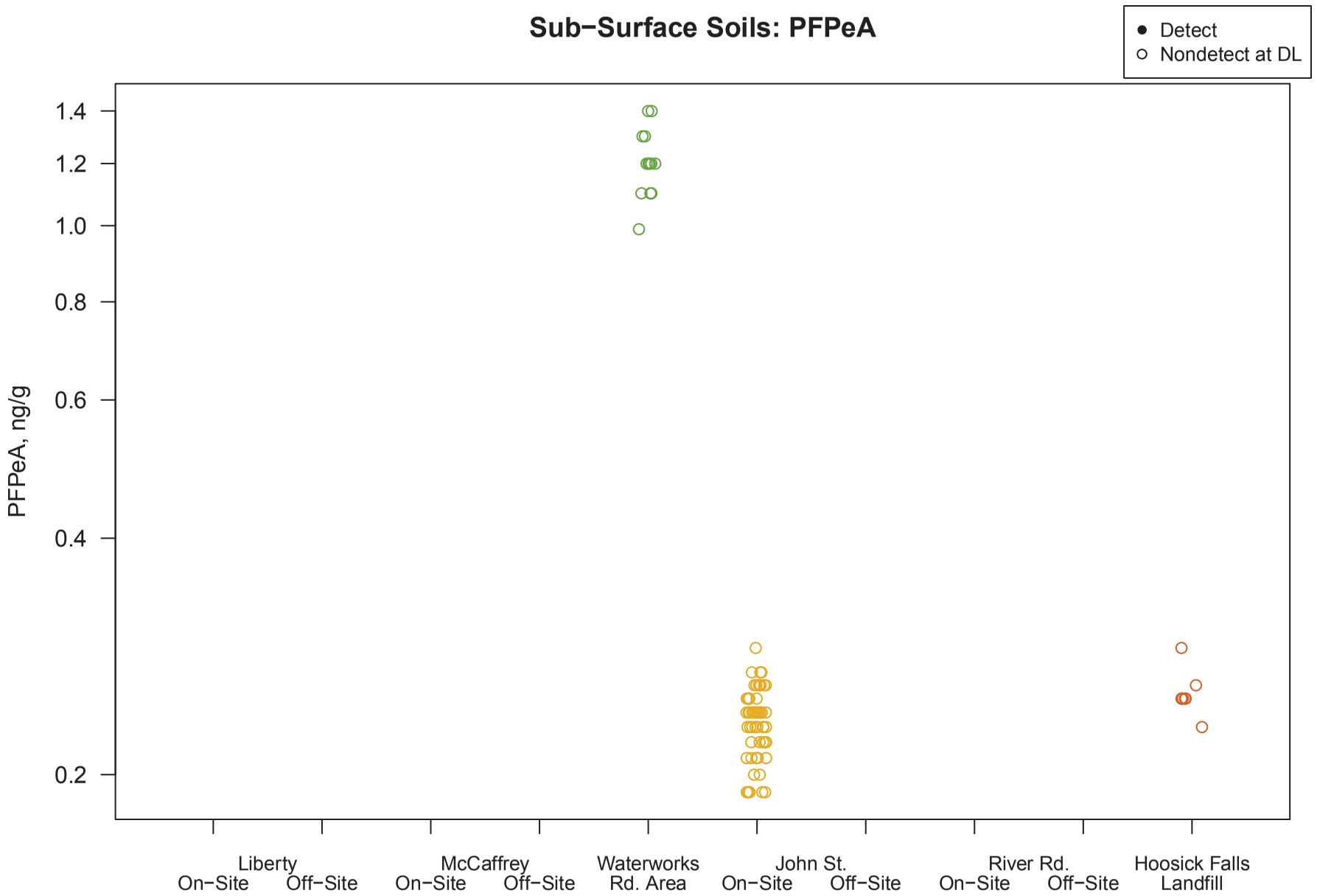
Detect
Nondetect at DL
PFOA, ng/g
100.0
50.0
20.0
10.0
5.0
2.0
1.0
0.5
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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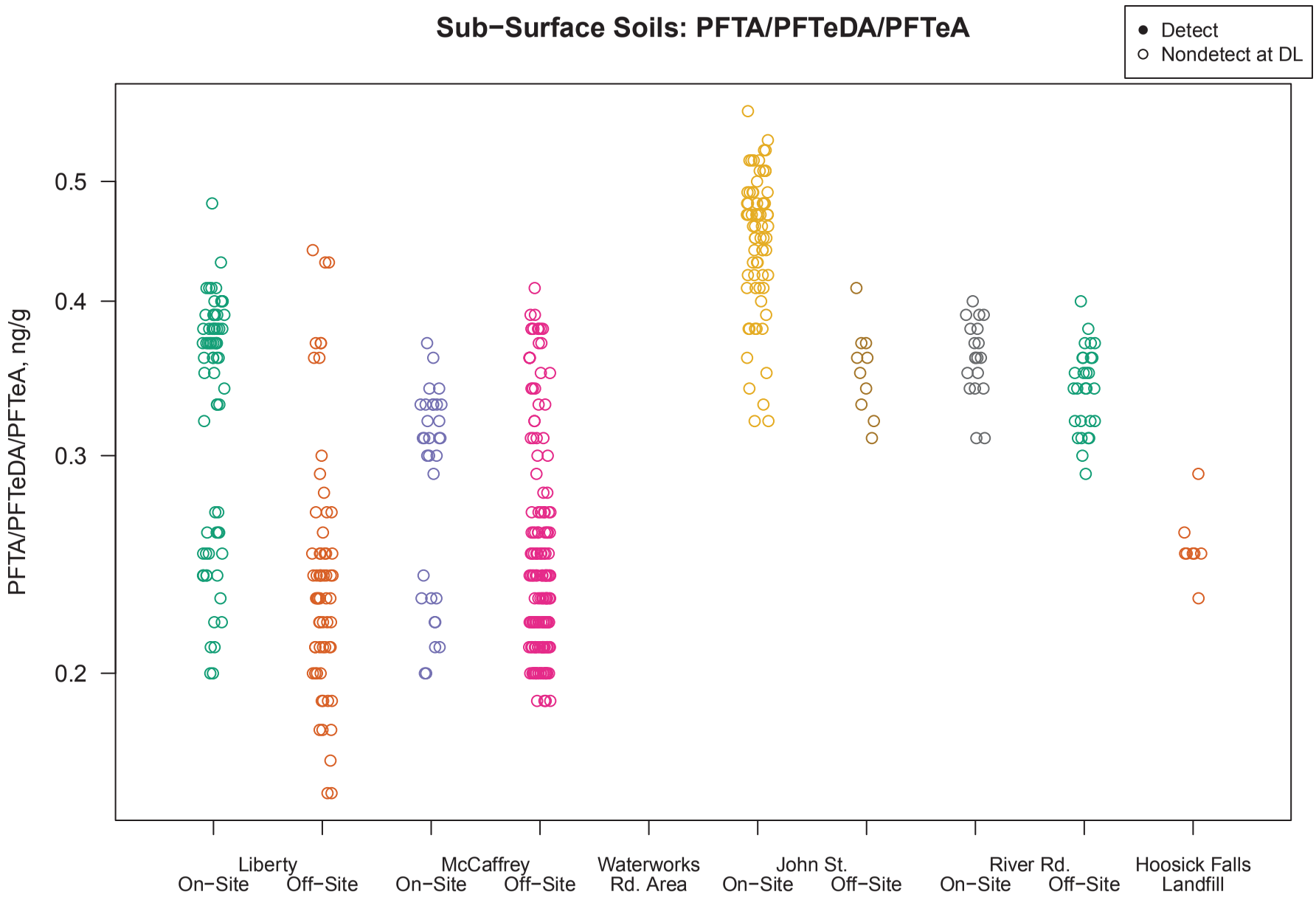
Detect
Nondetect at DL
PFPeA, ng/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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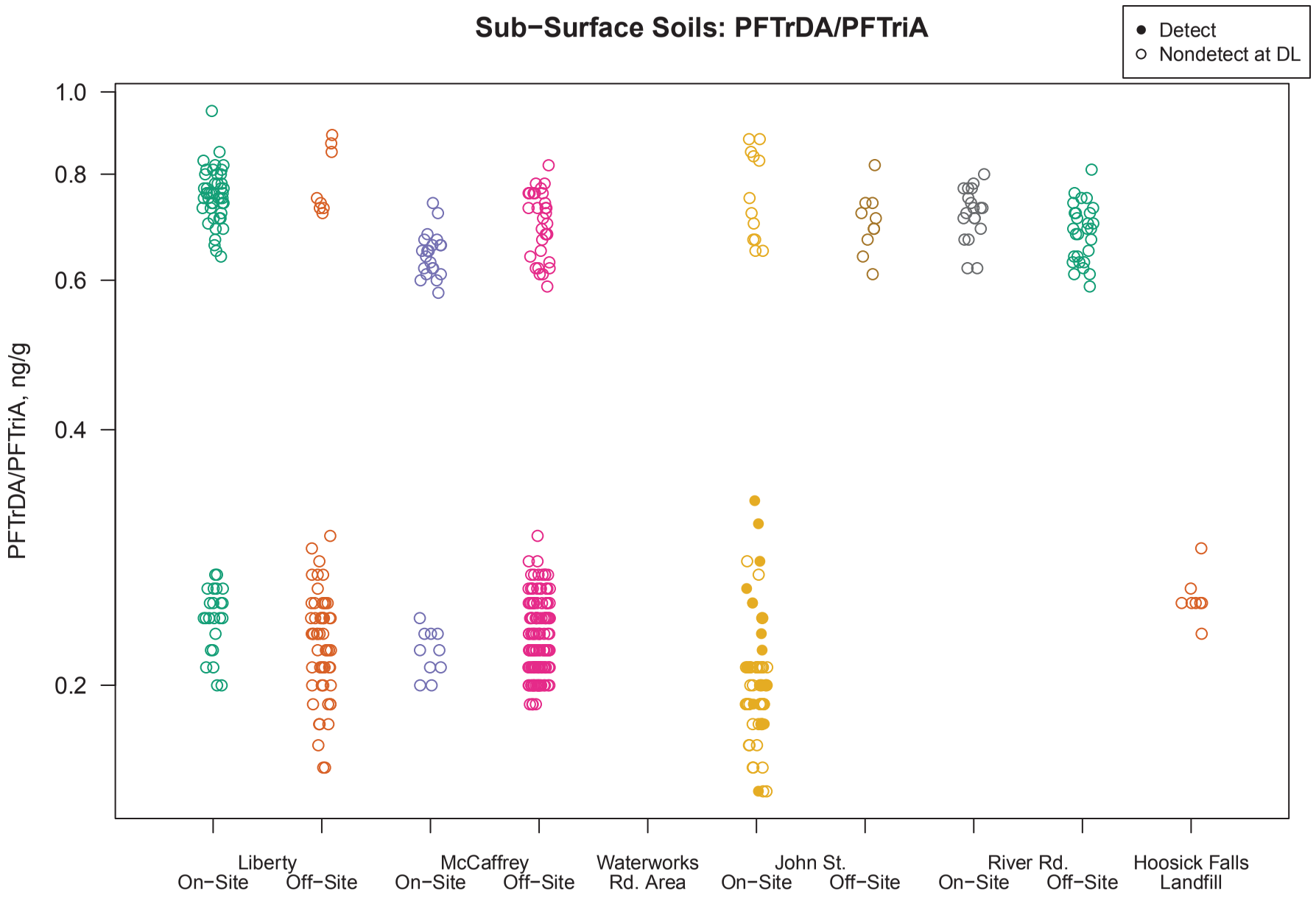
Detect
Nondetect at DL
PFTA/PFTeDA/PFTeA, ng/g
0.5
0.4
0.3
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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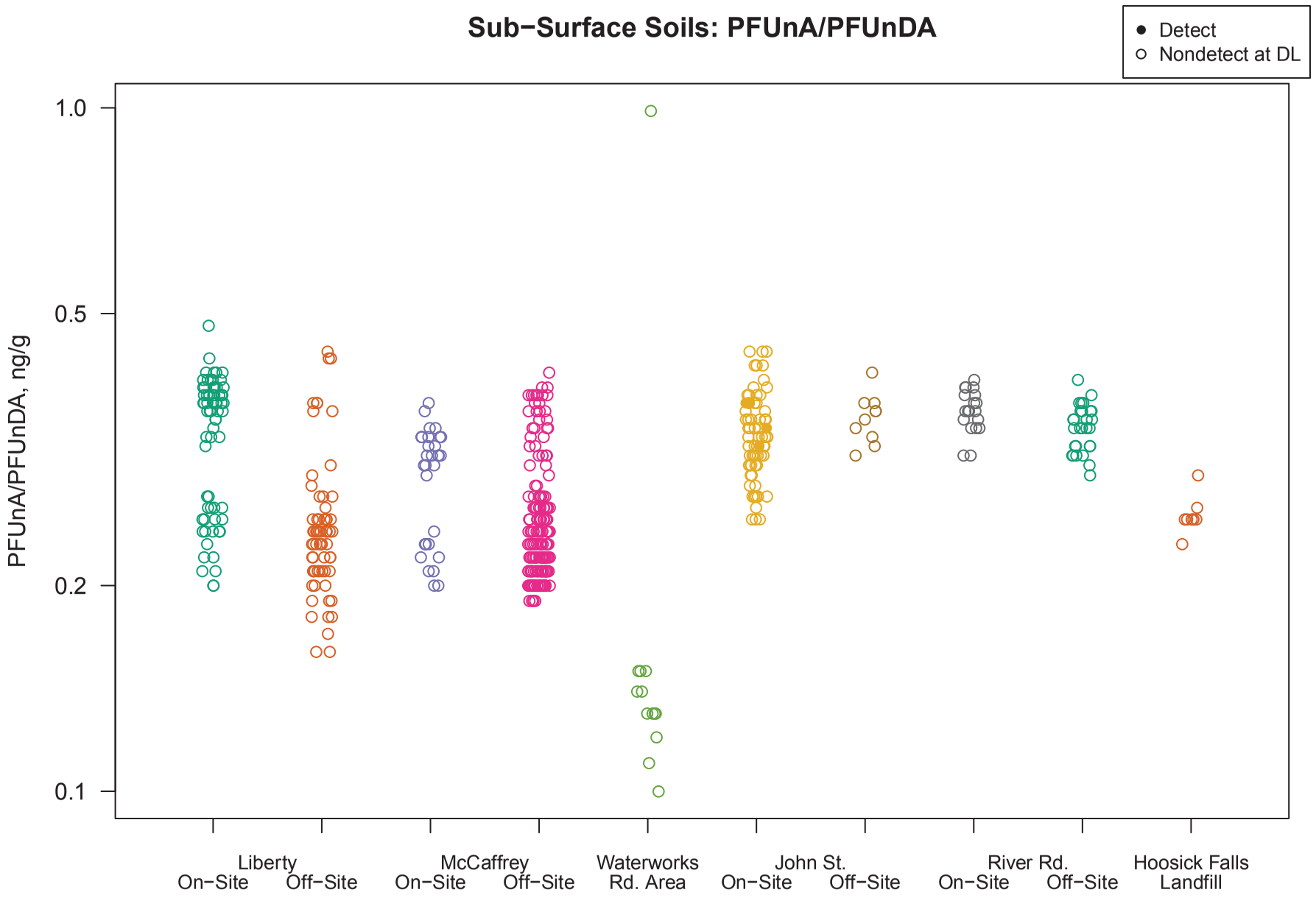
Detect
Nondetect at DL
PFTrDA/PFTriA, ng/g
1.0
0.8
0.6
0.4
0.2
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill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Detect
Nondetect at DL
PFUnA/PFUnDA, ng/g
1.0
0.5
0.2
0.1
Liberty
On−Site
Off−Site
McCaffrey
On−Site
Off−Site
Waterworks
Rd. Area
John St.
On−Site
Off−Site
River Rd.
On−Site
Off−Site
Hoosick Falls
Landfill

ATTACHMENT C
WEATHER STATION OPERATION AND MAINTENANCE PLAN

Operation and Maintenance Plan

The purpose of this operation and maintenance plan is to provide information on the setup, operation and maintenance of Met One's All in One Weather Sensor (AIO 2) and Met One's Model 360 Precipitation Gauge, referred to herein as the "Weather Station", which is installed at the Saint-Gobain facility at 14 McCaffrey Street in Hoosick Falls, NY.

Overview of Equipment

The Weather Station provides measurements of wind speed, wind direction, ambient air temperature, relative humidity, barometric pressure and rainfall. All measurements but rainfall are provided via sensors within the AIO-2, which is an all-in-one unit that is relatively small and rugged. Rainfall measurements are provided by an external sensor that measures rainfall continuously. Power is provided to the unit via the Comet cloud Service (CCS) Modem 2, which also transfers the data from these sensors to a database. Further details and specifications on these sensors and equipment can be found in the attached manufacturer's operational manuals.

Equipment Installation and Operation

Each of the sensors, mounts and the modem were installed according to the manufacturer's operational manual. The Weather Station was installed on the roof of the McCaffrey Street facility and began collecting data on November 13, 2018. The AIO-2 is attached to a 6-foot telescoping tripod, which is attached to a metal railing on the roof (See Figure 1). The precipitation gauge is installed on a cross-arm attached to the tripod at a height of 5 feet and approximately 18 inches away from the tripod (See Figure 1). The modem is installed near the base of the tripod and receives the AC power for the entire station. The AIO-2 and the precipitation gauge are connected to the modem via quick-connect connectors.

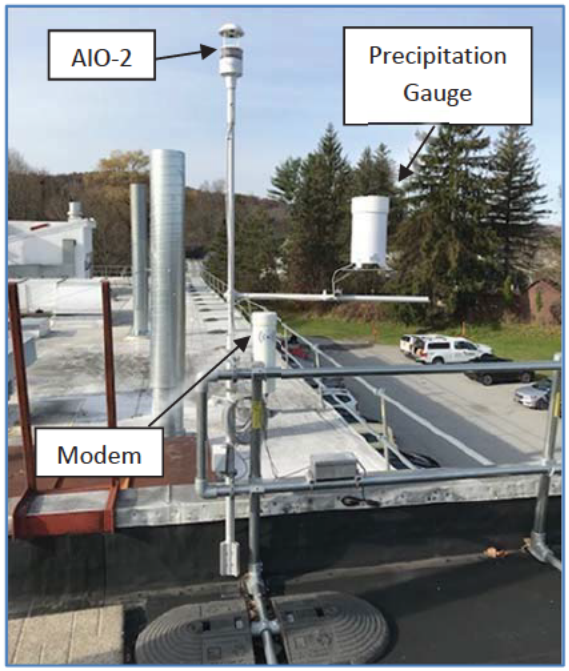

Figure 1- Weather Station Installation

Periodic Inspection and Maintenance

Data is transferred every 15 minutes to a database which monitors for erroneous values and automatically alerts users if data is not being collected at the Weather Station which may trigger an inspection. The AIO-2 has no moving parts and therefore requires no maintenance for wear items. However, inspection of the Weather Station and data collected will help ensure that there are no electrical or mounting issues.

Visual inspections from the ground surface will be completed once per month or as needed to ensure proper operation. Visual inspections determine if the Weather Station is properly mounted and not damaged.

Inspections on the roof of the facility will be performed once per quarter to ensure the Weather Station is secured, undamaged, and not blocked or obstructed. The Weather Station will be inspected to ensure that all components are well-secured and upright. All cables will be inspected for secure connections or any signs of damage. Minor issues (e.g., tightening mounts, securing cables) will be addressed as soon as possible to ensure proper operation.

A field audit of the Weather Station will performed annually using portable instrumentation. The audit of the wind, temperature, relative humidity, and barometric pressure sensors requires co-located portable sensors to collect a parallel data set for a desktop comparison. Data from audits will be evaluated in accordance with United States Environmental Protection Agency (USEPA) guidelines[1]. Prior to the audit of the rain gauge, the funnel and bucket will be cleaned as needed in accordance with the manufacturer's operational manual. The audit of the rain gauge is accomplished by slowly introducing a measured volume of water into the gauge funnel and comparing the expected result, in accordance with the manufacturer's operational manual. The audit will be documented and summarized.

At the time of monthly or quarterly inspection and annual audits, data will be exported from the database and reviewed to confirm proper operation. If issues from inspections, audits, or data review are unresolved with basic repairs (e.g., damage or unresponsive sensors), then the sensor will be returned to the manufacturer for repair or replacement to restore proper operation as soon as possible. The table below summarizes the frequency of maintenance activities described above.

Frequency	Action Item
Real time	Data collection and surveillance
Monthly	Visual inspection of instrumentation from the ground surface and review of data
Quarterly	Inspection of instrumentation from the roof
Annually	Field audit using co-located portable sensors

[1] *United States Environmental Protection Agency (USEPA) Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements Version 2.0 (Final) (EPA-454/B-08-002) March, 2008*

Attachment A

Model AIO-2 All in One Weather Sensor

Operation Manual

MODEL AIO 2
ALL IN ONE WEATHER SENSOR

OPERATION MANUAL
Document No. AIO 2-9800 Rev. C

Met One
Instruments

1600 Washington Blvd.
Grants Pass, Oregon 97526
Telephone 541-471-7111
Facsimile 541-471-7116

Regional Sales & Service
3206 Main St. Suite 106
Rowlett, Texas 75088
Telephone 972-412-4715
Facsimile 972-412-4716

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AIO 2 Weather Sensor Manual

Technical Support

This manual is structured by customer feedback to provide the required information for setup, operation, testing, maintaining, and troubleshooting your AIO 2 Weather Sensor. Should you still require support after consulting your printed documentation, we encourage you to contact one of our expert Technical Service representatives during normal business hours of 7:00 a.m. to 4:00 p.m. Pacific Standard Time, Monday through Friday. In addition, technical information and service bulletins are often posted on our website. Please contact us and obtain a Return Authorization (RA) number before sending any equipment back to the factory. This allows us to track and schedule service work and to expedite customer service. Please have your instrument serial number available when contacting the manufacturer.

Contact Information:	Tel:	+ 541 471 7111	Address:	Met One Instruments, Inc.
	Fax:	+ 541 471 7116		1600 Washington Blvd
	Web:	http:/www.metone.com		Grants Pass, Oregon 97526
	Email:	service@metone.com		U.S.A.

Safety Notice

The contents of this manual have been checked against the hardware and software described herein. Since deviations cannot be prevented entirely, we cannot guarantee full agreement. However, the information in this manual is reviewed regularly and any necessary corrections are included in subsequent editions. Faultless and safe operation of the product presupposes proper transportation, storage, and installation as well as careful operation and maintenance. The seller of this equipment cannot foresee all possible modes of operation in which the user may attempt to utilize this instrumentation. The user assumes all liability associated with the use of this instrumentation. The seller further disclaims any responsibility for consequential damages.

Electrical & Safety Conformity

The manufacturer certifies that this product operates in compliance with the following standards and regulations:

FDA/CDRH This product is tested and complies with 21 CFR, Subchapter J, of the Health and Safety Act of 1968 US 21 CFR 1040.10

Table of Contents

1. Introduction & Overview – AIO 2 All In One Weather Sensor

1.1. Overview

The AIO 2 Weather Sensor provides measurements of wind speed, wind direction, ambient air temperature, relative humidity, and barometric pressure in a single, compact, rugged unit. It integrates a folded-path, low-power sonic anemometer with a precision thermistor temperature sensor, fast-response capacitive relative humidity sensor, and a state-of-the-art barometric pressure sensor. It also includes an internal flux-gate compass that allows for automatic alignment of wind direction to magnetic north, regardless of the sensor's orientation.

The small footprint and power efficiency of the AIO 2 make it ideal for remote regions, urban environments, air quality networks, construction/remediation sites, and other network applications. The unit can be used in permanent (cooperative weather networks, schools, public information dissemination) or temporary (emergency response, audit, research program support) installations.

Designed for maximum portability and utility, the AIO 2 is well suited for rapid deployment and use by one person under all conditions. The unit may be mounted on a tower, tripod or vehicle mast. Data output is a serial, digital message that can be interfaced to most data logging systems.

The AIO 2 even has the capability to connect an external contact closure rain gauge (such as the Met One 360 or 370) and/or solar radiation sensor (such as the Met One 096A-2). If these inputs are present, their measurements are then integrated into the AIO 2 serial data output.

2. Specifications

Wind Speed

- Range 0 to 60 m/s (0 to 134 mph)
- Accuracy ±0.5 m/s or 5% of reading (1)
- Resolution 0.1 m/s

Wind Direction

- Range 0 to 360°
- Accuracy ± 5° (including Compass)
- Resolution 1.0°

Temperature

- Range -40 to +60 °C (-40 to +140 °F)
- Accuracy ±0.2°C (2)
- Resolution 0.1°C

Relative Humidity

- Range 0 to 100%
- Accuracy ±3% (3)
- Resolution 1.0%

Pressure

- Range 600 to 1100 hPa
- Accuracy ±0.5 hPa (3)
- Resolution 0.1 hPa

Alignment Compass

- Accuracy ±2°
- Resolution 1°

External Rain Gauge Input

- Resolution 0.25mm or 0.01”, user selectable

External Solar Radiation Sensor Input

- Measured in W/m^2

Electrical

- Measurement Rate Output: 1 Hz
- Signal Output RS-232, RS-485, and SDI-12
- Power Requirements 8 to 36 VDC
  30 mA nominal @ +12VDC

Environmental

- Temperature -40 °C to +60 °C (-40 to +140 °F)
- Humidity 0 to 100%

Notes:

1. Whichever is greater.
2. 0C to 60C. +/- 0.5C from -40C to 0C.
3. At 25 °C.

3. Unpacking & Installation

3.1. Unpacking

Any damages incurred to the equipment during shipping are the responsibility of the carrier. If any damage to the shipment is noticed before unpacking, a claim must be filed with the commercial carrier immediately. You should follow any special unpacking instructions provided by the carrier as you then carefully remove all items from the containers and inspect each component. It is recommended to document and photograph all damaged packages and items before, during, and after unpacking them.

Unpack the AIO 2 and accessories and make a visual inspection of the contents; contact your supplier if anything is missing. The AIO 2 Weather Sensor ships with the following items:

- AIO 2 All In One Weather Sensor.
- Calibration certificate.
- Operation manual (this document).

Optional Accessories that may be purchased include:

- 10523 ¾" IPS pipe vertical mounting adaptor
- 10106 Universal mounting arm
- 10600 Interface station – provides wiring terminals, 12VDC power, USB and DB9 serial connections.
- WeatherView Software
- USB Driver CD
- Comet Terminal Software CD

The required 10624 signal cable is sold separately. It is custom built to the desired length.

Contact Met One Instruments (see the Technical Support section at the beginning of this manual) to arrange for any replacement items needed.

Please keep the carton(s) and associated packing materials for reuse.

3.2. Deployment

3.2.1. Tripod / Pipe top Installation:

The AIO 2 can be quickly and easily deployed on top of a Met One 905 tripod or any other vertical ¾" IPS pipe using the optional 10523 vertical mount.

Route the 10624 signal cable connector end through the 10523 mount adaptor as shown below.

Plug the cable connector into the base of the AIO 2 and turn the connector sleeve clockwise (as seen from below the sensor) until tight. Then slide the AIO 2 onto the top of the 10523 mount adaptor and tighten the two slotted base set screws as shown below.

Position the cable in the slot on the side of the mount and then slide the assembly onto the tripod mast or pipe. Tighten the 2 set screws on the 10523 mount to affix it to the tripod/pipe.

The AIO 2 includes an internal alignment compass so the adaptor and AIO 2 sensor can face any direction and still correctly read wind direction (as referenced to Magnetic North). The MD command can be used to set a magnetic declination to reference the wind direction reading to True North. See section 3.6 for more details about setting the magnetic declination.

Run the signal cable from the mount to the data collection device being used (such as a data logger or computer) following the wiring connections listed in section 3.3.

3.2.2. Universal Mounting Arm Installation:

If a tripod or ¾” pipe is not available, the optional 10106 Universal Mounting Arm can be used to mount the AIO 2 horizontally or vertically to a variety of vertical posts or pipes. The included hose clamps will fit up to 3” diameter posts, but larger user supplied hose clamps can be substituted to mount the arm to larger diameter structures.

10106 Universal Mounting Arm Orientation Options

Horizontal

Vertical

3.3. Input / Output Connections

10624 Cable Wire Color Designations:

RED	POWER POSITIVE (8-36VDC, 30mA nominal @ 12VDC)
BLK	POWER COMMON
BLU	SDI-12
GRN	SIGNAL COMMON
WHT	RS-232 TX
BRN	RS-232 RX
YLW	RS-485 +B
GRY	RS-485 -A
ORN	EXTERNAL RAIN GAUGE OPTION INPUT
VIO	EXTERNAL SOLAR RADIATION SENSOR OPTION INPUT
WHT/BRN	SHIELD (must be grounded for transient protection to function)

Warning: Do not short any of the signal or power wires to ground or to each other.

Maximum Cable Length Considerations:
The maximum recommended cable length depends on the communication protocol to be used:

RS-232C	50FT maximum
RS-485	4000FT maximum
SDI-12	200FT maximum

Connecting to the optional 10600 Interface Base Station

- The optional 10600 Interface Base Station provides:
  - 12VDC power to the sensor
  - Convenient wiring terminal blocks for the AIO 2 sensor
  - Connection points for optional external Rain gauge and Solar radiation sensors.
  - USB and DB9 serial port outputs for easy Computer connectivity.

- See the included 10600 manual for use and connection details.

3.4. Operational Checkout

Connect the AIO 2 to your data logger or recording electronics. Connect power to the sensor cable per wiring diagram in section 3.3. The AIO 2 will automatically start streaming its serial output and your recording electronics should start displaying or recording measurements from the AIO 2. Verify the data seems reasonable by comparing it to data from a local weather source. If the data looks OK, the unit is in operation. If data is questionable, contact Met One Instruments, Inc. Service Department for further guidance (see the Technical Support section at the beginning of this manual).

3.5. Maintenance

The unit has no moving parts and therefore requires no periodic maintenance for wear items. It is recommended that the data be checked every 6 -12 months to be sure there has been no failure of any of the electrical components. This can be done by placing a small container (at least 12inch diameter) over the sensor to zero check the wind measurement. The ambient temperature, relative humidity, and pressure readings can be verified against collocated devices such as the Met One 083E-1-35 T/RH sensor and Met One 092 BP sensor.

3.6. Setting Magnetic Declination

The internal flux gate compass automatically corrects the wind direction in the AIO 2 to magnetic North. This means that the unit will *not* require directional alignment or orientation upon deployment.

If it is necessary to measure wind direction referenced to True North it is important to understand and know the magnetic declination of the area in which the sensor is being operated. The declination in the AIO 2 is factory set at zero degrees. To change this, refer to the MD command instruction in section 7.1.11 for setting the Magnetic Declination.

4. User Selectable Options

The following User Defined Options can be set following the instructions detailed in Appendix A.

BV Battery Voltage Printout Toggle On/Off
CV Compass Reading Printout Toggle On/Off
ID View / Set Instrument ID
MA Set MODBUS Address
MD Set Magnetic Declination
ME Metric or English Units
OI Set Output Interval
PU Set Pressure Units
RT Output Record Type
RU Set Rain Units
RV Display Firmware Version Number
SA SDI Address
SC Solar Option Calibration Constant
ST Set Serial Trigger Address
SU Set Wind Speed Units
TU Set Temperature Units
Q Quit Terminal Mode and Save changes

5. User Interface

The output of the AIO 2 is a fixed length, comma delimited, serial data stream. The serial output is factory set for 9600 baud, no parity, 8 data bits, 1 stop bit, and no flow control. The output interval default is once per second. This may be changed using the *OI* command (see Appendix A). The data is easily viewed and can be displayed and captured using Met One Instruments' Comet Software or other terminal communication program.

An ***example*** of the standard output format is shown below:

000.6,272,+023.6,022,0974.3,000.00,0000,12.7,U0,*02257 CR/LF

Each parameter is a fixed length with leading zeros separated by a comma. The string terminates with a Carriage Return and Line Feed. Field parameters are defined as:

000.6,272,+023.6,022,0974.3,000.00,0000,12.7,U0,*02257 CR/LF
WS,WD,AT,RH,BP,RN,SR,BV,CONFIG,CheckSum

The wind speed, temperature, pressure and rainfall units can be changed with the *SU, TU, PU,* and *RU* terminal commands respectively. Please refer to Appendix A for more information.

NOTE: the internal alignment compass reading can be added to the output string using the CV command; see Section 7.1.3 for details and an output string example.

The AIO 2 output can also be configured to emulate the Legacy AIO 102780 output data format. An ***example*** of the Legacy AIO output format is shown below:

002.6, 219, +020.8, 042, 1013.2, *1787CR/LF

Each parameter is a fixed length with leading zeros separated by a comma and one space. The string terminates with a Carriage Return and Line Feed. Field parameters are defined as:

002.6,	219,	+020.8,	042,	1013.2,	*1787
WS	WD	Temp	RH	BP	Check Sum

Note: when displaying the pressure in In/Hg, there will be an extra leading zero character but the fixed length of the field will not change.

A check sum parameter will be added to the end of the message (*9999).

The check sum is the addition of all the characters from the start of the message through the first character preceding the asterisk (*). The check sum is expressed as a decimal number. This is a 16 bit sum and should not overflow past 4 digits given the number of characters in the output string.

Polled data mode (RS232 or RS485)

The sensor can be set for polled data mode instead of continuous serial output by setting the OI command to Zero, and using the serial trigger string to request a data string. Refer to the *ST* terminal command in Appendix A for instructions on setting the Serial Trigger.

SDI-12 Interface

In addition to the above communications methods, the sensor can be polled by an SDI-12 Master Station for data. This operates completely independent of the RS232 or RS485 communications and can be used in conjunction with those methods. Data are polled using a series of SDI-12 commands. Please see appendix A for a list of supported SDI commands. The default SDI Address for the AIO 2 is zero.

Please consult your data-logger manual for more information on SDI interfaces or call Met One for additional help.

6. Standard Configuration

Serial Interface
The serial interface is fixed at 9600 Baud and configured for No Parity, 8 Data Bits and 1 Stop Bit, with no flow control.

Wind Speed
The Wind Speed unit choices are MPH or M/S. The default is M/S. The Speed range for M/S is 0-60. The Speed range for MPH is 0-134.

Temperature
The Temperature unit choices are Degrees C or Degrees F. The default is Degrees C. The range for Degrees C is -40 to +60, the range for Degrees F is -40 to +140.

Pressure
Pressure Range choices are In/Hg, Millibars, or mm/Hg, and the default is Millibars. The Pressure range for Millibars is 600-1100, for In/Hg is 17.72 to 32.48, and for mm/hG is 450 to 825.

Precipitation Input
The Precipitation resolution can be 0.25mm/tip or 0.01”/tip. 0.25mm/tip is the default.

Solar Radiation Input
The Solar Radiation input units are watts per square meter. The default calibration constant is 2 W/m^2 per mV (1.000VDC = 2000 W/m^2).

7. Appendix A

7.1. Terminal Mode and SDI Commands

RS232 / RS485 Terminal Mode Commands

Terminal mode is activated by entering three carriage return characters within a 2 second period. Terminal mode times-out after 2 minutes of inactivity.

Successful entry into Terminal Mode will return an asterisk prompt:

7.1.1. H,h,? – Display Help Menu

BV - Battery Voltage Printout Toggle On/Off
CV - Compass Heading Printout Toggle On/Off
ID - View / Set Instrument ID
MA - Set MODBUS Address
MD - Set Magnetic Declination
ME - Metric or English Units
OI - Set Output Interval
PU - Set Pressure Units
SA - SDI Address
SC - Solar Calibration
RT - Output Record Type
ST - Set Serial Trigger Address
SU - Set Speed Units
TU - Set Temperature Units
RV - Display Firmware Version Number
RU - Set Rain Units
Q - Quit command mode and save any changes

NOTE: The commands noted in this appendix will change both the RS232 and RS485 outputs. The SDI-12 output can be configured independently. See pages below for SDI-12 commands.

7.1.2. BV – Battery Voltage Printout Toggle On/Off

This command enables or suppresses the Battery Voltage reading in the serial string output.

COMMAND	**RESULT**
BV<cr>	Report current setting
BV0<cr>	Battery Voltage Measurement removed from serial output 000.0,000,+024.5,045,0970.5,000.00,0000,M0,*02112
BV1<cr>	Battery Voltage Measurement enabled in serial output 000.0,000,+024.5,045,0970.5,000.00, 0000,**12.0**,M0,*02344

7.1.3. CV – Compass Measurement Printout Toggle On/Off

This command enables or suppresses the Compass Reading in the serial string output.

COMMAND	RESULT
CV<cr>	Report current setting
CV0<cr>	Compass Measurement removed from serial output 000.0,000,+024.5,045,0970.5,000.00, 0000,12.0,M0,*02344
CV1<cr>	Compass Measurement enabled in serial output 000.0,000,+024.5,045,0970.5,000.00, 0000,12.0,**240**,M0,*0254

7.1.4. ID – View / Set Instrument ID

Read or Set the Instrument ID

COMMAND	RESULT
ID<cr>	Report the Instrument ID setting (provides help)
ID XX<cr>	Set Instrument ID to number from 1 to 99

7.1.5. MA – View / Set Modbus Address

Read or Set the Modbus Address

COMMAND	RESULT
MA<cr>	Report the Modbus Address setting (provides help)
MA XX<cr>	Set Instrument ID to number from 1 to 247. Setting this value to 0 will disable Modbus.

7.1.6. ME – Metric or English Units

This command will set all units in the the serial port's output to Metric or English

COMMAND	RESULT
ME<cr>	Report Units setting
ME0<cr>	Set Units to Metric (Default): WS: m/s AT: Deg C BP: mbars RN: mm
ME1<cr>	Set Units to English: WS: MPH, AT: Deg F BP: inHg

	RN: inches

7.1.7. SU –Wind Speed Units

Read or Set this serial port's output Units for Wind Speed

COMMAND	RESULT
SU<cr>	Report Units setting
SU0<cr>	M/S
SU1<cr>	MPH

7.1.8. TU –Temperature Units

Read or Set this serial port's output Units for Temperature

COMMAND	RESULT
TU<cr>	Report Units setting
TU0<cr>	Fahrenheit
TU1<cr>	Celsius

7.1.9. PU –Barometric Pressure Units

Read or Set this serial port's output Units for Pressure

COMMAND	RESULT
PU<cr>	Report Units setting
PU0<cr>	Millibars (Default)
PU1<cr>	Inches of Mercury
PU2<cr>	Millimeters of Mercury

7.1.10. RU –Rain Units

Read or Set this serial port's output Units for Pressure

COMMAND	RESULT
RU<cr>	Report Units setting
RU0<cr>	mm (Default)
RU1<cr>	Inches

7.1.11. MD –Magnetic Declination

The flux compass in the AIO 2 sensor provides Wind Direction to MAGNETIC north. Software in the Interface allows the setting of a declination angle to correct the Wind Direction output to TRUE north. It is recommended that this procedure be done in the lab, but can be done in the field as well. Once the declination angle is set in the sensor, it is stored in non-volatile memory, and does not have to be reset each time the sensor is fielded. The declination angle must be reset only if the system is used in a different geographical location separated by many miles from the location where the declination was originally set.

It is suggested that the magnetic declination be determined before performing this calibration. Visit the following web site for help in determining the correct declination for your site:

www.ngdc.noaa.gov/geomag/declination.shtml

Click “Compute your declination”. On the next page, enter either zip code, or select country and city, then click “Get Location” and then “Calculate”. Alternatively, you can enter longitude and latitude directly, and then click “Calculate”. Declination is reported in Degrees, Minutes and Seconds. Divide minute’s value by 60 to get decimal fraction of degrees (I.E. 50 minutes = 0.8 degrees). If the declination needs to be adjusted, please use the *MD* command as shown below.

Read or Set the Magnetic Declination

COMMAND	**RESULT**
MD<cr>	Report Magnetic Declination setting
MDXX.X<cr>	Set Declination to XX.X Degrees

Note: West declination values are entered and reported as negative values.

7.1.12. OI –Output Interval

Read or Set the Output Interval for this serial port
Note: This command is not supported by SDI-12.

COMMAND	**RESULT**
OI<cr>	Report Output Interval setting
OI0<cr>	For Serial Trigger (Address must be set with ST command).
OI1<cr>	Sensor Output every 1 second (Default)
OI2<cr>	Sensor Output every 2 seconds
OI3<cr>	Sensor Output every 5 seconds
OI4<cr>	Sensor Output every 15 seconds
OI5<cr>	Sensor Output every 30 seconds
OI6<cr>	Sensor Output every 60 seconds

7.1.13. ST – Serial Trigger

Read or Set the Serial Trigger character string (Poll command)

COMMAND	RESULT
ST<cr>	Report Serial Trigger string setting (provides help)
ST XXXXXX<cr>	Set Serial Trigger

7.1.14. SA – SDI-12 Address

Read or Set the SDI-12 Address, used to poll data in SDI-12 mode.

COMMAND	RESULT
SA<cr>	Report SDI-12 Address string setting (provides help)
SAx<cr>	Set SDI-12 Address, where 'x' is in the range [0-9], [A-Z] or [a-z] Case Sensitive.

7.1.15. SC – Solar Calibration

Read or Set the Solar Radiation Input Calibration Constant, units are in W/m^2 per mV.

COMMAND	RESULT
SC<cr>	Report Solar Radiation Input Calibration Constant Default is 2 W/m^2 per mV (1.000V = 2000W/m2)
SCX.XXX<cr>	Set Solar Calibration Constant to x.xxx in W/m^2 per mV.

7.1.16. RT – Output Record Type

Read or Set the Output Record type.

COMMAND	RESULT
RT<cr>	Report Output Record Type
RT1<cr>	Set Output Record Type to Met Record format (default).
RT2<cr>	Set Output Record Type to AIO format for compatibility with legacy AIO 102780 systems.

7.1.17. RV – Software Version Number

Report the current Software Version Number

COMMAND	RESULT
RV<cr>	Report current Software Version

7.2. SDI-12 Commands

NAME	SDI-12 COMMAND	SENSOR RESPONSE
Address Query	?!	*a*<CR><LF> Where *a* = address
Acknowledge Active	*a*!	*a*<CR><LF> Where *a* = address
Send Identification	*a*I!	*a*13METONE AIO 2 2.0.0*xxxxx*<CR><LF> Where *a*=address and *xxxxx* = S/N
Change Address	*a*A*b*!	*b*<CR><LF> Where *b* = new address
Start Measurement	*a*M!	*a*0009<CR><LF> Where *a* = address
Start Measurement with CRC	*a*MC!	*a*0009{crc}<CR><LF> Where *a* = address and {crc} = CRC
Send Data	*a*D0!	*a+bbb.b+ccc.c+ddd.d+eee.e*<CR><LF> Where *a* = address, *bbb.b* = wind speed, *ccc.c* = wind direction, *ddd.d* = temperature, and Send Data *eee.e* = relative humidity
	*a*D1!	*a+ffff.f+gggg.g+hhhh+ii.ii*<CR><LF> Where *a* = address, *ffff.f* = barometric pressure, *gggg.g* = Rain Option, *hhhh* = Solar Option, and ii.ii = Power Supply Voltage
Start Concurrent Measurement	*a*C!	*a*00009<CR><LF> Where *a* = address
Start Concurrent Measurement with CRC	*a*CC!	*a*00009{crc}<CR><LF> Where *a* = address and {crc} = CRC
Continuous Measurements	*a*R0!	*a+bbb.b+ccc.c+ddd.d+eee.e*<CR><LF> Where *a* = address, *bbb.b* = wind speed, *ccc.c* = wind direction, *ddd.d* = temperature, and *eee.e* = relative humidity
	*a*R1!	*a+ffff.f+gggg.g+hhhh+ii.ii*<CR><LF> Where *a* = address, *ffff.f* = barometric pressure, *gggg.g* = Rain Option, *hhhh* = Solar Option, and ii.ii = Power Supply Voltage
Continuous Measurements with CRC	*a*RC0!	*a+bbb.b+ccc.c+ddd.d+eee.e*{crc}<CR><LF> Where *a* = address, *bbb.b* = wind speed, *ccc.c* = wind direction, *ddd.d* = temperature, *eee.e* = relative humidity, and {crc} = CRC
	*a*RC1!	*a+ffff.f+gggg.g+hhhh+ii.ii*{crc}<CR><LF> Where *a* = address, *ffff.f* = barometric pressure, *gggg.g* = Rain Option, *hhhh* = Solar Option, and ii.ii = Power Supply Voltage and {crc} = CRC

NAME	SDI-12 COMMAND	SENSOR RESPONSE
Report Wind Units	*a*XSU!	*a*XSU*b*!<CR><LF> Where *a* = address, and *b* = 0 for Meters per Second (default), or 1 for Miles per Hour
Set Wind Units *a*XSU*b*	*a*XSU*b*!	
Report Temperature Units	*a*XTU!	*a*XTU*d*<CR><LF> Where *a* = address, and *d* = 0 for Celsius (default), or 1 for Fahrenheit
Set Temperature Units	*a*XTU*d*!	
Report Pressure Units	*a*XPU!	*a*XPU*f*<CR><LF> Where *a* = address, and *f* = 0 for Millibars (default), or 1 for Inches of Mercury
Set Pressure Units	*a*XPU*f*!	
Report Rain Units	*a*XRU!	*a*XRU*f*<CR><LF> Where *a* = address, and *f* = 0 for mm (default), or 1 for Inches
Set Rain Units	*a*XRU*f*!	
Report Version Number	*a*XRV!	*a*XVN*xx x*<CR><LF> Where *a* = address and *xx x* = firmware version

8. Modbus

8.1. Modbus operation:

The AIO 2 can be queried for data using the Modbus RTU protocol. The AIO 2 will automatically detect a Modbus data request via its standard RS-232 or RS-485 interface, and will change to Modbus mode, ready to send out data as requested by a connected Modbus Master.

If the AIO 2 is to be used as a Modbus device, it is recommended to set the Output Interval (OI) command to 0 (zero) to turn off the 1/second output, as shown in section 7.1.12. This will prevent any serial traffic conflicts.

The AIO 2 can be assigned a Modbus address between 1 to 247, which allows it to be addressed on a multiple device network. Setting the Modbus address to 0 will disable the Modbus functionality of the AIO 2.

The AIO 2's current measurement data can be polled via Modbus using the 3X and 4X register addresses:

3X Registers

ModBus Name		Addr	Type	Points	
MB_123456	=	0	float	2	Known value for easier Byte Order configuration
MB_SN	=	2	Char	5	Serial Number String
MB_Revision	=	7	char	20	39 Char + Zero Terminator word aligned to 40 bytes
MB_WS	=	100	float	2	Wind Speed
MB_WD	=	102	float	2	Wind Direction
MB_AT	=	104	float	2	Ambient Temperature
MB_RH	=	106	float	2	Relative Humidity
MB_BP	=	108	float	2	Barometric Pressure
MB_Rain	=	110	float	2	Rain (Reset on Read)
MB_Solar	=	112	float	2	Solar Radiation Disregard if not installed
MB_Batt	=	114	float	2	Supply Voltage
MB_Comp	=	116	float	2	Compass Heading

4X Registers

ModBus Name		Addr	Type	Points	
MB_Byte_Order	=	0	Int	1	1 thru 4

9. Appendix B

9.1. Theory of Operation

Wind

The Met One sonic anemometer operates on the principal that the speed of the wind affects the time it takes for sound to travel from one point to a second point. If the sound is traveling in the direction of the wind then the transit time is decreased. If the sound is traveling in a direction opposite the wind then the transit time is increased.

Ambient Temperature

The temperature sensor in the AIO 2 uses a precision Thermistor. This provides highly accurate and stable temperature readings.

Relative Humidity

The relative humidity sensor is a capacitive polymer sensor which is constructed to provide excellent resistance to wetting, dust, dirt, oils, and common environmental chemicals.

Barometric Pressure

The barometric pressure sensor is a stable transducer using nano-technology, yielding a linear and repeatable sensor with low hysteresis.

This piezo-resistive pressure sensor module is mounted on an electronic circuit board within the sensor. A microcontroller controls the operation of the sensor and the data interface.

The microcontroller polls the pressure sensor module once per second for the barometric pressure and the ambient temperature. The raw readings are temperature corrected by the microcontroller.

Fluxgate Compass

The internal compass module is low power and compact. It employs a pair of magneto-resistive sensors, which change with varying magnetic field strengths, to sense the Earth’s magnetic field.

The AIO 2 microprocessor measures the output of the internal compass and then corrects the wind direction data for the orientation of the sensor. The output of the AIO 2 wind direction is relative to magnetic North. A user programmable value of Magnetic Declination may optionally be entered through terminal mode. This enables wind direction output relative to True rather than Magnetic North.

10. Warranty / Service

Warranty

Products manufactured by Met One Instruments, Inc. are warranted against defects and workmanship for a period of one (1) year from the ship date.

Any product found to be defective during the warranty period will, at the option of Met One Instruments, Inc., be replaced or repaired. In no case shall the liability of Met One Instruments, Inc. exceed the purchase price of the product.

This warranty may not apply to products that have been subject to misuse, negligence, accident, acts of nature, or that have been altered or modified other than by Met One Instruments, Inc. Consumable items such as filters, bearings pumps and batteries are not covered under this warranty.

Other than the warranty set forth herein, there shall be no other warranties, whether expressed, implied or statutory, including warranties of fitness of merchantability.

Service

Any product being returned to Met One Instruments, Inc. for service, repair or calibration, including items sent for warranty repair, must be assigned a return authorization (RA) number. Please call (541) 471-7111 or send an email to service@metone.com requesting an RA number and shipping instructions.

All returns must be shipped to the factory, freight pre-paid. Met One Instruments, Inc. will pay the shipping charge to return the product to the end user after repair or replacement of an item covered by warranty.

All instruments sent to the factory for repair or calibration must be free of contamination resulting from sampling chemicals, biological matter, or radioactive materials. Any items received with such contamination will be disposed and the customer will be billed a disposal fee.

Replacement parts or service/repair work performed by Met One Instruments, Inc. are warranted against defects in material and workmanship for a period of ninety (90) days from the date of shipment, under the same conditions as stated above.

REV 2011

Attachment B

Model 360 Precipitation Gauge

Operation Manual

1.0 General Information

NOTE: Remove screens during winter operation.

1.1. Specifications

The Model 360 Precipitation Gauge is an accurate, sensitive and low maintenance sensor designed to measure rainfall on a continuous basis. Water does not collect in the sensor, but is drained each time an internal bucket fills with 0.1mm, 0.2mm or .25mm of rainfall depending on set standard calibration, and a switch closure pulse is also sent to the translator module or data logger for counting. The sensor is calibrated at shipment and requires no adjustments after the mounting.

TABLE 1-1: MODEL 360 PRECIPITATION GAUGE SPECIFICATIONS

Rain Gauges:	**360 Rain**	**362 Rain**	**364 Rain**
Plastic Tip Bucket Model #:	360	362	364
Metal Tip Bucket Model #:	360-1	362-1	364-1
Funnel Area:	200cm^2	200cm^2	200cm^2
Standard Calibration:	.25mm/tip or .01in/tip	.20mm/tip	.10mm/tip
Accuracy:	0 to 30mm/hr ± 1.0% 30 to 120mm/hr ± 5.0%	0 to 30mm/hr ± 1.0% 30 to 120mm/hr ± 5.0%	0 to 30mm/hr ± 1.0% 30 to 120mm/hr ± 5.0%
Switch:	Reed Switch, rated at 10mA, 28VDC	Reed Switch, rated at 10mA, 28VDC	Reed Switch, rated at 10mA, 28VDC
Operating Temperature:	0°C to +60°C	0°C to +60°C	0°C to +60°C
Height/ Weight:	30.5cm / .92kg	30.5cm / .92kg	30.5cm / .92kg

Rain & Snow Gauges:	**365 Rain & Snow**	**367 Rain & Snow**	**369 Rain & Snow**
Plastic Tip Bucket Model #:	365	367	369
Metal Tip Bucket Model #:	365-1	367-1	369-1
Funnel Area:	200cm^2	200cm^2	200cm^2
Standard Calibration:	.25mm/tip or .01in/tip	.20mm/tip	.10mm/tip
Accuracy:	0 to 30mm/hr ± 1.0% 30 to 120mm/hr ± 5.0%	0 to 30mm/hr ± 1.0% 30 to 120mm/hr ± 5.0%	0 to 30mm/hr ± 1.0% 30 to 120mm/hr ± 5.0%
Switch:	Reed Switch, rated at 10mA, 28VDC	Reed Switch, rated at 10mA, 28VDC	Reed Switch, rated at 10mA, 28VDC
Operating Temperature:	-25°C to +60°C	-25°C to +60°C	-25°C to +60°C
Thermostat Set Point for Funnel & Base Heater:	4.4°C	4.4°C	4.4°C
Heaters:	Funnel: 24VAC/DC, 75watt Base: 24VAC/DC, 50watt	Funnel: 24VAC/DC, 75watt Base: 24VAC/DC, 50watt	Funnel: 24VAC/DC, 75watt Base: 24VAC/DC, 50watt
Height/ Weight:	30.5cm / 1.1kg	30.5cm / 1.1kg	30.5cm / 1.1kg

1.2. Sensor Signal Cable

The Sensor Cable Is a vinyl-jacketed 2 conductor shielded cable connecting to the sensor via an internal terminal strip. Cable length is designated in XX feet on each cable part number label.

1.3. Heater Power Cable

The Heater Power Cable Is a vinyl-jacketed 2 conductor shielded cable connecting to the sensor via an internal terminal strip. Cable length is designated in XX feet on each cable part number label.

2.0 Installation

2.1. Location

Choose a site where the height of any nearby trees or other objects above the sensor is no more than twice their distance from the sensor. A uniform surrounding of objects (such as an orchard) is beneficial as a windbreak. Non-uniform surroundings (such as a nearby building) create turbulence, which affects accuracy.

2.2. Setup

1. NOTE: The Rain gauge is designed for installation on a customer-built pedestal mount.

2. Prepare the pedestal for mounting and leveling the rain gauge.

3. Route the #3519 Signal Cable and if applicable the #3517 Heater Power Cable up through the pedestal center tube. (Refer to Figure 2.1)

FIGURE 2.1: 3519 SIGNAL CABLE

4. On the rain gauge, remove three screws/washers near bottom of housing that secure housing to base. Slowly and carefully lift the housing straight up from base.

NOTE: If rain gauge is heated carefully disconnect the funnel heater from the heater wiring terminal block. Insure that all wiring is connected properly before closing the housing.

FIGURE 2.2: HEATED FUNNEL ASSEMBLY

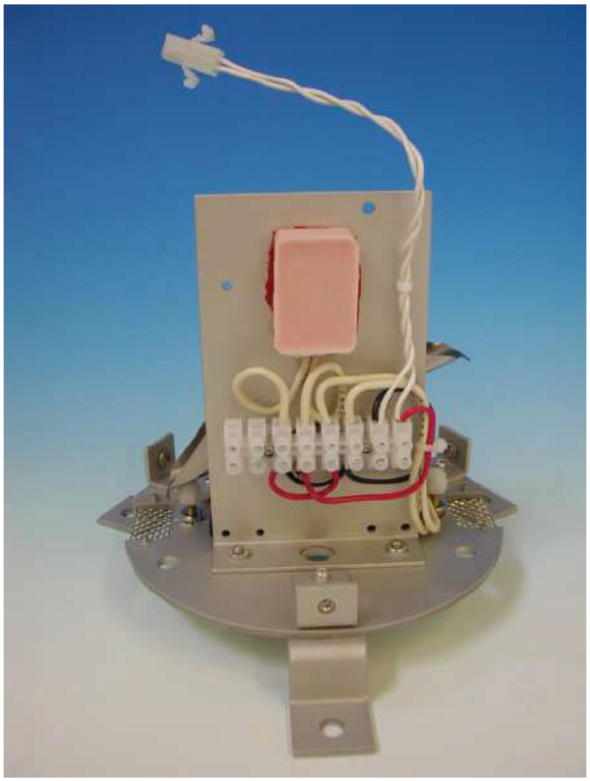


FIGURE 2.3 HEATER TERMINAL ASSEMBLY

5. Connect the #3519 Signal Cable & #3517 Heater Power Cable (if applicable). (Refer to Figure 2.4).

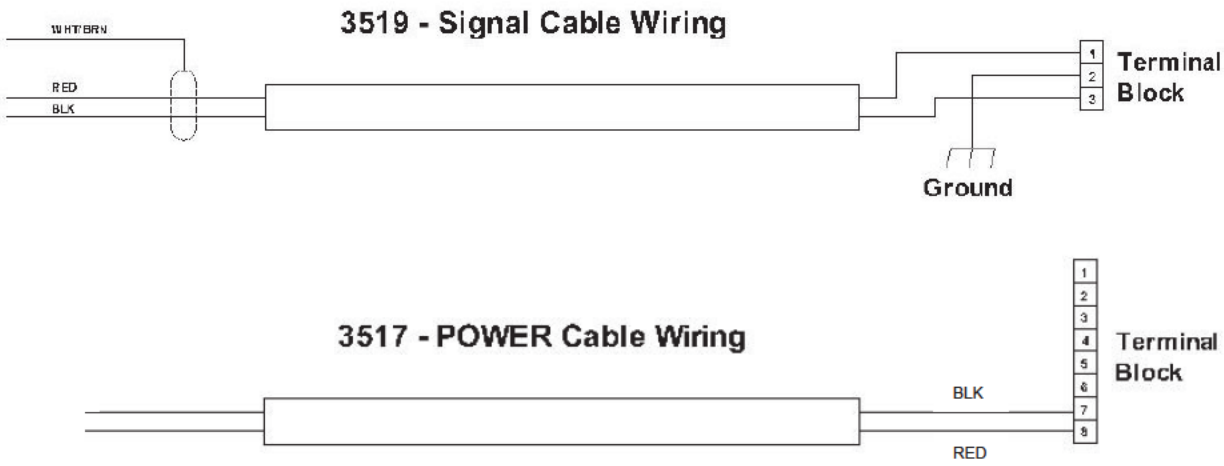


FIGURE 2.4: 3519 SIGNAL CABLE WIRING & 3517 HEATER POWER CABLE WIRING

6. While pushing cable down into the pedestal center tube check cable routing under the rain gauge for kinks or binding, correct as required.

7. Connect the #3519 Signal Cable to the logger/counting device. Connect the #3517 Heater Power Cable to the power source.

NOTE: Before turning on power to heated rain gauge insure proper voltage and wattage are being applied. Refer to the heater specifications in section 1.1.

8. Level the rain gauge by observing the location of the bubble in the bubble level (adjust as required). Note: This rain gauge has been calibrated at the factory with the bubble centered; any deviation from this could affect accuracy. (Refer to Figure 2.5).

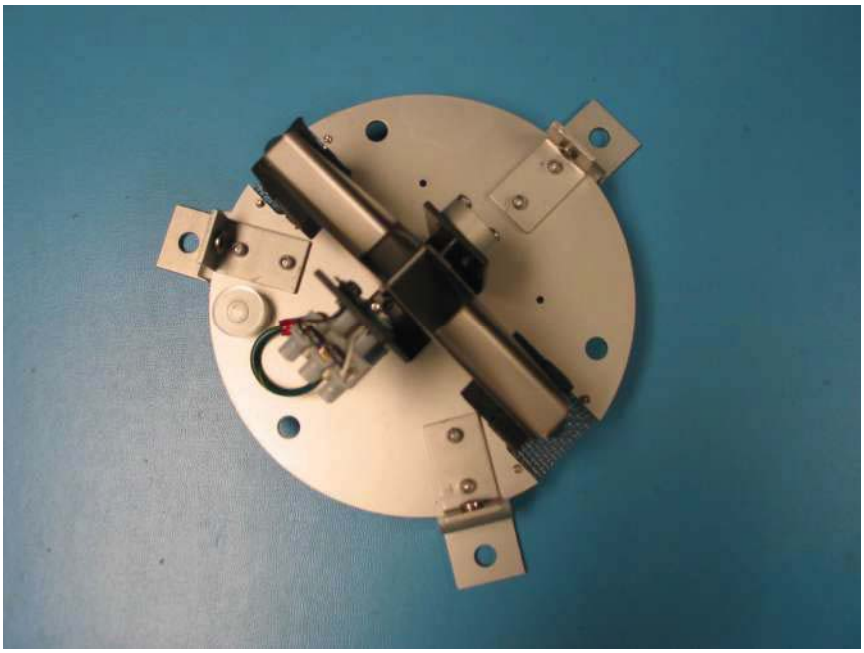


FIGURE 2.5: BUBBLE LEVEL & MOUNTING ADJUSTMENT

CAUTION

Gently remove the foam shipping restraints (Refer to Figure 2.6) from the tipping bucket. Manually tip the bucket for specified calibration rainfall recorded per each tip. If no output, check connections.

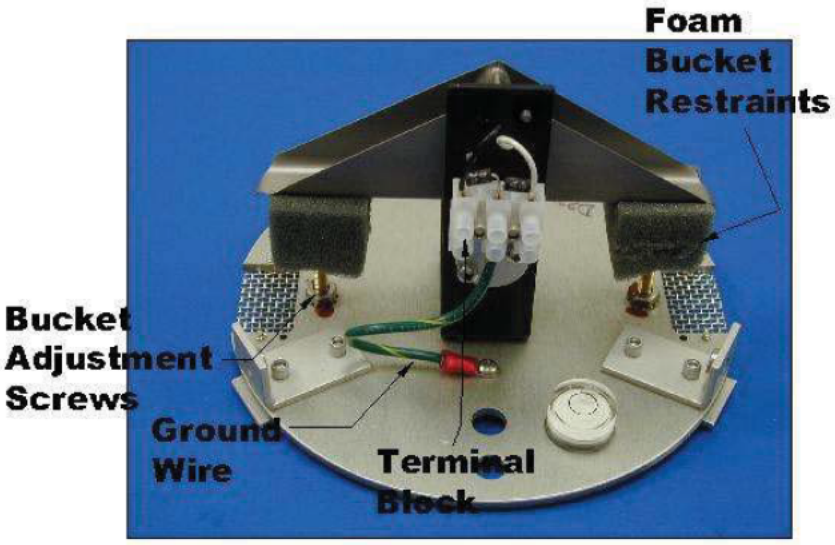
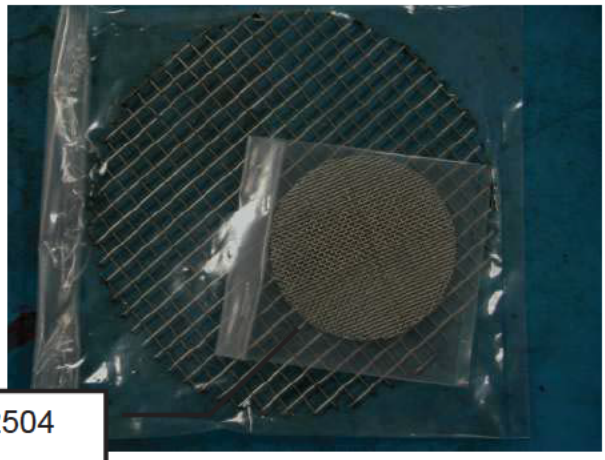


FIGURE 2.6: FOAM BUCKET RESTRAINTS

9. Insure that all wiring is connected properly before closing the housing.
10. Install the housing onto the rain gauge base.
11. Align holes in housing and captive nuts in base. Re-install three screws and washers to secure housing onto base.
12. Remove both screens from plastic bags and install in funnel as shown below. (Refer to Figure 2.7). Care must be taken at the sharp-edged orifice to avoid personal injury and damage to the thin edge.



PART# 2504
& 3465

FIGURE 2.7: COLLECTION FUNNEL & ORIFICE SCREENS

13. Rain gauge is now ready for operation.

CAUTION
To avoid possible damage and loss of calibration during any further shipments, re-insert foam shipping restraints to immobilize the tipping bucket.

3.0 Calibration

The sensor is factory calibrated, recalibration is not required unless damage has occurred or the adjustment screws have loosened. To check or recalibrate, perform the following steps:

a. Remove housing

b. Check the bubble level to see if the sensor is level.

c. Wet the tipping bucket assembly using a buret or graduated cylinder; slowly pour the measured quantity of water into the tipping bucket, which should then tip. Repeat for the alternate bucket. If both buckets tip when filled with the measured quantity of water, the sensor is properly calibrated. If they do not, recalibrate as follows:

TABLE 3-1:CALIBRATION QUANTITIES

Tip Calibration	Water Quantity
0.1mm	2.0 milliliters
0.2mm	4.0 milliliters
0.25mm or .01in	5.0 milliliters

1. Release the lock nuts on the cup adjustment screws.
2. Move the adjustment screws down to the position that would place the bucket far out of calibration.
3. Allow the measured quantity of water to enter the bucket.
4. Turn the cup adjustment screw up until the bucket assembly tips. Tighten the lock nut.
5. Repeat steps 3 and 4 for the opposite bucket.
6. Measure the quantity of water necessary to tip the bucket several times to ensure proper calibration.

d. After installation and calibration (if necessary), replace the housing on the gauge.

4.0 Maintenance*

At six-month intervals, perform the following steps:

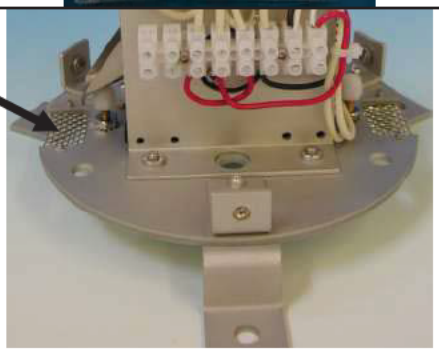
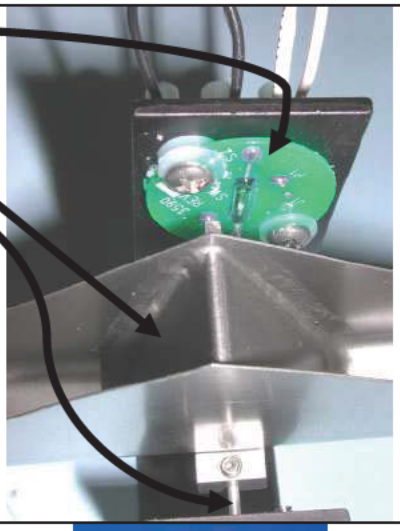
a. Clean funnel and buckets.

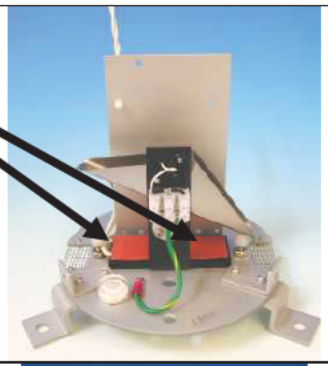
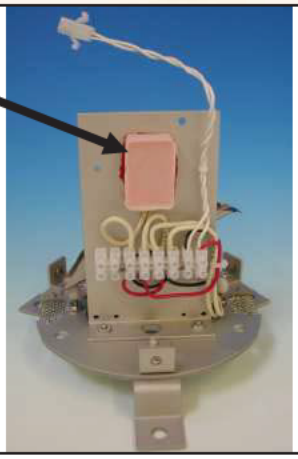
b. Do NOT lubricate the pivot shaft, as any lubricant may attract dust and dirt and cause wear or drag.

c. Verify that the bucket moves freely and that translator card or data logger registers proper calibration for each bucket tip.

*Based on average to adverse environments.

TABLE 4-1: 360 SERIES PART REPLACEMENT

ITEM	DESCRIPTION	PART #	IMAGE
1	Screen, 2-9/16 DIA., SST	2504	
2	Screen, Primary (6" RG)	3465	
3	Screen, Base	3522 (2 PLCS)	
4	Circuit Board Assy, Reed Switch	3487	
5	Assy, Tip Bucket (Plastic)	3554	
6	Assy, Tip Bucket (Metal)	3478	
7	Pivot Shaft	3477	
8	Heated Funnel Assy	10159	

9	Lower Heater Element	9684	
10	Lower Heater Thermostat	9685	

Attachment C

Comet Cloud Service: CCS Modem 2

Operation Manual

COMET CLOUD SERVICE
CCS MODEM 2
CCS-9800 REV A
OPERATION MANUAL

Met One Instruments, Inc
1600 Washington Blvd.
Grants Pass, Oregon 97526
Telephone 541-471-7111
Facsimile 541-471-7116

Regional Service
3206 Main St. Suite 106
Rowlett, Texas 75088
Telephone 972-412-4715
Facsimile 972-412-4716

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Comet Cloud Service Modem Manual

About This Manual

This document is organized with the most important information grouped together for easy reference by the user. All owners and operators should read and understand the sections on installation, setup, and field calibrations. Other sections that provide in-depth information on subjects such as theory, diagnostics, accessories, and alternate settings provide valuable information which should be consulted as needed. Electronic versions of this manual are also available.

Technical Service and Warranty

This manual is structured by customer feedback to provide the required information for setup, operation, testing, maintaining, and troubleshooting your unit. Should you still require support after consulting your printed documentation, we encourage you to contact one of our expert Technical Service representatives during normal business hours of 7:00 a.m. to 4:00 p.m. Pacific Standard Time, Monday through Friday. In addition, technical information and service bulletins are often posted on our website. Please contact us and obtain a Return Authorization (RA) number before sending any equipment back to the factory. This allows us to track and schedule service work and to expedite customer service.

Phone:	**(541) 471-7111**	Fax:	(541) 471-7116
E-Mail:	service@metone.com	Web:	www.metone.com
Address:	Technical Services Department Met One Instruments, Inc. 1600 NW Washington Blvd. Grants Pass, OR 97526		

Table of Contents

1 INTRODUCTION

1.1 About the Comet Cloud Service (CCS) Modem

The Met One Instruments, Inc. Comet Cloud Service (CCS) modem provides real time remote connectivity to a range of Met One particulate and weather sensors. The CCS package includes the cellular modem hardware, a personalized webpage dashboard, and 1 year of free cellular and cloud website data hosting services.

The CCS web dashboard gives current measurement values graphically and in tabular form; the private link can be shared with other authorized users allowing easy data sharing across an organization. Data is stored in the cloud for 2+ years, and can be downloaded to a computer or other device at any time.

The CCS modem uses Met One's standard communication protocol to identify and setup any connected compatible device. Dual quick-connect connectors are included and allow 2 devices, such as an NPM Sensor particulate monitor and an AIO 2 weather sensor, to share one common modem and website.

1.2 Comet Cloud Service Modem Specifications

Parameter	Specification
Power:	Input: 12 VDC
Power Consumption:	110 mA Average Draw
Operating Temperature:	-25° to +60°C / -13° to +140° F
Ambient Humidity Range:	0 to 100% RH, non-condensing.
Mounting:	Pole mounting bracket with hose clamps.
Unit Weight:	0.95 kg / 2.1 lb.
Unit Dimensions:	36.7 X 11.5 cm / 14.5 X 4.5 in (H X DIA.)
Rating:	IP64
GPS:	Internal GPS module included
I/O Interface:	MOI 7500 Protocol, via RS-485 or RS-232
Network Compatibility:	CDMA (U.S. Domestic) GSM (Internationally w/ over 550 networks)
Data Collection on Modem:	Every 1 Second
Data Storage on Cloud:	Standard: USA: 15 Minute - Global: 60 Minute
Data Storage on Cloud:	2 Years (oldest data overwritten after that)
Data Plan:	1 year of Service included with purchase of CCS Modem Renewals available from Met One Instruments, Inc. Service Department.

Specifications may be subject to change without notice.

2 Setup and Startup

The Comet Cloud Service (CCS) modem is designed for rapid deployment and easy setup by a single person. This section describes the basic assembly, setup, and start-up of the instrument.

2.1 Unpacking the CCS Modem

When unpacking a new CCS Modem, verify that the contents are undamaged. Any damages incurred to the equipment during shipping are the responsibility of the carrier. If any damage to the shipment is noticed before unpacking, **a claim must be filed with the commercial carrier immediately**. You should follow any special unpacking instructions provided by the carrier as you then carefully remove all items from the containers and inspect each component. It is recommended to document and photograph all damaged packages and items before, during, and after unpacking them. Contact Met One Instruments to arrange for any replacement items needed.

2.2 Components

Each CCS Modem includes:

CCS Modem

Mounting clamps

DC power cable

Comet Software CD

Accessories purchased separately may include:

9438-4 AC Power supply

Sensor-to-modem cables

2.3 Installing the CCS Modem

The CCS will need to be mounted to a vertical pole or post as shown in the image above. Using the supplied metal clamps, tighten the mounting bracket to the mounting pole.

NOTE: The CCS Modem includes an internal GPS that adds station location data to the Cloud website and downloaded station data. For best GPS operation, the CCS Modem should be installed outdoors with an unobstructed view of the sky.

Mount sensor(s) to be connected with CCS Modem in accordance with each product's installation documentation.

2.4 Connect Sensors to the CCS Modem

The CCS Modem can collect and report measurement data from up to 2 compatible Met One Instruments, Inc. weather and air quality sensors. The currently compatible sensors are:

- AIO 2 Sonic Weather Sensor — Wind Speed/Direction, Temperature, Humidity, Pressure
- MSO-485 Weather Sensor — Wind Speed/Direction, Temperature, Humidity, Pressure
- 597 Weather Sensor — Temperature, Humidity, Pressure
- ES-642 Dust Monitor — PM2.5, or PM10, or TSP Particulate Mass
- NPM SENSOR SERIAL — PM2.5, or PM10, or TSP Particulate Mass
- E-BAM PLUS — PM10 or TSP Particulate Mass
- Automet 580 — Datalogger and any connected sensors

Connect the appropriate sensor cable(s) to each sensor, and to the CCS Modem's communication ports.

Sensor Connector

Sensor Connector

CCS Power Supply Input

CCS Bottom Connector Plate

2.5 Powering on the Device

Connect the included DC power cable to a 12VDC power source, or optional 9438-4 AC power supply to an AC outlet. Next connect the DC cable connector to the power connector on the underside of the CCS Modem.

Once the CCS Modem 2 and connected sensors are powered on, they will automatically begin to sample and report data to the Cloud at the proper interval (15 minutes in the USA, 60 minutes globally). Please allow several data intervals worth of time for the first data points to appear.

3 Downloading and Viewing the Data

Currently, Met One offers two options for downloading and viewing the data from a CCS MODEM 2 system; a web interface and a windows application. This section will cover both options.

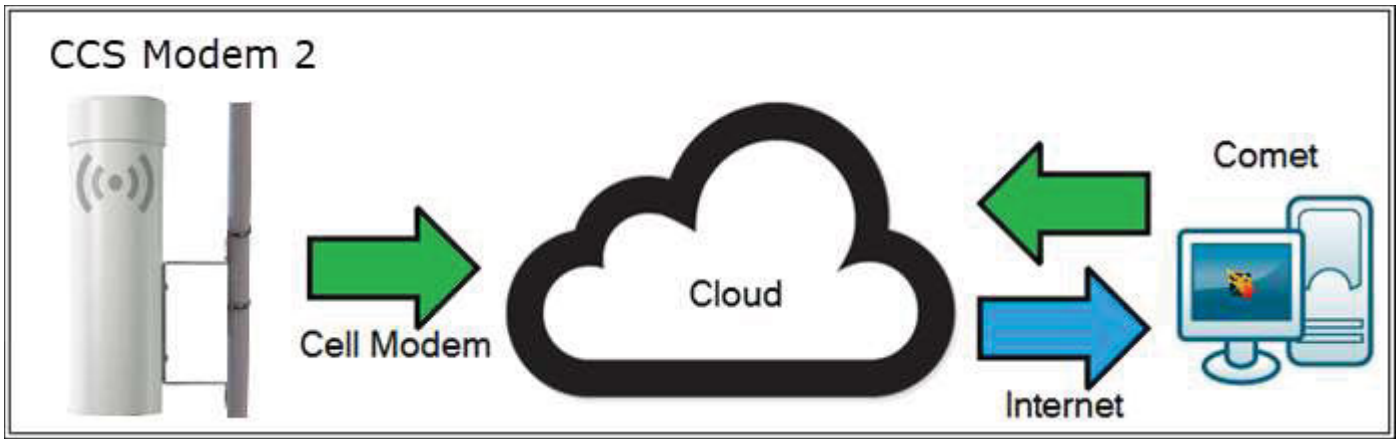
3.1 Comet Software

The CCS Modem is supplied with a CD containing a free copy of the Comet™ program. Comet is a simple, Windows-based, communications terminal program developed by Met One Instruments. Comet allows the user to connect to the cloud and download the data from each CCS cloud service webpage.

The Comet CD also contains a very comprehensive pdf user's manual for the program. Insert the CD and install the program onto the computer that you will be using, reviewing the manual for more operational details.

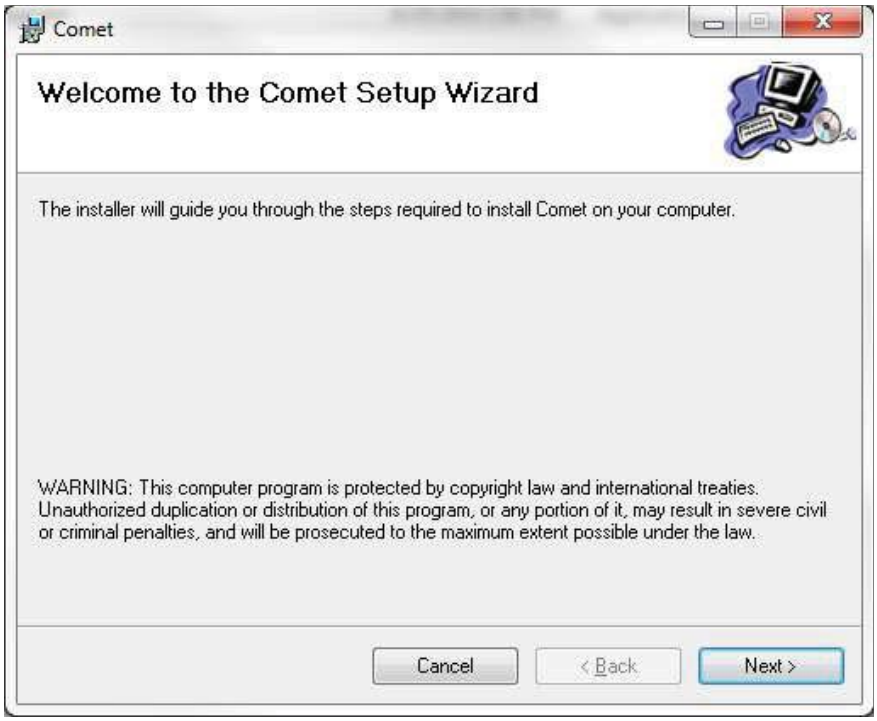
3.1.1 Cloud Service Webpage

The CCS Modem includes a cloud service for storing and viewing its data. Once the CCS modem collects the required number of data samples, it connects to the internet and secure Cloud site and uploads the data to that site. Each CCS system comes with a webpage link for remote, real time viewing of the systems latest data.



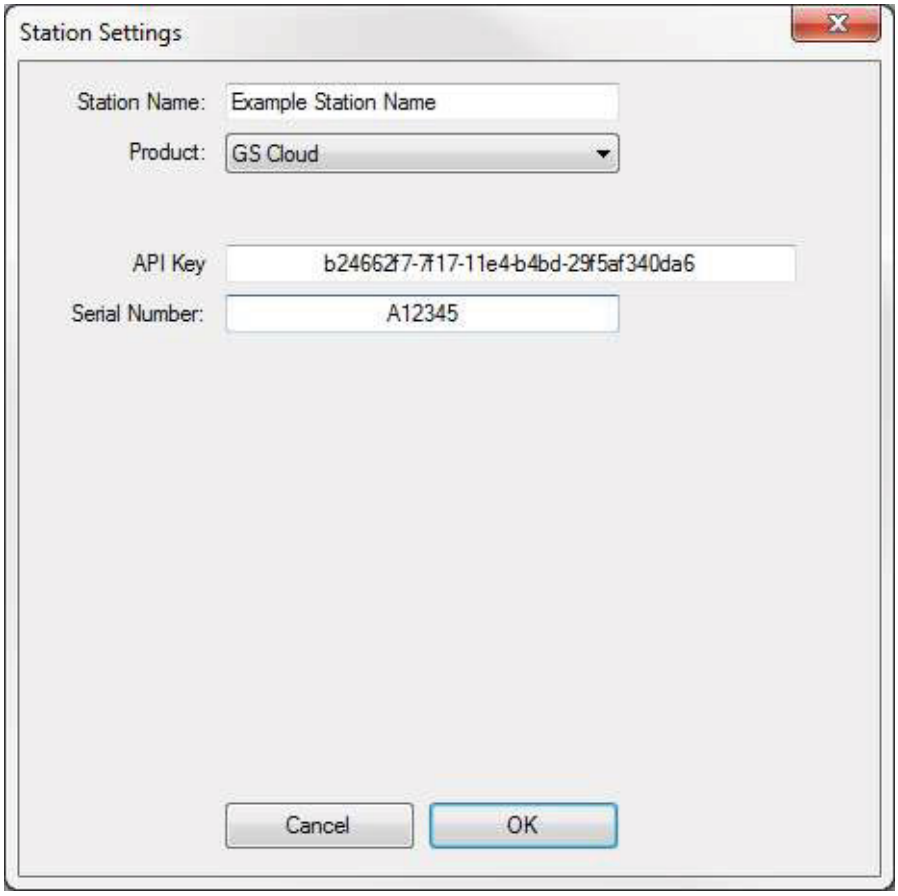
3.1.2 Comet Installation

Insert the Comet CD into your PC and the install program should run automatically as shown in the image below. If an AutoPlay pop-up window appears, select “Run AutoRun.exe”. Select Install Comet to begin the installation process. Follow the on screen instructions until Comet is successfully installed.



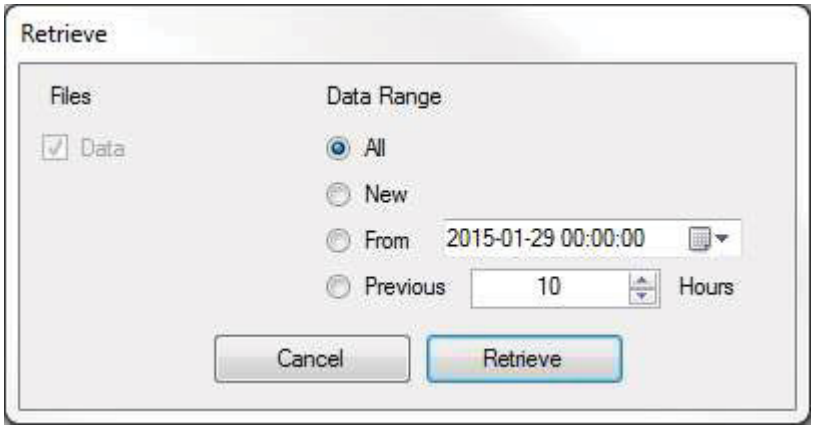
3.1.3 Setting up a Station

When prompted, press the create button to create a new station for your CCS Cloud site. If Comet does not prompt you, go to Station -> New to create a new station. As shown in the image below, give your station a name and choose the GS Cloud plugin from the drop down menu. Users will then need to enter their API key and device serial number in order to authorize the access to the device's data. Press OK to save your station.

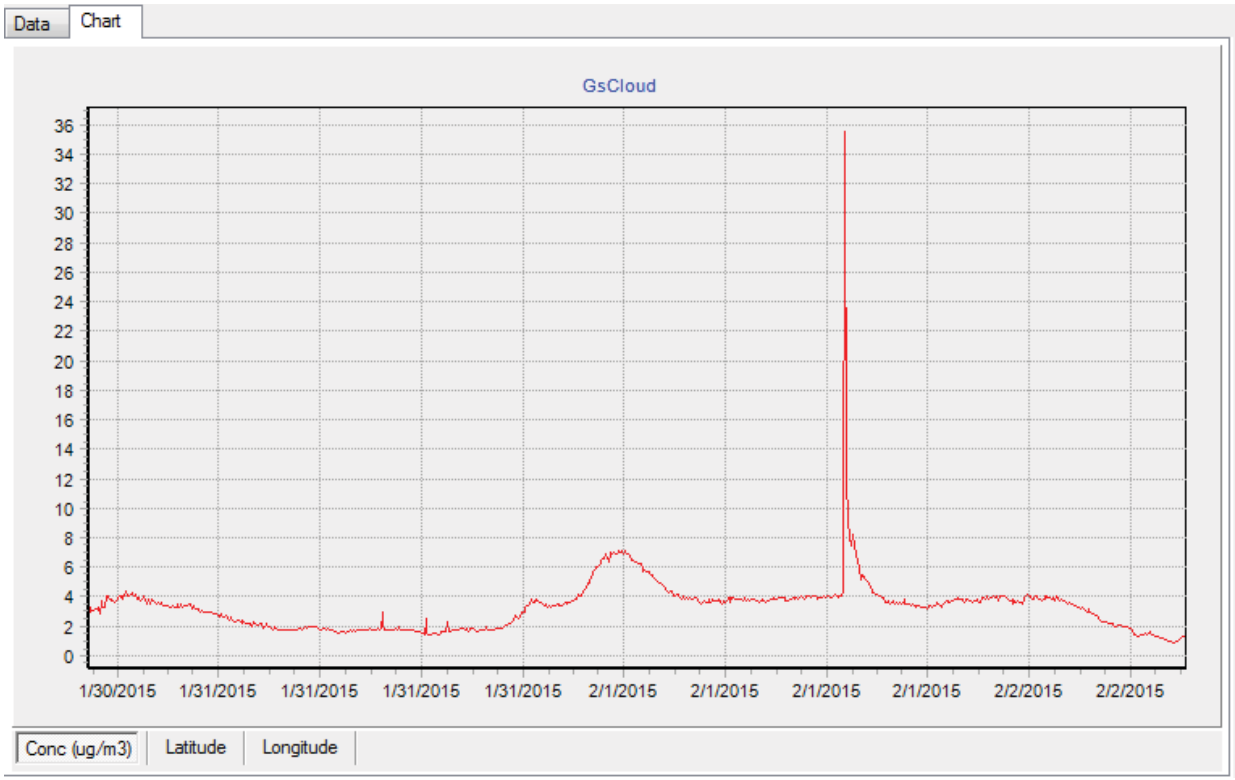


Note: Customers will be e-mailed an API key after their device has been shipped.

Press the Retrieve Current button to open the Retrieve Menu screen. When prompted, enter a data range and press Retrieve to download your station's data from the cloud.



Comet will then connect to the cloud site and download the device's data. Users can then use the data tab and chart tab to visually look at the data. When Comet downloads the data, a CSV file is created in the users My Documents folder.

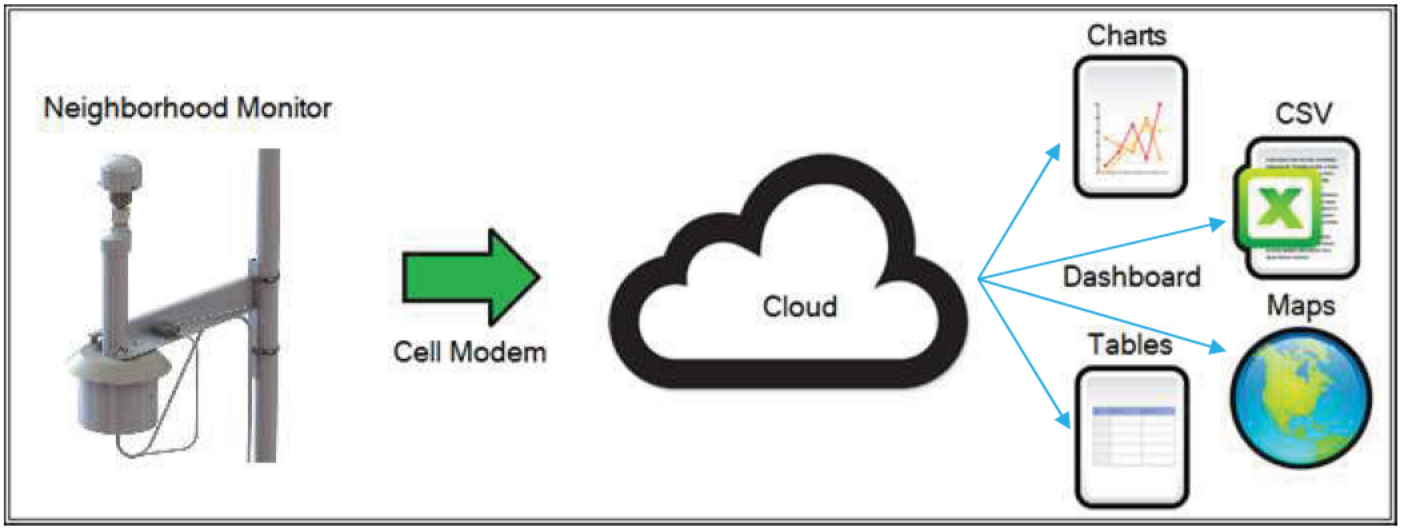


3.2 Web Interface

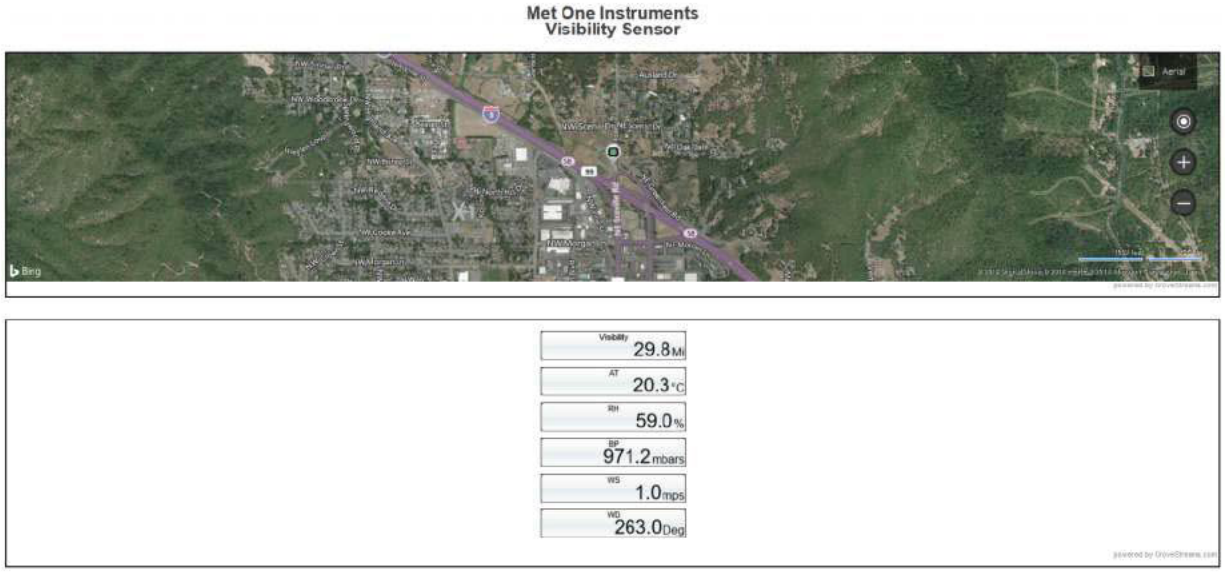
A second method for downloading and viewing the data is through the web portal. Each customer will be sent a private link to a custom dashboard in which users and can view, chart, and download/export their data.

3.2.1 How the Cloud Works

The CCS uses a cloud service for storing and viewing data from the connected sensors. After the CCS collects the data from the connected sensors, it connects to the internet and designated secure Cloud site via its internal cell modem. Once connected It will push the data to the cloud site. Users may then go to their dashboard and graphically view their data.



Below is an example dashboard setup:



Note: Customers are sent a unique web link with their system.

3.2.2 Data Retention

The cloud site stores data for a minimum of 2 years, after which the oldest records may be over-written. Met One recommends users use the Comet utility program to download and data and store the data to a local computer or network. Comet automatically creates a comma separated CSV data file for the current date when a user downloads the data. The CSV file can be found in the My Documents folder.

4 Data Plans and Renewal

The CCS MODEM 2 includes one year of cellular data and website hosting at no extra charge. The cloud service can be renewed by contacting the Met One Service department at service@metone.com or 541-471-7111.

The following data plans are available:

680781	CCS Data Plan, 15 Min USA
680782	CCS Data Plan, 5 Min USA
680783	CCS Data Plan, 60 Min Global
680784	CCS Data Plan, 15 Min Global

5 Troubleshooting

The CCS is designed for minimal field maintenance. Should a CCS data modem require maintenance, refer to the Technical Service section on page 2 of this manual for technical support contact information.

5.1 Suggest Periodic Maintenance Intervals

There is no periodic maintenance required for the CCS data modem.

Attachment D

Model 905 Tripod

Operation Manual

MODEL 905
TRIPOD

OPERATION MANUAL
Document No 905-9800
REV B

Met One Instruments, Inc.
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Distribution & Service: 3206 Main Street, Suite 106, Rowlett, TX 75088, Phone (972) 412-4747, Fax (972) 412-4716
http://www.metone.com

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Manual Title

Technical Support

Should you require support, please consult your printed documentation to resolve your problem. If you are still experiencing difficulty, you may contact a Technical Service representative during normal business hours—7:30 a.m. to 4:00 p.m. Pacific Standard Time, Monday through Friday.

Voice: (541) 471-7111

Fax: (541) 471-7116

E-Mail: service@metone.com

Mail: Technical Services Department
Met One Instruments, Inc.
1600 Washington Boulevard
Grants Pass, OR 97526

Table of Contents

MODEL 905 TRIPOD
OPERATION MANUAL

The Model 905 is a lightweight collapsible tripod designed for rapid deployment and retrieval. It can be easily transported and erected by a single person. It is intended to support a complement of weather or atmospheric instrumentation weighting up to 15 pounds at winds up to 90 mph.

Specification:

Weight	15 pounds
Collapsed length	48 inches
Erected height	6 feet or telescoping to 10 feet. Unit is provided with guy cables when mast is erected to 10 feet height.
Instrument mounting	Top of mast is same diameter as ¾ inch water pipe, to fit most cross arm clasps. All other members are 1-5/16 inch diameter.
Materials	Stainless steel or epoxy painted aluminum.

Transport Mode

When collapsed, the tripod legs are folded upward. The stainless steel release pins are replaced in their holes to prevent loss. The mast is telescoped inward and retained by the long stainless steel release pin. In this mode the overall length is 48 inches and the overall diameter is 9 inches. The guy cables are normally removed in this mode to make handling easier. Place them in the plastic bags provided to avoid tangling and damage.

Erecting

See Figure 1. This is usually easier if the tripod is placed upside down. Remove one of the stainless steel pins and pivot the leg until the tongue bottoms between the two plates on the hub; then reinsert the release pin. Repeat for the remaining two legs. Turn the tripod right side up and stand it on its legs.

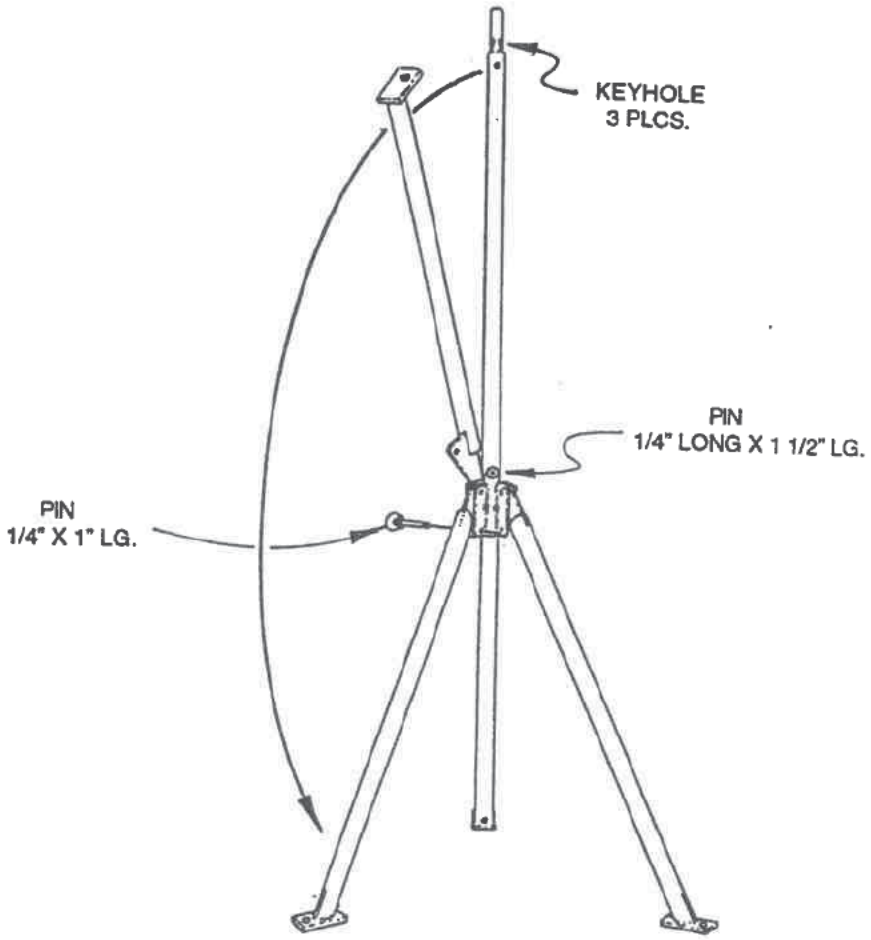

FIGURE 1

Raising and Lowering

At the 6-foot height, the mast release pin will always remain in place to ensure North orientation. If the 10-foot height is being used, note that the telescoping section has two aligned holes, one at the top and one further down. Any alignment made with the mast at six feet will be maintained when the mast is elevated to 10 feet if these holes are used. To raise the mast, simply remove the pin, slide the mast up until the upper set of holes align and re-pin.

Guying

At the 6-foot height, guy cables are not required. At 10 feet the guy cables should be used. To install the guy cables, simply slip the ball end of the cable into one of the holes at the top of the mast, bring the cable down through the slot at the bottom of the hole. See Figure 2. Open the latch at the bottom of the cable and insert the hook into the slit at the bottom of the appropriate leg. Repeat for all three legs. Do not close the latches at the lower ends of the cables until all three cables are attached. To lower the mast, it is necessary to first release all three latches. The guy cables are spring loaded and should never require adjustment.

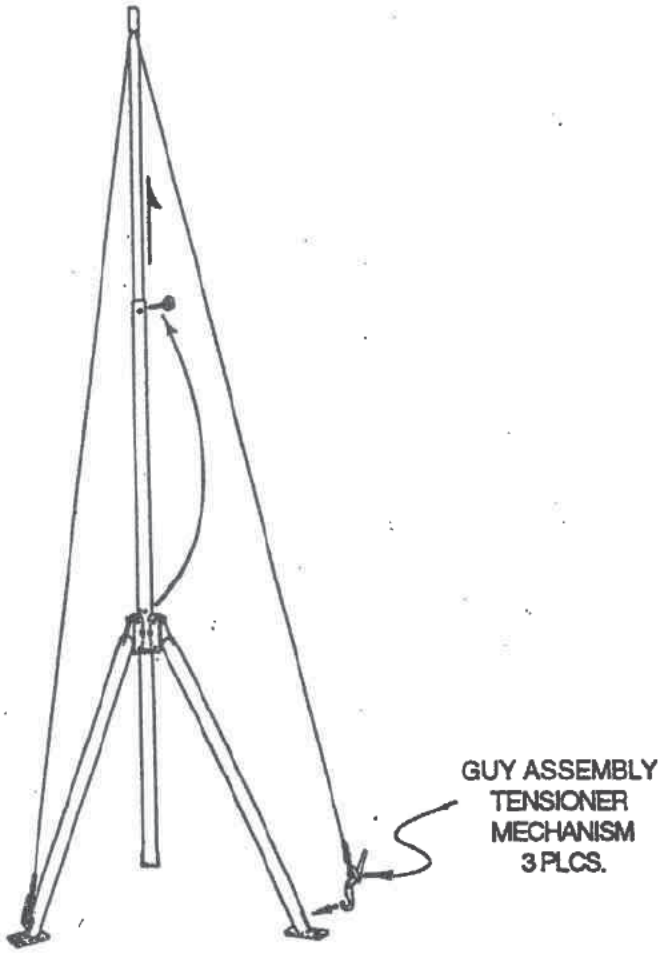

FIGURE 2

Securing the tripod to the ground

The unit will free stand in no-wind conditions. In wind up to 30 mph, the center tether may be used. See Figure 3.

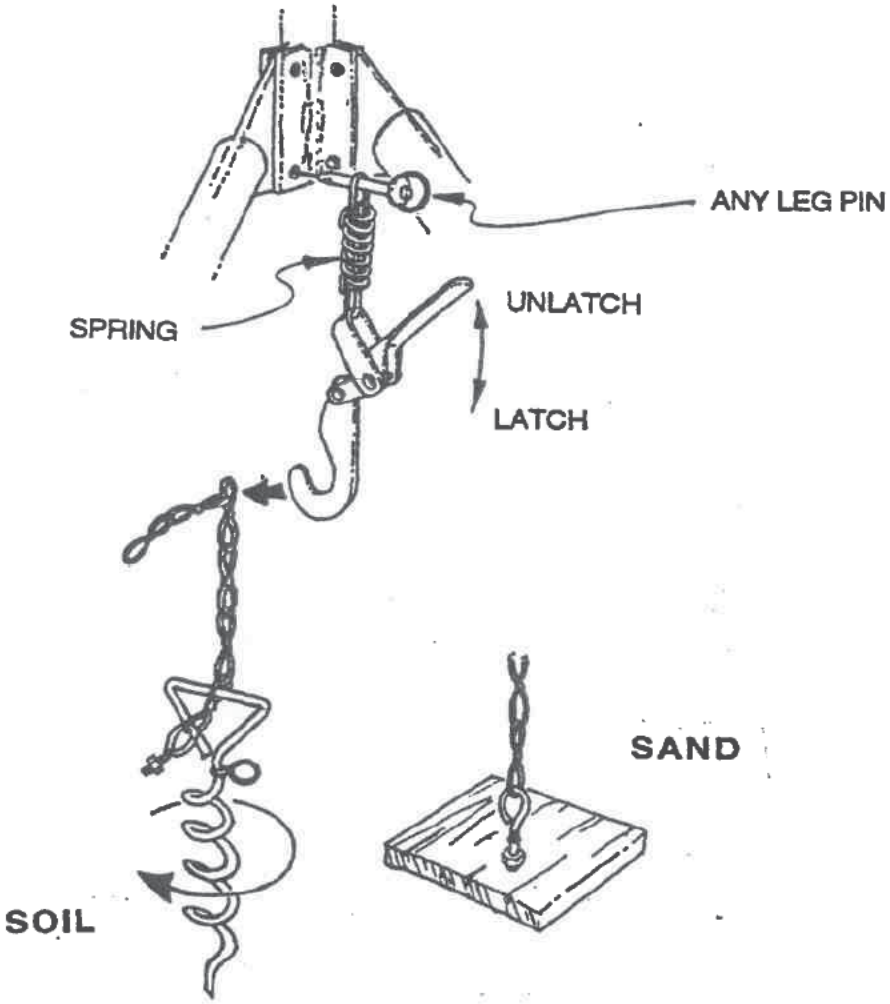

FIGURE 3

The auger is intended for use in firm soil. If the terrain is soft (i.e. sand or snow) the tether can be attached to a buried plate. The tether is supplied with an eyebolt, which may be fastened to a piece of plywood, sheet metal, or other convenient material, then buried. If the legs sink into soft terrain, likewise attach a piece of wide flat material to each leg with a bolt through each foot. Foot pads do not get buried.

The unit can also be staked to firm soil with steel re-bar stakes at each foot.

In winds over 30 mph the unit should be bolted or lag screwed to a solid deck. Holes are provided in the feet for this purpose.

If properly secured to a solid deck and with the guy wires in place, the unit will withstand 90 mph winds.

Replacement parts

The following replacement parts may be ordered from Met One Instruments.

1. Guy wire kit, MOI#10037
2. Short stainless steel release pin. ¼" X 1" (For legs, 3 required), MOI#790232
3. Long stainless steel release pin. ¼" X 1 ½" (For telescoping mast), MOI#790233
4. Ground tether kit, including: latch, spring, chain, eyebolt and auger. MOI#7090-1
5. Replacement guy wires. 1/16" X 105" S.S. ,MOI#975002
6. Mast Guide (top guide) attached to the fixed (outer) mast housing. MOI#3177
7. Mast Sleeve (bottom guide) attached to the sliding (inner) mast. MOI#3176

Warranty

Products manufactured by Met One Instruments, Inc. are warranted against defects and workmanship for a period of one (1) year from the ship date.

Any product found to be defective during the warranty period will, at the option of Met One Instruments, Inc., be replaced or repaired. In no case shall the liability of Met One Instruments, Inc. exceed the purchase price of the product.

This warranty may not apply to products that have been subject to misuse, negligence, accident, acts of nature, or that have been altered or modified other than by Met One Instruments, Inc. Consumable items such as filters, bearings pumps and batteries are not covered under this warranty.

Other than the warranty set forth herein, there shall be no other warranties, whether expressed, implied or statutory, including warranties of fitness of merchantability.

Service

Any product being returned to Met One Instruments, Inc. for service, repair or calibration, including items sent for warranty repair, must be assigned a return authorization (RA) number. Please call (541) 471-7111 or send an email to service@metone.com requesting an RA number and shipping instructions.

All returns must be shipped to the factory, freight pre-paid. Met One Instruments, Inc. will pay the shipping charge to return the product to the end user after repair or replacement of an item covered by warranty.

All instruments sent to the factory for repair or calibration must be free of contamination resulting from sampling chemicals, biological matter, or radioactive materials. Any items received with such contamination will be disposed and the customer will be billed a disposal fee.

Replacement parts or service/repair work performed by Met One Instruments, Inc. are warranted against defects in material and workmanship for a period of ninety (90) days from the date of shipment, under the same conditions as stated above.

REV 2013

ATTACHMENT D
SOIL SAMPLE AREA INFORMATION